

The Identification of Risk Factors of Delay On The Road Construction Project in Indonesia

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Abstract— In the construction of road projects, there are risks in, especially related to the time of project. This is a concern because in its construction, road projects are often related to social impact in the society, such as the road closures, the route changes, etc. The delay in road projects will impact not only to the contractor and the project owner, but also to the society. The purpose of this research is to identify the risk factors that cause delay in the road construction project. Meanwhile, the purpose of this study is to identify risk factors that affect the occurrence of delay in road projects from the perspective of contractor. The method used in this research was quantitative descriptive method. The primary data used in this study were obtained through survey method, questionnaire, and interview. While the secondary data obtained through literature studies previous studies and existing project data. Data processing method in this research use Risk Breakdown Structure for risk factor causing delay in road project.

Keywords— Risk Management, Road Project, Factors of Delay Project

I. INTRODUCTION

Infrastructure projects are the heart of the economy. Because, infrastructure is able to provide a multiplier effects. Infrastructure is an opening for the rise of other sectors. In addition, infrastructure, especially road infrastructure, is able to promote equity, reduce poverty, reduce unemployment, and reduce the gap in socio-economic factors.

Road infrastructure is a land transportation infrastructure that covers all parts of the road, including complementary buildings and equipment that are intended for traffic, which is on the ground, above ground level, below ground level and / or water, and above the water surface, except railroad tracks, lorry roads and cable roads. Roads as part of transportation infrastructure have an important role in the fields of economy, socio-culture, environment, politics, defense and security, and are used for equity to create people's prosperity [1].

In the construction of road projects, there are risks in them, especially those related to the time of construction. This is a concern because in its construction phase, road projects often relate to social life in the society, such as examples of road closures, the transfer of flows, and so on. Delays in road projects will have an impact not only on contractors and project owners, but also on the society.

Risk is a consequence of uncertain conditions. In a construction project, the uncertainty is very large because it

cannot be predicted exactly how much profit or loss will be obtained [2].

Risks related to the time of construction project on road infrastructure were the main concerns in this study. Some road projects have a social impact on the surrounding communities during the construction. Project delays will have a greater impact on social aspects. With the identification of risks that can lead to delays in road projects, it is expected to be used as a reference for road projects.

The purpose of this study is to identify risk factors that affect the occurrence of delays in road projects from the perspective of contractor.

II. LITERATURE REVIEW

A. Literature Review of Construction Project Risk Management

Risk management is an important part of the risk taking process in construction projects. Risks can have an impact on project productivity, performance, quality and costs. Risks in construction projects cannot be eliminated, but these risks can be minimized or transferred to third parties [3].

Risk management is a systematic process, identifying, analyzing and determining risk response. This also includes maximizing the likelihood of positive events and minimizing the possibility of adverse events to achieve project goals [4]. Risk identification is defined as a process of identifying systematically and sustainably, classifying risks and carrying out initial assessments of risks associated with construction projects [5].

B. Literature Review of the Causes of Delay in Construction Projects

The success of the project can be defined as achieving goals as determined in the project plan, these objectives are related to cost, quality, and time. A successful project means that the project has completed its technical performance according to specifications, maintains its schedule, and remains within budget costs. [6].

The project objectives or project objectives are accuracy in cost, quality, and time. Projects that are not managed properly will have an impact on cost overrun and delay.

In construction, delay can be defined as overtime, because it is outside the settlement date specified in the contract. Delay of project is a project that passes the time of

the scheme planned and is considered a common problem in construction projects. For the owner, delay means loss of income. In some cases, for contractors, delays mean higher overhead costs due to longer service periods, higher material costs through inflation, and due to increased labor costs [7].

The causes of delay were classified into nine (9) groups according to the source of delay : Related to the project, owner, contractor, consultant, design, materials, equipment, labor, and external factors [7].

The main factors causing delay in construction projects, where the assessment was based on the perception of the owner, contractor, and consultant. Assessment is carried out on the same causative factor. The results showed that the main cause of delay in construction projects was financial / cashflow factors [22]. The other expert said that the main factors causing delay in road construction project was the resources management, such as the equipment and labour in project [8].

C. Literature Review of the Risks That Impact on Delays in Construction Projects

Delays occur in most construction projects, both simple and complicated. Construction delays can be defined as time outside the contract date or beyond the date on which the parties agree to sending the project or service to the customer [7].

The risks that have an impact on the completion of the project are related to labor, contractor, consultant, owner, material, and external factors [9].

III. RESEARCH METHODS

The method used in this research is quantitative descriptive method, which is a form of research based on data collected during a systematic study of the facts and properties of the object under study by combining the relationships between the variables involved, then interpreted based on the theory and related literature.

Descriptive research is research that answers the formulation of a problem regarding an independent variable. Quantitative research is research based on the philosophy of positivism, used to examine certain populations or samples, data collection using research instruments, data analysis is quantitative / statistical, with the aim of describing and testing predetermined hypotheses [10].

Data retrieval in this study uses questionnaires and interview techniques to determine the opinions or perceptions and experiences of respondents about risk factors that affect the occurrence of delays in the road project.

