A STUDY OF RISK MANAGEMENT IN CONSTRUCTION PROCUREMENT
PROJECT

ROZMA BINTI MUHAMAD RIDZWAN

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ABSTRACT

Construction is well known as a high-risk project as it involves in lot of uncertainty at which it must be carefully managed. In risk management it is contractor’s job to take the risk or to avoid the risk in their construction project. Some of them also may take some action in order to reduce the risk in their construction project. In construction project we always heard about the project is over schedule, project over budget, low quality of project, problems with the tender, problem with the client, problem with the sub-contractor and etc. Hence, this research is to study the possible risk in construction project, to determine the level of awareness of the procurement risk among contractor in construction project and lastly to identify the tools and technique used in managing risk of construction procurement process. This method of research is both qualitative and quantitative based. A questionnaire survey and interview was conducted to collect data from contractor Grade 1. Questionnaire surveys were distributed to 118 respondents from construction firms in Pasir Puteh area and three Grade 1 contractors was interviewed. The data collected is calculated using the percentage analysis. The result shown that financial, management, time and technical are the risk that involved in construction and the level of awareness of risk among the contractors are high. The contractors also have their own tools and technique in managing risk in construction procurement. In conclusion, the risk in construction is not a small issues in construction and the contractor must take quick action in managing the risk in construction.
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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Construction is defined as the process of building and structures something (Dictionaries, 2014) for example building of new office block, houses, or roads and highways. Construction is also actions of something are put together from a separate resource or material to produce something. The installations such as air-conditioning, escalator, elevators, plumbing and electrical work also the activities that been include in construction process. In construction a project there also certain thing that needs to be carrying out before it such as the need of site preparation of clearing the site or facilities such as streets, utility connections, water supply, sewers and others. In order to start a specific project in the construction there are some step such as construing, interpreting or explaining all the work to the team members, fellow workers and also the stakeholder of the project so that all the people who involve in that construction project clearly understand what the project is all about and their roles and responsibilities in that project.

1.2 PROBLEM BACKGROUND

Construction is well known as a high-risk project as it involves in lot of uncertainty at which it must be carefully managed. According to Khumpaisal, S. (2007) performance of workers, delays in materials supply, the quality of material, project budget and cost control, or the complexity of project procurement process are the
examples of sources risks and uncertainty in construction project. In this risk management the contractor also has the choices either to take the risk or to avoid the risk in their construction project. Some of them also may take some action in order to reduce the risk in their construction project. In this construction project there are two things that need to focus on and to deal with. They are understand what type of task that been undertaking and also what are be working on. This is because in construction process it involves many parties such as clients, designer, contractors, project supervisor design process, project supervisor construction stage, as well the employees. Everyone must understand their own roles and appreciate their roles from the other parties. Then, risk especially in procurement starting from early design process until the end of the construction stage.

Risk is defined as known and unknown danger that might cause positively impact or negatively impact for a project (Dictionaries, 2014). Risks will lead to the failure for a project to complete on time and eventually lead to cash flow shortages and the project may be fail. Every project type risk and uncertainty is something that cannot be avoided and something that might occur but risk still can be managed (Khumpaisal, S. 2007). That is why the construction project must not be under estimate. This is because there are three things that are important in construction industry, time, quality and cost. This triple constrains shows that cost also plays an important part in the construction project at which it involves the procurement process. In construction risk is something that must be focus on especially during the starting point of each project as each stage have their own unexpected situation that might occur. This triple constrain are the key project factors that will influence the stakeholder of the best procurement method especially the views and opinions from clients, contractors and consultants (Smith, J. et al., 2004). Figure 1.1 shows the tripe constrain. Time, quality and cost must also be fit the design and construction of buildings that compromise in the circumstances at the time of conception. However, procurement method selection is strongly related with client project characteristics and the individual project requirements.
Besides, procurement is something that is most comment before the project start and also for the ongoing project in construction. Procurement in construction includes several processes. They are select and determine the project criteria, set the contractual framework, invite and select the tenders and lastly awarding the contract.

