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PROJECT MANAGEMENT MATURITY AND PERFORMANCE
MEASURES OF PROJECT MANAGEMENT KNOWLEDGE AREAS
IN JABATAN KERJA RAYA

NOR HAZLIN BINTI MOHAMMAD

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

Faculty of Civil Engineering
Universiti Teknologi Malaysia

DECEMBER 2010

I declare that this capstone project report entitled *"Project Management Maturity And Performance Measures Of Project Management Knowledge Areas In Jabatan Kerja Raya"* is the result of my own research except as cited in the references. The capstone project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

The importance of project management maturity models has become essential in assessing an organization's current capabilities. These models are used to assess the maturity of an organization and to ensure of its efficiency and uniformity in delivering projects. Besides that, these models are used to further improve the organization to be a better one. Jabatan Kerja Raya (JKR) has received many critics from its clients for the "lack of quality" in delivering projects. Many incidents reported in the media have affected the credibility of JKR as the technical advisor and executor of government projects. Thus, in overcoming this weakness, the objectives of this study are to determine the adoption of the nine knowledge areas of project management in JKR, to assess the current maturity level of project management as perceived by project managers in JKR, to identify initiatives of the nine knowledge areas of project management to improve the maturity level of JKR and to establish the key performance indicators of the nine knowledge areas of project management to improve the maturity level of JKR. 65 project managers and project team members were asked to answer the designed questionnaires. Descriptive analysis was applied to answer the research questions and objectives. The study has revealed that almost 90 percent of the respondents felt that understanding the nine project management knowledge areas was important when managing projects. JKR project managers applied project management knowledge areas when managing projects by the mean score ranging from 3.6 to 4.1. The overall maturity level of JKR was analyzed to be at Level 2. 25 key performance indicators were proposed in the study in order to improve JKR maturity level from Level 2 to Level 3.

ABSTRAK

Penggunaan Model Kematangan Pengurusan Projek telah menjadi perkara yang perlu dalam menilai keupayaan semasa bagi sebuah organisasi. Model Kematangan Pengurusan Projek digunakan untuk menilai keupayaan sesebuah organisasi untuk memastikan keseragaman dan keberkesanan dalam menjalankan sesuatu projek. Selain itu, model ini juga digunakan untuk mengenalpasti penambahbaikan yang perlu untuk memajukan organisasi tersebut. Jabatan Kerja Raya (JKR) telah menerima banyak kritikan daripada pihak pelanggan mengenai kualiti projek yang dilaksanakan olehnya. Kejadian mengenai struktur bangunan runtuh dan lain-lain insiden yang dilaporkan di dalam media telah memberi kesan kepada kredibiliti JKR sebagai penasihat teknikal dan pelaksana projek-projek infrastruktur kerajaan. Dalam menangani kelemahan ini, kajian ini dilakukan untuk mengenalpasti penggunaan sembilan bidang pengetahuan dalam pengurusan projek, menilai kematangan semasa pengurusan projek bagi JKR, mencadangkan inisiatif-inisiatif dan pengukur prestasi bagi meningkatkan kematangan pengurusan projek JKR. Sejumlah 65 pengurus projek dan ahli pasukan projek telah mengambil bahagian dalam kajian ini. Analisa diskriptif telah dilakukan untuk menjawab persoalan dan objektif kajian. Hasil kajian ini menunjukkan 90 peratus daripada responden menyatakan pemahaman kepada sembilan bidang pengetahuan dalam pengurusan projek adalah penting dalam mengurus projek. Pengurus projek dan ahli pasukan projek menggunakan sembilan bidang pengetahuan dalam pengurusan projek semasa mengurus projek mereka dengan skor purata 3.6 hingga 4.1. Kematangan semasa pengurusan projek JKR yang telah dianalisa adalah pada kematangan tahap 2 dan sejumlah 25 inisiatif dan pengukur prestasi telah dicadangkan untuk menambahbaik kematangan pengurusan projek JKR daripada kematangan tahap 2 kepada kematangan tahap 3.

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LIST OF ABBREVIATIONS

APM	-	Association of Project Management
BSC	-	Balanced Scorecard
CMM	-	Capability Maturity Model
ENAA	-	Engineering Advancement Association of Japan
EoT	-	Extension of Time
EQA	-	European Quality Award
HOPT	-	Head of Project Team
IEEE	-	Institute of Electrical & Electronics Engineers, Inc
IS	-	Information System
JKR	-	Jabatan Kerja Raya
KPI	-	Key Performance Indicator
KRI	-	Key Result Indicator
MBNQA	-	Malcolm Baldrige National Quality Award
OGC	-	Office of Government Commerce
PI	-	Performance Indicator
PMBok	-	Project Management Body of Knowledge
PMI	-	Project Management Institute
PROKOM	-	*Cawangan Pengurusan Projek Kompleks*
ProMMM	-	Project Management Maturity Model
SEI	-	Software Engineering Institute
SKALA	-	*Sistem Kawal dan Lapor*
SPICE	-	Structure Process Improvement for Construction Enterprise
SPK	-	*Sistem Pengurusan Kualiti*
WBS	-	Work Breakdown Structure

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1   Background of Study

A successful project management usually makes an organization pertinent. Some of the criteria for a project success are when it is delivered on time, within the budget and within the scope that are satisfactory to the client's requirement (Kerzner, 2006). Therefore, if a project did not require more time and more money than expected; then it can be considered as successful.

