AWARENESS OF RISK MANAGEMENT AMONG CONTRACTORS IN THE GOVERNMENT CONSTRUCTION PROJECT

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Thesis submitted in fulfillment of the requirements
for the award of the
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I dedicate this research to my parents, to my lectures and family for unending supports

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ABSTRAK

Malaysia adalah salah satu ekonomi paling pesat berkembang di dunia dan secara aktif bekerja untuk mencapai status berpendapatan tinggi. Industri pembinaan adalah salah satu industri terbesar di dunia. Sumbangan industri ini ke arah Keluaran Dalam Negara Kasar (KDNK) global berkisar pada satu per sepuluh dari jumlah keseluruhan. Oleh itu, risiko memainkan peranan penting dalam kejayaan projek pembinaan. Masalah kelewatan dalam industri pembinaan adalah fenomena global dan industri pembinaan di Malaysia tidak terkecuali. Selain itu, dokumen tender adalah salah satu peranan penting untuk menguruskan risiko dalam kemajuan projek pembinaan. Oleh itu, penyelidikan ini memberi tumpuan kepada kesedaran di kalangan kontraktor dari sudut dokumen tender. Matlamat kajian ini adalah untuk mengkaji pengurusan risiko dalam projek pembinaan, untuk menilai kesedaran pengurusan risiko di kalangan kontraktor dalam projek pembinaan kerajaan dan untuk menganalisis kesedaran pengurusan risiko di kalangan kontraktor dalam projek pembinaan kerajaan. Responden dari pelbagai syarikat kontraktor dan organisasi yang terlibat dalam projek kerajaan telah didekati untuk mendapatkan maklum balas mereka terhadap kesedaran tentang pengurusan risiko dalam projek pembinaan dengan mengedarkan soal selidik. Daripada tinjauan itu, hasilnya menunjukkan kesedaran di kalangan kontraktor yang sederhana dan kemajuan kerja merupakan isu yang paling penting dalam projek pembinaan. Di samping itu, pelbagai syarikat dan organisasi kontraktor perlu meningkatkan tahap kesedaran dalam pengurusan risiko dan menekankan isu ini untuk melonjakkan Malaysia sebagai negara maju. Cadangan yang disenarai memberikan peningkatan dalam kesedaran tentang pengurusan risiko dalam projek pembinaan kerajaan.

ABSTRACT

Construction industry is one of the biggest industry in the whole world. The contribution of this industry towards the global Gross Domestic Product (GDP) revolves around one-tenth of the total amount. Therefore, risk plays an important role in the success of construction project. The problem of delays in the construction industry is a global phenomenon and Malaysia is no exception. Other than that, the tender document is one of the important role to manage risk in construction project progress. This research, therefore, focused on the awareness among contractors in term of tender document. The goals of these research were to study the risk management in construction project, to evaluate awareness of risk management among contractors in the government construction project and to analyze awareness of risk management among contractors in the government construction project. The respondents from various contractor companies and organizations which involved in government project have been approached to get their respond toward the awareness of risk management in construction project by questionnaire distribution. From the survey, the result showed that the awareness among contractors were moderately aware and working progress was the most crucial issue in construction project. Therefore, various contractor companies and organizations need to improve the awareness level in risk management and emphasize this issue to elevate Malaysia into a developed country. The recommendation listed provide further enhancement in awareness of risk management in government construction project.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Construction industry is one of the biggest industries in the whole world. The contribution of this industry towards the global Gross Domestic Product (GDP) revolves around one-tenth of the total amount. Construction industry is also a potential employment generator and provides work to almost seven percent of the total employed person in the whole world. The extent of this industry has become so vast that the energy, in the form of electricity or fuel, consumed by it hovers around two-fifth of the total energy consumed all over the globe. The resources that are utilized in World Construction Industry is also staggeringly high and itself consumes fifty percent of the total world resources. Construction industry is the base of the world economy which is achieved through the construction of real estate properties (both residential and commercial), bridges, tunnels, roads, railway tracks and compartments, airports, etc.

Malaysia is actively working towards achieving a high-income status. This involves intensive transformation of the economic structure. The government has outlined an economic road map to transform the country in order to be recognised as a developed nation. Malaysia began develop its construction industry since independence. According to (Lewis, 1955), more than half of capital formation consists of work in construction. Hence, the expansion of capital is a function the rate at which the construction industry can be expanded. This can be seen in the initial economic plan (1956-1960) where it was basically a development expenditure plan. The primary concern was developing the infrastructure during independence because of its

inadequacy. In order for the nation's economy to prosper, the construction industry has to be developed first for the economy to take a one step further.

The importance of construction sector can be seen clearly and it has been developed since independence. The construction sector was the main contributor to the GDP at 9.9%, followed by manufacturing (7.3%), agriculture (7.1%), private consumption (6.5%), and petroleum and mining (2.1%). The GDP from construction in Malaysia increased to 14093 MYR Million in the first quarter of 2018 from 13352 MYR Million in the fourth quarter of 2017. GDP from construction in Malaysia averaged 10269.76 MYR Million from 2010 until 2018, reaching an all-time high of 14093 MYR Million in the first quarter of 2018 and a record low of 6464 MYR Million in the first quarter of 2010.

The concept of risk management is widely used in all industries, such as manufacturing, mining, agriculture, services and construction sector. Each sector have their own risk management standard, but all of the standards are remain the same regardless of the sector. According to the Project Management Institute (PMI) (2004), project risk management is one of the nine most critical parts of project commissioning. This show a significant connection between a project success and managing risk. Meanwhile risk management is considered as the most difficult area within construction management (Winch, 2002; Potts 2008) its application is promoted in all projects in order to avoid negative consequences (Potts, 2008).

The Association for Project Management (2000) stated that risk is unavoidable in construction projects and thus, risk management is a hastily developing management tool in construction project due to the realization of its importance as an integral part of project management. Risk management is one of the most vital procedures and capability way in coping with project risks and uncertainties. In order to rescue the poor reputation of construction industry in project performance, the right implementation of risk management is essential. With the implementation of risk management, the common problem in construction projects such as delay in project delivery, over budget, unsatisfactory product quality, unsafe working environment and etc. needs can be

eliminated. Therefore, it could be argued that risk management is important especially during the decision making process with regard to risks.

The success of a construction project is determined by completion time, budget, in accordance with the specification and stakeholders' satisfaction. Functionality, profitability to contractors, absence of claims and court proceeding and "fitness for purpose" for occupiers have also been used as measures of project success (Majid, 2006). However, (Chan and Chan, 2004) define project success thing as different to different people. Each client, consultant, contractor, designer as well as subcontractor has their own interpretation in determining the success of a project. Chan and Chan (2004) further conclude that the definition of project success is depending on project type, size and sophistication, project participants and experience of owners, etc. However, in construction projects, reseachers agree that interpretation on the project success is merely based on the so called golden triangle namely time, cost and quality (Abdullah et al., 2010; Endut et al., 2005; Le-hoai et al., 2008; Majid, 2006; Ogunlana and Promkuntong, 1996; Othman et al., 2006; Sambasivan and Soon, 2007). The problem in the construction highlighted in this paper is according to the above mentioned success factors.

