"I hereby declare that I have read this capstone project report and in my opinion this project report is sufficient in terms of scope and quality for the award of the degree of Master of Project Management"

Signature :……..

Name of Supervisor : Prof. Dr. Muhd Zaimi Abd. Majid

Date : January 2014

EFFECTIVENESS OF CURRENT PROJECT MANAGEMENT OFFICE IMPLEMENTATION IN PUBLIC WORKS DEPARTMENT

AZARUL AZLAN BIN MOHD RADHI

A capstone project report submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Project Management

Faculty of Civil Engineering
Universiti Teknologi Malaysia

JANUARY 2014

I declare that this capstone project report entitled "*Effectiveness of Current Project Management Office Implementation in Public Works Department*" is the results of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature :……..

Name of Supervisor : Azarul Azlan Bin Mohd Radhi

Date : January 2014

To my beloved family, especially my wife Syalfarina Bt. Razali, my children Haziq Mikhail, Hafiy Mikyad and Airis Sofea also my lovely father and mother. Thanks for your never ending love, support and also who are the source of inspiration and true love.

ACKNOWLEDGEMENT

First of all, praised to the Almighty Allah for the guiding me to complete the project report. Then I would like to express my sincere appreciation to my project supervisor, Prof. Dr. Muhd Zaimi Abd. Majid for his generous advice, patients, guidance and encouragement during the duration of my capstone project. Without his support and interest, this capstone report would not have been the same as presented here.

Secondly, I would like to express my gratitude to all PWD professionals who generously spent their precious time to participate in the questionnaire survey for this project. Their contributions are invaluable to the success of the study which is really appreciated.

Furthermore, I would like to express my sincere thanks to my family and all of my friends who have given me a lot of support, advice and encouragement given to me unconditionally in completing this project report.

Finally, without the contribution of all those mentioned above, this work will not have been possible.

ABSTRACT

An effective and efficient project implementation in Public Works Department (PWD) is a major issue that should be taken seriously by PWD in order to sustain the government and public confidence to PWD as the main project implementor in Malaysia. Even though PWD have so many systems for monitoring such as Control and Report System (SKALA) and tracking tools such as Critical path Method (CPM), the rate of project failure still remain high. The problem and issues related to the performance of Project Management Office was identified by distributing a questionnaire. Issues on resources allocation, contractors' performance, project management skill level among PWD staffs, work pressure and the development of project information systems are the major issues selected by the respondents. Therefore, this study will focussed on the effectiveness of current PMO and what are the improvement method/process that can be done. Method of this study is through questionnaire survey among the PWD staff and data taken will be analysed by using SPSS software. From the findings, it is shown that PMO still have to be improved due to the several issue stated in the chapter. The issue involved is by asking the opinion of PWD staff. In conclusion it can be concluded that even having the tools, programme and initiatives, there are still room for improvement to the current PMO in order to achieve the mission and vision that has been set out.

ABSTRAK

Pelaksanaan projek yang berkesan dan cekap dalam Jabatan Kerja Raya adalah isu utama perlu dijaga dan dipandang serius oleh Jabatan Kerja Raya untuk mengekalkan kepercayaan orang ramai kepada Jabatan Kerja Raya sebagai pelaksana projek utama di Malaysia. Walaupun Jabatan Kerja Raya mempunyai begitu banyak sistem untuk memantau seperti 'Sistem Kawal & Lapor' (SKALA) dan alat-alat pengesanan seperti Kaedah Laluan Kritikal (CPM), kadar kegagalan projek masih kekal tinggi. Dalam kajian sebelum ini, cadangan Pejabat Pengurusan Projek untuk pelaksanaan dalam Jabatan Kerja Raya telah dilakukan untuk menyusun strategi, menggerakkan dan memudahkan peningkatan pengurusan projek amalan terbaik di seluruh Jabatan Kerja Raya melalui penyelarasan, komunikasi, piawaian, pengukuran prestasi, perkongsian pengetahuan, bimbingan dan mentor. Oleh itu, kajian ini akan tertumpu kepada keberkesanan semasa Pejabat Pengurusan Projek dan apakah penambahbaikan kaedah / proses yang boleh dilakukan. Kaedah kajian ini dilakukan dengan melakukan kajian soal selidik di kalangan kakitangan JKR dan data yang diambil akan dianalisis dengan menggunakan perisian SPSS. Daripada penemuan ini, ia menunjukkan bahawa Pejabat Pengurusan Projek masih perlu meningkatkan prestasinya kerana beberapa isu yang dinyatakan dan dibincangkan. Isu tersebut telah ditentukan dengan bertanya kepada kakitangan Jabatan Kerja Raya secara umum. Dalam bab terakhir, dapat disimpulkan bahawa walaupun terdapat kaedah pengurusan projek dan beberapa program telah dimulakan, namun masih terdapat banyak penambahbaikan perlu dibuat kepada Pejabat Pengurusan Projek bagi mencapai misi dan visi yang telah ditentukan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Introduction

Project Management Office (PMO) has been established in Public Works Department (PWD) since end of 2010 and has been operating by administration with the shortage of resource. The focus of Project Management Office in that time is to strategize the Malaysian 10th Plan (RMK10) project implementation where the process has been collaborating with *'Sistem Kawal dan Lapor'* (SKALA).

Project management knowledge is a powerful tool for the success of the project implementation. It is the application of tools, skills, technique and knowledge to the project implementation in order to meet the client's expectations from the project. There are few reasons on why project failed. The major issue is results from the poor project management knowledge, lack of project management skills and communications, and also did not learned from the past experience even though it is documented for reference. From the Tandish CHAOS Report (2009), it shows that only 32% project were completed on time while other 68% projects do not meet the time, cost, quality and scope which is targeted by the stakeholders. The survey also shows that the establishment of Project

Management Office (PMO) is top three reasons that drive successful project delivery.

By implementing Project Management Office (PMO), Public Works Department (PWD) is hoping that they will be able to minimize project delay and project failure. It is planned by Public Works Department (PWD) that in 2012, the continuation to focus on knowledge and appreciation of cultural practice turns into a job with coaching and mentoring. With short and medium-term programs that increase target set of Project Management Maturity level to level 3 in 2015.

The current study focuses on the method using by the current Public Works Department (PWD) Project Management Office (PMO) whether it has achieved the Public Works Department (PWD) mission and vision by developing Project Management (PMO) unit.

PMO is a competency center to improve the management of projects, programs and portfolios. It is a maturing process for organization starting with adopting sound Project Management principles to reduce risks to implement project. The next stage is Program Management to optimize resources across multiple projects to achieve the strategic goals. The final stage is Portfolio Management to ensure the right initiatives are selected to optimize outcomes from carrying out the business (refer Figure 1.1).

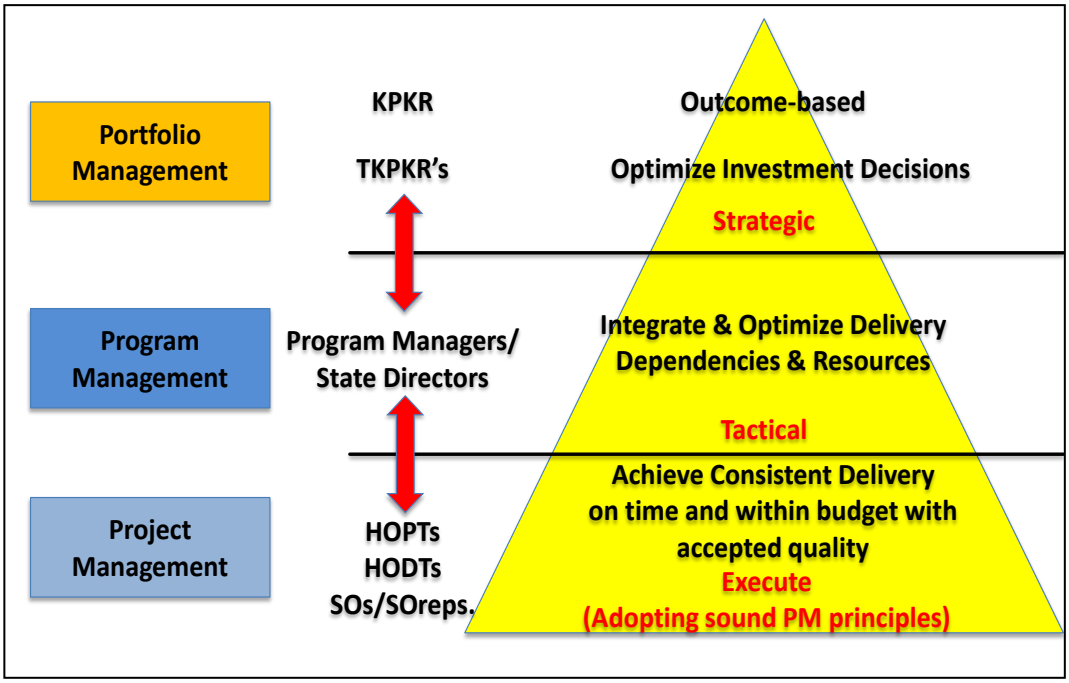

Figure 1.1: PMO Set Up in PWD

Source: PWD

1.2 Background of Study (Current PMO in PWD)

PMO has been established due to low achievement for project performance in 9th Malaysia Plan (refer Table 1.1). Therefore PMO has been established end of 2010 in PWD to drive effective project delivery through Project Office (PO). Vision of PMO is to be the centre of excellence in project management in the construction industry through elevation of project management maturity to the highest level. While the mission is to strategize, propel and facilitate enhancement of project management best practices across PWD through coordination, communication, standardization, performance measurement, knowledge sharing, coaching and mentoring. To facilitate successful project delivery through effective strategic partnership with clients and stakeholders. The strategy is to operationalize PO enterprise wide. Role of PMO is:

i) Linking strategy to implementation.

ii) Facilitate Top Management/Director/Program Manager in project implementation.

iii) To promote Project Management best practices in project implementation.

Table 1.1: Ninth Malaysia Plan Project Under PWD

Total 9th MP Project	6,126	100.00%
Planned Completed	4,808	78.49%
Actual Completed	4,688	76.53%
Project Cancelled	207	3.38%
Project Continued to 10th MP	1,231	20.09%

Source: PWD Jan. 2014

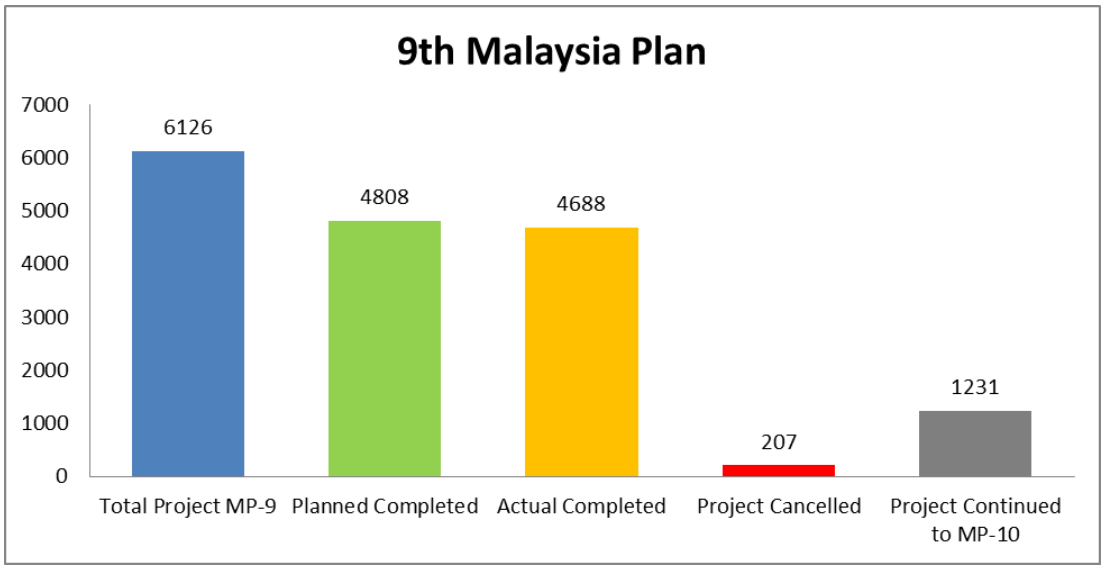

Figure 1.2: Performance of 9th MP PWD Project

Source: PWD Jan. 2014

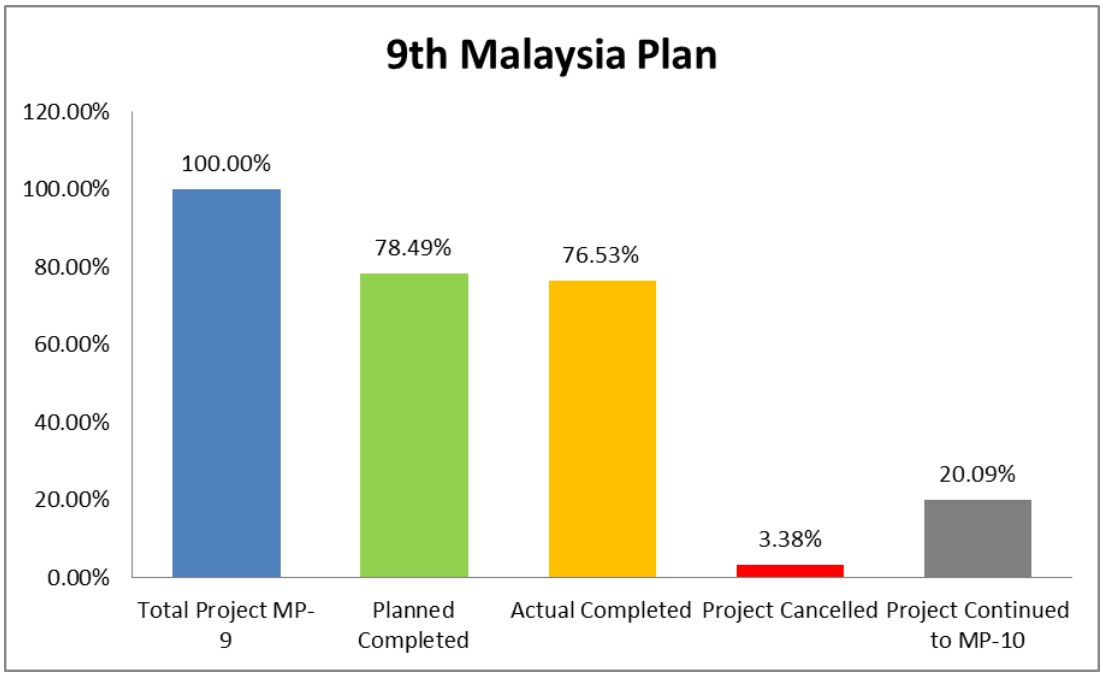

Figure 1.3: Performance of 9th MP PWD Project in Percentage

Source: PWD Jan. 2014

1.3 Problem Statement

Even though the existence of Public Works Department (PWD) since few decades and a lot of changes done by the top management with so much systems such as *'Sistem Pengurusan Kualiti'* (SPK), the numbers of project failure (late and cost overrun) still increase and remain high from year to year. The success factor of Project Management Office are time, cost, quality and scope. There are three (3) role of Project Management Office:

1) To strategies project implementation.
2) Tactical approach of project implementation.
3) Project execution adopting sound PM principles.

After two and half years of the establishment of the Project Management Office (PMO) since end of 2010, they are still have project failure in Public Works Department (PWD) even in state and federal level. Although there is a programme that has been established by the Project Management Office (PMO) to the staff, the vision and mission of Project Management Office (PMO) still not achieve.

Table 1.2: Project Delivery Performance

Years	2011	2012	2013
Total Project Nos.	380	655	630
Pre-Construction	38	251	285
Under Construction	342	404	345
Project Delivery (%)	97%	90%	92%

Source: PWD Jan. 2014

Even the existence of PWD since 1872 (141 years), a lot of changes has been faced by the PWD. PMO was established in PWD in November 2010. But the number of project 'failure' (late and cost overrun) still remain high (Project Status Report, 12/2011, 12/2012 & 12/2013). Refer Table 1.2.

