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Factors Affecting Contractor's Risk Attitude from Malaysia Construction Industry Perspective

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Abstract: - *Risks always lead to the failure of the contractor to complete projects on time. This situation is caused by many factors. The contractor's failure to plan, manipulate, perform, monitor, control and take into account all factors and risks involved may not guarantee the success of a project. In order to improve performance in Malaysia construction industry, the introduction of OSH Act 1994 have made all industry in Malaysia to identifying hazards, conducting a risk assessment and controlling those risk and at the same time implementing an integrated system to ensure consistency and better performance of projects in Malaysia industry. A total number of ninety-five (95) risk factors that are dampening and affecting contractor productivity in Malaysia construction industry were revealed by the ranking of the contractor risk attitude factors through SPSS. In the same vein, the risk factors were further classified into six (6) sub-classes depending on their nature and likelihood of occurrence. Such as (Technical risk, Logistical risk, Management risk, Social-political risk, financial risk, and Environmental risk). In order to achieve the proper response rate for this study, in total 250 questionnaires were distributed to the construction industry in Kuantan Malaysia randomly. Of the 250 questionnaires distributed, 234 questionnaires were received with an equal percentage of 93.6%. Conversely, 7 questionnaires were found to be unusable due to missing data or provided the same responses to all the questions. Thus overall, 90.8% of the total questionnaires were usable concluding with an effective sample of 227. Statistical Package for Social Science (SPSS) version 21.0 for MS Window was used to analyse the collected data. The demographic profile of the companies and respondents were analysed with descriptive statistics. This study also focused on the G7 contractors operating in Malaysia construction industry that specialise in building, bridge and road construction project.*

Keywords: - *Contractor's Risk Attitude, Risk Management, Risk Attitude, Risk, Malaysia, SPSS.*

1.0 Introduction

Construction industry have become one of the main industry that has meaningfully contributed to the country with rapid growth in Malaysia industry. According to the Construction Industry Development Board (CIDB), this industry has attained RM110 billion value of projects in the year 2013. Those projects include infrastructure, transportation and oil and gas sectors. Implementation of the project on schedule is a problematic task to attain in the undefined, complex, multiparty, and dynamic environment of construction projects (Kim, & Reinschmidt, 2011) Because of this, the industry is always open to arguments. It is common for the applicant chasing claim for work or services for imperfect work delayed completion and changes of scope (Adeleke, et al).

The CIDB Malaysia, which is an organization established with the main function of developing, improving and expanding the Malaysian construction industry, has identified individual and other sustainability-related issues as one of the top issues of the construction industry (CIDB Malaysia). The CIDB Malaysia has organised several workshops, dialogues and discussions to methodically address and prioritise environmental needs in the construction sector (CIDB Malaysia). Other institutions in Malaysia such as National Institution of Valuation, Malaysia (INSPEN), Malaysian Science and Technology Information

Centre (MASTIC) and local universities are among the leading institutions that have spearheading research in this area (Abidin, 2010).

The above efforts instigate interest among private construction companies and professional bodies to lead by example on sustainable projects. Projects such as low-energy and zero-energy office and DDC projects were initiated as pioneer projects. Developers have been highlighted as one of the key players in realising the vision of sustainable construction (Cha, & Ellingwood, 2012). Several programmes have been initiated by the government, professional bodies and private organisation to raise the awareness and to promote sustainable application among project developers. For example, a renewable energy programme called "SURIA 1000 for Developer" has been introduced to the Malaysian property developers to be involved in total sustainable housing development via the use of Building Integrated Photovoltaic (BIPV) to generate clean electricity from solar energy. The Board of Architects Malaysia or Persatuan Arkitek Malaysia (PAM), in collaboration with the Association of Consulting Engineers Malaysia (ACEM), has launched a rating system known as Green Building Index (GBI) Malaysia in 2009 to lead the Malaysian property industry towards becoming more environment-friendly. This rating Government Developer Achieving sustainable construction Clients Buyers. All this system provides opportunities for developers to design and construct green, sustainable buildings that can provide energy and water savings, a healthier indoor environment, better connectivity to public transport and adoption of recycling and greenery for their projects. Several seminars, professional talks and conferences have been held under the theme of sustainable construction to raise developers' awareness about the importance of sustainable practices and risk management in Malaysia construction industry (Cha, & Ellingwood, 2012).

Therefore, contractor's risk decision making is in the fundamental of construction risk management (Huang, et al 2007). Throughout the period of construction projects development, particularly in the design stage, the participants were challenged with huge risk decision-making problems, which were completely addressed through recognizing, analysing and replying to possible risks, and eventually enhancing solutions (Akintoye, et al 1997). Some researchers have industrialized a variety of approaches to enable a more objective risk decision-making process. The most generally useful approaches comprise of the predictable profit and loss value decision technique, the decision diagram technique, the matrix decision technique, the marginal decision technique, the Bayesian decision technique, and the Markov decision technique.

Also, most of the techniques presented above are based on the predictable value principle, which needs iterative decision-making processes for satisfactory data collection. This is because the predictable value could not be designed from a onetime risk decision-making circumstance. Alexopoulos, (2009) also identified that decision makers perceive risks differently in numerous circumstances, which is inflated by factors such as engineering experience, education background, individual beliefs, and principles. Those particular observations cause differences in decision making, making it unbearable for people to make the right decision in all the circumstances in pursuit of maximum expected value. In that case, the maximum expected value theory is inadequate in explaining humans' behaviour in the risk-decision making process (Lee, et al 2016).

In general, contractors risk attitudes is much related to the decision maker's individual sensitivities (Alexopoulos, et al 2009). Risk attitude was defined as a chosen state of mind with esteem to those uncertainties that could have a positive or negative consequence on activities', Therefore, people's risk attitudes reflect their individual characteristics and experience, also reflect on the economic, procedure and management environment which they fit too. Even in similar decision circumstances, dissimilar decision makers would create different, sometimes even the opposite decision and judgements. The individual judgment extremely related to the human issues in the decision making procedure is

frequently presented as a risk attitude, which plays a major part in decision making. Henceforth, decisions that made without seeing the decision maker's risk attitude might not be convincing or dependable. However, those issues that are influencing decision makers' risk attitudes in construction projects remains unsolved. This paper aims to pinpoint the critical factors affecting contractors' risk attitudes in Malaysia construction industry perspectives (Wang, et al 2011).