In (2007 Khumpaisal) studied the risks in the construction procurement process and the mitigation within the construction industry in which they identify all the risk that involve in construction and after that they construct a Contract Risk profile as a tool to the manager to determine the risk and for each contractor to considering the contract risk. Design and construction is thing that need to be procured separately and the relationship is between them, include the deposition of risk. These things are something that is crucial to be includes in the considerations in procurement. This is because rather than as a stand-alone process, procurement is the part of a broader asset in construction.

Risk in construction procurement is something that usually faced by the contractor in Malaysia. Moreover, there are lots of contractors are born in this construction industry every day. One of the biggest challenges for all contractor in the 21st century is in the managing the risk in their daily work practice. In today global
business environment, contractor of construction industry facing internal risk and also the external risk from community pressures, client pressure and also competitive pressures. But many contractor especially Grade 1 contractor are not using a good interaction with their own targeted suppliers in dealing with the contract and also the procurement process. Other than that, Grade1 contractor also often faced with the risk in procurement during the contracting. In managing the contract they had faced with lack of understanding on what the contact is all about especially the contract requirement; cost uncertainty, technical unknowns as well with the schedule uncertainty.

Besides, numerous problems are detected in the procurement processes that involve the risk for both contractor and also the client, Badarudin (2006). Late of delivery of good from supplier, the exchange of market price for goods and the quality of the product from the supplier as well the outsource will also affect the construction process. Other than that, it also pressure for the contractor if this kind of problem faced by them as it will affected from the beginning until the end of the project that is when the project is finish.

1.3 PROBLEM STATEMENT

There are many risks that being faced by the contractor especially in order to finish a certain project that being carried out by them. But many contractors not realize too much on the risk in especially in procurement. Procurement indeed the most important things that need to be prioritize in the project starting from the early stage of the construction process.

In construction project we always heard about the project is over schedule, project over budget, low quality of project, problems with the tender, problem with the client, problem with the sub-contractor and etc. Generally, there is no construction project without risk and it may affect the project negatively. Besides, the effects of the risk are usually very difficult to predict.

There are many project cannot completed in allocated time. In addition, there also project that been abandoned by the contractor and the complete project but not in the form of exceed the quality needed. This problem is due to the weak in management,
non-systematic risk management, non-systematic organizational management and also not has the right method to handle problem that arise. In order to complete in the right time, quality and cost, it is important to make a proper and good management of risk and cooperate among each other. Besides, analyze of risk is also very important and know a right method to handle the risk is a must. This is because there is no construction project that except from risk.

Increasing the awareness about the risk in procurement construction in Kelantan area and Malaysia is the trend that being said by the Malaysia government in order to protect the contractor right in this industry. Consequently, the contractor must take a quick action to prevent this kind of risk affect their working project. Risk in construction may come in many ways. Minimizing the risk can help the contractor in recovery the value of money and learn on how to fully understand the contract all about.

The above statement leads to the research questions to be figure out in this research project, namely: What is the possible risk in construction industry, awareness of the procurement risk among the contractor and the tools and technique used in managing risk of construction procurement process?

1.4 RESEARCH OBJECTIVES

Below are the research objectives of this study:

1. To study the possible risk in construction project.
2. To determine the level of awareness of the procurement risk among contractor in construction project.
3. To identify the tools and technique used in managing risk of construction procurement process.
1.5 RESEARCH QUESTIONS

The following research objectives were used for this study in order to accomplish all the objectives of this study:

1. What is the possible risk in construction industry?
2. What is the level of awareness of the procurement risk among contractor in construction project?
3. What is the tools and technique used in managing risk of construction procurement process?