1.1.1   Project Management (PM) Maturity

Kerzner (2004) described project management maturity as the processes of development and systems that were repetitive and provided a high likelihood of project success. Meanwhile Crawford (2007) defined the five level of project management maturity as initial process, structured process and standards, organizational standards and institutionalized process, managed process and optimizing process. The importance of project management maturity is to assess

organizations' current capabilities and assist in improving the organization to achieve better performance.

1.1.2 Project Management Maturity Model

There are many project management maturity models available to assess the maturity of the organization and to ensure efficiency and uniformity in projects. Some of them are the Capability Maturity Model (CMM), which is developed by Software Engineering Institute (SEI), The Project Management Maturity Model developed by PM Solution, The Organizational Project Management Maturity developed by Project Management Institute (PMI) and The Prince2 Maturity Model developed by Office of Government Commerce (OGC).

1.1.3 Key Performance Indicator (KPI)

Key Performance Indicator (KPI) is a quantifiable measurement that replicates the critical success factors of an organization. KPIs enable an organization to measure progress against the plan to achieve its strategic goals. Examples of KPIs that have been used to measure organization's performance are costs, quality, quantity, cycle time, efficiency, productivity. Hence, the indicators have to be correctly defined, measured and cascaded from the top management throughout the organization.

According to (Kerzner, 2006), KPIs can be used to measure the quality of the process to achieve the end results. It is an internal measure that can be reviewed on a

periodic basis throughout the project life cycle. Some examples of measures in project life cycle are the use of the project management methodology, establishment of the control process, use of interim metrics, quality of resources assign versus planned and client involvement.

The JKR Business Sector is responsible to implement national development projects specifically in building roads and constructing buildings. The main activities under this sector are to plan, design, coordinate and monitor the implementation of projects for the various government's ministries and departments. This sector is divided into six branches which are The Building Works Branch that implements general building projects; The Road Branch which executes the road project, The Air Based And Maritime Branch which focuses on building of airports and jetty, The Health Works Branch which builds hospitals and clinics, The Security Works Branch which focuses on military and armed forces projects, The Education And Higher Learning Works Branch which is responsible for schools and universities projects.

1.2   Problem Statement

Jabatan Kerja Raya (JKR) has been established for more than 100 years. Since then there have been many improvement in terms of processes, the way the project managers manage projects to suit the challenging environment. In delivering projects for the government of Malaysia, JKR has developed the *Sistem Kawal dan Lapor* (SKALA), a project monitoring system which was develop in 1985, JKR has also applied the quality management system MS ISO 9001 which is certified by SIRIM and it has also applied the standard price for small work developed by Contract and Quantity Surveying Division. In addition, JKR has too, applied many other systems, standard and guidelines.

JKR has been the implementer for building and constructing the government's infrastructures for many many years. However, issues relating project implementation by JKR are still matters of concern. Recently, JKR has been criticised by clients' departments for "lack of quality" (Judin, 2009) in delivering projects. Terengganu Stadium roof collapse and burst pipe at Kompleks Pejabat Kerajaan Persekutuan, Putrajaya, and Mahkamah Persekutuan were the incidents which have affect the credibility of JKR as technical advisor and executor of government projects. In January 2010, the Public Accounts Chairman said that weak management skills of JKR had been identified as the main reason for the collapse of the Terengganu Stadium roof and several other public structures in the states (Zulkifli, 2010). He also mentioned that the capabilities needed to be improved and this was agreed by JKR.

The issues and problems of projects delivered by JKR as reported in the media raised a few questions, such as: How important it is for JKR project managers to understand the nine knowledge areas of project management in managing projects? Do JKR project managers apply the nine knowledge areas when managing projects? What is JKR current project management maturity level? What are the initiatives and key performance indicators for the nine project management knowledge areas to improve the maturity level of JKR?

Thus, there is a need to change the project implementation system to improve the delivery of projects. In order to improve or increase the capability of the organization in terms of project management, this study will assess the current maturity level within the organization, plan and focus on areas for improvement and hence, increase the level of maturity in JKR specifically in project management.

1.3   Objective of the Study

The objectives of the study are:

i.   To determine the adoption of the nine knowledge areas of project management in JKR.

ii.   To assess the perceived current maturity level of project management in JKR.

iii.   To identify initiatives of the nine knowledge areas of project management to improve the maturity level of JKR.

iv.   To establish the key performance indicators of the nine knowledge areas of project management to improve the maturity level of JKR.

