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What is the impact of cost overrun risk on the final cost of building construction projects in the government

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ABSTRACT

Cost overrun occurs due to factors affecting cost components that often escape control, so there is a tendency to increase as a result of weak control by the company, either from the planning consultant or the Public Works and Spatial Planning Office (DPUPR). The purpose of this study was to determine the effect of cost overrun risk on the final cost of building construction projects in the Boyolali Regency government. The research method used is descriptive method. The survey results in the form of interviews and questionnaires from experts and respondents were processed with parametric analysis, statistical methods with descriptive analysis, correlation analysis, and regression analysis. The result of this study is to determine the cost overrun risk variables that have the most influence on the final cost performance of building construction projects in the Boyolali Regency Government, namely the problem of unavailability and foreign currency fluctuations and the acceleration of the schedule and given recommendations for action to control it.

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1. INTRODUCTION

A construction project is the process by which the plans or designs and specifications of the planners are converted into physical structures and facilities. This process involves the organization and coordination of all project resources such as manpower, construction equipment, permanent and temporary materials, supplies and facilities, funds, technology, methods and time to complete the project on time within budget, quality standards and in accordance with the quality and performance standards specified by the planners (Tama et al., 2020). The larger the size of a project means the more problems that must be faced. If the problem is not handled properly, it will have an impact, one of which is cost overrun (Tama et al., 2020).

According to (Pandey et al. 2017), project control is an effort in the form of actions to regulate constraints, coordinate and regulate so that planning can be carried out so that project goals can be achieved, namely projects that are of quality, on schedule, and within budgeted costs. One indicator of the success of a project is the monitoring of project cost details, thus providing optimal profit for the contractor. The main problem that often occurs is the difficulty of identifying what risks can affect project cost performance at the beginning of project planning until completion. In addition, there are other supporting factors so that project success indicators can be maximized, namely Putting the overhead structure in place so that it benefits the organization by optimizing processes that add value to products or services; Identifying activities performed, measuring value

and cost and linking these activities to organizational output and taking action to obtain improvements (corrective action) as a continuous process that depends on existing conditions.

The company must be able to make calculations and know the overhead costs that will be reserved, the amount of overhead costs ranges from 11% - 15% of the direct cost of the project (Assaf et al, 2001). The amount of overhead costs depends on the duration and complexity of a project, so the costs are dynamic. Currently, there is a tendency for overhead costs to increase due to weak control by the company.

Basically, in the implementation of construction projects, there are many projects that experience cost overruns and time delays. Cost overrun at the project implementation stage is highly dependent on the planning, coordination, and control of the contractor and depends on the estimated cost budget, so that the construction of a project that is in accordance with the type of construction requires the expertise, knowledge and experience of both planners, construction managers and contractors.

Commercial building project types (housing complexes, apartments, office buildings, shopping centers, shop complexes, hotels) and public facility buildings (school buildings, government buildings, recreational facilities, markets and terminals) experience cost overruns more often, compared to industrial buildings (Sari et al., 2020).

Regional development whose source of funds comes from the APBD and the Special Allocation Fund (DAK) is mostly characterized by typical or prototype characteristics, which are planned to be almost similar to each other. There are only a few parts that need minor changes due to adjustments to space requirements or adjustments to existing land. In addition to accelerating planning due to the encouragement of equitable development in each region, buildings that have a typical shape will help facilitate short, medium and long-term maintenance. This can be seen from several buildings in Boyolali that have almost uniform basic shapes, such as government office buildings, health centers, and multi-purpose buildings.

The selection of case studies on buildings in Boyolali Regency has never been done before and is specifically oriented towards buildings that have typical characteristics with almost the same land area and building area and budget. In addition to the same typical characteristics, there are several buildings located in adjoining locations so that it becomes a separate complexity in the implementation of the work.

