A STUDY ON RISK MANAGEMENT KEY PERFORMANCE INDICATORS FOR DEVELOPING COMPREHENSIVE MALAYSIAN STANDARD RISK MANAGEMENT PERFORMANCE LEVEL IN CONSTRUCTION INDUSTRY

AHMAD FAISAL BIN ZULKIFLI

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ABSTRACT

In managing project, manager will face risk in various situations, if risk is left unattended, a devastating impact may get on the project. In severe cases, risk not only retarded the project growth but also destroyed the project. In order to comprehend the impact of risk, project manager are using the risk management, not just that risk management also have become one of the big part in project management around the world. The importance of risk management has cause the risk management to have its own measure to establish the effectiveness performance of risk management. This research are conducted to study about risk management performance indicator and it also will give a good picture on how the key performance indicator for risk management are constructed base on the specific objective of the related department or organization. This proposed risk management indicator is suitable to be used in construction field because the research been conducted by using G7 contractor as respondent. The indicators are formulated base on the objective of implementing risk management that been extracted from previous research. After have obtained a complete list of objective it been distributed to the respondent in form of questionnaire. The feedback from the respondent will determine which the objectives are preferable to be used as indicator. The result is set of key performance indicator that can be used to evaluate risk management performance in construction industry. The indicators are formulated base on the chosen objective of implementing risk management after getting a complete list of the selected objective from the distributed questionnaire. Therefore, having this indicator can make the evaluation process of risk management performance easier and the benchmark in standardize order.

ABSTRAK

Dalam menguruskan projek, pengurus akan berdepan dengan risiko dalam pelbagai situasi, jika risiko dibiarkan tanpa pemantauan projek mungkin akan terkena impak yang sangat teruk. Ada sesentengah kes yang teruk, risiko bukan hanya merencat perjalanan projek malah turut memusnahkan projek tersebut. Bagi menangani kesan risiko ke atas projek pngurus telah mengunakan pengurusan risiko, bukan itu sahaja pengurusan risiko telah menjadi sebahagian besar dalam pengurusan projek di seluruh dunia. Kepentingan pngurusan risiko dalam menguruskan projek telah menuntut pengurusan risiko untuk mempunyai cara pengukurannya sendiri demi mengukur keberkesanan dan prestasi pengurusan risiko tersebut. Kajian ini dijalankan untuk mengkaji petunjuk prestasi pengurusan risiko dan ia juga akan memberi gambaran yang lebih jelas tentang bagaimana penunjuk prestasi untuk pengurusan risiko yang diformulasikan berdasarkan objektif tertentu organisasi yang berkaitan. Penunjuk pengurusan risiko yang dicadangkan ini sesuai digunakan dalam bidang pembinaan kerana kajian yang telah dijalankan dengan menggunakan kontraktor G7 sebagai responden. Petunjuk digubal berdasarkan objektif pelaksanaan pengurusan risiko yang dipetik daripada kajian sebelum ini. Selepas memperolehi senarai lengkap objektif, ia telah diedarkan kepada responden dalam bentuk soal selidik. Maklum balas daripada responden akan menentukan objektif yang lebih sesuai untuk digunakan sebagai penunjuk. Hasilnya adalah set petunjuk prestasi yang boleh digunakan untuk menilai prestasi pengurusan risiko dalam industri pembinaan. Petunjuk digubal berdasarkan objektif yang dipilih dalam melaksanakan pengurusan risiko setelah mendapat senarai lengkap objektif yang dipilih daripada soal selidik yang diedarkan. Oleh itu, dengan adanya penunjuk ini boleh membuatkan proses penilaian prestasi pengurusan risiko lebih mudah dan mengunakan penanda aras yang lebih seragam.

