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Analysis of Contractor's Performance Effect on Quality and Cost Efficiency Project Achievement on Road Development Project in Tulungagung Regency

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Abstract* —This research was conducted to determine the factors that affect the contractor's performance towards the achievement of project objectives precisely the quality and cost of the road construction project in Tulungagung Regency and obtain the most dominant factors influencing it, so that it can determine the right strategy to minimize the failure of achieving the project objectives. Data analysis method used is factor analysis and Path analysis of answers from questionnaires distributed to 35 respondents from the Owner and Supervisory Consultants who understand the conditions and are directly involved in the work of road construction project in Tulungagung Regency in the 2017 budget year. F test found that factors X1 to X9 have a direct or indirect effect on the non-achievement of Quality Target (Y1) with Fcount = 7.260> Ftable = 2.262 and Cost Target (Y2) with Fcount = 3,600> Ftable = 2,228. But individually the factors that significantly affect Y1 are X2; X5; X6; X8; and X9 with t count> t table. On the other hand, the factors that significantly affect Y2 are X2; X5; X6; X9 and Y1 with t count >t table towards Y2 either directly or indirectly through Y1. The dominant factor that directly or indirectly affects the achievement of quality and cost targets are Factor X9 with the β Standardized Coefficient value of 0.480 and 0.638 respectively.*

***Keywords*—** *Contractor's Performance, Quality, Cost.*

I. INTRODUCTION

The development of road infrastructure in Tulungagung Regency is one of the main components of the dynamics of economic development in general, spatial development specifically and more specifically as a developer element of the potential natural resources that have not yet emerged, or the potential of resources that will be explored or those that have been exploited. As a connecting element, road infrastructure needs to emphasize revitalization data by leading to more efficient potential. [1]

Along with the increase in economic growth and traffic development, as well as government policies in the field of land transportation, especially in Tulungagung Regency, there is also a growing need for road facilities and infrastructure, so that development in the road infrastructure sector must be able to support these conditions. [2]

To achieve the purpose of road construction in Tulungagung Regency as required, then the implementation requires a service provider (contractor) who is experienced in their field and has a performance and is able to carry out the work properly, so that the work will be completed in accordance with the time and quality target achieved by the amount of cost as budgeted. The bigger a project, the more complex the mechanism, the more problems that will be faced and if not handled properly, the problem will have an impact, one of which can be in the form of freezing cost / cost overrun and quality that is not in accordance with the plan. Therefore the construction of road construction that is good and in accordance with the required quality must be carried out. [3]

However, in the implementation, not all road project buildings in Tulungagung Regency, especially in the 2017 budget year, can be implemented in accordance with the target time, quality and costs as determined. It can be seen from around 13.5% of the development results not in accordance with the quality and expected costs. As an example in the implementation of the construction of project A road, there is a quality of concrete construction less than the specified specifications, fc 20. Therefore, the contractor must dismantle the work that is not in accordance with the quality. It causes the construction costs incurred to increase and if not anticipated further, it can cause over time. The problem is allegedly due to the contractor working on the project that does not fully understand the importance of the implementation of construction project management and does not have good performance to support the success of the project.

In order to improve the professionalism of the contractor's performance, the handling cannot be conducted partially, but this process requires a thorough improvement. These improvement efforts must be based on the right vision, mission, and strategy. So far, the right strategy has not been found in an effort to overcome it. Therefore, this study was conducted to determine the extent to which the contractor's performance affects the achievement of appropriate quality and cost project objectives which are the main subject of the success of road construction project in Tulungagung Regency.

II. RESEARCH METHOD

A. Research Site

The site of this research is road construction project in Tulungagung Regency which was done in the 2017 budget year and did not meet the quality and cost targets, such as:

1. Road Improvement / Widening Project of SumberinginKidul - Pandansari

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2. Road Improvement / Widening Project of Tamanan - Boyolangu (DAK) Road Section,
3. Road Improvement Project ofRejosari - Kaligede,
4. Concrete Road Development Project of Pagerwojo Village,
5. Kradinan - Sidomulyo Road Development Project.

Fig. 1. Research Site Map

B. Population and Sample

The population of this study are the personnel of the Supervision Consultant, and the Owner who knows the conditions and who are directly involved in the work of road construction project in Tulungagung Regency that was done in the 2017 budget year and did not meet the quality and cost targets, namely as many as 38 people consists of elements of Owner as many as 23 people, taken from KPA as many as 1 person, PPK as many as 2 people, PPTK as many as 1 person, BAPPEDA as many as 3 people, PPHP as many as 5 people and Field Supervisor as many as 11 people and from the element of Supervisor Consultants, it is as many as 15 people, taken from Site Engineer as many as 5 people, Quality Engineers as many as 5 people and Chief Inspector as many as 5 people. In this study, samples were taken randomly using disproportionate stratified random sampling (Sugiyono, 2006). From the calculation results, the total number of samples to be taken is 35 respondents

C. Instrument Feasibility Test

1. Validity test

In this validity test later, it can show how far the level of accuracy of the use of measuring instruments to the symptoms you want to measure. [4] Questionnaires can be considered being valid if the questions in a questionnaire are able to express something that will be measured by the questionnaire. [5] Valid whether or not of an instrument can be known by comparing the Product Moment Person correlation index with a significant level of 0.05 (5%) by comparing r count with rtable, it can determine the validity of the instrument with the following criteria:

$r_{count} > r_{table}$: Valid, $r_{count} < r_{table}$: Not Valid

2. Reliability test

Reliability is an index that shows how far a measuring instrument can be trusted or reliable. In other words, reliability shows the consistency of a measuring instrument in measuring the same symptoms. [5] In this study, the reliability test uses the Alpha Cronbanch approach. The instrument is stated to be reliable if the Alpha Cronbanch value is > 0.6.

