



Identification of Risk Factors Cause Cost Overrun at Toll Road Project

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In Central Java, Indonesia currently has several toll road projects that are also included in the government's national strategic project. This project is a series of Trans Java Toll Road, which connects Java from the West to the East. As a national government strategic project, these projects are a priority. The high demands from the government have an impact on project targets primarily related to costs. Unexpected costs in the project arise in an effort to solve problems. Any change in project cost results cost overrun in the project. The purpose of this study is to identify risk factors that affect the occurrence of cost overrun on toll road projects. This research is restricted to toll road objects in Pantura (national strategy project) that are still in the construction process. The method used in this research is qualitative descriptive method. The data used are secondary data derived from previous research on similar topics.

Keywords: Risk at Construction, Cost Overrun, Highway Project.

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1. INTRODUCTION

One of the challenges in Indonesia's increasing economic growth and improving competitiveness is the improvement of infrastructure. The quality of Indonesia's infrastructure in the 2013–2014 is ranked 82 out of 148 countries.¹ One of the infrastructure that plays an important role in supporting the economic growth of a country is the road infrastructure. Road plays an important role because it is useful in supporting the smooth of goods transportation and services, and also the road infrastructure serves to connect an area to the others.

Pantura road is one of the national road in Indonesia with length of 1,316 km. This road passes along the north coast of Java and passes through at least 5 (five) provinces in Java Island. Pantura can be said as the main vein of transportation in Indonesia, especially Java because is has high level of significance where the road is traversed by approximately 40,000 to 50,000 vehicles on a daily basis.²

There are currently several toll road projects that are included into the government's national strategic project in Central Java. The toll road project is being held to assist the performance of Pantura in accommodating the vehicles.

The obstacles were the high demand and expectation of the government to the projects that included in the national strategy project. The problems in the project plus the high demands from the government have an impact on project targets primarily related to costs. Unexpected costs in the project arise in an effort to solve problems in the project. Any change in the project

cost will resulted in cost overrun in the project. Cost overrun is a condition in which the actual cost exceeds the planned cost.⁴ The purpose of this study is to identify the risk factors that affect the cost overrun on toll road projects, in this case in Pantura toll road project.

2. MATERIALS AND METHODS

The research method was qualitative, means a study that examines the quality of relationships, activities, situations, or various materials. The data used were secondary data obtained from journals and previous studies that used as a guidance to obtain the risk identification of causing cost overrun in toll road projects.

3. RESULTS AND DISCUSSION

Risk management is an approach that made toward risk. It was done by identification and analysis of risk. Risk identification is the most important step in project risk management (PRM), as the risk models are constructed based on previously defined risk sources and their interrelations.³

In reviewing the cost overrun the risk identification factors, that have the potential impact on project costs, must be known. Cost overrun in the construction phase is highly dependent on the planning, coordination, control of the contractor, and also on the estimation cost planning.⁴ Based on the literature studies that have been done, the factors of cost overrun in construction project shows as in Table I.

Based on references from previous researches, risks of cost overruns in toll road projects has been identified. In general,

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Table I. Previous studies.