1.6 RESEARCH HYPOTHESES

According to the objectives, there were a few hypotheses that can be found. Below are the lists of the research hypothesis of this study:

1. Risk in construction
   \( H_0 \): The contractor in construction industry in Kelantan knows the possible risk in construction procurement process.
   \( H_1 \): The contractor in construction industry in Kelantan does not know the possible risk in construction procurement process.

2. Awareness
   \( H_0 \): The contractor in construction industry in Kelantan aware about risk in construction procurement.
   \( H_1 \): The contractor in construction industry in Kelantan not aware about risk in construction procurement.

3. Tools and technique
   \( H_0 \): The contractor in Kelantan area is known the tools and technique used in managing risk of construction procurement process.
   \( H_1 \): The contractors in Kelantan area do not know the tools and technique used in managing risk of construction procurement process.
1.7 RESEARCH SCOPE

In Malaysia the construction industry can be divided into class A, B, C, D, E and Grade 1 contractor. To facilitate this research, the scope of this study is narrowed down of focusing only for Grade 1 contractor. Grade 1 contactor is a bumiputera contractor which is register with Malaysia Construction Industrial Development Board (CIDB). The targeted area of this research is concentrated only to the contractor Grade 1 of construction in Kelantan area. However, the risk in construction may involve in many kind of risk and sources of risk. So to narrow down the dispersed, this research is only specific focus on the risk in the construction procurement in project. In order to get more accurate data, this research make an action to choose the study developing area which has a lot of distribution of Grade 1 contractor in Kelantan construction area in district of Pasir Puteh. This research also will only touch the level of awareness of the Grade 1 contractor on the procurement risk in construction perspective. From this research it also will lead to the technique used by Grade 1 contractor in managing the possible risk of construction project.

1.8 SIGNIFICANCE OF STUDY

This kind of research will be conducted at construction Industry Company. This is because it is common for every project in construction especially the contractor and the suppliers involved or used in the purchasing in order for them to finish up their project whether it is a small or big project. Therefore, this research will provide a positive feedback for the contractor that involve in this research. Besides, the procurement process or the outsourcing process will be improved after conduct this research.

Based on this research, the contractor will know what is the exactly risk is all about especially risk in procurement construction process. The contractor also will know or faced this kind of risk or have the experience before about this risk especially for the Grade 1 contractor. It can also expose the contractor about the procurement and the way to choose the outsourcer and the supplier that can work together with them
during the project. This procurement also involves of contract that the contractor will be understand of or perhaps be the guideline for contractor in contract and procurement.

This study can be very useful to both contractor and their outsource in the way of awareness and the implementation of risk in procurement construction. This is due the fact that when contractors know and aware of risk of procurement in construction industry as well as implement it in their organizations they actually will avoid the possible risk and thus can earn more profit in their project. This thing will get a high profit margin as the contractor will not waste their money to re-correct what they have done especially when they get a reasonable outsource with a better quality and thus will also increase the customer satisfaction.

Besides, this research also can bring benefit not only for the Grade 1 contractor but also to the other class of contractor such as class A, B, C, D, and also E contractor as all class of contractor is possible to face the risk in procurement construction. It also can act as future reference for the contractor on the risk in procurement in their construction project.

1.9 OPERATIONAL DEFINITION

Construction.

Construction can be defined as a complex in industry, volatile one and responsive, for the temporary relationship it is so essence according to one-off projects (Smith, J. et al., 2004). According to Dickinson, O. (2009), constructions are complex contractual relationships which involve many stakeholders and can be tangible that are of finite-duration.

Project.

Project is defined unique that become evident when a discrete event is combined with several element such as environmental, temporal, and managerial variations (Puddicombe, 2012). A project has starting and also ending point that require resources.
**Procurement.**

Procurement is the purchasing of product which involve the value of money and is supported by the transparency, ethics, effectiveness and accountability in core principle governing public procurement (Raymond, 2008).

**Risk.**

Risk is the uncertainty that might face by certain project and can be controlled to some certain extent at which risk can be transferred or share with other project entities (Tsung, C.S and Min, L.Y. 2010).

