

Staff Planning Observation of Pt ABC Contractor from the Cost Side towards Project Characteristics

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ABSTRACT: PT ABC contractor has employee cost planning problems that the preliminaries value in the realization phase often experience an increase, whereas the portion of employee costs to the preliminaries value is 30-40% which means that if there is an increase in the potential to reduce the company's profits. In this study, the authors intend to review the increase in employee costs when planning against realization and looking for trends towards some project characteristics. The results showed that 77% of projects experienced an increase in employee costs when plans for realization. However, the increase in employee costs is influenced by the increase in contract value due to variation order, then after re-analysis, 54% of projects experienced an increase in employee costs. The increase in employee costs also has a tendency towards the characteristics of the project, which occurs when the project has a number of floors above 20 floors, in addition to an area of more than 30,000 m², and on the type of building of houses of worship.

KEYWORDS: the cost of employees, preliminaries, project characteristics

I. INTRODUCTION

In the cost of preliminaries, there are components that have a large and dominant value, namely the cost of employees. Employee costs are costs incurred to pay professionals who have provided their services in the form of mind and energy in a construction management.

Planning employee costs is considered still far from maturity. In the PT ABC company, employee cost planning is obtained from the engineering department which ideally determines the needs of employees during the project with less attention to the cost side. Whereas the principle of doing business in general is to seek profits by streamlining spending. So, there is no meeting point between technical and business perspectives. In addition, in determining the number of employees so far does not have a specific reference, meaning based on estimates and intuition from planners who are considered to have experience in the world of construction. This makes the determination of the employee cost budget is not measurable, even though the employee costs have a large portion of around 30-40% of the cost of preliminaries.

Based on observations at PT ABC, there was a significant change between the planning of employee costs and their realization so as to make the costs of preliminaries swell which resulted in a decrease in contractor profits. There are 2 stages in planning employee costs, namely the tender stage and the RAP (Implementation Budget Plan) stage. At the tender stage the tender team is carried out, while the RAP stage is carried out by the project team before the project runs. What is common when planning the tender phase to the RAP stage has increased employee costs, and in the realization phase there will be an increase which makes the costs of preliminaries even greater.

The analysis is carried out based on the formulation of measuring the increase in employee costs when planning against the realization and predicting these costs, in addition to reviewing the relationship of the increase in employee costs to several parameters of the project characteristics and confirm its relevance to the dynamics during construction. Based

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on the formulation, this study intends to examine the increase in employee costs directly between planning and realization and considering the factors that influence it, besides making a formula to predict employee costs. Next, examine the tendency of rising employee costs to several project characteristics.

II. LITERATURE REVIEW

According to Suharto [10], one of the determinants of the success of a project is labor. Labor means human beings who work in an organization that has the potential to move the system and function as non-material capital [4] (Handoko, 1984). According to TOTAL Company [9], the workforce involved as contractors are project managers, construction managers, site managers, commercial managers, engineering managers, quality assurance managers, general affair supervisors, HSE managers, surveyors, mechanics, drafter, quality supervisors, quantity surveyors, storekeepers, cashier, bar bending scheduler, and site engineer.

According to Diamant and Roy (1990) [3], the main purpose of cost estimation is to explain the costs of the use of resources used to achieve the expected criteria of goods or services. At the initial stage, service users make a non-detailed cost estimation with the aim of obtaining a feasibility study of a project to be built (Hardie, 1986) [5]. According to O'Brien (1994) [7], basic construction costs consisting of soft costs, land costs, financing, interest, equipment, and commissioning. In addition, the preliminary costs of the construction budget consist of 5 major parts, namely employee costs, general field costs, financial costs, equipment costs, and preparation costs (PT TOTAL, 2013) [8].

