p–ISSN: 2723 - 6609 e-ISSN: 2745-5254
Vol. 5, No. 3 March 2024 http://jist.publikasiindonesia.id/

Analysis of The Causes of Delays and Overbudget And Mitigation To Overcome Them In PT.WER Construction Projects

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Keywords:
delay; overbudget; cost; multiple linear regression; RII.

ABSTRACT

This study discusses variables that affect delays and overbudget in construction projects at PT. WER. Taking the approach of multiple linear regression analysis and the Relative Important Index (RII), this study shows that the most influential variables for delay and overbudget involve unavailability of manpower, changes in the behavior of the surrounding community, lack of project team knowledge about work sites, lack of knowledge transfer between project teams, and lack of maturity of project team competencies. The results of the study provide an in-depth understanding of the condition of PT. WER, which at certain periods experienced delays and overbudgets on a number of its projects. The proposed mitigation measures involve partnerships with educational institutions to increase the availability of skilled labor, improve communication with local communities, increase project team knowledge through training and guidance, encourage knowledge transfer between project teams, and implement continuous training programs to improve project team competencies. The conclusion of this study provides a foundation for companies to develop more effective mitigation strategies to achieve optimal project success.

Introduction

The successful completion of a project is the goal of carrying out a project, where the project is a unique activity and has a period of time (end), then the success of the completion of a project will be determined at the end of the project (ARIYANTO, 2020). The classic criterion of practice is the measure of a project's direct performance against its main design parameters schedule (time), budget (cost), scope, and quality which the literature tends to refer to as measures of project management success. This definition was already established in the earliest discussions of projects in the management literature (Bannerman, 2008).

Delays in construction projects refer to situations where the project is not completed according to the planned schedule. This means that construction work took longer than expected in the initial planning (Christarindra & Nurcahyo, 2021). Delays in construction projects can occur for a variety of reasons, including those previously mentioned, such as

scope changes, bad weather, obstacles in obtaining permits, delays in shipping materials, and other issues. Budget on a construction project means that the cost of the project exceeds the budget that has been set or planned in the initial planning. This is a situation where the actual expenditure on a construction project exceeds a predetermined estimated cost (Hermanto, Apriansyah, Fikri, & Albetris, 2019).

In a construction project, delays and overbudgets will affect the performance of the project, which, of course, also affects the performance of the construction company working on the project (Lubis, Harahap, & Puspita, 2022). In this study, the object of research used is PT WER, where PT. WER is a company engaged in construction and PT. WER has applied project management knowledge to each of its construction projects. At PT. WER currently has a problem where in the July 2023 period, there are 84 ongoing projects, of which 18 projects are overbudgeted according to CPI calculations, and there are 49 projects experiencing delays according to SPI calculations as illustrated in Figure 1 below:(Wahyuningtyas & Waskito, 2021)

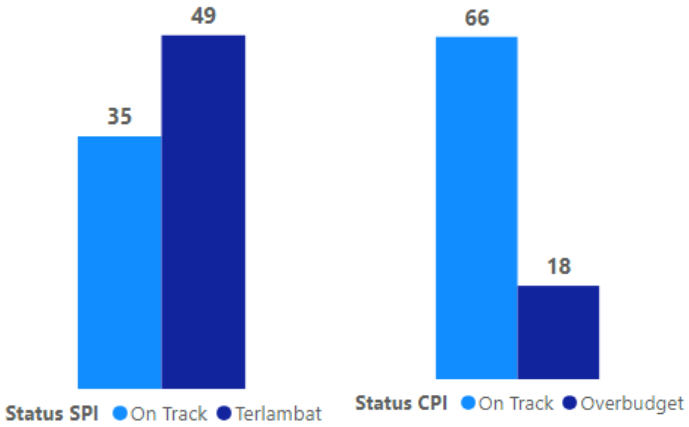

Figure 1 The Project is late and over budget at PT. WER

Of the 18 (eighteen) projects that experienced overbudget, including four road and bridge type projects, five water building type projects, three building type projects, one transmission and distribution type project, 3 EPC type projects and two railway type projects, as illustrated in Figure 2 below (Ningsih & Dukalang, 2019).

