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Analysis of Project Cost Management and The Effect On Cost Overrun In Construction Projects

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ABSTRACT : One indicator of the success of a project is how good we carry out the project based on cost estimation and also provide an optimum financial benefit for the contractor. The current condition is, there is so many problem related the failure of construction project caused of delay schedule and cost overrun. This condition has increased in construction projects because the contractors and project owners did not use the correct management methodology so that projects delays and cost overruns. Identifying the causes of cost overrun and classifying the correct project cost management variables is now become our consideration in this study. The first research problem is how to identify cost overrun in construction, the second research problem is to identify factors and variable project cost management. For the third research problem is the research framework of project cost management. The result of first research problem identified that there are 52 variables classified in 9 factors which become the main cause of cost overrun like cost estimation, Implementation and working relationship, project document aspect, material, labor, equipment, project finance aspect, implementation time, economic feasibility and natural environment. For the second problem has been identified that there are 55 variables that are classified into 4 main factors in project cost management such as cost management plan, estimate cost, determine budget and control cost. And For the third problem has been identified that the increasing project cost management is expected to reduce the potential cost overrun

KEYWORDS: Cost overrun, Plan cost management, estimated cost, determine cost, control cost

I. INTRODUCTION

Project is an activity that is limited by time and resources such as cost, materials, equipment and people, so it requires good project management since feasibility study, design preparation, procurement process, construction implementation until operational process. When project become more complex and identified that the number of resources is very less, so it will also require better and more integrated project management and control systems.

One indicator of the success of a project is how good we carry out the project based on cost estimation and also provide an optimum financial benefit for the contractor. According to Chad and kumaraswamy [5], Aftab [2] completing the project according to the cost plan is one of the criteria to get success of a construction project. The above statement is also supported by (Marshall, 2007) that one of the success criteria of a project is the achievement of cost and time as planned.

The problems now is the number of construction project that meet delay and cost overrun is getting higher. Such as (Leeman, 2007) states that project failures have increased in construction projects because contractors and project owners do not use the correct management methodology so that projects are subject to delays and cost overruns. Cost overrun problems significantly affect the cost of construction projects and have become the world's concern. Some researchers also highlighted the discovery of poor performance on the implementation of construction projects. Flyvbjerg, Holm, and Buhl, [8] studied 258 construction projects in 20 different countries and said that 90% of the

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projects facing cost overrun problems in the implementation of the project. Based on the article (Bureau of Economic Analysis, 2009) states that in 2007, the cost incurred for the construction industry in the United States reached \$ 1.246 trillion and on direct costs for repair work swelled for \$ 62 billion.

Research Problems

1. What is factors and variables project cost management in construction project?
2. What is factors and variables cost overrun in construction project?
3. How does the framework of project cost management and its impact on cost overruns on construction projects?

II. LITERATUR REVIEW

Project Cost Management

Project Cost Management is a professional capability and expertise in planning and controlling costs for a construction project as well as analyzing the potential of risks that potentially lead to swelling of construction costs. according to (Young &Lbbs, 2002) Cost management is a process of controlling expenses on construction projects in every stage from feasibility to handover and ensuring that the cost plan is still in place. This is also supported by Dof [6] which states that the process in cost management involves various work phases from the initial stage, the planning stage, the implementation stage, the control stage and the completion stage.

In the 6th edition of PMBOK [3] explained that the project cost management process consists of:

- a. Plan Cost Management is the process of identifying how construction costs are estimated, budgeted, managed, supervised and controlled.
- b. Estimated Cost is a process of analyzing cost calculations based on existing construction methods and resources.
- c. Determine Cost is a process in analyzing the estimated cost of construction that is running and compared with the existing cost planning.
- d. Control Costs is a process of controlling outgoing costs and analyzing and comparing actual costs with planned costs.

Cost Overrun

Cost Overrun also known as a cost increase, underrated or budget overrun, involves unexpected costs incurred in excess of budgeted amount due to an underestimating of the actual cost during budgeting. Cost overruns that occur in a construction project can be caused by internal factors and external factors. The cost overrun is consist of three parts:

- a. Cost Overrun in the early stages of the construction project
- b. Cost Overrun during construction project
- c. Cost Overrun on post construction

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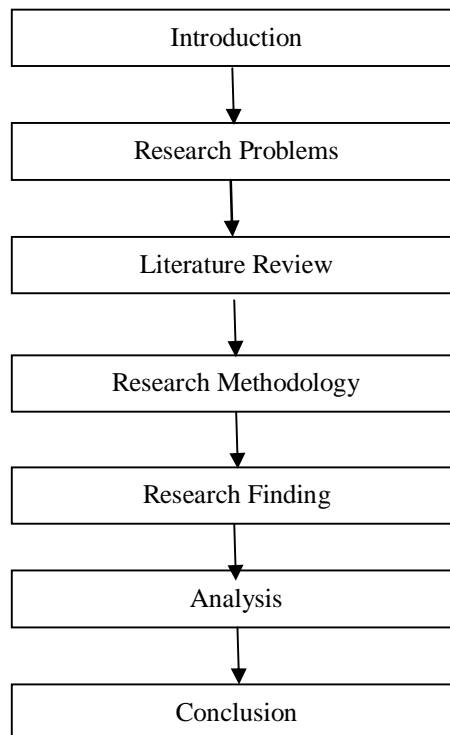
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III. RESEARCH METHODOLOGY

In this research the methodology is as follows:



Picture 1. Research Methodology

Based on the above framework can be explained that the research method used begins from identifying the background of research problems, namely by conducting literature studies on various previous studies. Furthermore, in the identification of research problems, then conducted literature review to explain the basic theory related to research problems.