2.0 Literature reviews

2.1 Risks Management

No construction project is free of risks. The state becomes worse for the contractors due to the competitive environment of the construction sector. These risks can affect the schedule, costs, quality and in the long run the project objectives.

Risk management process starts with risk identification, which is identifying the type and the source of risks. It also continues with classifying the types of risks and their impact on the project. Risk analysis will filter and priorities the identified risks. Following the risk analysis, a risk response plan is then developed. During project In line with this, a various construction project in Malaysia comprises of high risk due to the procedures implementation, the risks identified and their responses are monitored and reviewed (Sathishkumar, et al 2015).

Furthermore, Projects need to abide with such as introducing, preparation, supervisory, implementing and concluding. In addition, the risk level during the construction stages is higher than the other types of economic industry. Commonly, risk can be effortlessly found in some process of project management in construction industries (Sathishkumar, et al 2015). According to the Project Management Institute (PMI), the risk is an undefined condition which will give a negative influence on a project objective.

Adeleke, et al (2018) also revealed that risk management is recognized as one of the significant scopes that contains in project management ten knowledge areas. Likewise, construction projects comprise of many parties such as engineer, architect, project manager, quantity surveyor, designers, contractors, subcontractor and clients. Moreover, the level of risk in the construction project always depends on the size of the project and the difficulty of the project (Anaman, et al 2007). According to Tah and Carr (2001), all the construction industries faced a different type of risk and this happens due to the poor result in the performance of the activities which leads to increase in costs and delays to the project. In addition, construction project becomes more complex and difficult when adopting new methods for responding to risk as the contractors need to consider how to treat and which method is suitable for their organization (Tah, et al 2001).

However, risk response approach remains the weakest part of the risk management process, where the proper management needs a prudent identification of risks in a well-defined manner, which can only be attained when "all" parties complicated in the construction initiative, namely, clients, consultants, contractors, authorities and policymakers, comprehend their risk responsibilities, risk event conditions and risk handling capabilities (Hillson, et al 2007; Perera, et al 2009). Risks always occur in construction projects and often cause schedule delay or cost overrun. Risk management is a process which consists of identification of risks, an assessment with qualitatively and quantitatively, response with an appropriate method for treatment and control risks. Risk management is recognized as an indispensable contributor to business and project achievement since it attention on addressing uncertainties in an active manner in order to minimize pressures, maximize chances, and optimize the achievement of objectives (Sathishkumar, et al 2016).

Risk management certification should be reviewed all the time to make sure that the output of risk monitoring and control can provide lessons for future expertise and decision maker (Loosemore, et al 2008).Nevertheless, the response is needed in every stage to appraisal the treatment plan. And, when new risks arise, it may look back to the risk identification stage to reduce the effect of the risk

during the course of the project (Adeleke, et al 2016).

According to (Jaskowski and Biruk 2011), the construction project is pretentious by various types of risk factors, such as accident, weather, location, clients, contractors, subcontractors, staff, crew, labours and defects. To control or to minimize the level of risk effects, risk management should be applied to reduce the potentials of the risk incidence. Moreover, the studies of Sambasivan and Soon (2007), revealed 28 main construction-related risks such as lack of effective communication between parties, lack of construction risk management, lack of material, unappropriated safety precautions and lack of equipment has been figured out as the primary factors (Adeleke, et al 2017).

2.2 Construction risk groups

It is necessary to set up a systematic framework for classifying the risks in overseas construction projects because risk factors in overseas projects cover such huge areas, and the linkages between them are so complicated. There are numerous ways that can be used to classify the risks for construction projects, for example in accordance with their occurrences in different construction stages, or in accordance with the nature of the risks. Risks related to the construction industry can be broadly categorized into;

