Improving the Effectiveness of Risk Management Among Sub-Contractors in the Northern State of Malaysia

Nurqameela Md Radzi[1], Kartina Alauddin[2] and Mohmad Mohd Derus[3]
Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus, 32610 Seri Iskandar, Perak, MALAYSIA

Email: [1]qameela94@gmail.com, [2]karti540@uitm.edu.my, [3]moham266@uitm.edu.my

ABSTRACT

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The risk should be managed crucially by any level of multidiscipline. Construction activities involved hazardous situations and unpredictable incidents during construction. There is a central issue triggered by sub-contractors' tasks, i.e., failure to manage the risk management of main contractors effectively. Many factors contributed to the ineffectiveness of risk management implementation among sub-contractors, including lack of skills and expertise, lack of experience, and communication breakdown with the team. Therefore, this paper significantly provides the results of a survey of sub-contractors involved in the Northern construction projects. The goal of this study concerns the strategies to improve the effectiveness of sub-contractors in managing the risk on site. These are described with the results of the questionnaire survey analysis from 300 respondents. The respondents are from sub-contractors among G1 to G4 in the northern state of East Malaysia. Using the Kruskal-Wallis test, sixteen strategies were identified from the literature have been tested among the sub-contractors. The finding reveals that only ten approaches, i.e., effective site management and supervision, experience contractors, good feasibility studies, project understanding, thoroughly investigate vendor capabilities, frequent progress meetings, systematic coordination between parties, allocation enough resources, the right path, and proper identification of risk does give significant strategies to improve implementation of risk management among sub-contractors in the northern states of Malaysia.

Keywords: Risk Management, Sub-Contractors, Strategies, Effectiveness, Construction

INTRODUCTION

The main cause of construction projects is the ineffective implementation of risk, specifically the ineffective risk analysis that could put any construction project in danger. Phan (2020) mentioned that construction risk management aims to plan, monitor, and control the measures required to avoid risk exposure. Risks cannot be eliminated, but practitioners can improve, minimise, or mitigate the ineffective implementation of risk management by applying risk management principles. Construction projects are inherently complex and involve multiple feedback processes (Naveed and Khan, 2021). 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. Previous studies show that one of the best ways to manage risks is to know the various types and how to manage those risks, but it has not yet been clarified whether the strategy can help sub-contractors in Malaysia's northern state. A successful risk management initiative should be proportionate to the level of risk in the organisation, which is related to the size, nature, and complexity of the organisation, aligned with other corporate activities, comprehensive in its scope, embedded into routine activities, and dynamic by being responsive to changing circumstances (Naveed and Khan, 2021). Problems between contractors and sub-contractors have been identified as some of the factors contributing to delays in the Malaysian construction industry (Yoke-Lian et al., 2012). Thus, the purpose of this paper is to determine the strategies to improve the effectiveness of sub-contractors in the Northern state of Malaysia in managing the risk on site.

LITERATURE REVIEW

Risk Management Terminology

According to Health & Safety Authority (2018), the risk is defined as a 'hazard' situation that could lead to harm. Meanwhile, 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 organization and its external environment or context (McCaig, 2010).

Problem between Sub-Contractor and Main Contractor

Lagiman (2017) identified a poor level of information sharing between main contractors and sub-contractors. Quality of work is a standard coordinated to control all the activities in construction industries to provide the effectiveness and the efficiency of the construction performance. The lack of reliable support from subcontractors will affect the other party's work, especially when the scope of works is related to the quality factor (Nguyen and Nguyen, 2020). However, most poor construction quality occurs due to ineffective communication, information delay, and project complexity (Naveed and Khan, 2021); it can be avoided by implementing effective risk management (Lagiman, 2017). Yuan et al. (2020), in their research on the railway construction cost, found that to achieve sustainable cost control, decision-makers should pay more attention to the effects of cost-estimating risks in their risk management.

The Strategies to Improve Risk Management Effectiveness

Effective Site Management and Supervision

In this context, preservation ensures ineffective risk management can be improved. This mitigation plan is listed under the contractor's site management group. Thus, contractors are entitled to have the skills to monitor and supervise work operations and activities, organise work operations and activities, and have an excellent capability to lead construction sites successfully. The contractors should also improve their site managerial decision-making and supervision skills (Singh, 2020). According to Kluwer (2016), the purpose of management on-site includes work allocation and planning, monitoring performance and compliance, decision making, provision of leadership and team-building and ensuring workforce participation.

