COMPETENCIES

OF

CONSTRUCTION MANAGER

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UNIVERSITI TUNKU ABDUL RAHMAN

COMPETENCIES OF

CONSTRUCTION MANAGER

ALASTAIR CHAI HAN RONG

A project report submitted in partial fulfillment of the

requirements for the award of the degree of

Bachelor of Science

(Hons.) Construction Management

Faculty of Engineering and Green Technology

Universiti Tunku Abdul Rahman

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DECLARATION

I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other degree or award at UTAR or other institutions.

Signature : _____

Name : _____

ID No. : _____

Date : _____

COMPETENCIES OF CONSTRUCTION MANAGER

APPROVAL FOR SUBMISSION

I hereby certify that this project report entitled "**COMPETENCIES OF CONSTRUCTION MANAGEMENT GRADUATES IN MALAYSIA**" was prepared by **ALASTAIR CHAI HAN RONG** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Science (Hons.) Construction Management at University Tunku Abdul Rahman.

Approved by,

Signature : _____

Supervisor : Asst. Professor Dr. Olanrewaju Abdullateef Ashola

Date :_____

Specially dedicated to my pillars of strength all these years, and they are no other than my beloved father and mother.

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COMPETENCIES OF

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ABSTRACT

In Malaysia's construction industry, there are no specified statement that outline a construction manager's competencies. Traditionally, the position of project manager are mainly claim out by the architect or the civil engineer. But however there are several problem that found out by studies which is architect and engineers lack in management skills. Although quantity surveyor can handle on the procurement and contract documentation work, but they are still lack in management skill compare with construction manager. CIDB (Plan, 2006), described that, project performance in Malaysia design faults had contributed a mean of 50% to quality failures, and construction faults by 40%, and lastly material with only 10%. Where half of the failure are contribute by construction stage where under the management of construction manager. It have the possibilities that the required skills and knowledge are not sufficient for construction manager in Malaysian industry. It is important to find out which competencies that the industry emphasized on.

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CHAPTER 1

INTRODUCTION

1.1 GENERAL

In this following chapter, the background of the titles in this studies will be defined and continue with clarifying the problem statement and the aim and objective in this studies. Lastly this chapter will end out with the scope of limitation, significance of study and research framework.

Firstly, Construction industry acted as a significant role by framing wealth and improving quality of life in Malaysia. Construction industry also supplied over 1.2 million working opportunities to Malaysia society. Based on CIDB Malaysia, 934590 under various categories registered construction personal (green card). Out of this total, 709,724 personal [75.9%] were local construction personnel.

1.2 Background

By the increasing of the demand on construction industry workforce, Malaysia's higher education system such as college and university are offer more and more diplomas, degree, master even PhD courses which related to construction industry due to satisfy the market workforce demand. *Traditionally the professionals that used to dominate manage on construction project are ordinary from the architect and civil engineer before the adoption of Bachelor of construction management course.* (Sher & Walker, 2013). From the early generation construction carrier such as architect, engineer, quantities surveyor, contractor there are more new specific construction work position are been accepted by construction industry such as project manager and construction manager. Thurs, construction management was published to the society to create such position to improve the productivity and efficiency.

The duties of Construction managers can be delimited as arranging and conformity construction programme sequences and processes. The duties are including permitting, resources supply chains, comply with safety code and both costing and timeline projections. However their work are not covered on the practical construction work. *The changes in the ways construction projects arc procured, designed and constructed had become the fruition that construction management discipline needed to be responded.* (Sher & Walker, 2013).

Cultural and structural reform is needed for Malaysia due to the characterization of adversial and inefficient in Malaysian construction industry. (Kamar, 2012). In Construction industry, a single project may cost on a very huge amount on different phases. Any mistake may cause huge losses. Weakness and factors always have a tide relationship to lack of manpower, quality of production and do not finish work on time.

Besides that, work performance also a key of success. Compare to a high experience labour force, work performance for a fresh graduate is weaker than a high experience worker.

1.3 Problem statement

In Malaysia's construction industry, there are no specified statement that outline a construction manager's competencies. Traditionally, the position of project manager are mainly claim out by the architect or the civil engineer. But however there are several problem that found out by studies which is architect and engineers lack in management skills. For instance, *construction project management that leaded by Architects and civil engineers, there are short of concentration management skills due to architecture and civil engineering degree programs are not covered on management subject for instance finance, economies, management principles, accounting and construction law).*(Sher & Walker, 2013). Although quantity surveyor can handle on the procurement and contract documentation work, but they are still lack in management skill compare with construction manager.

CIDB (Plan, 2006), described that, *project performance in Malaysia design faults had contributed a mean of 50% to quality failures, and construction faults by 40%, and lastly material with only 10%*. Where half of the failure are contribute by construction stage where under the management of construction manager. It have the possibilities that the required skills and knowledge are not sufficient for construction manager in Malaysian industry.

For fostering the next generation of construction manager by resolving the current problem, University played a very important role on producing a qualified new generation of construction manager's skills and knowledge with by teaching them with proper explicit knowledge. *For the knowledge that recorded as word, number, and codes and can found in books, web, and visual and oral mean are defined as explicit knowledge*. (Brennenraedts, Bekkers, & Verspagen, 2006) .

1.3 Aim

The aim that appeared in this study is to explore out the competencies for a degree based construction managers in Malaysian construction industry.

1.5 Objective

In order to achieve the aim, the following objectives developed:

1. To evaluate the competencies of construction manager.
2. To categorize the competencies of construction manager

1.6 Scope plus Limitation

So as to accomplish the aim and objective for this study, the study will individually concentrate on the particular construction companies which currenly operating in Johor and Ipoh, Penang, Kuala Lumpur. Owing to the rapid growth in construction activities which is the Iskandar project, the project had increase the urbanisation development. The construction consultant based employer are not tageted for the respondent in this study. Only employer who currenly/previously worked as construction manager are targeted as the respondant.

1.7 Significance of Study

The employer's working experience and the number of project that involved is sufficient for discover the important competencies for Construction manager on their work and also lead to discover required abilities that specific project work task. Project performance will be affected indirectly. Furthermore, construction manager in our country are not clearly defined. Construction management is a professional job and certain competencies that should be predominated only can be called as a construction manager.

Therefore, this research is significance to raise on the important competencies of the construction manager who holding construction management background. It expected this study can stimulate Universities's faculty, govornment and also CIDB to find out and reconsider education system in order to improve students competencies.

1.8 Research framework

The research methodology has determine the phase of this study,which as followed by:

Figure 1.1 Research process

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The relationship between input Competencies and University's knowledge is direct reflecting each other. In the following section, the study will discuss about the Universities that provide the Bachelor degree of construction management and the similarities and dissimilarities of the program structure. Following up with the profession and importance of construction manager in the industry. Lastly there will be the discussion on competencies of construction manager. The study are going to discuss the types and which competencies are indispensable for a construction manager.

The level of risk in Malaysia *Construction project in Malaysia involving a high level risk during construction phase and it is deem with much higher than other types of economic function.* (Personal, Archive, Siew-ling, Mansor, & Khim-sen, 2012). According to ministry of housing and local government Malaysia, there are 4.52% of the project are characterize as sick project in private sector. Which mean there are 169 out of 3737 project until July of 2015. Therefore, that essential for this study to getting out due to encounter the current situation in construction industry.

2.2 Construction sector in Malaysia

As a definition, the construction industry development board had redefined the term of construction management.

Figure 2.1 Redefining construction management of CIDB, CIDB (Plan, 2006)

With holding a construction management degree also useful in getting several profession job which included building control surveyor, facilities manager, constructor, construction superintendent, production manager, project manager, general construction manager, executive construction manager, general contractor, contractor, and subcontractor.

The classification of residential construction, non-residential construction and engineering construction are the main kind of construction in Malaysian construction industry. Malaysian construction industry is in the highly competitive market which locate around Johor Iskandar, Klang valley and developing cities in every state.

Malaysian construction industry had contributed RM 32.2 billion to Malaysian GDP with the increase of 9.6% based on year 2013 until March of 2014. Table 2.1

Table 2.1 GDP and price of economy activities contribution

	2010	2011	2012	2013	2014
	RM.bill	RM.bill	RM.bill	RM.bill	RM.bill
1	**635.7**	**666.9**	**693.1**	**736.3**	**780.6**
2	**51.3**	**54.3**	**54.8**	**56.3**	**58.0**
3	**66.2**	**62.6**	**63.4**	**64.9**	**66.9**
4	**170.3**	**178.2**	**186.7**	**192.8**	**200.1**
5	**21.5**	**22.5**	**26.5**	**29.3**	**32.2**
6	**359.8**	**385.2**	**410.0**	**432.3**	**457.1**
Inflation		**3.2**	**1.6**	**1.6***	**2.0~3.0**
1= GDP2005, 2=agriculture, 3=Mining, 4=Manufacturing, 5=Construction, 6=Services					

Although Malaysian construction industry getting better by increasing in total amount of money (Table 2.1) but Malaysian construction industry still facing on several challenges on Malaysian construction sustainability. Stakeholder are taking attention on sustainability due to the interest on the project. (Chan, Lee, & Lee, 2014)

The one of the challenges that Malaysian construction is facing now is Constraint of finance. For the sustainability for the construction industry, protection of environment, economic and social development are needed to be maintain for the balance. (Shen and Vivian, 2010).

Besides that, there are another challenges that related to this study which is the awareness and knowledge in construction industry. It is very important that the awareness on the stakeholder in the construction project to sustain on construction industry. Furthermore lack in related knowledge are also the factor to sustain construction industry. New generation are some of construction issue are not giving at precedence. (Chan et al., 2014)

2.3 Table 2.2 Universities that provide Construction management Degree course in Malaysia

University	Faculty of Program	Program Duration	Location	Public/ Private University	Part time
Universiti Tunku Abdul Rahman (UTAR)	Faculty of Engineering and Green Technology	3 years	Kampar, Perak	Private	Yes
Universiti Teknologi Mara (UiTM)	Faculty of Architecture, planning & surveying	3.5 years	Shah Alam, Selangor	Public	No
Universiti Sains Malaysia (USM)	School of housing and Planning	3 years	Penang	Public	No
Limkokwing University of Creative Technology	Faculty of Architecture & The built environment	3 years	Cyberjaya, Kuala Lumpur	Private	No
Universiti Tun Hussien Onn Malaysia (UTHM)	Faculty Technology Management and Bussiness	4 years	Batu Pahat, Johor	Public	No
Infrastructure University Kuala Lumpur (IUKL)	Faculty of Engineering and Technology Infrastructure	3 years	Kuala Lumpur	Private	No
Linton University College	Quantity Surveying and Construction Management	3 years	Ipoh, Perak	Private	No
Wawasan Open University (WOU)	School of Science and Technology	5 years	Georgetown , Penang	Private	Yes

In Malaysia society, there are only 8 universities that offer the Bachelor degree programme of construction management where included Universiti Tunku Abdul Rahman by Faculty of Engineering and Green Technology (table 2.2). See (appendix 1) for details of programme structure. The aim of the program is to ensure graduate student to be competitive in the construction industry. For instance, the construction management course aim to *offer learner to comprehend on complete construction and progress procedure, on the opening from the client's brief distributed to the lead advisor followed by the design and planning stages to the construction, finish, occupation and maintenance of the facility. (UTAR, 2015).*

Universiti Teknologi Mara by Faculty of Architecture, planning & surveying (table 2.2). *The faculty emphasis on* ***procedure***, ***analysis*** *and minutiae comprehension of theories and way applied in construction and development* (UiTM, 2014). Universiti Sains Malaysia by School of housing and Planning, *the structure contain the aim of the School to exploit a larger range for complex and creative skills, knowledge and activities cope with built environment.* (USM, 2014). Limkokwing University of Creative Technology by Faculty of Architecture & The built environment, faculty of university *emphasize on more management knowledge and skill which included management in Contract, building, economies and software are also studied within this field*. (LIMKOKWING University, 2015).

Universiti Tun Hussien Onn Malaysia by Faculty Technology Management and Business. In UTHM, the duration of course is 4 years due to the industrial training for the course is 6 month. It is result to the University are putting afford on letting student taking more experience and tacit knowledge before entering to real job. Infrastructure University Kuala Lumpur by Faculty of Engineering and Technology Infrastructure. The course in the faculty emphasize that *procuring and directing human and physical resources for the successful and prudent realisation of a construction project*. (IUKL, 2015).

Linton University College by Quantity Surveying and Construction Management. In the finding in Linton University, the website only provide information about quantity surveying and leak information for construction management but they still offering CM course. Wawasan Open University by School of Science and Technology. The duration for this course consumed 5 years to finish due to the course is completed by part time learning. Overall all the universities, the duration of the course is mostly 3 years only.