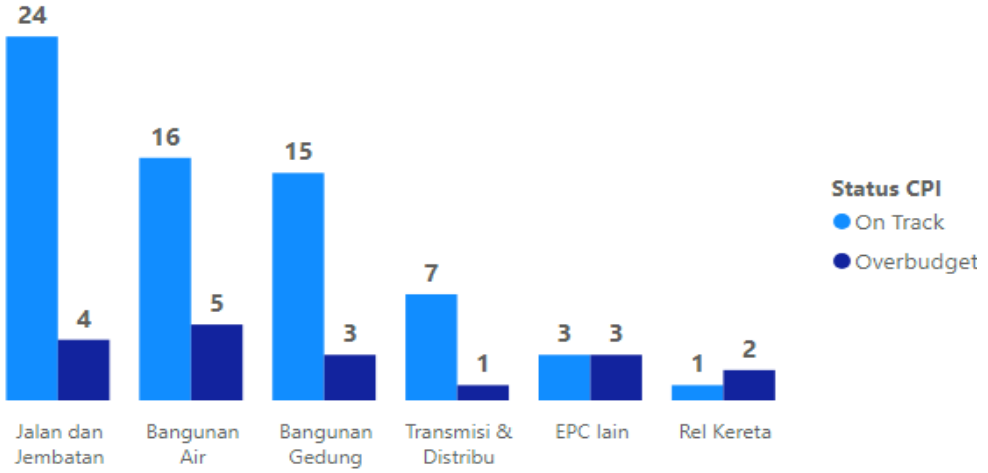

Figure 2 Overbudget projects by type

Of the 49 (forty-nine) projects that experienced delays, including 16 road and bridge type projects, 11 water building type projects, 12 building type projects, four transmission and distribution type projects, 5 EPC type projects and one railway type project, as illustrated in Figure 3 below (Nurdiansyah & Rahman, 2019).

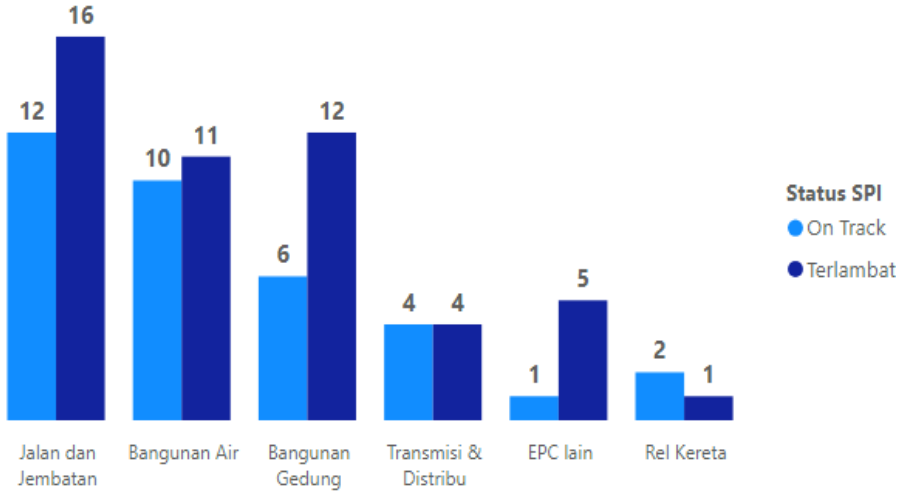

Figure 3 Late projects by type

In the data above, it can be seen that PT. WER has many projects with various types of projects being worked on. Construction projects undertaken by PT. WER has varying contract values (Paparang, Walangitan, & Pratasis, 2018). The contract value of PT. WER has a range between Rp. Fifty billion to Rp. 4 trillion rupiah, depending on the type of project and the difficulty of the project (PERDANA, 2017).

1. Road and bridge projects undertaken by PT. WER has a contract value between Rp. Fifty billion to more than Rp. 4 trillion, with an average contract value of Rp. 850 billion, where problems in road and bridge projects vary, such as different types of land with the design, incompatibility of the design with the field, unfinished environmental permits, complicated implementation methods and requiring high-tech tools, traffic diversion, especially for projects in big cities, bad weather, a financial turnover that is not smooth and project management is not optimal; (Ramadona, Pratami, & Yasa, 2020)
2. PT undertook the water-building project. WER has a contract value of between Rp. Seventy billion to more than Rp. 1 trillion, with an average contract value of Rp. 350 billion, where problems in water building projects include inappropriate groundwater analysis, flood risk that occurs due to rainfall, high tides, design incompatibility with the field, unfinished environmental permits, bad weather, distance from the work site with the required manpower and materials, poor financial turnover and project management that is not optimal; (Rita & Carlo, 2021)
3. PT carried out the building project. WER has a contract value between Rp. 10 billion and more than Rp. 1 trillion, with an average contract value of Rp. 300 billion, where problems in building projects include design incompatibility with the field, complicated implementation methods and require high-tech tools, lack of compliance with work safety, financial turnover that is not smooth that can slow down the progress of work and project management that is not optimal; (Sahadi, 2018)
4. The electricity transmission and distribution project was undertaken by PT. WER has a contract value between Rp. 50 billion to more than Rp. 3 trillion, with an average

contract value of Rp. 700 billion, where problems in electricity transmission and distribution projects include design incompatibility with the field, unfinished work site permits, bad weather, distance from the work site with the required manpower and materials, still unaccustomed project teams with new technology, a financial turnover that is not smooth and project management is not optimal; (Sobari & Lutfi, 2018)

5. EPC project undertaken by PT. WER has a contract value between Rp. 100 billion to more than Rp. 500 billion, with an average contract value of Rp. 250 billion, where problems in EPC projects include design incompatibility with the field, unfinished work site permits, bad weather, distance from the work site with the required manpower and materials, still unaccustomed project team with new technology, Design changes required due to technical factors or changing project owner needs, errors in the interpretation or implementation of project technical specifications, financial turnover that is not smooth and project management is not optimal; (Zachawerus & Soekiman, 2018)
6. Railway Project undertaken by PT. WER has a contract value between Rp. 100 billion to more than Rp. 350 billion, with an average contract value of Rp. 280 billion, where problems in the railway project include design incompatibility with the field, difficulty in obtaining permits or complying with construction regulations, bad weather, distance from the work site with the required manpower and materials, unstable soil or potential landslides, conflicts with local communities or other related parties, financial turnover that is not smooth and project management is not optimal.