According to (Ogunlana and Promkuntong, 1996), there is three main problems namely problems of shortages or inadequacies in industry infrastructure (mainly supply of resources), problems caused by clients and consultants and problems caused by contractor incompetence in the construction of high rise building in Bangkok, Thailand. A Study in Vietnam construction industry found that poor site management and supervision, poor project management assistance, financial difficulties of owner, financial difficulties of contractor; design changes are five most frequent, severe and important causes of delays (Le-hoai et al., 2008). Ten most problematic factors are found by (Sambasivan and Soon, 2007) while assessing the delay causes and the effects in the Malaysian construction industry. Those problems are contractor's improper planning, contractor's poor site management, inadequate contractor experience, inadequate client's finance and payments for completed work, problems with subcontractors, shortage in material, labor supply, equipment availability and failure, lack of communication between parties, and mistakes during the construction stage. Furthermore, Abdullah et

al., (2010) reveal that the significant delay causes in MARA (Majlis Amanah Rakyat) construction projects in Malaysia were cash flow and financial difficulties faced by contractors, contractors' poor site management and ineffective planning and scheduling by contractors. The above findings on the causes of delays are used as the basic factors in assessing the problems in public construction projects in Malaysia.This document is a template created to ease the thesis writing process. The file is in *.dotx* extension, a dedicated file extension for creating a template in *Microsoft Word*. Before this template can be applied to your document, it is important that you should enable several *Microsoft Word* features first.

1.2 Problem Statement

The lack awareness of risk management in construction project among contractors, consultants, and clients leads to the failure of project in Malaysia. Many of them are keep repeating a same mistake in construction industries. The federal government department in Malaysia under Ministry of Works Malaysia (MOW) which is Malaysian Public Works Department (JKR) have setting up the policies and procedures in tender awarding and construction process in Malaysia. The problem of incompetence contractor are should not be happen because all the policies and procedures in tender awarding are already provided. Contractors in Malaysia are not clearly know the content of policies in construction which has been set by government. Some of the contractors ignores the policies to reduce the cost and shorten the duration of construction project.

1.3 Objective of Study

The main objective of this study was to assess the awareness of risk management among contractors in the government construction project. The specific objectives of this study are listed as follows:

i. To study the of risk management in construction project.
ii. To evaluate awareness of risk management among contractors in the government construction project.
iii. To analyze awareness of risk management among contractors in the government construction project.

1.4 Scope of Study

In order to achieve the objective of study, the scope of study were listed down as below:

1) This study will be conducted in Malaysia construction project
2) The questionnaire are focussing on government construction project
3) Evaluate the improvement can be made to increase awareness in risk management among contractors.

1.5 Significant of Study

This study is important because the lack of awareness in risk management can lead to the fall construction industries in Malaysia. This study is to ensure the safety of building in the future towards achieving high-income country.

With this study, various parties can see the awareness of risk management in the government construction project and also consider the best solution for improving the awareness and ethic in construction project in Malaysia.

1.6 Structure of Thesis

This thesis consist of five chapters. Chapter one comprises the introduction section. It states the study background, problem statement, objectives of study, scope of study and lastly significant of study. For chapter two, describe the key term in purpose of these study and comprises the literature review that related and suitable for these study. Chapter three explains the research methodology that used for planning research type data collected and the method of data analysis to be employed. For chapter four present the result that obtained from the survey and discussed the result from analysis. Finally, chapter five comprises the conclusion from the overall chapter and relates some recommendation for future work on research field.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Although risk is widely studied, no uniform definition for risk exists. In another words, definition for risk is still flawed. Generally, risk is the event which traditionally is likely to occur, and could negatively affect the project outcome in term of time, cost, quality and other relevant performance criteria (Olsson, 2008).

According to Carbone and Tippett (2004), it is critical to have a helpful technique to plan for and cope with construction risks and uncertainties. Such technique which is risk management should be easily understood, utilised and applied by the project team. In fact, risk management is predicting the unpredictable. It is a vital management tool which helps to control construction project risks (Mills, 2001). Similarly, The Association for Project Management (2000) defines risk management as the process which enables the analysis and assessment of project risks. It is the process created to mitigate and control the risks which are the barriers to the successful completion of project performance. Risk management is the process of identifying, evaluating and managing risks. Tang et al (2007) stated that risk management is an essential element of the decision making process in construction projects. Construction management researchers noted that risk management is an integral part of organisational process and not just as a set of tools and techniques IRM, AIRMIC and ALARM, (2002);

Hamimah Adnan et al. 2008; Kululanga and Kuotcha, 2010). It is the process where the project team explicitly address the risks and uncertainties. Then, they systematically evaluate and analysis the risk based on the best information. Risk management is important to create value to the project team by unblock the successful project activities and portfolio. It will increase the likelihood of beneficial project performance in term of budget, schedule, and quality if risk management is appropriately commenced.

Risk management is a constant and developing management tool which must be carried out all the way through the organization's approach and execution of that approach (Raz and Michael, 2001). Risk management is not a one day off activity.

However, there is lack of sufficient data that can be referred when managing the project risk. This is due to the uniqueness of construction project, where there are no two identical projects. Therefore, risk management in construction industry is different from other industry where there are references to take up as an actuarial approach. Risk management in construction industry need an intuitive approach due to its variables such as technical, engineering, innovative, procurement and strategic content (The Association of Project Management, 2000).

IRM, AIRMIC and ALARM (2002) stated that there are many methods when managing the risk and it is impossible to set and fix it up. Thus, there is no any certain box ticking strategy or demonstrable process exists in risk management standard. Usually, the organisations themselves will create their own methodology, approach, and standard in managing the risk.

2.2 Risk Management

2.2.1 Risk Management in Construction Industries

IRM, AIRMIC and ALARM (2002) mentioned that when dealing with the risks, it is better to address systematically all the risks regarding the past, present, in specific and future activities in the construction organisation. This is because the approach of risk management of is traditionally applied instinctively, based on judgement and previous experience of the practitioners. Such approach will cause the project risks remain embedded and flawed.

In fact, the ad-hoc project team of construction industry is contributed by different professionals with different task and role to perform. But yet they are tightly interrelated. Thus, each professional not only suffer the risk from their own execution but also influenced by the risk faced by other professionals (Tserng et al, 2009). Therefore, the commitment, participation, and communication of project team to the overall risk management process are very important to come out with the successful and well-done end product (Chapman, 1999).

2.2.2 Risk Management in Malaysia Construction Industries

According to Hamimah Adnan et al (2008b), as Malaysian construction industry has a bad reputation in managing the risk, risk management must be implemented to avoid project failure and project underperformance. As mentioned by Hamimah Adnan, Kamaruzaman Jusoff and Mohd Khairi Salim (2008), risk management includes proper

risk mitigation after identified, evaluated and analyzed the risk events. Risk mitigation plan must capable to minimise the negative impacts with reasonable costs. More often than not, risk management is essential for Malaysian contractors to ensure the project success.