D. Data Processing and Data Analysis

Data obtained from the results of the survey (questionnaire) will be processed to obtain information in the form of tables. The processed data results are used to answer the question in the formulation of the problem. Data processing should pay attention on the type of data collected by concentrating on the objectives that will be achieved. The accuracy in the analysis technique greatly affects the accuracy of the results of the study. The data analysis technique used is factor analysis and Path analysis. [6] The results of the questionnaire data with a range of 1 to 5 from each of these variables are then repeated, so that each variable containing several indicators will produce only one score which is then analyzed using factor analysis and Path analysis. Data processing was done with the help of the Statistical Package and Service Solution (SPSS) 15 program for Windows.

E. Path Analysis

To examine the questions related to the factors that affect the contractor's performance towards achieving the project objectives precisely the quality and cost of the road construction project in Tulungagung Regency and to determine the most dominant factors influencing it, the analysis technique used is Path Analysis (Solimun et al , 2008). The variables consist of Corporate Culture Variables (X1), Human Resources (X2), Discipline (X3), Experience (X4), Profit Amount (X5), Material (X6), Equipment (X7), Work Implementation Method (X8) and Financial Capability (X9) affect the failure to achieve the project goals precisely in quality and cost. Based on the relationship between variables theoretically, it can be modeled in the form of path diagrams such as Figure 2 shown as follows:

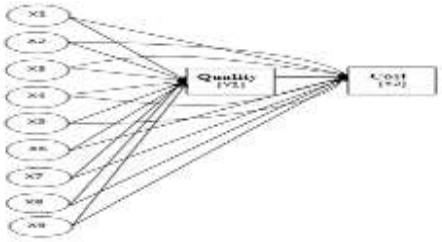

Fig. 2. Path Diagram

III. RESULTS

A. Result of Path Analysis

This study comprises of two equations; the first equation is describing the relationship of Corporate Culture (X1), Human Resources (X2), Discipline (X3), Experience (X4), Profit Amount (X5), Material (X6), Equipment (X7), Work Implementation Method (X8), Financial Ability (X9) towards Quality Target (Y1), and the second session describes the

relationship of Corporate Culture (X1), Human Resources (X2), Discipline (X3), Experience (X4), Profit Amount (X5) Material (X6), Equipment (X7), Work Implementation Method (X8), Financial Capability (X9) and Quality Target (Y1) towards Cost Target (Y2).

B. Path Analysis of the First Equation (X1-X9 towards Y1)

The results of the OLS estimation of the first equation are presented in Table 1 below:

TABLE 1. OLS Results of the First Equation

Independent Variables	Beta	t_{count}	Sig t
Corporate Culture (X1)	-0.068	-0.384	0.704
Human Resources (X2)	0.391	3.097	0.005
Discipline (X3)	-0.029	-0.225	0.824
Experience (X4)	0.033	0.251	0.804
Profit Amount (X5)	0.243	2.138	0.042
Material (X6)	0.368	3.054	0.005
Equipment (X7)	0.072	0.629	0.535
Work Implementation Method (X8)	0.473	3.455	0.002
Financial Capability (X9)	0.480	2.906	0.008
$R^2 = 0.723$ $t_{table} = 2.059$ $F_{table} = 2.262$ Dependent Variable = Quality Target (Y1)			

Source: SPSS Analysis, 2018

OLS results of the first equation obtain R2 value of 0.723 or 72.3% meaning that the Variables of Corporate Culture (X1), Human Resources (X2), Discipline (X3), Experience (X4), Profit Amount (X5), Material (X6), Equipment (X7), Work Implementation Method (X8), Financial Capability (X9) have an effect of 72.3% on Quality Target variable (Y1), while the remaining 27.7% is affected by other factors.

Based on Table 1, testing hypotheses simultaneously uses the F test. In the distribution table F, it is obtained that Ftabel values with degrees of freedom (df) n1 = 9 and n2 = 25 is 2.262. If the F value of the calculation results in table 4.13 is compared to F_{table}, then the F_{count} of the calculation results is more than F_{table} (7.260 > 2.262). In addition, in table 4.13, it is also obtained that a p-value of 0.000. If the p-value is compared to $\alpha = 0.05$, the p-value is less than $\alpha = 0.05$. From these two comparisons, the decision of H0 is rejected at the level of $\alpha = 0.05$. Thus, it can be concluded that there is a significant effect simultaneously between X1, X2, X3, X4, X5, X6, X7, X8 and X9 on the quality target (Y1) in road construction project in Tulungagung Regency.

Based on Table 1, it can be seen that the amount of the path coefficient between Corporate Culture (X1) to Quality Target (Y1) is -0.068, the value of t_{count} is -0.384 and Sig. t is 0.704. Because the absolute value of t_{count} is < t_{table} (-0.384 < 2.059) and Sig t> 0.05 (0.704 < 0.05), it can be concluded that the hypothesis that there is an effect of Corporate Culture (X1) on Quality Target (Y1) is rejected. It means that the high and low Corporate Culture (X1) will not have an impact on the good or bad Quality Targets (Y1) that will be achieved.