No.	Researchers	Title of the study	Factor of cost overrun
1	Jesper Kranker Larsen, Geoffrey Qiping Shen, Søren Munch Lindhard, and Thomas Ditlev Brunoe ⁵	Factors affecting schedule delay, cost overrun, and quality level in public construction projects	Material consultant misjudgment; inconsistency of project documents; late user change; lack of preliminary examination before design or tendering; inexperienced consultant
2	Garry D. Creedy, Martin Skitmore, and Johnny K. W. Wong ⁶	Evaluation of risk factors leading to cost overrun in delivery of highway construction projects	Changes in the design and scope of work; inadequate investigation and latent conditions; lack of documentation, specifications and design; the cost of project management by the owner; relocation cost; constructability; price extraction; right-of-way-costs; contractor risk; environment
3	Aftab Hameed Memon, Ismail Abdul Rahman, Ade Asmi Abdul Azis ⁷	Preliminary study on causative factors leading to construction cost overrun	Poor design and design delays; unrealistic contract duration and scope of work; lack of experience; delays in delivery of materials and equipment; relationship between management and workers; late preparation and approval of drawings; inadequate planning and scheduling; site management and supervision incompetence; errors during construction; change of specification and material type
4	Hamed Samarghandi, Seyed Mohammad Moosavi Tabatabaei, Pouria Taabayan, Ahmad Mir Hashemi and Keith Willoughby ⁸	Studying the reasons for delay and cost overrun in construction projects: The case of Iran	From a contractor's perspective: Inaccuracy of budget planning and resources; use of low quality materials and lack of equipment; lack of experienced human resources. From the consultant's perspective: Less accurate in the FS review; technical document error; inaccuracy of technical documents.
5	Henry Alinaitwe, Ruth Apolot and Dan Tindiwensi ⁹	Investigation into the causes of delays and cost overrun in Uganda's public sector construction projects	Changes in the scope of work; late payment; weak supervision and control; the high cost of capital; security and unstable political conditions.
6	Tonny Sahusilawane, Mohammad Bisri, Arif Rachmansyah ¹⁰	Analysis of causes factors cost overrun on building construction project in ambon city	The high frequency of implementation changes; too much repetition of work because of poor quality; Too many projects are handled at the same time; lack of coordination between the main contractor and the sub-contractor; lack of coordination between construction manager-planner-contractor; disagreements occur within the project process; the project manager incompetent.
7	Oko John Ameh, Aliu Adebayo Soyngbe and Koleola Tunwase Odusami ¹¹	Significant factors causing cost overrun in telecommunication projects in Nigeria	Risk factors include construction, financial condition, cost estimate, environment
8	Sameh M. El-Sayegh, Ph.D.; and Mahmoud H. Mansour ¹²	Risk assessment and allocation in highway construction	Of the 33 risks identified in toll road projects in the UAE. The risk of planning inefficiencies is rated as the greatest risk to the project.

Table II. Risk identification.

Identification of risk	References
Internal	
Poor design	Creedy et al., ⁶ Memon et al., ⁷ El-Sayegh et al., ¹² Samarghandi et al. ⁸
Frequent design/scope of change	Creedy et al., ⁶ Memon et al., ⁷ Samarghandi et al., ⁸ Alinaitwe et al., ⁹ Ameh et al. ¹¹
Inexperienced or newly qualified consultant	Memon et al. ⁷
Inexperienced or newly qualified contractor	Larsen et al., ⁵ Memon et al., ⁷ Samarghandi et al., ⁸ Ameh et al. ¹¹
Delays in reviewing and approving design by client	Memon et al. ⁷
Mistake in technical documents	Memon et al., ⁷ Samarghandi et al. ⁸
Inadequate labour availability	Alinaitwe et al., ⁹ Ameh et al. ¹¹
Low productivity of labour	Memon et al., ⁷ Samarghandi et al. ⁸
Fluctuations in the price of materials	Creedy et al., ⁶ Memon et al., ⁷ Ameh et al. ¹¹
Adherence of outdate construction method	El-Sayegh et al., ¹² Samarghandi et al. ⁸
Rework	Memon et al., ⁷ Alinaitwe et al. ⁹
Poor monitoring	Alinaitwe et al. ⁹
Eksternal	
Subcontractor's performance	Memon et al. ⁷
Unforseen soil conditions	Lee (2008), El-Sayegh et al. ¹²
Government policies (law and regulation)	Ameh et al. ¹¹
Project location	Creedy et al., ⁶ Alinaitwe et al., ⁹ Ameh et al. ¹¹
High inflation and interest rate	Samarghandi et al., ⁸ Alinaitwe et al. ⁹
Bad weather	Creedy et al., ⁶ Memon et al., ⁷ El-Sayegh et al., ¹² Samarghandi et al., ⁸ Ameh et al. ¹¹
Long period between design and time of tendering	Ameh et al. ¹¹
Supplier's manipulation	Ameh et al. ¹¹
Duration of contract period	Ameh et al. ¹¹

this risk identification consists of 2 groups, internal and external factors. The identification of these risks is presented in Table II.

Risk identification that causing cost overrun on toll roads based on study literature are 21 risks that divided into 12 internal risks and 9 external risks. The identification of these risks can be used as reference in toll road projects to develop risk management concepts in forecasting cost overruns in the project.

4. CONCLUSION

The conclusion from this research based on the study literature that has been done is that the cause of the cost overrun in toll road project consists of 21 risks, where many risks arising from internal factors. For further research, it can be analyzed the risk and risk response that is expected to reduce the probability of potential cost overrun in toll road projects.

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