2.4 Similarities and dissimilarities within the Universities Program structure

Among all the University which provide the program of construction management degree, the Universities program structure shows the required competencies and understanding for CM. *The industry is expecting the fresh graduates that generated by the universities are prepared and ready to work for the particular career in term of predominate the competencies, knowledge and skills for the job, good attitude and interpersonal skills with high integrity plus the capability to learn* .(Kementerian Pengajian Tinggi Malaysia, 2012).With the absence of University subject, the similarity of major and core major subject of construction management degree course among the universities in table 1 are listed in table

Table 2.3 similarity and dissimilarity among University course structure

Similarities	Dissimilarities
1. Project management 2. Environmental science 3. Management principle 4. Building service 5. Construction economic 6. Construction estimating 7. Financial management 8. Value management 9. Contract and procurement 10. Legal system and construction law and administration 11. Surveying and fieldwork 12. Safety and health 13. Building measurement 14. Construction material 15. Building technology 16. IT and CADD 17. Building structure 18. Study of drawing 19. Research methodology	1. Engineering graphic 2. Sustainable development and design 3. Building and civil engineering qualities 4. Properties management 5. Qualitative and quantitative analysis 6. Professional practice management

The particular subject is characterized by the similarities of the knowledge and skill in that particular subject although the title of the subject is different. However not all of the Universities having exactly same program structure. There are several similarities and dissimilarities due to the difference in University prospection on the Input competencies to the particular career. In spite of there are differences in program structure, but all of the Universities that provide construction management degree course had approved the qualification from The Malaysia Qualification Agency (MQA)

2.5 Table 2.4 List of stakeholders in construction in industry

The list of the numbers of stakeholders in construction project is depends on the size and the complexity of the project. The list of the stakeholder in this study in only stated out a part of them but not completed.

1. Client	13. Structural Engineer
2. Project Manager	14. Geospatial Modeller
3. Investors	15. Quantity Surveyor
4. Suppliers	16. Building Surveyor
5. Financial firms	17. Hydrographic Surveyor
6. Regulatory authorities	18. Construction Manager
7. Managing Director	19. Site Supervisor
8. Chairman	20. Planner
9. Site Supervisor	21. Facilities Manager
10. Civil Engineer	22. Town Planner
11. Buyer	23. CAD operator
12. Architects	24. Estimator

2.6 Profession in Construction management

In construction industry, there many kind of profession who used their skill and knowledge to work together as a team to achieve on the objective. There 4 kind well known profession which included Architect, Engineer, quantity surveyor and construction manager.

2.6.1 Architect

Architect is the person who have obligation on the design for a construction project. Architect also own the duties to the client on issue the drawing, plan, and specification within the reasonable time. He is also act as a consultant in the construction organization for any recommendation that related in construction project. Architect also responsible on issuing certificate under building contract which included interim certificate, practical completion certificate, making good defect certificate and final certificate. However, these are only a part of the obligation of an architect. *During the design phase, the architect may call to account to draft a programme for planning permission or preparation of tender document for contractors and finally give recommendation to contractor regarding the appointment.* (Archi-, 2014).

2.6.2 Engineer

In general, there are several kind of engineer that involve in construction project. For instance, environmental engineer, structural engineer, geotechnical engineer, transport engineer, water resource engineer. Generally engineer are liable on planning on particular section in construction project. Surveying, engage with research, analysing, planning the engineering construction and supervise all the way from starting to finishing are the job scope for engineer. Information are provided to relate parties in order to avoid any issues occur in every stage of the construction. However the numbers and kind of engineer are also depends on the size and complexity of the project.

2.6.3 Quantity surveyor

Quantity surveyor, the person who liable on the monetary sector in construction project in general. Besides on calculate in the cost of the project, quantity surveyor are also responsible on managing on the efficiency of budgeting, estimating and contracting. *Predicting, analysing, scheduling, monitoring and accounting are the basis of providing an appropriate management in cost by Quantity surveyor*. (Nkado & Meyer, 2001). Furthermore, quantity surveyor are also take part on resolving any conflict between the parties in the agreement.

However, this study is only focus on the profession on construction manager. In Construction industry development process, it included large span of sectors to work in a team to achieving on the final output. Construction management is a complete procurement management system for construction development. It also act as an aegis and affluence for the built environment. In construction industry management technique had been brought to the construction process due to improve work performance and have a consummate procedure. Management technique played a very major role on construction company's strategies. *Bad rate of annual growth in Construction Company was leaded by the drop in construction accomplishments since 1985 to 1987. Flexible management style had implemented by Construction companies as the prior tactic of survival. (* Abu bakar & Yusuf, 2011)

2.7 Construction manager

As the company getting a complex and bigger project, a management leader should be awarded to maintain or improve the efficiency and productivity of the particular project. *The significant factors that advanced a projects all long to productivity are having a construction manager to manage on the project*. (Sabet & Ansari, 2014). *During construction project, a construction manager played as a business body that assist the adoption of the construction management project delivery system*. (Zwikael & Ahn, 2011)

Construction manager is the person who manage the construction process and liable on the project and from the initial stage until the final finish and make sure the work finish on time. The objective of a Construction manager that needed to obligate to precise on the limited resource in order to obtain cost effective strategies to complete the schedule within the budget. *Construction manager act as the main role of consort the function around the project management process with the several members of construction team to guarantee all of the members perform the right tasks at right time* (Clements & Gido, 2012).

Furthermore, construction management also needed to be accomplish such as setting a realistic goal and monitoring and controlling the construction project, and any related management task. *The interchangeable obligation of the construction manager consist of administration, consultation, assistance, budgeting, checking, consulting, coordination, documentation, estimation, evaluation, expedition, management, planning, recording, reporting and scheduling* (Shaker, 2007)

Table 2.5 Duties of construction manager

Predesign phase	Design phase
1. Develop scope of project and areas of use 2. Conduct market research 3. Collect typical operating costs, tax information, etc. 4. Establish models for optimizing return on investment 5. Develop broad outline Schedule 6. Develop conceptual budget 7. Evaluate financing sources and Alternatives 8. Develop target design fees 9. Develop feasibility study Report 10. Establish cash flow projections 11. Determine organization and 12. staffing to administer project 13. Outline responsibilities of the project team 14. Establish basic communication procedures 15. Prepare contractual Agreements 16. Establish reporting and accounting procedures 17. Interview and select architects, engineers, estimators, land surveyor, and other consultants 18. Conduct site evaluation 19. Select project delivery system (traditional, D/B, multiple primes) 20. Explore partnering possibilities between parties	1. Assist designer in preparing detailed design schedule 2. Interview and select special consultants 3. Develop security loss prevention program 4. Arrange survey monitoring of adjacent properties 5. Liaise with owner's legal Counsel 6. Develop bid package formats 7. Identify and purchase long-lead items 8. Develop phased construction schedule 9. Initiate preliminary insurance review 10. Arrange and chair design coordination meetings 11. Oversee the production of schematic drawings 12. Prepare outline Specifications 13. Identify, review, and recommend special areas of study 14. Prepare and analyze alternate design schemes 15. Conduct constructability Reviews 16. Conduct value engineering Analysis 17. Coordinate engineering Designs 18. Arrange for models, mock-ups, renderings, etc. of key design elements 19. Conduct public Consultations 20. Review operating and maintenance costs 21. Establish general conditions of contract 22. Evaluate labor and trade contractor markets 23. Prepare general or trade contractor bid lists 24. Monitor cost estimates as details develop 25. Update cash flow Requirements 26. Establish insurance Program 27. Assemble tender documentation for owner's confirmation 28. Finalize selection of architectural components and Systems 29. Liaise with jurisdictional authorities over design details 30. Review working drawings and specifications

Table 2.5 Duties of construction manager (continue)

Bidding phase	Construction phase
1. Review and weigh owner's proposed procurement systems 2. Advice method of choosing contractors 3. Create bidding calendars 4. Advice breakdown of bid packages to be let 5. Issue invitation to bidders 6. Conduct campaign to increase 7. bidder interest 8. Prepare sets of bid documents (general and special conditions, contract forms) 9. Establish prequalification criteria for bidders and prequalify bidders 10. Prepare documents for alternative bids 11. Evaluate requests for substitutions during bid phase 12. Prepare, review, and distribute addenda 13. Maintain a log of bidders 14. Establish and conduct prebid Meetings 15. Establish and conduct bid Openings 16. Accept, evaluate, and examine bids for responsiveness and price 17. Conduct post bid conferences 18. Notify bidders of bid results 19. Negotiate with bidders 20. Assist owner in contractor selection 21. Organize and conduct preaward meetings 22. Assemble, deliver, and execute contract documents 23. Assist owner in the award of contracts 24. Approve subcontractors and 25. Suppliers 26. Issue notice to awarda 27. Prepare forms of contracts and proposals	1. Project team 2. Meetings handling Guarantee on approvals, permits, and licenses are obtained 3. organize access to momentary facilities and services 4. Begin system of cost control 5. Oversee once-a-month on accounting review 6. Bring up to date on cash flow 7. Begin shop drawing submittal Procedures 8. Expedite deliveries 9. Obtain schedule updates from trades and suppliers 10. Evaluate progress and update Schedule 11. Establish payment procedures to contractors and suppliers 12. Approve monthly progress Billings 13. Report to owner monthly progress, payments, costs, and trends 14. Review submissions for design requirements compliance 15. Receive, record, and schedule turnaround of submissions 16. Review and approve change Orders 17. Coordinate distribution of change order information 18. Facilitate settlement of contract disputes Administer safety and security programs 19. Deal promptly with labor relations problems 20. Arrange inspections by jurisdictional authorities 21. Establish reasonable dates for substantial completion 22. See that no liens exist for the work 23. Verify all deficiencies and Outstanding documents are Completed 24. Establish reasonable dates for final completion 25. Approve final payments to Contractors 26. Inspect and monitor conformance to design 27. Select independent testing companies 28. Administer quality assurance and control programs 29. Verify monthly progress billings against actual work to date 30. Issue certificate of substantial Completion 31. Issue punch list at substantial completion 32. Issue certificate of final completion 33. Review and evaluate documentation of claim by trade contractors

Table 2.5 Duties of construction manager (continue)

Post construction
1. Advise owner of expected 2. Liaise with operating staff manager to arrange training. 3. Obtain and verify guarantees 4. Obtain and verify "as-built Drawings 5. Coordinate commissioning, testing, balancing of all systems 6. Arrange acceptance and approval of completed facilities 7. Transfer facility to owner's "care, custody, and control's 8. Arrange final photographs and publicity releases 9. Arrange opening ceremonies 10. Perform final accounting 11. Prompt contractors to rectify Deficiencies 12. Liaise with jurisdictional authorities for certificates and permits 13. Verify all guarantees, manuals, and documentation are received 14. Recommend holdback Releases 15. Assist in expediting guarantee items 16. Conduct post occupancy evaluation

2.8 Competency of construction manager

Competency can be defined as a combination of a knowledge, skills, and behaviours that effective the output of a particular work task or job. (Harvard University). In the others way an individual needed competency to carry out on a particular work task. Competency can be determined by the study of the particular work task. In the view of construction management, *the competencies for a construction manager is the capability of the CM to perform in a required standard. In this current society, the complexity of the construction project go increasing and condition on construction manager faced on more challenges, as a result complementary competencies are required for CM*. (Torres-machí, Carrión, Yepes, Pellicer, & Asce, 2013).

Not only on additional require competencies, synchronize of the competencies for construction manager also have to emphasize due to reach the output. *For the successful output, the required construction technical knowledge and behaviours has to combine by CM in order to stimulate effective teamwork and communication*. (Dainty et al., 2005).

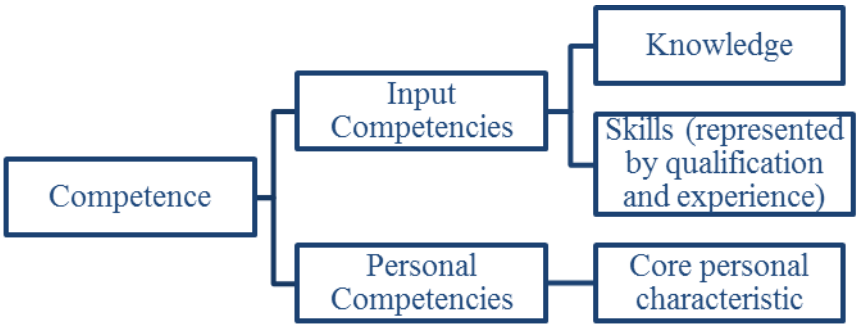

Figure 2.2The types of Competencies

The competencies can be classified into two categories (Figure 2.1) which is input competencies and personal competencies. The input competencies can be delimited to the information of comprehension, skills and capabilities that a worker brings to a job. An individual competencies is the essential characteristic original in a person ability to implement on a job. This research is focus on the which input and personal competencies that the construction manager should emphasize in the industry.