Since government construction projects use a budget that has been systematically determined and determined, the use of the budget must be calculated effectively and efficiently without reducing the quality and quality both in terms of materials, materials, and the final result of the work. In order for the cost overrun value to be minimized on the project, it is necessary to know the causes of cost overrun in terms of planning and implementation, resource coordination, financial and time control.

By identifying the factors influencing the risk of cost overrun on the final cost of the development project, we will be able to prevent cost deviations in the overall project work, so that in the end it will be able to improve the performance and quality of the project. If the risk of cost deviation is not controlled properly, there will be a greater impact of cost, time and quality losses for the Government as the organizer of development activities and the Cooperation Contractor because they have to submit a revised budget to the Planning Consultant and the relevant Office (DPUPR) which may not necessarily get approval.

2. RESEARCH METHOD

This research was conducted to identify the Effect of Cost Overrun Risk on the Final Cost of Building Construction Projects in the Boyolali Regency Government, and recommendations for action on risks in these projects to be used as an advantage in the implementation of similar projects in development activities.

The data used in this study are data obtained from a site survey of administrative data on Building Development at the Boyolali Regency Public Works and Spatial Planning Office (DPUPR) in the Cipta Karya field as many as 22 Local Government Buildings and 22 Puskesmas Buildings. In determining the sample of this study using the Slovin Formula. For data collection using a

questionnaire, shown to experts, namely experts in their fields both in technical planning DED (Detail Engineering Design) and project implementation in the field.

Data analysis in a quantitative way, namely the survey results in the form of questionnaires and interviews from experts and respondents are processed in accordance with the method used. The data analysis method used in this research is statistical analysis using SPSS (Statistical Package for Social Sciences). Data analysis and processing in this study are validity reliability test, descriptive analysis, risk analysis, correlation analysis, multiple regression analysis and factor analysis, opinions and answers of experts then from these assumptions conclusions are drawn.

3. RESULTS AND DISCUSSIONS

The results of the data obtained in this study were carried out through 4 stages by distributing questionnaires. There are 61 variables taken from the journal, for which an expert opinion is needed for validation, whether the expert agrees with the existing variables and affects the cost performance of the building project which is the object of research. Experts were selected using the Purposive Sampling method with the aim of being able to respond to the research. The experts who were contacted and filled out the questionnaire for the first stage questionnaire were 5 people. Based on the five respondents (experts) who each provide their assessment of the risk variables that affect the final cost performance of the project.

After stage 1 data collection was carried out and the number of new variables was obtained according to the results of expert validation, then proceed with stage 2 data collection. The second stage of data collection and questionnaires was carried out to 5 respondents as a test of understanding the questionnaire format and how to fill it in, resulting from stage 1 data collection. From the results of interviews with respondents, it was found that all respondents could understand the questionnaire format and how to fill it in, so the questionnaire could be used for stage 3 data collection.

The third stage of the questionnaire was conducted to the Building Project Executors as the tender winners, Directors of Works and Supervisory Consultants to find out the perception of the frequency of risks and their impact on the final cost performance of Building Construction projects in the Boyolali district government. From the results of the distribution made to 44 respondents, 48 valid questionnaires were obtained, of which 48 questionnaires will be used in further data processing.

In stage 4 data collection, after obtaining the main risk variables from the test analysis results in stage 3, expert interviews were conducted again to get answers according to expert experience to recommend overcoming problems in the study. From the final interview to the experts, input/comments were obtained regarding the recommended action plan for the main risk. The experts interviewed used the Purposive Sampling method in order to answer according to the research objectives. For assumption testing using SPSS (Statistical Package for Social Sciences), it is known that the research data is not problematic and passes the test.

Based on the results of data collection, in the section above, it can be seen that there is an influence of Cost Overrun risk on the final cost of the Building Construction project in Boyolali Regency Government on the Risk variable at the initial stage of the project, the project implementation process, post-project and simultaneous variables at the initial, implementation and post-project stages.