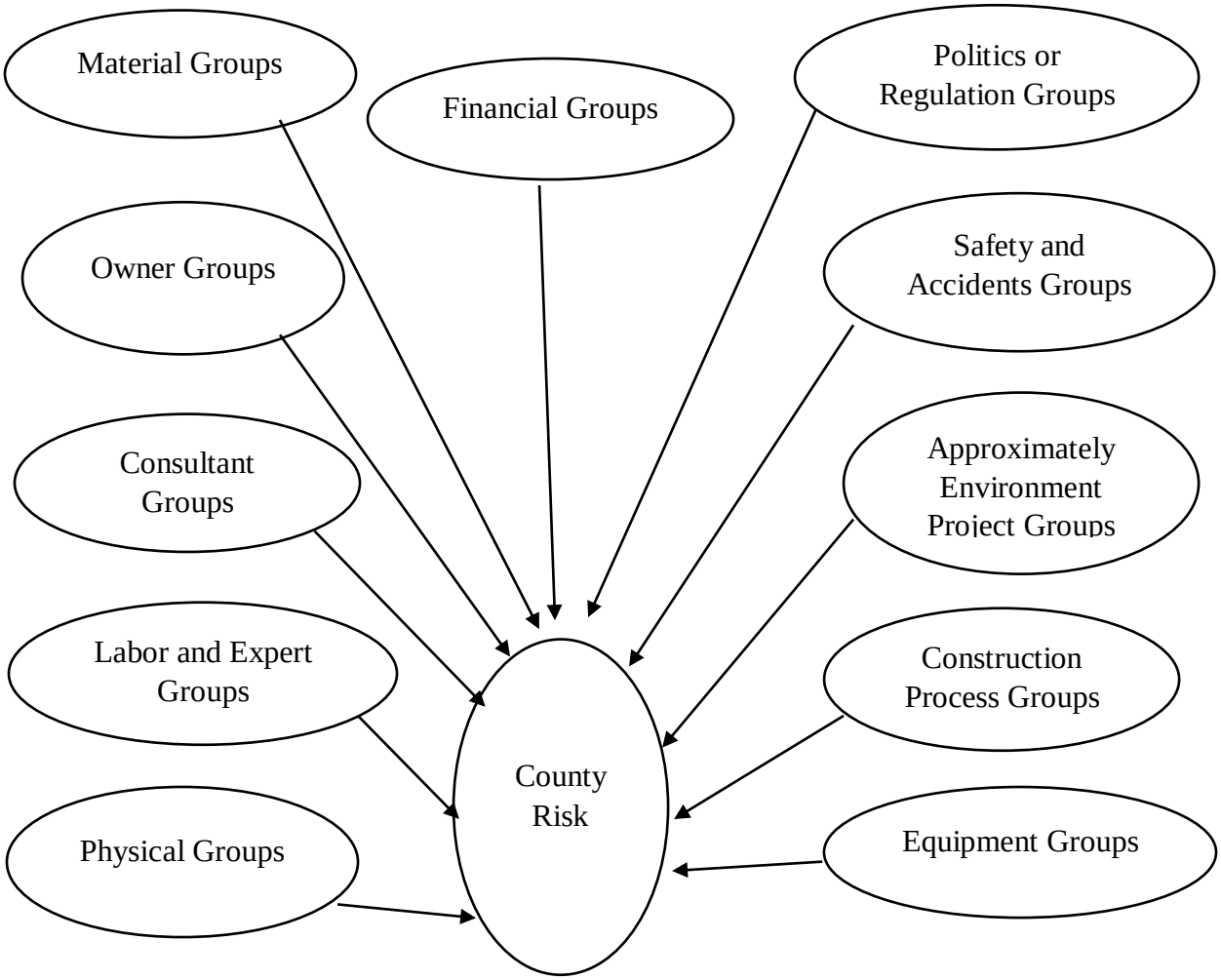

Figure.1: Risk and its environment.

2.3 Construction risk groups and their risk factors in Malaysia construction industry

	1.
1.Physical groups ➢ Natural disasters ➢ Land surface conditions ➢ Groundwater conditions Uncertainty conditions in the field ➢ Skills and expertise ➢ Discipline	
2. Labour and Experts groups ➢ Productivity ➢ Less compact teamwork ➢ Arguments workers ➢ Lack of workforce ➢ Labour strike ➢ Design errors	
3.Consultant groups ➢ Incomplete design data ➢ Late information from planners	
4.Owner groups ➢ Financial Failure owner ➢ Change order	
5. Material groups ➢ Damage during shipment ➢ Damage during storage ➢ Delay in delivery ➢ Damage during shipment ➢ Damage during storage ➢ Low-quality material ➢ Productivity and efficiency	
6.Equipment groups ➢ Lack of equipment ➢ Age tools unsuitable ➢ Damage to equipment ➢ Changes in construction work due to difficult to implement	
7.Construction Process groups ➢ Changes in construction work due to difficult to implement ➢ The quality of work is not good / quality of work ➢ Communication and Coordination problems The method implementation is wrong	
8. Approximately Environmental Projects groups ➢ Access to the project site ➢ Traffic jam ➢ Disturbances ➢ Lack of equipment and material storage	

9. Safety and accidents groups ➢ The machine is not checked before operating ➢ Workers do not include protective equipment ➢ Safety regulations are not implemented on the ground	
10. Politics or Regulation groups ➢ Changes in government regulations ➢ Government policies that led to the cessation of the project ➢ Monetary instability ➢ Complicating the matter licensing	
11. Financial groups ➢ Availability of funds ➢ Late payments by owner ➢ Inflation ➢ Fluctuation ➢ Material prices are more expensive than expected ➢ The incremental cost of leasing equipment ➢ Wage workers are more expensive than slightly its estimate ➢ The high cost of equipment maintenance ➢ Natural disasters ➢ Land surface conditions ➢ Groundwater conditions Uncertainty conditions in the field ➢ Skills and expertise ➢ Discipline	

Risk is a multifaceted singularity that has physical, cultural, social dimension and monetary effect on construction project. The imports of risk actions go well beyond the nonstop physical harm to monetary or physical properties, people or environments to effect the way a society operates and people think. Experience of risk is not only shaped by the extent of probable harm but also by the way in which we interpret or the way we filter information about it (Loosemore, et al 2008). Risk can travel in two directions: the outcome may be better or worse than originally expected. These are known as upside and downside risks. Risk and uncertainty will apply to the forecast price or time for the entire project and for any subcomponent, subcontract, operation or activity within it. Similarly, risk and uncertainty will be attached to assumptions about weather, inflation, strikes and other external aspects of projects.

Therefore, risk can be defined as: Exposure to the possibility of economic and financial loss or gain, physical damage or injury, or delay as a consequence of the uncertainty associated with chasing a particular course of action.

2.4 Risks Attitudes

According to Hyung-gin (2011), the attitude is founded on a personality's positive or negative assessment on the consequences of a specific type of behaviour, as well as own principles or knowledge about the consequences. Hence, numerous risk attitudes could be applied, and these would lead to different real behaviours and consequences (Hillson, et al 2007). From this point, attitude plays a significant part in influencing the decision makers' behaviour and attitude. Construction risk management would be problematic and imprecise to examine the decision-making behaviours without a good understanding of their risk attitudes. Attitude can be described as the favourable/unfavourable moods towards a particular behaviour (Ajzen, et al 2000). Decision maker practices belief to a behaviour that creates an individual attitude towards those attributes of behaviour (Chen, et al 2016).

Even though such external factors are beyond the control of contractors, and therefore, "hypothetically" speaking, the related risks should not even be allowed by them, clients tend to discuss what they are beyond their control too, and therefore seek to apply the "burden sharing" concept among the parties complicated by endeavouring to allocate shares of these risks to consultants and contractors as well. Such an exercise is "independently" recognized by most contractors and is commonly, yet unconnectedly, provisioned for under the bid possibility funds (Adeleke, et al 2015).

Likewise, the risk response approach remains the weakest part of the risk management process in Malaysia construction project, where the proper management requires a practical identification of risks in a well-defined manner, which can only be attained when "all" parties involved in the construction project, namely, clients, consultants, contractors, authorities and policymakers, comprehend their risk responsibilities, risk event conditions and risk handling capabilities (Yi, et al 2011).

2.5 Contractor's Risk Attitudes

However, one's attitude is always reflected in the contractor's behaviour and we always act in accordance with our attitudes. Abdelhamid, et al (2000), explained the relationship among contractors' risk perception, attitude and behaviour by setting out the possible change in design from perception to attitude to behaviour. They also investigated the factors (termed as 'situational variables') driving contractors' behaviours away from their attitudes. Major factors include the employer's reputation to honour payment on time, contractor's need for more works and amount of liquidated damages, etc.