In Malaysia, contractors apply simple, quick, reasonable and inexpensive methods during risk identification such as checklist methods and brainstorming sessions. Risk identification mode was different for different projects. Basically, it depends on the characteristic of construction projects and it must commence in the initial stage. Risk analysis requires personnel experience, training, risk management software and specialist advice to come out with appropriate response. For contractors in Malaysia, risk response is concentrated on risk events with high probability of occurrence and high impact. However, not all the companies carry out the adequate process of reporting, reviewing, and monitoring the continuing risk management activity (Norazian Mohd Yusuwan et al, 2008).

Norazian Mohd Yusuwan et al (2008) further stated that in the Malaysian construction industry, risk management is quite a new management concept. Zultakiyuddin Ahmad Rashid, Hamimah Adnan and Kamaruzaman Jusoff, (2008) emphasized that risk management is essential and necessary to achieve the project performance; however, Malaysian construction industry players do not reveal such urgency. In fact, construction industry players should be proactive in implementing risk management.

Moreover, Roshana Takim and Akintoye (2005) stated that risk management is still rhetorical in Malaysian construction industry due to insufficient knowledge. Besides, contractors are reluctant to implement risk management in order to minimize the

operational cost of projects. Their awareness on benefits and importance of risk management is relatively low. Nevertheless, it is proven by Norazian Mohd Yusuwan et al (2008) that risk management is implemented by companies in the operation of construction activities, although the number of identifiable and effective risk management framework practitioner in Malaysia is only a small scale. However, formal risk management is implemented by companies with high reputation, stable financial status and involved in massive construction projects only. According to Zultakiyuddin Ahmad Rashid et al. (2008), risk management practice in Malaysian construction companies is different. It depended on the policies of company, resources allocated, nature of projects and so on. In fact, certain standardization on risk management should be executed to ensure that the least mandatory approach of risk management is applied.

2.3 Contract and Procurement

Policies	Procedures	Practices
Public accountability	All procurements of work, supplies or services of more than RM200,000 per year shall be tendered.	The client will appoint consultants comprising consultant's architects, civil engineering consultants and structures, engineering consultants mechanical and electrical, as well as material measurement consultants, to advise them on the implementation of construction projects.

Transparently managed	Distribute at least 50% of work worth over RM200,000 to RM350,000 to be matched among Bumiputera contractors	The tender evaluation process includes all documentation work such as the preparation of tender documents conducted by the appointed quantity surveying consultant.
Fair and equitable	Evaluations need to be implemented on the lowest tender to the tenders thet are within reasonable prices. Tenders whose prices are considered to be too high compared to the Department's Budget may be exempt from evaluation.	
Open competition	The contract shall be signed as soon as possible after all terms and conditions agreed by both parties and not later than four months from the date of issue of the letter of acceptance.	
Best value for money	The Letter of Acceptance shall be issued to the successful contractor as soon as possible after the	Only competence and free tenders of any legal and contractual defects that way affect their eligibility

	decision of the Procurement Board is obtained and within the validity period of the tender.	according to current practices, are eligible to be considered

Table 2.1 Policies, Procedures, and Practices in Contract and Procurement

CHAPTER 3

METHODOLOGY

3.1 Introduction

The methodology flow process is important to ensure all the objectives are obtained. Furthermore, methodology flow process is used to conduct the research. This chapter is going to review the whole method used in this research in order to obtain data and also to achieve research objectives.

The methodology is important in collecting data which is necessary in statistical analysis for this research. The finding in the literature review in previous chapter may not conclude the data needed in statistical analysis. To identify the awareness among contractors in government construction project, primary data collection had been carried out.

3.2 Methodology

In order to gain all the data in this research a few methods had been applied. The first method is by finding as much as possible literature reviews which overview the Risk Management in Construction Project. The second method is by gathering lots of information from journals, books, and internet. The third method are by giving out the questionnaire to various organizations around Peninsular Malaysia and conducting

interview with some expertise in construction. Furthermore, the last method is data analysis where all the data which had been collected at previous method will be analyze. Figure 3.1 show the methodology and method used in this research.

