

**THE IMPLEMENTATION OF PROJECT MANAGEMENT OFFICE FOR
PROPERTY DEVELOPERS IN MALAYSIA**

By

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Specially dedicated to
my beloved Vanice and family.

ABSTRACT

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Every project is dynamic in property development. Without the knowledge in Project Management, it is difficult to complete a project from project initiation to project closure. Hence, many property developers have chosen to implement Project Management Offices (PMO) for effective project control and better stakeholder support for projects. PMO plays the roles in handling the budget, scheduling, reporting, scope, compliance with corporate governance, risk management activities and expected to accelerate the procurement and approval process which can help to cut times in half in some cases. The aim of this project is to study the implementation of PMO at Property Developers in Malaysia. Through this research, the differences between the PMO's roles, functions, tools and techniques were determined. The findings indicated there were significant different between most of the PMO's roles, functions, tools and techniques.

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APPROVAL SHEET

This project report entitled “THE IMPLEMENTATION OF PROJECT MANAGEMENT OFFICE FOR PROPERTY DEVELOPERS IN MALAYSIA” was prepared by CHEE JENN YAP and submitted as partial fulfilment of the requirements for the degree of Master of Science in Project Management at Universiti Tunku Abdul Rahman.

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DECLARATION

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

(CHEE JENN YAP)

Date 9 MAY 2014

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CHAPTER 1

INTRODUCTION

1.1 Rationale

The project management office (PMO) or project office is an organization developed to support the project manager in carrying out their duties (Kerzner 2009). PMO must have good working relationships with both the project and functional managers and the project office personnel must have the same dedication toward the project. In other words, PMO is usually responsible to provide project management support functions or direct management of a project (Project Management Institute 2008).

Therefore, many property developers have chosen to implement PMO for effective project control and better stakeholder support for projects. For them, PMO plays the important roles in handling the budget, scheduling, reporting, scope, compliance with corporate governance, risk management activities and expected to accelerate the procurement and approval process which can help to cut times in half in some cases. Moreover, a well-implemented PMO can also act as the centralize point for capturing and transferring knowledge which will somehow enhance the performance and maturity of project management at the organization (Desouza and Evaristo 2006).

Although the implementation of PMO have many advantages to the organization, there are still many organizations have project failures while practicing

project management through PMO. The reasons for project failures that identified by some researchers are as follows:

- poor knowledge management
- lack of effective project estimation and budgeting
- poor communication
- poor information sharing practices
- inadequate reuse of past experiences and lessons learned
- lack of consistency in management
- lack of formal tracking

From the review of literature, some researchers found out that there might be relationship in between the PMO's roles, functions, tools and techniques which are indirectly influencing the project critical success. Therefore, this research was carried out to study the implementation of the PMO's roles, functions, tools and techniques for the Property Developers in Malaysia.

1.2 Aim and Objectives

The aim of this research is to study the implementation of Project Management Office (PMO) for Property Developers in Malaysia.

The objectives of the study presented in this report are as following:

- (1) To identify the PMO's roles and functions for the Property Developers.
- (2) To find out the PMO's tools and techniques for the Property Developers.
- (3) To determine the differences between the PMO's roles, functions, tools and techniques for the Property Developers.

1.3 Scope of Study

For the purpose of this study, the survey questionnaires were distributed to 138 companies of property developer in the Kuala Lumpur, Malaysia. The population is based on the list of developers by REHDA (2012).

The study will only focus on the PMO's roles and function which will be studies and evaluated together with the tools and techniques in order to determine their relationship.

1.4 Chapter Outline

The first chapter of this research will be discussed the background of the topic together with the problem statement and the significance of study. The aim and objectives will be defined together with the scope of study.

The second chapter is the literature review which will review the previous researches that are related to the basic definition of Project Management Office, PMO's roles and functions as well as the PMO's tools and techniques.

The third chapter is related research methodology. It is mainly to establish the research design for quantitative research. And, the method for data collection and data analysis will be discussed in detail.

The fourth chapter is about the result and discussion of the research. All the result will be analyzed and discussed in detail. The outcome of the research will also be interpreted.

The last chapter is about conclusion and recommendation. This chapter will summarize and conclude the research together with the findings in responding to the research objectives. Furthermore, the research implication will also be discussed as well as the limitation of the research. In the end of this chapter, the recommendation for the future research will also be discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter examines literature related to Project Management Office (PMO) in order to provide a foundation for the propose of this research study.

The following topics will be reviewed:

- Roles and functions
- Tools and techniques

2.2 Project Management Office

Project Management Institute (2008) defined project management office (PMO) as an organizational body that assigned various responsibilities related to the centralized and coordinated management of those projects under its domain. They are responsible to provide project management support functions or direct management of a project.

Kerzner (2009) stated that the project office is an organization developed to support the project manager in carrying out their duties. Project office must have good working relationships with both the project and functional managers and the project office personnel must have the same dedication toward the project.

Mantel et. al. (2011) stated that PMO is more or less like a functional group that set up by a parent organization. Such group may act as staff to some of to all projects. The technical work will be supplying by the functional units while the project office may handle the scheduling, budgeting, scope, reporting, compliance with corporate governance, and risk management activities.

2.3 PMO's Roles and Functions

The PMBOK Guide by Project Management Institute (2008) stated that the PMO should act as a supporting role for the project managers within the organization as follows:

- To identify and develop the project management methodology, standards, and best practices;
- To monitor and audit the project management standards, policies, procedures
- To manage and develop the project policies, templates, procedures, and other shared documentation;

- To manage shared resources across projects
- Coaching, mentoring, training, and oversight;
- Coordinating communication across projects.

A studies by Desouza and Evaristo (2006) stated that the PMOs play an important role in the strategic alignment of the organization's objectives. It is interrelated to the long-term objectives of the business. To align projects with organization objectives, the low priority projects should be terminated to avoid the causing time, resources, financial loss to the organization (Stanleigh, 2006). If the strategic alignment of the organization's objectives can be achieving, it has direct influence on the strategic growth of the organization. The ongoing project decision support for a business expansion strategy will be contributed positively by the projects undertaking (Desouza & Evaristo, 2006).

On the other hand, Karayaz and Gungor (2013) stated that the alignment to strategic goals is bound to how the PMOs are structured. There is a great possibility for PMOs not to be effective in an unstructured organizational environment. It is because PMOs need to collaborate with upper management to integrate overall business strategies into project management efforts. Therefore, PMOs act as a bridge between the project member and the upper management, the business strategies can be implemented easily to achieve an organization's common goals or strategies.

In addition, Desouza and Evaristo (2006) also stated that PMO is to serves as command centre through knowledge management in order to enhance the implementation of lessons learned, best practices and etc. In other words, it allows all

projects to use the same resources owned by the organization whereby it can achieve effective sharing of resource (Karayaz & Gungor 2013).

Furthermore, PMO is also responsible to ensure the quality of the deliverables are consistent through project monitoring. The defined standards and methodologies need to be followed which was highlighted by Desouza and Evaristo (2006). And, PMO needs to conduct project evaluation through review of the operation and approving of change request as well as the management of the resources. Besides that, PMO needs to ensure the ongoing projects are being conducted in an efficient manner through reviewing of project status report and project meeting that should be arranged for project monitoring purposes (Desouza and Evaristo 2006).

Artto *et. al* (2011) concluded that the tasks of a PMO can be grouped into five categories: (1) managing practices, (2) providing administrative support, (3) monitoring and controlling projects, (4) training and consulting, and (5) evaluating, analyzing and choosing projects. 'Managing practices' is mainly to incorporate the continuous improvement of the organization through developing standard procedures, information systems, and tools. 'Providing administrative support' is the PMO to provide assistant to the project managers on the administrative tasks to reduce their workload. 'Monitoring and controlling projects' is that the PMO to monitor and control the collecting of reports, conducting post-project review, auditing projects, and allocating resources. 'Training and consulting' is to responsible on consulting, training of employees and mentoring in the aspect of project

management. 'Evaluation, analyzing and choosing projects' is to manage the portfolio within the organization including championing project seeds and ideas.