The construction industry has changed and it has been improving by applying new materials, new construction methods, and advanced project delivery methods. But one thing has not changed, contractors have to deal with risks characteristic in their jobs and they always face competition in the market. Contractors' compensations for delivering a complete facility are based on their winning bids, especially in competitive bidding environments (Jaafari, et al 2001).

Many researchers have studied different risk attitudes among organizations, and also among individuals (Hillson, et al 2007; Pennings, et al 2000).They classified Contractor risk attitudes into three common types of contractors risk attitude which are risk-averse, risk-neutral, and risk-seeking in construction industry.

The risk-averse contractor is a contractor who prefers lower returns with known risks rather than higher returns with unknown risk. For example, contractors with risk-averse preference are willing to take an amount of money smaller than the expected value of the huge amount of money in a contact Chun, et al (2016); El-Sayegh, (2008) and Wang, & Yuan, (2011). The risk-neutral contactor is a contractor places himself in the middle of the risk spectrum, represented by the risk-seeking contractor at one end and risk-averse contractor at the other. The party's decision is not affected by the degree of uncertainty in a set of outcomes, so a risk-neutral party is indifferent between choices with equal expected payoffs even if one choice is riskier (Chun, et al 2016). The risk-taker contractor is a contractor who risks everything in the hope of achievement or accepts the greater potential for loss in decisions and tolerates uncertainty. A contractor who willing to do things that involve danger or risk in order to achieve a goal. An individual that tends to behave in a way that can potentially cause physical harm or financial loss, but might also present an opportunity for a rewarding outcome (Chun, et al 2016).

2.6 Relationship between Factors Affecting Risk Attitude and Contractors Risk Attitudes in Construction industry

When a project goes wrong and fails to achieve its purpose, it is common to review the project to find out what made it fail in order to not repeat the mistake. Many times it can be quite easy to pinpoint reasons why a particular objective could not be accomplished. However, while answering the question of why a project went wrong is

relatively easy, answering the question of why a project was successful is more complicated. There is never one single simple answer to this question. Still, the question is important and needs to be asked in order to continuously discuss what drives building and road projects towards success by contractors (Abidin, 2010).

The character of contractors represents an organized, controlled, determined, and effective manner, including facets like dutifulness, cautiousness, rationality, and orderliness. More careful persons tend to engage in less risky behaviour than other people (Dikmen, et al 2007). Thus, careful persons are likely to be cautious and rational in risky situations and to make appropriate decisions in extreme situations. They can also control their risk-taking tendencies better.

The Emotional Stability has facets such as like stability, calmness, impulse control, cool-headedness, and tranquillity. The essence lies in the idea of fearlessness in many situations (Chauvin, et al 2007). Emotionally stable individuals are less likely to be nervous or to demonstrate risky or impulsive actions (Lauriola, et al 2001). In other words, due to the traits related to stability and calmness, individuals will be more risk avoiding and thus perceive high levels of risk (Dikmen, et al 2007).

Competition and risk are two of the most frequently used terms to describe the construction business. Competition in a market is developed by multiple competitors, who may behave differently under uncertain environments depending on their own risk attitudes. Over time, organizations develop their own cultures. A firm's culture, especially its risk culture, defines its own approach to dealing with uncertainty (Hillson, et al 2007).

Generally, most individuals and small groups confronted with a hazard with potentially grave consequences are risk-averse in their attitudes. On the other hand, corporations or government agencies with large resources tend to show a more risk-neutral attitude. The importance of risk-aversion in the decision-making process has been recognized in the literature. Risk-averse decision makers tend to overestimate possible losses and limit state probabilities, especially for low-probability events that are outside the realm of their experiences. They may resist choosing a decision alternative which a traditional quantitative risk assessment (e.g. minimum expected cost analysis) suggests is near-optimal, and are likely to pay excessive premiums to reduce the risk, especially when personal injury is involved (Chun, et al 2016).

According to Toh (2001), the most appropriate time to evaluate a project is before completion. However, this is seldom done because completed projects are considered by contractors as the end of antiquity. The project managers tend to ignore this because new projects are far more interesting and important than the old ones. This does result in a huge loss of receiving knowledge and experience from an earlier project that ended up with a success or a failure. A study of success factors in completed successful projects would hinder this and provide information about useful factors that could help project managers in their future projects.

Many researchers backing ‘‘environment" as a factor affecting the contractor's success Walker, et al (2000). Further described ‘‘environment" as all external influences on the construction process, including social, political, and technical systems. The attributes used to measure this factor are the economic environment, social environment, political environment, physical environment, industrial relation environment, and level of technology advanced. Development needs of the project team members, and most important for forecasting the performance level of a construction project before it commences (Chun, et al 2016).

Therefore, Contractors' risk attitudes affect their bidding decisions in which they are exposed to uncertainties and competition. The competing contractors may have different risk attitudes that are part of their own organizational culture that has been developed over time. Different risk attitudes can explain the differences in how firms do their business (Pennings, et al 2000).Heterogeneity in risk attitude and resultant differences in the ways they do business lead to questions about the

relationships between risk attitude and firm performance, especially market diversification in the current study. In a risky situation, individuals perceive the situation in their own ways, which are affected by their own risk attitude. Organizational risk attitude is subconscious within an organization but it defines what risks can be accepted and what risks cannot be accepted within an organization (Cha, et al 2012; Chun, et al 2016, Lauriola, et al 2001).