Testing the hypothesis of the effect of Human Resources (X2) on Quality Targets (Y1), the amount of the path coefficient between Human Resources (X2) to Quality Targets (Y1) is 0.391, the tcount is 3.097 and Sig t is 0.005. Because the absolute value of t_{count} is > t_{table} (3.097 > 2.059) and Sig t < 0.05 (0.005 < 0.05), it can be concluded that the hypothesis which states that there is effect of Human Resources (X2) on Quality Target (Y1) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher Human Resources (X2) will have an impact on the better Quality Targets (Y1) that will be achieved, otherwise the lower Human Resources (X2) will have an impact on the lower Quality Targets (Y1) achieved.

Hypothesis testing of the effect of Discipline (X3) on Quality Target (Y1), the amount of the path coefficient between Discipline (X3) on Quality Target (Y1) is -0.029, the tcount is -0.225 and the Sig t is 0.824. Because the absolute value of t_{count} is < t_{table} (-0.225 < 2.059) and Sig t is > 0.05 (0.824 > 0.05), it can be concluded that the hypothesis which states that there is effect of Discipline (X3) on Quality Target (Y1) is rejected. It means that the high and low Discipline (X3) will not have an impact on the good and bad of achieving the Quality Target (Y1).

Testing the hypothesis of the effect of Experience (X4) on Quality Target (Y1), the amount of the path coefficient between Experience (X4) on Quality Target (Y1) is 0.033, the value of tcount is 0.251 and Sigt is 0.804. Because the absolute value of t_{count} is > t_{table} (0.251 < 2.059) and Sig t is > 0.05 (0.804 > 0.05), it can be concluded that the hypothesis which states that there is an effect of Experience (X4) on Quality Target (Y1) is rejected. It means that the high and low experience (X4) will not have an impact on the good or bad quality target (Y1).

The effect of Hypothesis testing of the Profit Amount (X5) on the Quality Target (Y1), the amount of the path coefficient between the Profit Amout (X5) on the Quality Target (Y1) of 0.243, the tcount of 2.138 and the Sig t of 0.042. Because the absolute value of t_{count} is > t_{table} (2.138 > 2.059) and Sig t is < 0.05 (0.042 < 0.05), it can be concluded that the hypothesis which states that there is an effect of Profit Amount (X5) on Quality Target (Y1) is accepted which is directly proportional. It means that the higher the Profit Amount (X5), it will have an impact on the better the Quality Target (Y1), otherwise the lower the Profit Amount (X5), it will have an impact on the lower Quality Target (Y1) achieved.

Testing the Hypothesis effect of Material (X6) on Quality Target (Y1), the amount of the path coefficient between Material (X6) on Quality Target (Y1) is 0.368, the tcount is 3.054 and Sig t is 0.005. Because the absolute value of t_{count} is > t_{table} (3.054 > 2.059) and Sig t is < 0.05 (0.005 < 0.05), it can be concluded that the hypothesis which states that Material (X6) affects Quality Target (Y1) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Material (X6), it will have an impact on the better the Quality Target (Y1) that will be achieved, otherwise the lower the Material (X6), it will have an impact on the lower Quality Target (Y1) that is achieved.

Testing the hypothesis of the effect of Equipment (X7) on the Quality Target (Y1), the amount of the path coefficient of Equipment (X7) on the Quality Target (Y1) is 0.072, the value of tcount is 0.629 and Sigt is 0.535. Since the absolute value of

t_{count} is < t_{table} (0.629 < 2.059) and Sig t is > 0.05 (0.535 > 0.05), it can be concluded that the hypothesis which states that there is effect of Equipment (X7) on Quality Target (Y1) is rejected. It means that the high and low equipment (X7) will not have an impact on the good or bad quality target (Y1).

In hyphotesis testing of the effect of the Work Implementation Method (X8) on the Quality Target (Y1), the amount of the path coefficient between the Work Implementation Method (X8) on the Quality Target (Y1) of 0.473, the tcount of 3.455 and the Sig t of 0.002. Since the absolute value of t_{count} is > t_{table} (3.455 > 2.059) and Sig t is < 0.05 (0.002 < 0.05), it can be concluded that the hypothesis which states that there is the effect of the Work Implementation Method (X8) on Quality Target (Y1) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Work Implementation Method (X8), it will have an impact on the better Quality Target (Y1) that will be achieved, otherwise the lower the Work Implementation Method (X8), it will have an impact on the lower Quality Target (Y1) achieved.

In hyphotesis testing of the effect of Financial Capability (X9) on Quality Target (Y1), the amount of the path coefficient between Financial Capability (X9) on Quality Target (Y1) of 0.480, tcount of 2.906 and Sig t of 0.008. Since the absolute value of t_{count} is > t_{table} (2.906 > 2.059) and Sig t is < 0.05 (0.008 < 0.05), it can be concluded that the hypothesis which states that there is an effect of Financial Capability (X9) on Quality Target (Y1) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Financial Ability (X9) will have an impact on the better the Quality Target (Y1) that will be achieved, otherwise the lower the Financial Capability (X9) will have an impact on the lower Quality Target (Y1) that is achieved.

C. Path Analysis of the Second Equation (X1-X9 and Y1 towards Y2)

Since the three assumptions are fulfilled, the analysis can proceed to the second equation. The results of the OLS estimation of the second equation are presented in Table 2.

The OLS results of the second equation show that R2 value of 0.600 or 60% meaning that the variables of Corporate Culture (X1), Human Resources (X2), Discipline (X3), Experience (X4), Profit Amount (X5), Material (X6), Equipment (X7), Work Implementation Method (X8), Financial Capability (X9), and Quality Target (Y1) affect 60% of the Cost Target (Y2) variable, while the remaining 40% is affected by other factors.