2.8.1 Personal competencies of construction manager with construction management background

The personal competencies is shown by the core personality characteristic of the construction manager. Away from the construction related skills, the personal competencies are required to handle managerial-related work task for a construction manager. Differences personality manager's preferences are leaded to consecutive alteration in associated behaviours, it can occasion in very specific patterns of communication with subordinates. *That is the reason why the required competency in term of skills, knowledge and behaviour should be possessed by construction manager*. (Crawford, 2000). The example for personal competencies are shown in table 2.6

Table 2.6 types of personal competencies

Global competencies	Managing change	Planning and organization	Personal skill	Result orientation	Leadership
Competencies	-Initiative -Risk taking -Innovation -Elasticity and adaptableness	-Critical thinking -Decision creation -Arrangement -Quality focus	-Spoken communication -Sensitivity -Relations -Cooperation	Accomplishment -Costumer focus -Awareness in business -Learning orientation	-Authority and presence -Motivation -Human development -Elasticity

Source: (Arditi & Balci, 2009)

2.8.2 Table 2.7 Competencies of construction manager

1. Communication(oral/written) 2. Motivation of others 3. H&S 4. Decision making 5. Predicting and planning 6. Cost budget control 7. Observation to employee 8. Team building 9. Quality control and assurance 10. Managing time 11. Materials planning and control 12. Human resource planning and control 13. Set objective and goals 14. Directing meeting 15. Managing conflict/crisis 16. Hiring/award: supervisor/foreman 17. Delegating responsibilities 18. Maintenances of Program 19. Tenant welfare 20. PR 21. Hiring/ award: subcontractor 22. Employee training: supervisor/foreman 23. Competitive tendering 24. Investigation of project risk/uncertainty 25. Programme design 26. Identifying personal strengths/weakness 27. Employee training: management 28. Site safeties 29. Productivity maintenance and control 30. Negotiate: client 31. Costing and estimating 32. Rival awareness 33. Managing change 34. Hiring/ award: : management 35. Negotiate: main contractor 36. Negotiate: subcontractor	37. Organization of communication system 38. Managing job stress 39. Hiring/ award: manual labour 40. Plant planning and control 41. Negotiate: supplier 42. Creativity 43. Career development and appraisal 44. Decanting buildings 45. Tactical planning 46. Construction legation 47. Property protection 48. Organization structure 49. Dissolution: subcontractor 50. Job analysis/specification 51. Working regulation agreement 52. Dissolution: supervisor/foreman 53. Contract drafting 54. Sources of finance 55. Employment legislation 56. Client/consumer protection law 57. Promotion and transfer 58. Employee welfare/counselling 59. Negotiate: Government bodies 60. Advertising and promotion 61. Market research 62. Termination/dismissal: manual labour 63. Termination/dismissal: management 64. Company law 65. Use of computer technology 66. Negotiate: trade union 67. Organization culture 68. Planning law 69. Managing others national culture 70. Demotion and retirement 71. Foreign language Source:(Steinman, Deshpande, & Farley, 2000)

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

In previous chapter which is literature review, theoretical statement and idea are collected by the researcher. However, all of the statement was a second hand data which researched by others researcher. Besides that, in nowadays the world keep changing. Theoretical data and statement might needed to be updated for more accuracy research. Especially on a research with less information such as the title for this research, a latest data and information are needed to conduct and provide for the following analysis.

In the coming chapter, Firstly the research will discussion on how the problem statement are formed and the formulation of objectives followed by the discussion of the review of the literature review. Secondly, the formation of questionnaire will be explain and analysed in detail. Thirdly, results gathered from the questionnaire will also be critically examined.

3.2 Methodology

In this research, an ordinary research procedure are conducted. The sequence started with the identification of problem statement, formation of aim and objective due to counter on the problem, continuing with collection of secondary data then primary data (questionnaires), analysis of data, conclusion of research and the lastly on formulating recommendation for the research. The research ends with a formal presentation and feedback from supervisors and panel judges.

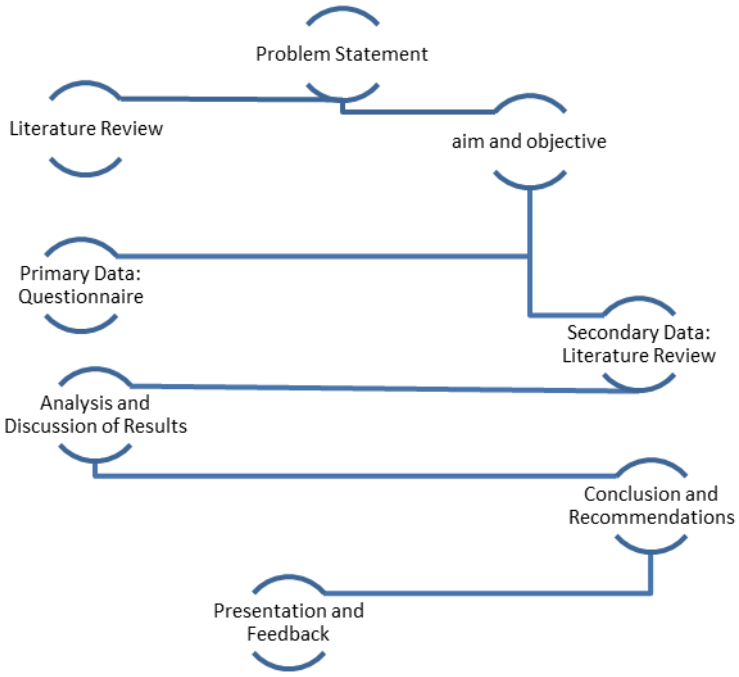

Figure 3.1 Research methodology

3.2.1 Problem statement

In Malaysia's construction industry, there are no specified statement that outline the critical construction manager's competencies and traditionally, the position of project manager are mainly participated by the architect or the civil engineer. But how ever there are several problem that found out by studies which is architect and engineers leak in management skills. Although quantity surveyor can handle on the procurement and contract documentation work, but they are still leak in management skill compare with construction manager. So it is critical to solve this problem in our construction industry. Besides that, there half of the failure are contribute by construction stage where under the management of construction manager. It have the possibilities that the required skills and knowledge are not sufficient for construction manager in Malaysian industry.

3.2.2 Aim and objectives

The aim is to counter the problem that faced in this research. In this research the problem is surrounding on the University Graduated "CM" competencies. To find it, it is essential to know what is a construction manager is. Then, it is important to know what kind of roles for a construction manager in Malaysia construction industry. In order to find out the competencies for a graduated CM, consideration in University course structure are also a part in this study. With all of the finding in this study, we are able to process out the ordinary competencies for a construction manager. And lastly the real definition in term of competencies for a construction manager will be stated out.

3.2.3 Secondary Data

All information regarding to the role of construction manager and its competencies were combined in literature review. During the same time, University course structure are also been used to analyse the input competencies for a graduated construction manager. Also, the definition of the competencies are stated out in literature review. This step was carried out to justify and conclude the competencies that provided by University in Malaysia. Then, all factors that related to CM competencies were identified for the purpose of providing suitable recommendations later on.

3.2.4 Primary Data

There are several quantitative data collection methods which are observation, survey and interview methods. Survey method is chosen for this research because the targeted population are in several areas, such as KL, Johor, Penang and Perak as well. Survey questionnaire by hand/postage/online does not require the researcher to travel, which saves on cost, and also does not require the researcher to travel from place to place, and thus saves on time as well.

3.2.5 Targeted Respondents

The targeted respondents are focus on contractor based employer and consultant based employer are not targeted in this study. Due to the reason of consultant based employer might offering a consultant based job or work task to a graduated CM. There are only contractor based employer familiar on the construction management work task and competencies. Although there are no proper way to finding out a contractor based employer which hiring a graduated CM, a contractor based employer which hiring a graduated CM will be finding out through interviewing.

3.2.6 Questionnaire

Online survey questionnaires will be sent out for the purpose of gathering primary data for importance on competencies for a graduated CM toward the construction manager in Malaysia's construction industry. These questionnaires will be sent to employer who hired a graduated CM. The first batch respondents are searched through past University Graduated CM. for the following employer are to be searched by interview after the questionnaire are sent out by handling. Firstly, respondents will be prompt for their details to avoid incomplete return of questionnaires.

For the importance of the competencies of CM, Likert Scale of 5-point is used to assess respondents' overview on a statement. The meaning of each rating is as follows:

1	-	Least important
2	-	Less important
3	-	Slightly important
4	-	Important
5	-	Very important

3.2.7 Reliability Test and validity test

There are three (3) forms of reliability namely test-retest reliability method, alternate-form reliability test and internal consistency reliability test. Validity test is implemented for obtaining a good covariance between each component. There are various kind of validity test which consisted Communalities and Principal Component Analysis.

In test-retest reliability method, a particular questionnaire is given out to the respondents at a said time, and then given to them again after a given period. In alternate-form reliability test, the questionnaire is separated into two or more

versions. In these versions, different words of the same meaning is used to represent the question or answer. Lastly, in internal consistency reliability test, however, it only requires the questionnaire to be completed once (without the need for pre-test nor post-test). The first two methods do not provide a coefficient to determine reliability, and we need an alternate method of calculation such as Pearson's correlation or ANOVA test. Hence, due to simplicity offered by internal consistency reliability test (one-time method), and also suggested by (Zinbarg et al, 2005), Cronbach's Coefficient Alpha was used. It was also stated that this coefficient is important for both reliability and validity test.

Cronbach's Coefficient Alpha

The formula of for CC Alpha is as follows:

$$CC\ Alpha = \left[1 - \frac{\sum(positive\%)_i(negative\%)_i}{Variance}\right]\left[\frac{k}{k-1}\right]$$

The measurement of the alpha value should between 0.6 and 0.9 for a good reliability

3.2.8 Analysis and Discussion of Results

The collected data will be stored and analysed using Statistical Package for Social Science (SPSS) and also weighted average method. Then, discussions will be carried out to justify the data collected.

3.2.9 Conclusion and Recommendations

Upon finishing the analysis and discussion, a summary of the findings are made. List of recommendations to tackle the low implementation of VM in construction projects are also made here nonetheless.

3.2.10 Presentation and Feedback

Finally, a short presentation will be held where panel judges will give their critics to stimulate improvements on the current research.

CHAPTER 4

DATA ANALYSIS

4.0 Introduction

In chapter 4 of this studies, the presentation of the result from the data that collected from the questionnaire will be further discusses and analyse. The presentation comprised preliminary analysis of data collected, background of the respondents and graduates or candidates, validity test and reliability test of the measurement, ranking of the competencies that need by CM's graduates.

4.1 Preliminary Analysis

The survey questionnaire of this study is distributed to 400 respondents which based on calculated sample size with a range of 300 sets as shown in Chapter 3. The data collected via face-to-face (by collaboration with internship students to their company) and online survey questionnaire. From data screening, only 94 sets (23.5%) are useable survey questionnaires from the overall of 101 returned sets.

Table 4.1 Preliminary Analysis

Description	Quantity	Percentage (%)
Total questionnaire was distributed	400	100%
Total questionnaire was returned	101	25.25%
Useable questionnaire	94	23.5%
Incomplete questionnaire	7	1.75%

4.2 Respondent Demographics

CM graduate's superior was targeted in this studies and the selection based on the organization that hired CM graduates. The following sections will have a further discussion on respondent's professional background, highest academic qualification. Organization, current position, years of working experience, number and types of projects had involved in 10 years. Besides that, respondents' candidate details such as years being working in the organization, University, gender, title of position and whether is the first place of work after candidate graduate.

4.2.1 Professional background of superior

In the light of figure 4.1, the figure shown that the highest rate of professional background which goes to engineering (35%) with the number of 35 out of 94 respondents. This is continued by architecture (30%) with the respondents of 28 out of 94. Respondents who holding a construction management background occupied 22% which consist of 21 respondents. Respondents who holding with quantities surveying and estate management were the least amount in overall sample which consisted 10% and 1% respectively.

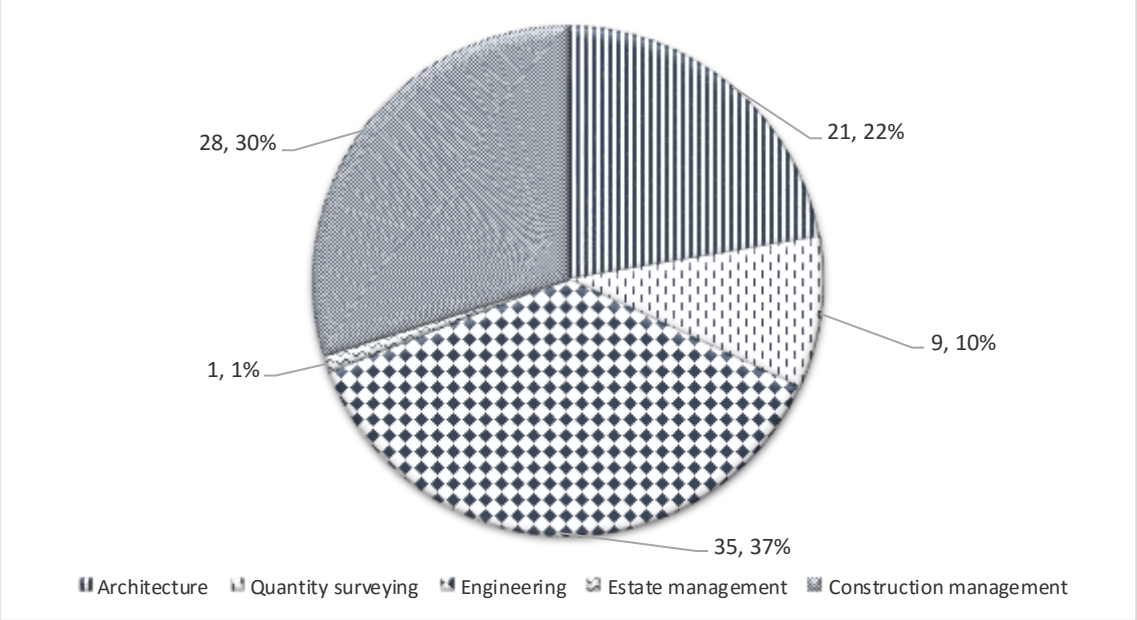

Figure 4.1 Professional background

4.2.2 Highest academic qualification

For the academic qualification of respondents, Figure 4.2 shown that most of the respondents were holding a bachelor degree which contained 54%. And followed by this, Master degree occupied 35%. And continued by PhD, MBA, and Diploma which are 5%, 2.5 %, and 2.5%. Lastly is “other” category which is under advance diploma with a percentage of 1%.

