ANALYSIS OF THE INFLUENCE OF INTERNAL AND EXTERNAL FACTORS OF THE PROJECT ON THE QUALITY OF THE TALANG DURIAN – PONDOK UDEN ROAD CONSTRUCTION PROJECT

M. Zen Sunardi[1], A. Andini Radisya Pratiwi[2], Chandra Afriade Siregar[3], R Didin Kusdian[4], Dody Kusmana[5]

Master of Civil Engineering Study Program, Sangga Buana YPKP University Bandung
Email: mzensunardi530@gmail.com

ABSTRACT

This study aims to analyze the influence of internal and external project factors on the quality of the Talang Durian – Pondok Uden Road construction project. The research method used was multiple linear regression analysis with a total sampling technique, with 33 respondents directly involved in the project implementation. The results showed that partially, the technology/equipment variable had no significant effect on the quality of the construction project, with a significance value of 0.527. The materials variable had a positive and significant effect on project quality, with a significance value of 0.010 and a coefficient of 0.324. Human resources also had a positive and significant effect, with a significance value of 0.000 and a coefficient of 0.393. The work method variable showed a positive and significant effect, with a significance value of 0.021 and a coefficient of 0.224. Finance had a positive and significant effect on project quality, with a significance value of 0.003 and a coefficient of 0.415. Meanwhile, external factors had no significant effect partially, with a significance value of 0.176. However, simultaneously, the six independent variables significantly influenced construction project quality, with an F-value of 142.365 and a significance level of 0.000. The coefficient of determination (R^2) of 0.970 indicates that 97% of the variation in project quality can be explained by the variables in the model, while the remaining 3% is influenced by factors outside this study.

Keywords: *Project Quality, Internal Factors, External Factors, Road Construction, Multiple Linear Regression*

INTRODUCTION

The construction industry is now more competitive than ever, especially in Indonesia. Therefore, many companies, including contractors, strive to win the competition in the construction industry by improving the quality of their products and services to ensure customer satisfaction (Subandiyah, 2016). Construction companies that fail to prepare to improve the quality of their work or products will face difficulties in competing. Mulyono (2016) stated that company success is achieved through the implementation and maintenance of a quality management system, which continuously improves company performance effectively and efficiently.

The Bengkulu Provincial Government is aggressively implementing its road infrastructure acceleration agenda throughout 2025. A total of 22 road repair and improvement project packages are funded by the Regional Budget (APBD) worth approximately IDR 546–600 billion. Ten packages have entered the contract stage for implementation starting in June–July 2025. Seluma Regency is one of the main focus areas, including the approximately 1.6 km Talang Durian–Pondok Uden section, with a contract value of approximately IDR 4.3–4.5 billion, funded by IDR 6.7 billion from the oil palm DBH (Regional Revenue Sharing Fund).

The Talang Durian–Pondok Uden road provides vital access for the farming communities in Talang Durian and Pondok Uden villages. Therefore, the quality and sustainability of the construction are crucial for effective harvest distribution and community mobility.

Quality is a crucial factor, along with capability, time, and cost, determining the success of a project. These three factors are often cited as crucial issues in construction project implementation. Quality management requires regulatory measures, commonly referred to as quality management. Project quality management encompasses the activities required to optimize quality policies and project processes (Mulyono 2016).

In the world of construction projects, we have recognized the importance of quality control. Control can be defined as the process of determining what has been achieved, evaluating performance, and taking corrective action if necessary. In other words, quality control is a performance evaluation step undertaken to ensure quality improvement. Project quality control is typically conducted through statistical measurements or checklists to evaluate the desired quality process or to ensure compliance with predetermined specifications (Susanti, 2018).

Many statements regarding the causes of road damage are based solely on visual observation, such as the influence of water and vehicle loads exceeding the design load, even without accurate technical data (Ma'soem, 2006 in Laksono 2016). The facts show that road damage is more often caused by inadequate implementation of quality standards. Vehicle loads and standing water are only external factors that accelerate early damage, but what is most important is how internal factors (pavement bearing capacity) are able to maintain the road so that it is not easily affected by these two external factors (Setijowarno, 2008 in Laksono 2016).

This is supported by research by Mulyono (2016), which states that the dominant factors causing road damage are pavement construction quality (44.2%), road surface drainage (40.2%), and vehicle load repetition (15.6%). Research by Lakawa (2022) indicates that adding 2%, 3.5%, and 5% LGA Asbuton as a substitute for 60-70 penetration asphalt increases stability, Marshall Quotient (MQ), and voids filled with asphalt

(VFB). However, the 5% LGA content does not meet flow specifications.