Based on the observations of researchers in several previous studies regarding the causes of delays or overbudget in construction projects, the object of research used was mostly one construction project, then based on the size of the contract value and the variety of problems in each type of construction project at PT. WER, it is felt that this research is needed to obtain the variables that most affect delays and overbudget in the project, as well as mitigation that needs to be done to follow up so that the project can be completed according to the specified target (Priyahita, Sugianti, & Aliah, 2015).

This research was conducted with the following objectives:

1. Analyzing the causes of delays and overbudget of construction projects at PT. WER.
2. Provide suggestions and input on mitigation steps that need to be taken by the project team to be able to mitigate delays and overbudget of construction projects at PT. WER.

Research Methods

The methods used in this study are quantitative and qualitative research, where quantitative research includes collecting data related to variables that most influence delays and overbudgets in PT construction projects (Sugiyono, 2019). WER uses multiple linear regression methods and Relative Important Index (RII). Then, from the results of the research obtained, interviews (qualitative research) will be conducted with the management of PT. WER to be able to obtain suggestions for mitigation of future improvements (Arikunto, 2010).

Research Variables

In this study, there are two types of variables, namely variables whose values will affect the value of other variables called exogenous variables, and variables whose values are influenced by the value of other variables, called endogenous variables (Mendenhall et al., 2017) This study aims to prove the hypothesis of a correlation between exogenous variables to endogenous variables which means that if verifiable causes occur in a project, Then it will cause delays and overbudget on construction projects.

Exogenous variables (dependent / free) in this study use aspects that cause delays and overbudgets in the project. Where each variable is a situation where the variable is carried out or occurs in the project. Endogenous variables (independent / bound) in this study use causal variables that cause the project to experience delays and overbudget (Cooper & Schindler, 2014).

The independent variables for this study are variables (X1-X8) are the causes of delays and overbudgets in the project, where X1 = Weather Variables, X2 = Financial Variables, X3 = Location Variables, X4 = Project Owner Variables, X5 = Control Variables, X6 = Regulatory/Licensing Variables, X7 = Partner Variables and X8 = Project Team Variables, and dependent variables (Y) are delays and overbudgets. Where can be seen like an equation.

$$Y_1=\beta_0+\beta_1X_1+\beta_2X_2+\ldots+\beta_8X_8 \quad (3.\ 1)$$

Where:

Y = Dependent variable (delay &; overbudget)
X = Independent Variable (cause of delay &; overbudget)
β = Vector parameter to be estimated

Data Collection Techniques

In this research activity, data will be obtained through two data sources, namely:

a. Data Primer

Is data obtained directly from the original source. In this study, primary data were obtained from the distribution of questionnaires to respondents whose population was all project teams and employees of PT. WER, and sample plan is PT WER project team consisting of:

1) Project Manager (Work experience >10 th)
2) Site Manager di proyek (Work experience >5 th)
3) Production & Equipment Officer (Work experience >5 th)
4) Production & Equipment Manager (Work experience >10 th)

Respondents in this study amounted to 51 people. A questionnaire is a number of written questions used to obtain information from respondents in the sense of reports about their personality, or things they know (Arikunto, 2021). This questionnaire uses the Likert scale, which is a psychometric scale commonly used in questionnaires, and is the most widely used scale in survey research.

b. Data Seconds

Is a source of research data obtained by researchers indirectly. In this study, researchers used secondary data from books and a number of scientific journals described in Chapter 2. This source was used as the basis for determining the causal variables in this study. The causal variable will be the content of the statement on the questionnaire distributed to respondents.

Descriptive Analysis

Descriptive analysis is a statistic used to analyze data by describing or describing the data that has been collected as it is without intending to make generalized conclusions or generalizations (Sugiyono, 2019). Descriptive analysis in this study serves to determine the demographics of the respondents, so that researchers can find out the background of the respondents and other researchers in the future can adjust add or subtract from the profile which can be the scope of new research.

In general, the scoring technique used in this research questionnaire is the Likert scale technique. According to (Sugiyono, 2018) Likert scale is used to measure attitudes, opinions and perceptions of a person or group of people about social phenomena. The study will use questionnaires as a medium for data collection and use auxiliary programs for statistical calculations.

Normality Test

Data normality testing to find out whether the data used is normally distributed or not. In this study, the normality test used the Smirnov Kolmogorof test because the test is an approach to the lilefors test. For this test the real level $\alpha = 0.05$. The tested statistical hypothesis is stated as follows.