Based on table 2, hypothesis testing simultaneously by using the F test In the distribution table F, it is shown that Ftabel values with degrees of freedom (df) n1 = 10 and n2 = 24 are equal to 2,228. If the F value of the calculation results in table 4.14 is compared to F_{table}, then the F_{count} of the calculation results is more than F_{table} (3,600 > 2,228). In addition, in table 4.14, it also obtained a p-value of 0.000. If the p-value is compared to $\alpha = 0.05$, the p-value is less than $\alpha = 0.05$. From these two comparisons, the decision of H0 is rejected at the level of $\alpha = 0.05$. Therefore, it can be concluded that there is a significant affect simultaneously among X1, X2, X3, X4, X5, X6, X7, X8 and X9 on the Cost target (Y2)

TABLE 2. OLS Results of the Second Equation

Independent Variables	Beta	t_{count}	Sig t
Corporate Culture (X1)	0.142	0.658	0.517
Human Resources (X2)	0.543	2.172	0.004
Discipline (X3)	0.172	1.068	0.296
Experience (X4)	-0.188	-1.168	0.254
Profit Amount (X5)	0.544	2.216	0.036
Material (X6)	0.595	2.563	0.017
Equipment (X7)	0.238	1.679	0.106
Work Implementation Method (X8)	0.084	0.413	0.683
Financial Capability (X9)	0.638	3.619	0.001
Quality Target (Y1)	0.516	2.101	0.046
$R^2 = 0.600$ $t_{table} = 2.064$ $F_{table} = 2.228$ Dependent Variable = Cost Target (Y2)			

Source: SPSS Analysis, 2018

Based on table 2, it can be seen that the amount of the path coefficient between Corporate Culture (X1) to the Cost Target (Y2) is 0.142, the value of tcount is 0.658 and the Sig t is 0.517. Since the absolute value of t_{count} is < t_{table} (0.658 > 2.064) and Sig t is > 0.05 (0.517 > 0.05), it can be concluded that the hypothesis that the effect of Corporate Culture (X1) on Cost Target (Y2) is rejected. It means that the high level of Corporate Culture (X1) will not have an impact on the good and bad Cost Target (Y2) that will be achieved.

In hyphotesis testing of the effect of Human Resources (X2) on the Cost Target (Y2), the amount of the path coefficient between Human Resources (X2) on the Cost Target (Y2) is 0.543, the tcount is 2.172 and the Sig t is 0.004. Because the absolute value of t_{count} is > t_{table} (2.172 > 2.064) and Sig t is < 0.05 (0.004 < 0.05) then it can be concluded that the hypothesis which states there is the effect of Human Resources (X2) on Cost Target (Y2) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher Human Resources (X2) will have an impact on the better Cost Target (Y2) that will be achieved; otherwise the lower Human Resources (X2) will have an impact on the lower Cost Target (Y2) that will be achieved.

In hyphotesis testing of the effect of Discipline (X3) on the Cost Target (Y2), the amount of the path coefficient between Discipline (X3) on the Cost Target (Y2) is 0.172, the tcount is 1.068 and the Sigt is 0.296. Because the absolute value of t_{count} is < t_{table} (0.172 < 2.064) and Sig t is > 0.05 (0.296 > 0.05), it can be concluded that the hypothesis that the effect of Discipline (X3) on Cost Target (Y2) is rejected. It means that the level of Discipline (X3) will not have an impact on the good and bad of achieving the Cost Target (Y2).

Testing the hypothesis of the effect of Experience (X4) on the Cost Target (Y2), the amount of the path coefficient between Experience (X4) on the Cost Target (Y2) is -0.188, the value of t_{count} is -1.168 and the Sig t is 0.254. Since the absolute value of t_{count} is < t_{table} (-1.168 < 2.064) and Sig t is > 0.05 (0.254 > 0.05), it can be concluded that the hypothesis which states that there is an effect of Experience (X4) on the Cost Target (Y2) is rejected. It means that the high and low

experience (X4) will not have an impact on the good and bad Cost Target (Y2).

Hypothesis testing the effect of the Profit Amount (X5) on the Cost Target (Y2), the number of the path coefficient between the Profit (X5) and the Cost Target (Y2) is 0.544, the tcount is 2.216 and the Sig t is 0.036. Since the absolute value of t_{count} is > t_{table} (2,216 > 2,064) and Sig t is < 0,05 (0,036 < 0,05) then it can be concluded that the hypothesis which states that there is an effect of Profit Amount (X5) on Cost Target (Y2) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Profit Amount (X5) will have an impact on the better Cost Target (Y2) that will be achieved, otherwise the lower the Profit Amount (X5) will have an impact on the lower Cost Target (Y2) that is achieved.

In hypothesis testing of the effect of Material (X6) on Cost Target (Y2), the amount of the path coefficient between Material (X6) and Cost Target (Y2) is 0.595, the tcount is 2.563 and the Sig t is 0.017. Since the absolute value of t_{count} is > t_{table} (2.563 > 2.064) and Sig t is < 0.05 (0.017 < 0.05), it can be concluded that the hypothesis which states that there is the effect of Material (X6) on Cost Target (Y2) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Material (X6) will have an impact on the better Cost Target (Y2) that will be achieved, whereas the lower the Material (X6) will have an impact on the lower Cost Target (Y2) that will achieved.