2.4 Tools and Techniques

2.4.1 Project standard and procedures

The standardization of project management practices and tools in the organizations can ensure the consistency and continuity of project documentation by virtue of having a centralized point of reference of policies and procedures (Rad 2001, Karayaz and Gungor 2013). The standardization of project management practices can be achieved through providing software, standardizing policies and procedures.

Desouza and Evaristo (2006) stated that a successful PMO shall have good documentation system such as the PMO charter, policy and methodology. The PMO charter is the brief to the project which will also have the detail information of the deliverables required. It may also include information related to the organization's strategic or operational goals.

A PMO policy is to establish for the purpose of encouraging effective project portfolio management (Desouza and Evaristo 2006). PMO will ensure they are on the right track based on the policy that states the organization's principles and objective

as a guideline for the implementation of risk management, people management and communications management.

As for the PMO methodology, it should provide a framework of tools, processes and metrics to the project managers in responding to the management of project as well as the reporting line and the budgeting (Desouza and Evaristo 2006).

2.4.2 Post Project Review & Lessons Learned

Stanleigh (2006) stated that lessons learned is to retain project knowledge by passing it to the future project teams. The PMO needs to take the responsibility to call for a meeting that normally known as Project Close-out Meeting to capture the knowledge or lesson learned throughout the project. The purpose of the closing meeting is to collect the historical archives of a completed project by getting the project team to contribute their ideas through discussions. And the most important is to ensure that everyone is aware of the input will be captured and the objective for the meeting (Stanleigh 2006).

Karayaz and Gungor (2013) stated that the knowledge that gaining from the lesson learned or post project review can help to reduce problems rising from the uncertainties and lack of standardization. Further, it also can improve the

performance and maturity of project management at the organization (Desouza and Evaristo 2006)

2.4.3 Training and Consulting

The appropriate project management methods and tools can be provided through training services to the organization by the PMO (Karayaz and Gungor 2013). The project management practices as well as the need for training of human resources, and assistance in employing project management grow are concerning by the organizations especially for project-based organizations. As a result, continuous training is a significant player in improving themselves and to survive in such a competitive environment (Karayaz and Gungor 2013).

2.4.4 Reassignment of People

Kamara *et. al.* (2003) stated that the project knowledge can be transferred through assigning of the people from one project to another. For tacit knowledge, it is encourage to conduct the interaction through face to face or people to people. In this case, that is possible to allow the less experienced personnel to assist or supervise in

carrying out the work by the experienced personnel. It is because observation and mirroring of the experienced personnel are the good method of knowledge transferring (Tan *et. al* 2010).

Tan *et. al* (2010) also stated that the shortcomings of the knowledge transfer through reassignment of people are the vulnerability to staff turnover and the willingness of knowledge sharing by the experienced personnel.

2.4.5 Knowledge Management

Levinson (2014) defined Knowledge Management (KM) is the process of generating value through the intellectual knowledge based assets that allow knowledge sharing, capturing and transferring through the employees, departments and even with other companies in an effort to devise best practices.

Desouza and Evaristo (2006) stated that PMO may also act as a Knowledge Manager that is responsible for the collecting and managing the best practices and insights. It provides project expertise, mentoring and training through a knowledge base. Further, it also play an important role to ensure the successful delivery of specific projects through the providing of the overview of the project portfolio as well as focusing on project delivery on behalf of the organization (Desouza and Evaristo 2006).

2.4.6 Performance Evaluation

Project Management Institute (2008) stated that the objective for performance evaluation to be conducted is for clarification of roles and responsibilities, constructive feedback to team members, discovery of unknown or unresolved issues, development of individual training plans, and the establishment of specific goals for future time periods.

Carrillo et. al. (2010) stated that the evaluation is to ensure that the project team is to deliver the work done with added value to the business within the specific time frame. In other words, the performance evaluation is also to ensure that the implementation of a methodology is follow closely the process of adoption.

2.4.7 Quality Management

Kerzner (2009) stated that quality management has equal priority with cost and schedule management. The assistant project manager for quality or the quality assurance department may be responsible to the direct measurement of quality. To support each and every project, there are six quality management concepts as follows:

- Quality policy

- Quality objectives
- Quality assurance
- Quality control
- Quality audit
- Quality program plan

2.4.8 Communication Management

Project Management Institute (2008) defined Project Communications Management includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information. Effective communication creates a bridge between diverse stakeholders involved in a project, connecting various cultural and organizational backgrounds, different levels of expertise, and various perspectives and interests in the project execution or outcome (Project Management Institute 2008).

The effectiveness of communication among team members is contributed directly to the project success. Different communication of language may lead to problematic issue or becomes a cumbersome to the project (Desouza and Evaristo 2006).

2.4.9 Change Management

Carrillo *et. al.* (2010) stated that control change is required when there is any possibility of changing the project scope, cost, time or quality as well as the process. Therefore, it will need necessary decisions to be taken for the process and the people involved should also be informed of these changes.

The PMBOK Guide by Project Management Institute (2008) stated that Perform Integrated Changed Control is the process of reviewing all change request, approving changes and managing changes to the deliverables, organizational process assets, project documents and the project management plan.

Creasey (2014) defined change management is the process, tools and techniques to manage the people-side of change to achieve the required business outcome. Change management incorporates the organizational tools that can be utilized to help individuals make successful personal transitions resulting in the adoption and realization of change.

2.5 Conclusion

In summary, the literature review in this chapter was provided a basic framework for the survey questionnaire design in the later chapter.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter will form the methodology that served as a guideline to carry out this research. Literature review, questionnaire design, pilot study, sampling design, and data analysis will be explained in this chapter to show the detail research methodology for this research.

3.2 Literature Review

In this research, the reviews on other researchers' studies and findings will provide knowledge on the PMO's roles and functions as well as the PMO's tools and techniques. The secondary data gathered through literature review will be applied and adopted to develop questionnaire for survey purpose.

The reviews are mainly focusing on the definition of Project Management Office, PMO's roles, functions, tools and techniques. Furthermore, researches that direct or indirectly related to the topic will be review also in order to identify all the

relevant knowledge. In other words, Project Management Office that related to other industry can be a good review for the research.

3.3 Survey Questionnaire

In survey research, questionnaire is to be considered as one of the most commonly used instruments. Wimmer and Dominick (2003) explained that this is mainly because the ability of questionnaire in collecting large amount of data at a reasonable cost and without geographical constraint.

Due to financial and time constraint, the questionnaire will be the most suitable tools to gather the information from large number of respondents within the selected geographical area. For instance, electronic questionnaire will be used for this study in order to reach the respondents within a short time period. The internet can help to distribute the questionnaire very quickly whereby it can reduce the time and the overall research cost. If compare to the printed questionnaires to respondents personally or distribute through mails, that are more time consuming and may encounter geographical boundaries.

Thus, the electronic questionnaire will be carried out to reach the respondents in Kuala Lumpur. In term of questionnaire design, all questions will be designed as close-ended questions for the ease of answering and lesser time consumption. To

allow the respondents to have easy understanding and reading of the question, all questions are also constructed in short and precise format.

3.4 Pilot Study

According to Wimmer and Dominick (2003), pilot study is important to find out whether the questionnaire is designed correctly for the research in order to discover the areas of misunderstanding for rectification. For this research, pilot study will be conducted after questionnaire design so that it can ensure the questionnaire is well structured before the actual questionnaire survey is carried out.

To conduct pilot study, the draft questionnaire were distributed to 5 respondents that known by the researcher. The process will be carried out in a week time before the actual launched date of the survey to allow sufficient time for necessary amendments. If no major problem is encountered through pilot study, the questionnaire will be used to carry out the actual survey. On the other hand, if there is a need to revise the questionnaire due to the adoption of other researchers' or scholars' questionnaire, which helped to reduce the occurrence of errors during the questionnaire construction.