According to Ahmad et al. (2020), factors influencing the effectiveness of work implementation include coordination between agencies, extreme weather, delays in material testing, contractor experience, and equipment availability. Facts show that one of the road sections in Selumang Regency, the Talang Durian-Pondok Uden road, is showing signs of damage in the form of cracks, raveling, and peeling of the pavement layer before reaching its design life.

Several previous studies have examined aspects that influence the quality of construction projects. Research conducted by Rahmat Ali et al. (2022) on the Tedubara-Pising Road improvement project found that financial factors, human resources, location, materials, and equipment significantly influenced project quality. These findings demonstrate the dominant role of finance and labor in project success. Meanwhile, Ilyas Firdaus et al. (2025) identified materials as the dominant factor contributing to the low quality of road work in Sijunjung Regency, followed by human resources, equipment, finance, work methods, and the environment. This study emphasized the importance of material control and improving worker competency.

Furthermore, research by Pamungkas (2024) showed that both internal and external project factors simultaneously have a significant influence on risk management-based project performance. In the context of a hydrometallurgical smelter project, risks such as labor shortages, rising material prices, and unpredictable weather have been proven to impact project quality and timelines.

Road infrastructure development is a key element in improving regional connectivity, accelerating economic growth, and supporting equitable national development. Road construction projects, such as the Talang Durian-Pondok Uden Road project, play a strategic role in opening transportation access and improving community mobility in the region. However, the implementation of these projects often encounters various problems that hinder the achievement of optimal construction quality.

These problems generally originate from two broad categories: internal factors and external factors of the project. Internal factors include human resources, project management, equipment, work methods, and materials. External factors, on the other hand, encompass weather, environmental, social, political, legal, and financial conditions of the project. An imbalance in managing these factors can lead to non-conformity to technical specifications, delays, cost overruns, and even a decline in the quality of project results.

Various problems that arise in road construction projects, such as delays in completion, substandard work quality, and discrepancies between planning and implementation on the ground, demonstrate the need for a comprehensive evaluation of the factors influencing project quality. In this context, a systematic, data-driven analysis is essential to identify key variables that significantly influence project quality.

Based on the background outlined above, the researcher is interested in conducting further research entitled "Analysis of the Influence of Internal and External Project Factors on the Quality of the Talang Durian – Pondok Uden Road Construction Project."

The following is the conceptual framework for this research.:

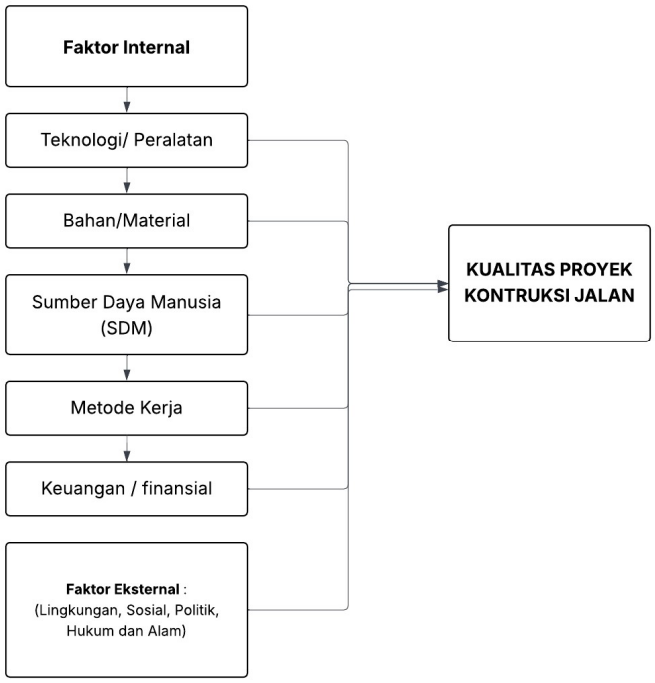

Figure 2.1 Thinking Framework

METHOD

The research methods used in this study are descriptive and verification. Descriptive methods are used to describe the condition or value of one or more variables independently, while verification methods can be defined as research conducted on a specific population or sample with the aim of testing a predetermined hypothesis.