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CI	Construction Industry
KPI	Key Performance Indicator
RM	Ringgit Malaysia
RMKPI	Risk Management Key Performance Index
PKK	Pusat Khidmat Kontraktor

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The title for this research is Establishing Risk Management Key Performance Indicators for Developing Comprehensive Malaysian Standard Risk Management Performance Level in Construction Industry. This research is stressed on finding a suitableset of indicators for a Malaysian standard risk performance level. In this chapter there will review of background study, problem statement, research objectives, research questions, significance of study and also an expected result. The background study will contain the general description about the study for easier understanding. The background study also give point on how the research started to take place and what problem that lead to the start of this research. The research objective were identified and to get the correct answer the right research question been formulated base on the research objective. In the significance of study the importance of doing this research will be discussed.

1.2 BACKGROUND OF STUDY

Risk is a potential that any action or activity that may have an impact on the achievement of objectives.Risk need to be handled carefully to ensure its not going to inhibit the growth of the project. In a severe case risk not just retards the growth of the project it also leads to total failure. The consequences of mishandling the risk alert every party in construction industry to implement a proper risk management in their

organization. Risk is the possibility that events, their resulting impacts and dynamic interactions may turn out differently than anticipated (Miller andLessard, 2001).

The idea of risk management is to manage risks effectively (Lyons andSkitmore, 2004).It is widely recognized as one of the most critical procedures and capability areas in the field of project management (Artto et al., 2005). Risk management help in managing projects by identified early the potential risk issue. Risk management usually more concern about the future issue where the uncertainties at its peak. Proper risk management allowsany ill effect that may happen in future to be alleviated or totally reduced.

Studies show that risk management does make a difference; the statement proved due to organizations that employ formal risk management practices do outperform those that do not employ such practices (Anbari, 2005). Because of this advantage, risk management has gained it place as one of the knowledge area in managing project.Similar with any other industries, risks also exist in the construction field (Zultakiyuddin and Hamimah, 2008). Moreover, construction projects are characterized as very complex projects, where uncertainty comes from various sources (Miller and Lessard, 2001). As risk management concern about the uncertainty in the future of the project this point gives enough reason for construction project to have a good risk management. In confirming that risk management implementation for the organization are going well, the performance of the system need to be compute.

Performance of the risk management need to be measured in quantified way for a follow up, this is needed because risk management need for a feedback to increase its efficiency. However making risk management efficiency at peak is not an easy task, it's a major challenge for project manager (Lee andAzlan, 2012). The studies to increase the effectiveness for risk management are increasing and have been a focus recently. The important of project risk management have been supported by Kululanga and Kuotcha (2010) with statement saying that poor implementation of project risk management lead

to project failure, this happen via budget and time overrun and also from quality scope. That is why the measuring of risk management performance is necessary.

The performance of risk management can be easily assessed if there are standardized references.The problem is establishing a standardized reference of risk management performance is difficult, this is because each company has their own way in handling a risk and their own reference for measuring performance of their risk management. This is where a standardized version of risk management performance system come in handy, the system consists set of indicators that act as a guidance to monitor the performance of the risk management. These set of indicators will be used to measure risk management performance and effectiveness. It will reflect the organizational, growth, capacity and organized actions taken to reduce vulnerability and losses, to prepare for crisis and to recover efficiently from catastrophes. It offers a qualitative measure of management based on preset “goals” or “standards” that risk management efforts should aim to attain (Carreño et al., 2005).

1. 3 PROBLEM STATEMENT

It is essential to understand exactly what is meant by risk before it can be managed. Risk and uncertainty are inherent in all construction projects, regardless its size (Carr and Tah, 1999; AbdulRahman et al., 2007). Risk in construction has been the distinguished feature because of time and budget overrun in the field of construction project (Akintoyeand MacLeod, 1997). Therefore risk management has become the essential part in managing project. Though an organization have a risk management, the framework still need to be assessed in order for it to stays effective to the organization.This show the necessary to have certain measure to evaluate the risk managementthat being implemented in the organization. How exactly we can measure risk management performance?

The importance of the Comprehensive Malaysian Standard Risk Management Performance Level in Construction Industry is inevitable in assessing risk management performance.Before establishing a standard risk management matrix to be used in construction industry, it also important to use a quality indicator for the standard risk performance level.Institute of Operational Risk (2010) believes that there is logic in thinking that changes in value of the indicators is reckoning with the change in risk management performance of a certain organization.Currently there is no specific indicators exist in the countries, widely accepted, to rate directly the performance of risk management (Carreño et al., 2004). Nevertheless the stereotype model must have very credible set of key matrix and assessment indicator.