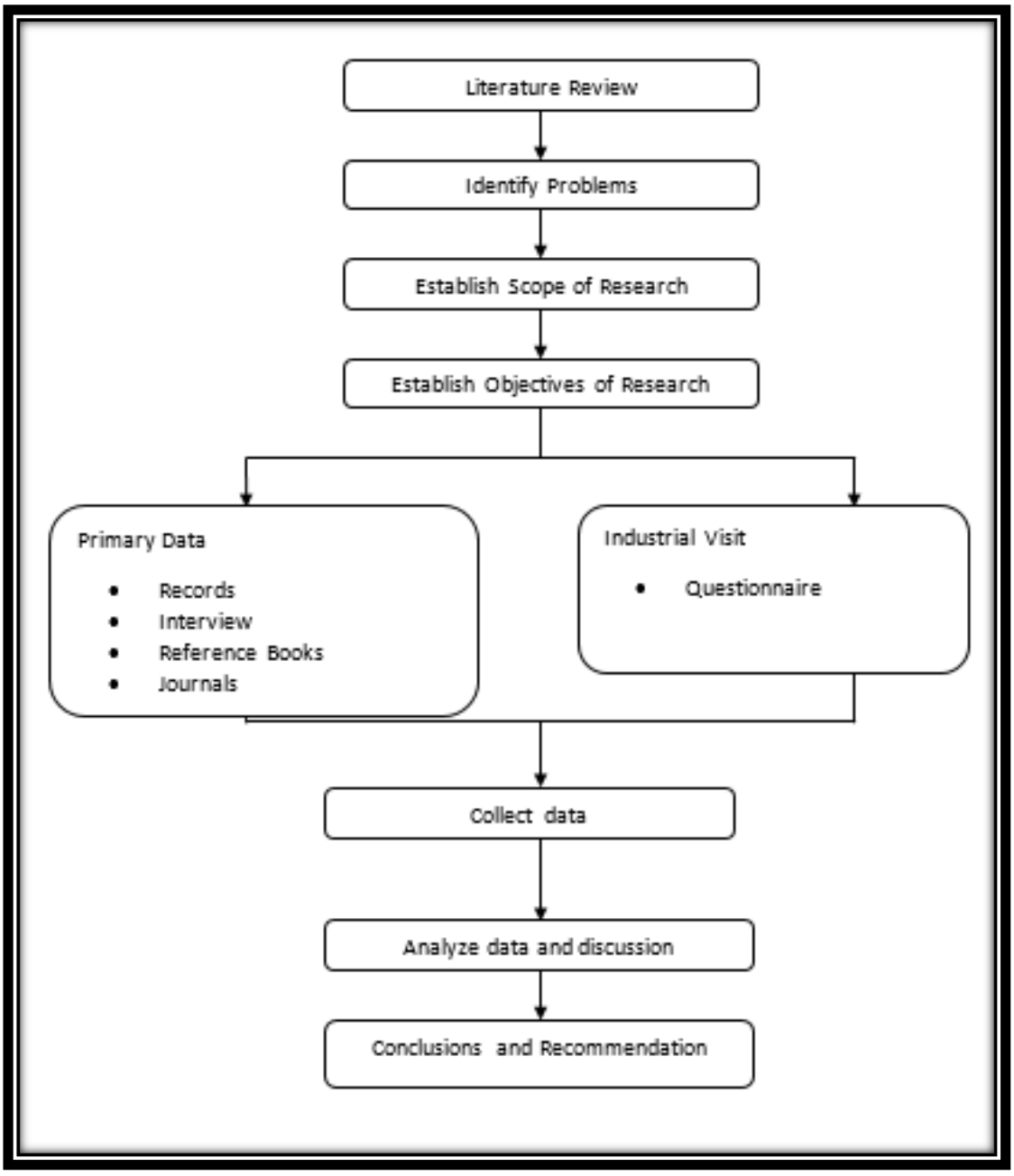

Figure 3.1 Research Methodology

3.3 Data collection

Data collection is a level where all the information regarding of the research was gathered. The data gathered from the basic information until the complex information in order to achieve the objectives of this research. The data collection in this research is divided into two parts. The parts involved in this data collection are:

i. Primary data collection.

ii. Industrial visit.

At this level, mostly the data gathered are from questionnaire and a little from conducting interview from relevant individual.

3.3.1 Primary Data Collection

Primary data collections in this research were collected through extensive of literature review. All the primary data in this research were collected through books, journal, articles, internet, conference papers and etc. Most of the data collected are related to the Risk Management in Construction Project.

3.3.2 Industrial Visit

In this industrial visit level, a few visits had been made to a few relevant organizations and companies in order to distribute questionnaire and conducting interview. The purpose of this industrial visit is to collect enough data through questionnaire distribution and interviews.

3.3.2.1 Questionnaire

A questionnaire consist of a few sections of question had been distributed to different types of organizations and companies in the relevant fields. The questionnaire was structure in four different sections.

i. Section A : Personal Particular

This section purpose is to gained personal particular information. This section focused on the personal background which included the respondent name, designation, and organization/companies profile.

ii. Section B : Individual Awareness

The main purpose of this section is to gain respond from respondent on the awareness among them about tender document. Respondents are requested to indicate on a scale from 1 to 5 whether they aware with tender document in solving problem by using Likert Scale. Each scale from point 1 to 5 represents the following rating in Table 3.1.

iii. Section C : Issues and Disputes

In this section, respondent will be asked the issues and disputes that frequently happen in the meeting. From all of the issue, five most crucial issues will be selected and analysed.

Table 3.1 Ordinal Scale Level of Agreement

1	Not at all
2	A little
3	Moderately
4	A lot
5	Extremely

3.4 Data Analysis

All the data collected from the questionnaire was then analyze. The data were analyzed using few methods. The methods used are Frequency Analysis and Average Index. At the preliminary analysis Frequency Analysis was used. From the analysis, the result of frequency and percentage can be calculated.

3.4.1 Average Index (AI)

The data was then analyzed using Average Index (AI). Al-Hammad and Sadi Assaf (1996) stated that the formula for Average Index is as shown in Equation 3.1 :

$$\text{Average Index (AI)} = \frac{\sum \alpha_i x_i}{\sum x_i} \quad 3.1$$

Where:

α_i = index of a class; constant describing the weight given to **i**

x_i = variable describing the frequency of the response for i = 1,2,3,4,5

Based on the assumed values stated earlier:

x_1 = Frequency of the 'strongly disagree' response and corresponding to: $a_1 = 1$

x_2 = Frequency of the 'disagree' response and corresponding to: $a_2 = 2$

x_3 = Frequency of the 'neutral' response and corresponding to: $a_3 = 3$

x_4 = Frequency of the 'agree' response and corresponding to: $a_4 = 4$

x_5 = Frequency of the 'strongly agree' response and corresponding to: $a_5 = 5$

From the frequency analysis, the average index was the calculated. For this research the average index has been rated into five levels of achievement which were:

Table 3.2 Level of Achievement

Not at all	$1.0 \leq$ Average Index < 1.5
A little	$1.5 \leq$ Average Index < 2.5
Moderately	$2.5 \leq$ Average Index < 3.5
A lot	$3.5 \leq$ Average Index < 4.5
Extremely	$4.5 \leq$ Average Index ≤ 5.0

CHAPTER 4

RESULTS AND ANALYSIS

4.1 Introduction

All the data in this research was collected through questionnaire. This questionnaire purpose was focused on the level of knowledge, experience, issues and challenges in application of Sustainable Urban Development in Malaysia.

All the data in this research was analyzed and the result was presented by using pie chart, graph, column and bar chart. The main purpose of analyzing the data collected was to get result which can achieve the objectives of the research.

This chapter however is divided into four sections. The questionnaires consist of four sections which are:

1. Section A : Personal Particular
2. Section B : Individual Awareness
3. Section C : Issues and Disputes

4.2 Questionnaire Collection

A set of 50 questionnaires have been distributed to various types of company and organization in construction field. However, only 30 set of questionnaires were managed to get response. This means that only 30 respondents made response to the questionnaire out of 50 sets of questionnaire. Moreover, the entire questionnaires were filled accordingly.

Table 4.1 Number of Questionnaire Sent and Returned

METHOD OF SENDING	NUMBER OF QUESTIONNAIRE		RETURNED RATE (%)
	SENT	RETURN	
BY HAND	45	26	58
EMAIL & WEBSITE	5	4	80
TOTAL	50	30	60