1.10 **EXPECTED RESULTS**

There are several expected results that may come out after this chapter one is accomplish. After accomplishing this chapter the predicted result include reaching the objectives that been stated in the study. Besides, it also can give full and clear information about The Risk Management in Construction Procurement Process to both researchers and also to the organizations in construction project itself. Last but not least, this research also expected to be one of the reference to the other researcher that interested in the risk in construction procurement topic thus provide them a guideline for a better research in the future.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter it reviews the related article and research literature about risk in construction procurement in order to support this study. This chapter consists of two parts. First, it starts with the review of the risk in general that faced by Grade 1 contractor. Then, it followed by the risk in construction.

2.2 RISKS IN GENERAL

2.2.1 Risk Definition

Risk is defined as a condition involving exposure to danger for example the financial loss (oxforddictionaries, 2014). According to this definition, the risk will occur if there is the possible exposure inside the project including in the financial. As we all knows that in any project especially in the construction the financial is very important. Besides, the main use of the financial is to procure something as well as to outsource something
According to (Show, Q.W, Dulaimi, M.F and Aguria, M.Y. 2004) risk can be anything at which it multi-facet. Risk could be the likelihood of occurrence of an event or the combination of events at which it happened during the overall process in the context of construction project. Risk also may occur if in the decision making or planning situation, there are the lack of predictability about the structure outcome or the possible consequences that might happen. In that case, risk is actually needed to be managed. However, this management of risk is not only to secure the work but also in the context of making the profit in construction.

Most of the project will involve risk and any project which did not have risk is actually not worth pursuing (Chapman, C. and Ward, S. 2003). This is because for him any project at which involve risk will eventually give the good benefit in return. Risk also may become both treat and also opportunity in a project. Risk also can be easily managed more effectively if the organization has a better understanding of the concept of nature of risk. For some organization they believe that risk cannot escape from unforeseen disasters. However it can work with higher margins and less contingency.

According to Adnan (2008), risks have on the finance with the lowest cost. That is why risk management will involves in the appropriate handling process after evaluation and analysis in order to minimize the negative outcome of risk. The real risk in the construction project is from a lack of consideration. In other hand the risk come from the conflict by various numbers of situations. The contractor also not supposed to only focus on the success of the design and build project but also in the context of identify and analyze the risk that occur during the design and build the project. The difficulty in allocating the resources properly also always been faces in the risk management.

Risk in project is complex just like the project itself. It also having broad scope of possible effect on the project as it arise from a wide range of sources (Hilson, D. Grilmaldi, S. and Ffele, C. 2006). Risk also act as key factor for project success for every project. Work Breakdown Structure (WBS) and Risk Breakdown Structure are methods used for understanding and managing risk in a project.
Now from my point of view the definition of risk is very broad. It involve not only with lot of people as well with the finance but also the profitability, the scope and also the willingness to accept the risk or not. Risk also may be faced by everyone in that construction project not only by the contractor but also the stakeholder itself and something that cannot be easily avoided. In that case all the contractors as well the stakeholder must predict the possible risk in that project so that an action can be done to reduce the risk and if possible try something that can avoid the risk.

2.2.2 Risk Management

Since 17th century organizations have been practicing risk assessment and risk management. However in the risk management plan, most of the companies did not validate the risk (Kurniawan, D. 2007). In real world, project risk actually need to be managed according to the process of identify, analyze, treat and also monitor all the possible risk. These processes are the fundamental steps but there are so many different descriptions of this systematic process. By continuously go through the process throughout the life cycle of the project is actually is the key factor to a successful risk management plan.

According to Adnan, (2008), appropriate handling of risks after evaluation and analysis to minimize the negative impacts is also involved in risk management. Risk management is applied to obtain key indices for successful design and also to establish the necessary strategies. To ensure that risk not impede the success of the project, it is important for contractor to identify and analyze the risks that occur. In other word, we need to prioritize the risk process then the risks with greatest loss are handled first whereby the lower probability of occurrence loss is handled later. The risk management process can be very difficult as we need to balance both high and low risk in one time. Besides, it also very hard to allocate the risk properly.