3.5 Sampling Design

This research aimed to study the implementation of PMO for property developers which is specifically in Malaysia context. Therefore, the targeted population of this research are all Malaysians who are currently working in the property development industry as a project manager or related to project management in an organisation or have been working in industry previously. Due to constraint of time and cost, the sampling will be narrow down to target population whom are currently located in Kuala Lumpur only.

For this research, the survey questionnaire were sent to 138 companies to take part of the survey. 138 participants will be determined as the adequate sample size as this is the population of the property developers in the Kuala Lumpur based on the list of developers by REHDA (2012).

3.6 Data Analysis

For the data collection that obtained from survey questionnaire will be analysed with the software Statistical Package Social Science (SPSS). Through the software, it can use to test the reliability of the result and the relationship between the variables with Pearson's Correlation Analysis.

3.6.1 Reliability

Wimmer and Dominick (2003) mentioned that any scale of measurement that has not undergone reliability test is a poor research because the unreliable measures are unable to detect the relationship between variables. According to the studies by Hair *et. al.* (2006) where he found that study each items need to score a minimal agreed reliability value for Cronbach's Alpha, which is 0.70, to be verified as reliable.

3.6.2 One-way ANOVA

ANOVA is an acronym for ANalysis Of VAriance. It is the analysis of the variance of values by comparing them against another set of values (Griffith 2010). If the Sig value is greater than .05, it can be concluded that there is no statistically significant difference. If the Sig value is less than or equal to .05, it can be concluded that there is a statistically significant.

3.7 Conclusion

In summary, this chapter included the research methodology that was served as a guideline to carry out this research . The next chapter will be the outcome of research methodology which is the result and discussion.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter analysed the result through the survey questionnaire that distributed to 138 companies of property development in Kuala Lumpur. The particulars of the respondents which were obtained from Section A will be summarised in this chapter and will be discussed in further together with the data collected from the Section B and C. The Section B is related to the roles and functions of the PMO and the Section B is related to the PMO's tools and techniques.

There were only 53 numbers of respondents replied with feedback throughout the 138 companies. In order words, the response rate was only 38.4 percents. Due to the low response rate, this studies might not able to cover all the opinion from the property developers in Kuala Lumpur.

The outline of this chapters are follows:

- 4.2 Reliability Test
- 4.3 Summary of Respondent
- 4.4 Summary of the Results
- 4.5 Responses to Research Objectives

4.2 Reliability

Table 4.1 shows the result of Cronbach's Alpha test which was used to check the reliability of the consistency of the questionnaire. The reliability statistics below has shown that Section B *Roles and Functions of PMO* had good internal consistency with Cronbach's Alpha of 0.860.

As for the Section C *PMO's Tools and Techniques*, Cronbach's Alpha of 0.923 was obtained, this shown that the data collected for this section had excellent internal consistency.

Table 4.1: Reliability Statistics

	Cronbach's Alpha	N of Items
Section B: Roles and Functions of PMO	0.860	5
Section C: PMO's Tools and Techniques	0.923	9

4.3 Summary of Respondent

Table 4.2 shows the respondent's age. The majority of the respondents have age above 31 (n = 41, 77.4%). The highest percentage is 39.6% (n = 21) with the respondents have age between 31 to 40. For the age between 26 to 30 and 51 to 60,

both age groups had 17% (n = 9). Only 5.7% (n = 3) of the respondents have age between 20 to 25. None of the respondent has age larger than 60.

Table 4.2: Respondents' Age

Age	Frequency	Percent
20 - 25	3	5.7
26 - 30	9	17
31 - 40	21	39.6
41 - 50	11	20.8
51 - 60	9	17
> 60	0	0

Table 4.3 shows the academic qualification of the respondents. The majority of the respondents are holder of Bachelor's degree (n = 34, 64.2%). Respondents with Master's degree had the second higher number with the total 12 nos. (22.6%). Only 9.4% (n = 5) of the respondents are Advanced Diploma certificate holder. Diploma certificate holder among the respondents had 3.8% (n = 2). None of the respondent is Doctor of Philosophy degree holder.

Table 4.3: Respondents' Academic Qualification

Levels	Frequency	Percent
Diploma	2	3.8
Advanced Diploma	5	9.4
Bachelor's Degree	34	64.2
Master's Degree	12	22.6
Doctor of Philosophy	0	0

Table 4.4 shows the profession/discipline of the respondents. Half of the respondents are from the profession/discipline of Architecture (n = 31, 58.5%). Property Development/Real Estate Management had the second higher number of respondents with 15.1% (n = 8). Respondents with Engineering profession/discipline

had the third higher number with 13.2% (n = 7). Project Management and Quantity Surveying had only 9.4% (n = 5) and 3.8% (n = 2). None of the respondent is from Construction Management or others profession/discipline.

Table 4.4: Respondents' Profession / Discipline

Profession / Discipline	Frequency	Percent
Property Development / Real Estate Management	8	15.1
Construction Management	0	0
Architecture	31	58.5
Engineering	7	13.2
Quantity Surveying	2	3.8
Project Management	5	9.4
Others	0	0

Table 4.5 shows the years of experience that the respondents had in Project Management. The majority of the respondents had working experience from 6 to 10 years with 41.5% (n = 22). The respondents with 11 to 20 years working experience in Project Management had the second higher number with 30.2% (n = 16). 15.1% (n = 8) of the respondents had 20 to 30 years working experience in Project Management. Less than 10% of the respondents had working experience more than 5 years in Project Management. Only 3.8% (n = 2) of the respondents had working experience in Project Management in between 31 to 40 years. None of the respondent has working experience more than 41 years in Project Management.

Table 4.5: How many years experience do you have in Project Management?

Working Experience	Frequency	Percent
1 - 5	5	9.4
6 - 10	22	41.5
11 - 20	16	30.2
20 - 30	8	15.1
31 - 40	2	3.8
41- 50	0	0
> 50	0	0

Table 4.6 shows the role of the respondents perform on projects at PMO. The majority of the respondents are Project Manager (n = 22, 41.5%). 24.5% (n = 13) of the respondents are Senior Executive/Assistant Manager at PMO. Managerial levels like Executive Director, CEO, COO or General Manager had 15.1% (n = 8) among the respondents. Project Executive level had 18.9% (n = 10).

Table 4.6: What role do you perform on projects?

Role	Frequency	Percent
Project Executive	10	18.9
Senior Executive / Assistant Manager	13	24.5
Project Manager	22	41.5
Executive Director / CEO / COO / General Manager	8	15.1

Table 4.7 shows the average size of Project Management Office / Department that the respondents are working at. Half of the respondents are from PMO that built up between 11 to 20 persons (n = 29, 54.7%). PMO with 5 to 10 persons had the second higher number among the respondents (n = 12, 22.6%). Only 11.3% (n = 6) of the respondents are working at PMO with below 5 person and more than 20 persons.

Table 4.7: Average size of Project Management Office/Department?

Number	Frequency	Percent
< 5	6	11.3
5 - 10	12	22.6
11 - 20	29	54.7
> 20	6	11.3

Table 4.8 shows the number of on-going projects for the PMO that respondents are working at. The majority of PMO have on-going projects between 5 to 10 numbers (n = 23, 44%). 32.1% (n = 17) of the PMO have more than 10 number of on-going projects. 23.9% (n = 13) of the PMO have less than 5 number of on-going projects.

Table 4.8: Number of On-going projects for the PMO?

Number	Frequency	Percent
< 5	13	23.9
5 - 10	23	44.0
> 10	17	32.1

4.4 Summary of the Result

For this sections, the survey questionnaire result of Section B and C will be summarised in detail under the following sections:

4.3.1 Roles and Functions of PMO

4.3.2 PMO's Tools and Techniques

4.4.1 PMO's Roles and Functions

Refer to table 4.9 below, the PMO's roles and functions were measured on a balanced five point Likert scale from Strongly Agree =1 to Strongly Disagree = 5, with a midpoint of Neutral = 3.