Cost overrun, causing significant losses for the contractor, occurs due to internal factors, namely planning and schedule, organization and human resources / personnel, administration and work contracts, field arrangements and needs, project activity time, project monitoring and control in the field. The external factors of the construction project itself include political, economic, socio-cultural, financial, natural, and environmental factors.

The cost overrun risk variables that have the most influence on the final cost performance of building construction projects in the Boyolali Regency Government, namely the problem of unavailability and foreign currency fluctuations and the acceleration of the schedule and recommendations for action to control them, both at the initial stage of the construction project, during the construction project process and post-construction.

Causes of Cost Overrun and How to Prevent Cost Overrun

Cost Overrun on the Project has an impact on time / schedule, cost / cost, field work, and project safety. The causes of Cost Overrun come from a list of risk variables including estimation errors or planning predictions, natural disasters, limited finance / funds, lack of skill / competence of workers and environmental conflicts. Things that have the potential to cause deviations (Risk factors), are Delays in payment and funding costs, demand requirements from clients, inflation costs, government regulations, project limitations and company growth.

Through a survey research strategy with questionnaires, which is carried out to identify cost overrun risk factors that influence and have an impact on the final cost of the project according to perceptions based on questionnaires filled out by respondents on experts/experts to validate the risk variables obtained from the results of the literature study, namely the Technical Team staff, Development Section Head, Head of Cipta Karya, Bina Marga, and PSDA of the Boyolali Regency Public Works and Spatial Planning Office, Development Assistant and random sampling to a team of experts and technical teams at the Boyolali Regency Development Planning Consultant and Contractor as a service provider, it can be seen that: a) The causes of cost overrun in building construction projects in Boyolali Regency are influenced by several factors. Based on the answers to the questionnaire results, there are 2 main factors, namely Availability and foreign currency fluctuations, with a Level of Influence / Risk Impact on Final Project Cost Performance with a high value scale, which is 7%-10% with moderate risk frequency, which occurs under certain conditions. b) Then for the occurrence of schedule acceleration, has a Level of Influence / Risk Impact on the Final Project Cost Performance with a high value scale, which is 7%-10% with a high risk frequency, which often occurs in every condition.

Based on the stages of analysis that have been carried out and how to prevent there are 2 main variables that affect cost overruns in the final cost of building construction projects in Boyolali Regency, namely: a) Availability and foreign currency fluctuations with an influence of 35%. b) The occurrence of schedule acceleration with an influence of 35.2%.

The results of analyzing the answers from experts to answer the cost overrun factors of availability and foreign currency fluctuations obtained improvement steps by providing Cashflow in foreign currency with Ajusted R Square of 37.8%. The results of analyzing the answers from experts to answer the cost overrun factor of Schedule Acceleration obtained corrective steps with the use of accelerated materials with an Ajusted R Square of 28.9%.

To prevent the risk of cost overrun on the final cost of building projects in Boyolali Regency in the future, special attention needs to be paid to the most influencing factors, namely the availability and fluctuation of foreign currencies and the occurrence of schedule acceleration. Answering the cost overrun factor of availability and foreign currency fluctuations, corrective measures are obtained by providing cash flow in foreign currency and preventive measures can be taken with the efficiency of experts according to their fields with the right placement.

Furthermore, the impact of fluctuations in foreign exchange rates against the Rupiah resulted in higher prices for materials imported from abroad. Because raw materials still depend on imports from abroad, the selling price of retail goods automatically increases. An example is the raw material for concrete iron. In addition, there is also the import of fuel oil, which of course has an impact on the production costs of finished materials.

Actions to improve final cost performance

Corrective actions required to correct cost deviations depend on the cause of the deviation and the impact of the level of difference between the realization and the plan, categorized as functional modification actions, re-planning and system changes. Practical actions that can be taken by contractors to reduce costs include: a) Estimating overhead costs from the beginning with reference to the document. b) To obtain an accurate estimate of the project duration, it is necessary to plan and schedule the appropriate activities which greatly affect the supervision costs and financial costs. c) Have appropriate field management to keep the project progress on schedule and limit delays. d) Plan the mobilization or construction of temporary facilities by storing them for use in the next project. e) Recruiting engineers and supervisors at low cost and using as few administrative staff as possible. f) Utilize existing resources from the client if possible to rent rather than building new facilities.