Use of Experienced Sub-contractors and Suppliers

Experienced sub-contractors and suppliers are believed to influence the contractor site management performance. Marzouk et al. (2013) mentioned that many problems during work progress might arise because of improper selection of sub-contractors, such as impaired quality of works and delays in project duration. They are also unable to recognise the possible risk that might be appeared for any decisions or actions they took. Meanwhile, experienced sub-contractors will adequately use their experience to ensure no costly action need to be part of their decision. As a result, ineffective risk management can be improved in any possible way.

Use of Appropriate Construction Methods

Nowadays, there is much new technology in the construction industry, including the various methods mentioned to be one of the mitigation plans in eliminating or narrowing cost overrun due to ineffective risk management in the construction project. The contractor is advised to implement the preferred construction method that they usually use. According to Teartisup (2017), appropriate

technology is the proper use of technology, according to situations and the environment such as location, local resource, and cultural and economical for the desired purpose.

Good Feasibility Study

The feasibility study is also known as a preliminary study. It has been carried out at the very early stage of a project to determine the proposed project is feasible, cost effective and profitable or not. According to Mwanzoni (2015), a good feasibility study will give the correct answer before money, time, and resources utilisation on whether the project is viable or not. Besides that, a good feasibility study comprises several elements: the project scope, the current market analysis, the requirements, the approach, evaluation, and review of the proposed project.

Make Sure the Project is Properly Understood before Embarking on

All stakeholders' understanding of the project is necessary to ensure no discrepancy arises during the construction that might increase the project cost (Luceno et al., 2018). It can also assist the contractor inadequately managing the site by the project's requirements. This situation will prevent problems during the project progress, error or mistake during construction, which might delay the project duration and cost.

Attempt to stay within the Scope that was Originally Planned

Changing project scope during construction is the biggest challenge for the project manager and contractor. This will result in variation works that might omit the cost or addition in the contract sum in the worst scenario. According to Viswanathan (2012), drastic scope change will put a project in danger, including the risk of construction cost overrun. It is essential to create awareness of how the project scope might impact the project.

Thoroughly Investigate a Vendor’s Capabilities

One of the ways to eliminate or narrow the ineffective implementation of risk management is by thoroughly investigating vendors’ capability, especially their financial status. The team’s capability needs to evaluate whether it matched the proposed project prerequisite condition. Improper or unmatched skills required can cause a significant draw to the project (Viswanathan, 2012).

Exchange Rates where On the Particular Date the Estimate Was Compiled

As currency fluctuation can impact the project’s financial management, the estimation should include a statement of the exchange rates. The exchange rate statement might be advantageous for the contractor’s financial management in any construction project.

Frequent Progress Meeting

A progress meeting is held in a construction project to enable the client to receive the construction progress report. All the parties involved in the project need to attend this meeting. The decision can be made during the meeting, and the information can be transferred to the respective parties. Few issues might be raised during the progress meeting, such as quality issues, design issues and some issues that may impact the cost.

Clear Information and Communication Channel

A clear information and communication channel is needed to resolve issues in a project. It is essential to avoid any ambiguous matter during the construction as it may affect the construction

productivity. According to Aiyewalehinmi (2013), stated in his research that construction productivity is related to the quality of information flows between the people involved in the project, including the people who manage the project as well as the people who do the works.

Frequent Coordination between the Parties

Frequent coordination between parties is believed to counter all issues, such as delays in the project schedule. Based on the study by Divya and Ramya (2015), poor communication and coordination is a crucial factor related to both client and contractor, which causes construction delays. Thus, this method is also believed to overcome and narrow the ineffective risk management in the construction project.

Developing Human Resources in the Construction Industry

One of the factors causing cost overrun due to ineffective risk management relates to human resources, which is the workforce or worker to carry out the work. The high demand and low supply of workers in construction are the factors for the government to develop human resources in the industry. The lack of skilled labour in a particular work will make the contractor calls for expertise from other countries. Thus, developing human resources such as giving technical knowledge to personnel might overcome this issue.

Allocation of Enough Resources for Complexity of Works related to Design Change

The design change is expected in construction. For a complex design change, the resources, including people, materials and equipment, are crucial to ensure the scope is buildable. Sufficient resources must be well allocated to cope with the design change. According to Watt (2014), resource planning is necessary to ensure the resources are available and assigned to each activity in your project. This approach can eliminate ineffective implementation risk management as idle resources can be avoided, and proper help can be achieved.