The response summary for Section B shows that for the question: Q8 *Strategic alignment of the organization's objective*, 88.7% of respondents agreed or strongly agreed (n = 47). For the question: Q9 *Identifying and developing project management methodology, best practices, and standards*, 81.1% of respondents agreed or strongly agreed (n = 43). For question: Q10 *Monitor compliance with project management methodology, best practices, and standards*, 79.3% of respondents agreed or strongly agreed (n = 42). For question: Q11 *Coordinating communication across projects*, 77.3% of respondents agreed or strong agreed (n = 41). For question: Q12 *Managing shared resources across all project administered by the PMO*, 79.3% of respondents agreed or strongly agreed (n = 42).

Table 4.9: PMO's Roles and Functions Response Summary

No.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
Q8	13	34	4	1	1	1.92	0.756
Q9	23	20	3	5	2	1.92	1.107
Q10	11	31	10	1	0	2.02	0.693
Q11	13	28	5	6	1	2.13	0.981
Q12	8	34	9	2	0	2.09	0.687

Table 4.10 shows the statistics for PMO's roles and functions. Q8 *Strategic alignment of the organization's objective* and Q9 *Identifying and developing project*

management methodology, best practices, and standards were both had the lowest mean score at 1.92 (*SD* = 0.756) and 1.92 (*SD* = 1.107). Q11 *Coordinating communication across project* had the highest mean score at 2.13 (*SD* = 0.981). Q12 *Managing shared resources across all projects administered by the PMO* had 2nd higher mean at 2.13 (*SD* = 0.981) and Q10 *Monitor compliance with project management methodology, best practices, and standards* had the 3rd higher mean at 2.02 (*SD* = 0.693).

Table 4.10: PMO's Roles and Functions Statistics

No.	Mean	<i>SD</i>	Minimum	Maximum
Q8	1.92	0.756	1	5
Q9	1.92	1.107	1	5
Q10	2.02	0.693	1	4
Q11	2.13	0.981	1	5
Q12	2.09	0.687	1	4

4.4.2 PMO's Tools and Techniques

Refer to table 4.11 below, the PMO's tools and techniques were measured on a balanced six point Likert scale from Advanced = 1 to Not Practice = 6.

The response summary for Section C shows that for the question: Q13 *Project standard and procedures*, 49.1% (n = 26) of respondents think that their PMO is good at this tool and technique. For the question: Q14 *Post project review and lessons learned*, 50.9% (n = 27) of the respondents think that their PMO is good

at this tool and technique. For the question: Q15 *Coaching, mentoring and training*, 34% (n = 18) of respondents think that their PMO is average at this tool and technique. For the question: Q16 *Reassignment of people*, 37.7% (n = 20) of respondents think that their PMO is average at this tool and technique. For the question: Q17 *Knowledge management*, 34% (n = 18) of respondents think that their PMO is poor at this tool and technique. For the question: Q18 *Performance evaluation*, 30.2% (n = 16) of respondents think that their PMO is good at this tool and technique; For the question: Q19 *Quality management*, 47.2% (n = 25) of respondents think that their PMO is good at this tool and technique. For the question: Q20 *Communications management*, 49.1% (n = 26) of respondents think that their PMO is average at this tool and technique. For the question: Q21 *Change management*, 34% (n = 18) of respondents think that their PMO is advanced at this tool and technique.

Table 4.11: PMO's Tools and Techniques Response Summary

No.	Advanced	Good	Average	Normal	Pool	Not Practice	Mean	SD
Q13	0	26	12	10	5	0	2.89	1.031
Q14	0	27	7	4	15	0	3.13	1.316
Q15	1	8	18	4	11	11	3.92	1.479
Q16	4	18	20	2	9	0	2.89	1.171
Q17	0	11	15	4	18	5	3.83	1.355
Q18	2	16	14	9	11	1	3.26	1.258
Q19	4	25	4	2	12	6	3.21	1.657
Q20	0	19	26	0	8	0	2.94	0.989
Q21	7	13	18	11	4	0	2.85	1.133

Table 4.12 shows the statistics for PMO's tools and techniques. Q15 *Coaching, mentoring and training* had the highest mean score at 3.92 ($SD = 1.479$). Q17 *Knowledge management* had the second higher mean score at 3.83 ($SD =$

1.355). Q18 *Performance evaluation* had the third higher mean score at 3.26 (*SD* = 1.258). Q21 *Change management* had the lowest mean score at 2.85 (*SD* = 1.133). The second lower mean score at 2.89 which were Q13 *Project standard and procedures* (*SD* = 1.031) and Q16 *Reassignment of people* (*SD* = 1.171).

Table 4.12: PMO's Tools and Techniques Statistics

No.	Mean	<i>SD</i>	Minimum	Maximum
Q13	2.89	1.031	2	5
Q14	3.13	1.316	2	5
Q15	3.92	1.479	1	6
Q16	2.89	1.171	1	5
Q17	3.83	1.355	2	6
Q18	3.26	1.258	1	6
Q19	3.21	1.657	1	6
Q20	2.94	0.989	2	5
Q21	2.85	1.133	1	5

4.5 Responses to Research Objectives

This section will be responded to the research objectives as follows:

- (1) To identify the PMO's roles and functions for the Property Developers.
- (2) To find out the PMO's tools and techniques for the Property Developers.
- (3) To determine the difference between the PMO's roles, functions, tools and techniques for the Property Developers.

The research objective no.1 was mentioned in previous section 4.4.1 PMO's Roles and Function and the research objective no.2 was mentioned in previous

section 4.4.2 PMO's Tools and Techniques. Therefore, only research objective no.3 will be discussed in this subchapter.

In order to determine the difference between the PMO's roles, functions, tools and functions, One-way ANOVA was used to analyse the data collection through survey questionnaire. This test can determine whether any significance different between two groups.

4.5.1 PMO's Roles and Functions: Strategic Alignment of the Organization's Objectives VS PMO's Tools and Techniques

Table 4.13 shows the result of ANOVA analysis for PMO's Roles and Functions: Strategic Alignment of the Organization's Objectives VS PMO's Tools and Techniques. There were significant differences for the following:

- Project Standard and Procedures (Sig. value = 0.004)
- Post Project Review and Lessons Learned (Sig. value = 0.002)
- Knowledge Management (Sig. value = 0.001)
- Quality Management (Sig. value = 0.026)
- Communication Management (Sig. value = 0.013)
- Change Management (Sig. value = 0.000)

Therefore, the result suggested that if the PMO of Property Developer has focused on Strategic Alignment of the Organization's Objectives as one of their PMO's roles and functions, it is most likely the PMO of the Property Developer are practicing the abovementioned PMO's tools and techniques.

Table 4.13: The Differences between PMO's Roles and Functions: Strategic Alignment of the Organization's Objectives VS PMO's Tools and Techniques

	Sum of Squares	df	Mean Square	F	Sig.
Q13	15.131	4	3.783	4.518	0.004**
Q14	26.057	4	6.514	4.884	0.002**
Q15	18.194	4	4.548	2.286	0.740
Q16	9.355	4	2.339	1.182	0.142
Q17	30.105	4	7.526	5.527	0.001**
Q18	14.438	4	3.609	2.553	0.051
Q19	28.905	4	7.226	3.048	0.026**
Q20	11.599	4	2.900	3.548	0.013**
Q21	22.899	4	5.725	6.260	0.000**

**p < 0.05 level.

4.5.2 PMO's Roles and Functions: Identifying and Developing Project Management Methodology Best Practices, and Standards VS PMO's Tools and Techniques

Table 4.14 shows the result of ANOVA analysis for PMO's Roles and Functions: Identifying and Developing Project Management Methodology Best Practices, and Standards VS PMO's Tools and Techniques. There were significant differences for the following:

- Project Standard and Procedures (Sig. value = 0.000)
- Reassignment of People (Sig. value = 0.000)
- Performance Evaluation (Sig. value = 0.001)
- Quality Management (Sig. value = 0.000)
- Communication Management (Sig. value = 0.036)
- Change Management (Sig. value = 0.000)

Therefore, the result suggested that if the PMO of Property Developer has focused on Identifying and Developing Project Management Methodology Best Practices, and Standards as one of their PMO's roles and functions, it is most likely the PMO of the Property Developer are practicing the abovementioned PMO's tools and techniques.

