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Stakeholder Analysis on Construction Project Success of the Rest Area Tebing Tinggi-Indrapura Zone A

Saskia Yulia Rahmi[1*], Rezky Ariessa Dewi [1*], Syahrizal [1], Gina Cynthia Raphita Hasibuan [1], Gea Geby Aurora Syafridon [1], Indra Jaya [1]

[1] *Department of Civil Engineering, Faculty of Engineering, Universitas Sumatera Utara, Medan, 20155, Indonesia*

*Corresponding Author: saskiayuliaa29@gmail.com, rezky.ariessa@usu.ac.id

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ABSTRACT

The construction project of the Tebing Tinggi–Indrapura Toll Road Rest Area Zone A, valued at Rp209,026,536,000, faces various challenges, particularly related to stakeholder involvement, which may not always optimally support project objectives and can sometimes hinder project progress. Therefore, stakeholders play a crucial role in determining project success. This study aims to analyze the relationship between stakeholders and construction project success, as well as to identify the stakeholder with the most dominant influence on project success. The research involved 27 respondents consisting of project owners, contractors, consultants, and suppliers. The collected data were analyzed using SPSS version 27. The results show that owners, contractors, consultants, and suppliers simultaneously influence project success, with F-calculated greater than F-table (53.923 > 2.816). Partially, the contractor variable has a T-calculated value of 6.206 greater than T-table (1.717) with a significance value of 0.001 < 0.05, while the consultant variable has a T-calculated value of 2.162 greater than T-table (1.717) with a significance value of 0.042 < 0.05. These results indicate that contractors are the stakeholders with the most dominant influence on construction project success.

Keywords: *Stakeholder, Project Success, Rest Area, Tebing Tinggi-Indrapura Toll, Construction Project.*

1. Introduction

The construction industry is widely recognized as one of the most complex and dynamic sectors due to the involvement of numerous stakeholders who possess diverse interests, responsibilities, and levels of influence throughout the project lifecycle. Unlike manufacturing industries, construction projects are temporary in nature, highly dependent on coordination among parties, and often exposed to uncertainty related to technical, financial, environmental, and organizational factors [1]. Project success has been measured using criteria, namely time, cost, and quality [2]. In construction project management, project success is generally evaluated through several key performance indicators, including cost performance, schedule performance, quality achievement, and stakeholder satisfaction. Cost performance refers to the ability of the project to be completed within the planned budget, while schedule performance reflects the completion of project activities according to the planned timeline. Quality achievement refers to the compliance of construction outcomes with the required technical standards and specifications. In addition, stakeholder satisfaction is increasingly recognized as an important dimension of project success because construction projects involve multiple parties whose expectations must be effectively managed [3],[4].

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Stakeholders are defined as individuals or organizations that can affect or are affected by the achievement of project objectives [5]. In construction projects, key stakeholders typically include project owners, contractors, consultants, and suppliers, each of whom plays a distinct and interdependent role. The project owner is responsible for defining project objectives, securing funding, and making strategic decisions. Contractors are primarily responsible for execution and resource management, consultants provide technical planning and supervision, while suppliers ensure the availability and quality of construction materials [6]. Stakeholder influence on project success varies depending on project characteristics, organizational structure, and the effectiveness of coordination mechanisms [7].

Contractors, for instance, often have a dominant influence due to their direct involvement in construction activities, workforce management, and on-site decision-making. Consultants play a crucial role in ensuring technical compliance and quality control, while suppliers contribute through timely material delivery and supply chain reliability [8]. Meanwhile, project owners significantly influence success through leadership, decision-making speed, and regulatory compliance [9].

Infrastructure development projects, such as toll road rest areas, present additional challenges because they involve large-scale investments, public service functions, and strict regulatory requirements. Rest areas serve an important role in supporting transportation systems by providing rest facilities for drivers, improving road safety, and enhancing travel comfort on long-distance routes. The development of rest areas is also regulated by infrastructure planning guidelines issued by the Indonesian Ministry of Public Works and Housing, which determine distance requirements and facility standards for toll road service areas. Therefore, the development of rest areas requires effective stakeholder coordination to ensure that the project objectives are successfully achieved.