In statistical theory, regression is the dependence of one variable on one or more other variables that function as explanatory, so that the variable can be predicted or estimated from the state of the explanatory variable (Gujarati, 2009) [2]. According to Levin and Rubin (1998) [6], regression is used to predict the value of an unknown variable based on the strength of the relationship with other variables. Regression equation describes the linear relationship between variables, giving the symbol Y is the predicted variable and X for the predictor, if the predictor is more than 1 then it can be called multiple linear regression and can be given the symbol $X_1, X_2 \dots X_k$ (Cramer & Howitt, 2006) [1].

III. RESEARCH METHODOLOGY

The research stage is a guide for analyzing data in order to achieve a study of the increase in employee costs when planning against realization with the right perspective.

1. Data Collection. The data used in the analysis are during the tender or Real Cost (RC), Project Budget Plan (RAP), and Realization (REAL) consisting of employee costs, contract values, project characteristics, namely the number of floors, type of project, area of structure and architecture, and project location is built.
2. Measuring Direct Employee Cost Increase. The first stage is to directly measure the increase in the cost of employees while RC towards RAP, RAP towards REAL, RC towards REAL and jointly RC towards RAP with RAP towards REAL.
3. Making Employee Cost Modeling when Planning and Realizing. The second stage conducts a regression analysis between the cost of RC employees with the initial contract value and REAL employee costs with the final contract value. In regression analysis employee costs become predictable factors and contract values become predictors. After that, it is obtained a regression equation that is used as a model to predict employee costs when planning and ending the project.
4. Regression Test between Employee Costs and Contract Value. The third stage does 2 things, namely regression analysis and interviewees related to the relationship between employee costs and contract value. Regression analysis has been carried out in the second stage. In interviewing the resource person, the construction agent is directly involved in controlling employee costs when the project is running, namely the commercial manager.
5. Measuring Increase in Employee Costs with the Ratio between Employee Costs and Contract Value. Measurement of the increase in employee costs in the fourth stage by making the ratio between employee costs and contract value.

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The ratio made in number 2 in each project is the cost of RC employees to the initial contract value and REAL employee costs to the final contract value, after which it is reviewed by making a category of increase and decrease.

6. Looking for Trend of Increasing Employee Costs in Characteristics of the Project. The fifth stage looks for a tendency to increase or decrease employee costs for each project characteristic. The intended trend of obtaining an information pattern increases employee costs for project characteristics, namely the number of floors, the type of project, the extent of the structure and architecture, and the location of the project.
7. Interview with resource persons. The final stage is a resource interview which aims to examine the relevance of the results of the analysis with the dynamics of the situation in the Project. At this stage, interviewing construction expert staff who are directly involved in controlling employee costs while the project is underway, in this case the general manager and project manager.