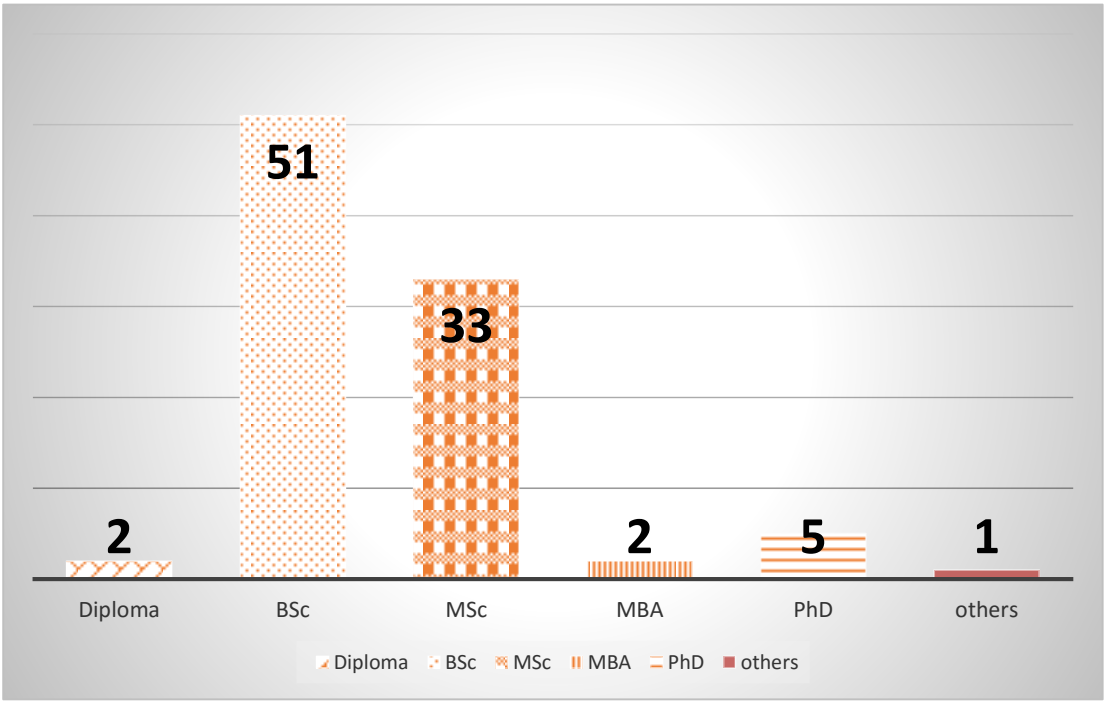

Figure 4.2 Superior highest academic qualification

4.2.3 Organization of respondents

Based on the figure, the organization that involve in this studies most are main contractor which take up 47 out of 94 respondents. Followed up with subcontractor which is 23, private developer with 19 and trade contractor and client which consist of 3 and 2 respondents respectivel.

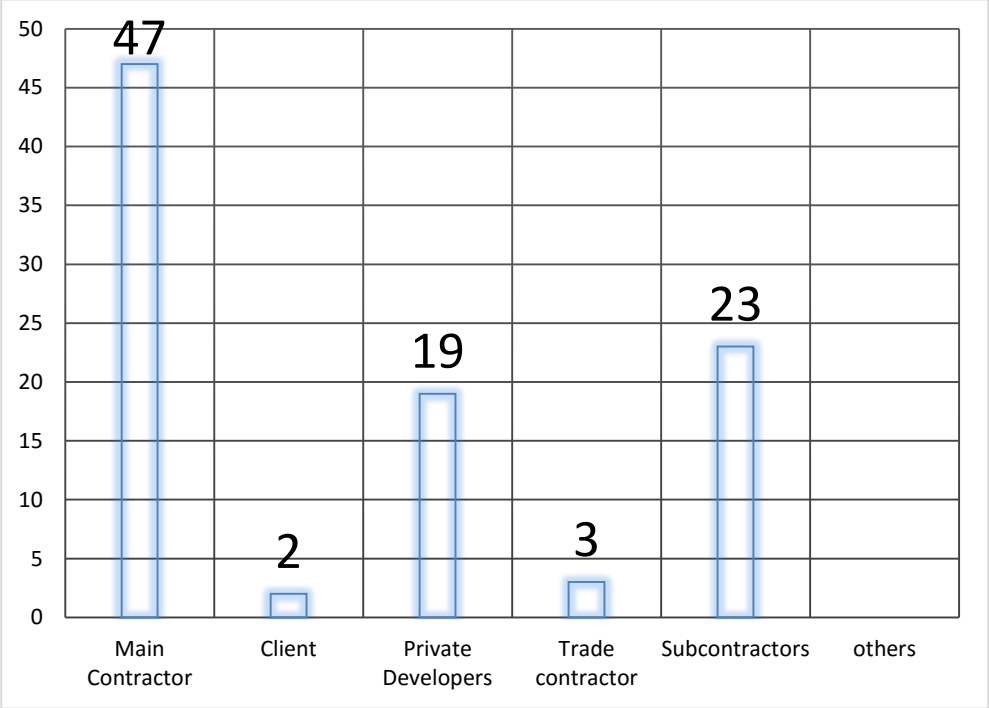

Figure 4.3 **Organization of respondents**

4.2.4 Current position

Most of the respondents are currently in the position of project manager with the percentage of 65%. It could resulted due to the face-to face questionnaire by helping from internship trainees to their project manager. This followed by managing director with 19%, by the interpretation of the data, most of the managing director is come from the organization of subcontractor. Senior supervisor occupied 8%, contract manager 2%, manager and others occupied 3% each. In the category of "other" they are normally consisted of site manager.

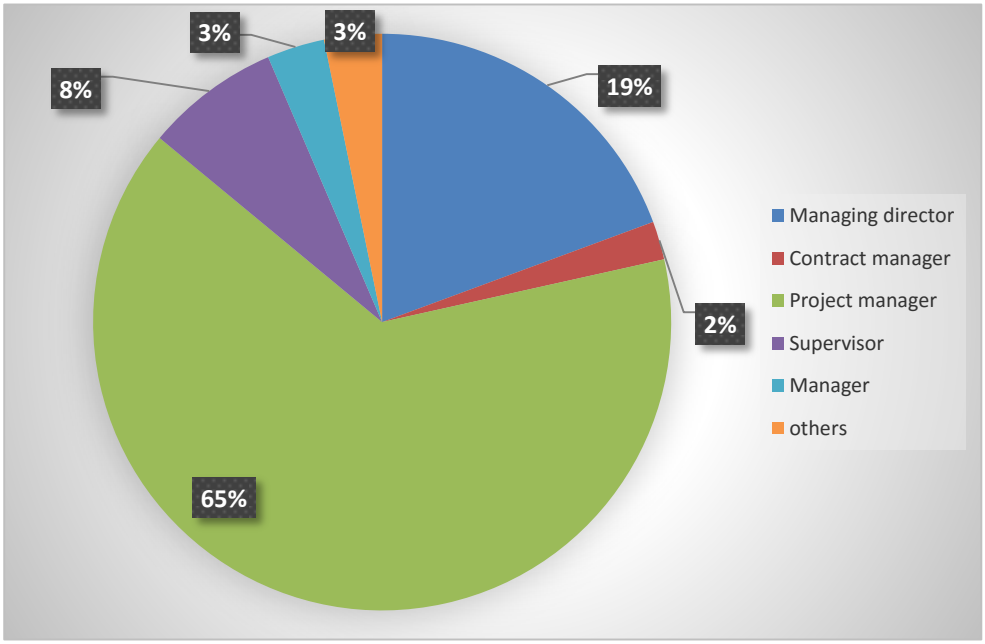

Figure 4.4 **Current position of respondents**

4.2.5 Working experience of respondents

In the figure of working experience, most of the respondents worked at least 10 years to less than 15 years and with a percentage of 49%. This flowered up with the respondents who worked 5 years to less than 10 years and with a percentage of 35%. Then, respondents who work on 15 years to less than 20 years occupied 9 % of total respondents. Superior who worked not more than 5 years is only have the percentage of 6%. Lastly, the person who work over 20 years and above is only taken up 1%. The reason that the majority of the Working experience was focusing on 10 years to less than 20 years is because the question survey is difficult to reach on high title of position in a larger organization.

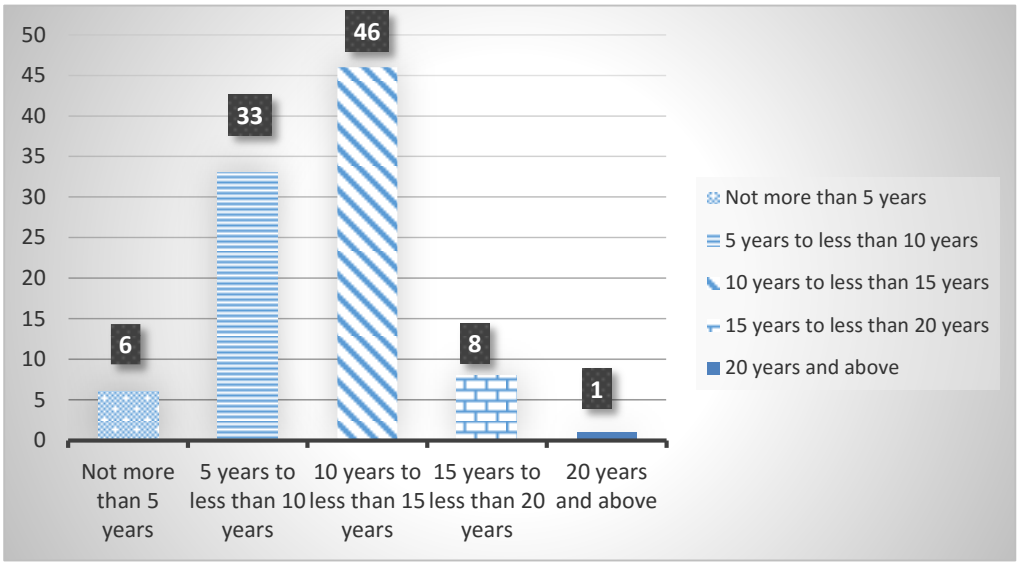

Figure 4.5 **Working experience of respondents**

4.2.6 Project involved in the last 10 years

From the least to the highest, only 1 person who involved 16-20 projects in last 10 years. Followed up with 5 person who involved 20 projects and above in last 10 years, it consist of a high experience managing director of a client. Some are those subcontractor who only involved on partial work of total project and this is the reason why they reached 20 projects in last 10 years. Besides that there are also 5 person who work less than 5 projects in last 10 years. It continued with 23 person who involved 11-15 projects in last 10 years. And lastly is the highest of 60 persons who involve 5-10 projects in last 10 years, it could be resulted by the working experience of the respondents, as the figure 4.6 had shown the majorities of the respondents have the working experience between 10 years to less than 15 years.

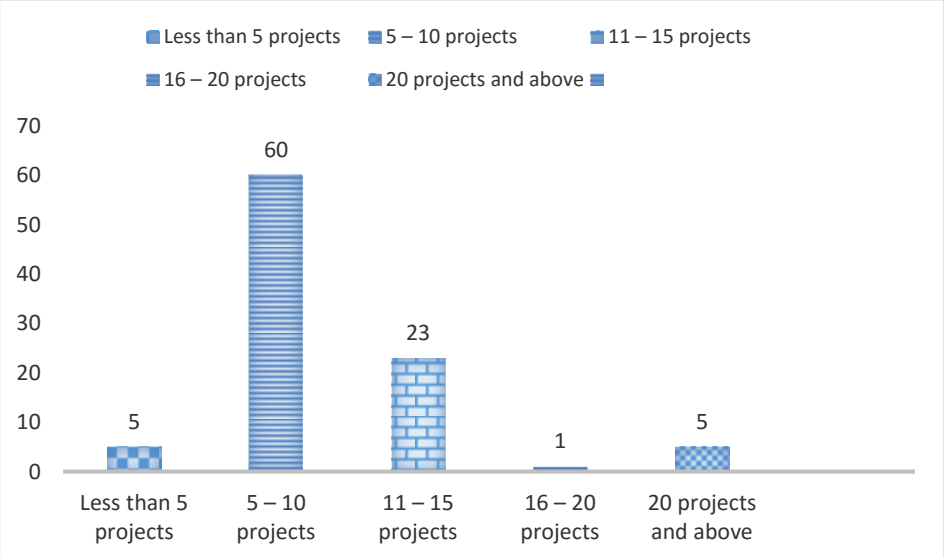

***Figure 4.6 Project* that involved in last 10 years**

4.2.7 Types of project that the organization was involved

In the figure we can see that, most of the respondents' organization involved on building which have the percentage of 47.8%. As followed with civil engineering with a percentage of 28.7% and lastly are infrastructure and M&E with 11.8% each. As the figure had shown there no people involved in oil and gas sector.