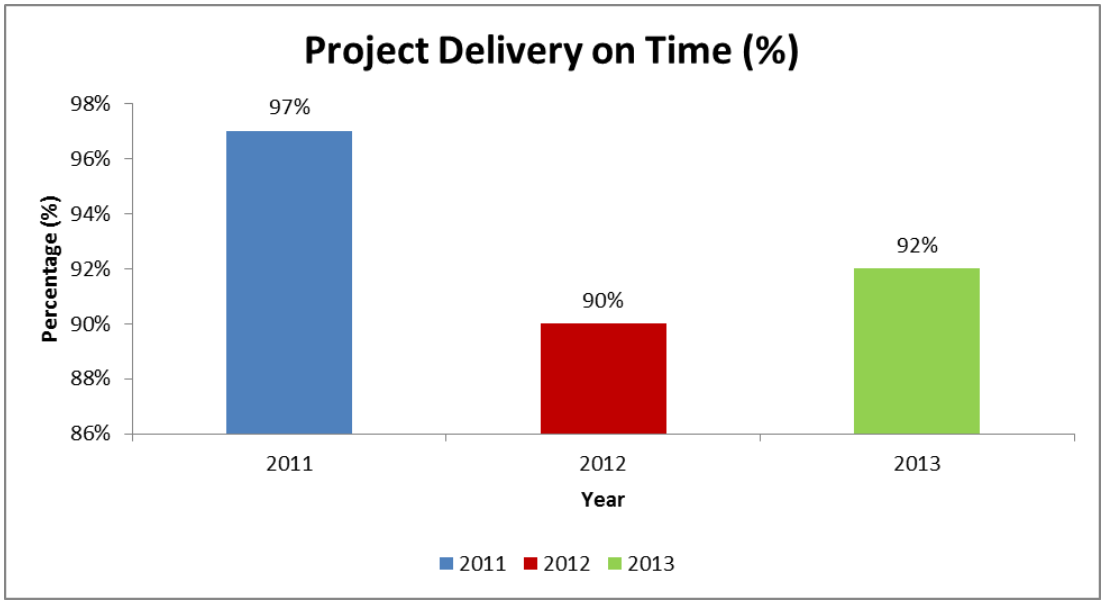

Figure 1.4: Project Delivery Performance

Source: PWD

Figure 1.4 showing that project delivery at 2011 is at 97% from 380 of the total projects has been launched, at 2012 project delivaey is at 90% from 655 of the total projects has been launched and at 2013 is at 92% from 630 of the total project has been launched. It means that project numbers getting increased but the project delivery performance getting down.

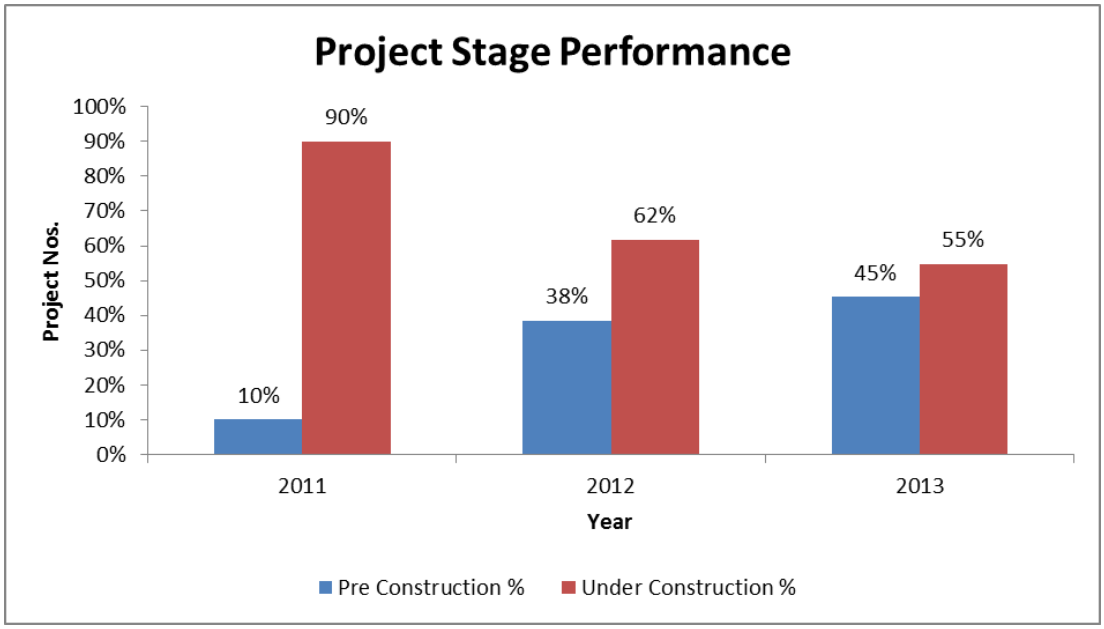

Figure 1.5: Project Stage Performance

Source: PWD

Figure 1.5 showing project performance for year 2011, 10% projects is at pre construction stage and 90% projects is at construction stage. For year 2012, 38% projects is at pre construction stage and 62% projects is at construction stage and for year 2013, 45% projects is at pre construction stage and 55% projects is at construction stage. From the figure, it shows that most of the project pending at pre construction stage and it has been increased at every years. While project at construction stage getting decreased at every years. From 90% at 2011, getting down to 62% at 2012 and even getting lower at 2013 which is 55%.

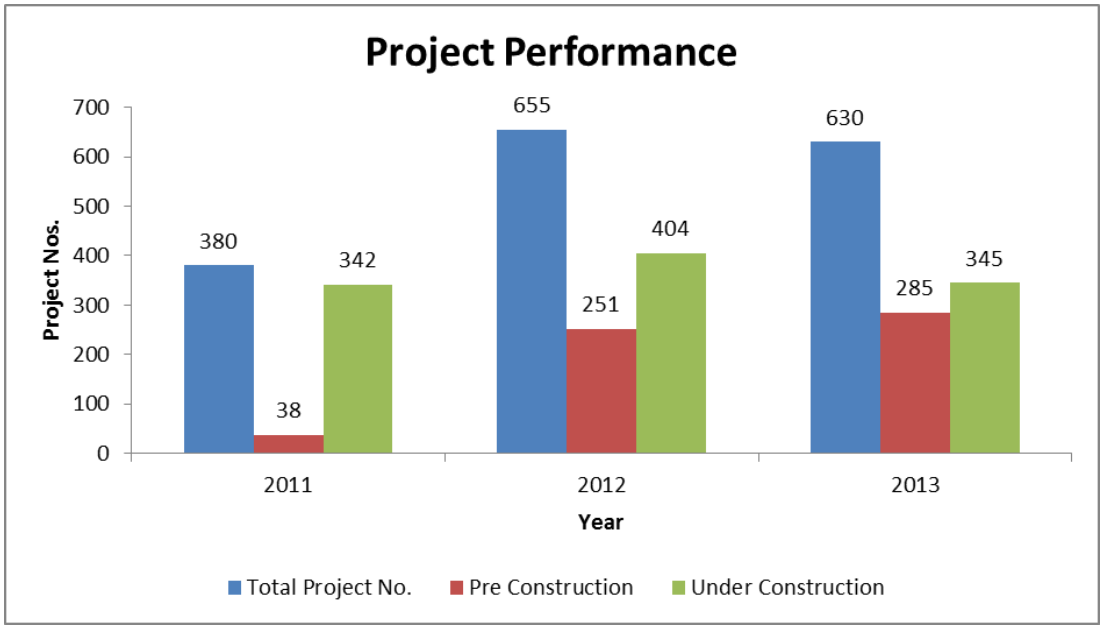

Figure 1.6: Summary of Project Performance

Source: PWD

PMO has been developed with so much programed to make sure PWD will be the leader of technical agencies in Malaysia.

- Strategic stakeholder management for buy- in of PO function.
- Proper and functional set up of P.O at all level.
- Roll out master program.
- Project Implementation strategy according to ACAT level.
- Roll out Best Practices.
- Establish Project Performance Reporting Structure at Different Level.
- Establish Project Resource Deployment Process.

		2011				2012				2013			
No.	Item	Achived	Not Achieve	Total	%	Achived	Not Achieve	Total	%	Achived	Not Achieve	Total	%
1	Advertise the project on schedule	53	3	56	95%	241	25	266	91%	208	24	232	90%
2	Issuing project LOA on schedule	79	2	81	98%	277	11	288	96%	224	11	235	95%
3	Pending the signature of the contract documents (from LOA <4 month	19	1	20	95%	151	48	199	76%	131	26	157	83%
4	End of contract period uncompleted (LAD / At large)	65	18	83	78%	50	31	81	62%	42	13	55	76%
5	The contract was completed on schedule	706	88	794	89%	274	86	360	76%	259	66	325	80%
6	Submission of the project on schedule	733	21	754	97%	288	32	320	90%	290	26	316	92%
7	Pending of Final Certificate (CPC target <6 months)	373	119	492	76%	672	94	766	88%	271	67	338	80%

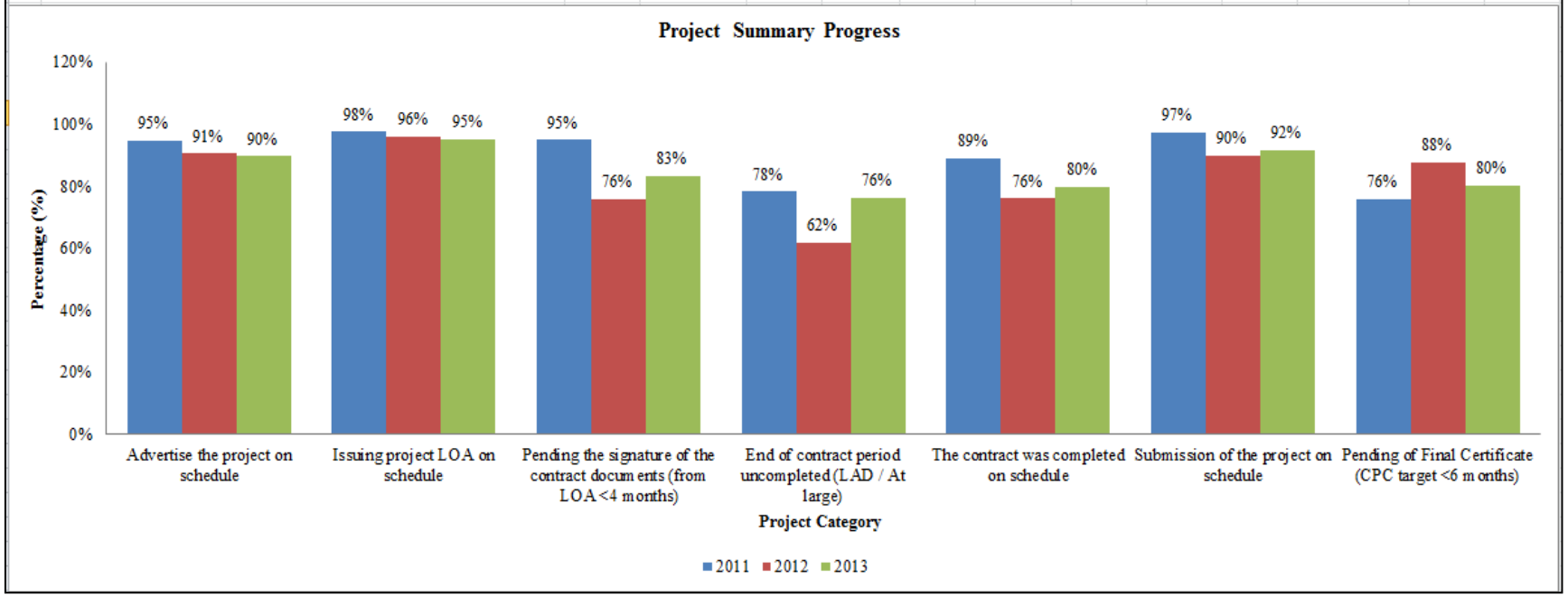

Figure 1.7: Project Summary Progress

1.4 Aim and Objectives of Study

The aim of this study is to determine effectiveness of current Project Management Office (PMO) since it implementation for three (3) years in Public Work Department (PWD). If the effectiveness is still low, then what are the improvements can be made to achieve department mission and vision. In order to achieve the aim, the objectives of this study are outlined as follows;

a) To investigate issues related to performance of PMO; and
b) To identify and establish the improvement method/process of PMO in PWD.

1.5 Scope of Study

The scope of the study involved professional in various unit in PWD includes from headquarters (portfolio office), PWD branches (programme office) and PWD States (project office). Each of the above sections will be involved and how they implementing their knowledge on project management will be determine. The issues that contributing to the project failure will be evaluated.

This study will be focussed on the current Project Management Office implementation since end of 2010 whether it has been achieved the vision and mission in order to make Public Work Department (PWD) is a well-known technical department in Malaysia.

This study is just to evaluate performance after the establishment of Project Management Office (PMO) to see whether the Project Management Office is functioning to the Public Work Department (PWD) or not.

Data will be collected by doing a descriptive survey and distributing questionnaires to the respective office in order to collect a data directly or indirectly from the Public Work Department staff.

1.6 Brief Research Methodology

The framework of study for this study called research methodology is to guide the researcher on how to conduct the study. The process of the study is known as data collection, analysing, interpretation and observation. The research will be carried out in three phases to execute the different tasks as shown in Figure 3 below. Phase 1 is the determination of objectives and scope of the study and literature review. Phase 2 involves the studies of current Project Management Office (PMO), designing and conducting questionnaires and also data analysis. Then Phase 3 is the findings of the data analysis and recommendations (refer Figure 1.8).

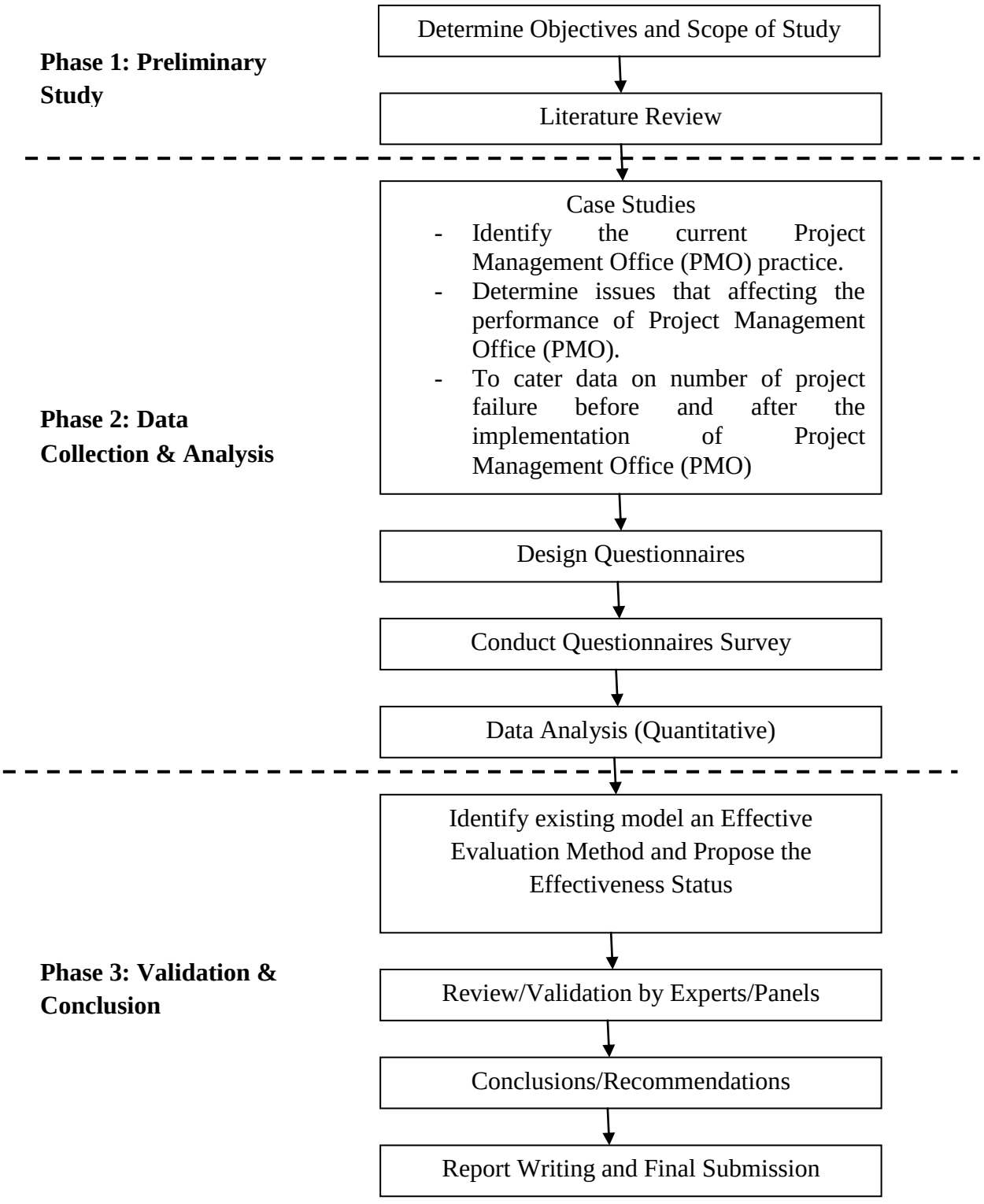

Figure 1.8: Research Methodology

1.7 Summary of Chapters

This study had been divided into six (6) chapters. The first chapter explains the introduction of the study, background of the study, problem statement, aim and objectives, scope of the study and brief research methodology that being implemented in to the study.