H0 : Normally distributed samples

H1 : The sample is not normally distributed

The test criterion is reject H0 if the significance is less than $\alpha = 0,05$

Multicollinearity Test

Multicollinearity tests are performed to find out whether there are independent variables that are correlated with each other or not. To test the existence of multicollinearity, it can be seen through the value of Variance Inflantion Factor (VIF) and tolerance value for each independent variable. If the tolerance value is above 0.10 and the VIF is less than 10, it is said that there are no symptoms of multicollinearity.

Heteroscedasticity Test

The heteroscedasticity test is performed to detect the variance inequality of the regression model residuals on one observation. The heteroscedasticity test in this study used the Glejser test. This test compares the significance of this test if the results are > 0.05 or 5%. If significant above 5%, it is concluded that the regression model does not contain heteroscedasticity

Regression Model Interpretation

The statistical analysis used in this study was multiple linear regression. This analysis is used to determine the magnitude of the influence of independent variables, namely the causes of delay and overbudet on the project on the dependent variables, namely delay and overbudget. The magnitude of the influence of the independent variable with the dependent simultaneously and also partially.

Test F

The F statistical test basically shows whether all the independent variables included in the model have an influence together on the dependent variable. To find out whether the regression model used is a fixed model can be done by comparing the F values of the table and F count or comparing between the values of sig and α=0.05.

Coefficient of Determination Test

The coefficient of determination analysis is used to determine the percentage of variation of the independent variable used in the model capable of explaining the variation of the dependent variable. The results of the determination analysis can be seen in the model summary output from the results of multiple regression analysis.

T Test

The statistical t-test (t-Test) aims to determine the significant relationship of each independent variable to its dependent variable. Partial hypothesis testing is carried out by comparing the calculated t value with the table t value.

Relative Importance Index (RII)

From the data obtained will be obtained variables that most affect the success of the project, in this study will be seen which project management knowledge variables have the greatest value affecting project success.

Results and Discussion

Primary data collection in this study was carried out through the distribution of questionnaires to the building type construction project team at PT. WER, where the questionnaire contains 39 questions related to variables that cause delays and overbudgets according to the project conditions handled by each respondent. From the distribution of the questionnaire, 51 questionnaire data were obtained in which all questions had been filled in completely. The distribution of questionnaires was carried out using google forms due to the spread of projects handled by respondents.

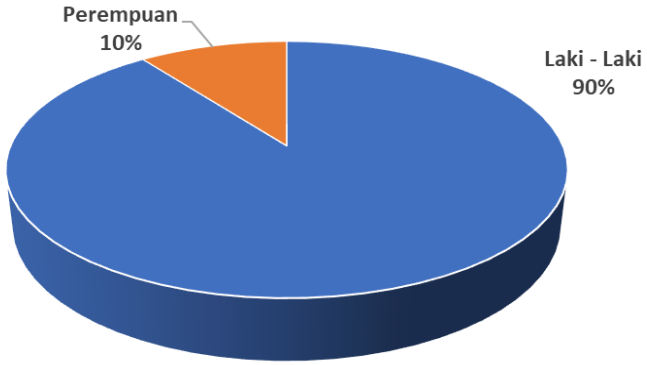

Figure 4 Respondent profiles by gender

Based on the graph, the respondents taken in this study were dominated by men. The percentage of respondents with male gender is 90% while respondents with female gender are 10% of all respondents. All respondents taken in this study were divided into 5 age groups. The age groups consist of age groups under 20 years, 20-29 years, 30-39 years, 40-49 years, and age groups over 50 years. As a profile of respondents based on age, the percentage of each age group of respondents in this study is shown in Figure 4. 2 profiles of respondents by age.

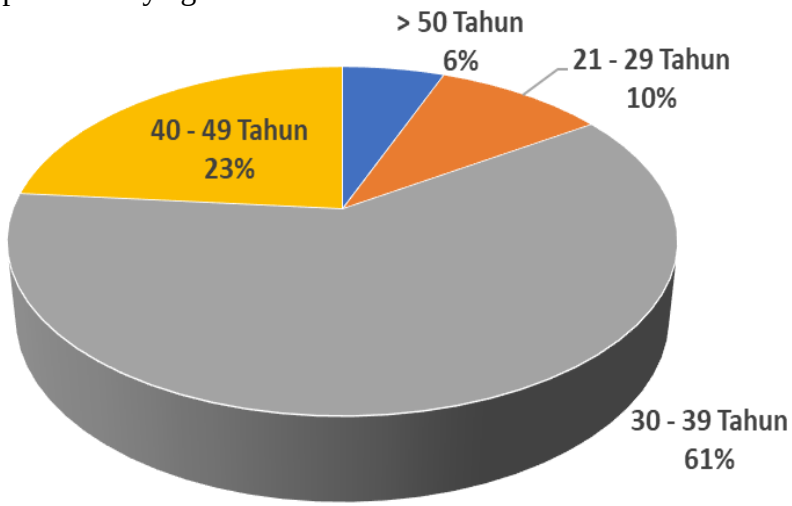

Figure 5 Profile of respondents by age

Based on Figure 5 above, the most respondents in this study were in the age group of 30-39 years, respondents in the age group had a percentage of 61 percent, while respondents in the age group under 40-49 years with a percentage of 23 percent of respondents in the age group of 21-29 years with a percentage of 10 percent and respondents in the age group over 50 years with a percentage of 6 percent. Furthermore, the following Figure 6 shows the percentage of respondents based on the last education that has been completed.