Even at present there is no specific indicators yet, there some initiatives have been taken at the regional and national levels. In order to select a good indicator to measure the risk management performance, first thing need to come in mind is what the organization aim in implementing risk management? When the answer is decide, the potential indicators will start to show its shape. This research will grant set of key risk indicator that convenient for developing Comprehensive Malaysian Standard Risk Management Performance Level in construction industry field.

1.4 RESEARCH OBJECTIVES

In order to study key performance indicator for risk management this research have been guided by the following research objectives:

i. To identify risk management objectives which will be used as performance indicators for risk management assessment.
ii. To propose a set of key risk indicators to be used for risk management assessment process in construction industry.

1.5 RESEARCH QUESTIONS

Specific questionnaire are being develop in order to guide research for reliable result. The question is based on:

i) 1. What are risk management objectives can be found from the previous study?

ii) 2. How develop set of key risk indicators in construction industry?

1.6 SCOPE AND LIMITATIONS OF STUDY

The scope of this research will focus on contractor company in Lembah Kelang specifically in Shah Alam that registered under the Pusat Khidmat Kontraktor (PKK). The research will be conduct in Shah Alam because Shah Alamis one of the developed areas in Lembah Kelang. Therefore, a lot of well-established company are situated in this region.This study also focused on the contractors that have G7 contracting license. According to CIDB requirement for G7 license is to have a project that value from 10 million ringgit and above. Large project usually implement risk management more seriously because of the project values is bigger. That is why this researchtargetsthe respondent from G7 grade only.

One of the limitations of this study is time, cost and distant.This research should be for entire country (Malaysia), because of the said limitation the research only will be conduct in region (Shah Alam), to ensure the research is complete on time. The method of acquiring the data also a limitations, this is because questionnaire heavily depending on the respondent commitment. If the respondent is does not want to commit, they just tick down the answer without even reading the question, if they willing to commit, the actual answer will be obtained. That is why method of this researches also a limitation for this study.

1.7 SIGNIFICANT OF STUDY

This research will provide the answer for the construction industry on what the appropriate set of indicator can be used in analyzing a risk management performance. By finding the saidindicator, the finding can be used as a standard reference for any party of construction industry for more standardize risk management evaluation. This will lead to better understanding and a sync view on the performance of the risk management that been implemented.

1.8 Expected Result

This research will be expecting a practical and relevant key risk indicator that can be used in Malaysian construction industry. The set of indicator can be used by all part of Malaysian construction industry and this will provide the party involve with the same benchmarking in evaluating their performance of risk management.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Construction industry is one of the industries in Malaysia, it been mobile since the early time of Malaysia existence. Constructions industry is very important to this country development. One of the important of construction industry is providing jobs to the people thus reducing rate of unemployment in this country. That's why construction industry can be state as one of the industry that strongly pushes the country growth. Other than that, it also plays an important role in giving infrastructure required for socioeconomic development while being a major contributor to overall economic growth. As one of the developing country, construction industry also become one of the industry that been rapidly develop in recent years. As any other major sectors, the construction industry also exposed too many predictable and unpredictable risks (Norazian et al. 2008).

Risk is potential for any action taken or any activity executed will lead to undesirable outcome. The term of 'risk' originates from the early Italian word risicare, which means, "to dare" (Bernstein, 1996). According to Bernstein (1996) the line that separates modern and the historical time is the human mastery in managing risk. People start to manage risk because the impact of mishandling the risk that appears is too unpredictable. The risk may seem small but in longer time period the impact is devastating. There is no fixed definition of risk, every field of work has its own unique risk. Economists, social scientists, risk theorists, statisticians, and actuaries each have

their particular perception of risk. That is why risk management is crucial in every industry.