The above cost control aims to obtain a verification process for the comparison between actual performance and the standard plan that has been made in the planning phase, for decision making, so that based on the conditions obtained at the control stage, it will be analyzed by the implementer and management, so that a result is obtained in the form of feedback to management, planners and implementers, identification of deviations, and opportunities to determine appropriate corrective actions and risk evaluation.

The prioritization of the list of risks that have been identified for handling using the chance of occurrence and its effect on project performance, in this study through risk response planning, in the form of preventive action, namely by: a) having stock of materials or materials with the assumption that the materials used often have significant price spikes. b) Cooperating with vendors related to materials or materials by providing prices / pricelists within a certain tenor or period of time. So that when there is a price increase, construction service actors already have guidelines or price contracts according to the pricelist that has been given by the vendor. c) Targeting work package contracts with the shortest possible time / short term, and as much as possible avoiding multi-year construction work contracts due to significant increases in material / material prices every year. d) Taking steps to cooperate with several vendors, to obtain materials at various prices, so that in the event of a shortage of materials / materials can be directly resolved by substituting materials without compromising the quality of work.

Answering the cost overrun factor in the occurrence of accelerated schedules, corrective steps can be taken with the use of accelerated materials and preventive measures can be taken by taking into account environmental conditions, weather, and urgency in planning before starting work accompanied by the right schedule. Then some other preventive measures can be by applying effective and efficient work methods, adding tools and labor for time efficiency, adding time for labor / overtime, and carrying out administrative reporting work activities along with completeness documents in a good and orderly manner. time.

4. CONCLUSION

There are 2 main variables that affect cost overrun in the final cost of building construction projects in Boyolali Regency, namely: Availability and foreign currency fluctuations with an influence of 35% and the occurrence of schedule acceleration with an influence of 35.2%. The results of analyzing the answers from experts to answer the cost overrun factor of availability and foreign currency fluctuations improvement steps by providing Cashflow in foreign currency with Ajusted R Square of 37.8%. The results of analyzing the answers from experts to answer the cost overrun factor of Schedule Acceleration obtained improvement steps with the use of acceleration materials with Ajusted R Square of 28.9%.

To prevent the risk of cost overrun on the final cost of building projects in Boyolali Regency in the future, special attention needs to be paid to the most influencing factors, namely the availability and fluctuation of foreign currencies and the occurrence of schedule acceleration. Answering the cost overrun factor of availability and foreign currency fluctuations, improvement steps are obtained by providing cash flow in foreign currency and preventive measures can be taken with the efficiency of experts according to their fields with the right placement. Answering the cost overrun factor of Schedule Acceleration, corrective measures are obtained by using accelerated materials and preventive measures can be taken by taking into account environmental conditions, weather, and urgency in planning before starting work accompanied by the right schedule.

This research provides an important contribution to understanding the impact of cost overrun risk on the final cost of building construction projects in the government. By analyzing the factors that cause cost overruns and measuring their impact directly, this research provides valuable insights for stakeholders in project management. However, there are several limitations that need to be considered. First, this research may be limited by the availability of complete and accurate data, especially if the projects involve different parties with varying recording systems. Apart from that, qualitative aspects such as project management and government policies also need to be considered further.

For further research, it is recommended to dig deeper into the factors that contribute to cost overrun, including the role of contractors, risk management, and changes in the project environment. Additionally, research could broaden its scope to include projects in the private sector to compare practices and outcomes. Developing predictive models to identify cost overrun risks in advance could also be a useful step. Thus, further research can provide a more comprehensive understanding of how to effectively manage the risk of cost overrun, both in the context of the government and the private sector, to increase the efficiency and effectiveness of building construction.

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