Next start using qualitative research methods to identify factors and variables in accordance with the above research problems. Once the factors and variables are identified continue with the discussion of research results and end with the conclusion.

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IV. RESEARCH ANALYSIS

Analysis the first research problems.

Identification of causal factors is done on the literature and research that is considered relevant to the issues to be discussed. According to Santoso [9], the causes of cost overrun are divided into eight groups, including estimation of cost, implementation and working relationship, material, labor, equipment, financial aspects, implementation time, and political policy. In this research, the approval rate with high percentage (above 80%) is the group of estimation factor of cost, material and political policy. In Sahusilawane [10], eight groups of factors are inventories into three main groups according to the construction management philosophy of the planning part (implementation and employment relationships and cost estimates), the coordination sections (material, labor and equipment) and the control section (project finance aspect, time of execution and political wisdom).

In Fahira research [7], there are 38 factors causing cost overrun with the result of research of the factors that most influence the happening of overrun (swelling) cost at building construction project is the existence of material price increase, high price / equipment rent, material damage, happened labor cost fluctuations, poor cost control in the field, inaccurate cost estimates, and new government financial wisdom. In Memon [1], 35 causal factors are categorized into six groups: site managerial relations, design and documentation, financial management, information and communication, human resources, other resources, and project scope. The results showed that the factor of managerial relationship of the site contribute greatly to the cost overrun.

From the above description, there are similarities in several studies in identifying and establishing 9 factors and 52 causal variables of cost overrun in construction projects. These factors are: Cost estimation, Implementation and employment relationships, project document aspect, material, labor, equipment, project finance aspect, implementation time, economic feasibility and natural environment.

Analysis the second research problems

Based on the analysis of PMBOK 6th edition on project cost management, 55 variables have been identified from 4 factors in project cost management. The results of identification and classification of project cost management in Table 1. These variables will be used in the formation of correlation model between project cost management on the potential cost overrun.

| Factor | Variable of Project Cost Management |
|------------------|---|
| Plan Cost | Preapproved financial resources, Schedule & Risk Management Plan, Organizational culture and structure, Market condition & Exchanges rates, Published commercial & Project management information, Productivity differences , Financial controls procedures, Existing formal, informal cost estimating, budgeting, Financial database, strategic funding, level of accuracy, Organizational procedures links, Reporting formats |
| Estimate Cost | Cost & Quality management plan, Scope baseline, Lessons learned, risk register, Project schedule including resource requirements, Cost estimating policies, templates, Historical information, lessons learned repository, statistical relationship, aggregating the estimates of the lower level components of the WBS, Consist of Most Likely, optimistic and pesimistic point of estimating, Direct and Indirect Cost including contingency cost, Detailed Document including basis of the estimate. |
| Determine Budget | Cost & resources management plan, Basis of cost estimates, project schedule & risk register, Business case, benefits management plan, agreement information and costs relating to products, services, results, Existing formal and informal cost budgeting, Cost budgeting tools, |

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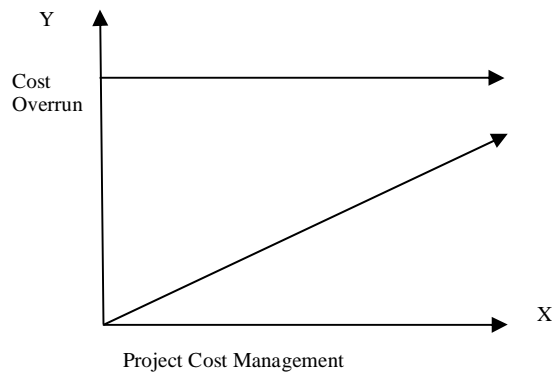
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| | |
|--------------|---|
| | reporting methods, Determine Budget process, project characteristics (parameters), reconciled with any funding limits on the commitment of funds for the project, Financing entails acquiring funding for projects |
| Control Cost | Cost management plan, performance measurement baseline, projected expenditures plus anticipated liabilities, contains data on project status such as which costs have been authorized, Existing formal and informal cost control-related policies, procedures, guidelines Cost control tools, Monitoring and reporting methods, Control Costs process including Variance analysis, Earned value analysis, Forecasting and Financial analysis. |

Analysis of the third research problems

In this research is expected the final result of this research is as follows:



Picture 2. Research Diagram

In the diagram above can be explained that the increasing effectiveness of project cost management (X) will have an impact decreasing the cost overrun.

V. CONCLUSION

The conclusions in this research are:

1. On the first research problems is there are 52 variables causing cost overrun in construction project. All variables have been identified and classified into 9 factors causing cost overrun. These factors are cost estimation, Implementation and employment relationship, project document aspect, material, labor, equipment, project finance aspect, implementation time, economic feasibility and natural environment.
2. On the second research problems is there are 55 variables in the project cost management proposed as a model to minimize the potential of cost overrun on construction projects. These variables have been identified and classified into 4 main factors, including: cost management, estimate cost, cost budget and control cost.
3. On the third research problems is the increasing effectiveness of project cost management X will have an impact decreasing the potential of cost overrun.

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