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Towards Safe Cities & Resilient Communities

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INEFFECTIVE IMPLEMENTATION OF RISK MANAGEMENT AMONG SUB-CONTRACTORS: A CONCEPTUAL PAPER

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Abstract - Construction is a high-risk activity, which must be managed from procurement, throughout the design process and to the end of the construction stage. It involves professionals of different set of skills and expertise. Each party in the construction industry plays an important role in order to complete any project within the timeline, the lowest cost and the best quality product. The main cause problems occur in construction industry is due to ineffective implementation of risk management. The methods used in this research are mixed methods which were qualitative and quantitative. This research advocates the strategies that can overcome ineffective implementation of risk management among sub-contractors. Besides, this research also will provide a better understanding on the effective implementation of risk management practice in Malaysia and how the strategies can be implemented or used as guidelines by construction companies especially sub-contractors in their respective projects.
Keywords - Risk, Risk Management, Sub-Contractors

1 INTRODUCTION

Construction industries are one of the industries that will naturally involve in high risk and high uncertainty. In construction projects, the three primary targets which are the cost, time and quality are very subjective. The main cause problem occurs in construction projects are due to ineffective implementation of risk specifically the ineffective risk analysis which could put any construction projects in danger. Implementation of a good risk management is very important in construction industry because it will lead to the success or failure of the project. The main principle of risk management is not about eliminating the risks but to control it properly. In construction industry there are many unpredictable risks like performance of construction players, resources availability, surrounding area and involvement of all the involved parties. Thus, the main goal of implementing effective risk management in construction projects are to complete the projects within stipulated time, cost, good quality and environmental limits.The purpose of this study is to provide a better understanding on the effective implementation of risk management practice by sub-contractors in Malaysia.

2 PROBLEM STATEMENT

The main problem to be highlighted in this paper is the lack of risk management, specifically the ineffective risk analysis, could put construction projects in danger. Risks cannot be eliminated but by applying the principles of risk management practitioners are able to improve, minimize or mitigate the ineffective implementation of risk management. Implementation of a good risk management is very important in construction industry

because it will lead to the success or failure of the construction projects are inherently complex and involve multiple feedback processes due to the rapid change in technology, environment and inflation, effective risk management implementation is a management tool that the construction industry cannot afford to ignore. According to Sawczuk (1996), no matter how small or simple the project is, it still can go wrong. Risk cannot be avoided but must be recognized, assessed and well-managed. Construction Management Practices | IRMI.com. (2018) stateda successful construction project must meet the expected level of quality, time and cost. The effective implementations of risk management has to be integrated and aligned so that the people will perform their work efficiently, effectively, and safely.

3 PURPOSE OF STUDY AND RESEARCH QUESTIONS

This conceptual paper is to provide better understanding on the effective implementation of risk management practice by sub-contractors in Malaysia. Therefore, the research questions for this paper are:

1. What critical factors causing the ineffective implementation risk management in sub-contractors organisations?
2. How ineffective implementation risk management among sub-contractors contribute to the construction projects impact?

3.1 Significance of the Research Questions

This conceptual paper is significant because it will investigate a number of critical factors that causeand impact the construction projects towards ineffective risk management by sub-contractors. This paper will determine those factors and make recommendations for future research.

3.2 Analysis and Discussion of the Literature

In order to achieve the answer to those research questions, this section describes the literature review on risk management and factors contribute to the ineffective risk management.

3.3 Risk Management

Ward and Chapman (2003)defined ‘risk’ as ‘‘hazard, chance of bad consequences, loss, exposure to chance of injury or loss’’. According to Health and Safety Authority (2018), risk is defined as ‘hazard’ where a situation which could lead to harm. However, Smith et al. (2006), defined risk as an unforeseen event that occurs during the process of construction projects. Edgerton (2008) asserted thatrisk is quantified as the combination of the probability if the event occurred and the impact of the resulting consequence. Besides, risk can impact an organisation whether in the short, medium and long term. Risk regarding the possibility of loss can be especially problematic. If a loss is certain to occur, it may be planned in advance and treated as a definite.