2.7 The Conceptual Framework

Factors Affecting Contractors Risk Attitudes

Independent Variable

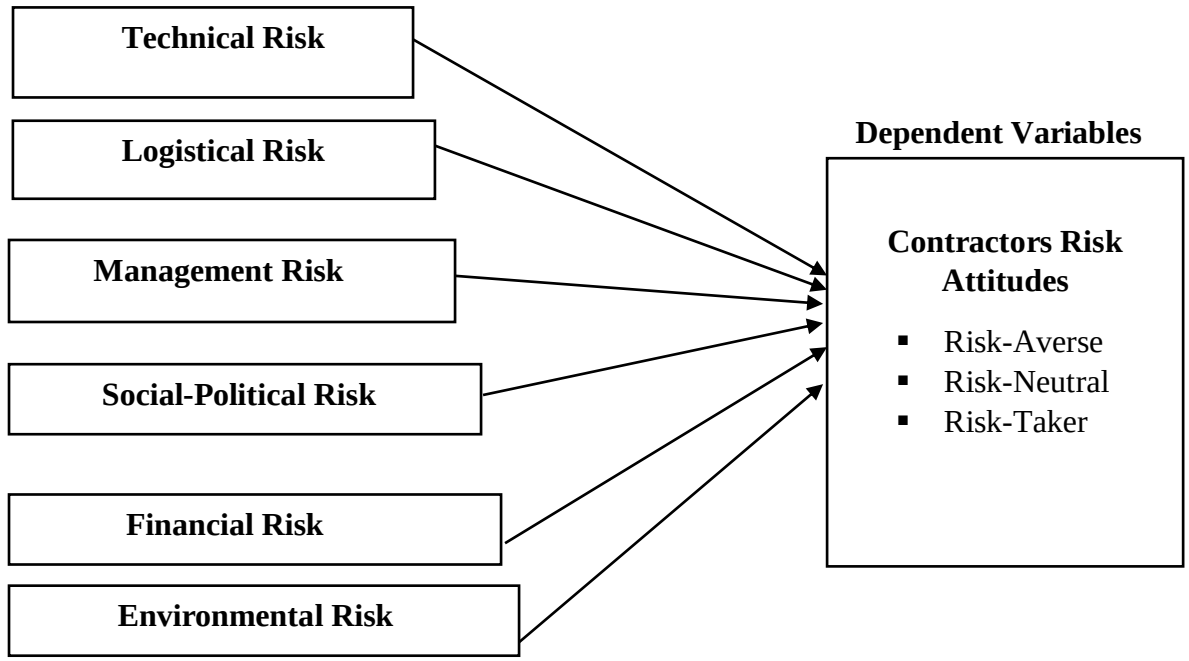

Figure. 2: Conceptual Framework

2.8 Previous studies on risk attitude among Malaysia contractors

Study of Wang et al (2011), revealed that the connection between attitude and decision-making behaviour has been presented in many fields as well as in construction management area. Theory of planned behaviour by Ajzen (2009), is one of the best dominant models to representing the relationship between attitude and decision-making behaviour, in the model, attitudes, individual norms and perceived behaviour regulator influence behavioural purposes, which in turn control the possibility of behaviour that is yet to happen Zou, et al (2009).

According to Roshana et al (2012), there is a robust departure between design and actual realisation of construction. In effect, construction industry tend to lay emphasis more on the project at hand in terms of their influence to the successful achievement of project and pay little attention to the issues immediately outside a project such as learning and improvement issues, or transfer of individual learning into organisational learning. This situation is obvious in the public and government industry of the Malaysian construction project.

Renuka, et al (2014), explains that infrastructure development increases the growth of countries economy and generates a large number of job opportunities. Hence those projects comprise a large amount of investment to carry out. In view of that, if any sort of wastage (either time, resources etc.) occurs that would lead to the huge financial losses. These losses occur due to various risks related to such mega projects. Accordingly, these risks play a vital part in the achievement of the project within the time schedule and planned budget. In this context, various studies have been reviewed and lead, this study discusses the

dangerous risk factors and its assessment techniques through a relative study of various international construction projects.

Roshana and akintola (2012) have shown how management of construction projects is mainly short-term oriented and the tactical component in decision making is often inattentive. Most developments that take place are of a technological nature, while improvisation is more valued than organised. This is in line with the opinion of Culp (1993), that deteriorating in many quality management efforts is due to the lack of clearly defined and measurable goals. This all calls for a well-organised improvement process in construction project development.

Sathishkumar (2015) also present that risks are very common in the construction sector. The risk is the Possibility of suffering loss and the impact on the involved parties. The risk is identified and then risk assessment and analysis is done. Then risk management and risk mitigation are carried out. Risk affects the construction sector negatively and focusing on risk decrease measure it important. The purpose of this study is to assess the use and method of risk identification techniques in the construction industry in Malaysia. They are classified in specialized industrial construction, infrastructure and heavy construction.

Risk management is one of the ten knowledge areas (i.e., scope management, integration management, cost management, time management, resource management, human management, procurement management and risk management) spread by the Project Management Institute (PMI, 2000). Furthermore, risk management in the construction project management context is a comprehensive and methodical way of identifying, analysing and responding to risks for the achievement of project goals. The goals of the risk management process include identifying risks and improvement of construction project management processes and efficient and effective use of the resources. The risk may also stand as opportunities, but the fact that most of the risk usually has negative results has made most of the people to only think about the negative side of risk (Baloi, et al 2014).

3.0 Methodology

Statistical Package for Social Science (SPSS) version 21.0 for MS Window was used to analyse the collected data. The demographic profile of the companies and respondents were analysed with descriptive statistics. This study also focused on the G7 contractors operating in Malaysia construction industry that specialise in building, bridge and road construction project. The data collection process took between two and three weeks .The survey questionnaire was prepared both in Malay and English languages so as to allow the respondents respond in the most convenient manner. Before the copies of the questionnaire were distributed, the selected contractors' committees were duly informed about the details of the survey procedures. Likert scale is a psychometric type of scale used in instruments to tap respondents' extent of agreement or otherwise in a given statement. The adopted Likert scale was originally 5-point scale that ranges from neither "very low" to"very high" with"low nor high" in between. Many researchers will prefer to use longer scales by adding options.

In this study, the selection of an odd scale particularly the 5-point scale is appropriate because it will increase the reliability of the data as well as lessen social desirability bias (Adeleke, et al 2016). Respondents shall be asked to respond to the items by indicating their level of agreement using a five-point Likert scale.

4.0 Summary of the findings.

4.1 Response Rate

In survey research, response rate represents the number of people invited to participate in the study and the number of persons who actually complete the survey instrument and there are no standard expectations for response rates as they could vary across surveys survey (Adeleke, et al 2017). In order to achieve the proper response rate for this study, in total 250 questionnaires were distributed to the construction industry in Kuantan Malaysia randomly. Of the 250 questionnaires distributed, 234 questionnaires were received with an equal percentage of 93.6%. Conversely, 7 questionnaires were found to be unusable due to missing data or

provided the same responses to all the questions. Thus overall, 90.8% of the total questionnaires were usable concluding with an effective sample of 227. Therefore, a response rate of 90.8% is considered adequate for the analysis in this study.

