

The Risk Analysis of Human Resources to Cost Performance in Mat Foundation of Construction Project “X” In South Jakarta

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ABSTRACT: The development of construction in Indonesia has a lot of progress in terms of quantity and quality, it can be seen from the number of buildings from urban areas to rural areas. For example, High Rise Building projects in urban areas that use the Mat Foundation method for foundations designed to address narrow land. Many factors influence the success of Mat Foundation implementation, such as human resources, because in the absence of professional and competitive human resources, the implementation of the Mat Foundation will not be maximal which will affect the cost performance of the project. This research problem is conducted to prove and analyze the influence of human resources on cost performance in the implementation of Mat Foundation on high rise building project. This research uses survey method. The object of research is the human resources in the Mat Foundation at construction project "X" in south jakarta and the research sample is the project manager along with the project team. The data obtained from the questionnaire which is given to the respondent related to the implementation of Mat Foundation construction project "X". Data processing using the help of SPSS program. It is expected that these results can increase knowledge and understanding of efficient and effective human resource management in the implementation of Mat Foundation construction project "X" in South Jakarta so that it can get cost performance in accordance with the plan.

KEYWORDS: Human Resources, Project Cost Performance

I. INTRODUCTION

Development of construction in Indonesia is experiencing a lot of progress both in terms of quantity or quality, it can be seen from the large number of buildings from the urban areas to the rural areas. Jakarta itself have a local regulations i.e. DKI Jakarta Perda No. 7 of the year 2010 which govern the Division of the building into three levels, high-rise (over 8th floors), stratified medium (5-8 floors), low-rise (up to the 4th floors). [1] Many High Rise Building in Jakarta are using *Mat Foundation* method for the Foundation that created to overcome the narrow land. *Mat Foundation* is one of the economical solution in order to overcome the limitations of building construction. In the cycle of Mat Foundation, there are several phases with activities that have a type and intensity. In construction work, *Mat Foundation* maintains several methods of workmanship which contained the elements of uncertainty that can trigger the risk of failure, especially if the *Mat Foundation* casting is done massively or mass concrete. [2] A lot of things to consider, including control over the heat resulting from the process of hydration of concrete that is great, thus can lead to cracking and the occurrence of cold joint which resulted in the casting takes a long time. [3] Therefore required the ability to manage all project resources to minimize the risk.

The overall research problems are:

- What are the factors and variables HR risk project "X" construction in South Jakarta?
- How to measure the performance of the project cost?
- How the results of the risk analysis of the factors and variables of HR?
- How the improvement against the results of the study?

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This research examined as a basis for the thesis with the ultimate goal to give recommendation methods used in human resource management to improve the cost, which in this study is limited to the work of the *Mat Foundation* on the "X" Construction project in South Jakarta. To clarify the purpose and benefits of this research, it can be outlined as follows:

- Identify the factors and variables of human resources.
- This research will measure the performance of the project costs.
- This research will examine the results of the analysis of the risk factors and variables of HUMAN RESOURCES.
- This research will examine the results of repair/improvement against the results of the study

II.LITERATURE REVIEW

Risk Management

Risk management is a structured approach or methodology in managing uncertainty relating to the threat; a series of human activities including risk assessment, development of a strategy to manage it and risk mitigation by using resource management. Strategies that can be taken include moving the risk to another party, avoiding the risk, reducing the negative effect of the risk, and accommodate some or all of the consequences of a particular risk. .[10] Objectives of the implementation of risk management is to reduce the risks that vary with regard to the areas that have been chosen at a level that is acceptable to the community. This can be in the form of various types of threats caused by environmental, technological, human, organizational and political. On the other hand, the implementation of risk management involving all means available to humans, in particular, for risk management entities (humans, staff, and organization).version really takes place.[4]