Risk management is identification, analysis, assessment, control, and avoidance, minimization, or removal of intolerable risks. An organization may use risk assumption, risk avoidance, risk retention, risk transfer, or any other strategy (or combination of strategies) in proper management of future events. In recent years, concentrated research and development has been done in the area of risk management. It is widely recognized as one of the most critical procedures and capability areas in the field of project management (Royer, 2000). Risk management work as a system, and in ensuring that our system is in good shape and delivering a quality service the system need to be assess and measured the performance, this is because of the changes is surrounding that render the system effectiveness to drop.

Risk Management Key Performance Indicator (RMKPI) is the indicator that was designed to assess performance of the risk management system (Cardona, 2005). It brings together a group of indicators that measure risk management performance and effectiveness. These indicators imitate the organizational, growth, capability and formal actions taken to reduce vulnerability and losses, to get ready for crisis and to recover proficiently from disasters. This index was designed to assess risk management performance. It provides a qualitative measure of management based on presets goals that risk management efforts should aim to achieve (Carreño et al. 2000). The aggregation of the indicators is the point where few set of indictors need to carefully selected in ensuring the indicators are qualify and covering every gap of the risk management performance.

Risk management performance indicator or also known as RMKPI been studied by a lot of past researcher and this have given the author for this research a general picture on the functionality of the RMKPI. The studies also show what the characteristic of the good risk management indicators is. Moreover, the information on the issues that leads to the formation of these risk management performance indicators also been discovered and the issues can be further highlighted. The issues also can be as a milestone to the future research. The procedure on how the RMKPI is been established also touched in the past research and give the author on how to develop the indicator.

2.2 RISK MANAGEMENT KEY PERFORMANCE INDICATOR FUNCTIONALITY

Developing RMKPI is very worth it to the organization, because RMKPI pack with few great function that give edges to the company that using it. Carreño et al., state that RMKPI give overview on the risk management performance (2000). RMKPI assess effectiveness of the risk management. The performance can be assumed high if the effectiveness of the risk management is high. This will be a great tool in increasing the performance of the risk management, this happen in a way like gap analysis. The concept of gap analysis is where the company at present? What the companies want to achieve? And how the company can achieve that? Using RMKPI we can answer the first two questions. What the performance of risk management? And what the level of the performance of risk management it wants to be? The indicator is the first step in correctly assessing the risk (Cardona, 2005). The advantage of the RMKPI also been mentioned in previous research.

As a first systematic and consistent international technique RMKPI allow the creation of risk management performance benchmarks (Carreño et al., 2000). In case of having the standard version of risk management performance benchmark will give construction industry practitioner a reference that can be used for their policy making. Using standard reference will bring every party in the industries to the same level of their understanding. This will make them more in sync thus increasing the performance of the risk management. The country that have made quite a progress in identifying risk now show greatest advance in risk reduction. Moreover, the largest improvement was made in term of indicator for disaster management (Cardona, 2005).

2.3 RISK MANAGEMENT KEY PERFORMANCE INDICATORS CHARATERISTICS

Risk Management Key Performance Indicator is type of Key Performance Indicators (KPI). KPI is totally different with key risk indicator. From previous finding,

key risk indicator measure how risky that certain activity, it different with KPIs, KPIs measure the performance of that certain activity. Moreover key risk indicator helps the company to predict the risk that may emerge in the future. On the other hand, KPI helps the company to measure how they perform in the past. A KPI is a metric and not a target. Often stated as a ratio or percentage it permits data to be pursued over time to form trends in performance. Targets are often expressed as objectives and may be included in the performance data to highlight under- or over-performance. KPI is very useful in measuring risk management performance.

Risk Management Key Performance Indicator has easy application to be used periodically, facilitating management risk aggregation and comparison between countries, cities or regions, or any other territorial level. Also, the methodology should be easy to apply in different time periods, in order to analyze its evolution. In risk management assessment, it is necessary involving data with incommensurable units or information that only can be valuated using linguistic estimates (Carreño et al, 2000). This system of indicators provides a holistic approach to evaluation that is also flexible and compatible with other evaluations methods. As a result it is like li to be increasingly used to measure risk and risk management conditions. The system main advantage lies in its ability to disaggregate results and identify factors that should take priority in risk management actions, while measuring the effectiveness of those actions. This method (RMKPI) is one of controlling risk rather that obtaining precise evaluation of it (Cardona, 2005).