The Rest Area Tebing Tinggi–Indrapura Zone A project was selected as the case study because it represents an important supporting facility within the Trans-Sumatra toll road network. As part of a strategic national infrastructure system, the development of this rest area involves multiple stakeholders with different responsibilities and interests, making stakeholder management a critical factor in achieving project success. Although project success may also be influenced by various factors such as organizational capability, technological aspects, and risk management, this study specifically focuses on stakeholder-related factors because stakeholder interaction and coordination are considered key elements in construction project implementation.

Therefore, this study seeks to analyze the relationship between key stakeholders such as owners, contractors, consultants, and suppliers, and construction project success using a quantitative approach. The objectives of this study are to analyze the relationship between stakeholder involvement and construction project success, and to identify the stakeholder with the most dominant influence on project success in the Rest AreaTebing Tinggi–Indrapura Zone A project. The findings of this study are expected to provide practical insights for project managers and policymakers in improving stakeholder management strategies to enhance the success of future infrastructure projects.

2. Method

The research approach used in this study is a descriptive quantitative approach. Primary data was obtained through the distribution of questionnaires and interviews with 27 respondents directly involved in the project. The sampling technique used in this study was the Slovin method, which is commonly applied to determine the required sample size in quantitative research [10]. This study used the following five variables:

1. X1 – Owner
2. X2 – Contractor
3. X3 – Consultant
4. X4 – Supplier
5. Y – Construction Project Success

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Each variable is measured using several indicators as presented in the Table 1.

Table 1. Variables, Indicators and Corresponding Codes

Variable	Code	Indicator
Owner (X1)	X1.1	Clarity of project vision and objectives
	X1.2	Quality of planning and decision-making
	X1.3	Communication and coordination
	X1.4	Compliance with regulations
Contractor (X2)	X2.1	Work quality
	X2.2	Schedule adherence
	X2.3	Efficiency in resource utilization
	X2.4	Occupational health and safety
	X2.5	Risk management capability
Consultant (X3)	X3.1	Accuracy in planning
	X3.2	Quality of solutions provided
	X3.3	Compliance with standards and regulations
	X3.4	Coordination with related parties
Supplier (X4)	X4.1	Quality of materials and equipment
	X4.2	Timeliness of delivery
	X4.3	Availability of stock
	X4.4	Service and responsiveness
Construction Project Success (Y)	Y1	Timeliness (project completion on schedule)
	Y2	Cost efficiency
	Y3	Construction quality

Each variable was measured using several statement indicators on the questionnaire, which were assessed using a Likert scale with four or more questions combined with a choice of options provided to form a score/value from respondents to determine the level of agreement with the statements in the questionnaire, such as knowledge, attitude, and behavior (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) [11]. The scoring results of the variables obtained were then analyzed using Statistical Program for Social Scince (SPSS) Version 27. The factor analysis using SPSS is as follows:

a. Validity Test
b. Reliability Test
c. Normality Test
d. Heteroskedasticity Test
e. Multicollinearity Test
f. Multiple Linear Regression Test
g. Partial T Test
h. Simultaneous F Test

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i. Correlation Coefficient Test
j. Coefficient of Determination Test

3. Results and Discussion

3.1 Data

Primary data refers to data collected directly from the field during the research. The main source of this data comes from the responses of respondents obtained through the distribution of questionnaires to parties directly related to the issues being studied. Secondary data was collected through documents and information available at agencies related to the project. This type of data includes documents such as the project's organizational structure and S-curve.

3.2 Validity Test

Table 2. Validity Test Results

Variable	Item	R Count	R tabel	Result
Owner (X1)	X1.1	0.710	0.396	Valid
	X1.2	0.892	0.396	Valid
	X1.3	0.870	0.396	Valid
	X1.4	0.868	0.396	Valid
Contractor (X2)	X2.1	0.818	0.396	Valid
	X2.2	0.739	0.396	Valid
	X2.3	0.651	0.396	Valid
	X2.4	0.705	0.396	Valid
	X2.5	0.833	0.396	Valid
Consultant (X3)	X3.1	0.818	0.396	Valid
	X3.2	0.590	0.396	Valid
	X3.3	0.829	0.396	Valid
	X3.4	0.553	0.396	Valid
Supplier (X4)	X4.1	0.426	0.396	Valid
	X4.2	0.764	0.396	Valid
	X4.3	0.778	0.396	Valid
	X4.4	0.724	0.396	Valid
Construction Project Success (Y)	Y1	0.706	0.396	Valid
	Y2	0.772	0.396	Valid
	Y3	0.826	0.396	Valid

Based on the results of the r table from 27 respondents at a significance level of 5% in the distribution of r table values, a value of 0.396 was obtained. Then, the calculated r value from the results of calculations using

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SPSS software will be compared with the known r table value. Attribute data is declared valid if the calculated r > r table.