IV. RESEARCH ANALYSIS

Analysis 1 Increase in Employee Costs when Planned toward Realization

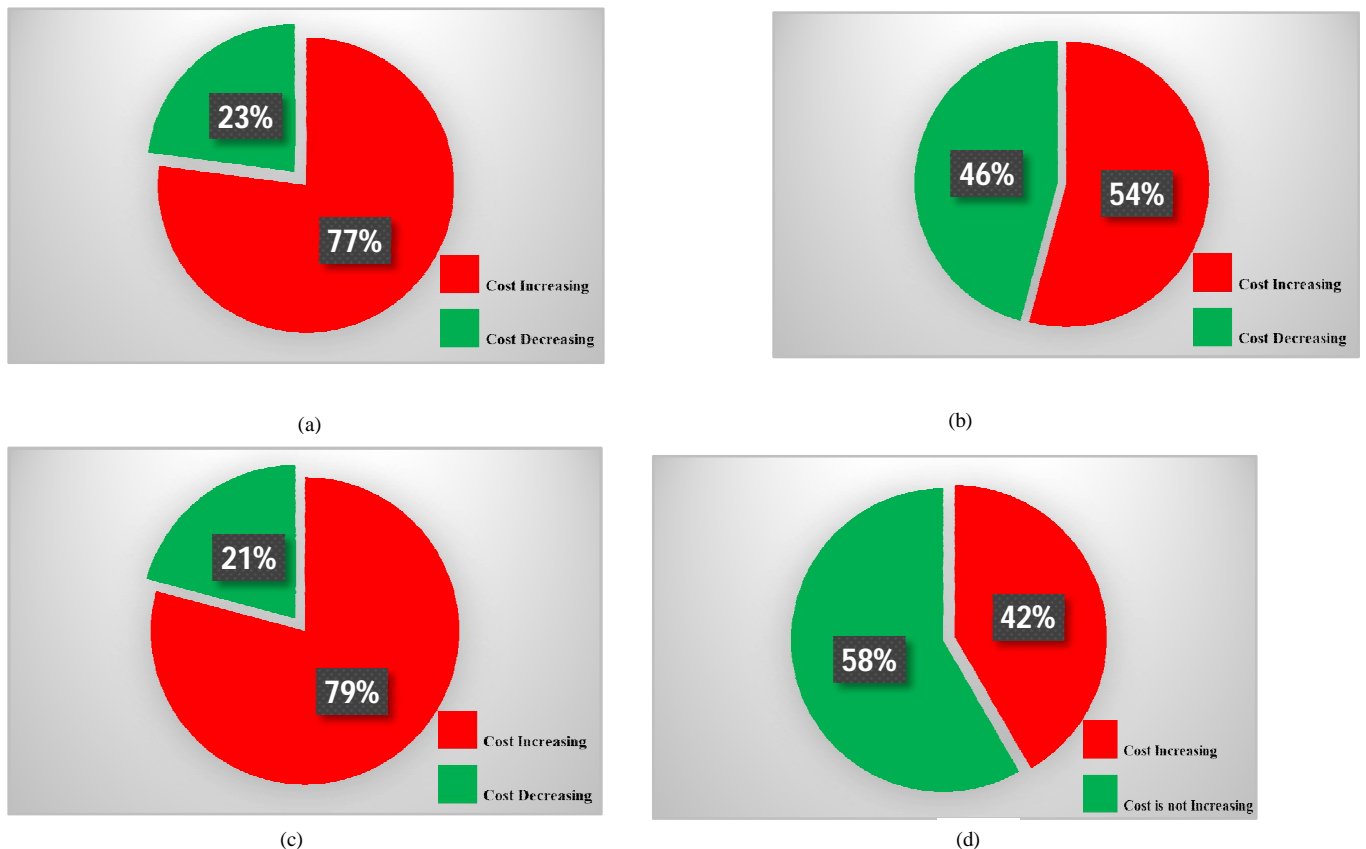


Fig. 1. (a) Percentage of Increase and Decrease in RC Employee Cost towards REAL (b) Percentage of Increase and Decrease in RC Employee Cost towards RAP Employee Costs (c) Percentage of Increase and Decrease in RAP Employee Cost towards REAL (d) Percentage of Increase and Decrease in RC Employee Cost towards RAP Employee Cost and RAP Employee Cost towards REAL Employee Cost

The results of reviewing changes in the value of employee costs when planning the tender process for the final realization of the project in Figure 1 (a) obtained 77% of projects or a number of 37 projects experienced an increase

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and 11 projects experienced a decline. In addition, changes in the value of employee costs when planning the tender process for project team planning in Figure 1 (b) obtained an increase percentage of 54% or in quantity states that as many as 26 projects experienced an increase in employee costs during the RAP process and 22 projects decreased, this means when the team Project planning makes employee costs more likely to be planned for the tender team. The results of the analysis of changes in employee costs when planning the project team towards the final realization of the project in Figure 1 (c) there is a percentage that states employee costs increased by 79% or in quantity states 38 projects have increased and 10 projects have decreased employee costs. This means that the project team's planning has a tendency to exceed its own planning. In addition to changing employee costs simultaneously when planning the tender process for project team planning and when planning the project team towards the final project realization in Figure 1 (d) there is a 42% percentage of the project going up from the initial tender process then planning by the project team and when the final realization project, this means that there is a significant increase in employee costs because each plan always increases until the realization stage. Quantitative data states that 20 projects always increase during the RC process to RAP and RAP towards REAL, while 58% or 28 projects do not increase simultaneously.