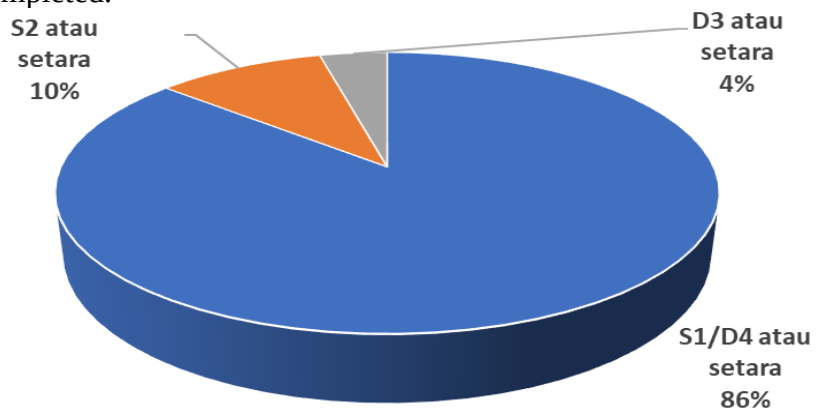

Figure 6 Profile of respondents by education

The graph shows the percentage of respondents based on their respective levels of education, high school, diploma, S1 and S2. Most respondents have completed education at the S1 / D4 level or equivalent, which is 86 percent, then for the second highest percentage, namely at the last level of S2 education or equivalent, which is as much as 10 percent, and in 3rd place, namely respondents with the last education level D3 or equivalent, namely with a percentage of 4 percent.

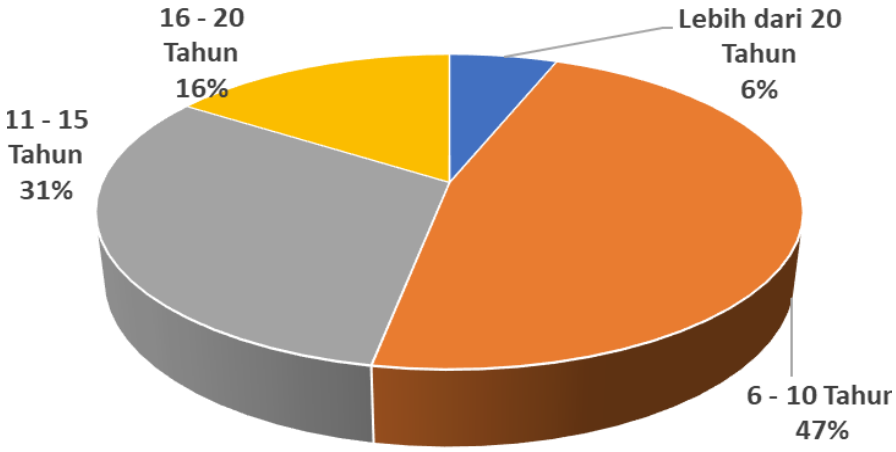

Figure 7 Profile of respondents based on work experience

The majority of respondents have 6 to 10 years of work experience which is 47 percent, then followed by respondents with 11 to 15 years of experience at 31 percent, respondents who have had work experience over 16 to 20 years at 16 percent then respondents with more than 20 years of work experience have the smallest percentage of 6 percent of all respondents.