4.2 Demographic Distribution of the Respondents

The demographic profile of the selected sample population's in terms of their gender, age, education, job position, working experience, company location Among these respondent 30 (13.2%) female and 197 (86.8 %) are males. The sample is spread out among all age groups, age below 18-34 are 88 with (38.8%), age below 35-44 are 88 with (38.8%), age below 45-60 are 42 with (18.5%) and 9 with (4.0%) respondents were 60 years above, whereas only four respondents contributed in this study were in-between 18 to 65 years of age .

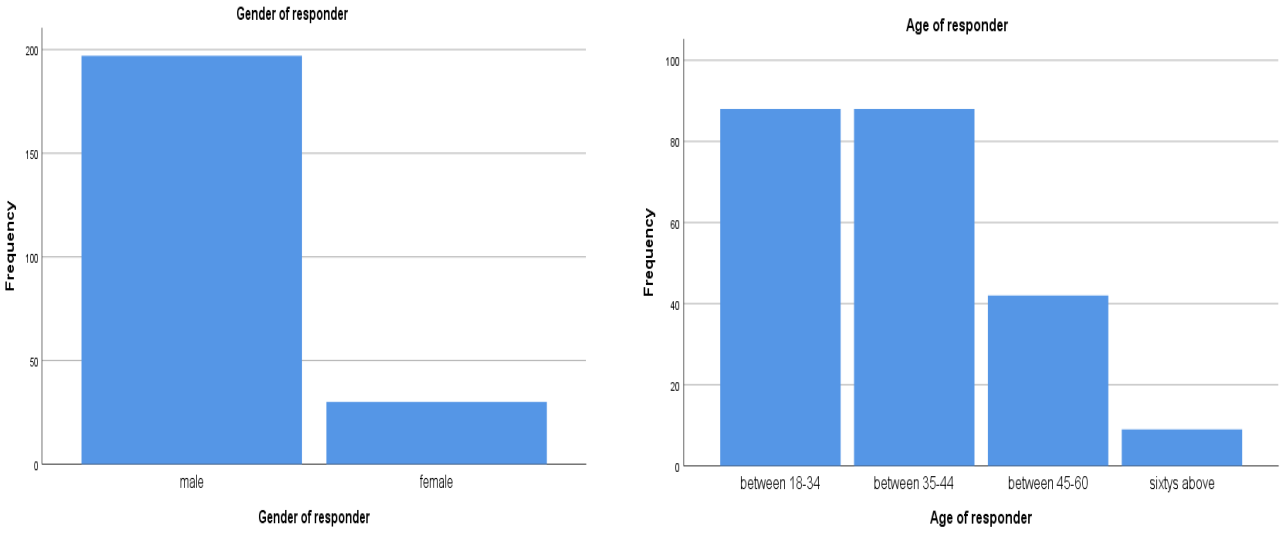

Figure 3: Demographic profile of Gender and Age

The number of contractors that respondents are 94 with (41.4%), contract managers are 41 with (18.1%), architects are 34 with (15.0%), project managers are 33 with (14.5%) and engineers are 25 with (11.0%). Regarding the qualification, the majority of the respondents held a master degree, they are 125 in numbers with (55.1%), respondents were having bachelor diploma followed with 55 (24.2%), finally, 41 (18.1%) respondent were having PhD degree.

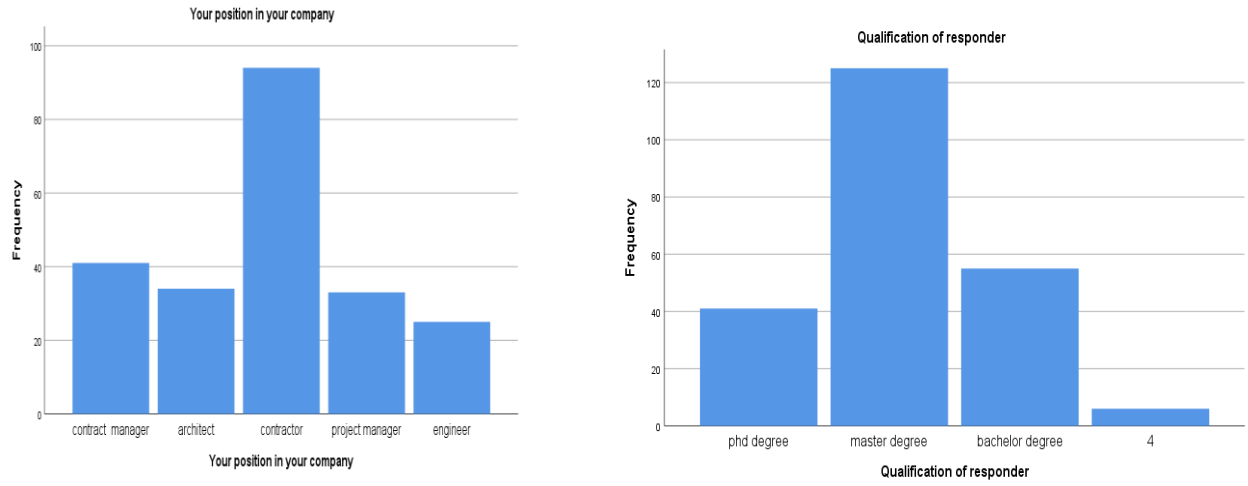

Figure 4: Demographic profile of Positions and Qualifications

From the experience level of the respondents, it was found that most of the respondents having moderate experience. A total of 98 with (43.2%) of respondents have experience of 4 to 6 years, followed by 80 with (35.2%), having less than 3 years,41 with (18.1%), having 7 to 9 years, and 8 with (3.5%), having above 10 year job experience.