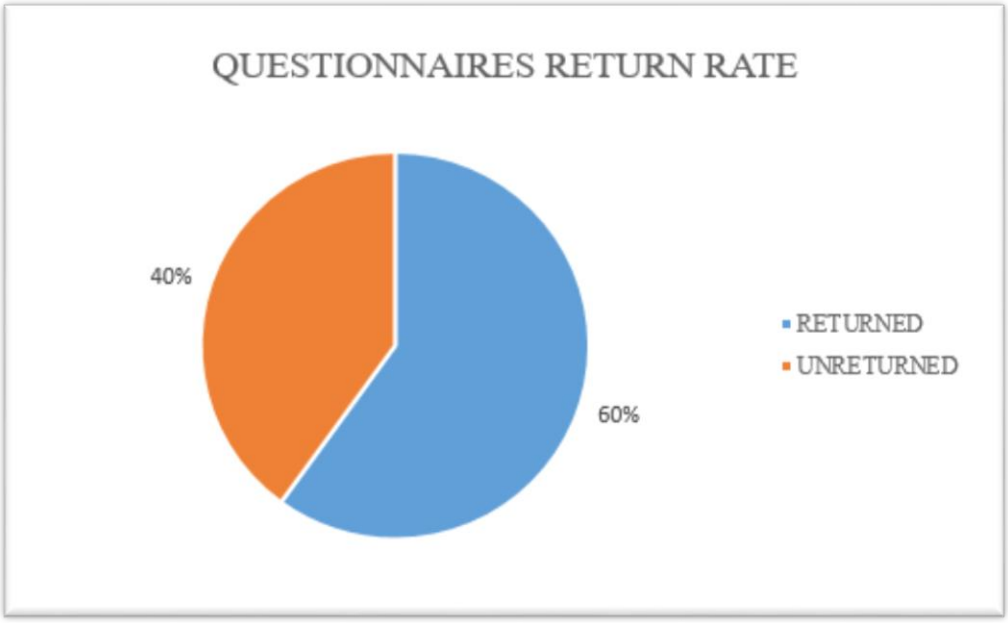

Figure 4.1 Questionnaire returned rates

4.3 Personal Particular

In Section A of the questionnaire, the respondents were asked to fill in their personal particular. The personal particulars of the respondents are shown in the next discussion.

4.3.1 Designation

Based on the questionnaire, the designation that involved were technician assistant, owner or investor, project manager, site supervisor, civil or structural engineer and quantity surveyor. Most of the respondents that answered the questionnaire were engineers. The least was project manager and quantity surveyor. They could be having certain level of professional knowledge, ability and maturity to give opinion in the questionnaires.

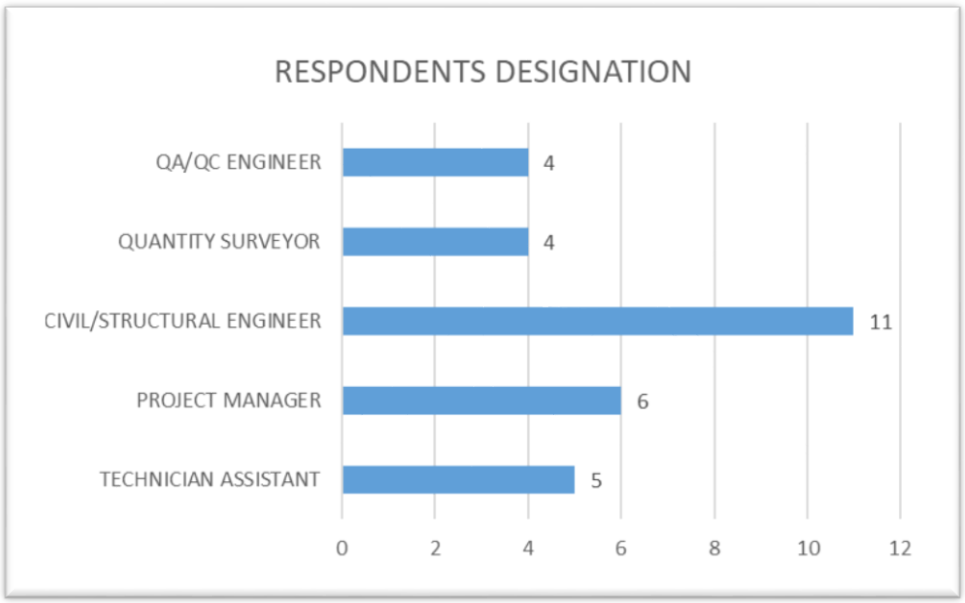

Figure 4.2 Respondents Designation

4.3.2 The Duration of the Company/Organization Served in Construction Field

The respondents have also been asked the duration of their company or organization served in construction field. Most of the respondent company or organization have served less than five years in construction field.

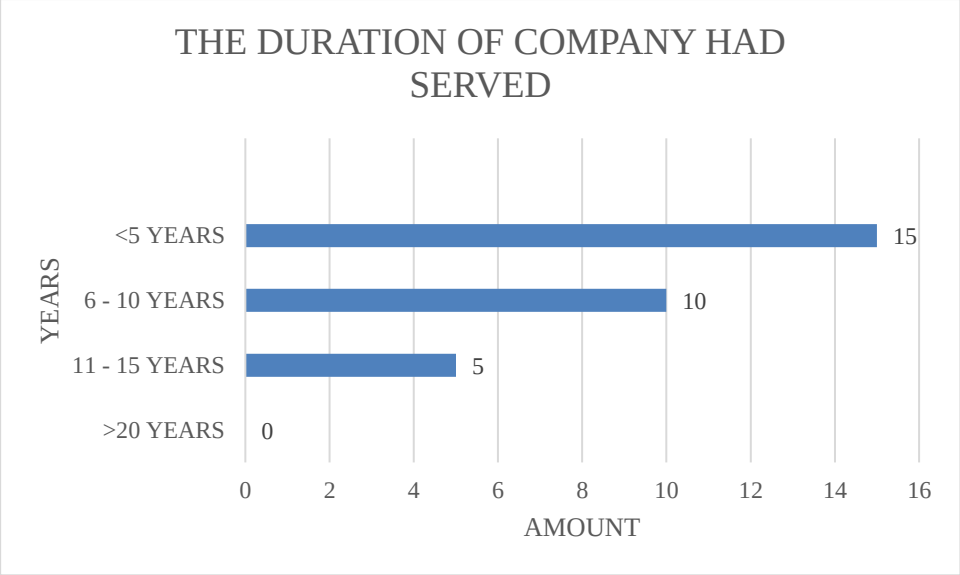

Figure 4.3 The Duration of Company had served

4.4 Individual Awareness on Risk Management in Government Construction Project

The results awareness on Risk Management among contractors were analyzed and discussed.

4.4.1 Level of Tender Document Understanding

Based on the Figure 4.4, most respondents are moderate understanding and a lot of tender documents have understanding of about 33% percentage. Meanwhile, there were no respondent with a little understanding.

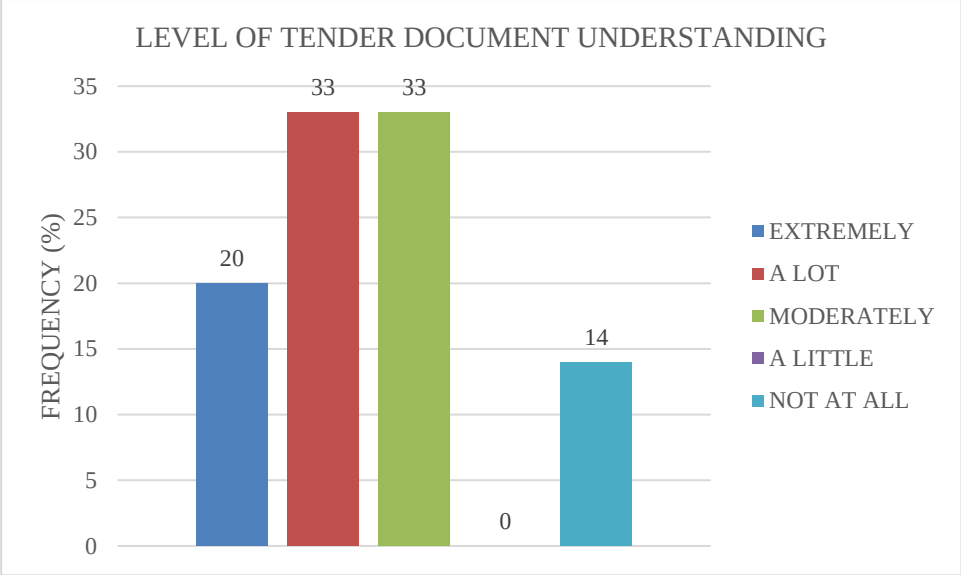

Figure 4.4 Percentage frequencies of Level of Tender Document Understanding

4.4.2 Frequency to Open the Tender Document

Based on the Figure 4.5, most respondents are a little aware on the Risk Management due to the frequency to open the tender document in government construction project. On the other hand, none of the respondents were extremely aware.