Multiple Regression Analysis

In this study, to determine the influence of Technology/Equipment, Materials, and Human Resources on Project Quality, an analysis technique will be used, namely multiple regression analysis. This analysis tool measures the influence of more than one independent variable on a dependent variable as a predictor factor. The equation model is as follows:

$Y=\alpha+\beta_1 X_1+\beta_2 X_2+\beta_3 X_{(3)}+\beta_4 X_4+\beta_5 X_5+\beta_6 X_6+e$

Source: Sugiyono (2021:258)

Where:

Y = dependent variable (Project Quality)

X_1 = independent variable (Technology/Equipment)

X_2 = independent variable (Materials)

X_3 = independent variable (Human Resources)

X_4 = independent variable (Work Methods)

X_5 = independent variable (Finance)

X_6 = independent variable (Economic Factors) External)

α = Y value if X = 0

β = multiple linear coefficient

e = residual

Before conducting a regression analysis, it is necessary to test the classical assumptions using the following test model:

Correlation Coefficient Analysis

Correlation is a unidirectional relationship between the causal or influencing data, called the independent variable, usually symbolized by the letter X, and the affected data, called the dependent variable, usually symbolized by the letter Y.

Coefficient of Determination Analysis (R2)

According to Sugiyono (2013:241), the coefficient of determination is defined as the ability of variable X (the independent variable) to influence variable Y (the

dependent variable). The larger the coefficient of determination, the better X's ability to explain Y. The formula for the coefficient of determination is as follows:
KD = r^2 × 100%
Where:
Kd = Coefficient of Determination
r = Coefficient of Determination Value

Hypothesis Testing
Partial Regression Test (t-Test)
Test The t-statistic is used to test the influence of each independent variable used partially.
The t-test formula is as follows:
t=β_i/(Sβ_i)
Source: Sugiyono (2021: 187)
Description:
β_i: Regression Coefficient
Sβ_i: Standard Deviation of the Regression Coefficient
The test requires comparing the calculated t-value with the t-table value at a significance level of 5%. If the calculated t-value is greater than the t-table value and the sig. value is less than 0.05, then Ho is rejected and Ha is accepted, indicating that the independent variable individually influences the dependent variable. If the calculated t-value is less than the t-table value and the sig. value is more than 0.05, then Ho is accepted and Ha is rejected, indicating that the independent variable individually does not influence the dependent variable (Ghozali, 2013: 99).

Simultaneous Regression Test (F Test)
This test is conducted to determine whether the independent variables have a significant effect on the dependent variable (Ghozali, 2016:105). The formula used to calculate F is as follows:
F=(R^2/k)/((1-R^2)(n-k-1))
Source: Sugiyono (2021:197)
Where:
R = multiple correlation coefficient
k = number of independent variables
n = number of sample members

RESULTS AND DISCUSSION

Classical Assumption Test Results
1) Normality Test Results
Normality can be tested statistically using the Kolmogorov-Smirnov test. If the p-value is > 0.05, the data are normally distributed. The results of the Kolmogorov-Smirnov test are as follows:

Table 4.20 Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			33
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		1.03754380
Most Extreme Differences	Absolute		.065
	Positive		.065
	Negative		-.064
Test Statistic			.065
Asymp. Sig. (2-tailed)[c]			.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		.974
	99% Confidence Interval	Lower Bound	.970
		Upper Bound	.978

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 926214481.

Source: Data Processing with SPSS 25, 2025

Based on Table 4.20, the Kolmogorov-Smirnov test shows that the significance value of 0.200 is greater than 0.05, indicating that the data obtained are normally distributed, thus meeting one of the assumptions for hypothesis testing.

To determine the normality of the regression results, a normal distribution graph can also be used. To further clarify the distribution of the data in this study, the figure below shows a normal distribution P-plot..

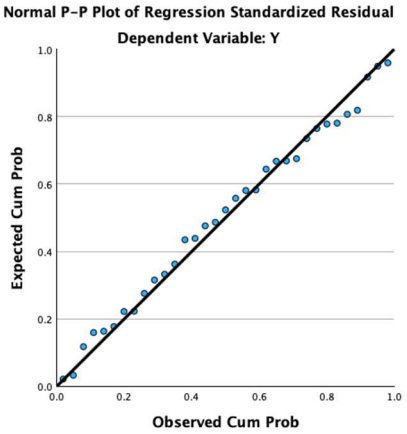

Figure 4.1 Normal P-Plot Graph (Normality Assumption)

Based on the P-plot results in Figure 4.1, the points are diagonally distributed, thus indicating that the research data is normally distributed.