Stay Diligent about Keeping the Project on the Right Path

Project planning is the first thing to be done before starting the work on site. It involves the production of a work programme which includes the time and duration to do the job. As it is already planned early, the contractor should keep the project on the right path. According to Buys (2015), it is mentioned that to help the project to stay on track, the project's goals need to be defined as per client requirements. The project goal is to ensure the project success, which is to complete a project within the stipulated time, budget and required specification.

Proper Identification, Allocation and Management of Risk

Construction is a risky business. However, it can be controlled. As said by Sir Michael Latham, no construction project is free of risk. It can be managed, minimised, shared, transferred or accepted. However, risk cannot be ignored. Each risk involves money. Thus, proper identification, allocation, and management of risk are necessary to overcome the problems.

Proper Project Planning and Scheduling

The most crucial element in project management is planning and implementing effective risk management, and it is used to fight against cost overrun and delays. Proper planning and scheduling have been supported by Mochai (2009), which stated in his article that proper project planning allows for a reduction of the cost and duration and increases the quality of the project's life.

RESEARCH METHODOLOGY

This research is based on a quantitative approach, which involved the production of a questionnaire regarding the 16 strategies in improving the effectiveness of risk management among sub-contractors. The questionnaire was based on a rank scale of 1-5 to be ranked. The respondents were asked to evaluate the listed criteria based on a 5 Likert Scale with 1 = Strongly Disagree to 5 = Strongly Agree. This research has used the probability sampling technique, a simple random sampling method. The targeted sample in this study is contractors registered under the Construction Industry Development Board (CIDB) in Malaysia. To achieve the confidence level of this research, about 342 questionnaires were distributed to all contractors from G1 to G4 in the northern area of Malaysia. The method used to distribute the questionnaire is by online survey (google form). As a result, 300 respondents give their feedbacks. Feedbacks from the survey were analysed using SPSS Version 24. The data analysis is processed using the Kruskal-Wallis test to compare significant differences in agreement among the contractors.

ANALYSIS AND DISCUSSION

There are 342 questionnaires distributed to the target population. Three hundred (300) questionnaires were returned and valid for further analysis. Most of the respondents are contractor G2 with 37 percentages, followed by contractor G1 with 26 shares. Then contractors G3 are higher than G4, which is 19 and 18 percentages respectively.

Kruskal Wallis Results for Strategies to Improve Risk Management among Sub-contractors

Table 1 shows the strategies to improve the effectiveness of the implementation of risk management, Kruskal-Wallis test results, degree of freedom, and significant level based on the respondent's grade of organisations. The purpose of this analysis is to test whether there is a substantial relationship between contractor grades with the factor chosen for strategies to improve risk management among sub-contractors. Based on Table 1, out of 16 means, six factors showed no significant (NS) difference. On the other hand, the remainder criteria demonstrated a significant difference between respondents. It shows that respondents achieved consensus on the ten factors that will be great strategies to improve risk management among sub-contractors in the northern state of Malaysia.

Table 1: Strategies to Improve Risk Management among Sub-contractors

Item	Strategies To Improve	H Statistic	df	Establish	Significant Level	Remarks
1	Effective Site Management and Supervision	6.677	3	0.083	p<.05	S
2	Use Experienced Contractors	11.804	3	0.008	p<.05	S
3	Use Appropriate Construction Method	3.616	3	0.306	p<.05	NS
4	Good Feasibility Studies	8.035	3	0.045	p<.05	S
5	Project Understood Before Embarking	9.787	3	0.020	p<.05	S
6	Attempt To Stay Within the Scope	5.090	3	0.165	p<.05	NS
7	Thoroughly Investigate Vendor Capabilities	9.167	3	0.027	p<.05	S
8	Include Statement of Exchange Rates	0.469	3	0.926	p<.05	NS
9	Frequent Progress Meeting	16.389	3	0.001	p<.05	S
10	Clear Information and Communication	5.985	3	0.112	p<.05	NS
11	Frequent Coordination Between Parties	7.798	3	0.050	p<.05	S
12	Developing Human Resources	2.915	3	0.405	p<.05	NS
13	Allocation Enough Resources	21.410	3	0.000	p<.05	S
14	Keeping Project Right on Path	8.826	3	0.032	p<.05	S
15	Proper Identification of Risk	8.571	3	0.036	p<.05	S
16	Proper Project Planning and Scheduling	1.383	3	0.709	p<.05	NS

Effective site management and supervision

The surveys show that respondents identified effective site management as the most critical criteria that influence the decision to overcome the implementation of risk management among sub-contractors. The importance of having effective site management is to achieve a successful construction project in terms of work operations and until the handover of the project. Kluwer (2016) said that the purpose of supervision on-site includes work allocation and planning, monitoring performance and compliance, decision-making, provision of leadership, and team building to ensure workforce participation. Effective site management can also provide all workers to mitigate the on-site risk during construction in achieving zero-injury cases. This is supported by Project Academy (2012), which said that construction site management is preserving living and non-living elements by adopting appropriate management of construction activities.