Human Resource Management

In construction project According to Soeharto (1997) in organizing the project, human resources in the form of manpower is the deciding factor of the success of a project. The type and intensity of the rapidly changing project activities throughout the cycle, so that the provision of the amount of labor would have to include an estimate of the types of labor and when necessary. By knowing the estimated number and schedule needs, then the provision of human resources in both quality and quantity to be better and more efficient. asserts that theoretically, the purposes of the average amount of labor can be calculated from the total work scope of the project is stated in hours of people divided by the period of the project. But this method is less efficient because it does not correspond to the actual reality, as it would cause wastage by bringing at once the entire needs of the workforce at the beginning of the project. Thus, in planning a realistic amount of labor need to pay attention to various factors, i.e., labor productivity, resource limitations, the number of construction labor in the field and smoothing the amount of labor in order to prevent turmoil (fluctuation) .[5]

The Performance of The Construction Cost

Soemardi, et al (2006:3) explains that the cost management of the project (project cost management) involves all the processes that are needed in the management of projects to ensure completion of the project in accordance with an approved cost budget. Project costs on construction projects are distinguished into two types: Direct costs and Indirect Cost. [5] Direct costs are all costs directly related to the execution of the construction work in the field. The costs are grouped in direct costs are the costs of materials or materials, the cost of workers or wages and equipment costs. Indirect costs are all costs of projects that are not directly related to the construction field but these costs must exist and can't be removed from the project (Nugraha et al. 1986). The costs included in indirect costs are overhead costs, incidentals (contingencies), advantage or profit, taxes and more. [8]

The Method of Execution of The Construction.

The construction method is a way to carry out the construction process so that reached an outcome that suits your project planning. Requirements of a method of construction (IR. Eddy Jennifer Goulden, MM, MT, "method of Construction", 2006), among others, guarantee of the quality of its construction, ensuring security and safety, guarantee the absence of environmental pollution, guarantee fees posed very efficiently, ensuring the fastest implementation time,

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ensures efficient use of resources and effective, ensures ease of implementation during the construction, the technology used is not outdated.[6]

Methods of Work of Mat Foundation.

Mat Foundation called Raft Foundation is a concrete plate-shaped raft widened across the base of the building that is used to forward the building load to the basic layers of soil or rock beneath it. Mat foundation system eliminates a pile cap and tie beam was replaced with a massive foundation that unites the entire pile cap or bored pile and can even be called a giant pile cap as well. On the building, the most feared of the Foundation problem is the problem of soil degradation settlement, but can be overcome with Mat foundation. With Mat Foundation, not the decline did not happen, however, a decrease that occurs will be the same in all parts of the building. The decline is not the same in parts of the building, will make our building cracks and failure both structurally as well as architectural. Mat Foundation was able to unite our building Foundation system and forced the building go down together .[6]

The role of Contractors In construction projects.

Success in business depends on the development of cooperation created by the third element of implementing development, i.e. settings of each item as well as setting work orderly and regular in creating functional and unity actions to achieve the goals set. In addition to these four elements must work in accordance with the laws and regulations in the contract documents or Jobber Agreement agreed upon and signed together. Although it has the same goal, i.e. so that development can be successful, but in fact the position, role and between the owners of the project by contractor opposite each other. Project owners can expect to have quality construction products, timely, but inexpensively, while contractors as it sells the service, expects the project will be able to produce the maximum profit, trustworthy owner, can reach the desired accomplishments, strengthening the reputation of the company, and etc.[8]

III. RESEARCH METHODOLOGY

The methodology used in this research using four factors: Personality, education and knowledge, competence and experience. Data obtained through the results of questionnaires by respondents who work in construction of high rise building. The research question is:

- What are the factors and variables HR risk project "X" construction in South Jakarta?
- How to measure the performance of the project cost?
- How the results of the risk analysis of the factors and variables of HR?
- How the improvement against the results of the study?