1) Multicollinearity Test Results

Multicollinearity issues can be detected by examining the VIF value. If the VIF value is less than 10, the model can be concluded to be free from multicollinearity. The VIF values in this study are as follows:

Table 4.21 Multicollinearity Test Results

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	X1	.124	8.038
	X2	.123	8.145
	X3	.104	9.596
	X4	.157	6.359
	X5	.104	9.651
	X6	.115	8.682

Source: Data Processing with SPSS 25, 2025

Based on Table 4.21, it can be seen that the Technology/Equipment variable has a VIF value of 8.038, Materials has a VIF value of 8.145, Human Resources

(HR) has a VIF value of 9.596, Work Methods has a VIF value of 6.359, Finance has a VIF value of 9.651, and External Factors has a VIF value of 8.682. Therefore, all six independent variables have VIF values below the established limit of 10. These results indicate that the model does not contain multicollinearity among the independent variables.

1) Heteroscedasticity Test Results

To test whether there is inequality in the variance and residuals from one observation to another in the regression, the heteroscedasticity test is used. A regression model is considered good if the variance and residuals of the observation values exhibit homoscedasticity, or if there is no heteroscedasticity.

To determine whether or not heteroscedasticity is present, a Glejsers test will be conducted. The results are as follows:

1) Heteroscedasticity Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.024	.564		.042	.967
	X1	.024	.054	.233	.444	.661
	X2	-.051	.070	-.397	-.727	.474
	X3	.011	.054	.117	.212	.833
	X4	.033	.047	.315	.693	.495
	X5	-.083	.064	-.707	-1.293	.207
	X6	.068	.049	.761	1.396	.174

a. Dependent Variable: ABS_RES

Source: Data Processing with SPSS 25, 2025

The test results indicate that the probability (sig) values for variables X1 = 0.661, X2 = 0.474, X3 = 0.833, X4 = 0.495, X5 = 0.207, and X6 = 0.174 are greater than 0.05, indicating no heteroscedasticity. Heteroscedasticity can be detected by observing the scatterplot graph between the predicted value of the dependent variable, ZPRED, and its residual value (SRESID). The following figure is used to detect the presence or absence of heteroscedasticity symptoms:

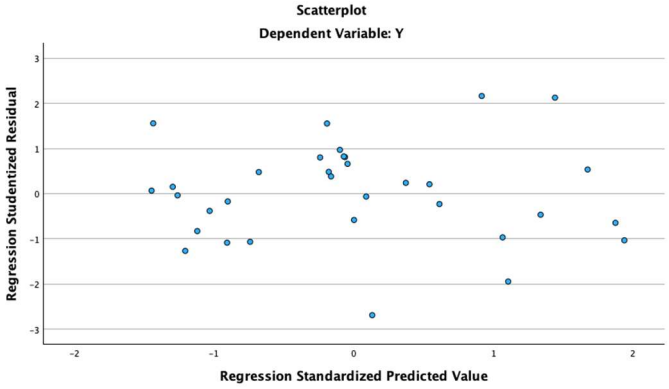

Figure 4.2 Heteroscedasticity test with scatterplot

From Figure 4.6, it can be seen that there is no heteroscedasticity in the model because there is no clear pattern in the image, and the points are spread above and below the number 0 on the Y axis. This indicates that in the model, the variance of the residuals from one observation to another is the same or constant. Therefore, the assumption of no heteroscedasticity or

homoscedasticity has been met for the regression equation.

Multiple Linear Regression Analysis

Table 4.23 Regression Coefficient Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.433	1.084		-1.322	.198
	X1	-.081	.104	-.075	-.779	.443
	X2	.324	.118	.264	2.740	.011
	X3	.393	.110	.375	3.589	.001
	X4	.224	.091	.210	2.462	.021
	X5	.415	.129	.336	3.209	.004
	X6	-.074	.093	-.078	-.787	.438
a. Dependent Variable: Y						

Source: Data Processing with SPSS 25, 2025

Based on Table 4.23, the constant values and regression coefficients are obtained, allowing for the formation of a multiple linear regression equation as follows:

Y = a + b1X1 + b2X2 + b3 + X3 + b4X4 + b5X5 + b6X6 + e

Y = -1.433 – 0.081 (X1) + 0.324 (X2) + 0.393 (X3) + 0.224 (X4) + 0.415 (X5) – 0.074 (X6) + e

Hypothesis Testing

Results of the t-Test (Partial Test)

The significance test of the regression coefficients in this study used SPSS 25, as shown in Table 4.29, summarized below:

Table 4.24 Partial Test Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.433	1.084		-1.322	.198
	X1	-.081	.104	-.075	-.779	.443
	X2	.324	.118	.264	2.740	.011
	X3	.393	.110	.375	3.589	.001
	X4	.224	.091	.210	2.462	.021
	X5	.415	.129	.336	3.209	.004
	X6	-.074	.093	-.078	-.787	.438
a. Dependent Variable: Y						

Source: Data Processing with SPSS 25, 2025

In the first hypothesis, namely the influence of Technology/Equipment on the Quality of Construction Projects, the calculated t value is -0.779, which is greater than the t table of 2.056, and it is known that sig. (0.443) is greater than the

significance level of α (0.05), so H0 is accepted, meaning that there is no significant influence between Technology/Equipment on the Quality of Construction Projects, with a negative regression coefficient.