2.4 RISK MANAGEMENT KEY PERFORMANCE INDICATOR ISSUES

At present, no specific indicators exist in the countries, widely accepted, to valuate directly the performance of risk management or other relevant issues that reflect what we want to measure as risk management. The Main trend in urban regeneration projects and large-scale development projects throughout the world has been the risk performance measurement system related to construction processes. Some initiatives have been taken at the regional and national levels (Mitchell, 2003).

People start to implement KPI in their measurement system because about 70 cent of balanced scorecard implementation fails (Neely, 2000). According to Neely, there two main reasons why measurement initiatives fail (2000). The first is that

measurement systems are often poorly designed. The second is that they are difficult to implement due perhaps to (politics, infrastructural issues, and loss of focus). KPI implementations can also suffer from the same issues. The KPI literature suggests that successful performance measurement depends on how well these KPIs are designed (Fiksel, 2002).

2.5 RISK MANAGEMENT KEY PERFORMANCE INDICATORS ESTABLISHED

Creating a measurement structure based on compound indicators is a major theoretical and practical challenge, which is made even more so when the aim is to create indicators that are clear, strong, illustrative, replicable, comparable, and easy to understand (Cardona, 2007). However there are a number of approaches to developing KPIs agencies are encouraged to identify approaches that are most relevant to their unique business outcomes and activities. This is necessary because different approach require different element and business process. One of the approach that been listed in this study is approach from Malaysia Productivity Corporation's KPI development guide book.

Malaysia Productivity Corporations' KPI development guide book give the reader a lot of information about KPI and the establishing process of KPI is no exception. For the first step is creating the project team. The team created must be a cross functional, which mean having different type of expertise in one group. It is necessary because to create KPIs that covering every desire goals and objective. In this case, the study want to establish set of KPI for risk management in order to doing so, cross functional team need to be assemble to ensure every risk aspect is taken into account. Two example of risk aspect is risk in business transaction and risk in workers safety. This is the first step in developing KPIs (KPI Development Guide, 2008)

The second step of developing KPI is mapping your core organisation process. Before you can drive the performance of your organisation you need to have the clear picture of the core processes. Draw a flow of diagram that shows the major step to

perform the task (KPI Development Guide, 2008). For the risk management, the general core process is risk identification, risk assessment, risk treatment and review control. This process may differ according to the organization itself. The agencies can implement effective KPI if the process is not fully understood. This step needs to be completed in order for the next step to take place.

The third step is established roles, responsibilities and critical success factors (CSF). Critical Success Factors is define as "The limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization (Rochart, 1979). For this step management need to clearly define each personal roles and which one is their responsibilities. After everyone have their parts and responsibilities, the director need to look at what is the CSF and what is it that employee needs to achieve successfully in that role to ensure that organisation is able to achieve its goals. For the risk management case, example of CSF is organizational structuring and design, communication, organizational culture and trust. These four important factors are from examination of risk mitigation problem by Grabowski and Roberts (1999).

The fourth step of KPI development is choosing the KPI basis. When reach at this step the team will probably have few CSF to be used as the basis. To make the evaluation is easier, the KPI must be short, concise and very meaning full. In order to do those, the team have to try assigning one or two KPI only for one CSF. However there are some vital factors that need to take into account before choosing the condescend KPI. Two example given here are, the person in that role need to have full control over achieving that KPI and the team need to have hard objective data(KPI Development Guide, 2008). This is the overall event that takes place in the step four.

The fifth step of the developing KPI is to set the KPIs. In this step the team need to choose the most critical KPI for the CSF of the company thus directly measure the performance. Example of KPI that can be set for risk management is number of failed project dues to risk issues not identified. Risk issues that emerge in the future and the risk management team can't identify it until the last minute is one of sign that show the risk management performance that very unsatisfactory. That is the fifth step of the KPI development from Malaysia Productivity Corporation's KPI development guide book.