Table 4.14: The Differences between PMO's Roles and Functions: Identifying and Developing Project Management Methodology Best Practices, and Standards VS PMO's Tools and Techniques

	Sum of Squares	df	Mean Square	F	Sig.
Q13	20.219	4	5.055	6.912	0.000**
Q14	15.619	4	3.905	2.517	0.053
Q15	20.068	4	5.017	2.572	0.050
Q16	34.452	4	8.613	11.213	0.000**
Q17	11.483	4	2.871	1.641	0.179
Q18	26.429	4	6.607	5.676	0.001**
Q19	57.887	4	14.472	8.189	0.000**
Q20	9.614	4	2.403	2.799	0.036**
Q21	23.913	4	5.978	6.692	0.000**

**p < 0.05 level.

4.5.3 PMO's Roles and Functions: Monitor Compliance with Project Management Methodology, Best Practices, and Standards VS PMO's Tools and Techniques

Table 4.15 shows the result of ANOVA analysis for PMO's Roles and Functions: Monitor Compliance with Project Management Methodology, Best Practices, and Standards VS PMO's Tools and Techniques. There were significant differences for the following:

- Project Standard and Procedures (Sig. value = 0.012)
- Post Project Review and Lessons Learned (Sig. value = 0.005)
- Coaching, Mentoring and Training (Sig. value = 0.000)
- Reassignment of People (Sig. value = 0.000)
- Knowledge Management (Sig. value = 0.007)
- Performance Evaluation (Sig. value = 0.000)
- Quality Management (Sig. value = 0.010)
- Communication Management (Sig. value = 0.005)
- Change Management (Sig. value = 0.000)

Therefore, the result suggested that if the PMO of Property Developer has focused on Monitor Compliance with Project Management Methodology, Best Practices, and Standards as one of their PMO's roles and functions, it is most likely the PMO of the Property Developer are practicing the abovementioned PMO's tools and techniques.

Table 4.15: The Differences between PMO's Roles and Functions: Monitor Compliance with Project Management Methodology, Best Practices, and Standards VS PMO's Tools and Techniques

	Sum of Squares	df	Mean Square	F	Sig.
Q13	11.058	3	3.686	4.080	0.012**
Q14	20.700	3	6.900	4.874	0.005**
Q15	41.978	3	13.993	9.560	0.000**
Q16	23.576	3	7.859	8.065	0.000**
Q17	20.722	3	6.907	4.528	0.007**
Q18	28.906	3	9.635	8.842	0.000**
Q19	29.197	3	9.732	4.201	0.010**
Q20	11.723	3	3.908	4.896	0.005**
Q21	20.785	3	6.928	7.379	0.000**

**p < 0.05 level.

4.5.4 PMO's Roles and Functions: Coordinating Communication Across Projects VS PMO's Tools and Techniques

Table 4.16 shows the result of ANOVA analysis for PMO's Roles and Functions: Coordinating Communication Across Projects VS PMO's Tools and Techniques.

There were significant differences for the following:

- Project Standard and Procedures (Sig. value = 0.000)
- Post Project Review and Lessons Learned (Sig. value = 0.006)
- Coaching, Mentoring and Training (Sig. value = 0.007)
- Reassignment of People (Sig. value = 0.000)
- Performance Evaluation (Sig. value = 0.000)

- Quality Management (Sig. value = 0.000)
- Communication Management (Sig. value = 0.000)

Therefore, the result suggested that if the PMO of Property Developer has focused on Coordinating Communication Across Projects as one of their PMO's roles and functions, it is most likely the PMO of the Property Developer are practicing the abovementioned PMO's tools and techniques.

Table 4.16: The Differences between PMO's Roles and Functions: Coordinating Communication Across Projects VS PMO's Tools and Techniques

	Sum of Squares	df	Mean Square	F	Sig.
Q13	24.386	4	6.096	9.459	0.000**
Q14	22.816	4	5.704	4.071	0.006**
Q15	28.415	4	7.104	3.998	0.007**
Q16	38.281	4	9.570	13.903	0.000**
Q17	8.172	4	2.043	1.123	0.357
Q18	38.469	4	9.617	10.532	0.000**
Q19	62.928	4	15.732	9.464	0.000**
Q20	17.063	4	4.266	6.064	0.000**
Q21	11.272	4	2.818	2.436	0.060

**p < 0.05 level.

4.5.5 PMO's Roles and Functions: Managing Shared Resources Across All Projects Administered by the PMO VS PMO's Tools and Techniques

Table 4.17 shows the result of ANOVA analysis for PMO's Roles and Functions: Managing Shared Resources Across All Projects Administered by the PMO VS PMO's Tools and Techniques. There were significant differences for the following:

- Project Standard and Procedures (Sig. value = 0.000)
- Post Project Review and Lessons Learned (Sig. value = 0.000)
- Coaching, Mentoring and Training (Sig. value = 0.012)
- Knowledge Management (Sig. value = 0.004)
- Performance Evaluation (Sig. value = 0.000)
- Quality Management (Sig. value = 0.000)
- Change Management (Sig. value = 0.031)

Therefore, the result suggested that if the PMO of Property Developer has focused on Managing Shared Resources Across All Projects Administered by the PMO as one of their PMO's roles and functions, it is most likely the PMO of the Property Developer are practicing the abovementioned PMO's tools and techniques.

Table 4.17: The Differences between PMO's Roles and Functions: Managing Shared Resources Across All Projects Administered by the PMO VS PMO's Tools and Techniques

	Sum of Squares	df	Mean Square	F	Sig.
Q13	27.585	3	9.195	16.245	0.000**
Q14	31.046	3	10.349	8.560	0.000**
Q15	22.670	3	7.557	4.068	0.012**
Q16	9.387	3	3.129	2.476	0.072
Q17	22.482	3	7.494	5.031	0.004**
Q18	25.272	3	8.424	7.238	0.000**
Q19	62.210	3	20.737	12.621	0.000**
Q20	5.206	3	1.735	1.864	0.148
Q21	10.960	3	3.653	3.206	0.031**

**p < 0.05 level.

4.6 Conclusion

In summary, this chapter included the statistical analyses that were used to summarize the data, describe the sample, and address the research objectives. The conclusions and recommendations developed from these findings are included in the next chapter.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter will summarize and conclude the research together with the findings in responding to the research objectives. Furthermore, the research implication will also be discussed as well as the limitation of the research. In the end of this chapter, the recommendation for the future research will also be discussed.

5.2 PMO's Roles and Functions for the Property Developer

For the PMO's roles and functions of the Property Developer, basically the ranking table below can summaries the data collection and the analysis that mentioned in the previous chapter:

Table 4.18: The Ranking of PMO's Roles and Functions

Ranking	Roles and Functions
1	Strategic Alignment of the Organization's Objective
2	Identifying and Developing Project Management Methodology, Best Practices, and Standards
3	Monitoring Compliance with Project Management Methodology, Best Practices, and Standards / Managing Shared Resources Across All Project Administered by the PMO
4	Coordinating Communication Across Projects

The five roles and functions for the PMO were almost equally important to all the Property Developer's PMO based on the data collection. But the most important one is the Strategic Alignment of the Organization's Objective as It is interrelated to the long-term objectives of the business. To align projects with organization objectives, the low priority projects should be terminated to avoid the causing time, resources, financial loss to the organization (Desouza and Evaristo 2006). If the strategic alignment of the organization's objectives can be achieving, it has direct influence on the strategic growth of the organization.

Coordinating Communication Across Projects is the lowest ranking role and function if compare with others. Therefore, it should be improved by the Property Developer's PMO. It is because effective communication creates a bridge between diverse stake holders involved in a project, connecting various cultural and organizational backgrounds, different levels of expertise, and various perspectives and interests in the project execution or outcome (Project Management Institute 2008)

5.3 PMO's Tools and Techniques for the Property Developer

Based on the data collection and analysis on the earlier chapter, there are four tools and techniques that were identified to be a good practice by the PMO of the Property Developers. These tools and techniques are: Project Standard and Procedures, Post

Project Review and Lessons Learned, Performance Evaluation, and Quality Management. It is believe that these four tools and techniques are the traditional tools and techniques for most of the organization. Therefore, these tools and techniques are commonly practicing by the PMO of the Property Developer.