Use of experiences contractor

Most respondents accept that employing experienced contractors in construction can overcome the issues arising from the improper implementation of risk management among sub-contractors. This is because professional sub-contractors and suppliers affect the contractor site management

performance. A previous study showed by Marzouk et al. (2013) many problems during work progress might arise because of improper selection of sub-contractors, such as impaired quality of works and delay in project duration.

Good feasibility studies

A good feasibility study is another criterion that is indicated as a top priority of strategy to overcome the ineffective implementation of risk management issues among sub-contractors. A good feasibility study benefits the project's cost and makes the task more profitable. This is supported by Mwanzoni (2015) by stating that having a good feasibility study will give the correct answer before money, time, and resources are spent on whether the project is viable.

Project understood before embarking

Respondents agree that all sub-contractors must understand their project as a strategy to overcome the ineffective implementation of risk management among sub-contractors. This stage aims to ensure all parties can see all the risks that might arise during the construction period. Therefore, all sub-contractors can plan well and organise their work carefully. Luceno et al. (2018) said that a good understanding of the project before embarking from all stakeholders could mitigate the discrepancy during the construction of the work.

Investigate vendor capabilities

All respondents indicated that a thorough investigation of the vendor's capabilities is a strategy to overcome the ineffective implementation of risk management among sub-contractors. Due to the much trade involved in construction, many products and suppliers are needed in construction projects. Hence, all parties must evaluate their vendors before buying any product and their record in supplying the material (Viswanathan, 2012).

Having frequent progress meeting

The frequent progress meeting is another essential strategy agreed by the respondents as one of the strategies to overcome the ineffective implementation of risk management among sub-contractors. A progress meeting is held in a construction project to enable the client to discuss the dispute, and all problems arrive within the construction period. During the meeting, the decision can be made between the parties involved in construction.

Frequent coordination among key players

All respondents agree that frequent coordination between parties is one of the essential strategies to overcome the ineffective implementation of risk management among sub-contractors. A study by Yap (2013) mentioned that frequent coordination between parties involved is one of the top five methods to prevent construction delays. Hence, this method is also believed to overcome and narrow the ineffectiveness of risk management in construction projects.

Allocate enough resources

Allowing enough allocation of resources in construction is an essential strategy in overcoming the ineffective implementation of risk management among sub-contractors. Changes in design are common in the construction phases; hence, it needs enough resources to cope with this matter. When the procedure becomes more complex, it might involve many resources to succeed. According to Watt

(2014), resource planning is necessary to ensure the resources are available and signed for each activity in a project.

Keep the project on the right path

The respondents also agreed on this criterion to overcome the ineffective implementation of risk management among sub-contractors. Keeping the project on the right path can increase risk management performance and solve the issue at the site. In continuity, the project can be done more efficiently and finished. Buys (2015) mentioned that to help the project stay on track, the project's goals need to be defined as per client requirements.

Proper risk identification

As we know, construction is one of the riskiest businesses. Due to the complex design and hazardous nature of work, construction players agree that identifying risk is essential to overcome the ineffective implementation of risk management among sub-contractors. Each activity needs a proper planning before embarking on the project. Abdul Rahman et al. (2012) mentioned that humans and machinery are the most critical resources in construction industries.

CONCLUSIONS AND RECOMMENDATION

The study has clarified the strategies to improve risk management effectiveness among sub-contractors in the Northern states of Malaysia. By understanding the causes of the invalid risk management practice, the sub-contractors can help reduce some of the problems associated with the risks in the construction project and improve the risk management effectiveness. Successful implementation of risk management can result in efficient, effective, and safe construction projects for the sub-contractors. Further study may employ a qualitative or mixed-method approach and widen to all states in Malaysia. The richness and accuracy of the data may be increased should interviews be conducted in addition to the questionnaire survey. During pandemic Covid 19, further research may also be employed on how contractors solve this pandemic risk in their project. Respondents might misunderstand the questionnaire hence misleading the study outcomes. The research direction may also narrow down to a single case study.

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