The sixth step in developing KPI is set the target and review date. Setting the target is put a degree of the performance base on the KPI. That mean for the KPI example stated before, number of failed project dues to risk issues not identified, how many failed project dues to risk issues not identified need to be reduced to make the risk management performance in the acceptable condition. For example, the team set the threshold for the KPI is 10 to show that their risk management at poor level and less than 3 to show that their risk management performance at high level. Other than that, the team also set the review date, setting a review date also as important as setting threshold. Review date is like the measurement of the KPI will be taken. For example, some KPI will be review at the end of every month, and there are also the KPI that need to be assessed at the end of every year.

The seventh step is to facilitate the uses of KPIs to assist performance improvement. To maximize the efficiency in using KPI in the organisation, the employee need to be supplied with knowledge and training for better understanding on how the system using KPI works. Employees should be more motivated using KPI approach because they were given the roles and responsibilities as stated in previously on step 3. Moreover managers can encourage their subordinates to identify their own measures and find their own creative solution (KPI Development Guide, 2008). These approaches will bring more confident and brilliant employees to the company. After every step has been taken in developing and implementing KPI, they need to report the progress that been made for a better view on the performance.

Last but not least, is try to report every progress that been made. Every KPI have its own requirement of progress reporting. Some need to be report quarterly, annually and many other time intervals. The progress report also needs to deliver to certain stakeholder, knowing who will get what data and the frequency that those data are available, will help you determine how often to report to different audiences. The key audience that needs timely and prompt reporting is the one whose performance is being assessed. If their performance is not at the level expected or desired, prompt feedback is crucial to enable them to take appropriate corrective action. At the end of this step, the managers have done every part of developing KPI according to Malaysia Productivity Corporation's KPI development guide book.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this chapter, the author will explain the instruments and methods to be used to investigate the research about Establishing Key Risk Indicators for Developing a Comprehensive Malaysian Standard Risk Management Performance Level in Construction Industry.

3.2 RESEARCH DESIGN

In general method in conducting a research is divided into two; quantitative method and qualitative method. Quantitative method usually measure by a number and frequency of the involved variables. On the other hand qualitative method is been measure by mean or experiences. In short quantitative is involved number and can be calculated but qualitative can't be calculated. Qualitative method gives out easy information and statistical analysis that reliable for the research. Quantitative methods are associated with the scientific and experimental approach and are criticized for not providing an in depth description.

For the purpose of this study, the data gathered and will be examined by using quantitative method. Quantitative research is a survey design that places seriously stress on using formal uniformed question and preset response options in questionnaires or surveys administered to large number of respondents (Cavana et al., 2001). The research methodology selected for this searching for compatible risk indicator comprised a comprehensive literature review, a postal questionnaire to the construction industry practitioners and a statistical analysis of the survey data.

3.3 POPULATION AND SAMPLING

A population consists of all the subjects you want to study. Any inferences from a sample refer only to the defined population from which the sample has been properly selected. This is called the target population. Statistically, a population is an entire group about which some information is required to be ascertained. The population must be fully defined so that those to be included and excluded are clearly spelt out (inclusion and exclusion criteria).

In descriptive studies, it is customary to define a study population and then make observations on a sample taken from it. Study populations may be defined by geographic location, age, sex, with additional definitions of attributes and variables such as occupation, religion and ethnic group. For this paper, it will be conducted at random construction industry throughout Malaysia. The main objective on this study is to esttablished a standardized key risk indicator to be used in comprehensive Malaysian Standard Risk Management Perfomance level in construction industry. The people who involved in the construction industry in Malaysia will be considers as the population for this research.

When the population has been set up, then it needs to be sampling because population is too big for the research. Population sample means a group of people or events drawn from a population. A research study is carried out on a sample from a population. The goal is to be able to find out true facts about the sample that will also be true of the population. In order for the sample to truly reflect the population, you need