Preparation

The preparation includes literature review, determine data needs, gathering information is used as a resource intuitions, thesis proposal preparation, procurement administrative requirements for the acquisition of data, Manufacture and distribution of a questionnaire to the respondents

Research process

This study is limited by four factors: Personality, education and knowledge, competence and experience. Broadly speaking, the process of this research can be seen from the flowdiagram below :

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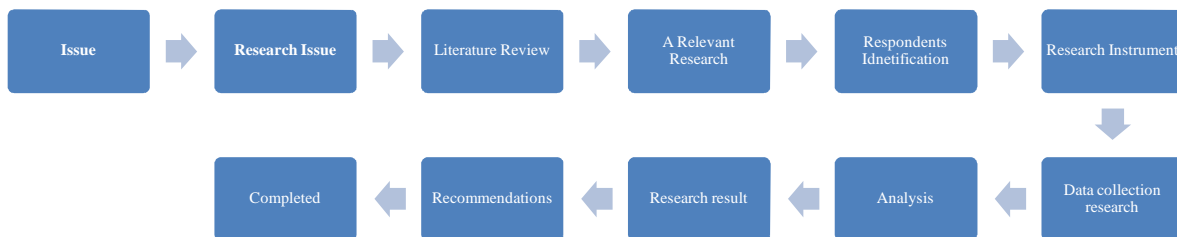


Figure 3.1 Research Process Diagram

Research Respondents

The respondents in this research is the Project Manager, site manager and staff are experts on the work of the Mat Foundation project x. data processing done by distributing questionnaires to 50 respondents, author of get the data about the perceptions of the respondents are:

- Respondents were generally not affected by the difference in work experience, all respondents have a working pengalama > 5 yrs, no differences are quite significant.
- Respondents have the same perception of good undergraduate education as well as S2. The difference in the perceptions of the respondents on several specific assessment can be caused by the difference in education namely S1 and S2. Long working experience and the type of his work can also cause a difference of perception by the respondents against the answers of the questionnaire

Research Instruments

The research instrument is a data collection tool that is used to measure the natural and social phenomena are observed.

Primary data, is data obtained from the interviews and answers to questionnaires from the results. The primary data obtained through sampling surveys, the number of respondents using questionnaires. The function of this questionnaire is as a data collector.

Secondary data, is data obtained from journals and other literature related to this research. Secondary data is data that is obtained in the form of ready-made, which is processed and presented by the other party.

Population and Sample

The respondents in this questionnaire are those corresponding to the selected criteria specified in the field of construction services. Given the limited ability, time and cost, then the sample method used is the method of Purposive Sampling. Sampling criteria for interviewees are as follows work in contracting companies, the age above 25 years.

Data Collection Methods

The method of Data collection In this research a discussion of research will use SPSS program assistance and use of qualitative methods. This is based on research from the literature and theories that have been there before. Then the data that existed previously will be used as a material in the process of passing the hypothesis of this research. Primary data in this study were obtained directly from the respondent by way of spreading a question or questionnaire with multiple choice type questions with a range of options (SS) strongly agree = 5, Agree = 4 (S), Less Agreed (R) = 3, Disagree = 2 (TS), Strongly disagree (STS) = 1. This question type is chosen to make the respondents in answering questions.

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IV. DISCUSSION AND ANALYSIS

Respondents Data Collection

This stage is the stage of collecting data from the questionnaire that was answered by respondents who have been determined, then will diolah with SPSS. Results of filling the questionnaire generate as much data as 50 respondents working in the high rise building project. Characteristics of respondents in this study can be seen in terms of: Gender Respondents, most respondents male sex as much as 90.00%, while the remaining 10.00% are female. Education, most respondents educated S1 (96.00%), while the remaining 4.00% of respondents educated S2. Years of working, most respondents have been working for 1-5 years (6.00%), while the remaining 50.00% have worked 6-10 years, as much as 32.00% working 11-15 years and as much as 12.00% of respondents worked > 15 years. Position, based on the results of questionnaires, as much as 20.00% working as an expert staff, 30.00% as Site Manager, 30.00% as Project Manager, and 20.00% as a Senior Manager.

Data Processing

In analyzing the problem using qualitative descriptive analysis, so that there are four important factors in the study are personality, education and knowledge, competence, experience

Of 4 factors consisting of 50 independent variables and one dependent variable analysis will be done in the form of The reliability analysis, correlation analysis, intercorrelation Analysis, Factor Analysis and Regression Analysis with SPSS version 25.

Correlation analysis & intercorrelation Analysis,

Based on the result of intercorrelation analysis (correlation values > 0.6) can be seen from the 22 independent variables analyzed, only the remaining 13 variables that pass the test of intercorrelation.