In table 1 it can be inferred, the calculation results obtained from the 27 respondents' answers that underwent validity testing, owner, contractor, consultant, supplier attribute instruments were generally valid because all calculated r values were greater than the table r value. Therefore, all questionnaire attributes could proceed to the next stage.

3.3 Reliability Test

Reliability testing aims to ensure that data remains reliable even when tested repeatedly and over a long period of time [10].

Table 3. Reliability Test Results

Reliability Statistic			
Variable	N of Items	Cronbach's Alpha	Description
Owner (X1)	4	0.849	Reliable
Contractor (X2)	5	0.806	Reliable
Consultant (X3)	4	0.649	Reliable
Supplier (X4)	4	0.627	Reliable
Construction Project Success (Y)	3	0.647	Reliable

In table 2, based on the reliability test results, the Cronbach's Alpha value for each research variable is above 0.6, which is the minimum threshold used as a reliability criterion. The Cronbach's Alpha value for the variables indicates that the research instrument has a good level of internal consistency.This means that each indicator in these variables can be relied upon to measure the construct being studied. Thus, all instruments used in this study are declared reliable and can be used in further analysis.

3.4 Normality Test

The data normality test used in this study was the Kolmogorov Smirnov test. Normality is fulfilled if the Asymp.Sig. (2-tailed) value is greater than the alpha value (0.05) [12].

Table 4. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		27
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.54900308
Most Extreme Differences	Absolute	.112
	Positive	.112

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	Negative	-.064
Test Statistic		.112
Asymp. Sig. (2-tailed)[c]		.200[d]

a. Test distribution is Normal.

b. Calculated from data.

Table 4 shows the results of the normality test using the One-Sample Kolmogorov Smirnov Test, an Asymp. Sig. (2-tailed) value of 0.200 was obtained. Because the significance value is greater than 0.05, it can be concluded that the data in this study is normally distributed. This indicates that the regression model used meets the normality assumption, so it can proceed to the regression analysis stage and other statistical tests.

3.5 Heteroskedasticity Test

The results of the heteroscedasticity test using the Glejser test, which regresses the absolute residual values against each independent variable [12].

Table 5. Heteroskedasticity Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.423	.612		.691	.497
	OWNER	.034	.047	.265	.722	.478
	CONTRACTOR	-.042	.052	-.389	-.798	.433
	CONSULTANT	.020	.054	.122	.367	.717
	SUPPLIER	-.001	.069	-.008	-.019	.985

a. Dependent Variable: ABS_RES

In table 5, the results of the heteroscedasticity test using the Glejser method show that all independent variables, Owner ($p = 0.478$), Contractor ($p = 0.433$), Consultant ($p = 0.717$), and Supplier ($p = 0.985$) have a significance value greater than 0.05. This indicates that there is no significant relationship between the absolute residual values and each independent variable, so that the error variance can be considered constant (homoscedastic), meaning that the regression model used in this study has fulfilled one of the classical assumptions that is important for the validity of multiple linear regression analysis.

3.6 Multicollinearity Test

Multicollinearity was evaluated through the Tolerance and Variance Inflation Factor (VIF) values in the Coefficients table. A model is considered free of multicollinearity if Tolerance > 0.10 (equivalent to VIF < 10) [12].