Risk management gives a clear framework for identify, analyze, evaluate, treat, monitor and lastly communicate the risk (CIDB, 2004). It is also essential to understand the risk that to be managed. Risk management contributes a big insight of impact
especially in the process of defining the steps, the sequence and in decision making process. It thus a good management practice as it recognizes the most integral part. Risk management also must be part of the organizational family as it always comes without being asked for. However, it contributes more as it enables continual improvement in decision making for an organization.

According to Mills, (2001), risk management is not a new theory. At first risk is managed traditionally by judgment that been informed by someone experience. The new concept of systematic approach changes the risk to become clearer and make it easy to manage. This risk management is practically required experience and training in order to use the techniques. Godfey (1996) said that, systematic risk management help in identify, and rank risk in creation the risk obvious. We also need to focus at the major risks of the project in order to minimise the potential damage in that project. When the risk is well managed we also can control the uncertainty aspect of risk. Risk management also known as tools that be created to reduce the uncertainty occuring when conducting the risk (Skorupka, 2008).

### 2.2.3 Risk Management Process

Jaafari and Anderson, (1995) said that there are three stage in risk management. They are risk identification, risk analysis and lastly risk response. The first step in risk management process is the risk identification and it is also very essential step. Risk identification is also the most difficult step in risk management (Willians, 1995). In risk identification the project is analysed from an overall point of view that is using top-down approach technique.

In risk identification they also some technique that can be used. They are brainstorming, expert judgement, and analyse from previous case study as a reference. In this step they also need to select which risk that is very important and need to be proritize first. In the brainstorming process all the contractor, project team and also the stakeholder need to identify what is the possible risk that might happened when handling that project. When having this process all the ideas are accepted and all the
project team must contributed an idea in order to make the identification process work smoothly. Then, for the expert judgement the contractor must refer the project to someone who has lot of experience especially in construuction. This is because we can get more valuable knowledge once we refer to someone who is expert in this area. An expert also well known for project risk because they have lot of experience in handling various of risk in construction. They also can give a good suggestion if the contractor need some help in that project. The contractor also can make prevouis case study as a reference. This is because most of them also provided a lot of information about project risk in construction.

Other technique that can be used in risk identification is by using cause and effect diagram (Russell and Taylor, 2000). It is very easy to use as it only give the importance of causes of a problem. Thus, it show the problems in a very specific domain in risk identification.

Second step in risk management process is analyse the risk. In risk analysis there are that can be use. They are brainstorming, probability impact matrix, Work Breakdown Structure (WBS), morte carlo analysis, Delphi Technique, and also decision tree method. These technique are very useful as we can mesure the likelyhood or the probability of occurance in that project (Mills, 2001). Sometimesit is express in monetary terms or damage. In real life the risk may come indirect and uninsured. Figure 1.2 shows the process associated with establishing and implementing a risk management plan. That is why the risk need to be analyze first. Therefore, the first sight of the risk is actually more complex and more complicated.

The next step is evaluate the risk. The risk need to be evaluated either it is worth to accept it or not. Some risk are worth to accept because although it give a risk at the biggining but it outcome is very good. Besides, the risk also need to be evaluate because the risk is just like an iceberg. It seams small in front but it is actually is very harmful to the project that being handle by the contractor.

Then there is the risk response. The more deliberate the response must be when the greater uncertainty with the project is faced by the contractor especially in response for risk in construction procurement. There are three ways in response to the risk. They
are avoid, reduce, transfer or to absorb the risk. However, the best position in handling the risk is by allocate to accept it (Mills, 2001).

Figure 2.1: The process associated with establishing and implementing a risk management plan

Source: CIDB, 2004