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Identification Type of Risk with Evidence to Kelantan's Flyover Projects

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Abstract

Risk management is a process to determine the project risks, analyse them, and decide on how to avert the risks on any project. However, steps in the risk management process should be included to deal with risks existed. Therefore, the objective of this paper is to determine common risks within the construction process of the flyover construction in Kelantan. For this research, the method used was the quantitative method by using a questionnaire survey. The respondents of this research were contractors G7 located in Kelantan. A total of 84 questionnaires were distributed, with 54 returned them. The analysis on the data collected was executed through the use of Statistical Packages for Social Science (SPSS) program. The collection of information was analysed thoroughly to produce a definite conclusion from the research that may help with the issue. The findings showed that ten items were identified. The result revealed that an escalation of construction material prices, unexpected subsurface conditions that cause difficulty to execute subsurface-related works and climates of weather problems that affect the construction progress and damages to a person's property or materials were crucial type of risks in construction process of the flyover construction in Kelantan. Further study suggests the study on risk management in more depth, widely and focusing on a project in Malaysia.

Keywords: Risk Management, Flyover Risks, Risks Identification, Flyover Construction, Kelantan

Introduction

The construction sector is one of the most demanding and difficult in Malaysia among other industries. This is because it differs from other industries due to its complex features. Because of its distinctive characteristics, including lengthy project timelines, intricate processes, high financial stakes, environmental restrictions, and dynamic organisational structures, the construction sector is therefore more vulnerable to risks than other industries

(Manal, 2019). According to its occurrence and effects on a project, risk can vary from one to another, and risk can alter during the course of a project's life cycle as adopted by (Adeleke et al., 2020 in Smith et al., 2006). Among all projects, , highway and flyover construction is considered as one of the hardest to be executed, particularly in congested areas, where it has higher level of risks associated with time, cost, and quality.

According to Adeleke et al (2020) report that recent industry risk management practices are disorganized, perpetual, and lax, leading to inadequate risk management. Therefore, if an accident occurs during construction, the risk management system may not be able to solve the problem, causing inconvenience to the people involved.

Patil (2019) reported that the construction of flyover bridge can be just as hazardous as the construction of highways as it involves not just the on-site workers, but also includes the pedestrians and non-site occupants all around. This is because the construction process is mainly executed right above the existing usable roads that may have vehicles passing by. Therefore, constructing the flyovers also requires a thoroughly planned risk management that will ensure minimal number of accidents towards all individuals within and outside the site.

Definition of Risks

Risk refers to uncertainty about and severity of the events and consequences (or outcomes) of an activity with respect to something that humans value (Aven & Renn, 2009). Risk is the effect of uncertainty on objectives (Risk Management, ISO, 2009). Risk also can be described as any situation or activity that is exposed to danger. According to Patil (2019), risk can be defined as the possibility of losing or gaining something, physical health, social status, or financial wealth through risk taking. Risks has two main components. That is, the likelihood that something will happen and the consequences if something happens. In the context of construction projects, or projects in general, risk is defined as the likelihood that something will happen that will jeopardy the project goals.

In the context of construction management, risk management includes a broad and structured method of identifying, analyzing, and response towards potential risks in order to achieve the goals and objectives set by a construction project (Manal, 2019).

Risk Categories

According to research executed by Choudhry & Aslam (2019) the risks fall into different categories, each with a different weight of project impact and frequency of occurrence in flyover construction projects. The same journal notes that risk categories were ranked by relative importance indicators, with financial, external, design, and administrative risks ranking in the top four of the seven categories. The external risks include several subcategories which are political, economic, legal, social, and environmental risks.

While Yadeta (2019) reported that each of subcategories under the external risks has its own subcategorised risks that commonly occurs in construction projects. Economic and political risks stood out as the highest in the of importance under external risks, with price inflation and corruption respectively placed highest in the rank under their own categories. While technical and management risks were ranked two of the highest in terms of internal

risks, which include major problems such as design changes, inadequate equipment, and labour, as well as coordination issues among the workers involved in the construction.

On the other hand, another research on risk management was also done by Patil (2019) where risk factors were ranked according to its importance and frequency of impacts on the projects, regardless the categories. The list includes design changes, poor site management, price fluctuation, unpredictable site condition, weather problems, and damages to surrounding structures.

Methodology

This study used a quantitative method, in which respondents were selected according to judgments made, also known as judgment sampling or targeted sampling, and only those who met the required characteristics were included in the data collection process. . study. The questionnaire was distributed to his G7 contractors responsible for constructing most of the overpasses in Kelantan, both from a design and construction perspective. According to these companies' websites, they have their own team of investigators, project managers, and most of the experts involved in the project. Porter (2019) also states that an acceptable response rate by email is 25% to 30%, he said. Most studies consider a 60% response rate to be acceptable (Fincham, 2008).