Chapter two (2) elaborate about the overview of the PMO. The definition of PMO and literature reviews on the objectives has been done in this chapter.

Chapter three (3) explains about the details of research methodology used in implementing the study. It consists of three phases which is Phase 1 is Investigations, Phase 2 for Data Collection and Analysis and Phase 3 for Validation and Conclusion.

Chapter four (4) describe about the details and analysis of the data from the respondent. The data was analysed using SPSS software.

Chapter five (5) is mostly discussion on findings from the data analysis. The discussion based on the objectives that has been determined in the earlier chapter.

Chapter six (6) concludes the overall study and suggest recommendations for future study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

PMO can be defining as an entity in the organizational body that has been assigned to a various responsibilities in order to centralised and coordinated management of any projects. It can be range from providing project management advisory to being responsible direct to the project that has been assigned to the team (PMI, 2008, p.11). From the previous study, it has been identified that a range of activities which is undertaken by the PMOs have not been examined by the researcher on the impact of PMO in the project management success and management satisfaction (Desouza and Evaristo, 2006; Hobbs and Aubry, 2007). There is a survey done by Hobbs and Aubry (2007) finds that the number of new PMOs is growing while the existing PMOs are also shutting down (Aubry et al., 2010a, b). Aubry et al. also find that the external influence such as politics also give an impact to the dissatisfaction with the performance and effectiveness of the PMO.

2.2 Activities of PMOs

It has been identified that any activities done by the PMOs was focussing on activities that energising the project in the previous study (Desouza and Evaristo, 2006; Hobbs and Aubry, 2007; Pemsel and Wiewiora, 2013). The activity has been identified and has been adopted in PWD by the Table 2.1 below:

Table 2.1: Activities Commonly Undertaken by PMOs

Level of influence	Activity
Strategic (Portfolio Office)	- To ensure the projects are aligned with the client objectives and contribute to the strategic growth of the organisation. - The efficient and effective knowledge of management for improving the policies, practices and methodology of project management in the organisation.
Tactical (Program Office)	- To ensure close integration between and within the ongoing projects. - To ensure the quality consistency and services in each projects. - Lesson learned and knowledge sharing across on-going projects.
Operational (Project Office)	- To provide regular status reports to the top management and coordinating the projects. - To ensure that information is available to make a project decisions. - To be a central source of information of the project. - Conducting routine project evaluations.

2.3 Effectiveness of PMOs

Table 2.1 showing that PMOs has been established to improve project performance and to reduce project failure. A multi-dimensional competing value of framework has been suggested by Aubry and Hobbs (2011) to evaluate the

performance of the PMO. But Desouza and Evaristo (2006) suggested that PMO performance can be measured by the project efficiency. It is found that programme management did not lead to improve project outcomes when standard methodologies in the organization has been introduces O'Leary and Williams (2008).

2.4 Issues of Implementing PMO

There will always be some challenges to overcome when implementing PMO in the organisation even though the organisations have followed the procedures (Initiation, Planning, Execution and Improvement). Lacks of guidance of overcoming the challenge by the managers to encounter the challenge that are likely to come up vary between the organisations as well as PMO structures.

Singh et al. (2009) present the top challenges and some series of action that can be taken to consideration before and while implementing a PMO;

1) Failure to manage the organizational resistance to change and rigid corporate structure.
    - Have a strong PMO appreciation who knows the value of PMO.
    - Demonstrate the value of the PMO with some early success.
    - Identify and seek support from opinion leaders within the organization who favour the PMO implementation.

2) Project managers with lack of experienced and PMO leadership.
    - Identify and hire an experience program manager who understands the culture and power relationship within the client organization.

- Bring the most talented project managers into the PMO implementation team.

3) Lack of appropriate change management strategy.
   - Adopt a flexible change management strategy that fits the organizational needs.
   - Employ process standardization prior to PMO implementation.

Desouza and Evaristo (2006) identified six (6) critical success factors of PMO success:

1) Build a strong foundation (understanding on how PMO will fit into the corporate culture).
2) Established the background (identify PMO drivers and goals).
3) Assign right projects to the right managers (technology-oriented versus business-oriented).
4) Clear reporting lines (roles, responsibilities and accountability issues should be clearly identified and implemented).
5) Ensure credibility providing mandate: PMO charter (specifying purpose, role, expectations, authority, customers, staff), PMO policy (objectives, guiding principles), and PMO methodology (tools, processes, metrics).
6) Use metrics to evaluate PMO.

2.5 Issues Related to PMO

There is a reason why PMO not perform well in the organizations. It is possibly because they don't have good strategy in place. With refer to Stanleigh

(2006), there are four (4) key factors that will immediately make a difference for PMO specifically and organization generally. They are:

1) Ensure that all strategically aligned by:
    - Review lessons learned from previous project.
    - Develop criteria against which all projects can be prioritized.
    - Align projects with corporate and departmental strategic plans.
2) Create a culture that supports a project management environment.
3) Implement strategic project management best practices.
    - "Project Close-out Meeting" should be hold by PMO as soon as possible after project completion.
    - Outcome of meeting is document of "Lesson Learned".
4) Create a strategic project measurement system.

Profitability targets and generate necessary return on investment will be seen when projects are in alignment with corporate goals. Working as a whole team is important to reach the corporate goals and this includes the PMO. Multiple PMOs could be set up in large organizations (Dinsmore and Cooke-Davies, 2006). The minimum functional of a PMO can be assistance to project managers and administrative support; assurance of project management processes; and project information management (APM, 2006, p. 14). The development of project management value framework is from the four (4) perspective of key project stakeholders which is enterprise, customers, subcontractors/suppliers, and community (Zhai, Xin, and Cheng, 2009).

A project's main characteristics is temporary, unique, goal focussed, it has time and cost constraints, consists of people, has low volume and high variety and uncertainty. The line of authority is often fuzzy since resources are coming from other functions within the organization and this usually leads to conflicts. (Maylor, 2010). According to do Valle et al. (2008), the first academic reference

of PMO appears in year 1998 when Harold Kerzner described Project Office in his book, (2009).

There are so many employees in large organizations, so it can be difficult to achieve similar procedures and good results from all projects undertaken. It can be easily to lose control over the project portfolio and the coordination of the projects. It is important for the organizations to be able to support the project managers with approved models, procedures and a defined way of working. The solution of these problems could be implementing a PMO and organizations will achieve project management oversight, control, support and alignment (Hill, 2004).

2.6 PMOs Contribution

The establishment of PMOs is for development of a theory of organisational project management. Project will be more tends to be concentrated and more visible in the organisations. PMOs complexity has been determined through the description of the variety in both the form and functions of PMOs (Hobbs, 2007; Hobbs and Aubry, 2007). PMO can be looking as an entity that is part of the organisations. PMO can also be known as innovation organisation but it is can be classified unstable if the evolving is occurring in the organisations. Organisational performance can be seen as a result from the multiple coexisting values within the organisations.

2.7 Improvement of PMO

PMOs are not created equally within the organisations. "*Although almost any forms of PMO will jumpstart incremental process improvement in organisation that has nothing in place, PMOs are incepted at different levels and with different capabilities*" (Crawford 2002, p. 67). The evolutionary continuum has been conceptualised in the same way as the project management maturity model (OPM3) (PMI 2004). Therefore, PMOs can be described in a few levels shown at Figure 2.1

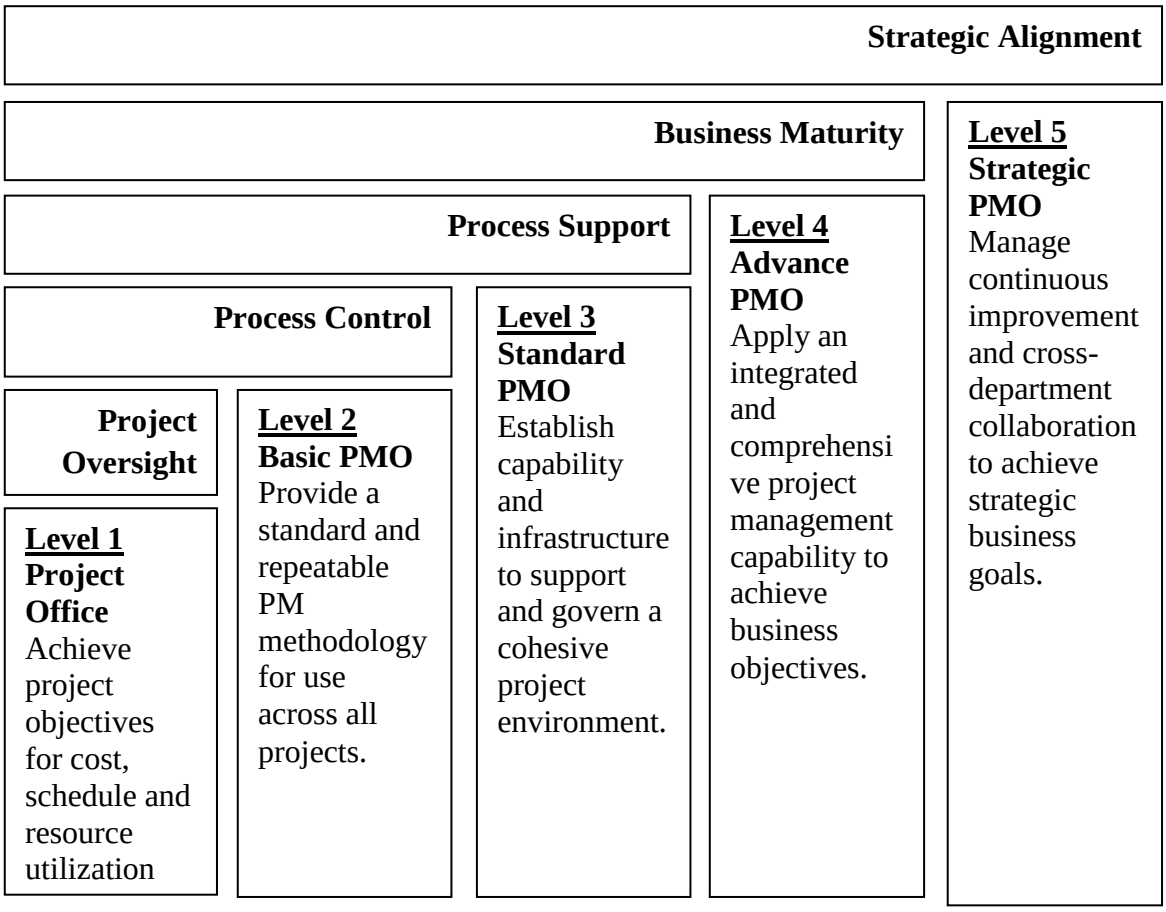

Figure 2.1: The Different Levels of the PMO Continuum (Adapted from Hill 2004)

By establishing and actively utilizing the PMO in the organizations can have the benefits such as growing staff professionalism, more productive and skilful project teams, profitability improvements, predictable and repeatable use of project management tools and techniques, standardization and profitability of tools and techniques, facilitation of use of project management in becoming a core competency, improvement in organizational design and performance; and external recognition for overall organizational performance (Well, 1999).

2.8 Innovation Organisational

It is often when the organisations were observed by the increasing of competition, increasing product rates, service provided and innovation process. By responding to these challenges, more flexible organisations should be developed which is projects are more numerous and strategically important. Many organisations have implemented new department called project management office or PMO. In many organisations, the implementation of PMO was not created with clear image of what this might entail. For one organisation to mimic from the other organisation, they must have clear perception on what is PMO is all about. Therefore adopting may produce an initial drive to set up a PMO without any explanation and reason on why the structured has been implemented in the organisation.

2.9 Impact on Execution and Success

Pellegrinelli and Garagna (2009) say that "*multi-project PMOs are organisations responses to their needs and environments – unique structural arrangements designed to fulfil a specific purpose*" (p. 651). It's means that the

task environment is very critical to identify the appropriate task to be undertaken by the PMOs. The major picture contributor for this organisation is the senior management who are typically heading the organisation. Task for PMOs was given by the key stakeholders and their requirements. The operational of PMOs was based on the management demands. With the existence of PMOs, Pellegrinelli and Garagna (2009) has been point out the needs for PMOs to survive and to fulfil the organisational needs. Changing preferences by acting as "*the fulcrum between forces for centralisation – the tendency for decision and policy making, executive powers and resources allocation to reside in a dedicated (line of) business unit or corporate function – and decentralisation – the tendency for decision and policy making, executive powers and resources allocation to be devolved throughout the organisation to individuals or operating unit*" (p. 652).

Quantitative research on the impact of PMOs on a single project management has failed to show the relationship between the involvement of PMOs and performance Improvements (Dai and Wells, 2004; Kwak and Dai, 2000). But in qualitative study from the 65 organisations showing that the near impossibility by calculating the direct impact of single projects (Thomas and Mullaly; 2008). There are so many fundamental question of PMOs contribution to performance which is unsatisfactory to answer. Therefore many consultants and academicians increasingly focus on this topic (Aubry et al., 2010a).

The best practices and success factors identified in the literature will be considered. The findings of Singh, Keil and Kasi (2009), Desouza and Evaristo (2006), Hurt and Thomas (2009), Anderson, Henriksen, and Aarseth (2007), the following ideas have to be considered.

1) Understand how PMO will fit into the corporate culture, create a culture of discipline and manage organizational resistance to change.
2) Have strong PMO leader who promotes the value of PMO.

3) Clearly define PMO goals, purpose, role, authority, responsibility and communicate them to all stakeholders.
4) Design PMO with specific needs and focus on improved project management practices. Conduct a stakeholder analysis.
5) Implementing or transforming a PMO, use appropriate change management strategy. Plan gradual development of PMO, start with some core tasks and demonstrate the value of PMO with an early success and let the PMO to progress through the life cycle.

2.10 Summary

From the literature review conducted in this study, the purpose of the PMO is to manage project performance central information in PWD in order to create knowledge base on the best practices in PWD. Knowledge was created by the appropriate practices and base on the lesson learned on the past project experience to ensure PWD staff increase their productivity as well as project performance.

Several issues have been discussed in this chapter. Failure to manage the appropriate change management strategy will never improve performance of the organization. The foundation of the organization should be strong in order to establish good background and drive PWD to achieve its goals. Mission strategy should be aligned with all departments in PWD. By creating a culture that supports a project management environment will enhanced performance of PWD.