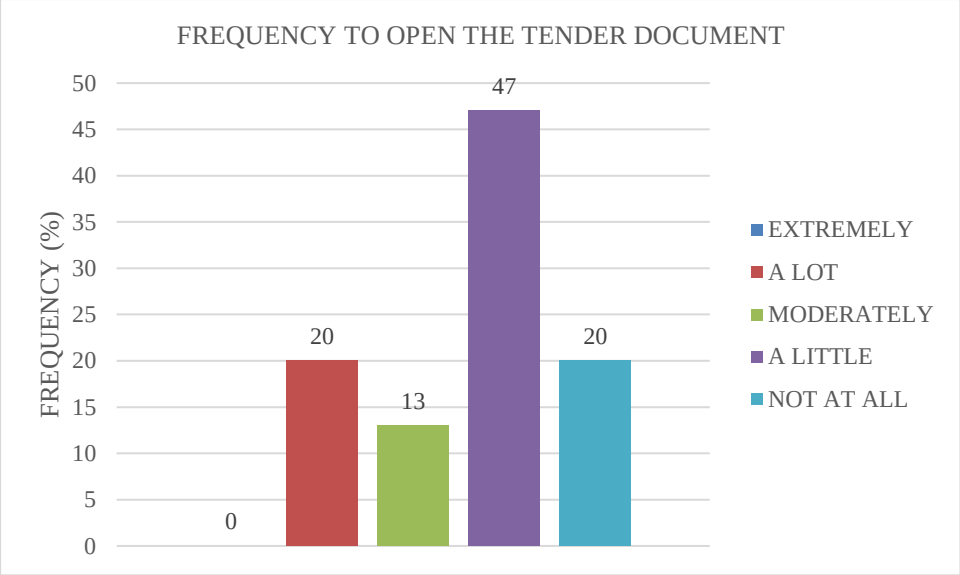

Figure 4.5 Frequency to Open the Tender Document

4.4.3 The Importance of Tender Document to Contractors

Based on the Figure 4.6, most respondents are a lot of aware on the importance of tender document to contractors with 43% percentage. However, none of the respondents were not at all aware.

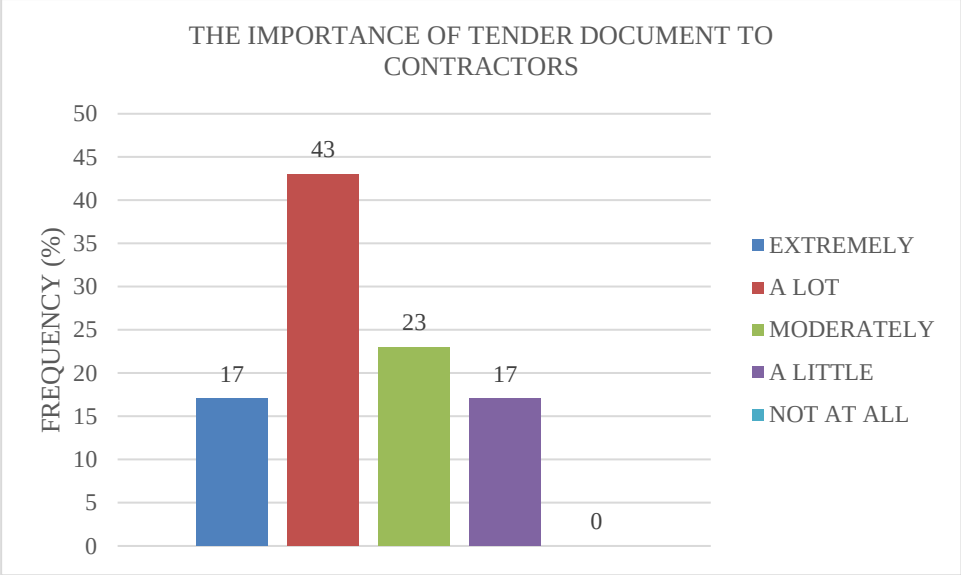

Figure 4.6 The Importance of Tender Document to Contractors

4.4.4 The Uses of Tender Document in Solving Problem

From Figure 4.7, 47% of the respondents, responded with a lot of aware for the uses of tender document in solving problem. Besides that, none of the respondents were a little and not at all aware on the uses of tender document.

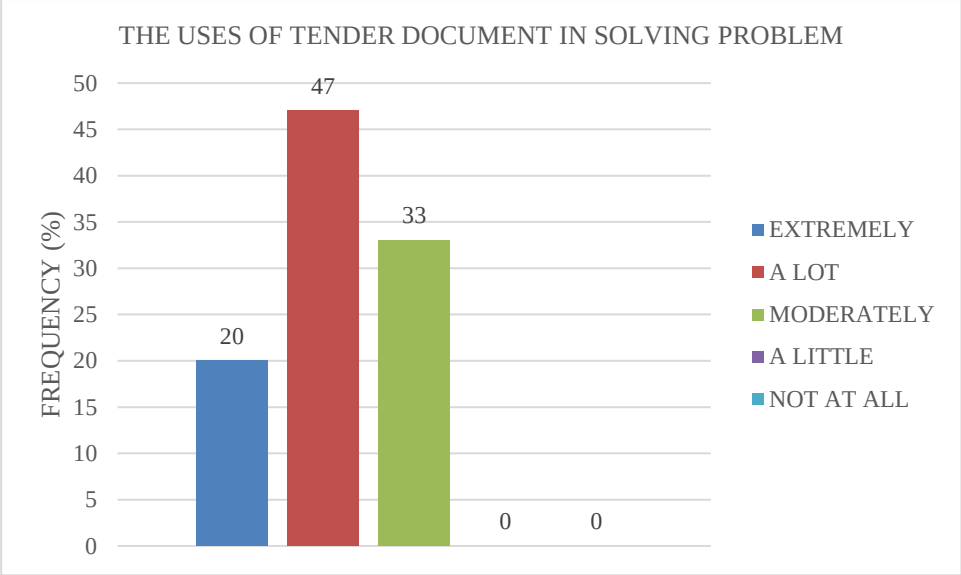

Figure 4.7 The Uses of Tender Document in Solving Problem

4.4.5 Tender Document as a Reference

Based on the Figure 4.8, 40% of respondents were extremely and moderately aware on the tender document as a reference when disputes happened. Again, none of the respondents were a little and not at all aware on the tender document as a reference.