In the second hypothesis, namely the influence of Materials on the Quality of Construction Projects, the calculated t value is 2.740, which is greater than the t table of 2.056, and it is known that sig. (0.011) is smaller than the significance level of α (0.05), so H0 is rejected, meaning that there is a significant influence between Materials on the Quality of Construction Projects, with a positive regression coefficient indicating that better Materials will have an impact on the Quality of Construction Projects, and vice versa, worse Materials will have an impact on the Quality of Construction Projects. In the third hypothesis, namely the influence of Human Resources (HR) on the Quality of Construction Projects, it was obtained that the calculated t value of 3,589 was greater than the t Table of 2.056 and was known sig. (0.001) was smaller than the significance level α (0.05) so that H0 was rejected, which means that there is a significant influence between Human Resources (HR) on the Quality of Construction Projects, with a positive regression coefficient indicating that the better the Human Resources (HR) the better the impact on the Quality of Construction Projects, and vice versa, the worse the Human Resources (HR) the worse the impact on the Quality of Construction Projects.

In the fourth hypothesis, namely the influence of Work Methods on the Quality of Construction Projects, it was obtained that the calculated t value of 2,462 was greater than the t Table of 2.056 and was known sig. (0.021) is smaller than the significance level α (0.05) so that H0 is rejected, which means that there is a significant influence between the Work Method and the Quality of Construction Projects, with a positive regression coefficient indicating that the better the Work Method, the better the impact on the Quality of Construction Projects, and vice versa, the worse the Work Method, the worse the impact on the Quality of Construction Projects.

In the fifth hypothesis, namely the influence of Finance/Financial on the Quality of Construction Projects, it was obtained that the calculated t value of 3.209 was greater than the t Table of 2.056 and was known sig. (0.004) was smaller than the significance level α (0.05) so that H0 was rejected, which means that there is a significant influence between Finance/Financial on the Quality of Construction Projects, with a positive regression coefficient indicating that the better Finance/Financial will have an impact on the Quality of Construction Projects, and vice versa, the worse Finance/Financial will have an impact on the Quality of Construction Projects.

In the sixth hypothesis, namely the influence of External Factors on the Quality of Construction Projects, it was obtained that the calculated t value of -0.787 was greater than the t Table of 2.056 and was known sig. (0.438) was greater than the significance level α (0.05) so that H0 was accepted, meaning that there is no significant influence between External Factors on the Quality of Construction Projects, with a negative regression coefficient.

F Test Results (Simultaneous)

Table 4.25 Results of Simultaneous Regression Significance Test

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1084.573	6	180.762	141.920	.000[b]
	Residual	33.116	26	1.274		

	Total	1117.689	32			
a. Dependent Variable: Y						
b. Predictors: (Constant), X6, X4, X1, X5, X2, X3						

Source: Data Processing with SPSS 25, 2025

Based on Table 4.25, the F-count value is 141.920 with a sig. of 0.00 with α = 0.05 (5%) and degrees of freedom df1 = k = 6 and df2 = n-(k + 1) = 33-(6 + 1) = 26, then the F-table is 2.47 so that the F-count is greater than the F-table (141.920 > 2.47) in addition, the sig. value is smaller than the confidence level (0.00 < 0.05) which indicates that H0 is rejected. Thus, this study shows that the regression means that Technology/Equipment, Materials, Human Resources (HR), Work Methods, Finance/Financial, External Factors have a significant effect simultaneously on the Quality of the Talang Durian – Pondok Uden Road construction project.

Correlation Coefficient Analysis

Table 4.26 Correlation Analysis

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985[a]	.970	.964	1.12858
a. Predictors: (Constant), X6, X4, X1, X5, X2, X3				
b. Dependent Variable: Y				

Source: Data Processing with SPSS 25, 2025

The calculation results above yielded an R value of 0.985, indicating a very strong relationship between Technology/Equipment, Materials, Human Resources (HR), Work Methods, Finance, and External Factors and construction project quality. The positive correlation indicates that the better the Technology/Equipment, Materials, Human Resources (HR), Work Methods, Finance, and External Factors, the better the construction project quality. Conversely, the worse the Technology/Equipment, Materials, Human Resources (HR), Work Methods, Finance, and External Factors, the worse the construction project quality.