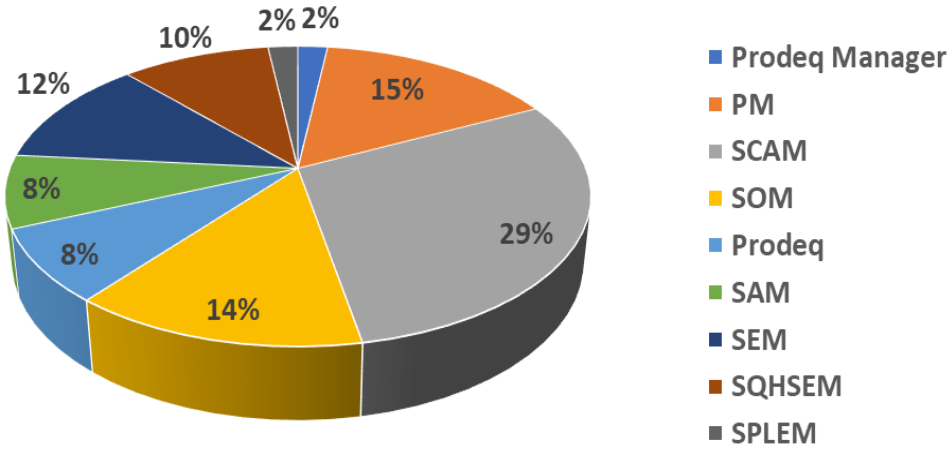

Figure 8 Profile of respondents by job title

Apabila dilihat dari profil responden berdasarkan jabatan, sebanyak 29% responden adalah Site Contract and Administration Manager (SCAM), 15% adalah Project Manager (PM), 14% adalah Site Opertional Manager (SOM), 12% adalah Site Engineering Manager (SEM), 10% Site Quality Health Safety and Environment Manager (SQHSEM), 8% Production and Equipment Officer (Prodeq), 8% Site Administration Manager (SAM), 2% adalah Site Procurement Logistic and Equipment Manager (SPLEM) dan 2% Production and Equipment Manager (Prodeq Manager).

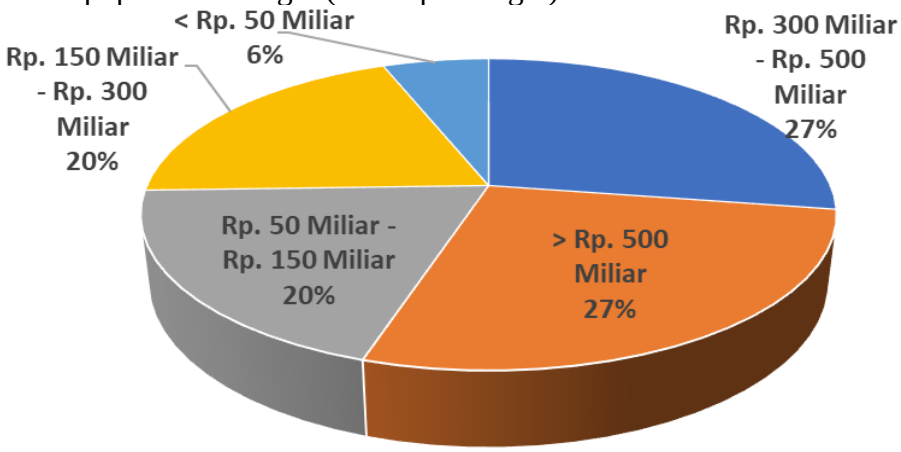

Figure 9 Profile of respondents based on contract value of project handled

From the graph above, it can be seen that most of the project contract values handled by respondents are dominated by contract values of more than Rp. 500 billion and contract values between Rp. 300 – Rp. 500 billion by 27 percent, then contract values between Rp. 50 – Rp. 150 billion and contract values between Rp. 150 – Rp. 300 billion by 20 percent, and the remaining contract value of less than Rp. 50 billion by 6 percent of the total respondents.

Based on the data obtained by researchers, it is known that the dominant respondents of the gender are men. And other factors in order of age, education, work experience and position are 30-39 years, S1 education, experience between 6 to 10 years, as Site Contract and Administration Manager (SCAM) 29%, and the contract value of the project managed is more than Rp. 500 billion.

Data Analysis

In this subchapter, the results of research will be presented on how the variables that cause delay and overbudget affect the delay and overbudget of construction projects at PT. WER. To test the validity of the questionnaire used, validity and reliability tests were carried out. The results of the validity test from 51 respondents at PT. The WER will be described as follows.

Normality Test

Data normality testing to find out whether the data used is normally distributed or not. In this study, the normality test used the Smirnov Kolmogorof test because the test is an approach to the lilefors test. For this test the real level $\alpha = 0.05$. The tested statistical hypothesis is stated as follows.

H0 : Normal distributed sample

H1 : The sample is not normally distributed

The test criteria are reject H0 if the significance is less than $\alpha = 0.05$ Based on the calculation results using IBM SPSS 26 software, the normality test results are as follows:

Table 1
Test of Normality Kolmogorov-Smirmov

		Unstandardized Residual
N		51
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	1.68696138
Most Extreme Differences	Absolute	.112
	Positive	.084
	Negative	-.112
Test Statistic		.112
Asymp. Sig. (2-tailed)		.151[c]

In the Test of Normality table, for Unstandardized Residual can be seen the value of Sig. in the Kolmogorov-Smirnov column is .112 which means 0.112. And sig value. amounted to 0.151. So that according to the test criteria, if the Sig. value is more than 0.05 then it fails to reject H0. This means that the data used is normally distributed.