1.4   Scope of Study

The scope of this study is on the adoption of the best project management that is based on the project management nine knowledge areas of Project Management Body of Knowledge (PMBoK), the current maturity of project management practices as perceived by the project managers in JKR and the key performance indicators of the knowledge areas of project management for the required level of maturity. This study focus on the feedback from the project managers and the project team members of various branches under Business Sector in JKR. The initiatives to improve the maturity level of JKR are based on the literature and relevant documents available in JKR.

1.5   Organization of Chapters

There are five chapters in this report. This chapter presents the introduction of the study. The second chapter presents the literature review on the areas of

project management maturity, the models used in assessing the project management maturity level, the performance measurement and the key performance indicators. This chapter also includes the past research conducted in the area of project management maturity and performance measurement in project management.

The third chapter outlines the methodology used in the study. The methodology is based on past research which has been discussed in the literature review. It also explains the pilot testing, the instruments used and the procedures involved in gathering and analyzing the data.

Chapter Four presents the analysis of data, the findings and discussion of the study. The response rate and demographic analysis were conducted. A reliability test using the Cronbach's Alpha value was performed to determine the internal consistency of the questions. Statistical analysis was conducted for each objective and research question. Discussions of the findings are also reported in this chapter.

Chapter five discusses the main findings reported in the Chapter four. Results for each objective, issue highlighted and suggestions from each finding will be reviewed. This chapter also provides the limitations and the contributions of the study. Finally, this chapter constructs a few suggestions for future study.

1.6 Summary

This chapter has discussed the problem statement, the objectives of the study, the scope and the explanation about the project management maturity level, the model of management maturity and the key performance indicator. The next chapter will discuss the concept of project management, project management body of knowledge, project management maturity, assessing project management maturity,

project management maturity model, performance measurement, project management performance and key performance indicator. Past researches that are relevant to this area are also discussed in the chapter.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

This chapter provides a review of literature in the area of project management, the concept project management maturity and performance measurement in project management maturity. Specifically, this chapter will review the project management maturity models that are used in assessing the maturity of organization. Past researches on these areas are also included in this chapter.

2.2   Project Management

A project is defined as an activity that has a specific objective, has a deadline, utilizes resources and cuts across several functional lines and has funding limits (Kerzner, 2005). A project can be divided into physical and non physical. Examples of physical projects are developing a new product and constructing a building or infrastructure, while non physical projects are implementing a new business process,

effecting a change in the structure, staffing, and acquiring a new modified information system.

Project Management Institute (PMI) (2008), said that a project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirement. Project management includes planning, scheduling and controlling a series of integrated task to achieve project's objectives and fulfills the concern of the clients (Kerzner, 2005). Therefore, a project management is an application of knowledge, skills, tools and techniques in planning, scheduling and controlling of project activities to meet the project's objectives.

According to PMI (2008) managing project requires identifying requirements; addressing the needs, concerns, and expectations of the stakeholders as well as matching the competing project constraints such as scope, quality, schedule, budget resources and risk. Kerzner (2005) further explained that there are two main activities in project management which are project planning and project monitoring. Project planning involves definition of work requirements, explanation of quantity and quality of work; and definition of resources required while project monitoring involves tracking progress, comparing actual result to predicted result, analyzing impact and making modifications.

Many organizations that apply project management when delivering projects will gain benefits such as lower cost and shortened development time (Kerzner, 2005). Lawlor (2010) listed out three steps in ensuring a successful project management. First, the project manager has to get management and stakeholder commitment and keep them informed about the project developments, achievements and risks. Second, the project manager has to define the scope, the goals and the objectives of the project. Besides that, the manager has to identify the activities and processes involved in a documented project management plan. The third step for the manager to do is to manage project resources, time, encourage teamwork, manage

communications with the stakeholders and put in effective control process to make sure the project deliverables meet the required standard.

2.3   Project Management Body of Knowledge

Project management body of knowledge is a series of process and knowledge areas generally accepted as best practice in project management (Huhghey, PMI). It is distinguished as an international standard by IEEE 1490-2003 and it can be applied in various industries such as in construction, software, engineering, automotive, etc. According to PMI, project management body of knowledge is generally accepted as good practice. It implies that the knowledge and practice described in the project management body of knowledge are applicable to most projects and gain consensus about their usefulness. Good practice implies that there is an agreement that the application of skills, tools and technique can enhance the project success. Therefore, the organization or the project team has to determine the good practice which is appropriate for a given project.

There are several of project management bodies of knowledge. Project Management Institute (PMI) has developed A Guide to the Project Management Body of Knowledge (PMBoK® Guide) which consists of the nine knowledge areas. They are the project integration management, project scope management, project time management, project cost management, project quality management, project human resources management, project communications management, project risk management, project procurement management.

Meanwhile the United Kingdom Association of Project Management (APM) Bodies of Knowledge are – general, strategic, control, technical, commercial, organizational, people. European countries such as Austria, France, and Germany have developed their own body of knowledge. Japan through Japan's Engineering Advancement Association (ENAA) develops its own project management body of