



Faculty of Engineering

SOURCES OF RISK AND RELATED EFFECTS IN THE MALAYSIAN CONSTRUCTION INDUSTRY

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To my beloved friends and family

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ABSTRACT

The construction industry nowadays has higher complexities with increased scope of work, number of players involved and is technically more advanced. However, the industry does not give adequate attention to proper risk management. Key risks need to be identified and assessed and methods on risk mitigation need to be mapped out to cater for these risks. Even the smallest mistake or unforeseen risk can lead to major lost and even bankruptcy to construction firms. Therefore, the aim of this paper is to provide a compilation of risk and effects of risk data for the Malaysian construction industry. The overall discussion will focus on the sources of risk related to each specific group; the direct effects of these risks, and also the correlation between the sources and effects. The data is collected by conducting structured questionnaire surveys and distributing it out to government agencies, quantity surveyors, consultants and contractors involved in the construction industry. An in depth study is also done on different methods of risk identification available in project management. Results of risk identification from other countries have been studied and compared to make this paper more comprehensive. It is hoped that through this research, a proper knowledge or risk retention centre can ultimately be created using the data compiled here and also from future research. Data can also be extracted from this centre to aid accurate qualitative and quantitative risk analysis. This is crucial for future risk assessments and management for the construction industry.

ABSTRAK

Industri pembinaan pada masa kini sering kali dikaitkan dengan kerumitan yang disebabkan oleh penambahan skop kerja, penglibatan individu dari pelbagai profesion dan secara teknikalnya lebih maju. Walaubagaimanapun, industri tidak memberikan perhatian yang mencukupi untuk pengurusan risiko yang lebih sistematik. Risiko yang utama perlu dikenal pasti, dinilai dan kaedah pengurangan risiko yang sistematik perlu diilhamkan untuk mengekang risiko ini. Satu kesilapan kecil atau risiko yang tidak dijangka bukan sahaja boleh menyebabkan kerugian besar malah menyebabkan satu satu firma pembinaan diisytiharkan bankrup. Kajian ini bertujuan untuk menghasilkan satu kompilasi risiko dan kesan daripada risiko untuk industri pembinaan di Malaysia. Perbincangan kajian ini bertumpu kepada punca utama risiko yang dikaitkan dengan kumpulan yang spesifik, kesan daripada risiko tersebut dan korelasi antara punca dan kesan. Data diperolehi melalui kaedah survei yang diedarkan kepada badan kerajaan, konsultan dan kontraktor yang terlibat dalam industri ini. Satu kajian terperinci juga dilakukan untuk mengenal pasti kaedah mengenal pasti risiko yang terdapat di dalam pengurusan projek. Keputusan kenal pasti risiko dari negara lain juga dikaji untuk mengutuskan lagi kajian ini. Dari kajian ini, ianya diharap bahawa pengetahuan atau pusat penempatan risiko dapat diwujudkan daripada data yang dianalisis sekarang dan untuk kajian di masa akan datang. Data dari pusat ini dapat diekstrak untuk membantu aspek analisis risiko dari segi kualitatif dan kuantitatif. Ini adalah sangat penting untuk pengurusan risiko yang baik dalam industri pembinaan negara.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Risk has always been a big factor in determining the success or failure of a construction project. BS 6079 (British Standard Institution 1996) defines risk as ‘ It is the uncertainty inherent in plans and possibility of something happening that can affect the prospects of achieving business or project goals’. Any definition of risk is likely to carry an element of subjectivity, depending upon the nature of the risk and to what it is applied. As such there is no all encompassing definition of risk. Chicken & Posner (1998) acknowledge this, and instead provide their interpretation of what a risk constituents:

$$\text{Risk} = \text{Hazard} \times \text{Exposure}$$

Smith (1999) defined risk as a decision expressed by a range or possible outcomes with attached probabilities. When there are a range of possible outcomes but no assumed probabilities, there is only uncertainty (ibid). A direct relationship between effective risk management and project success is acknowledged since risks are assessed by their

potential impact on the project objectives (Zou, 2007). When handled properly, it can spur on the company to make even more profit and achieve success. But if handled badly, one project alone could actually cost the whole company to go bust.

The construction sector is one of the important sectors that contribute to Malaysia's economic growth. The sector accounted for nearly 3.3% of GDP in the year 2005 and employed about 600,000 workers including 109,000 foreign workers. Numbers of projects awarded as of June 2008 are 5 768 with a total value of RM 58 955.65 million (MALBEX, 2009). The civil engineering sub-sector grew 6.3% (January – June 2007: 3.5%) due to higher activity in the oil and gas sector as well as the implementation of 9MP projects and growth corridors development (MALBEX, 2009).

Consequences of uncertainty and its exposure in a project, is risk. In a project context, it is the chance of something happening that will have an impact on the objectives. It includes the possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of the uncertainty associated with following a particular course of action. Risk thus has two elements: the likelihood or probability of something happening, and the consequences or impacts if it does. Managing risk is an integral part of good management, and fundamental to achieving good business and project outcomes and the effective procurement of goods and services. Risk management provides a structured way of assessing and dealing with future uncertainties.

1.2 Risk in the Construction Industry

The construction industry in Malaysia has changed significantly over the past decades. It is an industry that driven primarily by the government sector with a little collaboration with the private sector. Even so, times now are different as this industry is getting more complicated with much more parties involved. Because of this, it is very crucial to identify the significant risk in the industry so that a proper risk framework can be carried out.