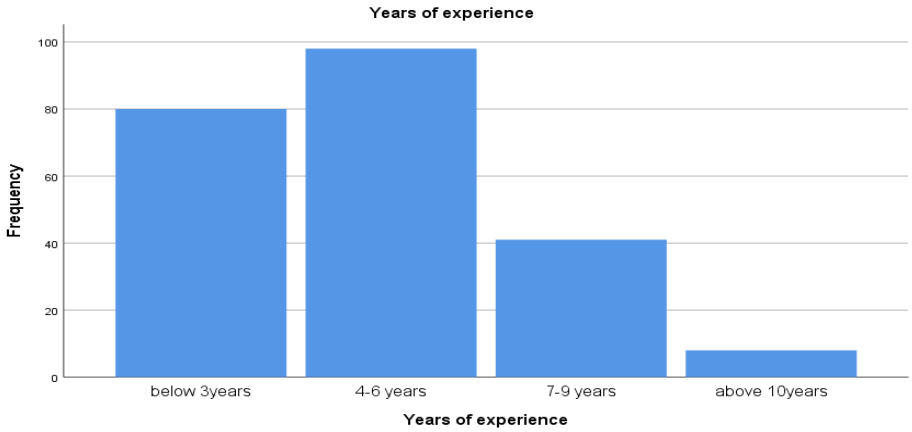

Figure 5: Demographic profile of Experience

In case of job specialize and company location, more than half of the respondents 155 with (68.3%) specialized on a building project, followed by 45 with (19.8%) respondents specialized on the road project and only 27 with (11.9%) of respondents are specialized on the bridge project. The respondents that located across Malaysia are 105 with (46.3%), follow by 69 with (30.4%) that are within few states in Malaysia, 30 with (13.2%) are in the international market and 23 with (10.1%) respondents are in the local market area.

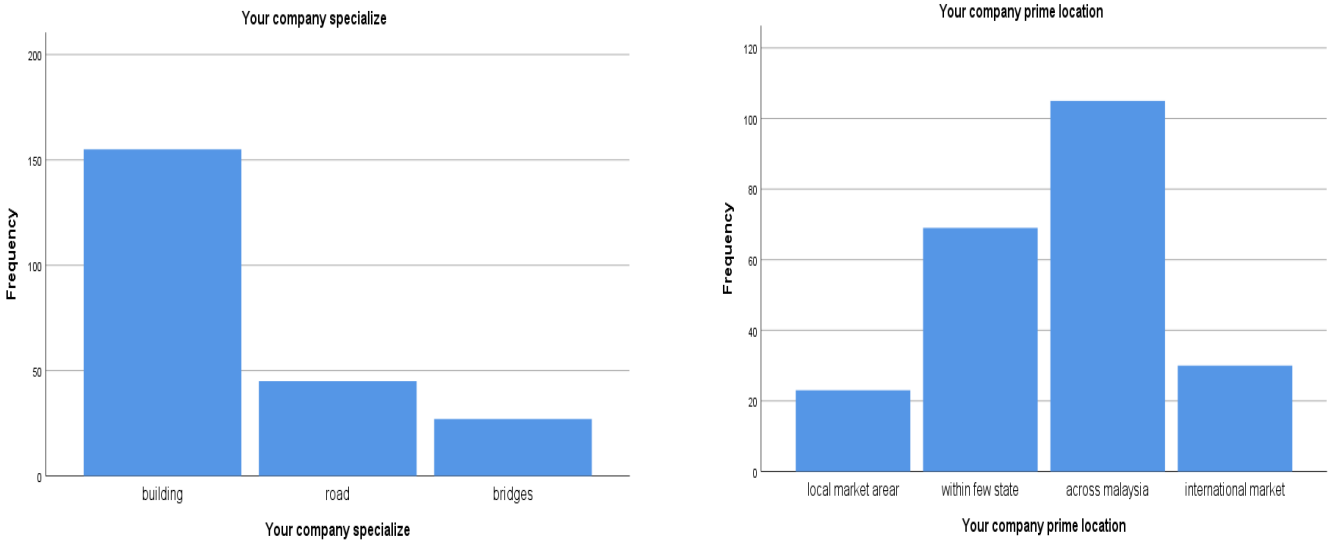

Figure 6: Demographic profile of Companies Specialize and Companies Prime Locations

4.3 Ranking of Specific Factors Affecting Contractors' Risk Attitudes among Malaysia Construction Industry.

The mean and standard deviation of each factor are derived from the total sample to determine the level of importance. If two or more factors happen to have the same mean value, the one with the lower standard deviation is considered as more important. To analyse the factors with relatively high mean values, which indicate higher impacts in the decision making, a measure is set in this study for the identification of those critical factors. The

factors with mean values that are greater than the average value of all mean values are classified as critical factors affecting contractors' risk attitudes. The ranking results of these factors are shown below.

Table 1. Ranking of Specific Factors Affecting Contractors' Risk Attitudes among Malaysia Construction Industry

Factors	Mean	Standard Deviation	Ranking
1. Management Risk	4.0066	.51715	1
2. Environmental Risk	3.7948	.49009	2
3. Financial Risk	3.7395	.54745	3
4. Technical Risk	3.5752	.60563	4
5. Logistical Risk	3.4978	.58522	5
6. Social Political Risk	3.4802	.52156	6

Management Risk was ranked the first place with the mean value: 4.0066, Std: .51715, among all important factors. Managerial risks relate to productivity, quality assurance, cost control and human resource management. Shirolkar et al., (2015) found that the most important risks in construction projects are those relating to safety, quality of work, weaknesses, productivity and competence. One management risk that frequently arises in international construction is the inadequate choice of project partner to joint projects.

The most common management-related risk is the indeterminate output of resources. Before you begin a project you need to be sure that you have adequately skilled staff and that you have sufficiently defined their roles and responsibilities. Failing to do this can lead to calamitous losses.

Environmental Risk was ranked as the second critical factor affecting contractors' risk attitudes with this mean value: 3.7948, Std: .49009. Environmental risks comprise of natural disasters, weather, and seasonal implications. These risks are usually ignored when people are unacquainted with local conditions. If you are going to be working on a project in a new city, you need to become familiar with that area's weather patterns. If you prepare for possible weather risks, you are much more likely to avoid possible delays and losses.