According to Menard (2017), construction projects are very complex and can pose various internal and external risks. A strict set of codes, laws, and regulations must be followed during the construction process to best avoid these risks. One of the best ways to manage risks is to know the various types and how you can manage them. Sources of risks can be divided into two which are internal and external risk. Examples of internal risk are site possession delay caused by sub-contractors, problem between sub-contractor and main contractor, quality of work done and availability of labour and equipment. Examples of

external risk are earthquake and landslide. For the types of risk, they are divided into technical risk, operating risk, environmental risk, management risk, financial risk and socio-political risk. Risk management is a process that is underpinned by a set of principles. In addition, it needs to be supported by a structure that is appropriate to the organisation and its external environment or context (McCaig, 2010). A successful risk management initiative should be proportionate to the level of risk in the organisation which is related to size, nature and complexity of the organisation, aligned with other corporate activities, comprehensive in its scope, embedded into routine activities and dynamic that is by being responsive to changing circumstances (McCaig, 2010).

Then, the main purpose of project's risk management is to identify, examine, select risk management techniques, implement the techniques and monitor the results for project success. Overall, risk management process includes the following main steps:

Figure 1: Risk Management Process
Source: Ramachandran (2013)

There are two basics types of approach to the management of risk in project which are informal and formal approach. The informal approach to the management of risk is one which views the risks in a subjective manner. and In addition, it is also due to the nature of this approach where many organizations implement these methods but do not realize that they are operating any kind of risk management procedure. One of the most widely used techniques in the informal approach to the management of risk is the provision of contingency fund. These are lump sum contingencies and percentage contingencies. A lump sum contingency is a sum of money put aside, in the project budget, in case any extra money is required during the project (Tadayon et al., 2012).Contingency funds can be used as a risk management technique because the amount of money allocated to a contingency fund should be representative of the cost of risks thought likely to occur in a particular project. Other informal procedures for the management of risks involve talking to experts or people with experience on similar projects and gaining their views as to the possible risk in a project, then reviewing the project in the light of these possible risks. The formal approach consists of an asset of procedures laid down by an organisationfor use in the management process. These procedures are structured and give guidelines to be followed, so that they can be used by any member of the organisation.

3.4 Factors Contributing to Ineffective Risk Management

The most common factors for the disaster of a project must be identified. It is very important because we can find the ways to remedy them. Besides, it is very important to

know the causes from the start of the project in order to develop methods to prevent the problem.

Factors contributing to ineffective implementation of risk management are:-

(a) Ineffective Information

Although this source could interact with the other causes of failure, we are going to examine it as a separate entry. If the project team does not have effective accurate information for the project, then they are not able to deliver the project with the desired outcomes. However, there is a limit to what can be known in a project; perhaps this cause of failure is inherent in any human venture. Nevertheless, there is limit information on the full details of the project.

(b) Ineffective Resources

Lack of resources in a project is considered as one of the most significant factors for the disaster of a project. Resources for a project are divided in three which cost, people and equipment.

Every project has serious divergences in its outcome especially to the final costing. If we do not have the money to pay these extra costs, then the project will fail. There are many causes which resulted from this including inaccurate estimation, changes in the project due to external factors, changes in requirements and so forth. Sometimes, the whole project must be completed to understand that the initial financial resourcing was incorrect.

In addition, having the wrong people in a project has a highly negative impact in the implementation of the project. Furthermore, a fully staffed project team who are unsuitable to work as a team or they need training in order to be productive, is also negative for the completion of the project.

Furthermore, lack of the proper equipment can lead to project delays, but this is not as critical as having the lack of people because it is very easy to plan from the beginning of the project, what equipment we will need. However, that does not mean that the wrong equipment or the late delivery will not cause serious problem in the project. In general, the lack of equipment is not considered a major factor of project disasters but it is a sign of poor management and planning.

(c) Ineffective Communication and Management

Strategies such as the commitment to improve communication within the team, receiving sufficient commitment from top to bottom, support from all levels of management and the consistent endorsement by top management especially communication between main contractor and sub-contractors will lead to project success (Chan et al. 2004). Baccarini and Collins (2003) found that communication is the most crucial for every level of the project management process. Nguyen and Ogunlana (2004) also found that the associated success factors in communication are related to the community's involvement, clear information or communication channels and frequent progress meetings. According to Alauddin and London (2011), a proper communication and management among project teams members need to be monitored by the project manager. If project team members keep their relationship steady and communicate properly between each other it can effectively give impact to the success of the construction projects.