Multicollinearity Test

Multicollinearity tests are performed to find out whether there are independent variables that are correlated with each other or not. To test the existence of multicollinearity can be seen through the value of Variance Inflantion Factor (VIF) and tolerance value for each independent variable. If the tolerance value is above 0.10 and the VIF is less than 10, it is said that there are no symptoms of multicollinearity. Based on the test results using IBM SPSS 26 obtained that the value of collinearity statistics as in Table 2 below:

Table 2
Multicollinearity test results

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Say.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	BRIGHT
1	(Constant)	3.121	1.702		1.834	0.074		
	X1	0.041	0.190	0.036	.215	0.831	0.484	2.064
	X2	0.264	0.122	0.387	2.169	0.036	0.425	2.351
	X3	-0.181	0.065	-0.464	-2.775	0.008	0.485	2.064
	X4	0.182	0.116	0.325	1.574	0.123	0.319	3.133
	X5	0.029	0.082	0.108	0.349	.729	0.140	7.128
	X6	-0.210	0.172	-0.250	-1.225	.227	0.327	3.056
	X7	-0.878	0.307	-0.607	-2.857	.007	0.300	3.330
	X8	0.325	0.152	0.739	2.148	.038	0.114	8.735

Based on the results in Table 2 it is obtained that the Tolerance value of each independent variable is above 0.1. Likewise, the value of the VIF of each independent variable is less than 10. This shows that there is no correlation between fellow independent variables in the regression model and it can be concluded that there is no problem of multicollinearity among fellow independent variables in the regression model formed.

Heteroscedasticity Test

The heteroscedasticity test is performed to detect the variance inequality of the regression model residuals on one observation. The heteroscedasticity test in this study used the Glejser test. This test compares the significance of this test if the results are > 0.05 or 5%. If it is significant above 5%, it is concluded that the regression model does not contain heteroscedasticity.

Based on the test results using IBM SPSS 26, it was obtained that the value of the heteroscedasticity test results as in Table 3 below:

Table 3
Heteroscedasticity test results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Say.
	B	Std. Error	Beta		
(Constant)	1.792	0.937		1.912	0.063
X1	0.077	0.105	0.150	0.739	0.464
X2	0.007	0.067	0.023	0.105	0.917
X3	0.049	0.036	0.276	1.360	0.181
X4	-0.027	0.064	-0.106	-0.422	0.675
X5	-0.023	0.045	-0.192	-0.508	0.614
X6	0.066	0.095	0.172	0.694	0.491
X7	0.120	0.169	0.183	0.709	0.482
X8	-0.113	0.083	-0.565	-1.352	0.184

Based on the results in Table 3 it is obtained that the significant value of the independent variable is greater than 0.05. This shows that the independent variable is not statistically significant in influencing the dependent variable absolute unstandardized residual (Absu) value. So it can be concluded that the regression model does not occur symptoms of heteroscedasticity.

Regression Model Interpretation

The statistical analysis used in this study was multiple linear regression. This analysis is used to determine the magnitude of the influence of independent variables, namely variables that cause project delays & overbudgets, namely Weather, Finance, Location, Project Owner, Control, Regulations / Permits, Partners, Project Teams and on dependent variables, namely Delay and Overbudget on construction projects. The magnitude of the influence of the independent variable with the dependent simultaneously and also partially.

Test F

The F statistical test basically shows whether all the independent variables included in the model have an influence together on the dependent variable To find out whether the regression model used is a fixed model can be done by comparing the F values of the table and F count or comparing between the values of sig and α=0.05. Based on the calculation results using the IBM SPSS 26 application, the following results were obtained:

Table 4
F test results

Model	Sum of Squares	df	Mean Square	F	Say.
Regression	107.355	8	13.419	3.961	0.001b
Residual	142.292	42	3.388		
Total	249.647	50			

The F values of the table for n = 51 and k = 8 at α = 0.05 using the calculation Ftable (k; n-k) = (8; 43) obtained a Ftable value of 2.18. The calculated F value is 3.961 with a significance value of 0.001 < 0.05. This shows that the independent variables causing project delays & overbudgets (weather, finance, location, project owner, control, regulations/permits, partners and project teams) influence together or simultaneously in explaining their effect on the dependent variables (delay & overbudget).

Test Coefficient of determination

The coefficient of determination analysis is used to determine the percentage of variation of the independent variable used in the model capable of explaining the variation of the dependent variable. The results of the determination analysis can be seen in the model summary output from the results of multiple regression analysis. As shown in Table 5 below.

Table 5
Coefficient of Determination Test Results

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.656[a]	0.430	0.321	1.84063

Based on the output results in Table 5, the correlation between the independent variable and the dependent variable is 0.321 as shown in the Adjusted R Square. This indicates that the contribution of tax sanction variables, tax awareness, taxation understanding to taxpayer compliance is 32.10%, while the remaining 67.90% is influenced by other variables that are not used in this study.

T Test

The statistical t-test (t-Test) aims to determine the significant relationship of each independent variable to its dependent variable. Partial hypothesis testing is carried out by

comparing the calculated t value with the table t value. The value of t of the table with α = 0.05 and free degrees (db) = n - k - 1 = 51 - 8 - 2 = 41 is 2.010.