Reliability analysis

Analysis of reliability is an advanced stage in the analysis of factors. By using SPSS .[9] the value of alpha crumbachs factor component reliability test results is 0.853, which means that the component is declared reliable factor.

Factor analysis

Factor analysis test conducted to establish some set of independent variables selected from the results of correlation and intercorrelation.[9]

Criteria of data that can be analyzed is data indicating factors $KMO > 0,5$ and Bartlett's test of significant Sphericity at < 0.05 . [9] By using SPSS, the value KMO results of the factor analysis was 0.742, KMO value gained more than 0.5, this means that the factor analysis can be performed. Significant value gained from Bartlett test is 0,000 and this value is less than 0.05, which means there is a significant relationship between independent variables both inside and outside factors.

Anti matrix Image.[9] Value diagonal anti Image Matrix in this study was > 0.500 , it indicates that the variable is suitable / appropriate to the structure of other variables in these factors. By using SPSS, the value of diagonal anti use values of all variables > 0.500 , which means that all variables are suitable / appropriate to the structure of other variables in the factor.

Total Variance Explained.[9] By Using SPSS, it can be seen that the total variance explained the results of the factor analysis are the four factors which each amounted to 63.568%. This means that the factor formed by 13 independent variables is quite good in explaining the factors in human resources management.

Linear Regression Analysis

Here is the entire stage regression analysis the following explanation:

Regression Model Selection

The method used in this regression is a stepwise method, in which all independent variables analyzed are filtered so as to get the independent variables are actually able to explain the dependent variable. By using SPSS, the amount of regression model formed is 6, the predictor variables, ie variables, which means that the variable X40 (clarity of duties

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and responsibilities) contributes to cost performance in Mat Foundation amounted to 51.8%, while the X48 for 16.4%, X6 for 8.4%, X45 5%, X33 3.2%, and X27 1.7% which is obtained from each increment factor. Variable X40,X48,X6,X45,X33 and X27 is able to explain the change in Y (cost performance) amounted to 86.5% while the remaining 13.5% explained outside of these variables, so that in subsequent analysis, the model used is a model VI.

METODE STEPWISE										
Model Summary ^g										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.719 ^a	0.518	0.508	0.37507	0.518	51.518	1	48	0.000	
2	.826 ^b	0.682	0.668	0.30800	0.164	24.183	1	47	0.000	
3	.875 ^c	0.766	0.751	0.26675	0.085	16.658	1	46	0.000	
4	.903 ^d	0.816	0.799	0.23953	0.049	12.047	1	45	0.001	
5	.921 ^e	0.848	0.831	0.21978	0.033	9.452	1	44	0.004	
6	.930 ^f	0.865	0.846	0.20996	0.016	5.214	1	43	0.027	2.035

a. Predictors: (Constant), X40
b. Predictors: (Constant), X40, X48
c. Predictors: (Constant), X40, X48, X6
d. Predictors: (Constant), X40, X48, X6, X45
e. Predictors: (Constant), X40, X48, X6, X45, X33
f. Predictors: (Constant), X40, X48, X6, X45, X33, X27
g. Dependent Variable: y