4 CONCEPTUAL FRAMEWORK

The conceptual framework for this research integrates the factors causing and giving impact to ineffective implementation of risk management. To show that this proposed

conceptual framework is appropriate to the research questions, the research questions are again stated here:

1. What critical factors causing the ineffective implementation risk management in sub-contractors organisations?
2. How ineffective implementation risk management among sub-contractors contribute to the construction projects impact?

This paper is based solely on a review of previous researches. Several methods were used to collect and reviewed the literature. First, research was conducted using Google search Engine and Google Scholar. The terms such as 'risk management', 'ineffective risk management' and 'sub-contracting issues' were used, and a limited amount of information was found. The most helpful literature is related to ineffective risk management toward ineffective communication and management. Second, research on selected databases pertaining to risk management was explored. The databases are Web of Science, Sciences Direct and Mandeley. The total of22articles were retrieved and reviewed (see Table 1).

Table 1 The list of Articles Retrieved and Reviewed

Item	Articles	Content
1	Design Management: Challenges for Adaptive Re-use, 2011, Alauddin, K. & London, K.	Explore the problems and critical success factors in the design brief development phase for heritage buildings.
2	'Exploring critical success factors for partnering in construction projects', 2004, Chan, A, Chan, D, Chiang, Y, Tang, B, Chan, E and Ho, K	Review of the development of the partnering concept in general and identifies critical success factors for partnering projects from various parties.
3	Main Statistics on Construction Projects Awarded, 2017, Construction Industry Development Board (CIDB)	Statistics on Construction Projects Awarded as of June 2017
4	Country Report Malaysia, 2017, Construction Industry Development Board (CIDB)	Country Report Malaysia about Malaysia Economic on 22nd AsiaConstruct Conference Seoul Korea
5	Critical success factors for projects, 2003, Baccarini, D and Collins, A	Explanation on critical factors to project implementation and critical areas that significantly impact project success.
6	Risk Management; Recommended Contract Practices for Underground Construction, SME, 2008, Edgerton W	To improve contract practices among construction practitioners
7	Hazards and Risk, 2018, Health and Safety Authority	Definition of Risk Management
8	Construction Management Practices, 2018, IRMI.com	Explain successful construction project must meet the expected level of quality, time and cost.
9	'Research and Evaluation Design', 2010, McCaig, C	Guide for Practitioners to do Research and Evaluation
10	The Types of Risks in Construction Projects,	Explanation on the types of risks in

	2017, Menard, S.	construction projects.
11	'A study on project success factors in large construction projects in Vietnam', 2004, Nguyen, L and Ogunlana, S	A study on project success factors in large construction projects.
12	Risk Management, 2013, Ramachandran P.P.	Diagram of risk management process
13	Managing Risk in Construction Projects, 2006, Smith N.J., Merna T., obling P.	How to manage risk in construction projects
14	Risk Avoidance for the Building team, 1996, Swaczuk, B	How to avoid risk for construction players
15	An Assessment of Risk Identification in Large Construction Projects in Iran, 2012, Tadayon, M., Jaafar, M., Nasri, E	An Assessment of Risk Identification in Large Construction Projects
16	Transforming project risk management into project uncertainty management, 2003, Ward, S. & Chapman, C.	Explanation on the reasons that focus on 'uncertainty' rather than risk could enhance project risk management, providing an important difference in perspective, including, but not limited to, an enhanced focus on opportunity management
17	The major causes of quality failures in the Malaysian building construction industry, 2012, Abdul-Rahman H., Al-Tmeemy S.M.H., Harun Z., Ye M., & Kho	The major causes of quality failures in the Malaysian building construction industry.
18	Construction Communication, 2003, Emmitt, S. and Gorse, C.	The importanceof communication in construction industry.
19	Improvement Of Relationship Between Main Contractor And Subcontractor For Successful Construction Project Implementation, 2017, Lagiman, S.	Explanation on how to improve relationship between main contractor and sub-contractor to achieve end goals.
20	Encyclopedia of Quantitative Risk Analysis and Assessment, 2008, Melnick E. and Everitt B,	Explanation about quantitative risk analysis
21	Supplier-contractor partnering impact on construction performance: A study on malaysian construction industry, 2015, Mirawati, N. A., Othman, S. N., & Ismail, R. M.	Explanation about the impact on construction performance on Malaysian construction industry.
22	Definition of Risk Management, 2011, Websters dictionary	Defination Risk Management