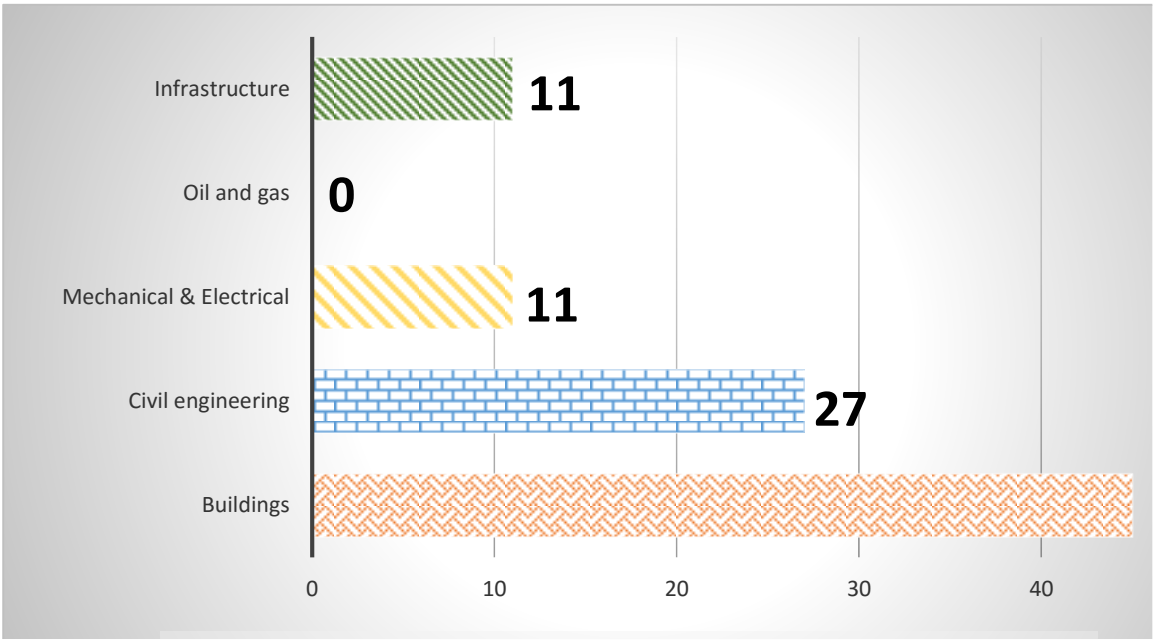

Figure 4.7 Types of project(s) the organization was involved

4.2.8 Years of graduates being work in organization

In the overall of the respondents, candidates who work not more than 1 year get the majorities with the percentage of 56.5%. It is resulted by most of the paper survey is collaboration with the internship students and their organization. For the graduates who worked 1- 2 years have the percentage of 14.8%. And lastly, graduate worked 4-6 years get the percentage of 28.7%

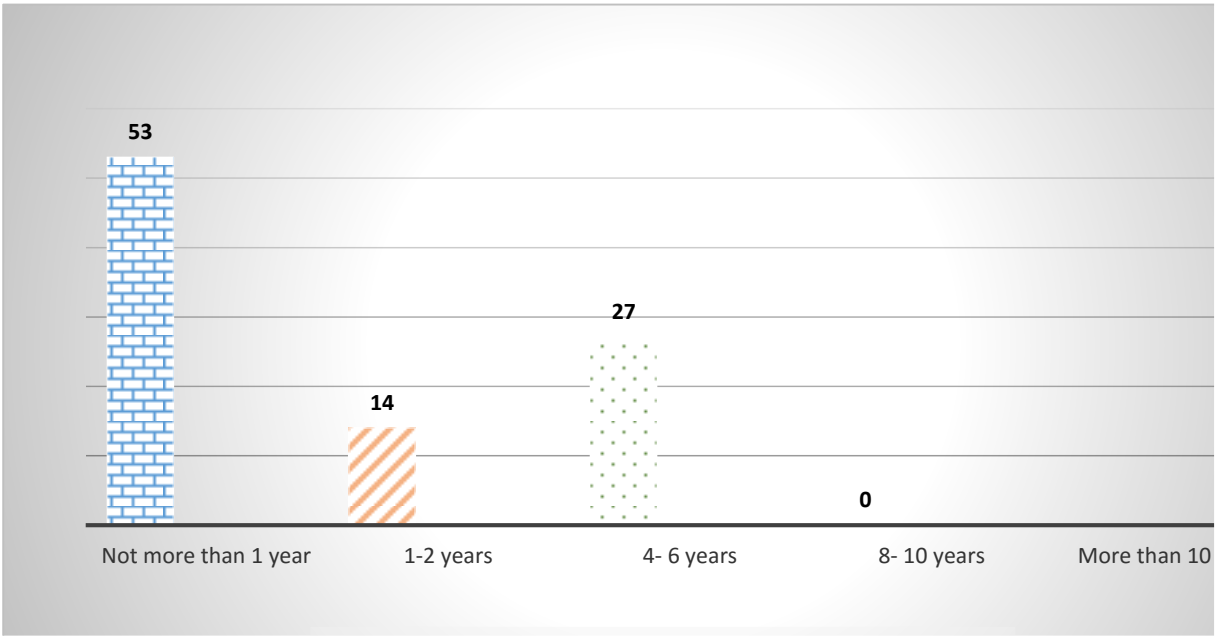

Figure 4.8 Year of candidates being work in organization

4.2.9 University of candidate and graduate and gender

The diversification of universities in this studies are shown by the figure 4.9. In the figure, there are 65% of the candidate/ graduate who studied in UTAR. And also with 18% of USM graduates, 16% of UiTM graduates and 1% of graduates who studied in University Lim Kok Weng. And there are no respondents for UTHM candidate. The university that shown in the figure are those universities that only provide on bachelor degree course of construction management.

Beside that in figure 4.1.1, there are only 22.3% of female candidates/ graduate involved in this studies, and the rest 77.7% are male candidates/ graduates.

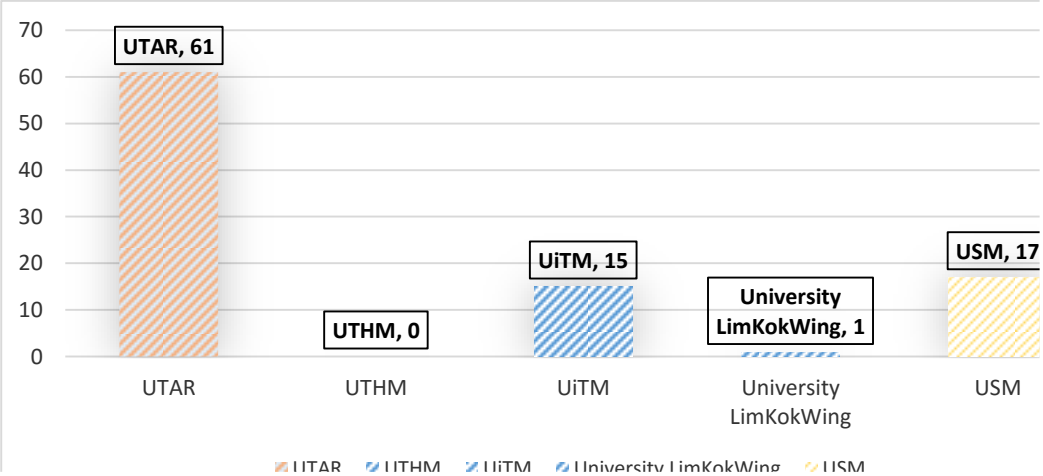

Figure 4.9 University of candidates

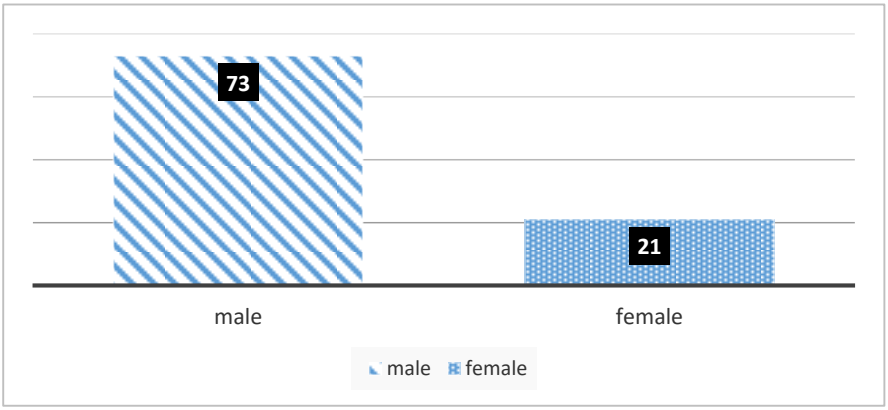

Figure 4.10 Gender of candidates

4.2.10 First place of work after candidates' graduation

There are only 19% of the graduates are not working for their first company after the graduation. There are 81% of the candidate/ graduate still remain on the first company after the graduation or undergraduate.

Due to the collaboration of the internship students, it caused the result that most of the position of the candidate or graduates are supervisor and with a percentage of 66%. There are 13% of the graduates work as construction manager all of them have the working experience at least 4 years. And the result followed with clerk of work who work under a private developers with 10% of total respondents. In the 4% of "others" category, it consist of assistant project manager and site manager. There are also 2% of construction management graduate work as quantity surveyor and engineer respectively.

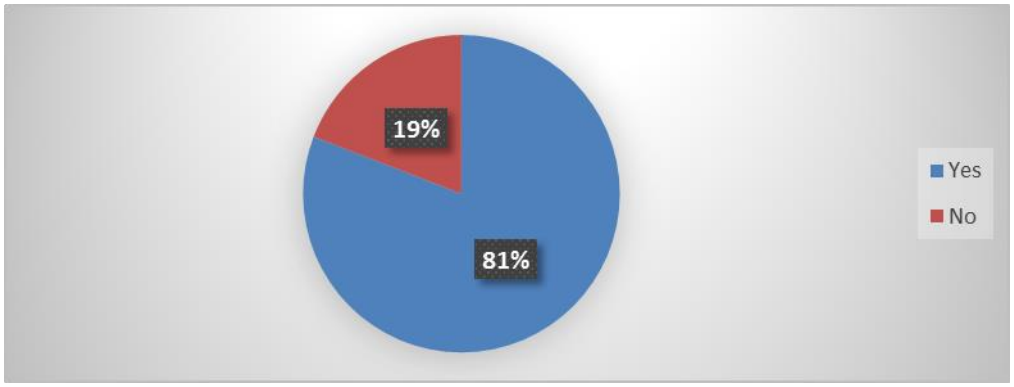

Figure 4.11 First place of work after graduation

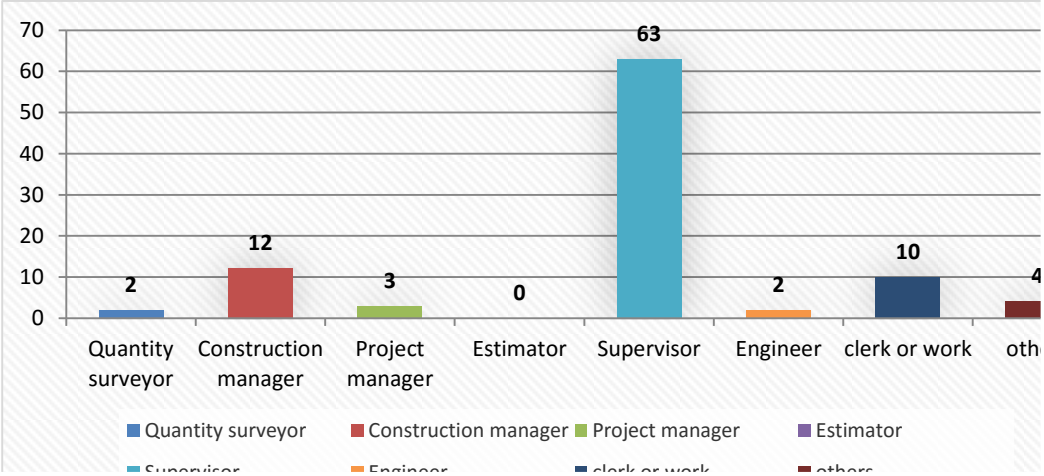

Figure 4.12 Position of candidates

4.3 Reliability Test and Validity Test of CM's competencies

This section is to test reliability and validity of the measurement scale for the competencies of CM graduates. Originally, there are total of 71 competencies.