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.889	0.244		11.833	0.000					
	X40	0.421	0.059	0.719	7.178	0.000	0.719	0.719	0.719	1.000	1.000
2	(Constant)	1.556	0.337		4.612	0.000					
	X40	0.405	0.048	0.691	8.377	0.000	0.719	0.774	0.690	0.995	1.005
	X48	0.349	0.071	0.406	4.918	0.000	0.454	0.583	0.405	0.995	1.005
3	(Constant)	1.070	0.315		3.392	0.001					
	X40	0.315	0.047	0.538	6.675	0.000	0.719	0.701	0.476	0.781	1.280
	X48	0.300	0.063	0.350	4.803	0.000	0.454	0.578	0.342	0.959	1.042
	X6	0.237	0.058	0.335	4.081	0.000	0.657	0.516	0.291	0.754	1.327
4	(Constant)	0.672	0.306		2.200	0.033					
	X40	0.263	0.045	0.449	5.834	0.000	0.719	0.656	0.374	0.693	1.443
	X48	0.304	0.056	0.354	5.412	0.000	0.454	0.628	0.346	0.959	1.043
	X6	0.210	0.053	0.297	3.983	0.000	0.657	0.510	0.255	0.737	1.357
	X45	0.175	0.050	0.249	3.471	0.001	0.551	0.460	0.222	0.796	1.256
5	(Constant)	0.543	0.284		1.914	0.062					
	X40	0.239	0.042	0.408	5.684	0.000	0.719	0.651	0.334	0.669	1.494
	X48	0.247	0.055	0.287	4.508	0.000	0.454	0.562	0.265	0.849	1.178
	X6	0.184	0.049	0.260	3.736	0.001	0.657	0.491	0.219	0.715	1.399
	X45	0.159	0.046	0.226	3.415	0.001	0.551	0.458	0.201	0.786	1.272
	X33	0.159	0.052	0.212	3.074	0.004	0.610	0.421	0.181	0.727	1.375
6	(Constant)	0.418	0.276		1.515	0.137					
	X40	0.205	0.043	0.350	4.784	0.000	0.719	0.589	0.268	0.588	1.700
	X48	0.218	0.054	0.254	4.045	0.000	0.454	0.525	0.227	0.801	1.248
	X6	0.189	0.047	0.267	4.017	0.000	0.657	0.522	0.225	0.713	1.403
	X45	0.140	0.045	0.200	3.117	0.003	0.551	0.429	0.175	0.762	1.312
	X33	0.156	0.049	0.208	3.157	0.003	0.610	0.434	0.177	0.727	1.376
	X27	0.120	0.052	0.152	2.284	0.027	0.563	0.329	0.128	0.714	1.400

a. Dependent Variable: y

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The regression equation can be formed from the table of coefficients obtained from a linear regression analysis regression models were established. Here is a table of coefficients are formed from the multiple regression analysis with SPSS:

According to the table 14 above, the regression equation between the variables X40,X48,X6,X45,X33 and X27 with Y as follows:

$$Y = 0.418 + 0.205X_{40} + 0.218 X_{48} + 0.189 X_6 + 0.140 X_{45} + 0.156 X_{33} + 0.120 X_{27}$$

by:

Y	= Cost Performance
X40	= Clarity of duties and responsibilities
X48	= Accordance quality with the standard that has been set
X6	= Finish the job before predefined schedule
X45	= always try to work effectively and efficiently
X33	= Have the ability to anticipate the effect of change
X27	= Lack of decision making skills

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The important factor and variable in human resources management to cost performance in Mat Foundation of construction project "X" in South Jakarta are Personality factor with variable finish the job before predefined schedule, second factor is competence with variable lack of decision making skills, have the ability to anticipate the effect of change, Clarity of duties and responsibilities, Always try to work effectively and efficiently and the last factor is experience with Accordance quality with the standart that has been set.

To Measure cost performance in Mat Foundation of construction project "X" in South Jakarta the need to be considered is the ability to complete the work before predefined schedule, the level of decision-making skills, the level of ability to anticipate the effect of change, clarity of duties and responsibilities, the level of ability to always try to work effectively and efficiently and quality in accordance with the standart that has been set.

From the survey has been done, gets result 86.5% respondents feel the ability to complete the work before predefined schedule, the level of decision-making skills, the level of ability to anticipate the effect of change, clarity of duties and responsibilities, the level of ability to always try to work effectively and efficiently and quality in accordance with the standart that has been set are simultaneously capable of contributing to the cost performance in Mat Foundation of construction project "X" in South Jakarta

Recommendations that can be used to increase the cost performance in Mat Foundation construction project "X" in South Jakarta are job description management in the process of recruitment human resources, make standarts for the human resources recruitment and for implementation of the job, placement of appropriate workers positions in accordance with their areas of expertise, Provision of training and giving full confidence to workers for making decision according to their job description

Suggestion

This research is very necessary to continue with the approach of other studies such as:

Research using the perception of the other party (owner & MK), in relation to the cost performance. Research on whether standardization is needed in recruitment and human resource management on construction projects.

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