According to the literature reviews, this proposed conceptual framework is synthesised appropriately with the risk management approach. The next section will discuss the assimilation of factors and impacts in risk management (see Figure2).

The development of the conceptual framework of effective risk management for sub-contractors illustrates the link between critical factors, impact and strategic to overcome

ineffective risk management among sub-contractors. Figure 2 shows the critical factors contribute to the ineffective risk management, the impact from ineffective risk management and how the implementation of strategic can provide an effective risk management by the sub-contractors. In this framework, the connection of critical factors such as human, technical and environment can give negative impact to the projects, main contractors and sub-contractors and to other resources. This highlights it is important for the main contractor to provide information on risk management to ensure the project run smoothly. However, the implication of ineffective implementation of risk management by the sub-contractors affect to the successful of the projects. To ensure the project is successfully done, the sub-contractors should have good experiences and implement good feasibility study, frequent progress meeting, clear communication, coordinate well between the parties involved, proper identification and allocation of risk and proper project planning and scheduling. This framework will be tested by the empirical data based on questionnaire survey and interviews with the sub-contractors. The future research methodology is discussed in the next section.

5 DATA COLLECTION AND DATA SOURCES FOR FUTURE RESEARCH

This paper solely based on a review of literature of risk management towards ineffective implementation by sub-contractors. For future research a quantitative and qualitative approach would be conducted to obtain data in 2018 from sub-contractors who are involved in private construction industry. According to CIDB Malaysia (2017a), nowadays private sector project is a lot more compared to public sector projects. Based onthis data, this research will focus on private sector projects due to accessible and richness of data onrisk management implementation. For the grades of contractor this research will focus on G3 and below which means G3, G2 and G1 due to the pattern of risk management that the contractors appliedand usually these contractors become a sub-contractor. According to CIDB Malaysia (2017b), Grade G1 to G3 contractors registered under CIDB Malaysia form the largest portion of contractors at 77.3% (55,850 contractors). This study will cover ineffective implementation of risk management during construction projects. As at 30 June 2017, the number of construction projects awarded in Malaysia in2016 to private sector are 1,645 and for the government sector is488 which leads to grand total 2,133 (CIDB, 2017b).

6 DATA ANALYSIS STRATEGIES FOR FUTURE RESEARCH

This research will involve one categorysource of data which isprimary. Primary data are collected through survey and interview. The main sources of input data for this research are the data gathered from the literature and through a questionnaire survey to a group of sub-contractors in the construction industry. The questionnaire was based on rank scale of 1-5. The respondents would beasked to evaluate the listed criteria based on a 5 Likert Scale with 1 = Strongly Disagree to 5 = Strongly Agree. For each criterion, the average value of the respondent's assessment will be called the index. To be more descriptive, the data will be analysed from the selected sub-contractor via the interview survey. The dataarethen processed by the means of content analysis for the purpose of generalizing its findings. Feedback from the survey conducted isanalysed using Statistical Package of Social Science (SPSS) Version 24. Apart from that, the structured interview will be conducted with the expert panel at a related area of study on the best strategies of risk management that can be implemented. From there, suitable chart, diagram and schedule will be used to represent the data. Last but not least, conclusion and recommendation are made to conclude the research

findings. These findings will be an input to help the subcontractors working in the construction industry preparing effective risk management processes for their new projects.