Table 1
Population and sample size of this research

Description	**Sample**
Quantity of distributed questionnaires	84
Quantity of returned questionnaires	54
Percentage	64%

Analysis and Findings

The data analysis process utilized the percentage analysis method in order to produce analysis findings that are understandable. The findings will be provided through tables with all necessary information needed. Among all options, quantity surveyor has the highest number of respondents which totalled up to 59% out of all other. Followed by project managers with 32% and other positions with only 9%, which is the lowest percentage among other data for these questions.

It is important to acknowledge the role of the respondents within their companies, in order to gain various stakeholders' perspectives regarding the risk management implemented on the flyover constructions to ensure a more diverse answers and opinions on this topic.

Table 2
Type of Risks

Item	Description	Rank	Perception Level	Mean
1)	Escalation of construction material prices.	1	Strongly Agree	4.77
2)	Unexpected subsurface conditions that cause difficulty to execute subsurface-related works.	2	Strongly Agree	4.77
3)	Climates of weather problems that affect the construction progress.	3	Strongly Agree	4.45
4)	There are no damages to a person's property or materials due to the construction.	4	Strongly Agree	4.42
5)	Inappropriate engineering and constructing techniques due to unclear and inadequate details in design drawings and specifications.	5	Strongly Agree	4.36
6)	Poor site management and supervision that cause confusion among on-site workers.	6	Strongly Agree	4.32
7)	Shortage of construction labours or tools and equipment	7	Strongly Agree	4.28
8)	Geological conditions that cause difficulty to access the site.	7	Strongly Agree	4.28
9)	Inadequate safety and health measures that cause	8	Strongly Agree	4.26
10)	casualties.	9	Strongly Agree	4.21
11)	Sudden design changes.	10	Strongly Agree	3.85
	Changes in tax regulations.			

According to Table 2 above, it shows that this research found that the most common risk that occurs in flyover construction is the 'Escalation of construction materials price', with the highest mean score of 4.47. This finding can be reinforced by Kumar (2020), where it is reported that one of the major risks of a construction project is due to price escalation of the materials, particularly for a long-term project where the hazard is most likely to occur. It is also stated in the same journal where it is critical to maintain and track the indicators in the market and the construction industry, in order to analyse the effects on the cost of construction project, to provide early planning for remedial measures to minimize the impact.

On the other hand, the least common risk that happens during flyover construction is under the economic risk category, which is the 'Changes in tax regulation'. This finding can be supported by Waidyasekara (2021), stated that tax rates corelate with the economic growth which can affect the construction industry, both in bad and good terms. Thus, proving that changes in tax regulations can indeed affect the construction of flyover and can still be considered as a risk.

Conclusion

In conclusion, flyover projects which has the higher probability for the risks to occur due to their construction nature which can cause harm to both the project and the surrounding structures and people. According to table 2, the type of risks listed can be classified into improper planning from the management team as the major finding in this

study. It is important for the risk management planning to be executed appropriately to ensure maximum effectiveness. This study contributes to the main type of risks that could have different approaches from the responsible construction player to mitigate and control the level of risks by using risks management. An efficient risk management can become one of success factors of construction projects as they provide backup plans and risk mitigation methods that can lessen the impacts on the development on various aspects.

Therefore, the suggestion that appropriate to this issues is using well-planned risk management that can assist with minimizing negative effects on the construction by assessing all possible risks and providing the most suitable solutions to each of them to counter any further problem. According to PMBOK® Guide, defines a risk management process as the "systematic process of identifying, analyzing, and responding to project risks. The elements of the risk management process consist of Risk Management Planning where initial work was performed to identify the risk management approach to be used on the program and the program-specific assessment criteria. Next is risk identification, which is a process of identifying the potential sources of risks both initially and on an ongoing basis. The next step is risk assessment where is the process of assessing the risks against the program assessment criteria. And the next steps in the risk management is risk response. According to Petrovic (2017) stated that risk response is referred to as generating various methods in managing and prevent the risks into a number of possibly effective choices, as well as determining on the best response, based on the risks that may occur. It is a creative process of identifying the risk response strategies that will be used and the detailed risk response plan. The process of responding to risk generally includes the appointment of qualified parties to deal with the risks, based on their expertise, so that the risks can be handled appropriately. Last but not least, Risk Monitoring and Control is vital to ensure the risk management is well control and achieved the objective.

The harmonization among the stakeholder and environment is crucial for long term sustainability of the environment. A well-planned risk management can assist with minimizing negative effects on the construction by assessing all possible risks and providing the most suitable solutions to each of them to counter any further problem.

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