Some improvement also being identified where the PMO maturity model should be understood by each manager. By appropriate change management

strategy, the gradual development will begin with some core tasks and demonstrate the value of PMO with an early success.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discuss the adopted research methodology. As per discuss in the Chapter 1 (Figure 1.8), this study consists of three phases for the research methodologies. Phase 1 is the investigations phase which is involves determination of the objectives and scope of the study and also the literature reviews. Phase 2 is the analysis which is involves the identification of the current PMO practice, issues that affecting the performance of the PMO and data collection on the number of the failure project before and after the implementation of PMO. Designing and conducting questionnaires survey also the analysis of the data. While in phase 3, the model of effective evaluation method and propose the effective status for the current PMO implementation. Reviewed/validation by the predetermined experts/panels in order to ensure its appropriateness and also conclusions with recommendations. Detail description of the research methodology and process are discussed in following section.

3.2 Phase 1 (Preliminary Study)

Phase one (1) consists of determination of the objectives and scope of the study. After the objectives and the scope been finalized, then literature review will be conducted to obtain some information and knowledge about this study.

3.2.1 Objective and Scope of the Study Determination

By conducting the preliminary studies on the subject matter and discussions related to Project Management Office (PMO) are necessary prior to the determination of this study's objectives and scope. This early investigation is able to give a general concept and understanding of the PMO and the basics work that need to be carried out. Most of the readings are obtained by using the facilities provided from the Universiti Teknologi Malaysia's main library (Perpustakaan Sultanah Zanariah – PSZ). The guidance in setting up the objective and scope of the study were discussed with the supervisor, Professor Dr. Muhd Zaimi Abd. Majid.

3.2.2 Literature Review

Literature review was conducted in the intention of to provide an understanding of the Project Management Office (PMO) conceptual framework and to identify its limitations as far as providing acceptable answers to issues under study. The necessary information and knowledge of PMO are obtain from previous studies and researches, such as articles, journals, paperwork, reports,

thesis and also some relevant books. The review has enabled the author to obtain the guideline and the lesson learnt of the establishment of PMO. It is basically, covers various definition of PMO and the development of principles and concepts of PMO.

This literature review was carried out by searching the web site for the established PMO models in PWD. Some established project management web site did provide some information on the operational PMO of some establishment. Although the set-up of those PMO is tailored to their organisation need, nevertheless they gave some idea of what a PMO supposed to be.

An extensive and comprehensive literature review was done to make sure this study was able to have more understanding in the following areas:

i) The issues commonly arise in the implementation of PMO; and
ii) The improvement method that has been done by the other organizations.

3.3 Phase 2 (Data Collection & Analysis)

In phase two (2), the activities to be done are data collection and data analysis. There will be primary and secondary data collection to be done. After that an analysis with method of frequency, relative importance index, reliability, normality and Spearman & Kendall's correlation analysis will use.

3.3.1 Data Collection

Data collection can be gathered by two (2) sources which are Primary Data Collections and Secondary Data Collections. From Sakeran (2009), the efficient mechanism for Primary Data Collection is questionnaires. It is used when the researcher knows what is required and how to measure the variable of interest. Also from Sakeran (2009) says that Secondary Data Collection refers to the information gathered by the others. The data can be internal or external of the organizations. It is can be accessed by going through the recorded or published information or by the internet/computer.

3.3.1.1 Primary Data Collection

In this case study, different Branches from each Sector and PWD States are to be chosen. This stage involves the actual and detail information collection on the PWD current project management practices. Several facts finding session to be carry out with those offices. The questionnaire technique is to be used. The purpose is to enquire the perceptions and opinions regarding the current PWD project management practice that can guide further enquiries and approaches into the subject matter. The objective of the questionnaire distribution is to get a representative sample so as to collect information on the wide-ranging functions in PWD project management practices. The questionnaire will be distributed thru email and the feedback will be getting from the replying emails.

Before distributing the questionnaires, the author will design such we called a questionnaires to make a survey and to gather a data for the analysis. A trial survey will be run in order to make sure the questionnaires was reliable and related to the objectives and the data taken can be analyse. After the

questionnaire was validate by the supervisor, then the actual questionnaires survey will be conducted by the researcher. Then from the feedback given by the sample population that has been determine, data analysis (quantitative) will be conducted.

This study will use Likert Scale questionnaires. It is designed in order to obtain the opinion and feedback from the PWD staff experienced on the understanding and experienced about the implementation of PMO. The questionnaire was designed by 5 Likert Scale as follows;

5 - Strongly Agree/Very Good
4 - Agree/Good
3 - Not Sure/Moderate
2 - Disagree/Poor
1 - Strongly Disagree/Very Poor

The structure of the questionnaire was divided into four (4) sections.

i) Section A: General Respondent Profile.

The first part of the questionnaire is covered the respondent background which is consists of gender, age, years of service in PWD, years of working experience, department and profession.

ii) Section B: Issues That Led to Poor Performance of PMO.

The second part of the questionnaire covered on the identification of issues that led to the poor performance of PMO. The factors listed were

determined from the literature review and from the interview among the PWD staffs. This part aimed to rate the degree of consent on the issues that led to the poor performance of PMO based on the respondent's experience and knowledge.

iii) Section C: Improvement Method/Process to PMO.

The third part covered on the proposed improvement method/process to PMO. The respondents were asked to rate the most suggested improvement method/process to facilitate the performance of PMO.

iv) Section D: Comments and Suggestions.

The fourth part was asking for the other suggestions and opinion from respondents if they have any other idea for issues and improvement method/process for PMO.

3.3.1.2 Secondary Data Collection

Secondary data were collected from the PWD PMO monthly report and PWD website. These data may comprise of the project number by the project status categorized, PMO organizations structures and PWD organizations structures generally. There was information of project status by years 2011 to 2013 when the PMO was established in PWD.

3.3.1.3 Pilot Study

Prior to the data collection, a pilot study was carried out using the initial draft of the questionnaire in order to ensure that the study instrument will established the productive form of data analysis. Twenty (20) respondents from various PWD departments were involved.

3.3.1.4 Survey Questionnaire

A total of two hundred (200) questionnaires were distributed by email to the respondents within the PWD department. The respondents consists the middle and upper level management staffs who have been involved in the planning and construction activities throughout the entire project.

3.3.2 Data Analysis.

After the questionnaire survey stage, those collected data information will be compiling and categorised and prioritised accordingly using content analysis methodology. Statistical Package for Social Science (SPSS V.19) was used. Four methods were used, which are; Frequency Analysis, Reliability Analysis, Normality Test and Correlations Test. Rank Spearmen and Kendall were used in order to test the significance difference between two variables. The information is used to identify the issues relate to the current project management practices. The issues will be comparing against after the current PMO implementation in order to analyse the performance of the current PMO since year 2010 until year 2013 in

PWD. As a government department, several limitations in PWD's project implementation are expected to be identified during the fact finding session with the questionnaire.

3.3.2.1 Frequency Analysis

Frequency analysis is an analysis method to measure the central tendency of the data and more importantly the dispersion of the data around the central tendency. The analysis involves constructing a frequency distribution. The frequency distribution is a record of the number of scores that fall within the response category. Sakeran (2009) said that the distribution then has two (2) elements:

i) The categories of response; and
ii) The frequency with which respondents are identified with each category.

3.3.2.2 Relative Importance Index (RII)

Relative Importance Index (RII) method is used by Kometa, S.T et al. (1994) and Sambasivan, M. and Soon, Y.W. (2007) to determine the relative importance of the various causes of delays. The same method was adopted in this study. Five point Likert Scale from 1 (strongly disagree) to 5 (strongly agree) was adopted and transformed to relative importance index (RII) for each issue as follows:

$$\textit{Relative Importance Index} = \frac{\Sigma X_i}{\Sigma W_i X_i}$$

where:

i = response category index
W = weighting given to each factor by the respondent (ranging from 1 to 5 where according to the Likert Scale)
X_i = frequency of the (i)th response given as percentage of the total responses for each factors.

The RII was used to rank the difference issues and improvement method. These ranking made it possible to cross-compare the relative importance of the factors as perceived by the respondents.

3.3.2.3 Reliability Test

Reliability test is a statistical analysis that is used to measure the internal consistency of the variable within a scale. Analysis that with a value of 0.7 to 0.8 is an acceptable value for Cronbach's alpha. Values substantially lower indicate a reliable scale. Kline (1999) notes that although the generally accepted value 0.8 is appropriate for cognitive tests such as intelligence test. For ability test, a cut-off point of 0.7 is more suitable. Sakeran (2009) says that the value of alpha is greater or equal to 0.7; it will be accepted as reliable.

3.3.2.4 Normality Test

This test enables to explore the distribution of a sample and test for certain patterns of non-normality. Since the normality tests included in analyse it are all hypothesis tests, they test a null against alternative hypothesis. For each test, the null hypothesis states the sample has a normal distribution, against alternative hypothesis that it is non-normal.

The p-value tells you the probability of incorrectly rejecting the null hypothesis. When it's significant (usually when less-than 0.10 or less than 0.05) you should reject the null hypothesis and conclude the sample is not normally distributed.

When it is not significant (greater-than 0.10 or 0.05), there isn't enough evidence to reject the null hypothesis and you can only assume the sample is normally distributed. However, as noted above, you should always double-check the distribution is normal using the Normal Q-Q plot and Frequency histogram.

3.3.2.5 Correlations Spearman and Kendall's

Correlations Spearman and Kendall's is a non-parametric test that is used to determine the correlation between two variables. It finds the relationships that come from the same population. The Spearman and Kendall's correlation coefficient is often described as being "nonparametric". In this study, the test will be able to identify whether the perspective of two sections between the issues and the improvement method is statically significant or non-significant.

The hypotheses are as follows;

Null hypotheses, H_0 : There is no relationship between lack performance issues of PMO with the improvement method to PMO.

Alternative hypotheses, H_1 : There is a relationship between lack performance issues of PMO with the improvement method to PMO.

Conover, 1999 says that at 95% of significance level if the *p*-value is less than 0.05, the results is statically significant, and the null hypothesis will be rejected and the alternative hypothesis will be accepted.

3.4 Phase 3 (Validation & Conclusion)

Phase three (3) is a final stage for this chapter where validation of the data and conclusion of the chapter. Review will be done by the researcher supervisor to ensure the data analysis was correct.

3.4.1 Review by Expert

Prior the final commencing of the works, the effectiveness of current PMO status will be reviewed by the experts in order to ensure its appropriateness.

3.5 Summary

The data collection for this study was obtained through questionnaires and literature review. The design of questionnaire was based on the objectives identified earlier in this study. The question survey was carried out in order to obtain response data from the respondent as much as researcher can. The respondent data will be analysed by using statistical analysis such as frequency, relative importance index, reliability, normality and Spearman & Kendall's correlation analysis to derive the findings and conclusion for this study.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter showing that the understanding and awareness of PWD staff about its current project management practice, tools and course that has been provided by PMO. Issues that led to the performance of PWD in generally and PMO in specifically in managing project. Questionnaires have been designed for data collection and it is distributed to the target group which is PWD staffs especially who is directly contributing to the project performance. Responses gathered will be analysing using quantitative method and 'Statistical Products and Solution Services' (SPSS) software. The analysis of issues and suggestion for improvement methods will relate to the current project implementation practice.

4.2 Questionnaire and Data Gathering

Questionnare has been distributed by email to two hundred (200) respondent. Out of two hundred (200) copies of questionnaires, only one hundred

and twenty (120) responden give respond to the questionnaire whilst the other eighty (80) respondent have not responded. Table 4.1 and Figure 4.1 showing the results of percentage of response from the respondent. 40% respondent did not giving a feedback maybe due to busy with work, do not open the email, not sensitive to the questionnaires, feel unimportant to answer the questionnaire and the most important thing that the questionnaire was distributed by email. It maybe will be more respondent feedback if the method used to meet or face to face. Questionnaire has been designed to suite the objectives of this study which is to investigate issues that led to the poor performance of current PMO and to identify or establish the improvement method/process of PMO in PWD. The set of questionnaire is at Appendix 1.

Table 4.1: Response Received from Respondents

Distributed Questionnaire	Quantity	Percentage (%)
Returned Questionnaire	120	60%
Unreturned Questionnaire	80	40%
Total	**200**	**100%**

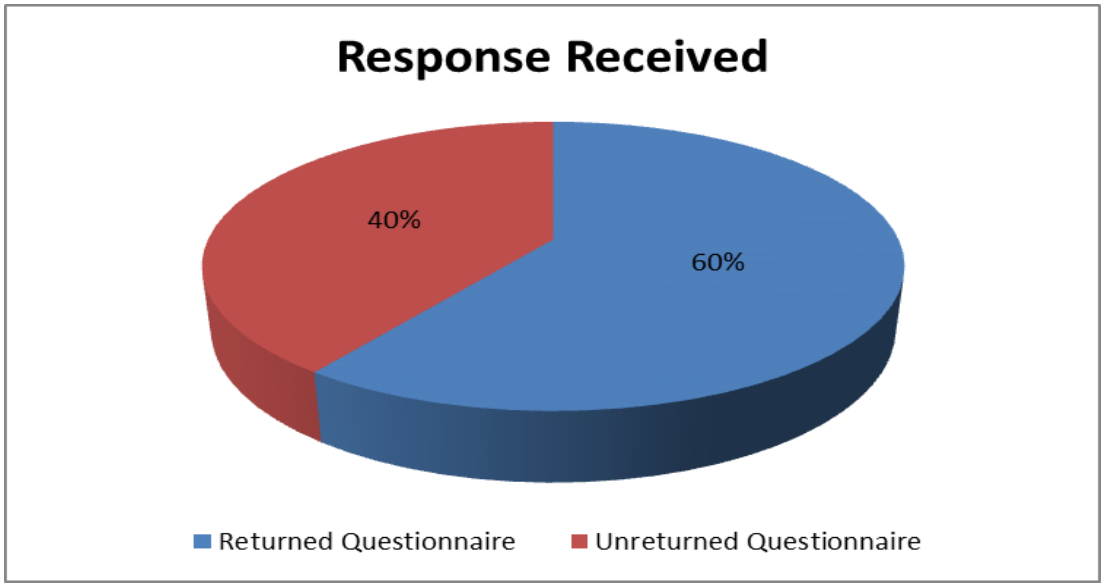

Figure 4.1: Respondents' Statistic

4.3 Data Analysis

From the respondent feedback, respondent data will be analyzed by grouping it to find the frequencies and percentage for each item. Then Repeated-Imputation Inference (RII), Mean and Standard Deviation of the data will be calculated. After that SPSS software will be used to run test as follows:

i) Demographic Characteristics of Respondents;
ii) Reliability Analysis;
iii) Normality Test; and
iv) Correlation Rank Spearmen & Kendall.

4.3.1 Demographic Characteristics of Respondents

This section normally discussed about the background of the respondents. It started with gender, age, years of service, years of experiences, department working and profession in PWD.

4.3.1.1 Gender of Respondents

From the total of 120 respondents, it is observed that 72% of the respondents are male while the other 28% are female (Table 4.2 and Figure 4.2). This is because most of the PWD staff is male especially working at project site.