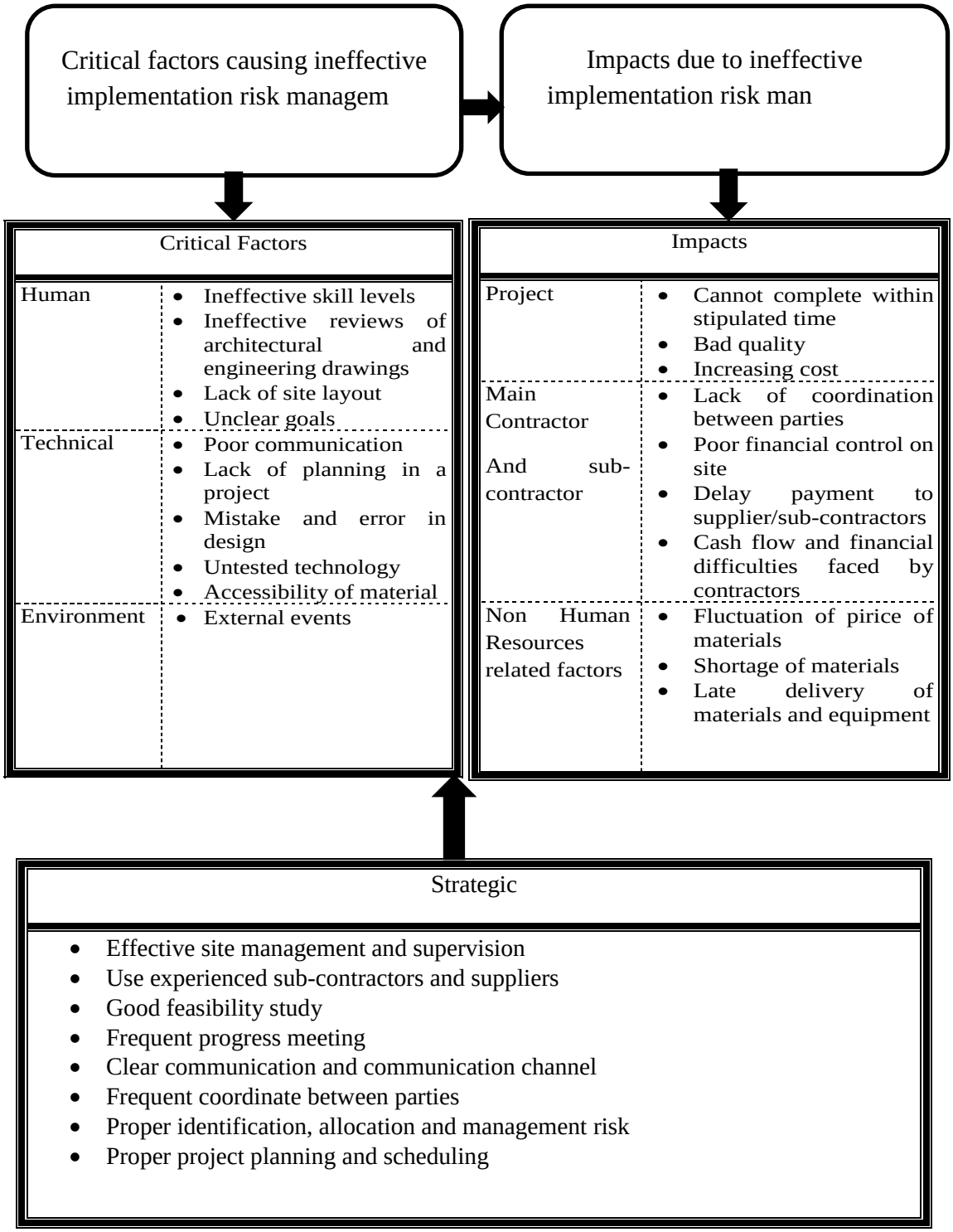

Figure 2 Conceptual Framework of Effectve Risk Management for Sub-Contractors

7 CONCLUSIONS

Based on the synthesis of literature review a conclusion can be drawn about what factors that cause and provide impact due to the ineffective implementation of risk management by sub-contractors. The types of projects, grades of contractors and location were the main focused in this research. The internal risks, external risks and types of risks were reviewed in this research in order to get a better understanding on the importance of risk management. By understanding the causes and effects of ineffective construction management practices, we may reduce or avoid some of the problems that occur in construction projects. The effective implementations of risk management in construction projects leads to people performing their work efficiently, effectively, safely and making construction project becomes a success.

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