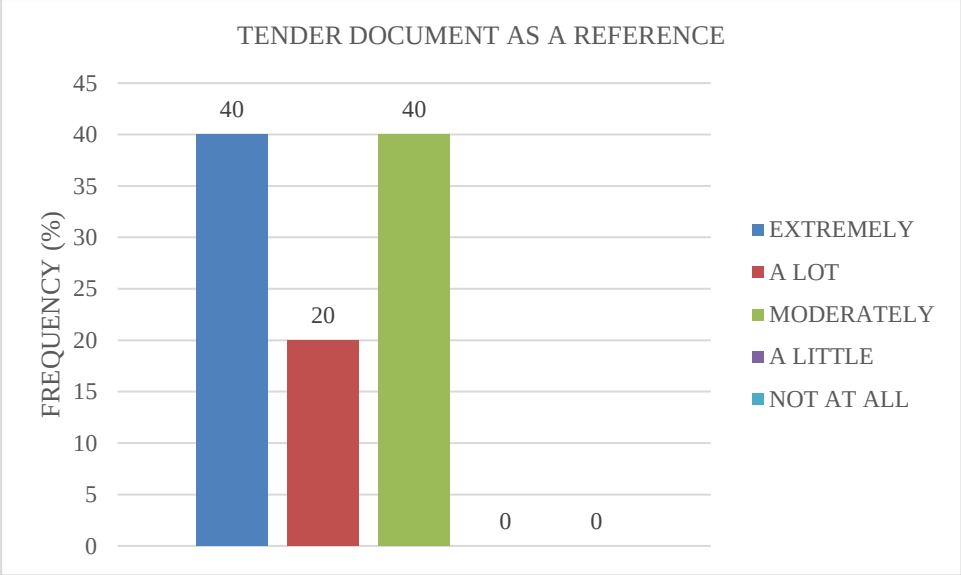

Figure 4.8 Tender Document as a Reference

4.4.6 Summary of Result for Individual Awareness

Data for the individual awareness have been analyzed by using AI method which have been explained in previous chapter (Chapter 3, Methodology). AI is then classified into five categories:

Table 4.2 Average Index Categories

Not at all	$1.0 \leq$ Average Index < 1.5
A little	$1.5 \leq$ Average Index < 2.5
Moderately	$2.5 \leq$ Average Index < 3.5
A lot	$3.5 \leq$ Average Index < 4.5
Extremely	$4.5 \leq$ Average Index ≤ 5.0

From the Figure 4.9 and Table 4.3, the result of the Average Index (AI) obtained was 3.45. This showed that the respondents were moderately aware on Risk Management in Government Construction Project that had been stated in the questionnaire.

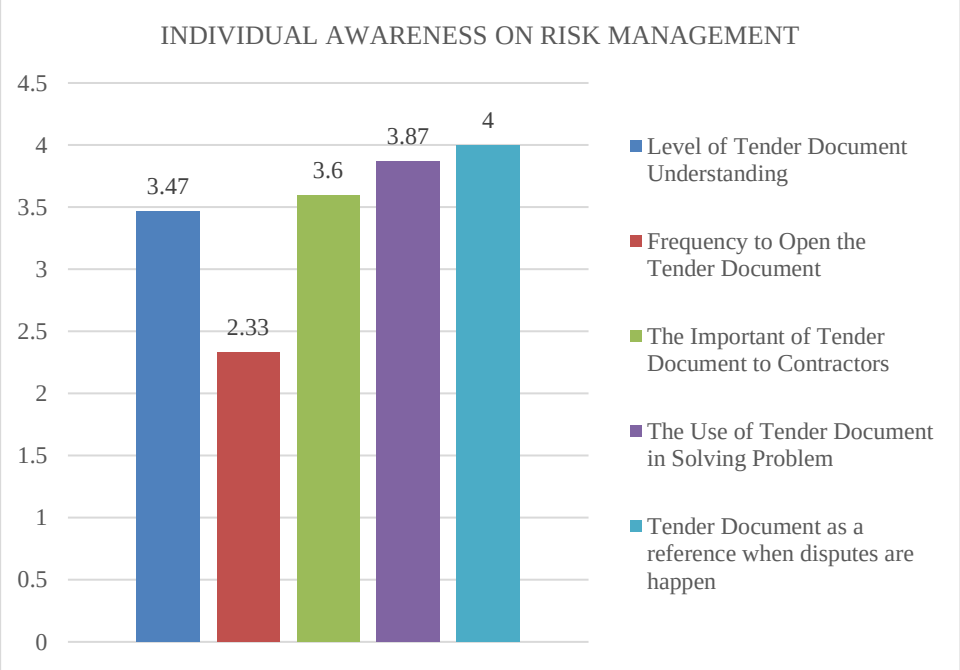

Figure 4.9 Individual Awareness on Risk Management

Table 4.3 Results of Average Index for Individual Awareness on Risk Management

Issues	*1		*2		*3		*4		*5		TOTAL		AVERAGE INDEX (AI)
Frequency	*f	%	*f	%	*f	%	*f	%	*f	%	*f	%	
Level of Tender Document Understanding	4	14	0	0	10	33	10	33	6	20	30	100	3.47
Frequency to Open the Tender Document	6	20	14	47	4	13	6	20	0	0	30	100	2.33
The Important of Tender Document to Contractors	0	0	5	17	7	23	13	43	5	17	30	100	3.6
The Use of Tender Document in Solving Problem	0	0	0	0	10	33	14	47	6	20	30	100	3.87
Tender Document as a reference when disputes are happen	0	0	0	0	12	40	6	20	12	40	30	100	4
Total													3.45

*f - Frequency of Respondent

*1 – Not a all

*2 – A little

*3 - Moderately

*4 – A lot

*5 – Extremely

4.5 Issues and Disputes

From all of the issues and disputes stated by respondents, the five most crucial issues have been selected as shown in Figure 4.10.

Based on the Figure 4.10, most of the respondents stated that work progress was the most issues and disputes raised in the meeting with 21 respondents. Following by material and specification issue with 17 respondents, safety and environmental issue with 15 respondents, change in design/drawing issue with 11 respondents and the least issue by contractors was machinery failure with 7 respondents.