Table 6. Multicollinearity Test Results

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF

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1	(Constant)	1.404	1.007		1.394	.177		
	OWNER	.120	.077	.178	1.561	.133	.324	3.089
	CONTRACTOR	.536	.086	.941	6.206	<.001	.183	5.465
	CONSULTANT	.191	.088	.223	2.162	.042	.394	2.537
	SUPPLIER	-.312	.114	-.377	-2.745	.012	.224	4.471

a. Dependent Variable: CONSTRUCTION PROJECT SUCCESS

In table 6, the analysis results show the analysis results show that the Owner variable has a Tolerance = 0.324 (VIF = 3.089), the Contractor variable has a Tolerance = 0.183 (VIF = 5.465), the Consultant variable has a Tolerance = 0.394 (VIF = 2.537), and the Supplier variable has a Tolerance = 0.224 (VIF = 4.471). All Tolerance values are above 0.10 and VIF is below 10, so it can be concluded that there is no multicollinearity among the independent variables. In other words, each X variable is not strongly collinear with each other, so that the regression coefficients can be interpreted accurately without bias due to linear relationships between predictors.

3.7 Multiple Linear Regression Test

Multiple linear regression tests are used to determine the direction and magnitude of the influence of several independent variables on one dependent variable simultaneously [12].

Table 7**.** Multiple Linear Regression Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.404	1.007		1.394	.177
	OWNER	.120	.077	.178	1.561	.133
	CONTRACTOR	.536	.086	.941	6.206	<.001
	CONSULTANT	.191	.088	.223	2.162	.042
	SUPPLIER	-.312	.114	-.377	-2.745	.012

a. Dependent Variable: CONSTRUCTION PROJECT SUCCESS

Table 7 shows the results of the multiple linear regression test, the following regression equation was obtained: $Y=1.404 + 0.120X1 + 0.536X2 + 0.191X3 - 0.312X4$

Y = Construction Project Success ; X1 = Owner ; X2 = Contractor ; X3 = Consultant ; X4 = Supplier

1. The constant value of 1.404 indicates that if all independent variables are considered constant or equal to 0 then the construction project success value is 1.404.
2. The owner (X1) has a positive coefficient of 0.120, which indicates that every 1-unit increase in the owner variable, assuming other variables remain constant, will increase the success of the construction

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project by 0.120 units. However, the significance value of 0.133 (> 0.05) indicates that the influence of the Owner variable is not statistically significant on project success.

3. Contractor (X2) has a positive coefficient of 0.536, indicating that every 1- unit increase in the contractor variable, assuming other variables remain constant, will increase the success of the construction project by 0.536 units.
4. Consultant (X3) has a positive coefficient of 0.191, indicating that a 1-unit increase in the consultant variable will increase the success of the construction project by 0.191 units, assuming other variables remain constant.
5. Supplier (X4) has a negative coefficient of -0.312, indicating that every 1-unit increase in the supplier variable, assuming other variables remain constant, will decrease the success of the construction project by 0.312 units. A significance value of 0.012 (<0.05) indicates that the supplier has a negative and significant effect on project success.

3.8 Partial T Test

The t-test or partial test is used to determine how much each independent variable individually affects the dependent variable [13].

Table 8. Partial T Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.404	1.007		1.394	.177
	OWNER	.120	.077	.178	1.561	.133
	CONTRACTOR	.536	.086	.941	6.206	<.001
	CONSULTANT	.191	.088	.223	2.162	.042
	SUPPLIER	-.312	.114	-.377	-2.745	.012

a. Dependent Variable: CONSTRUCTION PROJECT SUCCESS

Based on the t-test results show in table 8 that the Contractor and Consultant variables have a positive and significant effect on the success of construction projects, while Suppliers have a negative and significant effect, and Owners have no significant effect. The negative influence of the supplier variable may indicate issues related to material delivery delays, coordination problems, or supply chain disruptions during the project. This result indicates that contractors play a significant role in determining project success because contractors are directly responsible for construction execution, project scheduling, and quality control. This confirms that the success of the Rest Area Tebing Tinggi–Indrapura construction project is greatly influenced by the performance of effective contractors and consultants, while the role of suppliers needs to be improved so as not to hinder the achievement of project targets.

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3.9 Simultaneous F test

The F test or simultaneous test is used to determine whether all independent variables together have a significant effect on the dependent variable [13].