Analysis 2 Modeling Real Cost Employee Costs toward Initial Contract Value

Table. 1 Coefficient of Determination on Modeling REAL Employee Costs toward Initial Contract Value

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.912a	.832	.828	2763794693.32758

The coefficient of determination obtained from table 1 is 83.2% which means that the cost of employees when real cost can be explained by the variant of the initial contract value, besides that it is also obtained std. error of estimate is Rp.2,763,794,693 less than the standard deviation of real cost employee costs which means that the variance in the initial contract value is good if it is positioned as a predictor.

Table. 2 Regression between RC Employee Cost and Initial Contract Value

		RC	NK
Pearson Correlation	RC	1.000	.912
	NK	.912	1.000
Sig. (1-tailed)	RC	.	.000
	NK	.000	.
N	RC	48	48
	NK	48	48

Table 2 describes the correlation value between the cost of RC employees and the contract value with the Pearson Correlation method. The correlation between the variable employee costs and the contract value of 0.912 (1 = perfect), which means that both have a very strong correlation so that the contract value variable can be a good predictor.

Table. 3 Coefficient and Collinierity of Statistics on Modeling Real Cost Employee Costs toward Initial Contract Value

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2303905453.436	442064502.480		5.212	.000
NK	.022	.001	.912	15.069	.000

Table 3 gives the equations used as modeling. In the unstandardized coefficients column, the constant values and initial contract value coefficients are used as modeling of employee costs when RC toward the initial contract value, here is the regression equation obtained:

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$$Y = \text{Rp. } 2,303,905,453 + 0,022 X$$

Information:

Y: Employee Costs during RC

X: Initial Contract Value

Analysis 3 Employee Cost Modeling when REAL towards Final Contract Value

Table. 4 Coefficient of Determination in Modeling Employee Costs when REALtoward Final Contract Value

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.912a	.832	.828	2763794693.32758

The coefficient of determination obtained from table 4 is 77.5% which means that employee costs when realization can be explained by the variant of the final contract value, besides that it is also obtained std. error of estimate of Rp. 3,646,717,321 less than the standard deviation of employee realization costs which means that the final contract value variant is good if positioned as a predictor.

Table. 5 Correlation BetweenREAL Employee Cost and Final Contract Value

		REAL	NKA
Pearson Correlation	REAL	1.000	.881
	NKA	.881	1.000
Sig. (1-tailed)	REAL	.	.000
	NKA	.000	.
N	REAL	48	48
	NKA	48	48

In table 5 describes the correlation value between REAL employee costs and the final contract value with the Pearson Correlation method. The correlation between employee cost variables and contract value is 0.881 (1 = perfect) which means that both have strong correlations so that the contract value variable can be a good predictor.

Table. 6 Coefficient and Statistical Collinierity in Modeling Employee Costs when REALtowards Final Contract Value

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	2434378916.977	606239577.667		4.016	0.000
NKA	.028	.002	.881	12.601	0.000

In table 6 gives the equation that is used as a model. In the unstandardized coefficients column, the constant value and the initial contract value coefficient are used as modeling of employee costs when REAL towards the final contract value, here is the regression equation obtained:

$$Y = \text{Rp.} 2,434,378,917 + 0,028 X$$

Information:

Y: Employee Fees when REAL

X: Final Contract Value

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Analysis 4 Test the Correlation between Contract Value and Employee Cost Approach to Construction Executors in the Project