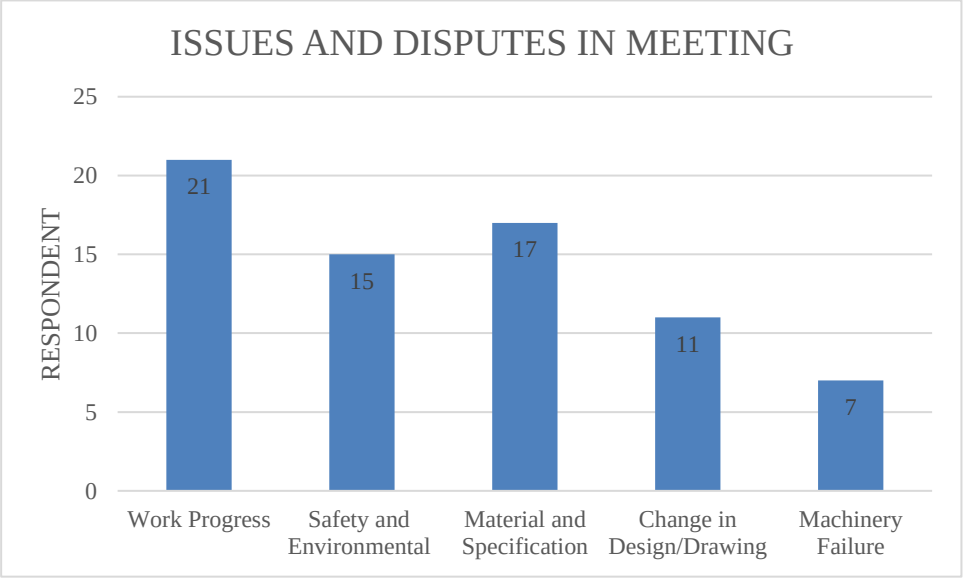

Figure 4.10 Issues and Disputes in Meeting

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

In this chapter, conclusion and recommendation are discussed deeply. Conclusion of all objectives of the research which listed earlier in chapter 1 is briefly discussed. Through the analysis and observation of the result in chapter 4, all the objectives meet its requirement. Besides, some recommendations were listed to improve the awareness and importance of Risk Management in Government Construction Project.

5.2 Conclusion

From this study, the overall awareness of risk management among contractors in government construction project were moderately aware. This shows that, the awareness level among contractors need to be improved. Besides that, working progress was the most crucial issue in construction project and the contractors have to emphasize this issue to elevate Malaysia into a developed country.

5.2.1 Objective 1: Study the Risk Management in Construction Project

Generally, the first objective was achieved through the literature review in the chapter 2. Throughout the literature reviews, the information gathered show that implementing Risk Management in construction project is very important in order to ensure smoothness of the project.

5.2.2 Objective 2: Evaluate Awareness of Risk Management among Contractors in the Government Construction Project

In evaluating the awareness of risk management among contractors, some of the information was gathered through the literature review. Moreover, questionnaires have also distributed in order to get data from various types of designation and companies or organizations which involved in construction field. For these objectives, five individual awareness questions were generated.

The individual awareness on Risk Management question that was managed to be generated were:

i. How much do you understand the tender document?
ii. How often do you open the tender document?
iii. How important the tender document to you?
iv. Does the tender document help to solve problems?
v. Did you refer the tender document when disputes happened in the meeting?

5.2.3 Objective 3: Analyze Awareness of Risk Management among Contractors in the Government Construction Project

To achieve these objectives, the awareness level that had been identified were analyzed.

5.3 Recommendation

5.3.1 Recommendation for the Study

From the analysis and personal side of view, there are several recommendations to manage the Awareness of Risk Management among Contractors:

a) The contractors must be exposed to the Risk Management in construction project to ensure the concepts can be implemented well.

b) All future engineer must be informed well the importance of tender document in construction project so that the all the future engineers can implement the tender document very well to prevent failure of the project.

c) Governments and concerned parties should give efficient amount of supports and enforcement in order to elevate Malaysia development by properly implement Risk Management in construction project.

5.3.2 Recommendation for the Future Studies

From this study, there are some suggestions for the future study. There are as listed below:

a) Detailed study on Risk Management in Construction.

b) To study the implementation of Risk Management in Construction.

c) To study the content and application of tender document in government construction project.

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APPENDIX
SAMPLE OF QUESTIONNAIRE FORM

BACHELOR OF CIVIL ENGINEERING
FACULTY OF CIVIL ENGINEERING & EARTH RESOURCES
UNIVERSITI MALAYSIA PAHANG

QUESTIONNAIRE FORM FOR FINAL YEAR PROJECT

RESEARCH TITLE :

AWARENESS OF RISK MANAGEMENT AMONG CONTRACTORS IN THE GOVERNMENT CONSTRUCTION PROJECT

- The purpose of this questionnaire is to gather information to fulfill the requirement for the bestowal of Bachelor Degree of Engineering in Civil.
- All the information will remain as Confidential information and will used as academic purpose only.
- Thank you for all you cooperation for answering the questionnaire form.

Student Name:
WAN AZWANFAKHRUL B. WAN IBRAHIM
940607-14-5231
013 - 6468774

Supervisor :
DR. MOHAMAD IDRIS BIN ALI
FACULTY OF CIVIL ENGINEERING

INTRODUCTION

TITLE: AWARENESS OF RISK MANAGEMENT AMONG CONTRACTORS IN THE GOVERNMENT CONSTRUCTION PROJECT

DEFINITION:

Risk Management

Risk Management is a means of dealing with uncertainty – identifying sources of uncertainty and the risks associated with them, and then managing those risks such that negative outcomes are minimized (or avoided altogether), and any positive outcomes are capitalized upon. The need to manage uncertainty is inherent in most projects which require formal project management.

Research goals and aim:

1. To study the risk management in construction project.
2. To evaluate awareness of risk management among contractors in the government construction project.
3. Analyze awareness of risk management among contractors in the government construction project.

SECTION A: PERSONAL PARTICULAR

1. NAME : …….

2. COMPANY/ORGANIZATION : ……

3. DESIGNATION : ……

4. DURATION OF THE COMPANY/ORGANIZATION HAD SERVED:

   [ ] < 5 years [ ] 11-15 years

   [ ] 6-10 years [ ] > 20 years

5. CURRENT PROJECT : ……

SECTION B: INDIVIDUAL AWARENESS

For this question, you are requested to choose either one from 1 to 5 whether you use the tender document with each of the statements regarding Awareness of Risk Management in Government Construction Project.
Where:

1-Not at all **4-A lot**
2-A little **5-Extremely**
3-Moderately

1.	How much do you understand the tender document?	1	2	3	4	5
2.	How often do you open the tender document?	1	2	3	4	5
3.	How important the tender document to you?	1	2	3	4	5
4.	Does the tender document helps to solve problems?	1	2	3	4	5
5.	Did you refer the tender document when disputes are happen in the meeting?	1	2	3	4	5

SECTION C: ISSUES AND DISPUTES

Based on your experience, list down the frequent issues and disputes happen in the meeting:

1) .....
2) .....
3) .....
4) .....
5) .....

THANK YOU.
WAN AZWANFAKHRUL B. WAN IBRAHIM
FACULTY OF CIVIL ENGINEERING AND RESOURCES
UNIVERSITI MALAYSIA PAHANG.