For the tools and techniques that are average for the PMO of the Property Developers are: Coaching, Mentoring and training, Reassignment of People, Communications Management and Change Management. Coaching, Mentoring, Training and Reassignment of People are more toward human resource management. Therefore, the PMO may not able to fully involve because most of the organization are still giving the authority to the Human Resource Department. As for the Communication Management and Change Management, it may not be common to all Property Developers if the formal project management practice is not fully implementing in the organization.

Moreover, the Knowledge Management which is supposed to be one of the important tools and techniques for the implementation of PMO but it is not reflecting on the data collection based on the Property Developer's PMO. It is believe that it has strongly related to the poor implementation of the formal project management (PM) among the Property Developer.

5.4 The Differences between PMO's Roles, Functions, Tools and Techniques for the Property Developer

The table 4.19 was summarised all the result of the ANOVA analysis for the differences between PMO's roles, functions, tools and techniques for the Property Developer. It shows that Project Standard and Procedures is one of the PMO's tools and techniques that commonly practicing by all the respondents based on the data collection. As highlighted by other researchers, the Project Standard and Procedures are important for a PMO especially for the Property Developer. It is because the standardization of project management practices and tools in the organizations can ensure the consistency and continuity of project documentation by virtue of having a centralize point of reference of policies and procedures (Rad 2001, Karayaz and Gungor 2013).

In term of quality management, this tool and technique is also commonly practicing by the PMO for the Property Developer based on the data collection. It will directly contribute to the project success if the PMO is good in quality management. And, the quality management will also act as a support for every project. The quality management concepts shall include quality policy, quality objectives, quality assurance, quality control, quality audit and quality program plan as stated by Kerzner (2009).

Furthermore, the result of the ANOVA analysis also tells us that there are few PMO's tools and techniques shall be giving more attention to improve the implementation of PMO. One of the tools and techniques is the Coaching, Mentoring

and Training. As mentioned by Karayaz and Gungor (2013), continuous training is a significant player in improving themselves and to survive in such a competitive environment. Reassignment of People is the another tool and technique that required more attention to the PMO for the Property Developer. As stated by Kamara *et. al.* (2003) that the knowledge acquired from one project can be transferred by assigning the people involved to another project. Therefore, Reassignment of People is important to increase the project success rate.

In addition, Knowledge Management (KM) is also not very common for the Property Developer's PMO based on the data collection. The KM is intellectual and knowledge-based assets that generate value to the organization (Levinson 2014). With the implementation of KM, the PMO will act as the command centre that have strong impact to the successful delivery of the specific projects (Desouza and Evaristo 2006).

Table 4.19: Summaries of the Significant Differences between PMO's Roles and Functions VS PMO's Tools and Techniques through ANOVA Analysis

	Project Standard & Procedures	Post Project Review & Lessons Learned	Coaching, Mentoring and Training	Reassignment of People	Knowledge Management	Performance Evaluation	Quality Management	Communication Management	Change Management
Strategic Alignment of the Organization's Objective	√	√			√		√	√	√
Identifying & Developing PM Methodology, Best Practices, & Standard	√			√		√	√	√	√
Monitor Compliance with PM Methodology, Best Practices, & Standard	√	√	√	√	√	√	√	√	√
Coordinating Communication Across Projects	√	√	√	√		√	√	√	
Managing Shared Resources Across All Projects Administered by the PMO	√	√	√		√	√	√		√

5.5 Research Implication

This research could help to determine the differences between the various PMO's roles and functions as well as their tools and techniques. If the property developers are to take this research as a reference material, they can enhance their PMO's roles and functions internally by improving any of the roles and functions that have significant relationship.

On the other hand, the property developers can also find out which of their tools and techniques need to be giving more attention based on the PMO's roles and functions that have been used as the core value for the company.

5.6 Limitation

The main limitation of this research is the low response rate of the survey questionnaire. There were only 53 numbers of respondents replied with feedback throughout the 138 companies. Due to the low response rate, this studies might not able to cover all the opinion from the property developers in Kuala Lumpur.

5.7 Recommendations

For the future research, the research methodology is sugesred to be changed from quantitative to qualitative as the response rate is hard to achieve for the similar research topic. The qualitative research is not only giving the detail information to the research but it also able to have more accurate information if compare with quantitative research that normally conducted with survey questionnaire.

In term of research topic, the critical success of the project should be related to the PMO's tools and techniques as well as the PMO's roles and functions. This could be used to determine which of the PMO's tools and techniques or PMO's roles and functions that is contributed to the critical success of the project.

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APPENDICES

APPENDIX A: Survey Questionnaire

Dear Sir / Madam,

This research is to fulfill part of MSc Project Management assessment from University Tunku Abdul Rahman. The aim of this research is to study **The Implementation of Project Management Office for Property Developers in Malaysia.**

It would be very much appreciate if you could participate in this survey by completing the attached questionnaire which will only take about 15 minutes to complete. There are no right or wrong answers. Your sincere answers will greatly contribute to the development of this academic research. Please be assured that all information will be treated with strictest confidentiality and only the aggregated data will be analyzed.

Thank you very much for your kind participation.

Yours sincerely,

Chee Jenn Yap (David)

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SECTION A: (Background of Respondents & PMO) Please select ONE answer from each statement that best describes you & your PMO.		
No.	Questions	Answers
1.	Age: (1) 20-25 (2) 26-30 (3) 31-40 (4) 41-50 (5) 51-60 (6) >60	
2.	Academic Qualification: (1) Diploma (2) Advanced Diploma / Higher Diploma / Graduate Diploma (3) Bachelor's Degree (4) Master's Degree (5) Doctor of Philosophy (PhD)	
3.	Profession/Discipline: (1) Property Development / Real Estate Management (2) Construction Management (3) Architecture (4) Civil Engineering (5) Quantity Surveying (6) Project Management (7) Others	
4.	How many years experience do you have in Project Management? (1) 1-5 (2) 6-10 (3) 11-20 (4) 21-30 (5) 31-40 (6) 41-50 (7) >50	
5.	What role do you perform on projects? (1) Project Executive (2) Senior Executive / Assistant Manager (3) Project Manager (4) Executive Director / CEO / COO / General Manager	
6.	Average size of Project Management Office / Department (1) <5 (2) 5-10 (3) 11-20 (4) >20	
7.	Number of on-going projects for the PMO? (1) <5 (2) 5-10 (3) >10	

	<p>SECTION B: (Roles and Functions of PMO)</p> <p>Rate the roles and functions that practicing by your PMO as follows: (1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree</p>	
8.	<p>Strategic alignment of the organization's objective <i>(Projects undertaken are in line with the long-term objectives of the organization.)</i></p>	
9.	<p>Identifying and developing project management methodology, best practices, and standards</p>	
10.	<p>Monitor compliance with project management methodology, best practices, and standards</p>	
11.	<p>Coordinating communication across projects <i>(To transfer experience among projects to ensure clear communication between project teams.)</i></p>	
12.	<p>Managing shared resources across all projects administered by the PMO <i>(Serving as a central repository of lesson learned, best practices, and standardized methodologies.)</i></p>	
	<p>SECTION C: (PMO's Tools & Techniques)</p> <p>Rate the level of the Tools & Techniques that practicing by your PMO with the following scales: (1) Advanced (2) Good (3) Average (4) Normal (5) Poor (6) Not Practice</p>	
13.	<p>Project standard and procedures (SOP, Guideline)</p>	
14.	<p>Post Project review and Lessons learned</p>	
15.	<p>Coaching, mentoring and training</p>	
16.	<p>Reassignment of people <i>(The knowledge acquired from one project can be transferred by reassigning the people involved to another project)</i></p>	
17.	<p>Knowledge management <i>(Through Web-based/Intranet or related platform for sharing and transfer of knowledge/experience)</i></p>	
18.	<p>Performance evaluation (KPIs)</p>	
19.	<p>Quality Management (ISO 9001:2000)</p>	
20.	<p>Communications Management <i>(Clear reporting lines, stakeholder management, performance reporting)</i></p>	
21.	<p>Change management <i>(Changes control in term of design enhancement, site condition, compliance of By-law and etc. Procedures for changes' approval/record/verification)</i></p>	