Coefficient of Determination Analysis (R2)

The coefficient of determination is obtained from the following calculation:

Table 4.27 Analysis of Determination Coefficient

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985[a]	.970	.964	1.12858
a. Predictors: (Constant), X6, X4, X1, X5, X2, X3				
b. Dependent Variable: Y				

Source: Data Processing with SPSS 25, 2025

$$Kd = r^2 \times 60\% = 0.933^2 \times 100\%$$
$$= 0.970 \times 100\%$$
$$= 97\%$$

The calculation results above show a coefficient of determination of 97%, indicating that Technology/Equipment, Materials, Human Resources (HR), Work Methods, Finance, and External Factors influence construction project quality by 97%, while the remaining 3% is influenced by other factors not examined.

DISCUSSION

The Effect of Technology/Equipment on the Quality of the Talang Durian – Pondok Uden Road Construction Project

The use of appropriate technology and equipment in construction projects is a crucial factor in ensuring smooth and high-quality work. Appropriate, efficient equipment in good condition can increase productivity, reduce work time, and minimize technical errors. Therefore, this study examines whether the Technology/Equipment variable (X1) influences Project Quality (Y).

Based on the results of the multiple linear regression analysis, a regression coefficient of -0.081 was obtained, with a significance value of 0.527 and a calculated t-value of -0.642. This significance value is greater than the 0.05 level (0.527 > 0.05), and the calculated t-value is less than the t-table value of 2.056 (-0.642 < 2.056), thus H_0 is accepted. This means that partially, the Technology/Equipment variable does not significantly influence the quality of the Talang Durian – Pondok Uden Road Construction Project. Furthermore, the negative regression coefficient also indicates that an increase in this variable tends to decrease project quality, although statistically insignificant.

These results indicate that although technology and equipment are important components of construction projects, in the context of this project, several obstacles may arise, such as suboptimal equipment conditions, low operational efficiency, or a mismatch between equipment types and field requirements. This is also evident from the respondents' responses in the previous table, where the average perception of technology/equipment only fell into the "Sufficient" category (3.31), with one of the lowest indicators being "equipment operates efficiently during project implementation," which only received an average score of 2.73.

This finding is inconsistent with research conducted by Rahmat Ali, Irwan Lakawa, Sitti Hawa, and Sufrianto (2022), which stated that project equipment has a significant and positive impact on construction project quality, as equipment availability and efficiency can accelerate implementation times and reduce the risk of work errors. This discrepancy in the results indicates that the effectiveness of technology and equipment is highly dependent on the context of its implementation in the field, including aspects of planning, maintenance, and suitability to project characteristics.

Thus, although technology/equipment can theoretically improve project quality, in the implementation of the Talang Durian – Pondok Uden Road project, technology/equipment has not significantly contributed to the resulting project quality.

The Influence of Materials on the Quality of the Talang Durian – Pondok Uden Road Construction Project

Materials are a crucial component in construction project implementation. Good material quality, timely availability, and compliance with technical specifications significantly determine the quality of construction work. Proper material management will impact the overall project quality.

Based on the results of the multiple linear regression analysis, the regression coefficient for the Materials variable (X2) was 0.324, with a significance value of 0.010 and a calculated t-value of 2.784, which is greater than the t-table of 2.056. Because the significance value is less than 0.05, H0 is rejected. This indicates a positive and significant influence between Materials on the Quality of the Talang Durian – Pondok Uden Road Construction Project. This means that the better the

materials used in a project, the higher the project quality, and vice versa.

These results are supported by respondents' responses, which indicate that most indicators for the materials variable fall into the good category, with an average score of 3.51. The indicator with the highest score is the availability of materials at the project site when needed, indicating that material logistics management is running quite well.

These findings align with research conducted by Ilyas Firdaus, Dwifitra Y Jumas, and Bahrul Anif (2025), which states that materials significantly influence work quality. Furthermore, research by Rahmat Ali, Irwan Lakawa, Sitti Hawa, and Sufrianto (2022) states that materials influence the quality of project implementation.

Therefore, it can be concluded that materials are a critical factor influencing the quality of construction projects. Therefore, selecting appropriate materials, timely procurement, and well-organized storage and distribution are essential aspects of every construction project.