Table 6
T Test Results

Model	t_{count}	t_{table}	Say.	Information
(Constant)	1.834		0.074	
X1	0.215	2.020	0.831	T count is smaller than T table and P-value greater than 0.05 (partially has no significant effect)
X2	2.169	2.020	0.036	T count is greater than T table and P-value is smaller than 0.05 (partially significant)
X3	-2.775	2.020	0.008	T count is smaller than T table and P-value is smaller than 0.05 (partially significant negative effect)
X4	1.574	2.020	0.123	T count is smaller than T table and P-value greater than 0.05 (partially has no significant effect)
X5	0.349	2.020	0.729	T count is smaller than T table and P-value greater than 0.05 (partially has no significant effect)
X6	-1.225	2.020	0.227	T count is smaller than T table and P-value greater than 0.05 (partially not significantly negative effect)
X7	-2.857	2.020	0.007	T count is smaller than T table and P-value is smaller than 0.05 (partially significant negative effect)
X8	2.148	2.020	0.038	T count is greater than T table and P-value is smaller than 0.05 (partially significant)

Relative Important Index (RII)

From the results of the questionnaire with Likert scale, the results of the assessment of the variables that most affect the delay & overbudget of construction projects at PT. WER Building Building as Table 7 follows.

Table 7
Result Analisa RII (Relative Important Index)

No	Variabel	Respondent's Answer					Total	W	RII	Rank
		STS	TS	R	S	SS				
		1	2	3	4	5				
(1)	(2)	(5)	(6)	(7)	(8)	(9)	(10)= Σ (5) → (9)	(11) = Σ (5)xLikert → (9)xLikert	(12) = (11)/(5 x (10))	(13)
1	X.1.1	2	5	5	22	17	51	200	0,0510	31
2	X.1.2	3	4	9	17	18	51	196	0,0520	28
3	X.2.1	2	2	6	14	27	51	215	0,0474	39
4	X.2.2	4	5	3	17	22	51	201	0,0507	32
5	X.2.3	0	5	5	19	22	51	211	0,0483	37
6	X.2.4	1	1	11	25	13	51	201	0,0507	32
7	X.3.1	3	10	18	15	5	51	162	0,0630	2
8	X.3.2	3	3	8	23	14	51	195	0,0523	27
9	X.3.3	5	5	5	19	17	51	191	0,0534	20
10	X.3.4	3	5	9	22	12	51	188	0,0543	16
11	X.3.5	2	9	10	20	10	51	180	0,0567	8
12	X.3.6	5	13	11	18	4	51	156	0,0654	1
13	X.4.1	6	2	7	19	17	51	192	0,0531	21
14	X.4.2	0	3	9	26	13	51	202	0,0505	34

15	X.4.3	0	4	7	25	15	51	204	0,0500	35
16	X.4.4	0	5	20	15	11	51	185	0,0551	13
17	X.4.5	1	8	14	20	8	51	179	0,0570	7
18	X.4.6	1	4	15	21	10	51	188	0,0543	16
19	X.5.1	3	3	10	27	8	51	187	0,0545	15
20	X.5.2	3	4	8	30	6	51	185	0,0551	13
21	X.5.3	1	8	15	20	7	51	177	0,0576	5
22	X.5.4	2	4	7	28	10	51	193	0,0528	24
23	X.5.5	1	6	2	31	11	51	198	0,0515	29
24	X.5.6	2	5	7	30	7	51	188	0,0543	16
25	X.5.7	2	3	9	28	9	51	192	0,0531	21
26	X.5.8	2	4	7	31	7	51	190	0,0537	19
27	X.5.9	1	4	8	29	9	51	194	0,0526	26
28	X.5.10	1	6	7	26	11	51	193	0,0528	24
29	X.6.1	5	4	12	17	13	51	182	0,0560	9
30	X.6.2	1	4	16	23	7	51	184	0,0554	11
31	X.6.3	0	7	15	21	8	51	183	0,0557	10
32	X.7.1	2	2	4	29	14	51	204	0,0500	35
33	X.7.2	0	2	3	30	16	51	213	0,0479	38
34	X.8.1	3	6	15	23	4	51	172	0,0593	3
35	X.8.2	2	4	16	26	3	51	177	0,0576	5
36	X.8.3	2	4	11	21	13	51	192	0,0531	21
37	X.8.4	1	4	10	20	16	51	199	0,0513	30
38	X.8.5	1	10	13	22	5	51	173	0,0590	4
39	X.8.6	2	4	13	25	7	51	184	0,0554	11

From Table 7 above, it can be seen that the variables that most influence the delay and overbudget in PT. WER and taken the top 5 are:

1. Unavailability of manpower at the location around the job (x 3.6)
2. Changes in Behavior of the Surrounding Community (X 3.1)
3. Project teams lack jobsite knowledge (x. 8.1)
4. No Transfer of Knowledge Between Project Teams (x 8.5)
5. Lack of Project Team Competency Maturity (X8.2)

Based on the results of RII analysis and the results of Test F and Test T, it is known that the most influential variables from the results of RII also significantly affect Test F and Test T.

Conclusion

Based on the results of the analysis conducted in this study, it can be concluded that the variables that most influence the delay & overbudget in the construction project of PT. WER uses the analysis method of Multiple Linear Regression Analysis and Relative Important Index (RII) as follows: Unavailability of Manpower at the location around the job. Changes in the Behavior of the Surrounding Community. The project team lacks jobsite knowledge. There has been no transfer of knowledge between project teams. Lack of Project Team Competency Maturity.

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