Testing the hypothesis of the effect of Equipment (X7) on the Cost Target (Y2), the number of the path coefficient between Equipment (X7) on the Cost Target (Y2) is 0.238, the value of t_{count} is 1.679 and the Sig t is 0.106. Since the absolute value of t_{count} is < t_{table} (1.679 < 2.064) and Sig t is > 0.05 (0.106 > 0.05), it can be concluded that the hypothesis that the effect of Equipment (X7) on Cost Target (Y2) is rejected. It means that the high and low equipment (X7) will not have an impact on the good and bad Cost Target (Y2).

Testing the hypothesis of the effect of the Work Implementation Method (X8) on the Cost Target (Y2), the number of the path coefficient between the Work Implementation Method (X8) on the Cost Target (Y2) of 0.084, t_{count} of 0.413 and the Sig t of 0.683. Since the absolute value of t_{count} is < t_{table} (0.413 < 2.064) and Sig t is > 0.05 (0.683 > 0.05), it can be concluded that the hypothesis which states that the effect of the Work Implementation Method (X8) on the Cost Target (Y2) is rejected. It means that the high and low Work Implementation Method (X8) will not have an impact on the good and bad Cost Target (Y2).

Testing the hypothesis of the effect of Financial Capability (X9) on Cost Target (Y2), the number of the path coefficient between Financial Capability (X9) and Cost Target (Y2) is 0.638, the tcount is 3.619 and Sigt is 0.001. Since the absolute value of t_{count} is > t_{table} (3.619 > 2.064) and Sig t is < 0.05 (0.001 < 0.05), it can be concluded that the hypothesis that the effect of Financial Capability (X9) on Cost Target (Y2) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Financial Ability (X9) will have an impact on the better Cost Target (Y2) that will be achieved, otherwise the lower the Financial Capability (X9) will have an impact on the lower Cost Target (Y2) that will achieved.

Hypothesis testing of the effect of Quality Target (Y1) on Cost Target (Y2), the number of the path coefficient between Quality Target (Y1) to the Cost Target (Y2) of 0.516, tcount of 2.105 and Sigt of 0.042. Since the absolute value of t_{count} is > t_{table} (2.105 > 2.064) and Sig t is < 0.05 (0.042 < 0.05), it can be concluded that the hypothesis which states that the effect of Quality Target (Y1) on Cost Target (Y2) is accepted. With the path coefficient positive sign, it indicates a relationship that is directly proportional. It means that the higher the Quality Target (Y1) will have an impact on higher the Cost Target (Y2), whereas the lower the Quality Target (Y1) will have an impact on lower Cost Target (Y2).

D. The Overall Result of Path Analysis

Based on the results of the overall path analysis, then the validity test of the model is done. In Path analysis, the indicator of model validity is the total determination coefficient obtained as follows:

Total Determination Coefficient

$R^2_{total} = 1 - Pe_1^2 Pe_2^2$

$R^2_{total} = 1 - (1-R_1^2)(1-R_2^2)$

$R_1^2 = 0.723$, dan $R_2^2 = 0.600$

respectively is the R square value of the first, and second equation models, so that the R2total value is 0.8892 or 88.92%. From the causal relationship between variables in the Path diagram, the total determination coefficient is 0.8892 or the information contained in the 88.92% data can be explained by the path model. Therefore, the results of path analysis are enough to be used.

Based on the results of the overall path analysis, it can be seen that there are 19 hypotheses tested directly, of which out of the 19 hypotheses, there are 9 hypotheses that are declared rejected namely Corporate Culture (X1), Discipline (X3), Experience (X4), Equipment (X7) has no significant effect on Quality Target (Y1) or Cost Target (Y2). It indicates that how good Corporate Culture (X1), Discipline (X3), Experience (X4), Equipment (X7) will not have an impact on Quality Target (Y1) or Cost Target (Y2).

Other ten hypotheses in this study were accepted, namely the effect of Human Resources (X2), Profit Amount (X5), Material (X6), and Financial Capability (X9) variables on Quality Target (Y1) and the effect of Human Resources (X2) variable. Profit Amount (X5), Material (X6), Work Implementation Method (X8) and Financial Capability (X9) are towards Cost Target (Y2) both directly and indirectly through Quality Target (Y1).

E. Indirect Effect Testing

In path analysis, indirect effect is known. Indirect effect is the effect that is measured indirectly on one variable to another, through an intermediary (mediation). The indirect effect coefficient is obtained from the results of the second time direct effect. If both direct effect coefficients are significant, the indirect coefficient of effect is also significant. However, if one or both of the direct effect coefficients are non-significant, the indirect coefficient of effectis non-

significant. There are four indirect effects tested in this study which are as follows:

TABLE 3. Result of Indirect Effect Testing in Path Analysis

Indirect Effect	Testing		Conclusion
	Direct Effect 1	Direct Effect 2	
X1 → Y1 → Y2 Coefficient: -0.068x0.516=-0.035	X1 → Y1 Coef : -0.068	Y1 → Y2 Coef : 0.516*	NotSignificant
X2 → Y1 → Y2 Coefficient: 0.391x0.516=0.202	X2 → Y1 Coef : 0.391*	Y1 → Y2 Coef : 0.516*	Significant
X3 → Y1 → Y2 Coefficient: -0.029x0.516=-0.015	X3 → Y1 Coef : -0.029	Y1 → Y2 Coef : 0.516*	Not Significant
X4→ Y1 → Y2 Coefficient: 0.033x0.516=0.017	X4→ Y1 Coef : 0.033	Y1 → Y2 Coef : 0.516*	Not Significant
X5 → Y1 → Y2 Coefficient: 0.243x0.516=0.125	X5 → Y1 Coef : 0.243*	Y1 → Y2 Coef : 0.516*	Significant
X6 → Y1 → Y2 Coefficient: 0.368x0.516=0.190	X6 → Y1 Coef : 0.368*	Y1 → Y2 Coef : 0.516*	Significant
X7 → Y1 → Y2 Coefficient: 0.072x0.516=0.037	X7 → Y1 Coef : 0.072	Y1 → Y2 Coef : 0.516*	Not Significant
X8 → Y1 → Y2 Coefficient: 0.473x0.516=0.244	X8 → Y1 Coef : 0.473*	Y1 → Y2 Coef : 0.516*	Significant
X9 → Y1 → Y2 Coefficient: 0.480x0.516=0.248	X9 → Y1 Coef : 0.480*	Y1 → Y2 Coef : 0.516*	Significant