Table 4.2: Gender of Respondents

Gender	Quantity	Percentage (%)
Male	87	72%
Female	33	28%
Total	**120**	**100%**

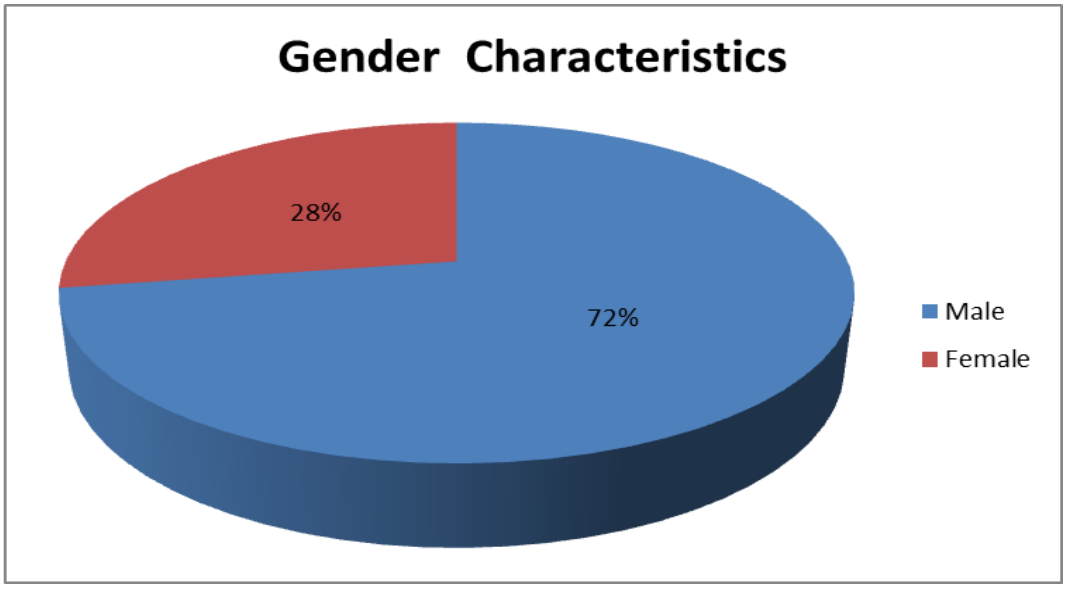

Figure 4.2: Respondent Gender Characteristics Percentage

4.3.1.2 Age of Respondents

From the Table 4.3 and Figure 4.3 below, it shown that most feedback was gathered from group age of 31 to 40 years which contribute 61% of the total respondent. While group age of less than 30 years is the lowest feedback gathered which is contributing only 5%. This was due to group age less than 30 years is a fresh and young engineer and did not fully understand what PMO is all about.

Table 4.3: Gender of Respondents

Age	Quantity	Percentage (%)
≤ 30	6	5%
31 - 40	73	61%
41 - 50	33	27%
≥ 51	8	7%
Total	**120**	**100%**

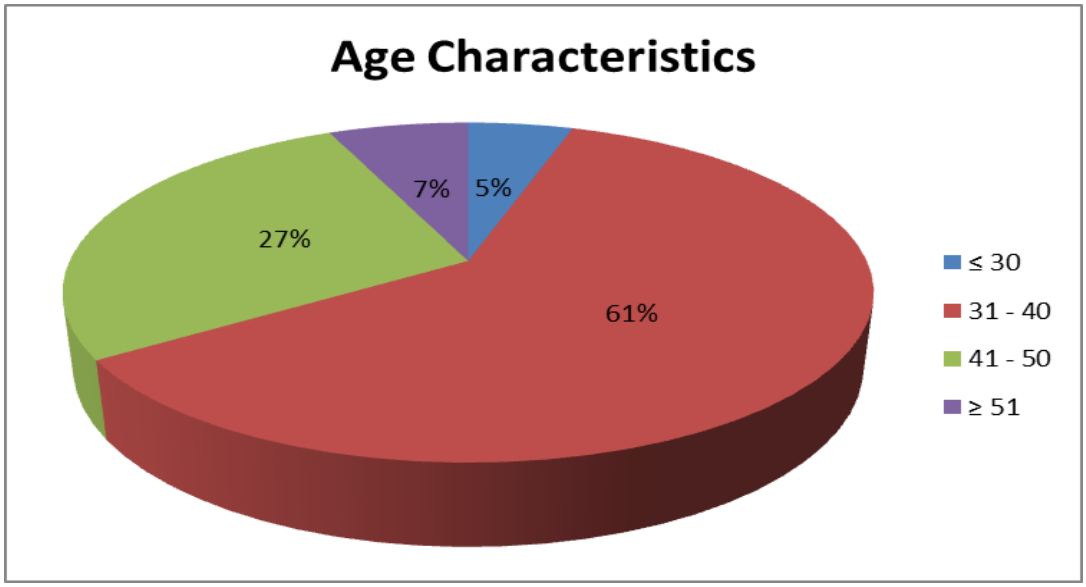

Figure 4.3: Respondent Age Characteristics Percentage

4.3.1.3 Respondents Years of Service

For the years of service characteristics (Table 4.4 and Figure 4.4), it shown that the highest respondents is 46% from 11 to 20 years experiences in PWD. And the lowest respondents are from group of more than 30 years experiences. This is due to the organizational structure of PWD which is like a pyramid. The higher the rank, the lesser the numbers of staff.

Table 4.4: Respondents Years of Service

Years of Service	Quantity	Percentage (%)
≤ 10	24	20%
11 - 20	55	46%
21 - 30	37	31%
≥ 31	4	3%
Total	**120**	**100%**

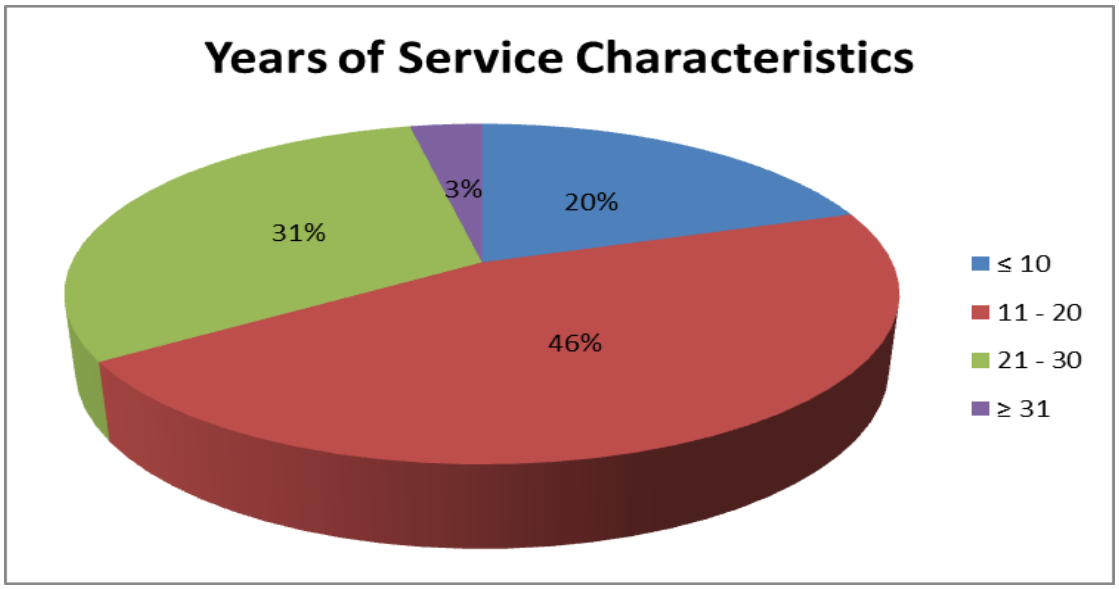

Figure 4.4: Years of Service Characteristics Percentage

4.3.1.4 Respondents Years of Experience

About 53% of the respondents experience between 31 to 40 years old which is the highest contribution to the question survey (Table 4.5 and Figure 4.5). While the lowest contributor to the data gathered is from the respondent of more than 30 years' experience that only 5%. This cause may due to the level or rank of the staff that has been mentioned earlier in Chapter 4.3.1.2.

Table 4.5: Respondents Years of Experience

Years of Experience	Quantity	Percentage (%)
≤ 10	13	11%
11 - 20	64	53%
21 - 30	37	31%
≥ 31	6	5%
Total	**120**	**100%**

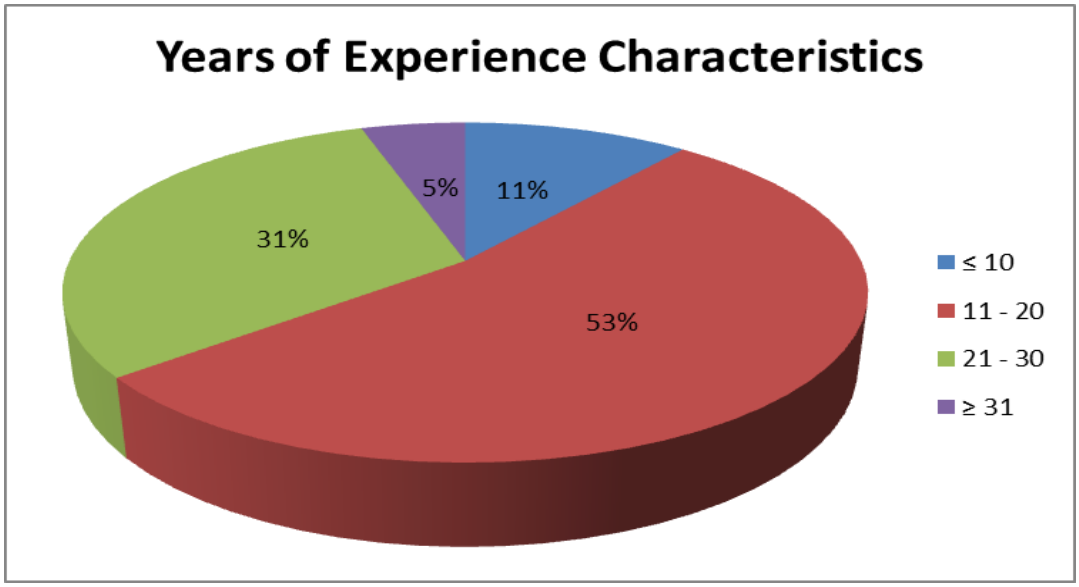

Figure 4.5: Years of Experience Characteristics Percentage

4.3.1.5 Respondents Departments

There are 39% respondents are from Head of Project Team and the lowest is from KADER post which is only 1% respondents in department characteristics (Table 4.6 and Figure 4.6). Most of the problems in project implementation are at the level of Head of Project Team (HODT) and Head of Design Team (HODT). This is due to 2 departments which are the largest contributor to the performance of the PWD.

Table 4.6: Respondents Department Characteristics Percentage

Age	Quantity	Percentage (%)
PMO	9	8%
HODT	35	29%
HOPT	47	39%
State	17	14%
District	7	6%
Project Site	4	3%
KADER	1	1%
Total	**120**	**100%**

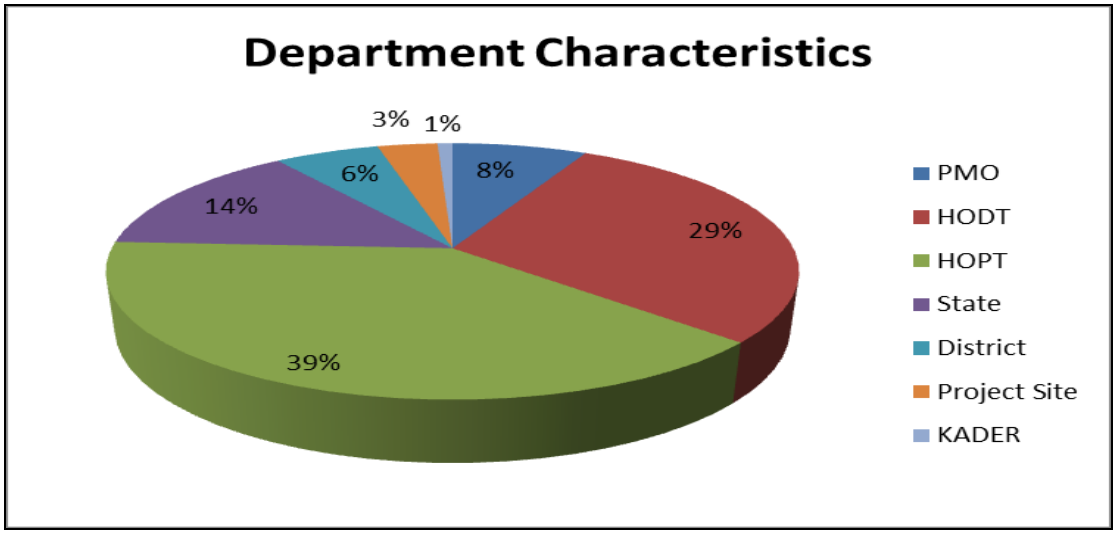

Figure 4.6: Department Characteristics Percentage

4.3.1.6 Respondents Profession

From the profession characteristics, it is shown that engineers are the major respondent who provide the feedback with the weightage of 96%. While management/administrator and land surveyor did not provide any feedback to the

questionnaire. This is because management/administrator staff feels they were not directly involved with the PMO or project. Very few numbers of land surveyor staffs in PWD and this is due to the fact that there is a Land and Survey Department which is not a department within PWD (Table 4.7 and Figure 4.7).

Table 4.7: Respondents Profession Characteristics Percentage

Age	Quantity	Percentage (%)
Engineer	115	96%
Architect	4	3%
Quantity Surveyor	1	1%
Management/Administrator	0	0%
Land Surveyor	0	0%
Others	0	0%
Total	**120**	**100%**

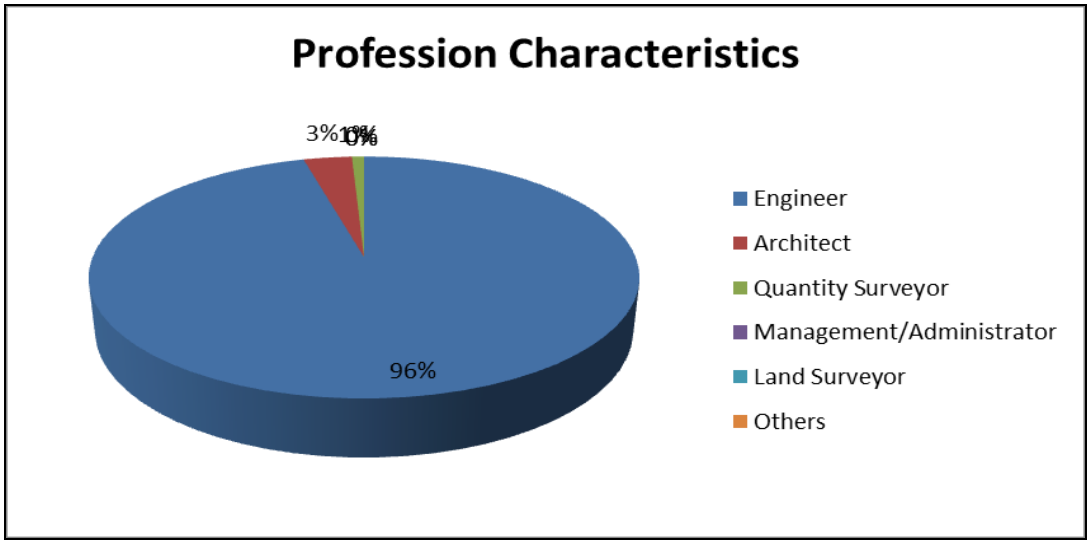

Figure 4.7: Profession Characteristics Percentage

4.3.2 Relative Importance Index (RII)

From the data collected, the Relative Important Index indicates the rating to each feedback by the respondent on the questionnaire components. Range of the RII is between 0.00 to 1.00. The RII analysis will be divided into section which is Section B (Table 4.8 and Figure 4.8) for the issues that led to the poor performance of PMO and Section C (Table 4.9 and Figure 4.9) which agree on the improvement method suggested on the PMO.

4.3.2.1 RII for Issues Related to Performance of PMO

The issues have been group into five (5) group where each group will be categorized and rank by group. Group number one is related to the project management process which relates to question 1 until question 7. From the RII, only top 5 issues will be further analysed. The issue can be rank through respondent on Q4, Q5, Q1, Q7 and Q2.

Group number two is related to the construction player performance. It is from question 8 to question 10. The rank for the RII for the opinion in Q9, Q8 and Q10 show that contractor is the main contributor to the performance of the project.

Group number three related to the PWD human resource problems. The question is from question 11 to question 13. The rank for the RII for the opinion in Q11, Q12 and Q13 show that project management skill level still low within PWD staffs.

Group number four is the influence of external issue to the performance of PMO. The question start from question 14 to question 18 and the RII determine the rank of the respondent opinion for Q18, Q17, Q16, Q14 and Q15.