All of the 71 competencies will be used for reliability Test and validity test. Besides that only those result that passed the minimum requirement will be considered to be use in the data presentation. The findings just then considered as reliable and valid for ranking objective of this study.

Reliability test is conducted to test the internal consistency of the measurement scale of the survey questionnaire. Cronbach alpha is used and the analysed items must obtain the value 0.6 above in order to justify the consistency of each item regardless sample size (MacCallum *et. al*., 2001).

Validity test is important to ensure the psychometrics of the measurement scale, in the manner of testing how good the individual item covariate with the other items within a similar measurement.

Communalities were tested under this study. The communalities are variable's variance which can explain by the principle of component. It must be extract to determine each of the variables is suitable for this study. The communalities value must be more than 0.5 (Priya and Shruti, 2015). The variable only will be considered for further analysis of value above 0.5 after the extraction in communalities. The communalities in extraction table are high indicates that each component represent the variable well. The extracted variable no more than value of 0.5 should be deleted on this analysis.

4.3.1 Reliability Test

Table 4.2 reliability statistic

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.941	0.941	71

In table 4.2, it shows the results of Cronbach's Alpha for 71 CM's competencies. As the table result had shown all the CM's competencies had passed the minimum requirement of Cronbach's Alpha with the result of 0.941 and the minimum of requirement of the value of Cronbach's Alpha which is 0.60. As the result in reliability statistic and item-total statistic, we can concluded that there are nothing to be omitted for reaching a higher Cronbach's Alpha seem the Cronbach's Alpha was already passed the minimum requirement with 0.941 and nearly reaching 1.

For the highest corrected Item-Total Correlation which is negotiate with trade union, organization culture, maintenance programme, cost budget control, and quality assurance, it is resulted as closely related with the remaining scales and a reliable data.

However, Cronbach's Alpha are still can be increased by omitting the competencies of "Health and safety", "Managing conflict and crisis", "Site safeties", "Job analysis specification", and "Demotion and retirement" to reach 0.942 of Cronbach's Alpha. But this action are not necessary

Table 4.3 Item-total statistic

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Communication	0.665	0.939
Motivation of others	0.682	0.938
Health and safety	-0.055	0.942
Decision making	0.101	0.941
Predicting and planning	0.151	0.941
Cost budget control	0.717	0.938
Observation to employee	0.686	0.939
Team building	0.448	0.940
Quality control and assurance	0.712	0.938
Managing time	0.221	0.941
Material planning and control	0.614	0.939
Human resource planning and control	0.325	0.940
Set objective and goals	0.288	0.940
Directing meeting	0.225	0.941
Managing conflict and crisis	0.015	0.942
Hiring supervisor and foreman	0.156	0.941
Delegating responsibility	0.433	0.940
Maintenances of program	0.727	0.938
Tenant welfare	0.689	0.938
Public relationship	0.213	0.941
Hiring subcontractor	0.456	0.940
Employee training for supervisor foreman	0.569	0.939
Competitive tendering	0.653	0.939
Investigation of project risk uncertainty	0.621	0.939
Programme design	0.390	0.940
Identifying personal strengths weakness	0.431	0.940
Employee training Management	0.060	0.941
Site safeties	0.048	0.942
Productivity maintenance and control	0.099	0.941
Negotiate client	0.280	0.940
Costing and estimating	0.470	0.940
Managing change	0.456	0.940

Table 4.3 Item-total statistic (continue)

Rival awareness	0.591	0.939
Hiring management	0.592	0.939
Negotiate Main contractor	0.613	0.939
Negotiate subcontractor	0.559	0.939
Organization of communication system	0.556	0.939
Managing job stress	0.464	0.940
Hiring manual labour	0.582	0.939
Plant planning and control	0.356	0.940
Negotiate supplier	0.207	0.941
Creativity	0.076	0.941
Career development and appraisal	0.533	0.939
Decanting buildings	0.570	0.939
Tactical planning	0.513	0.940
Construction legation	0.463	0.940
Property protection	0.618	0.939
Organization structure	0.464	0.940
Dissolution subcontractor	0.409	0.940
Job analysis specification	-0.092	0.942
Working regulation agreement	0.105	0.941
Dissolution supervisor foreman	0.277	0.940
Contract drafting	0.213	0.941
Sources of finance	0.586	0.939
Employment legislation	0.533	0.939
Client consumer protection law	0.711	0.938
Promotion ad transfer	0.679	0.938
Employee welfare counselling	0.558	0.939
Negotiate government bodies	0.466	0.940
Advertising and promotion	0.290	0.940
Market research	0.261	0.941
Termination dismissal manual labour	0.163	0.941
Termination dismissal management	0.534	0.939
Company law	0.325	0.940
Use of computer technology	0.668	0.938
Negotiate trade union	0.762	0.938
Organization culture	0.757	0.938
Planning law	0.586	0.939
Managing others national culture	0.311	0.940
Demotion and retirement	-0.047	0.942
Foreign language	0.244	0.941

4.3.2 Validity Test Result

Table 4.4 shows that all of the 71 competencies of CM graduates had reached the minimum requirement of 0.6 with the highest rate of 0.916 to the lowest rate of 0.622 which had proved every elements of competencies are qualified for the further analysis.

Table 4.4 Communalities

Competencies	Initial	Extraction
Team building	1	0.86
Health and safety	1	0.87
Investigation of project risk uncertainty	1	0.714
Decision making	1	0.872
Managing time	1	0.873
Site safeties	1	0.86
Productivity maintenance and control	1	0.847
Predicting and planning	1	0.846
Organization of communication system	1	0.802
Costing and estimating	1	0.763
Negotiate Main contractor	1	0.798
Property protection	1	0.763
Quality control and assurance	1	0.857
Observation to employee	1	0.899
Communication	1	0.879
Company law	1	0.858
Material planning and control	1	0.809
Cost budget control	1	0.887
Rival awareness	1	0.773
Managing change	1	0.807
Negotiate trade union	1	0.896

Table 4.4 Communalities (continue)

Client consumer protection law	1	0.924
Managing job stress	1	0.721
Negotiate subcontractor	1	0.748
Maintenances of program	1	0.814
Employment legislation	1	0.781
Construction legation	1	0.723
Use of computer technology	1	0.836
Tenant welfare	1	0.872
Organization culture	1	0.835
Promotion ad transfer	1	0.824
Hiring management	1	0.832
Termination dismissal management	1	0.825
Sources of finance	1	0.74
Decanting buildings	1	0.796
Tactical planning	1	0.828
Delegating responsibility	1	0.788
Organization structure	1	0.876
Employee training for supervisor foreman	1	0.86
Planning law	1	0.762
Programme design	1	0.803
Negotiate government bodies	1	0.84
Hiring manual labour	1	0.795
Motivation of others	1	0.828
Plant planning and control	1	0.657
Competitive tendering	1	0.924
Negotiate client	1	0.763

Table 4.4 Communalities (continue)

Career development and appraisal	1	0.809
Termination dismissal manual labour	1	0.916
Negotiate supplier	1	0.792
Contract drafting	1	0.869
Employee training Management	1	0.876
Managing conflict and crisis	1	0.824
Set objective and goals	1	0.895
Working regulation agreement	1	0.794
Directing meeting	1	0.914
Job analysis specification	1	0.841
Employee welfare counselling	1	0.888
Identifying personal strengths weakness	1	0.806
Hiring supervisor and foreman	1	0.883
Advertising and promotion	1	0.736
Human resource planning and control	1	0.827
Managing others national culture	1	0.622
Creativity	1	0.866
Dissolution supervisor foreman	1	0.865
Hiring subcontractor	1	0.826
Market research	1	0.851
Public relationship	1	0.859
Dissolution subcontractor	1	0.81
Foreign language	1	0.759
Demotion and retirement	1	0.723

Objective 1

4.4 To evaluate the competencies of construction manager

The level of importance the following criteria are considered in the importance of competencies for construction manager in Malaysia on a scale of 1- 5. Where 5 = Very important: 4 = important; 3 = slightly important; 2 less important and 1= least important.

Table 4.5 Ranking of the competencies

Competencies	1	2	3	4	5	Mean	Ranking
Team building	0	1	10	58	25	4.7021	1
Health and safety	0	1	0	32	61	4.6277	2
Investigation of uncertainty risk	0	0	6	62	26	4.617	3
Decision making	0	1	2	30	61	4.6064	4
Managing time	0	1	2	32	59	4.5851	5
Site safeties	0	0	9	29	56	4.5	6
Productivity maintenance control	0	0	6	37	51	4.4787	7
Predicting and planning	0	2	6	31	55	4.4787	8
Organization of communication system	0	0	4	52	38	4.3617	9
Costing and estimating	0	0	5	59	30	4.266	10
Negotiate Main contractor	0	1	6	55	23	4.2553	11
Property protection	0	1	7	54	23	4.2447	12
Quality control and assurance	0	2	6	55	31	4.2234	13
Observation to employee	0	2	3	61	28	4.2234	14
Communication	0	1	8	54	31	4.2234	15
Company law	0	1	5	23	65	4.2128	16
Material planning and control	0	2	4	61	27	4.2021	17
Cost budget control	0	1	7	58	28	4.2021	18
Rival awareness	0	1	11	51	31	4.1915	19
Managing change	0	0	7	26	25	4.1915	20
Negotiate trade union	0	1	9	56	28	4.1809	21
Hiring manual labour	0	1	9	56	28	4.1809	22
Motivation of others	0	2	6	60	26	4.1702	23
Plant planning and control	0	7	65	22	29	4.1596	24
Competitive tendering	0	1	8	60	25	4.1596	25
Negotiate client	0	0	4	73	17	4.1383	26
Client consumer protection law	0	0	3	22	69	4.1383	27

Table 4.5 Ranking of the competencies (continue)

Managing job stress	0	1	6	67	20	4.1277	28
Negotiate subcontractor	0	1	5	69	19	4.1277	29
Maintenances of program	0	1	9	61	0	4.1277	30
Employment legislation	0	2	7	63	22	4.117	31
Construction legation	0	0	6	71	17	4.117	32
Use of computer technology	0	3	12	51	28	4.1064	33
Tenant welfare	0	2	9	60	23	4.1064	34
Organization culture	0	3	5	66	201	4.0957	35
Promotion ad transfer	0	1	16	50	27	4.0957	36
Hiring management	0	1	6	70	17	4.0957	37
Termination management	0	0	28	55	11	4.0745	38
Sources of finance	0	1	9	67	17	4.0638	39
Decanting buildings	0	1	10	65	18	4.0638	40
Tactical planning	0	1	4	79	10	4.0426	41
Delegating responsibility	0	0	17	57	20	4.0319	42
Organization structure	0	1	13	63	17	4.0213	43
Employee training for supervisor foreman	1	1	14	58	20	4.0106	44
Planning law	0	2	14	61	17	3.9894	45
Programme design	0	0	12	71	11	3.9894	46
Negotiate government bodies	0	0	12	74	8	3.9574	47
Career development and appraisal	0	1	15	68	10	3.9255	48
Termination manual labour	0	0	28	55	11	3.8191	49
Negotiate supplier	0	1	26	56	11	3.8191	50
Contract drafting	0	0	30	53	11	3.7979	51
Employee training Management	0	0	27	59	8	3.7979	52
Managing conflict and crisis	0	1	31	54	8	3.734	53
Set objective and goals	1	2	24	61	6	3.734	54
Working regulation agreement	0	2	28	59	5	3.7128	55
Directing meeting	1	1	27	61	4	3.7021	56
Job analysis specification	0	1	34	53	6	3.6809	57
Employee welfare counselling	0	1	46	30	17	3.6702	58
Identifying personal strengths weakness	0	2	48	38	6	3.5106	59
Hiring supervisor and foreman	0	0	77	21	5	3.4574	60
Advertising and promotion	0	0	57	33	4	3.4362	61

Table 4.5 Ranking of the competencies (continue)

Human resource planning and control	0	3	57	27	7	3.4043	62
Managing others national culture	0	0	69	13	12	3.3936	63
Creativity	0	1	60	29	4	3.383	64
Dissolution supervisor foreman	0	3	59	27	5	3.3617	65
Hiring subcontractor	0	1	60	31	2	3.3617	66
Market research	0	2	64	21	7	3.3511	67
Public relationship	0	0	76	9	9	3.2872	68
Dissolution subcontractor	0	2	53	33	6	3.234	69
Foreign language	3	18	67	2	4	2.8511	70
Demotion and retirement	3	23	61	7	2	2.8511	71

Table 4.6 Frequency of scale

Scale	Least important	less important	slightly important	important	Very important	Total
Total frequency	7	116	1551	3424	1443	6541
Percentage	0.1%	1.8%	23.7%	52.3%	22.1%	100%

In this following section, we are going to find out which competencies that should be emphasised and more important to the construction industry by ranking with the mean of each components. For Analysis of the competencies, ranking of the competencies will be conduct in 4 different way which is ranking on all of the respondents, on upper manager, middle manager, and first line manager. Only the top 10 ranking will be discussed in this section.

These ranking shows the competencies that should be emphasize in different level of management in order to improve the performance of construction project.