The Influence of Human Resources on the Quality of the Talang Durian – Pondok Uden Road Construction Project

Human resources (HR) are a crucial factor in any construction project. A competent, experienced workforce capable of adapting to the dynamics of work in the field significantly influences the success and quality of project outcomes. Professional HR not only completes work technically but also maintains time efficiency, occupational safety, and output quality.

The results of multiple linear regression analysis indicate that the Human Resources variable (X3) has a regression coefficient of 0.393, with a calculated t-value of 3.589 and a significance level of 0.001. Because the calculated t-value is greater than the t-table (2.056) and the significance level is less than 0.05, H0 is rejected. This means there is a positive and significant influence between Human Resources on the Quality of the Talang Durian – Pondok Uden Road Construction Project. In other words, the better the quality of HR in a project, the higher the project quality tends to be.

Descriptively, the HR variable has an average score of 3.32, falling into the sufficient category. However, the indicator regarding workforce engagement in skills training scored relatively higher, indicating potential for improving human resource competency if training is conducted in a more structured and sustainable manner.

These results are consistent with research conducted by Rahmat Ali, Irwan Lakawa, Sitti Hawa, and Sufrianto (2022), which states that human resources have a direct relationship to the quality of construction work. Similarly, research by Ilyas Firdaus, Dwifitra Y Jumas, and Bahrul Anif (2025) concluded that adequately trained workers will positively contribute to project efficiency and quality.

Therefore, it can be concluded that sound human resource management, from recruitment and training to performance management, is essential to ensuring optimal construction project quality.

The Influence of Work Methods on the Quality of the Talang Durian – Pondok Uden Road Construction Project

The work methods used in construction projects play a crucial role in determining the efficiency, effectiveness, and quality of work results. Selecting the right work method will influence the flow of activities in the field, minimize technical errors, and accelerate the achievement of time and cost targets. Therefore, systematic work methods that comply with technical standards and are easily understood by the workforce will positively impact the overall project quality.

Based on the results of the multiple linear regression analysis, the Work Method variable (X4) has a regression coefficient of 0.224, with a calculated t-value of 2.462 and a significance level of 0.021. Because the calculated t-value is greater than the t-table (2.056) and the significance level is less than 0.05, H0 is rejected. This indicates a positive and significant influence between Work Methods and the Quality of the Talang Durian – Pondok Uden Road Construction Project. Therefore, the better the work methods implemented in the project, the higher the quality achieved.

Descriptively, the Work Method variable has an average score of 3.55 and is categorized as good. The statement that received the highest response was that the workflow in the method was easy to understand by project implementers, indicating that technical communication and work instructions were running quite effectively in the field.

These results align with research conducted by Ilyas Firdaus, Dwifitra Y Jumas, and Bahrul Anif (2025), which states that implementing appropriate work methods will reduce the risk of technical errors and increase project efficiency. Therefore, work methods are a crucial component of project management that cannot be ignored. Periodic evaluation and adjustment of work methods are necessary to align with evolving project conditions and technical needs in the field.

The Influence of Finance on the Quality of the Talang Durian – Pondok Uden Road Construction Project

Finance is a vital aspect in the implementation of a construction project. The availability of sufficient funds and efficient financial management enable each stage of the project to proceed according to plan. Proper budget management also supports the smooth procurement of materials, labor payments, and handling of emergencies that may arise during the project.

Based on the results of the multiple linear regression analysis, the Finance variable (X5) has a regression coefficient of 0.415 with a calculated t-value of 3.209 and a significance value of 0.004. Because the calculated t-value is greater than the t-table (2.056) and the significance value is less than 0.05, H0 is rejected. This indicates a positive and significant influence between Finance and the Quality of the Talang Durian – Pondok Uden Road Construction Project. This means that the better the financial conditions and management, the higher the project quality that can be achieved.

Descriptively, the Finance variable has an average score of 3.45, categorized as good. The statement that received the highest score was the open and accountable reporting of project funds, as well as the availability of funds during project implementation. This indicates that the project's financial management was transparent and supported the achievement of quality targets.

This finding is supported by research conducted by Rahmat Ali, Irwan Lakawa, Sitti Hawa, and Sufrianto (2022), which stated that finances influence the quality of construction projects. Furthermore, a study by Ilyas Firdaus, Dwifitra Y Jumas, and Bahrul Anif (2025) also stated that finances influence the quality of construction projects.

Thus, it can be concluded that sound and professionally managed finances are a crucial foundation for realizing a quality construction project. Therefore, project management must ensure that financial aspects are taken seriously from the planning stage through the final reporting.