Last group for issues category is group number five which is internal issues from PWD itself. Question is from question 19 to question 25. The top five (5) ranks for this group of opinion related to issues of PMO.

Table 4.8: Relative Importance Index (RII) for the Issues of PMO (Section B)

Issues	RII
Project alignment with poor strategy	0.61
Availability of relevant information to decision makers not sufficient and accurate	0.57
No standardization of project management tools	0.55
Weakness of allocation for resources across multiple projects. Classify projects using methodologies Acquisition Categorization (ACAT) for projects	0.68
Low project management maturity	0.61
Project selection not thoroughly	0.54
Not fit between project management methods and project characteristics	0.58
Consultant performance	0.66
Contractor performance	0.70
Staff performance	0.59
Project management skill level	0.67
Work climate	0.60
Work family equilibrium	0.57
Change in industry or market	0.58
Change in global or local economy	0.57
Change in regulatory environment	0.58

Table 4.8: Relative Importance Index (RII) for the Issues of PMO (Section B) (Continued)

Change in the national and local political environment	0.59
Pressure related to social responsibilities, ethics and others	0.61
Monitor and control project performance, including the development of Project Information Systems and reporting function	0.65
Develop and implement standards, including methodologies, processes and tools	0.62
Develop the competency of project personnel, including training and mentoring	0.64
Multi-project management, including participation in strategic planning and benefits management	0.62
Organizational learning, including the management of lesson learned, audits and mentoring of PMO performance	0.64
Management of customer interfaces	0.62
Execute specialized tasks for project managers, e.g. preparation of schedules	0.63

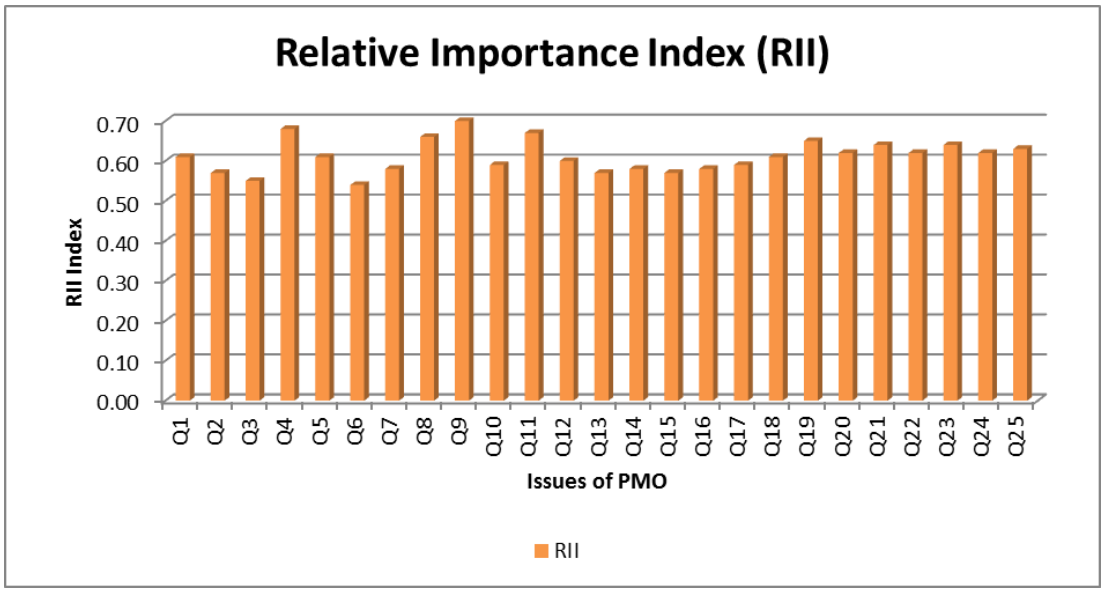

Figure 4.8: Relative Importance Index (RII) for the Issues of PMO

4.3.2.2 RII for Improvement Method/Process of PMO

The improvement method have been identified earlier and will be categorized and rank by using the RII analysis. In Section C, the rank will be identified from question 1 to question 14. From the RII, only top 5 issues will be further analyse. The issue can be rank as Table 4.9.

Table 4.9: Relative Importance Index (RII) for the Improvement of PMO (Section C)

Improvement	RII
Learned from others failure (Lesson Learned)	0.68
Create an expert on subject matters	0.67
Reviewing all the documentations to suite current conditions	0.62
Looking project as a lifecycle system	0.63
Centralized administration to improved communication among the branches	0.61
Conducting project audits	0.64
Promote project culture among the staffs	0.63
Provide a set of tools and templates for project management	0.66
Training, certification, consulting, mentoring, and competence development for the managers	0.68
Manage a risk database	0.63
Manage archives of project documentation	0.62
Provides project management consulting periodically as required	0.67
Develops, documents, and maintains project management best practices	0.65
Performs project reviews	0.63

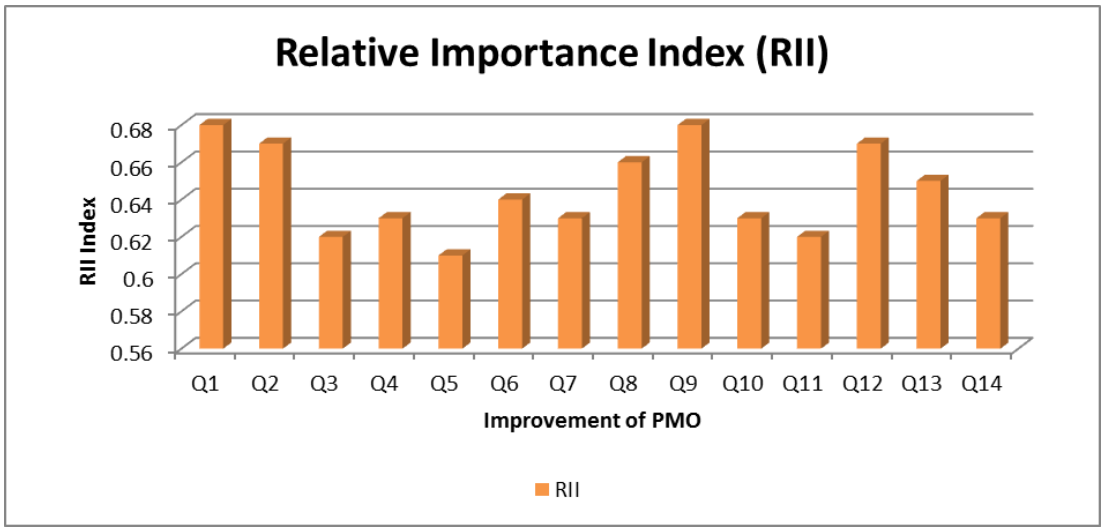

Figure 4.9: Relative Importance Index (RII) for the Issues of PMO

4.3.3 Reliability Analysis

From the questionnaire feedback, Reliability Test has been done to test whether the question is reliable or not to do the analysis. SPSS software is used to do the test and from Table 4.10 below, the result for Cronbach's Alpha is 0.851 for the issues related to poor performance of PMO and 0.852 for the improvement method/process to PMO which is greater than 0.7. Therefore the question and answer is reliable to be used and the items have relatively high internal consistency. A reliability coefficient of 0.7 or higher is considered "acceptable" in most social science research situations.

Table 4.10: Reliability Statistics

Item	Cronbach's Alpha	N of Items
Issues related to poor performance of PMO	0.851	25
Improvement method/process to PMO	0.852	14

4.4.2 Normality Test

Normality tests are for testing whether the input data is normally distributed. It can be done through some statistical tests such as Student's t-test, one-way and two-way ANOVA, because they make assumptions that data comes from a normally distributed population, and if such assumptions are not valid, the results of the tests will be unreliable.

The data provides several normality tests to determine whether or not a sample of values follows a normal distribution. The sample size N, the mean, the standard deviation, the SE of Mean, the statistic, a p-value, and a decision rule are output to a Report Sheet. Here we use Kolmogorov-Smirnov[a] method.

Table 4.11: Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Mean PMP	.207	120	.000	.941	120	.000
Mean Performance	.225	120	.000	.881	120	.000
Mean HR	.267	120	.000	.888	120	.000
Mean External	.302	120	.000	.845	120	.000
Mean Internal	.256	120	.000	.868	120	.000
Mean Improvement	.214	120	.000	.868	120	.000

Hypothesis:

- H_0: there is no difference between the distributions of data with normal distribution.
- H_1: there is a difference between the distributions of data with normal distribution.

From the Normality Test, all Sig. probability is equal to 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means that there is a difference between the distributions of data with normal distribution and the data that has been distributed is not normal.

4.4.3 Spearmen Rank correlation and Kendall's

This section showing analysis that has been done related to the top most (number 1) rank issues from the questionnaire feedback. It is to know the relationship between the main issues affecting the performance with the improvement method/process to PMO.

Table 4.12: Issue Related to Project Management

Issue Related to Project Management	RII	MEAN	RANK
Weakness of allocation for resources across multiple projects. Classify projects using methodologies Acquisition Categorization (ACAT) for projects	0.68	4.37	1
Low project management maturity	0.61	3.88	2
Project alignment with poor strategy	0.61	3.87	3
Not fit between project management methods and project characteristics	0.58	3.59	4
Availability of relevant information to decision makers not sufficient and accurate	0.57	3.58	5

Table 4.13: Relationship between Issues of Weakness on Allocation for Resources across Multiple Projects with Method of Creating an Expert on Subject Matters.

			Lacks of staff	Expert knowledgeable on subject matter
Kendall's tau_b	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.255 .004 120
	Expert knowledgeable on subject matter	Correlation Coeff. Sig. (2-tailed) N	.255 .004 120	1.000 120
Spearman's rho	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.261 .004 120
	Expert knowledgeable on subject matter	Correlation Coeff. Sig. (2-tailed) N	.261 .004 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a lacks of staff with the expert knowledgeable on subject matter.
- H_1: there is a relationship between a lack of staff with the creating an expert on subject matter.

Correlation coefficient for Rank Spearmen is 0.261, with the Sig. value is 0.004 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a lacks of staff with the expert knowledgeable on subject matter.

Correlation coefficient for Kendall Spearmen Rank is 0.255, with the Sig. value is 0.004 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a lacks of staff with expert knowledgeable on subject matter.

Table 4.14: Relationship between Issues of Weakness on Allocation for Resources across Multiple Projects with Method of Looking Project as a Lifecycle System.

			Lacks of staff	Training and centralization of administration
Kendall's tau_b	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.241 .004 120
	Training and centralization of administration	Correlation Coeff. Sig. (2-tailed) N	.241 .004 120	1.000 120
Spearman's rho	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.256 .005 120
	Training and centralization of administration	Correlation Coeff. Sig. (2-tailed) N	.256 .005 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a lack of staff with the training and centralization of administration.
- H_1: there is a relationship between a lack of staff with the training and centralization of administration.

Correlation coefficient for Rank Spearmen is 0.256, with the Sig. value is 0.005 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between a lacks of staff with the training and centralization of administration.

Correlation coefficient for Kendall Spearmen Rank is 0.241, with the Sig. value is 0.004 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between a lacks of staff with the training and centralization of administration.

Table 4.15: Relationship between Issues of Weakness on Allocation for Resources across Multiple Projects with Method of Training and Development of Project Managers.

			Lacks of staff	Training and development of project managers.
Kendall's tau_b	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.206 .021 120
	Training and development of project managers.	Correlation Coeff. Sig. (2-tailed) N	.206 .021 120	1.000 120
Spearman's rho	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.211 .021 120
	Training and development of project managers.	Correlation Coeff. Sig. (2-tailed) N	.211 .021 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a lack of staff with the training and development of project managers.
- H_1: there is a relationship between a lack of staff with the training and development of project managers.

Correlation coefficient for Rank Spearmen is 0.211, with the Sig. value is 0.021 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a lack of staff with the training and development of project managers.

Correlation coefficient for Kendall Spearmen Rank is 0.206, with the Sig. value is 0.021 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a lack of staff with the training and development of project managers.

Table 4.16: Relationship between Issues of Weakness on Allocation for Resources across Multiple Projects with Method of Managing Archives of Project Documentation.

			Lacks of staff	Managing archives of project documentation.
Kendall's tau_b	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	-.181 .040 120
	Managing archives of project documentation	Correlation Coeff. Sig. (2-tailed) N	-.181 .040 120	1.000 120
Spearman's rho	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	-.188 .040 120
	Managing archives of project documentation	Correlation Coeff. Sig. (2-tailed) N	-.188 .040 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a lacks of staff with the managing archives of project documentation.
- H_1: there is a relationship between a lacks of staff with the managing archives of project documentation.

Correlation coefficient for Rank Spearmen is -0.188, with the Sig. value is 0.040 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between a lacks of staff with the managing archives of project documentation.

Correlation coefficient for Kendall Spearmen Rank is -0.181, with the Sig. value is 0.040 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between a lacks of staff with the managing archives of project documentation.

Table 4.17: Relationship between Issues of Weakness on Allocation for Resources across Multiple Projects with Method of Providing Project Management Consulting.

			Lacks of staff	Providing project management consulting
Kendall's tau_b	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.209 .020 120
	Providing project management consulting	Correlation Coeff. Sig. (2-tailed) N	.209 .020 120	1.000 120
Spearman's rho	Lacks of staff	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.213 .019 120
	Providing project management consulting	Correlation Coeff. Sig. (2-tailed) N	.213 .019 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a lacks of staff with the providing project management consulting.
- H_1: there is a relationship between a lacks of staff with the providing project management consulting.

Correlation coefficient for Rank Spearmen is 0.213, with the Sig. value is 0.019 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a lack of staff with the training and providing project management consulting.

Correlation coefficient for Kendall Spearmen Rank is 0.209, with the Sig. value is 0.020 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a lack of staff with the training and providing project management consulting.

Table 4.18: Issue Related to Stakeholders Performance

Issue Related to Players Performance	RII	MEAN	RANK
Contractor performance	0.70	4.50	1
Consultant performance	0.66	4.26	2
Staff performance	0.59	3.80	3

Table 4.19: Relationship between Issues on Contractor Performance with Method of Lesson Learned.

			Contractor performance	Lesson learned
Kendall's tau_b	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.193 .034 120
	Lesson learned	Correlation Coeff. Sig. (2-tailed) N	.193 .034 120	1.000 120
Spearman's rho	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.194 .034 120
	Lesson learned	Correlation Coeff. Sig. (2-tailed) N	.194 .034 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a contractors performances with the lesson learned.
- H_1: there is a relationship between a contractors performances with the lesson learned.

Correlation coefficient for Rank Spearmen is 0.194, with the Sig. value is 0.034 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractors performances with the lesson learned.

Correlation coefficient for Kendall Spearmen Rank is 0.193, with the Sig. value is 0.034 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractors performances with the lesson learned.

Table 4.20: Relationship between Issues on Contractor Performance with Method of Providing a Set of Tools and Templates.

			Contractor performance	Providing a set of tools and templates
Kendall's tau_b	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.200 .027 120
	Providing a set of tools and templates	Correlation Coeff. Sig. (2-tailed) N	.200 .027 120	1.000 120
Spearman's rho	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.203 .026 120
	Providing a set of tools and templates	Correlation Coeff. Sig. (2-tailed) N	.203 .026 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a contractor performance with providing a set of tools and templates.
- H_1: there is a relationship between a contractor performance with providing a set of tools and templates.

Correlation coefficient for Rank Spearmen is 0.203, with the Sig. value is 0.026 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractor performance with providing a set of tools and templates.

Correlation coefficient for Kendall Spearmen Rank is 0.200, with the Sig. value is 0.027 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractor's performance with providing a set of tools and templates.

Table 4.21: Relationship between Issues on Contractor Performance with Method of Training, Certification, Consulting, Mentoring and Competency Development.