APPENDIX B:

One-way ANOVA Analysis

PMO's Roles and Functions: Strategic Alignment of the Organization's Objectives VS
PMO's Tools and Techniques

		Sum of Squares	df	Mean Square	F	Sig.
X13 -- Project standard & procedures	Between Groups	15.131	4	3.783	4.518	.004
	Within Groups	40.190	48	.837		
	Total	55.321	52			
X14 -- Post project review & lessons learned	Between Groups	26.057	4	6.514	4.884	.002
	Within Groups	64.018	48	1.334		
	Total	90.075	52			
X15 -- Coaching, mentoring & training	Between Groups	18.194	4	4.548	2.286	.074
	Within Groups	95.505	48	1.990		
	Total	113.698	52			
X16 -- Reassignment of people	Between Groups	9.355	4	2.339	1.812	.142
	Within Groups	61.966	48	1.291		
	Total	71.321	52			
X17 -- Knowledge management	Between Groups	30.105	4	7.526	5.527	.001
	Within Groups	65.367	48	1.362		
	Total	95.472	52			
X18 -- Performance evaluation	Between Groups	14.438	4	3.609	2.553	.051
	Within Groups	67.864	48	1.414		
	Total	82.302	52			
X19 -- Quality management	Between Groups	28.905	4	7.226	3.048	.026
	Within Groups	113.812	48	2.371		
	Total	142.717	52			
X20 -- Communication management	Between Groups	11.599	4	2.900	3.548	.013
	Within Groups	39.231	48	.817		
	Total	50.830	52			
X21 -- Change management	Between Groups	22.899	4	5.725	6.260	.000
	Within Groups	43.894	48	.914		
	Total	66.792	52			

APPENDIX C:

One-way ANOVA Analysis

PMO's Roles and Functions: Identifying and Developing Project Management Methodology Best Practices, and Standards VS PMO's Tools and Techniques

		Sum of Squares	df	Mean Square	F	Sig.
X13 -- Project standard & procedures	Between Groups	20.219	4	5.055	6.912	.000
	Within Groups	35.101	48	.731		
	Total	55.321	52			
X14 -- Post project review & lessons learned	Between Groups	15.619	4	3.905	2.517	.053
	Within Groups	74.457	48	1.551		
	Total	90.075	52			
X15 -- Coaching, mentoring & training	Between Groups	20.068	4	5.017	2.572	.050
	Within Groups	93.630	48	1.951		
	Total	113.698	52			
X16 -- Reassignment of people	Between Groups	34.452	4	8.613	11.213	.000
	Within Groups	36.869	48	.768		
	Total	71.321	52			
X17 -- Knowledge management	Between Groups	11.483	4	2.871	1.641	.179
	Within Groups	83.989	48	1.750		
	Total	95.472	52			
X18 -- Performance evaluation	Between Groups	26.429	4	6.607	5.676	.001
	Within Groups	55.873	48	1.164		
	Total	82.302	52			
X19 -- Quality management	Between Groups	57.887	4	14.472	8.189	.000
	Within Groups	84.830	48	1.767		
	Total	142.717	52			
X20 -- Communication management	Between Groups	9.614	4	2.403	2.799	.036
	Within Groups	41.217	48	.859		
	Total	50.830	52			
X21 -- Change management	Between Groups	23.913	4	5.978	6.692	.000
	Within Groups	42.880	48	.893		
	Total	66.792	52			

APPENDIX D:

One-way ANOVA Analysis

PMO's Roles and Functions: Monitor Compliance with Project Management Methodology, Best Practices, and Standards VS PMO's Tools and Techniques

		Sum of Squares	df	Mean Square	F	Sig.
X13 -- Project standard & procedures	Between Groups	11.058	3	3.686	4.080	.012
	Within Groups	44.263	49	.903		
	Total	55.321	52			
X14 -- Post project review & lessons learned	Between Groups	20.700	3	6.900	4.874	.005
	Within Groups	69.375	49	1.416		
	Total	90.075	52			
X15 -- Coaching, mentoring & training	Between Groups	41.978	3	13.993	9.560	.000
	Within Groups	71.720	49	1.464		
	Total	113.698	52			
X16 -- Reassignment of people	Between Groups	23.576	3	7.859	8.065	.000
	Within Groups	47.745	49	.974		
	Total	71.321	52			
X17 -- Knowledge management	Between Groups	20.722	3	6.907	4.528	.007
	Within Groups	74.750	49	1.526		
	Total	95.472	52			
X18 -- Performance evaluation	Between Groups	28.906	3	9.635	8.842	.000
	Within Groups	53.396	49	1.090		
	Total	82.302	52			
X19 -- Quality management	Between Groups	29.197	3	9.732	4.201	.010
	Within Groups	113.520	49	2.317		
	Total	142.717	52			
X20 -- Communication management	Between Groups	11.723	3	3.908	4.896	.005
	Within Groups	39.107	49	.798		
	Total	50.830	52			
X21 -- Change management	Between Groups	20.785	3	6.928	7.379	.000
	Within Groups	46.007	49	.939		
	Total	66.792	52			

APPENDIX E:

One-way ANOVA Analysis

PMO's Roles and Functions: Coordinating Communication Across Projects VS
PMO's Tools and Techniques

		Sum of Squares	df	Mean Square	F	Sig.
X13 -- Project standard & procedures	Between Groups	24.386	4	6.096	9.459	.000
	Within Groups	30.935	48	.644		
	Total	55.321	52			
X14 -- Post project review & lessons learned	Between Groups	22.816	4	5.704	4.071	.006
	Within Groups	67.260	48	1.401		
	Total	90.075	52			
X15 -- Coaching, mentoring & training	Between Groups	28.415	4	7.104	3.998	.007
	Within Groups	85.284	48	1.777		
	Total	113.698	52			
X16 -- Reassignment of people	Between Groups	38.281	4	9.570	13.903	.000
	Within Groups	33.040	48	.688		
	Total	71.321	52			
X17 -- Knowledge management	Between Groups	8.172	4	2.043	1.123	.357
	Within Groups	87.300	48	1.819		
	Total	95.472	52			
X18 -- Performance evaluation	Between Groups	38.469	4	9.617	10.532	.000
	Within Groups	43.833	48	.913		
	Total	82.302	52			
X19 -- Quality management	Between Groups	62.928	4	15.732	9.464	.000
	Within Groups	79.789	48	1.662		
	Total	142.717	52			
X20 -- Communication management	Between Groups	17.063	4	4.266	6.064	.000
	Within Groups	33.767	48	.703		
	Total	50.830	52			
X21 -- Change management	Between Groups	11.272	4	2.818	2.436	.060
	Within Groups	55.521	48	1.157		
	Total	66.792	52			

APPENDIX F:

One-way ANOVA Analysis

PMO's Roles and Functions: Managing Shared Resources Across All Projects Administered by the PMO VS PMO's Tools and Techniques