There are many types of risks in construction industry as according to Arditi(1985) and Diakwa(1990); they are Project-related risks, Government-related risks, Client-related risks, Design-related risks, Contractor-related risks, Consultant-related risks and Market-related risks. From here, it can be seen that having a proper risk management scheme would help to combat all these probability of risks happening and also its effects. Zou et al,(2007) suggested another way to classify risk. They are Project cost overrun risks, Project time delay risks, Project quality risks, Project safety risks, Project environmental sustainability risks,

According to Fang (2004), project risks are divided into two groups, according to their source, into internal and external. Internal risks are those that are project related and usually fall under the control of the project management team. External risks are those risks that are beyond the control of the project management team. According to Sameh (2007), he categorise internal risks according to owners, designers, contractors,

sub-contractors and suppliers; whereas external risks are political, social & cultural, economy, natural and others.

1.3 Problem Statement

It can be seen from the literature review that many other countries including China, Middle East, Hong Kong, Singapore and Russia have all done roughly the same research on risk identification and its sources in their respective countries. Due to many variables like topography, culture, methods etc; each country will have its own particular source of risk and also its range from most important down.

In Malaysia, only Sambasivan and Yao have done a proper survey on the causes and effects of delays in the Malaysian construction industry. Delays are actually the effects of risk. So, it can be seen that there is not enough research done particularly in identifying the sources and effects of risk in Malaysia. According to Bowers (1994), numerous techniques are available for the quantitative analysis of project risk, but without competent data they are worthless. Because of this, risk identification cannot be taken lightly as without a proper research on this, a quantitative analysis of risk cannot be done accurately because the input data is not sufficient.

An example of improper risk identification in Malaysia is described as follows:

EPF had to discontinue its housing projects on 419 pieces of land it owns in 2001 due to financial difficulties, poor planning & ineffective supervision. This includes projects on 415 pieces of land in Kuala Kuantan in Pahang and 4 pieces of land in Petaling district in Kuala Lumpur. The Auditor report stated that EPF owned a total of 486 pieces of land worth RM854.48 million and to-date only 46 of them had been fully developed. Some of the projects had to stop because EPF did not receive planning approval from the local government to change the land use from housing to commercial use (Excerpt from The Star Newspaper, 23rd July 2003).

From the above newspaper report, you can see that EPF did not implement proper risk management and took for granted a lot of risks. Examples of risk factors of this project which they fail to look at are:

- a. Lack of financial resources of the contractor
- b. Financial stability of EPF.
- c. Cost overruns due to delay.
- d. Poor quality of performance
- e. Lack of qualified staff
- f. Inaccurate cost.
- g. Deficiencies in contract document.
- h. Inaccurate time estimate.
- i. Cancel or delay project.
- j. Delay in presenting/addressing problems

From this example of poor construction and risk management, it can be seen that it is crucial to implement a proper identification of sources of risk in Malaysia. Tan Sri Lee Lam Thye (Chairman of the National Institute of Occupational Safety & Health (NIOSH)) pointed out that contractors should carry out Hazard Identification, Risk Assessment and Risk Control at work sites for the safety of the workers as well as the people. "Safety cannot be taken for granted. These places are bound to be risky but we must control it," he added (The Star Newspaper, 1st February 2007). By his statement, it shows another concrete reason why risk management is important and the first step to it is proper risk identification especially in the area of the construction industry in Malaysia.

1.4 Research hypothesis:

A proper risk identification research for the Malaysian construction industry needs to be carried out in order to achieve a good compilation of sources and effects of risks. This is imperative so that a pool of data can be available for future risk analysis that can occur in the construction projects.

1.5 Aims and objectives

This study is to identify the sources of risk and also its effects in the Malaysian construction industry. In order to achieve the aim of the research, the following objectives have been suggested.

- To study and compare the different methods of risk identification available in project management.
- To be able to identify the sources of risk.
- To be able to identify the effects of risk from the sources found.
- To have a compilation of risk and effects of risk data for the Malaysian construction industry.

1.6 Scope and Limitation of Study

The scope of this study is limited to only the people involved in the Malaysian construction industry. The study is limited to the time frame of this study which is approximately about a year. Hopefully, the data is extensive enough to be used for further studies.

1.7 Organization of Thesis

This research covers six segments as follows;

Chapter 1: The first chapter gives a brief introduction to construction industry and what risk is all about. This chapter's purpose is to introduce the subject, background of studies and the statement problem. Besides that, it defines the aims and objectives, the methodology of conducting this study and the thesis chapter layout.

Chapter 2: The second chapter gives an in depth insight to all the past and current studies going on about risk and why it is crucial to have a proper risk management. This part highlights the related issues for the research from available literature, where it starts from a bigger picture and zoom in detail to provide a hypothesis that supports the title of the research.

Chapter 3: In this chapter, more will be talked about how the research is done and the method used to get the results for my analysis of the sources and effects of risk in the Malaysian construction industry. This stage is the data and information collection stage. This is an important stage towards achieving the objectives of this research. In this stage, the further action is to collect the relevant information based on the secondary data from the published resources and to carry on a further research based on previous thesis. Originally from Lexis-Nexis database which provides cases of Malayan Law Journal which is very much related to this research.

Chapter 4: This part will represent the data and analysis to achieve the objective which has been formulated and finally to confirm the hypothesis made was earlier. Here, data will be analyzed statistically to determine whether the stated objectives have been achieved or vice versa. Different types of analysis will be carried out according to the requirements of the objectives.

Chapter 5: This is the final stage and the conclusion of the research. It will be able to summaries the research finding and addresses some implication to the construction industry in which heavily depends on these results for quantitative analysis for the risk management profile. Besides that, it also provides a guideline and strongly recommends any further research to be carried away from where it concluded.