			Contractor performance	Training, certification, consulting, mentoring and competency development
Kendall's tau_b	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.209 .022 120
	Training, certification, consulting, mentoring and competency development	Correlation Coeff. Sig. (2-tailed) N	.209 .022 120	1.000 120
Spearman's rho	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.210 .021 120
	Training, certification, consulting, mentoring and competency development	Correlation Coeff. Sig. (2-tailed) N	.210 .021 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a contractor performance with training, certification, consulting, mentoring and competency development.
- H_1: there is a relationship between a contractor performance with training, certification, consulting, mentoring and competency development.

Correlation coefficient for Rank Spearmen is 0.210, with the Sig. value is 0.021 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractor performance with training, certification, consulting, mentoring and competency development.

Correlation coefficient for Kendall Spearmen Rank is 0.209, with the Sig. value is 0.022 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractor performance with training, certification, consulting, mentoring and competency development.

Table 4.22: Relationship between Issues on Contractor Performance with Method of Providing Project Management Consulting Periodically as Required.

			Contractor performance	Providing project management consulting periodically as required
Kendall's tau_b	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.228 .013 120
	Providing project management consulting periodically as required	Correlation Coeff. Sig. (2-tailed) N	.228 .013 120	1.000 120
Spearman's rho	Contractor performance	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.228 .012 120
	Providing project management consulting periodically as required	Correlation Coeff. Sig. (2-tailed) N	.228 .012 120	1.000 120

Hypothesis:

- H_0: there is no relationship between a contractors performance with providing project management consulting periodically as required.

- H_1: there is a relationship between a contractors performance with providing project management consulting periodically as required.

Correlation coefficient for Rank Spearmen is 0.228, with the Sig. value is 0.012 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractors performance with providing project management consulting periodically as required.

Correlation coefficient for Kendall Spearmen Rank is 0.228, with the Sig. value is 0.013 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between a contractors performance with providing project management consulting periodically as required.

Table 4.23: Issue Related to Human Resource

Issue Related to Human Resource	RII	MEAN	RANK
Project management skill level	0.67	4.31	1
Work climate	0.60	3.83	2
Work family equilibrium	0.57	3.41	3

Table 4.24 Relationship between Issues on Project Management Skill Levels with Method of Competency Development.

			Project management skill levels	Competency development
Kendall's tau_b	Project management skill levels	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.205 .024 120
	Competency development	Correlation Coeff. Sig. (2-tailed) N	.205 .024 120	1.000 120
Spearman's rho	Project management skill levels	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.206 .024 120
	Competency development	Correlation Coeff. Sig. (2-tailed) N	.206 .024 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project management skill levels with the competency development.
- H_1: there is a relationship between project management skill levels with the competency development.

Correlation coefficient for Rank Spearmen is 0.206, with the Sig. value is 0.024 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project management skill levels with the competency development.

Correlation coefficient for Kendall Spearmen Rank is 0.205, with the Sig. value is 0.024 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project management skill levels with the competency development.

Table 4.25: Relationship between Issues on Project Management Skill Levels with Method of Providing Project Management Consulting.

			Project management skill levels	Providing project management consulting
Kendall's tau_b	Project management skill levels	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.230 .012 120
	Providing project management consulting	Correlation Coeff. Sig. (2-tailed) N	.230 .012 120	1.000 120
Spearman's rho	Project management skill levels	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.231 .011 120
	Providing project management consulting	Correlation Coeff. Sig. (2-tailed) N	.231 .011 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project management skill levels with providing project management consulting.
- H_1: there is a relationship between project management skill levels with providing project management consulting.

Correlation coefficient for Rank Spearmen is 0.231, with the Sig. value is 0.011 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project management skill levels with providing project management consulting.

Correlation coefficient for Kendall Spearmen Rank is 0.230, with the Sig. value is 0.012 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project management skill levels with providing project management consulting.

Table 4.26: External Issues on the Poor Performance of PMO

Issue Related to External	RII	MEAN	RANK
Pressure related to social responsibilities, ethics and others	0.61	3.88	1
Change in the national and local political environment	0.59	3.61	2
Change in regulatory environment	0.58	3.56	3
Change in industry or market	0.58	3.54	4
Change in global or local economy	0.57	3.42	5

Table 4.27: Relationship between Issues on Work Pressures Related to Social Responsibilities, Ethics and Others with Method of Promote Project Culture Among the Staff.

			Work pressures	Project culture
Kendall's tau_b	Work pressures	Correlation Coeff. Sig. (2-tailed) N	1.000 120	-.074 .396 120
	Project culture	Correlation Coeff. Sig. (2-tailed) N	-.074 .396 120	1.000 120
Spearman's rho	Work pressures	Correlation Coeff. Sig. (2-tailed) N	1.000 120	-.077 .403 120
	Project culture	Correlation Coeff. Sig. (2-tailed) N	-.77 .403 120	1.000 120

Hypothesis:

- H_0: there is no relationship between work pressures with the project culture.
- H_1: there is a relationship between work pressures with the project culture.

Correlation coefficient for Rank Spearmen is -0.077, with the Sig. value is 0.403 > 0.05. There for we will accept H_0 and reject H_1. It means there is no relationship between work pressures with the project culture.

Correlation coefficient for Kendall Spearmen Rank is -0.074, with the Sig. value is 0.396 > 0.05. There for we will accept H_0 and reject H_1. It means there is no relationship between work pressures with the project culture.

Table 4.28: Internal Issues on the Poor Performance of PMO

Issue Related to Internal issue	RII	MEAN	RANK
Monitor and control project performance, including the development of Project Information Systems and reporting function	0.65	4.24	1
Develop the competency of project personnel, including training and mentoring	0.64	4.15	2
Organizational learning, including the management of lesson learned, audits and mentoring of PMO performance	0.64	4.13	3
Execute specialized tasks for project managers, e.g. preparation of schedules	0.63	4.13	4
Develop and implement standards, including methodologies, processes and tools	0.62	4.05	5

Table 4.29: Relationship between Issues on Development of Project Information Systems with Method of Creating an Expert Knowledgeable on the Subject Matters.

			Development of project information systems	Creating an expert knowledgeable on the subject matters
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.397 .000 120
	Creating an expert knowledgeable on the subject matters	Correlation Coeff. Sig. (2-tailed) N	.397 .000 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.402 .000 120
	Creating an expert knowledgeable on the subject matters	Correlation Coeff. Sig. (2-tailed) N	.402 .000 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with creating an expert knowledgeable on the subject matters.
- H_1: there is a relationship between project information systems with creating an expert knowledgeable on the subject matters.

Correlation coefficient for Rank Spearmen is 0.402, with the Sig. value is 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with creating an expert knowledgeable on the subject matters.

Correlation coefficient for Kendall Spearmen Rank is 0.397, with the Sig. value is 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with creating an expert knowledgeable on the subject matters.

Table 4.30: Relationship between Issues on Development of Project Information Systems with Method of Reviewing All Documentations to Adapt with Current Conditions.

			Development of project information systems	Reviewing all documentations to adapt with current conditions
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.195 .029 120
	Reviewing all documentations to adapt with current conditions	Correlation Coeff. Sig. (2-tailed) N	.195 .029 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.199 .029 120
	Reviewing all documentations to adapt with current conditions	Correlation Coeff. Sig. (2-tailed) N	.199 .029 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with reviewing all documentations to adapt with current conditions.
- H_1: there is a relationship between project information systems with reviewing all documentations to adapt with current conditions.

Correlation coefficient for Rank Spearmen is 0.199, with the Sig. value is 0.029 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with reviewing all documentations to adapt with current conditions.

Correlation coefficient for Kendall Spearmen Rank is 0.195, with the Sig. value is 0.029 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with reviewing all documentations to adapt with current conditions.

Table 4.31: Relationship between Issues on Development of Project Information Systems with Method of Promoting Project Culture.

			Development of project information systems	Promoting project culture
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.216 .015 120
	Promoting project culture	Correlation Coeff. Sig. (2-tailed) N	.216 .015 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.221 .015 120
	Promoting project culture	Correlation Coeff. Sig. (2-tailed) N	.221 .015 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with promoting project culture.
- H_1: there is a relationship between project information systems with promoting project culture.

Correlation coefficient for Rank Spearmen is 0.221, with the Sig. value is 0.015 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between project information systems with promoting project culture.

Correlation coefficient for Kendall Spearmen Rank is 0.216, with the Sig. value is 0.015 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between project information systems with promoting project culture.

Table 4.32: Relationship between Issues on Development of Project Information Systems with Method of Providing a Set of Guidelines for Project Management.

			Development of project information systems	Providing a set of guidelines for project management
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.327 .000 120
	Providing a set of guidelines for project management	Correlation Coeff. Sig. (2-tailed) N	.327 .000 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.334 .000 120
	Providing a set of guidelines for project management	Correlation Coeff. Sig. (2-tailed) N	.334 .000 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with providing a set of guidelines for project management.
- H_1: there is a relationship between project information systems with providing a set of guidelines for project management.

Correlation coefficient for Rank Spearmen is 0.334, with the Sig. value is 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with providing a set of guidelines for project management.

Correlation coefficient for Kendall Spearmen Rank is 0.327, with the Sig. value is 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with providing a set of guidelines for project management.

Table 4.33: Relationship between Issues on Development of Project Information Systems with Method of Competency Development.

			Development of project information systems	Competency development
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.299 .001 120
	Competency development	Correlation Coeff. Sig. (2-tailed) N	.299 .001 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.303 .001 120
	Competency development	Correlation Coeff. Sig. (2-tailed) N	.303 .001 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with competency development.
- H_1: there is a relationship between project information systems with competency development.

Correlation coefficient for Rank Spearmen is 0.303, with the Sig. value is 0.001 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between project information systems with competency development.

Correlation coefficient for Kendall Spearmen Rank is 0.299, with the Sig. value is 0.001 < 0.05. There for we will reject H_0 and accept $H_{1.}$ It means there is a relationship between project information systems with competency development.

Table 4.34: Relationship between Issues on Development of Project Information Systems with Method of Risk Management Database.

			Development of project information systems	Risk management database
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.210 .019 120
	Risk management database	Correlation Coeff. Sig. (2-tailed) N	.210 .019 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.215 .018 120
	Risk management database	Correlation Coeff. Sig. (2-tailed) N	.215 .018 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with risk management database.
- H_1: there is a relationship between project information systems with risk management database.

Correlation coefficient for Rank Spearmen is 0.215, with the Sig. value is 0.018 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with risk management database.

Correlation coefficient for Kendall Spearmen Rank is 0.210, with the Sig. value is 0.019 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with manage risk management database.

Table 4.35: Relationship between Issues on Development of Project Information Systems with Method of Providing Project Management Consulting.

			Development of project information systems	Providing project management consulting
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.386 .000 120
	Providing project management consulting	Correlation Coeff. Sig. (2-tailed) N	.386 .000 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.390 .000 120
	Providing project management consulting	Correlation Coeff. Sig. (2-tailed) N	.390 .000 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with providing project management consulting.
- H_1: there is a relationship between project information systems with providing project management consulting.

Correlation coefficient for Rank Spearmen is 0.390, with the Sig. value is 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with providing project management consulting.

Correlation coefficient for Kendall Spearmen Rank is 0.386, with the Sig. value is 0.000 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with providing project management consulting.

Table 4.36: Relationship between Issues on Development of Project Information Systems with Method of Project Lesson Learned.

			Development of project information systems	Project lesson learned
Kendall's tau_b	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.181 .046 120
	Project lesson learned	Correlation Coeff. Sig. (2-tailed) N	.181 .046 120	1.000 120
Spearman's rho	Development of project information systems	Correlation Coeff. Sig. (2-tailed) N	1.000 120	.183 .045 120
	Project lesson learned	Correlation Coeff. Sig. (2-tailed) N	.183 .045 120	1.000 120

Hypothesis:

- H_0: there is no relationship between project information systems with project lesson learned.
- H_1: there is a relationship between project information systems with project lesson learned.

Correlation coefficient for Rank Spearmen is 0.181, with the Sig. value is 0.046 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with project lesson learned.

Correlation coefficient for Kendall Spearmen Rank is 0.183, with the Sig. value is 0.045 < 0.05. There for we will reject H_0 and accept H_1. It means there is a relationship between project information systems with project lesson learned.

4.4.5 Improvement method/process

From the questionnaires feedback, the improvement method/process that is required by the respondents can be rank as Table below:

Table 4.37: Improvement Method/Process to PMO

Issue Improvement Method/Process to PMO	RII	MEAN	RANK
Learned from others failure (Lesson Learned)	0.68	4.40	1
Provide a set of tools and templates for project management	0.68	4.40	2
Training, certification, consulting, mentoring, and competence development for the managers	0.68	4.40	3
Provides project management consulting periodically as required	0.67	4.34	4
Create an expert on subject matter	0.67	4.33	5

Table 4.38: Relationship Summary between Issues with Improvement of PMO

Correlations

			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Kendall's tau_b	Q4	Correlation	.160	.255**	-.125	-.096	-.241*	-.047	-.033	.082	.206*	-.118	-.181*	.209*	-.056	.007
		Sig. (2-tailed)	.074	.004	.155	.277	.004	.591	.705	.354	.021	.185	.040	.020	.534	.933
	Q9	Correlation	.193*	.177	.069	.061	-.123	-.085	.058	.200*	.209*	.108	-.037	.228*	.080	.089
		Sig. (2-tailed)	.034	.054	.444	.497	.157	.344	.518	.027	.022	.235	.684	.013	.379	.329
	Q11	Correlation	.161	.135	-.037	.106	-.035	.051	.086	.120	.205*	.104	-.010	.230*	.141	.018
		Sig. (2-tailed)	.076	.137	.683	.235	.682	.569	.335	.181	.024	.249	.909	.012	.120	.846
	Q18	Correlation	-.003	.113	-.019	-.158	.037	.055	-.074	-.047	-.033	-.046	-.072	.116	-.087	.014
		Sig. (2-tailed)	.973	.205	.824	.071	.661	.528	.396	.588	.712	.599	.414	.190	.324	.878
	Q19	Correlation	.117	.397**	.195*	.166	-.144	.171	.216*	.327**	.299**	.210*	.023	.386**	.021	.181*
		Sig. (2-tailed)	.194	.000	.029	.062	.091	.056	.015	.000	.001	.019	.793	.000	.820	.046
Spearman's rho	Q4	Correlation	.164	.261**	-.129	-.100	-.256*	-.049	-.035	.085	.211*	-.122	-.188*	.213*	-.057	.008
		Sig. (2-tailed)	.074	.004	.161	.277	.005	.596	.705	.354	.021	.185	.040	.019	.536	.934
	Q9	Correlation	.194*	.177	.070	.062	-.130	-.087	.059	.203*	.210*	.109	-.037	.228*	.081	.089
		Sig. (2-tailed)	.034	.053	.446	.499	.157	.346	.521	.026	.021	.236	.686	.012	.381	.331
	Q11	Correlation	.161	.136	-.038	.108	-.037	.052	.088	.123	.206*	.105	-.011	.231*	.143	.018
		Sig. (2-tailed)	.078	.137	.684	.239	.685	.574	.339	.182	.024	.253	.909	.011	.120	.847
	Q18	Correlation	-.003	.116	-.020	-.163	.040	.058	-.077	-.049	-.033	-.048	-.075	.120	-.090	.014
		Sig. (2-tailed)	.971	.206	.827	.076	.665	.532	.403	.593	.719	.605	.418	.191	.326	.878
	Q19	Correlation	.119	.402**	.199*	.171	-.152	.174	.221*	.334**	.303**	.215*	.024	.390**	.021	.183*
		Sig. (2-tailed)	.196	.000	.029	.062	.097	.057	.015	.000	.001	.018	.795	.000	.818	.045

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.5 Summary

From the analysis, we found that the main issues related to the performance of PMO are as below;

i) Weakness of allocation for resources across multiple projects. Classify projects using methodologies Acquisition Categorization (ACAT) for projects,
ii) Contractor performance,
iii) Project management skill level,
iv) Work pressure related to social responsibilities, ethics and others; and
v) Monitor and control project performance, including the development of Project Information Systems and reporting function.

While the improvement methods are as follows;

i) Learned from others failure (Lesson Learned),
ii) Provide a set of tools and templates for project management,
iii) Training, certification, consulting, mentoring, and competency development for the managers,
iv) Provides project management consulting periodically as required; and
v) Expert knowledgeable on subject matter.