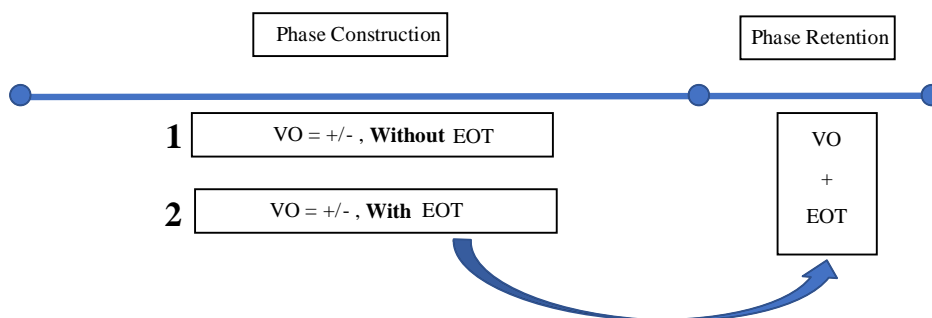


Fig. 2 Relationship Scheme Variation Order to Value of Preliminaries

Figure 2 is the result of interviews with field actors, namely the commercial manager, an explanation of the scheme is translated into the following two categories:

The Variation Order category affects the cost of preliminaries marked with EOT (Extend of Time):

1. Addition of Facilities / space / building / work after construction period
2. Termination of work because of another works.
3. Replacement at the request of the owner
4. Job delays due to logistical problems (related to owner's request)

The Variation Order category does not affect preliminary costs:

1. Change of Specifications before work is done.
2. Reimbursement for Mistakes by contractor.
3. Fulfillment of Contractor Standards, so that work is lacking.

Analysis 5 Ratio of Contract Value toward Employee Costs

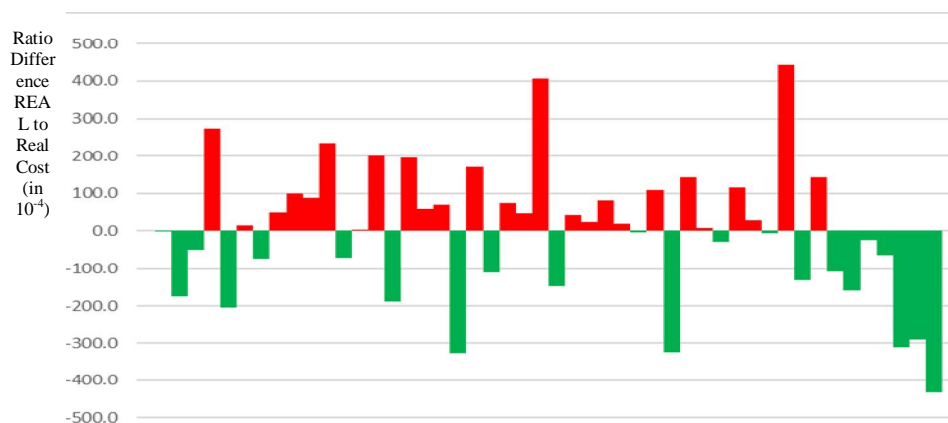


Fig. 3 Difference Ratio of Employee Costs toward Contract Value when Realizing the Plan

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In figure 3 it is obtained from the difference in the ratio of the current REAL to the RC on a scale of 10^{-4} which illustrates the increase and decrease in employee costs. This difference means that if the value is below 0 or minus, it means a decrease in employee costs and if a value above 0 means an increase in employee costs. This review illustrates that if the increase in employee costs by linking changes in contract values caused by variation order will give a different interpretation, that in fact a number of 22 of 48 projects experienced a decrease in employee costs and 26 projects experienced an increase in employee costs.

Analysis 6 Looking for Trend Changes in Employee Costs toward Project Characteristics

Number of floors

Reviewing the distribution of the number of projects in the category of changes in the ratio of the number of floors there is a tendency of an increase in the cost of employees in the project which has a total of 22 to 40 floors.