Source: SPSS Analysis, 2018

From the table above, the results of testing indirect effects are as follows:

1. Indirect effect between Corporate Culture (X1) on Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the number of the indirect effect coefficient of -0.035. Because one of the direct effects between Corporate Culture (X1) on Quality Target (Y1) is not significant, then the indirect effect between Corporate Culture (X1) on Cost Target (Y2), through the Quality Target (Y1) intermediary is insignificant. It means that with the high and low Corporate Culture (X1), it will not result in the good and bad of achieving the Cost Target (Y2) even though the Quality Target (Y1) is well-achieved.
2. Indirect effect between Human Resources (X2) on Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the indirect coefficient of effect of 0.202. Since both direct effects, which are between Human Resources (X2) and Quality Targets (Y1) are significant, and between Quality Targets (Y1) and Cost Target (Y2) are also significant, the indirect effect between Human Resources (X2) on Cost Targets (Y2), through the intermediary Quality Target (Y1) is significant. With positive-signed coefficients, meaning that the higher Human Resources (X2) will result in better Cost Target (Y2) if Quality Target (Y1) can also be achieved well.
3. Indirect effect between Discipline (X3) on Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the amount of indirect effect coefficient of -0.015. Because one direct effect between Discipline (X3) on Quality Target (Y1) is not significant, then the indirect effect between Discipline (X3) on the Cost Target (Y2), through the intermediary Quality Target (Y1) is insignificant. It means that the higher the Discipline (X3) will not result in the good and bad Cost Target (Y2) even though the Quality Target (Y1) is well-achieved.
4. Indirect effect between Experience (X4) on Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the amount of indirect effect coefficient of 0.017. Because one of the direct effects between Experience (X4) on Quality Target (Y1) is not significant, then the indirect effect between Experience (X4) on Cost Target (Y2), through the intermediary Quality Target (Y1) is insignificant. It means that the higher the Experience (X4) will not lead to the good and bad Cost Target (Y2) even though the Quality Target (Y1) is well-achieved.
5. Indirect effect between the Profit Amount (X5) on the Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the amount of the indirect effect coefficient of 0.125. Because both direct effects are between the Profit Amount (X5) on the Quality Target (Y1) is significant and between the Profit Amount (X5) on the Cost Target (Y2) is also significant, then the indirect effect between the Profit Amount (X5) on the Cost Target (Y2), through the intermediary Quality Target (Y1) is significant. With a positive-signed coefficient, meaning that the higher the Profit Amount (X5), the better the Cost Target (Y2) will be achieved if the Quality Target (Y1) can also be achieved well.
6. The indirect effect between Material (X6) on Cost Target (Y2), through the intermediary of Quality Target (Y1), obtained by the indirect effect coefficient of 0.190. Because both direct effects, namely between Material (X6) and Quality Target (Y1) are significant, and between Quality Target (Y1) and Cost Target (Y2) are also significant, the indirect effect between Material (X6) on Cost Target (Y2), through the intermediary Quality Target (Y1) is significant. With a positive-signed coefficient, meaning that the higher the Material (X6) will lead to the better achievement of the Cost Target (Y2) if the Quality Target (Y1) can also be achieved well.
7. Indirect effect between Equipment (X7) on Cost Target (Y2), through the intermediary of Quality Target (Y1), obtained by the indirect coefficient of effect of 0.037. Because one of the direct effects between Equipment (X7)

on Quality Target (Y1) is not significant, then the indirect effect between Equipment (X7) on the Cost Target (Y2), through the Quality Target (Y1) intermediary is insignificant. It means that the higher equipment (X7) will not result in good or bad Cost Targets (Y2) even though the quality target (Y1) is well-achieved.

8. Indirect effect between Work Implementation Method (X8) on Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the amount of indirect effect coefficient of 0.244. Because both direct effects, namely between the Work Implementation Method (X8) and the Quality Target (Y1) are significant, and between Quality Target (Y1) and the Cost Target (Y2) are also significant, the indirect effect between the Work Implementation Method (X8) on the Cost Target (Y2), through the intermediary Quality Target (Y1) is significant. With a coefficient that is positive, meaning that the higher the Work Implementation Method (X8) will lead to the better achievement of the Cost Target (Y2) if the Quality Target (Y1) can also be achieved well.
9. Indirect effect between Financial Capability (X9) on Cost Target (Y2), through the intermediary Quality Target (Y1), obtained by the amount of indirect effect coefficient of 0.248. Because both direct effects, namely between Financial Capability (X9) and Quality Target (Y1) are significant, and between Quality Target (Y1) and Cost Target (Y2) are also significant, the indirect effect between Financial Capability (X9) on Cost Target (Y2), through the intermediary Quality Target (Y1) is significant. With coefficients which are positive, meaning that the higher the Financial Capability (X9) will lead to better achievement of the Cost Target (Y2) if the Quality Target (Y1) can also be achieved well.