CHAPTER 5

DISCUSSION ON FINDINGS

5.1 Introduction

In this chapter, it will discuss on the finding for the data analysis that has been analysed using SPSS software. This chapter will discuss on two (2) perspectives which is issues that led to performance of PMO and the other is the improvement method/process to enhance PMO.

5.2 Issues Related to the Performance of PMO

From the analysis it found that five (5) major issues that led to the poor performance of PMO. From the RII analysis issues related to weakness of allocation for resources across multiple projects, contractor performance, project management skill level, work pressure related to social responsibilities, ethics and monitor and control project performance has been rank.

The weakness in the allocation resources across multiple projects is the most common issue highlighted by respondents in project management issue. In reference to the problem statement, project delivery from PWD was unfavourable in the opinion of client. The numbers of project delivered decreases year by year. The number of new staff intake increases year by year. But at the implementation level (State and District), there always been a request of additional staff due to the increasing numbers of project. A study is still being conducted on the weightage of the maximum work load that each professional can carry out.

On the stakeholder performance issue, such as the contractor's performance is the main contributor that influence the performance of PMO and PWD. Each project performance depends on the speedy delivery of the project and how it can be completed within the allocated budget and satisfy the client in term of quality. Most PWD projects were completed beyond the original schedule with several extension of time (EOT). For the time being, PWD is using SKALA as a monitoring tool to ensure contractors complete their project on time.

On issue related to the human resource, the respondent mostly indicated that the level of project management skill of the PWD officer were low. District and project teams' officer are most important personnel who are monitoring and controlling the contractor and project performance and quality. Skills need to be nurtured by providing training to the staff so that they can understand what is management skills is all about and can adopt it on their works.

External issue that influences the performance of PMO relates to a form of work pressure on the officers in the course of discharging his or her daily duties such as dividing between work demands against social responsibilities or ethics related work.

While the top internal issue is monitor and control project performance, including the development of Project Information Systems and reporting function. Though the system is good, not all staffs are well versed with the system while only some officers that have some competency with the system. Due to job rotation policy by PWD, they will be assigned to a new responsibilities or posting away from the current work. The staff should be given an opportunity to be well versed or highly competent with the system before the other staff can take over to ensure the increase in numbers of staff will not jeopardise the performance of the organization.

5.3 Improvement Method/Process to PMO

From the analysis, fourteen (14) options have been stated in the questionnaire and most respondent agreed on learned from failures. In actual fact, PWD has developed the data base on 'lesson learnt' but it not accessible by all PWD staff due to its bureaucracy. Therefore this 'lesson learnt' is the first method of improvement. It is just being disseminated as on lecture discussion in the internal PWD programme. However, it should be published as a guidebook to all PWD relevant staffs.

The second method is providing a set of tools and templates for project management. At the implementation level, PWD staff use the same tool which is SKALA and CPM. But they are unaware to the function and how to optimize the usage of the tools. The system just lay idle without serving its set purpose. PMO is yet to achieve its goal to standardize PM tools because the tools are still at development stage.

The third method is training, certification, consulting, mentoring, and competence development for the managers. This method also has been implemented by PWD but it is still not comprehensive. For the time being, PMO should be given the project management advice to project implementing teams. So that it will help guide the team to ensure the success of the project.

5.4 Summary

There will always be some challenges to overcome when implementing PMO in the organisation even though the organisations have the procedures in place (Initiation, Planning, Execution and Improvement). Lack of guidance to the project team to overcome the obstacles of project management will results in varying outcome between PWD's way of solving problem and PMO's intention.

This study focused on the issues and method for improvement of PMO performance in PWD. There were twenty five (25) issues that have been identified and most of it related to the improvement method that has been suggested in the questionnaire.

The issues were determined and the most critical issue is contractor's performance. This is because the performance of contractors will determine the successful of the project. Issues on allocation of resource, low level of project management skill, work pressure and the development of project information system are the other four (4) top issues agreed by the respondents.

To overcome the entire stated problem, the training, certification, consulting, mentoring and competence of the project managers should be developed. Lesson learnt guidance should be given and can be accessed to all PWD staff in order to make comparison and learned from the others' mistakes. PMO in PWD has established several programs and guidelines to ensure PWD delivers its mission and vision to the client.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusion and recommended of the study. The conclusion was discussed based on the objectives highlighted in the first chapter. While the recommendation to the problem statement will be based on identifying which existing model should be given emphasis and priority in the implementation of PMO in PWD.

6.2 Conclusions

In conclusion to this study, there are two (2) objectives of the study that have been successfully achieved. The objectives of this study are to identify the issues that led to the poor performance of PMO; and to identify the improvement method/process of the PMO.

6.2.1 Objective 1: To Identify the Issues that Led to the Poor Performance of PMO

The identification of issues that led to the poor performance of PMO was achieved. According to the analysis, the top five (5) issues that led to the performance of PMO is weakness of allocation for resources across multiple projects. Classify projects using methodology of Acquisition Categorization (ACAT) to projects, contractor performance, low project management skill level, pressure related to social responsibilities, ethics and others; monitor and control project performance; including the development of Project Information Systems; and reporting function.

The drivers of PMO establishment were found to be the intention to increase project management maturity, the expected value comprises such as elements, to increase performance through improved project delivery, strengthening competitive advantage and finding new business opportunities, growing competencies of the organization and developing personnel.

PMO is a department that make a change to an organization. The difference that PMO want to do may have a significant impact on an organization. It cannot be achieved without the cooperation and contribution from all parties. The main challenge for PMO is to get an employees and the culture to become more approachable and implementing change in their mind set and by that they will become more open to the changes that PMO brings.

6.2.2 Objective 2: To Identify and Established the Improvement Method of PMO

The second objectives of identifying the improvement method is to established some of the critical methods includes of learning from others failure; provide a guidelines for project management; training; certification; provides project management consulting periodically as required; mentoring; competency development for managers; and creating an expert knowledgeable on the subject matters.

6.3 Recommendation for Future Study

More extensive studies can be conducted by comparing different target group where more data can be acquired. This study is comparing three (3) years achievement of PMO and it is not adequate to be adopted as a change in the organizations will need longer time.

It is suggested also that the study will be extended to PWD clients, contractor and consultant to have an opinion and feedback about PWD's PMO from the perspective of others.

6.4 Recommendation to PWD

It is recommended that PWD need to emphasize and expand the use of project management methods and tools that have been made available. Weaknesses in project management can be reduced if the use of project management methods and tools are widely used in the PWD. Application of these methods should be applied, and the understanding of each staffs should be enhanced to increase the performance of the PWD.

REFERENCES

Andersen, B., Henriksen, B., and Aarseth, W. (2007), Benchmarking of project management office establishment: extracting best practices. *Journal of Management in Engineering,* Vol. 23 (2), 97-104.

APM (2006) Association for Project Management Body of Knowledge. 5th edition. Buckinghamshire: APM Publishing.

Aubry, M., Muller, R., Hobbs, B., and Blomquist, T. (2010), Project management offices in transition. *International Journal of Project Management,* Vol. 28 (8), 766-778.

Christine Xiaoyi Dai, William G. Wells (2004), An exploration of project management office features and their relationship to project performance, *International Journal of Project Management 22 (2004),* 523-532.

Crawford, L. (2002), Developing organizational project management capability: theory and practice. *Project Management Journal*, Vol. 37, 67-70.

Dinsmore, P.C. and Cooke-Davies, T.J. (2006), *The right projects done right! : from business strategy to successful project implementation*. San Francisco: Jossey-Bass.

do Valle, J.A., da Silviera e Silva, W., & Soares, C.A. (2008): Project Management Office (PMO) – Principles in practice. *AACE International Transactions*.p.PM71.

Hill, G., M. (2004): Evolving the project management office: A competency continuum. *Information Systems Management*. Vol. 21, No. 4, 45-51.

Hurt, M., and Thomas, J.L. (2009), Building value through sustainable project management offices. *Project Management Journal, Vol. 40 (1),* 55-72.

Kertas Kerja Mesyuarat Pengarah JKR Bil. 1/99, *Masalah-masalah dan isu dalam pelaksanaan projek-projek pembangunan di JKR-JKR Negeri*.

Kevin C. Desouza, J. Roberto Evaristo (2006), Project management office: A case of knowledge-based archetypes, *International Journal of Information Management 26 (2006)* 414-423.

Maylor, Harvey (2010): Project Management (4th edition). *Person Education Limited, Edinburgh* p. 15-35.

Monique Aubry, Brian Hobbs, Denis Thuillier (2007), A new framwework for understanding organizational project management through the PMO, *International Journal of Project Management 25 (2007),* 328-336.

PMBOK_Guide, PMI, 2004, page 11.

Public Works Department, *SKALA Project Performance Reporting*, 2013.

Sergio Pellegrinelli, Luciano Garagna (2009), Towards a conceptualisation of PMOs as agents and subjects of change and renewal, *International Journal of Project Management 27 (2009),* 649-656.

Singh R., Keil M., and Kasi V. (2009), Identifying and overcoming the challenges of implementing a project management office. *European Journal of Information Systems, Vol. 18 (5),* 409-427.

Thomas, J. L., and Mullay, M. (2008a), *Researching the value of project management.* Newton Square, PA: Project Management Institute.

Wells, William, 1999. From the Editor, *Project Management Journal* 30 (March):4-5.

Zhai, L., Xin, Y., and Cheng C. (2009), Understanding the value of project management from a stakeholder's perspective: case study of mega project management. *Project Management Journal*, Vol. 40 (1), 99-109.

APPENDICES A

SURVEY QUESTIONNAIRE

RESPONDEN NO: .....

MASTER OF PROJECT MANAGEMENT

(A Collaborative Master Degree Programme between JKR and UTM)

QUESTIONNAIRE FORM

EFFECTIVENESS OF CURRENT PMO IMPLEMENTATION IN JKR

All information in this questionnaire is CONFIDENTIAL and only be used for research.

This questionnaire form is a part of Masters Dissertation of a Final Year student of Universiti Teknologi Malaysia which aims **to investigate issues that led to poor performance of PMO** and **to establish the improvement method/process of PMO in JKR**. PMO is a part of the organization that has been assigned to a various responsibilities in order to centralised and to coordinated management of any projects in JKR.

INSTRUCTION:

- This questionnaire consists of three sections, **Section A, B, C and D**. You are asked to respond to all questions in accordance with the instructions given in each part.

- You are requested to answer all questions honestly. There is no right or wrong answers because the answers are just your opinion. All information and data compiled are solely used for the research and academic purposes only. Your answer will be treated as **CONFIDENTIAL** and your cooperation is highly appreciated.

- Please returned completed questionnaire to:

AZARUL AZLAN BIN MOHD RADHI.
JKR Daerah Gombak,
Tingkat 2, Bangunan Sultan Sulaiman,
Persiaran Pegawai,
Bandar Baru Selayang,
68100 Batu Caves,
Selangor Darul Ehsan.

Tel: 03-61311311, Fax: 03-61384113
Email: azarul@jkr.gov.my

Prepared by:

AZARUL AZLAN BIN MOHD RADHI
Matrix No: MA111251

Supervised By:

PROF. DR. MUHD ZAIMI B. ABD. MAJID
CTMC, FKA, UTM

SECTION A:

Respondent's Profile

Instructions:

Please select the appropriate answer for each question.

A1. Gender

☐ Male ☐ Female

A2. Age

☐ ≤ 30 years ☐ 31 – 40 years

☐ 41 – 50 years ☐ ≥ 51 years

A3. Years of Service

☐ ≤ 10 years ☐ 11 – 20 years

☐ 21 – 30 years ☐ ≥ 31 years

A4. Years of Experience

☐ ≤ 10 years ☐ 11 – 20 years

☐ 21 – 30 years ☐ ≥ 31 years

A5. Department

☐ PMO ☐ HODT

☐ HOPT ☐ State

☐ District ☐ Project Site

☐ KADER

A6. Profession

☐	Engineer	☐	Architect
☐	Quantity Surveyor	☐	Management/Administrator
☐	Land Surveyor	☐	Others (please specify) ……

SECTION B:

Issues That Led to Poor Performance of PMO

Instructions:

Please select the appropriate answer for each question.

*The following statement indicates **issues that may lead or contribute to the poor performance of PMO**. Please rate your level of agreement for each issues presented according to the Likert Scale given from 1 to 5.*

1	2	3	4	5
Strongly Disagree/Very Poor	**Disagree/Poor**	**Not Sure/Moderate**	**Agree/Good**	**Strongly Agree/Very Good**

No.	Item	Scale				
	Issue Related to Project Management Process					
1	Project alignment with poor strategy	1	2	3	4	5
2	Availability of relevant information to decision makers not sufficient and accurate	1	2	3	4	5
3	No standardization of project management tools	1	2	3	4	5
4	Weakness of allocation for resources across multiple projects. Classify projects using methodologies Acquisition Categorization (ACAT) for projects	1	2	3	4	5
5	Low project management maturity	1	2	3	4	5
6	Project selection not thoroughly	1	2	3	4	5
7	Not fit between project management methods and project characteristics	1	2	3	4	5
	Issue Related to Performance					
8	Consultant performance	1	2	3	4	5
9	Contractor performance	1	2	3	4	5
10	Staff performance	1	2	3	4	5
	Issue Related to Human Resource					
11	Project management skill level	1	2	3	4	5
12	Work climate	1	2	3	4	5
13	Work family equilibrium	1	2	3	4	5

	External Issue					
14	Change in industry or market	1	2	3	4	5
15	Change in global or local economy	1	2	3	4	5
16	Change in regulatory environment	1	2	3	4	5
17	Change in the national and local political environment	1	2	3	4	5
18	Pressure related to social responsibilities, ethics and others	1	2	3	4	5
	Internal Issue					
19	Monitor and control project performance, including the development of Project Information Systems and reporting function	1	2	3	4	5
20	Develop and implement standards, including methodologies, processes and tools	1	2	3	4	5
21	Develop the competency of project personnel, including training and mentoring	1	2	3	4	5
22	Multi-project management, including participation in strategic planning and benefits management	1	2	3	4	5
23	Organizational learning, including the management of lesson learned, audits and mentoring of PMO performance	1	2	3	4	5
24	Management of customer interfaces	1	2	3	4	5
25	Execute specialized tasks for project managers, e.g. preparation of schedules	1	2	3	4	5

SECTION C:

To Establish the Improvement Method/Process to PMO

Instructions:

Please select the appropriate answer for each question.

*The following statement indicates **the establishment to the improvement method/process of PMO**. Please rate your level of agreement for each issues presented according to the Likert Scale given from 1 to 5.*

1	2	3	4	5
Strongly Disagree/Very Poor	**Disagree/Poor**	**Not Sure/Moderate**	**Agree/Good**	**Strongly Agree/Very Good**

No.	Item	Scale				
1	Learned from others failure (Lesson Learned)	1	2	3	4	5
2	Create an expert on subject matters	1	2	3	4	5
3	Reviewing all the documentations to suite current conditions	1	2	3	4	5
4	Looking project as a lifecycle system	1	2	3	4	5
5	Centralized administration to improved communication among the branches	1	2	3	4	5
6	Conducting project audits	1	2	3	4	5
7	Promote project culture among the staffs	1	2	3	4	5
8	Provide a set of tools and templates for project management	1	2	3	4	5
9	Training, certification, consulting, mentoring, and competence development for the managers	1	2	3	4	5
10	Manage a risk database	1	2	3	4	5
11	Manage archives of project documentation	1	2	3	4	5
12	Provides project management consulting periodically as required	1	2	3	4	5
13	Develops, documents, and maintains project management best practices	1	2	3	4	5
14	Performs project reviews	1	2	3	4	5

SECTION D:

Other Comments and Suggestions

……

……..

……..

……

……..

……

……..

……

……..

END OF QUESTIONAIRE

THANKS TO ALL RESPONDENTS WHO RESPONDING TO THIS QUESTIONAIRES AND CONTRIBUTE TO MY RESEARCHER