Financial Risk was ranked the third place based on the survey results with this mean value: 3.7395, Std: .54745 among all important factors. Financial risks are risks relating to interest rates, credit ratings, capital supply, cash flows and rentals. Local objects reliability risk arises because projects involve local partners such as contractors, customers, suppliers and the success of these projects depends on their reliability and affluence. Rise, local taxes, delays in payment and obtainability and variation in foreign exchange are a few of the possible financial risks you might sustain during a construction project.

Technical Risk was ranked as the fourth critical factor affecting contractors' risk attitudes with this mean value: 3.5752, Std: .60563. Technical risks include design failure, equipment and systems failure, estimation error, collision and accidents. Other risks in this category are site location and access, and new technology failure. For local-foreign joint ventures, a technical risk that can arise is the partner's different practices and working procedures. Technical risks comprise anything that limits you from creating the product that your customer wants. This can include indecision of capitals and obtainability of materials, inadequate location investigation, appropriateness of specifications and incomplete design. These risks can commonly occur when there are changes in project scope and requirements, and if there are design errors or oversights.

Logistical Risk was ranked as the fifth critical factor affecting contractors' risk attitudes with this mean value: 3.4978, Std: .58522. There are numerous logistical risks that need to be addressed before beginning a project. These risks comprise

the availability of transportation facilities and the availability of equipment such as spare parts, fuel, and labour. Without addressing these logistical issues, you risk huge project delays and loses.

Social Political Risk was ranked as the sixth critical factor affecting contractors' risk attitudes with this mean value: 3.4802, Std: .52156. Political risk is defined as foreign government interference with the normal conduct of business. It includes war, civil disorder and industrial relations actions that affect the progress of the project. Wang et al., (2011) identified political risks to include expropriation, force majeure, and delay in approvals, corruption and change in the law. Social risks relate to criminal acts, civil torts and substance abuse.

It is not easy to measure contractors risk attitude since an individual contractor's own position in risk attitude is relative within the field of competition, the effect of contractors risk attitude among Malaysia construction companies.

The factors affecting contractor risk attitudes toward risk management in construction companies have been inspected by several previous researchers (El-Sayegh, et al 2008; Enshassi, et al 2008; Hanna, et al 2013; Hwang, et al 2014; Takim, et al 2005; Wang, et al 2011; Wiguna, et al 2005 and Zou, et al 2009). In Malaysia construction industries, predominant design indicates that while risk "maintenance" and "mitigation" are the most common responses related to construction issues, such as planning, scheduling, capitals, methods and techniques used on sites, equipment suitability and labour productivity, defective workmanship and rework, the risk "attitudes" response is the usual approach to clients' actions, or inactions, for example, delay in making decisions, delay in processing approved payments by consultants, frequent changes and variations, appointment of unqualified representatives and consultants' technical related factors in the form of errors and omissions in design drawings, outdated or unclear technical specifications, delay in responding to requests for information, delay in approving material samples and shop drawings, stringent inspections, in addition to external risks, which are beyond the control of the parties involved in the construction operation. Examples of which include inclement weather conditions, unforeseen or sudden escalation in prices, delay in permitting and government approvals and changes in statutory regulations, all these factors were opined to be affecting contractors risk attitude in Malaysia construction industry.

In addition, construction projects are very common and likely to happen at any phase of the project. Most changes, if not managed properly through a formalized change management process will have a significant negative impact on project objectives and affect its arranged sequence, unfavourably impacting productivity and accordingly causing schedule delays and cost overruns.

In the same vein, the construction project is are usually a temporary alliance of autonomous partners in which a project is 'organised to order'. As a result of this form of co-operation, participants such as consultants and contractors are partners for a particular project. A participating industry in one project cannot be sure that improvement processes learnt and results achieved from their last projects will be applied in another project given that they may be dealing with new partners unless specially demanded by the client.

In Malaysia construction industry, shortage of workers in the construction industry stems from civil engineers abandoning construction in favour of higher-paying IT industry jobs all these years. Within a short span of years, the whole thing may change to vice versa due to higher pay packages given by International /National companies" par with IT companies or even more. But now, that the infrastructure sector in Malaysia is growing; there is a huge demand and supply gap. Inadequate manpower may slow down infrastructure projects as companies may phase them longer than necessary. In Malaysia construction companies the problem of labour risk, improper project planning and budgeting, poor materials, lack of teamwork, change of top management and time schedule are the most six factors that are affecting contractors risk attitude among Malaysia construction companies. To overcome these problems, those factor of harshness must be identified and reduced to solve the problem.

5.0 Research Implications

As a result, Contractors should as well hire team members with high team competency, working experience, educational background, emotional

intelligence and physical health of their workers as this will help to increase the quality of the work and allow workers to know more about risk in construction industries. Furthermore, team members should be persuaded in attending training and courses on risk attitude.

This study on contractor risk attitudes is not the only essential to the academic world but also to the contractors, project managers, engineers who've required the controlling risk attitudes in every construction industry. It is obligatory to all construction industry in Malaysia to register their industry under CIDB and other related legislation to ensure all safety aspect and is obligated in the workplace. In the same vein, encouraging result toward improving the construction risk management in construction industry has become the most important part in construction industry for these recent years. Moreover, it also can help the industry to maximize their profit goals. Parties in construction industry can use the information in this research for developing the strategy on risk management.

6.0 Limitations of the study

Our research is not without limitations. This gives rooms for future researchers. The data were collected through a questionnaire survey conducted in one of the states in Malaysia Pahang, so the generalization of the findings should be done with caution. Future studies might carry out this research in other countries to ascertain if the results investigated in Malaysia will be similar. Likewise, a longitudinal analysis might provide better findings, such as going to the field to obtain the data more than once and test if differences exist.

7.0 Conclusions

The literature has been reviewed from the various journals and different papers regarding the effect of contractors risk attitude on competition in construction, Time schedule, material risk, financial risk and labour risk are four major risks identified which almost every company faces while in executing the project.

Also, the construction industry is considered as an important sector in the world as it develops and achieves the goals of society. The performance of the construction industry is affected by clients, contractors, consultants, stakeholders, regulators, national economies and others.

In construction projects, changes are very common and likely to occur at any stage of the project. Most changes, if not managed properly through a formalized change management process will have a considerable impact as they disrupt work and affect its orderly sequence, adversely impacting productivity and accordingly causing schedule delays and cost overruns.

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