IV. Discussion

A. *Strategy as the Effort to Improve Contractor's Performance in order that Project Quality and Cost can be Fulfilled*

Based on the results of path analysis, it is obtained that independent variables that have significant value (significant effect on the achievement of project objectives precisely the quality and cost of road development project in Tulungagung Regency) are Human Resources (X2), Profit Amount (X5), Material (X6), Work Implementation Method (X8), and Financial Capability (X9). While the variables that do not have significant value (but not significant effect on the contractor's performance towards the achievement of the project's quality objectives and the cost of road construction project in Tulungagung Regency) are Corporate Culture (X1), Discipline (X3), Experience (X4), and Equipment (X7) Furthermore, the factors that significantly affect the achievement of the project objectives precisely the quality and cost of road construction project in Tulungagung Regency can be explained as follows:

1. Human Resource Variable (X2), formed with manifest variables consisting of: Low work productivity (X2.1), low salary (X2.2), Not complying with job-desk and applicable authority (X2.3), Absence of training (X2.4), and inappropriate HR Placement (X2.5).
2. Profit Amount Variable (X5), formed by manifest variables consisting of: Often ignoring technical specifications (X5.1) and More prioritizing on completing the work quicker (X5.2).
3. Material Variable (X6), formed with manifest variables consisting of: Lack of material (X6.1), Material late delivery (X6.2), Material changes (X6.3), and Material Damage (X6. 4).
4. Work Implementation Method Variable (X8), formed with manifest variables consisting of: The contractor does not understand the work implementation method (X8.1), the Contractor does not understand well the purpose of the work implementation method (X8.2), and the Contractor does not remind his workers (X8.3).
5. Financial Ability Variable (X9), formed with manifest variables consisting of: Poor direct construction cost estimation (X9.1), Lack of Financial management experience (X9.2), Error working capital calculation (X9.3), Poor cost control (cashflow) (X9.4), lack of working capital to support activities (X9.5), and unclear supplier and subcon payment systems (X9.6).

Furthermore, strategies will be discussed which are used for factors that significantly affect the achievement of the project's quality objectives and the cost of road construction project in Tulungagung Regency.

B. *Strategy Used towards Human Resources Factor*

Based on Table 4, Factor of Human Resources is one of the variables that affect the contractor's performance towards the achievement of project objectives precisely the quality and cost of road construction project in Tulungagung Regency is Human Resource Factor. The positive standardized β coefficient value indicates that if the Human Resource Factor is getting better then it can be stated that there is a high probability that the contractor's performance will be accurate towards the achievement of the project's quality objectives and the cost of the road construction project in Tulungagung Regency is getting bigger. In addition, to find out which indicators have the most effect on the contractor's performance towards the achievement of the right quality project objectives and the cost of road construction project in Tulungagung Regency in Human Resource Factor can be seen at high loading in Table 4 below:

TABLE 4. Loading Factor Value on Human Resources Factor

Manifest Variables	Detail	Loading Value
X2.1	Low work productivity	0.874
X2.3	Not complying with job-desk and applicable authority	0.811
X2.4	Absence of training	0.721
X2.5	Inappropriate Human Resources placement	0.623
X2.2	Low salary	0.613

Source: SPSS Analysis, 2018

From Table 4 above, it is known that the indicator of the low productivity of work with a loading value of 0.874 is the indicator that mostly affects the performance of the contractor towards the achievement of the quality project objectives and the cost of road construction project in Tulungagung Regency,

thus the strategy used to solve it is that the contractor should employ Human Resources who are experienced and willing to work hard.

C. Strategy Used towards Profit Amount Factor

Other factors that affect the performance of the contractor towards the achievement of the project objectives are the quality and cost of the road construction project in Tulungagung Regency is the Factor of Profit Amount. The sequences of indicators that mostly affect the contractor's performance on achieving the project objectives are precisely the quality and cost of road construction project in Tulungagung Regency on the Profit Amount Factor which can be seen in Table 5 as follows:

TABLE 5. Loading Factor Value on Profit Amount Factor

Manifest Variables	Detail	Loading Value
X5.1	Frequently ignoring technical specifications	0.891
X5.2	More prioritizing on completing the work quicker	0.891

Source: SPSS Analysis, 2018

From table 5, it is known that indicators that frequently deny technical specifications and prioritize work quickly completed with a loading value of 0.891 from the Profit Amount factor (X5) as large as affecting the contractor's performance on the achievement of project quality and cost of road construction project in Tulungagung Regency, then the strategy used to solve it is that the Contractor must perform his work in accordance with the technical specifications that have been required and in addition to quickly completing the work of the contractor, he also must not override the quality of the project which is being done.

D. Strategy Used towards Material Factor

The Material Factor is also a variable that affects the achievement of the project's quality objectives and the cost of road construction project in Tulungagung Regency. The sequences of indicators that mostly affect the contractor's performance towards the achievement of project objectives are precisely the quality and cost of road construction project in Tulungagung District in Material Factors that can be seen in Table 6 as follows:

TABLE 6. Loading Factor Value on Material Factor

Manifest Variables	Detail	Loading Value
X6.2	Material late delivery	0.873
X6.1	Lack of material	0.794
X6.3	Material change	0.695
X6.4	Material damage	0.580

Source: SPSS Analysis, 2018

From table 6, it is known that the indicator of the material factor that mostly affects the contractor's performance on the achievement of the project target precisely the quality and cost of the road construction project in Tulungagung Regency is the late delivery of material with a loading value of 0.873. The strategy used to solve this is the Contractor must make a plan provision of material as needed and has been examined by a consultant and approved by the owner.