Based on the data collection from 94 respondents, the first place was goes to "Team building" with the Mean of 4.7021 it is also ranked in the first place by **upper manager**. Construction industry required team building in every stage of projects, no matter is on-site or off-site. Team building is a very important skill that used to

improve the efficiency of work. Lack in Team building will resulted in undergo on conflict and competing for own benefits or interest by different parties in construction projects. *A person who have a resolute effort is required in team building. The leader of team building usually take part by a Construction Manager or delegate of owner. The Construction Manager or delegate of owner normally experience in contracting in construction or have a builder background or professional designer background*. (Bender & Septelka, 1984)

Secondly, health and safety has ranked on the second place with the Mean of 4.6277, it is also ranked in the first place by middle manager and first line manager and the third place by the upper manager. Health and safety always the issue to be concern about since past generation. In this civilization society, the ability for handling health and safety issue was emphasized by the industry. Not only the safety and health on the site, it is also should be taking care the negative impact to the surrounding and environment. This affected the image of construction industry and also might leaded to the worker to be hard up. *The competency of health and safety are emphasized by the industry, it is owning to the additional cost which related to work related injuries, compensation to the injured labour, oblique costs from injuries, expenses on insurant and lawsuit.*(Kanchana, Sivaprakash, & Joseph, 2015)

As the table had shown, all of the respondents had ranked investigation of project risk uncertainty as the third place in overall ranking with the mean of 4.617. Investigation of project risk and uncertainty is also ranked as 2nd which considered as important by the upper manager. The differences between uncertainty and risk can be considered as uncertainty is something that unpredictable and risk is predictable and can occur. Normally, risk of a project was leaded by the uncertainty. However project risk might cause by others factors such as and closing date, expenses, limitation of resources, insufficient abilities and competencies, timeframes, and more. *Investigation of project risk and uncertainty had become one of the major issue that the construction industry are concerns about which included managers and specialists that taking part in construction projects nowadays. After the economic crisis in 2008, constriction industry are paying more attention on the issue of investigation of project risk and uncertainty*. (Junior & Carvalho, 2013)

Following by the 4th rank which is decision making which perceived as should be emphasized by construction management graduate in construction industry. The rank scored the mean with 4.6064 in total 94 respondents. It is also ranked as 4th place on upper manager, 3rd place in middle manager and 2nd place in first-line manager and with the mean of 4.5, 4.6522, and 4.4286. Decision making in construction had consist in various area. Different in the level of management, the level of risk for the decision will be different also. The higher the position of the manager the higher the risk in making a decision. So, *every decisions that made in the dynamic situation should contemplate in instant effects and long-term reaction.*(Tang, Mukherjee, & Onder, 2010) . Decision making no longer as personal competencies in construction industry, due to in a larger and complex project, several decision making technique such as Interactive Construction Decision Making Aid (ICDMA) are suggested for the decision making. Such knowledge and competencies can be handle before the candidate started their industry life.

For the 5th place of the ranking which is managing on time, it scored a mean of 4.5851 in term of all respondents. Ranked in 10th by upper manager, 2nd by middle manager and 5th by first line manager. The mean value are 4.44, 4.667, and 4.14 respectively. Managing on time can be defined as a systematic process that control on the time usage and recoding every time that had spent during the project period. Managing time effectively is important for the construction project in dealing with risk of making any work task in delaying. *Poor in time manage will directly causing the effect of project delays and critically resulted in overrun of cost, disagreements, extension of time, and lawsuit.* (Siew, Rahim, & Hamid, 2015). It is surprisingly the time managing is ranked in 10th by the upper management, it could be resulted their position need others competencies to achieve on their work task. However, time managing still ranked in 2nd and 5th by the middle and first line manager. Time management is more important when they are dealing on site.

This is following by the 6th rank which is site safety which perceived as should be emphasized by construction management graduate in construction industry. The rank scored the mean with 4.5 in total 94 respondents. It is also ranked as 3rd place on first line manager, 5th place in middle manager and with the mean of 4.285, and 4.536. As the result, middle manager and first line manager is more concern

about the competencies of safety in site. It could be explained by they spent most of their time in working in site. Critical injuries or accidents that causing in dead might delayed the projects and they have the responsibility for the accidents occur.

As the table had shown, all of the respondents had ranked Productivity maintenance and control as the 7th place in overall ranking with the mean of 4.4787. Productivity maintenance and control is also ranked as 4th which considered as important by the first line manager and ranked as 6th by middle manager with the mean of 4.2857and 4.5217. Productivity maintenance and control is an interconnected process that guarantee every single equipment, tools, and machinery always can be used and perform during the construction period to avoid any interruption of any single work task. This kind of competencies are emphasized by the middle manager and first line manager who have the responsibility to make sure the productivity of project was not been interrupted by the lack of maintenance.

Predicting and planning represented the 8th rank on the total respondents and upper manager with a total mean of 4.4787 and 4.4477. Predicting and planning also represented the rank of 4th and 7th on the middle manager and first line manager and with the mean of 4.5362 and 4. Predicting and planning have a synonyms as forecasting and planning. The competency of forecasting playing a significant role in construction planning and project scheduling. Not only had the work progress needed this kind of technique, predicting for the resource such as man power, material and finance are also needed to be included in the projects. Forecasting allowed the parties foreseen a certain amount or quotation for further decision making. Forecasting by using past experience is no longer sufficient for the construction project nowadays. *Every projects that related with construction generally is a project that in a complex structure and various work task is running in the same time. So that, forecasting needed a special treatment in order for a further planning.* (Sabry, 2014).

Organization of communication system represented the 9th rank by all the level of manager with the mean of 4.367. Organization of communication system delegate an intricate system of the information flow between the parties relationship in the organization. Organization’s communication system can be in 2 ways which is

formal communication system and informal communication system. In formal communication system, reference will be made out for every communication that made in the organization. For example architect using an architect instruction (AI) for requesting the builder for variation work and the reference had made for documentation. Besides that "request for information" (RFI) was used by the parties that ask for an information from another's parties in the organization. The competencies of Organization of communication system is perceived as an important competencies in the construction industry.

This is following by the 10th rank which is costing and estimating which perceived as should be emphasized by construction management graduate in construction industry with the mean of 4.266 and 4. It is also ranked as 8th by middle manager with the mean of 4.2609. *Estimating cost for construction is one of the critical errands in the phase of budget development in the life cycle of construction project.*(Ojo & Odediran, 2015). Construction manager have the responsibility to obtain the maximum profit of the organization.

Tenant welfare and Rival awareness is ranked on 5th and 6th with the mean of 4.5213 and 4.5011 by the top manager. It can be explained by their title of position is higher and their job scope is more emphasize to the surrounding market.

Table 4.7 the top 10 ranking which is ranked by Top manager (managing director)

Number of respondents, N=18

Competencies	Mean	Ranking
Team building	4.7778	1
Investigation of project risk uncertainty	4.7778	2
Health and safety	4.5556	3
Decision making	4.5224	4
Tenant welfare	4.5213	5
Rival awareness	4.5011	6
Motivation of others	4.3344	7
Predicting and planning	4.2414	8
Observation to employee	4.2334	9
Managing time	4.1124	10

Observation to employee welfare is ranked as 5th place with the mean of 4.5213 in the ranking which ranked by the top manager. And 9th by the middle manager with the mean of 4.2464. Supervision of work are always the essential of making the outcome reaching the requirement qualities for construction project. Besides that, an observation on employee also have the purpose of prevent the employee implementing their job in a wrong way and also avoid any crime activities in the site.

Table 4.8 the top 10 ranking which is ranked by middle manager (project manager, manager, site manager)

Number of respondents, N=69

Competencies	Mean	Ranking
Health and safety	4.6667	1
Managing time	4.6667	2
Decision making	4.6522	3
Predicting and planning	4.5362	4
Site safeties	4.5362	5
Productivity maintenance and control	4.5217	6
Communication	4.2754	7
Costing and estimating	4.2609	8
Observation to employee	4.2464	9
Quality control and assurance	4.2464	10

Lastly, Quality control and assurance was ranked 10th place by the middle manager and ranked in 8th place by the first line manager with the mean of 4.2464 and 4.0166. It is followed with Material planning and control which ranked in 9th by the first line manager with the mean of 4.0077.

Table 4.9 shows the top 10 ranking which is ranked by first line manager (supervisor)

Number of respondents, N=7

Competencies	Mean	Ranking
Health and safety	4.4286	1
Decision making	4.4286	2
Site safeties	4.2857	3
Productivity maintenance and control	4.2857	4
Managing time	4.1429	5
Organization of communication system	4.1429	6
Predicting and planning	4.0191	7
Quality control and assurance	4.0166	8
Material planning and control	4.0077	9
Costing and estimating	4	10

Quality control and assurance and Material planning and control is more emphasized in the site for the quality of the project's work and material planning control is due to avoid any shortage or surplus on ordering the material from the supplier. It is very surprisingly human resource planning and control had ranked in 62 which ranked by all of the respondents.

It can be simply explained by actually all of the mean of the competencies was scored quite nearly with each other, the mean of 3.4043 is considered as a high respond. However, still have others competencies that more important to the respondent.

For the competencies of managing others national culture, it ranked on 63 by all of the respondents. It is less important compare to others competencies to the industry because the foreign worker in current industry is mainly import from neighbourhood country which is in Asia countries. Although there are many kind of races, but the Asia's culture are still able to manage by the industry.

Table 4.10 shows the top 10 less important competencies ranking which is ranked by all respondents.

Competencies	Mean	Ranking
Human resource planning and control	3.4043	62
Managing others national culture	3.3936	63
Creativity	3.383	64
Dissolution supervisor foreman	3.3617	65
Hiring subcontractor	3.3617	66
Market research	3.3511	67
Public relationship	3.2872	68
Dissolution subcontractor	3.234	69
Foreign language	2.8511	70
Demotion and retirement	2.8511	71

Creativity had ranked 64 by all of the respondents with the mean of 3.383. The reason that creativity had ranked in such position can be explained with construction project is huge and complex process, it is more suitable for systematic solution instead of creative solution.

For the competency of dissolution supervisor foreman, it had ranked in 65 by all of the respondents with the mean of 3.3617. In Malaysia construction industry, *construction delays can be caused by financial problems, material management problems, planning and scheduling problems, insufficient site assessment, and shortage of manpower*. (Sambasivan & Soon, 2007). So instead of dissolution supervisor foreman, they are more concern about to hire supervisor and foreman due to the insufficient workman in the industry.

For the competencies of hiring and dissolution of subcontractor, they had ranked 66 and 69 by all of the respondents with the mean of 3.3617 and 3.234. It can be described with culture of Malaysia construction industry, it is high competition between subcontractors, and the employer is more concern about which subcontractor can give a lower price. Other than that, dissolution of subcontractor might lead to delay of the project. There are risk in this kind of decision, so the

employer rather focus on the quality assessment and supervision instead of dissolution of subcontractor.

Market research had ranked 67 by all of the respondents with the mean of 3.3511. The market research had ranked such low position it is due to in construction project is more focus on the process which could turn the every process become more efficient and effective. Market research is more concern to the pre-construction stage and it can also be done by others position that out of construction manager.

For the competencies of foreign language, it had ranked in 70 by all of the respondents with the mean of 2.8511. Foreign language was not emphasized due to most of the imported worker had already learned or have the ability to speak in Malay. In others way, senior foreign supervisor or foreman can explain to on those worker who unable to speak in Malay.

Lastly, the competencies of demotion and retirement had ranked in the last by all of the respondents with the mean of 2.8511. Normally, the job for demotion and retirement is controlled by the highest management or human resource department, so construction manager not often involve in this kind of situation.

Objective 2

4.5 Categorization of constriction managers' competencies

All of the 71 competencies can be categorize in to 9 categories which can be shown as below:

(Sumner & Powell, 2013)

1. Personal competencies
2. Planning and control
3. Negotiation
4. Hiring /award and termination
5. Organization management
6. Legislation and law awareness
7. Site management
8. Effective Marketing
9. Financing

4.5.1 Personal competencies and Planning and control

In the category of personal competencies as explained in chapter 2, personal competencies included the core personal competencies that construction manager should emphasize in the industry. Such as Communication, Motivation of others, Decision making, public relation, set objective and goal, identify personal strength and weakness and creativity. These abilities is an essential to build up success in order to encouraging to team member by showing the confidence of construction manager. Besides that these competencies is used to build up relationship and networking in professional setting.

Table 4.11 the categories of personal competencies and planning and control with each specific competencies component.

Personal competencies	Planning and Control
1. Communication 2. Motivation of others 3. Decision making 4. Set objective and goal 5. Identify personal strength /weakness. 6. Creativity 7. Foreign language 8. Computer technology 9. Job analysis 10. Public relation	1. Predict and planning 2. Quality control and assurance 3. Material planning/control 4. Human resource planning/ control 5. Productivity maintenance control 6. Plant planning/ control 7. Tactical planning 8. Program design 9. Investigation of project risk and uncertainty

In construction industry, planning and control played an important roles in the whole project process. Planning is always a must to ensure every resources are sufficient before that start of any work, it is also played as minimizing the risk in construction project. For example, Predict and tactical planning and Investigation of project risk and uncertainty usually implemented for analysing the future risk, and tactical planning is analysing the current situation and implement a strategies planning due to overcome the situation. Planning and control can in terms of quality, material, human resource, productivity maintenance and plant. Controlling is the action than manipulate the current resource in order to reach the expecting outcome.