A. Research Variable

Based on references from previous studies that already exist, obtained research variables that will be used in this study. The variables causing the delay factor in the road project in this study will be categorized into 9 categories of causes of delay as follows [7]:

- project,
- owner,

- contractor,
- consultant,
- design-team,
- materials,
- equipment,
- manpower (labor), and
- external factors

B. Research Flow Chart

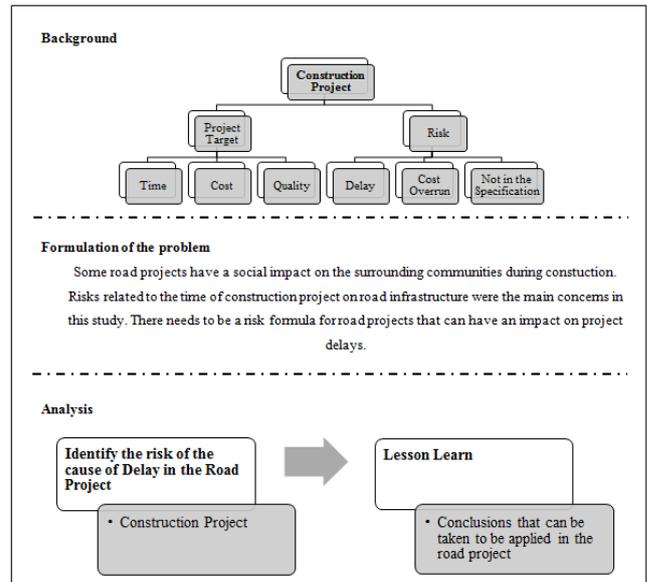


Fig. 1. Research Flow Chart

C. Data Collection

There are two types of data used in this research case study, primary data and secondary data. Primary data is obtained by conducting interviews, field observations with competent and expert parties. The primary data in this study are risk identification, and validation. Secondary data is obtained from technical documents on the project, study of literature, journals, papers and previous studies which can be used as guidelines to obtain initial risk identification combined with primary data.

D. Research Instruments

There are two types of data used in this research case study, primary data and secondary data. Primary data is obtained by conducting interviews, field observations with competent and expert parties. The primary data in this study are risk identification, and validation. Secondary data is obtained from technical documents on the project, study of literature, journals, papers and previous studies which can be used as guidelines to obtain initial risk identification combined with primary data.

- Questionnaire

This study requires a means in the form of a questionnaire that helps respondents answer a number of

questions provided. Questionnaire is a data collection technique by giving a set of questions or written statements to the respondent to answer. The questions contained in the questionnaire are about risk identification : the factor that causes delay in the project based on the perspective of each respondent.

- Interview

Interviews were conducted in a structured manner, which was carried out systematically based on a guide interview sequence that had been prepared before the interview. The interview technique in this study was to ask questions related to the factors causing the delay in the road project from the perspective of each respondent.

E. Data Processing and Analysis

Identification of Risk Variables is used to identify risk factors. The risks identified were obtained by brainstorming with the contractor at the time of the initial survey. The process of risk structuring at this stage can be facilitated by grouping risks using the Risk Breakdown Structure (RBS) method.

IV. RESULTS AND DISCUSSION

Based on literature studies that have been carried out, delay factors in construction projects have been examined by several experts. The risk identification variables in this study are as follows :

TABLE I. VARIABLE CAUSES DELAY IN ROAD CONSTRUCTION PROJECTS

	Identification of Risk	References
INTERNAL	Poor contract management	[11]; [12]; [21]; [22]
	Material shortages	[11]; [12]; [16]; [18]; [21]
	Poor cashflow management	[20]; [12]; [17]; [21]; [22]
	Estimated inaccurate costs	[12]; [21]; [22]
	Inappropriate implementation methods	[14]; [23]
	Lack of supply of skilled and unskilled labor	[18]; [21]; [14]
	Slow decision making by the project team	[15]; [17]; [21]; [22]; [23]
	Resource management problems	[17]; [18]; [20]; [22]
	Planning and scheduling issues	[18]; [21]; [22]
	Lack of equipment, unskilled operators, slow maintenance and old equipment.	[18]; [21]; [23]
	Delay in checking and testing work	[21]
	Low Bid	[20]; [21]; [22]

	Identification of Risk	References
EKSTERNAL	Lack of communication	[21]; [23]
	The overall organizational structure inappropriate related to the project	[22]; [23]
	Slow decision making by outsiders	[17]; [21]; [23]
	Inadequate control procedures	[21]
	Fluctuations in costs	[22]; [23]
	Change in scope of work (added work)	[13]; [22];
	Bad weather	[13]; [17]; [19]; [21]; [22]; [23]
	Accessibility	[13]; [22]
	Design changes	[14]; [16]; [18]; [19]; [22]
	Late payment to the contractor	[14]; [18]; [21]
	Poor management and supervision	[15]; [20]; [22]
	Unexpected location conditions	[15]; [17]; [19]; [21]; [22]
	Labor disputes and strikes	[17]; [22]; [23]
	Licensing and bureaucracy in government institutions	[18]
Delay in delivery of material	[19]; [21]; [22]	
Poor design	[18]; [19]	
Delay in work agreement	[14]; [22]	
Late information / bad communication	[21]; [23]	
Land acquisition problems	[21]	
Subcontracting system	[22]	
Relationship between parties who contract	[22]	
Errors and non-conformities in contract documents	[23]	

Source : Analysis

Risk identification that causing delay on road construction project based on study literature are 34 risks that divided into 14 internal risks and 20 external risks. The identification of these risks can be used as reference in road construction project to develop risk management concepts in forecasting delay in the project.

V. CONCLUSION

The conclusion from this research based on the study literature that has been done is that the cause of the delay in road construction project consists of 34 risks, where many risks arising from eksternal factors. For further research, it

can be analyzed the risk and risk response that is expected to reduce the probability of potential delay in road construction projects.

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