E. Strategy Used towards Work Implementation Method Factor

The Work Implementation Method factor is also a variable that affects the achievement of quality project objectives and the cost of road construction project in Tulungagung Regency. The sequences of indicators that mostly affect the contractor's performance on the achievement of project objectives are precisely the quality and cost of road construction project in Tulungagung Regency on the Factor of Work Implementation Method which can be seen in Table 7 as follows:

TABLE 7. Loading Factor Value on Work Implementation Method

Manifest Variables	Detail	Loading Value
X8.3	Contractor does not remind his workers	0.943
X8.2	Contractor understands less the purpose of work implementation method	0.839
X8.1	Contractor understands less the work implementation method	0.764

Source: SPSS Analysis, 2018

From table 7, it is known that the indicator of the Work Implementation Method is the most affecting the contractor's performance towards the achievement of the project's quality objectives and the cost of the road construction project in Tulungagung Regency is the Contractor must firmly give a warning if there are workers who do not follow the implementation method that has been realized, so that the work can be completed in accordance with technical specifications.

F. Strategy Used towards Financial Ability Factor

Financial Capability Factor is also a variable that affects the achievement of the project's quality objectives and the cost of road construction project in Tulungagung Regency. The sequences of indicators that most affect the contractor's performance on achieving the project objectives are precisely the quality and cost of road construction project in Tulungagung Regency on the Financial Capability Factor which can be seen in Table 8 as follows:

TABLE 8. Loading Factor Value on Financial Capability Factor

Manifest Variables	Detail	Loading Value
X9.3	Error in work capital calculation	0.916
X9.2	Lack of financial management experience	0.826
X9.1	Poor direct construction costestimation	0.819
X9.4	Poor cost control (cash flow)	0.810
X9.6	Unclear supplier and subcon payment systems	0.778
X9.5	Lack of working capital to support activitities	0.668

Source: SPSS Analysis, 2018

From table 8, it is known that the indicator of the Financial Capability factor that most affects the contractor's performance towards the achievement of the project's target quality and cost of the road construction project in Tulungagung Regency is the calculation of working capital error with a loading value of 0.916. The strategy used to solve it is the Contractor must place a management workforce that can manage and meet

working capital needs with various alternative sources of funds and able to minimize risk so that the revenue and expenditure plan can be monitored properly and the calculation of working capital becomes accurate.

V. CONCLUSION

From the F test, it was found that simultanously the factors of Corporate Culture (X1), Human Resources (X2), Discipline (X3), Experience (X4), Profit Amount (X5), Material (X6), Equipment (X7), Work Implementation Method (X8) and Financial Capability (X9) directly or indirectly affect the achievement of quality targets with F_{count} = 7.260> of F_{table} = 2.262 and Cost Target with F_{count} = 3.600> of F_{table} = 2,228.

However, individually the factors that significantly affect the Quality Target (Y1) are (X2) with tcount = 3.097> from t_{table} = 2.059, (X5) with tcount = 2.138> from t_{table} = 2.059, (X6) with t_{count} = 3.054> from t_{table} = 2.059, (X8) with t_{count} = 3.455> from t_{table}= 2.059 and (X9) with t_{count} = 2.906> from t_{table} = 2.059.

While the factors that significantly affect the Cost Target (Y2) are (X2) with t_{count} = 2.172 > from t_{table} = 2.064, (X5) with t_{count} = 2.216 > from t_{table} = 2.064, (X6) with t_{count} = 2.563 > from t_{table} = 2.064, (X9) with t_{count} = 3.619 > from t_{table} = 2.064 and (Y1) with t_{count} = 2.105 > from t_{table} = 2.064 to (Y2) either directly or indirectly through (Y1).

The most dominant factor affecting the achievement of Quality Target (Y1) is Financial Capability (X9) with the β Standardized Coefficient value of 0.480. While the most dominant factor affecting the Cost Target (Y2) is Financial Capability (X9) with β Standardized Coefficient of 0.638. Strategies to improve contractor performance in order that quality and project costs can be met are:

1. The contractor must place a management workforce that can manage and meet working capital needs with various alternative sources of funds and be able to minimize risks so that the revenue and expenditure plan can be monitored properly and the calculation of working capital becomes accurate.
2. The contractor must employ experienced financial management personnel so that the company's finances can be used properly.
3. The contractor must have a reliable project estimator with the ability to read and interpret images and accurately estimate project costs so that there are no project cost deviations.
4. The contractor must perform his work in accordance with the required technical specifications and give a firm warning if there are workers who do not follow the method of implementing the work that has been determined.
5. The contractor must make a plan to supply the material according to needs with quality that meets specifications, maintain the quality of the material during storage and make a good storage warehouse.

VI. SUGGESTIONS

1. The contractor must be able to establish good communication with the supervisory consultant, so that work results can be achieved that are in accordance with quality and costs.
2. Contract documents as a basis for the cooperation between the owner and the contractor must be in place and mutually agreed before the execution of the work begins so that both parties understand their respective rights and obligations.

VII. RECOMMENDATION

For further research, it is expected to add the dependent variables on time and other independent variables such as the Work Scheduling Method variable and the Work Environment variable and pay more attention on the indicators used, so that it is expected to be more applicable in order to improve this research.

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