4.5.2 Hiring/ award and termination

In an organization such as organization of a construction project, hiring work is very often in every stage of the construction process. From the early stage of hire a management such as main contractor to manage on the project to hire subcontractor, supervisor, foreman and manual labour before the start of construction stage. Hiring a good employee is an essential of making good for the output of the construction project.

Table 4.12 the category hiring/award and termination with each specific competencies component

Hiring/ award and termination	
1. Termination of Supervisor and foreman 2. Termination of Subcontractor 3. Termination of Management 4. Termination of Manual labour	1. Hiring Supervisor and foreman 2. Hiring Subcontractor 3. Hiring Management 4. Hiring Manual labour 5. Demotion/retirement 6. Promotion and Transfer

For termination of from management to manual labour, the competencies of termination should emphasize on when is the termination should be implemented and what cost should the employer needed payoff for the termination. For example, the termination of management (main contractor) will be occur when one of the parties breach on duty in the contact or perform in such unsatisfied work.

For the competencies of demotion and promotion of title of position, observation of construction manager must be very ingenious in order to analyse on employee performance and search out the potential leader for the project and demotion for those who cannot manage on their work.

4.5.3 Negotiation and legislation and law awareness

Negotiation is an art of speaking, due to the uncertainty and unforeseen incident in the construction, negotiation had become an essential skill that used to avoid on further dispute and solve the problem before that court case arise. Negotiation is a win-win situation to both parties who involved in the negotiation. In other hand, it also take part as improving in time, cost, and quality in the construction project. Negotiation on time, cost, and quality can be shown in subcontractor, suppliers, main contractor, government bodies and trade union during the negotiation of contracts due to obtain the best benefits and profit of both parties

Table 4.13 the categories of negotiation and legislation and law awareness with each specific competencies component

Negotiation	Legislation and law awareness
1. Subcontractor 2. Supplier 3. Main contractor 4. Government bodies 5. Trade union	1. Construction law 2. Contract drafting 3. Employee Legislation 4. Client/ consumer protection law 5. Company law 6. Planning law 7. Competitive tendering 8. Working regulation and agreement

In the categories of legislation and law, the function of law played a role as a guide for the construction manager to comply with. For example, there are several law which is construction law, company law, and client and consumer protection law. These law provide the rights of each parties and the limits of authorities of each parties. Besides that, competitive tendering and contract drafting is very important to a construction manager. The term can condition that listed in the contract will helps to improve the benefits and the rights of the organization, it is also indirectly affected in the competitive tendering which the client may take consideration in the purposed tender. Lastly employee legislation and working regulation and agreement, employees working hours and welfare is stated in the employee law by the government, so comply with the rule and regulation that implemented by the government is the responsibility of a construction manager.

4.5.4 Financing and Effective marketing

As in the categories of financing, it consist of cost and estimating, the understanding of source of finance and also cost budge control. Finance indicated all the monetary sectors in construction industry. Before the construction had started, construction manager should clearly understand where the finance source come from and where to use. After that cost and estimating determine the total cost of the project and lastly by implementing cost budget control to manage on exceeds usage of financing resources.

Table 4.14 the categories of financing and effective marketing with each specific competencies component.

Financing	Effective Marketing
1. Cost and estimating 2. Source of finance 3. Cost budget control	1. Advertising and Promotion 2. Market research 3. Rival awareness

For marketing purpose, construction manager is responsible to implement market research in order to study on the current market with the purpose of finding out the current price and the demand and supply of any related resource and customer. Marketing research also helped to analyse current advertising and promotion strategies for the developers. By the research of the market, construction manager able to aware on the rival in the market.

4.5.5 Site management

For the category of on-site competencies, safety and health always the most important competencies that construction manager must possessed. Poor in safety knowledge will bring disaster to human life, the knowledge of safety and health can be provided from CIDB and OSHA training programme. Observation of employee can be explained by supervision on the workers which leaded to catch up the progress and quality control. After the site possession, the main contractor have the obligation on every activities that happen in the site. Property protection can be simply done by the erecting the hoarding. Maintaining programme is such sustaining activities that ensure the project or building is in tip top condition and prevent decay occur.

Table 4.15 the category of site management with each specific competencies component

Site management	
1. Employee training Supervisor and foreman 2. Employee training Management 3. Health and safety 4. Observation on employee 5. Maintenance program	6. Welfare Tenant 7. Welfare Employee welfare 8. Site safety 9. Property protection 10. Decanting building

For the category of employee training, upper level of construction manager must have the ability to determine and provide which types of training for the employee. For example, supervisor and foreman should send to CIDB training, and construction manager should provide talks and training program for management employee for further improvement. In other hand, welfare for tenant and employee is also important to construction manager. Welfare can act as a motivation or encouragement for the tenant and employee, indirectly improve in work performance.

4.5.6 Organization management

For the competencies that a construction manager responsible in an organization, team building can be defined as an essential competencies that unite the whole organization. Directing meeting shows the leading skills of a construction manager in a meeting, it is also manage on assuage the tense of the meeting situation. Delegation of responsibility reflected the ability that allocate the best position for a right person, it is depends on the capability of the person who can really manage on the specific work task. Organization's structure, culture and communication system have an interrelated relationship, Organization structure of construction can be explained by the procurement system that the project is implementing. By mastering in the procurement system, the culture and the communication system of the organization can be easily to find out by referring the organization that implemented by the project.

Table 4.16 the category of organization management with each specific competencies component

Organization management	
1. Team building 2. Directing meeting 3. Delegating responsibility 4. Communication system of Organization 5. Organization structure	6. Organization culture 7. Managing Time 8. Managing Conflict/ crisis 9. Managing Change 10. Managing Job stress 11. Managing Others nation culture

Manage is a skill of coordination and action that used to achieve a defined objective. There are several types of competencies for managing in construction. For construction manager, managing in time is a critical ability to ensure the work is done on time. The technique for managing time such as critical path and time management is very well known for managing time for the project. Conflict in construction usually related to dissension of 2 parties or interest purpose. Master on the sequence of the process of arbitration and adjudication might help to solve on the conflict during the process. Every project never gone it smooth from the beginning until the end, there are many change or uncertainty occur during the period of project. The capability of construction manager to attempt to manage on the change is very important to ensure the project go through efficiently. Going through so many competencies, stress is a grooming and cummulative problem to project manager. Stress is affecting project manager physically and mentally, which contribute great impact to the project manager. Construction manager have the responsibility on manage on stress in order to relocate the distraction from the stress and focus on the work.

CHAPTER 5

RECOMMENDATIONS & CONCLUSION

5.1 Introduction

After the data collection and the data analysis from the previous chapter, in chapter 5 will be finalize on the whole studies and recommendation will also be given from the study. Several suggestion and recommendation will be given in the future researches for the last.

5.2 Recommendation and conclusion

By referring the result and analysis of the data from previous chapter, besides from the reliability of data, the reliability of respondents also can be supported by the titles of position of the respondents are all working as construction manager and majority of them having the working experiences at least 5 years.

As a conclusion for the total 71 competencies for construction manager, the top 10 of the competencies that can be finalize as the competencies that the industry had most emphasized which are Team building, Health and safety, Investigation of

project risk uncertainty, Decision making, Managing time, Site safeties, Productivity maintenance and control, Predicting and planning, Organization of communication system and lastly is Costing and estimating.

As a shallow view for the competencies that resulted in this study, most of the competencies can be achieved by using the way of gaining experience in the industry. However learning the competencies by using experience could also implemented by others profession such as architect, engineer and quantity surveyors, and end out with the construction management graduates losing their value in the industry. In a deeper angle of view, besides from starting from zero and gain experience in the industry, actually there are a lots of techniques, applications and approaches that established by studies and researches in order to obtain the quality of project performance. For example, multi criterial decision making approach (MCDM), total productive maintenance technique (TPM), critical path method (CPM)， work break down method (WBDM), risk management process, and computer application for forecasting planning. These techniques, applications and approaches are the key to achieve the competencies, but not only in a general view.

The knowledge and skill of these management techniques, applications and approaches makes a difference between a construction managers with others professional.

It is recommended the universities education system and CIDB to review on this studies to restructure the education course structure and the training programme for the construction manager in the current Malaysia industry in order to reach a high quality work performance.

5.3 Future Researches

In this research, majorly focuses on Johor and Ipoh, Penang, Kuala Lumpur. For a more accurate result, the number of respondents is the essential factors that improving the accuracy of the result. This is encouraging for all future researches on the competencies of construction manager can include wider area such as peninsular Malaysia and also Sabah and Sarawak. Besides that, the respondents in this study majorly is in the organization of main contractors and involved in building projects. It is expected for more diversification for the organization and building involved due to reach on more accurate and unbiasedness result. Furthermore, the competencies of construction manager can also be divert into more specific categories such as the knowledge, skills and also technique that required in order to achieve on that specific competencies.

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APPENDIX

Appendix A: Questionnaire

The competencies of construction manager

Dear Sir/ Madam,
Please spare some few minutes of your valuable time to complete this survey. This survey seeks to investigate the criteria that use to select suitable competencies that a construction manager should emphasised in Malaysia. Your feedback is extremely important towards improving performance of a construction manager. All information obtained is strictly confidential and will be used only for statistical analysis

Respondents' background (Please place a tick where appropriate)

1] Your professional background:
Quantity surveying□ Engineering□ Architecture□ Estate management□ Construction management □ Other□

2] Your highest academic qualification:
Diploma☐ BSc☐ MSc☐ MBA☐ PhD☐ Other, please specify_____

3] Your organization:
Main Contractor☐ Client☐ Private Developers☐ Trade contractor ☐ Subcontractors☐ Other, please specify_____

4] Your current position:
Managing director☐ Contract manager☐ Project manager☐ Supervisor☐ Manager ☐ other please specify_____

5] Your working experience:
Not more than 5 years☐ 5 years to less than 10 years☐ 10 years to less than 15 years☐ 15 years to less than 20 years☐ 20 years and above☐

6] How many projects have you been involved in the last 10 years?
Less than 5☐ 5 – 10☐ 11 – 15☐ 16 – 20 20 and above☐

7] Which of the following types of project(s) your organization is involves? [Please tick all that applies]
Buildings ☐ Civil engineering☐ Mechanical & Electrical☐ Oil and gas☐
Infrastructure ☐ Others_____

Candidate/ graduate details (Please place a tick where appropriate)

1] How long has the candidate/ graduate being working in the organization?

Not more than 1 years☐ 2- 4 years☐ 4- 8 years☐

2] Which university candidate/ graduate from?

UTAR ☐ UTHM ☐ UiTM □ University lim kok weng □ USM □

Others (please state) _____

3] Gender of the graduate/ candidate?

Male □ Female □

4] Is this his/ her first place of work after graduation?

Yes □ No □

5] What is the position of the candidate/ graduate in the organisation?

_____ .

The selection of suitable competencies that a construction manager should emphasized in order to improve project performance in Malaysia. Please, please place a tick on the level of importance the following criteria are considered in the selection of important competencies of construction manager in Malaysia on a scale of 1- 5. Where 5 = Very important: 4 = important; 3 = slightly important; 2 less important and 1= least important

	Least Important	Less Important	Slightly Important	Important	Very Important
Communication(oral/written)					
Motivation of others					
H&S					
Decision making					
Predicting and planning					
Cost budget control					
Observation to employee					
Team building					
Quality control and assurance					
Managing time					
Materials planning and control					
Human resource planning and control					
Set objective and goals					
Directing meeting					
Managing conflict/crisis					
Hiring/award: supervisor/foreman					
Delegating responsibilities					
Maintenances of Program					
Tenant welfare					
PR					

Hiring/ award: subcontractor					
Employee training: supervisor/foreman					
Competitive tendering Investigation of project risk/uncertainty					
Programme design					
Identifying personal strengths/weakness					
Employee training: management					
Site safeties					
Productivity maintenance and control					
Negotiate: client					
Costing and estimating					
Rival awareness					
Managing change					
Hiring/ award: : management					
Negotiate: main contractor					
Negotiate: subcontractor					
Organization of communication system					
Managing job stress					
Hiring/ award: manual labour					
Plant planning and control					
Negotiate: supplier					
Creativity					

Career development And appraisal					
Decanting buildings					
Tactical planning					
Construction legation					
Property protection					
Organization structure					
Dissolution: subcontractor					
Job analysis/specification					
Working regulation agreement					
Dissolution: supervisor/foreman					
Contract drafting					
Sources of finance					
Employment legislation					
Client/consumer protection law					
Promotion and transfer					
Employee welfare/counselling					
Negotiate: Government bodies					
Advertising and promotion					
Market research					
Termination/dismissal: manual labour					
Termination/dismissal: management					
Company law					
Use of computer technology					

Negotiate: trade union					
Organization culture					
Planning law					
Managing others national culture					
Demotion and retirement					
Foreign language					