Table 9. Simultaneous F Test Results

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.830	4	19.208	53.923	<.001[b]
	Residual	7.837	22	.356		
	Total	84.667	26			

a. Dependent Variable: CONSTRUCTION PROJECT SUCCESS

b. Predictors: (Constant), SUPPLIER, OWNER, CONSULTANT, CONTRACTOR

Table 9 shows the F test results, the calculated F value is 53.923, while the F table value at a significance level of 5% ($\alpha = 0.05$) with df1 = 4 and df2 = 22 is 2.816. Because the calculated F is greater than the F table (53.923 > 2.816) and the significance value < 0.001 is less than 0.05, it can be concluded that the regression model has a simultaneous significant effect. This means that all independent variables, consisting of owners, contractors, consultants, and suppliers, collectively have a significant effect on the dependent variable, namely the success of construction projects.

3.10 Correlation Coefficient Test

The correlation coefficient test is used to determine how strong the relationship is between the independent variables and the dependent variable [10].

Table 10. Correlation Coefficient Test

Correlations

		OWNER	CONTRACTOR	CONSULTANT	SUPPLIER	CONSTRUCTION PROJECT SUCCESS
OWNER	Pearson Correlation	1	.817**	.656**	.742**	.814**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	27	27	27	27	27
CONTRACTOR	Pearson Correlation	.817**	1	.736**	.861**	.927**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	27	27	27	27	27
CONSULTANT	Pearson Correlation	.656**	.736**	1	.758**	.748**
	Sig. (2-tailed)	.000	.000		.000	.000

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	N	27	27	27	27	27
SUPPLIER	Pearson Correlation	.742**	.861**	.758**	1	.735**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	27	27	27	27	27
CONSTRUCTION PROJECT SUCCESS	Pearson Correlation	.814**	.927**	.748**	.735**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	27	27	27	27	27

**. Correlation is significant at the 0.01 level (2-tailed).

In table 10, the results of the Pearson correlation coefficient test, all independent variables consisting of Owner (X1), Contractor (X2), Consultant (X3), and Supplier (X4) showed a positive, strong, and significant relationship with the Construction Project Success variable (Y). The correlation coefficient values for each variable are 0.814 for Owner, which has a very strong relationship because it is in the interval 0.80-1.00, 0.927 for Contractor, which has a very strong relationship, 0.748 for Consultant, which has a strong relationship because it is in the interval 0.60-0.799, and 0.735 for Suppliers, which has a strong relationship level, with a significance value of $p < 0.001$. This illustrates that the more effective the role of stakeholders in the planning, implementation, and material supply processes, the higher the level of project success that can be achieved. The Contractor variable has the strongest correlation value, so that contractor performance can be identified as the most dominant factor in supporting the achievement of project success. Overall, these results confirm that stakeholders have a significant contribution and play an important role in determining the success of construction projects.

3.11 Coefficient of Determination Test

The results of the coefficient of determination test to measure the extent to which independent variables explain dependent variables [12].

Table 11. Results of the Coefficient of Determination Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.953[a]	.907	.891	.59683

a. Predictors: (Constant), SUPPLIER, OWNER, CONSULTANT, CONTRACTOR

Table 11 shows the results of the coefficient of determination test, an Adjusted R Square value of 0.891 was obtained, which means that 89.1% of the variability in construction project success can be explained by the variables of owner, contractor, consultant, and supplier. Meanwhile, the remaining 10.9% is influenced by other factors outside this research model. The Adjusted R Square value is used to provide a more accurate estimate of the model's ability to explain the dependent variable by considering the number of independent variables. Thus, this regression model is good at explaining stakeholders' influence on project success, even though there are still other variables that have not been included in this study.

4. Conclusion

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This study concludes that stakeholders consisting of owners, contractors, consultants, and suppliers simultaneously influence the success of the Tebing Tinggi–Indrapura Toll Road Rest Area construction project. The results of the partial test indicate that contractors and consultants have a positive and significant effect on project success, while the supplier variable has a significant effect with a negative direction. Meanwhile, the owner variable does not have a significant partial influence on project success. The coefficient of determination shows that 89.1% of project success can be explained by the stakeholder variables examined in this study. Among all stakeholders, contractors have the most dominant influence on project success, as indicated by the highest t-value compared to other variables. The findings of this study provide practical implications for project managers and construction stakeholders. Effective coordination and communication among stakeholders especially contractors and suppliers are essential to improve project performance and minimize potential delays.

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6. Conflict of Interest

The authors of this work, whose names are stated below, attest to the absence of conflicts of interest.

Saskia Yulia Rahmi

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