Project Area

A review of the project area obtained a trend that the project with an area of more than 30,000 m² tends to increase employee costs, there are a number of 18 projects have increased and only 7 projects have decreased employee costs.

Building Type

A review of the type of building obtained a trend that the type of hotel project tends to decrease while the house of worship project tends to increase employee costs. In the type of project, Mall and Office have a flat distribution between increase and decrease so that there is no trend, while in the type of hospital, apartment, convention, power plant, school and show unit projects have a number of little or less than five so the trend cannot be reviewed that.

Project Location

A review based on the location of the project found no trend among them. Based on project locations spread across Indonesia, a trend review did not find a tendency to increase or decrease employee costs at a particular location or region. This can be explained that professionals who work both inside and outside Jakarta have the same competency standards, in addition from the side of the cost adjusted to the location which means having an out-of-town allowance according to the radius of the project and certainly in line with the value of the project contract.

Analysis 7 Expert Staff's Responses Toward Result

According to Mr. Sutoyo, as the Project Manager in this type of hotel project tends to experience savings is a natural thing because having specifications tends to be the same which has a big impact on saving employees. Mr. Sutoyo also stated that the opposite occurred in places of worship that tend to increase employee costs because houses of worship are dominated by complex architecture. This complexity has an impact on the needs of many employees, especially positions such as quality supervisors, site managers, quality control, quality assurance, and surveyors.

According to Mr. Sutoyo's experience, out-of-town projects tend to experience dynamic or uncertain situations in realizing employee costs. Circumstances that make the realization of employee costs increase are when the project supporting facilities are very minimal, but on the other hand the situation also has the potential to experience savings because the regional human resources that support actually require a much lower cost compared to bringing in from the center, namely Jakarta.

According to Mr. Yohanes Teddy as general manager that hotels tend to experience savings in the cost of employees and places of worship experiencing an increase in employee costs is the right thing. According to his experience, here are 4 types of project types that tend to increase employee costs:

1. Apartment
2. Houses of Worship
3. Hotel
4. Mall & Office

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According to him the apartment is a project that has the most potential to increase employee costs due to the uncertain handover process compared to hotels. This situation also applies to types of malls and offices where the contractor is only responsible for the building manager during the handover process.

According to Mr. Teddy's observation, there was a habit that was considered reasonable by the project team that the realization of employee needs tended not to refer to employee planning that had been made during the RAP. According to Yohanes, the increase in employee costs was due to the habit of not being fundamental to bringing in so large numbers of employees at the beginning of the project and the uncertain process of handover time that required relatively large numbers of employees.

V. CONCLUSION

Based on the results of the data analysis obtained, it can be concluded as follows:

1. The increase in employee costs when planning for realization cannot be measured directly from these costs but is affected by the increase in the value of the project contract caused by variation order.
2. The cost of RC employees to the initial contract value has a regression of 0.912 and has the following modeling:

$$\text{RC Employee Fee} = \text{Rp. } 2,303,905,453 + 0,022 \times (\text{Initial Contract Value})$$

3. REAL employee costs to the final contract value has a regression of 0.881 and has the following modeling:

$$\text{REAL Employee Fee} = \text{Rp. } 2,434,378,917 + 0,028 \times (\text{Final Contract Value})$$

4. Based on the analysis using the ratio between contract value and employee costs, a total of 22 projects have decreased and 26 projects have increased.
5. Based on the influence of the number of floors that the building that has 22 to 40 floors has a tendency to increase employee costs.
6. Based on a review of the building area that in buildings that have an area of more than 30,000 m² has a tendency to increase employee costs.
7. Based on a review of the type of project that in the type of hotel project tends to have a decrease in employee costs and at type of house of worship project tends to have an increase in employee costs.
8. Based on a review of the project location that there is no tendency to increase or decrease employee costs.

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