The Influence of External Factors on the Quality of the Talang Durian – Pondok Uden Road Construction Project

External factors include elements beyond the direct control of the project implementer, such as weather conditions, socio-political factors, government

policies, and the readiness of infrastructure around the project site. These factors can have both positive and negative impacts on the smooth running and final results of a project. In practice, project management needs to anticipate and adapt work strategies to evolving external conditions on the ground.

Based on the results of the multiple linear regression analysis, the External Factors variable (X6) has a regression coefficient of -0.074, a calculated t-value of -0.078, and a significance level of 0.438. Because the calculated t-value is smaller than the t-table (2.056) and the significance level is greater than 0.05, H0 is accepted. This means there is no significant influence between External Factors and the Quality of the Talang Durian – Pondok Uden Road Construction Project. However, the negative regression coefficient indicates that negative changes in external factors still have the potential to reduce project quality, although the effect was not statistically significant in this study.

Descriptively, the average respondent response to External Factors was 3.41, which is in the good category. Several indicators that respondents considered quite good were project readiness for natural disasters and the smooth land acquisition process. However, there were also indicators with low scores, such as weather conditions and project site access, which may pose challenges during implementation.

These results align with research by Wibowo and Sutanto (2019), which explains that external factors do not always have a direct impact on project quality, but can trigger obstacles if not properly anticipated. In the context of this project, the insignificant external influence may be due to the project implementer's already effective risk adaptation and mitigation strategies.

Therefore, although external factors do not statistically significantly impact project quality, attention to external elements remains crucial to prevent project disruptions that could hinder the achievement of the planned quality.

The Influence of Technology/Equipment, Materials, Human Resources, Work Methods, Finance, and External Factors on the Quality of the Talang Durian – Pondok Uden Road Construction Project

The quality of a construction project is influenced by many factors, both internal and external. In the context of the Talang Durian – Pondok Uden Road project, the variables analyzed simultaneously were Technology/Equipment (X1), Materials (X2), Human Resources (X3), Work Methods (X4), Finance (X5), and External Factors (X6). Each factor plays a complementary role in determining the final quality of the construction work, from planning to field implementation.

Based on the results of the F-test (simultaneous test), the calculated F-value was 141.920 with a significance level of 0.000. This value is greater than the F-table of 2.47 and significantly lower than 0.05. This indicates that simultaneously, the variables Technology/Equipment, Materials, Human Resources, Work Methods, Finance, and External Factors significantly influenced the quality of the Talang Durian – Pondok Uden Road Construction Project. This means that proper management and control of these six variables can improve the overall quality of the project.

The analysis also showed a coefficient of determination (R-square) of 0.970, indicating that 97 percent of the variation in project quality can be explained by these six independent variables. The remaining 3 percent is influenced by factors outside the research model. Furthermore, the correlation coefficient (R-square) of 0.985 indicates a very strong relationship between all independent variables and project quality.

These results support previous research by Ilyas Firdaus, Dwifitra Y Jumas, and Bahrul Anif (2025), which stated that the environment influences the quality of project work. Therefore, it can be concluded that construction project quality is not solely influenced by a single aspect but is the result of the integration of various important elements in project management. Therefore, to achieve high-quality project results, all aspects involved must be planned, controlled, and evaluated thoroughly and continuously.

CONCLUSION

After conducting data analysis and discussion, the results of the partial regression test show that Technology/Equipment has no significant effect on the quality of construction projects with a significance value of 0.527 (> 0.05), while Materials have a positive and significant effect with a significance value of 0.010 (<0.05) and a coefficient of 0.324, which confirms that the better the management of materials, the higher the quality of the project. Human Resources (HR) also have a positive and significant effect with a significance value of 0.000 (<0.05) and a coefficient of 0.393, indicating that the skills and abilities of the workforce are important factors in ensuring project quality. Likewise, Work Methods provide a significant positive effect with a significance value of 0.021 (<0.05) and a coefficient of 0.224, meaning that the implementation of effective work methods can improve project results. Finance/Financial has the most dominant influence with a significance value of 0.003 (<0.05) and a coefficient of 0.415, which means that financial stability and transparency greatly determine project quality. On the other hand, External Factors do not have a significant effect with a significance value of 0.176 (> 0.05), so that aspects such as weather and socio-political conditions do not have a real partial impact on project quality. However, simultaneously the six independent variables are proven to have a significant effect on the quality of construction projects with an F count value of 142.365, a significance of 0.000 (< 0.05), and a coefficient of determination (R^2) value of 0.970, which indicates that 97% of the variation in project quality can be explained by these variables, while the remaining 3% is influenced by other factors outside this study.

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