		Sum of Squares	df	Mean Square	F	Sig.
X13 -- Project standard & procedures	Between Groups	27.585	3	9.195	16.245	.000
	Within Groups	27.735	49	.566		
	Total	55.321	52			
X14 -- Post project review & lessons learned	Between Groups	31.046	3	10.349	8.590	.000
	Within Groups	59.029	49	1.205		
	Total	90.075	52			
X15 -- Coaching, mentoring & training	Between Groups	22.670	3	7.557	4.068	.012
	Within Groups	91.029	49	1.858		
	Total	113.698	52			
X16 -- Reassignment of people	Between Groups	9.387	3	3.129	2.476	.072
	Within Groups	61.934	49	1.264		
	Total	71.321	52			
X17 -- Knowledge management	Between Groups	22.482	3	7.494	5.031	.004
	Within Groups	72.989	49	1.490		
	Total	95.472	52			
X18 -- Performance evaluation	Between Groups	25.272	3	8.424	7.238	.000
	Within Groups	57.029	49	1.164		
	Total	82.302	52			
X19 -- Quality management	Between Groups	62.210	3	20.737	12.621	.000
	Within Groups	80.507	49	1.643		
	Total	142.717	52			
X20 -- Communication management	Between Groups	5.206	3	1.735	1.864	.148
	Within Groups	45.624	49	.931		
	Total	50.830	52			
X21 -- Change management	Between Groups	10.960	3	3.653	3.206	.031
	Within Groups	55.833	49	1.139		
	Total	66.792	52			

APPENDIX G:

List of Developers in Kuala Lumpur by REHDA (2012)

1. ABADI MAN NIEN SDN BHD
2. AMBER RESOURCES SDN BHD
3. AMITY BINJAI SDN BHD
4. ANDALAS DEVELOPMENT SDN BHD
5. AQUIRITS HOLDINGS SDN BHD
6. ARAPROP DEVELOPMENT SDN BHD
7. ASM DEVELOPMENT SDN BHD
8. AXIS MILESTONE SDN BHD
9. BANDAR RAYA DEVELOPMENTS BERHAD
10. BELLWORTH DEVELOPMENTS SDN BHD
11. BENETON PROPERTIES SDN BHD
12. BEVERLY TOWER DEVELOPMENT SDN BHD
13. BLUCONSTELLATION DEVELOPMENT SDN BHD
14. BOLTON BERHAD
15. BUILDMARK SDN BHD
16. BUKIT KIARA PROPERTIES SDN BHD
17. CANVAS DEVELOPMENTS SDN BHD
18. CRSC PROPERTY SDN BHD
19. DANAU LUMAYAN SDN BHD
20. DAYA NIAGA SDN BHD
21. DWITASIK SDN BHD
22. E & O PROPERTIES SDN BHD
23. ECS MUTIARA SDN BHD
24. EMINENT ACE SDN BHD
25. ENG LIAN ENTERPRISE SDN BHD
26. ENGTEX PROPERTIES SDN BHD
27. EVEREST POINT SDN BHD
28. EXCELJADE SDN BHD
29. EXCLUSIVE TEAM DEVELOPMENT (M) SDN BHD
30. F3 CAPITAL SDN BHD
31. FABER UNION SDN BHD
32. FAM DEVELOPMENT SDN BHD
33. FIAMMA DEVELOPMENT SDN BHD
34. FOCAL AIMS LAND SDN BHD
35. FORTSON SDN BHD
36. GAPURNA LAND SDN BHD
37. GEMA PADU SDN BHD
38. GLORY BOUNTY SDN BHD
39. GOMBAK LAND SDN BHD
40. GREEN RESIDENCES SDN BHD
41. HAP SENG LAND DEVELOPMENT (PUCHONG) SDN BHD
42. HARMONY PROPERTY SDN BHD
43. HEDGEFORD SDN BHD
44. HOUSING MANAGEMENT & DEVELOPMENT S/B
45. IGB CORPORATION BERHAD
46. IJM PROPERTIES SDN BHD
47. IMC HOLDING (M) SDN BHD
48. INSAS PROPERTIES SDN BHD
49. INTER RELATED TRADING (M) SDN BHD
50. IPMUDA PROPERTIES SDN BHD
51. IREKA LAND SDN BHD
52. KEJURUTERAAN BINTAI KINDENKO SDN BHD
53. KELANG LAMA LAND SDN BHD
54. KEN TTDI SDN BHD
55. KENNEISON BROTHERS SDN BHD
56. KH LAND SDN BHD

57. KIARAMAS DEVELOPMENT SDN BHD
58. KIP LAND SDN BHD
59. MACVILLA SDN BHD
60. MAGNA PARK SDN BHD
61. MAHAJAYA PROPERTY SDN BHD
62. MAKA JATI SDN BHD
63. MALAYSIAN RESOURCES CORPORATION BHD
64. MALTON BERHAD
65. MAYLAND DEVELOPMENT SDN BHD
66. MEDAN DAMAI SDN BHD
67. MEMANG JATI SDN BHD
68. MID VALLEY CITY SDN BHD
69. MITRAJAYA HOMES SDN BHD
70. MSL PROPERTIES SDN BHD
71. MULPHA LAND BHD
72. NARAJAYA SDN BHD
73. NAZA TTDI SDN BHD
74. NIKMAT KUASA SDN BHD
75. NURANI GEMILANG SDN BHD
76. ONE KLCC SDN BHD
77. ONG CHONG REALTY SDN BHD
78. OVERSEAS UNION HOUSING SDN BHD
79. PAGOJAYA (2000) SDN BHD
80. PALAM MESRA SDN BHD
81. PARK PROPERTIES SDN BHD
82. PERDANA PARKCITY SDN BHD
83. PERKUAT KUARI SDN BHD
84. PERMATANAH SDN BHD
85. PETALING GARDEN BERHAD
86. PILOT REALTY & DEVELOPMENT SDN BHD
87. PLATINUM VICTORY SDN BHD
88. PLENITUDE TEBRAU SDN BHD
89. PPB HARTABINA SDN BHD
90. PPC GLOMAC SDN BHD
91. PRIMABINA DEVELOPMENT SDN BHD
92. PURA DEVELOPMENT SDN BHD
93. PUTRAJAYA HOMES SDN BHD
94. QUILL INTERIOR HOLDINGS SDN BHD
95. RAWANG LAKES SDN BHD
96. RELIABLE CAPACITY SDN BHD
97. SAIWAI REALTY SDN BHD
98. SDB PROPERTIES SDN BHD
99. SEM SIONG INDUSTRIES SDN BHD
100. SENANDUNG BUDIMAN SDN BHD
101. SENTRAL CITY (M) SDN BHD
102. SERAI SAUJANA DEVELOPMENT SDN BHD
103. SERI MERAGA PROPERTIES SDN BHD
104. SETAPAK HEIGHTS DEVELOPMENT SDN BHD
105. SETIA PUTRAJAYA DEVELOPMENT SDN BHD
106. SHANGHAI REALTY SDN BHD
107. SHAYHER RENOVATION & BUILDERS SDN BHD
108. SIME DARBY PROPERTY BERHAD
109. SM LAND SDN BHD
110. SMD DEVELOPMENT SDN BHD
111. SOLID PROPERTY DEVELOPMENT SDN BHD
112. SPEARWIN DEVELOPMENT SDN BHD
113. SRI MELINGER SDN BHD
114. SRI SELTRA SDN BHD
115. SUNRISE BERHAD
116. SUNSURIA DEVELOPMENT SDN BHD
117. SUNTRACK DEVELOPMENT SDN BHD
118. SUNWAY D'MONT KIARA SDN BHD
119. SUNWAY SPK HOMES SDN BHD
120. SYARIKAT KEMAJUAN PERUMAHAN NEGARA SDN BHD
121. SYARIKAT MALURI SDN BHD
122. TA PROPERTIES SDN BHD

- 123. TARAGON YKS SDN BHD
- 124. TH PROPERTIES SDN BHD
- 125. TRADEWINDS CORPORATION BHD
- 126. TSI PROPERTY DEVELOPMENT SDN BHD
- 127. UDA HOLDINGS BERHAD
- 128. UNITED MALAYAN LAND BHD
- 129. URBAN HALLMARK PROPERTIES SDN BHD
- 130. UTAMA LODGE SDN BHD
- 131. VISTAJATI HOLDINGS SDN BHD
- 132. WARISAN TRADISI SDN BHD
- 133. WIMANIS SDN BHD
- 134. WINDSOR TRIUMPH SDN BHD
- 135. WTW REAL ESTATE SDN BHD
- 136. YBK ENGINEERING SDN BHD
- 137. YUK TUNG DEVELOPMENT SDN BHD
- 138. ZACKLIM PROPERTIES (M) SDN BHD