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Research Paper

Subcontractor / Foreman Procurement Management Strategy for Building Projects on Quality and Time Performance (Case Study: PT WIKA Gedung, Tbk)

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Abstract
The development of the construction sector in Indonesia continues to experience very rapid growth over time. One aspect of success in development is through developing competent workforce performance. Accuracy in the selection of subcontractors/foremen carried out by the person in charge of the project must be given great attention, so that there are no disputes between the two parties which could hamper the implementation of the construction project. This research aims to determine the extent of implementation of the analysis of factors that influence subcontractor/foreman management strategies in PT construction projects. WIKA Gedung, Tbk can be applied. In this research, interviews, observations and questionnaires were conducted which were distributed to 79 employees of PT WIKA Gedung, Tbk consisting of Project Managers and Heads of the Commercial / Equipment Procurement Section to obtain test data.The data obtained is through variable and that measured it, variable X (Subcontractor/Foreman Procurement Management Strategy) and Variable Y1 (Schedule Performance) as well as Variable Y2 (Quality Performance) with several methods using, Correlation Analysis, Regression Analysis and Quality Test.

Keywords: Procurement Management Strategy, Time Performance, Quality Performance

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I. INTRODUCTION

Background

Successful implementation of the project on time is the main goal for both the project owner and the contractor. Delays in project completion have a major impact on the company, especially in terms of finances or costs incurred. The longer the project takes to complete, the greater the costs incurred. This time and cost factor is an important thing that must be considered when working on various types of projects, one of which is construction projects.

Project management consists of four stages, namely planning, organizing, implementing and controlling. The planning stage involves planning time, costs and resources to estimate the work needed so that the project can be managed effectively and reduce risks in the project. The organizing stage is carried out to group types of work, determine the authority and responsibility of each element of the organization. The implementation stage is the implementation of plans that have been made previously. The final stage is the control stage which is intended to ensure that the project is carried out according to plan with minimal deviations.

Along with the development of the construction services business PT. WIKA Gedung, Tbk, it is hoped that contractors will pay attention to aspects other than the technical aspects which are the main key. The project management aspect of contractors is an important aspect that cannot be ignored in construction activities.

It is hoped that the results of this research can be used to help contractors determine or improve their organizational structure, so as to improve the quality and competitiveness of the company, especially for PT. WIKA Gedung, Tbk.

The person in charge of the project must pay attention to the accuracy in selecting subcontractors/foremen, so that disputes do not occur between the two parties which could hinder the implementation of the construction project.
The success of a job cannot be separated from participation of capable subcontractors/foremen work well and responsibly regarding supervision as an internal worker construction sector.
In this research, analysis will be carried outregarding influencing factorssubcontractor procurement management strategy/foreman by adding several factorscomes from literature studies and interviews withprojects located throughout Indonesia,especially by PT. WIKA Gedung, Tbk.

Scope of problem
a.) Construction projects in the building category.
b.) Research objects are carried out in PT projects. WIKA Gedung, Tbk in Indonesia from 2022 to 2023.

Research purposes
a.) Able to explain and identify the factors that form the basis for selecting a strategy for managing the procurement of sub contractors/foremen in PT construction projects. WIKA Gedung, Tbk.
b.) Able to identify the extent of implementation of analysis of factors that influence subcontractor/foreman management strategies in PT construction projects. WIKA Gedung, Tbk can be applied.
c.) Able to evaluate the quality and time performance of well-selected subcontractors/foremen.

Benefits of research
The results of this research can be used asrelevant references for research The next step is related to procurement analysisregarding decisions on selecting subcontractors/foremencarried out by the main contractor inconstruction project.

II. LITERATURE REVIEW

Construction Projects

A construction project is a series of activities that are planned and carried out sequentially and use many types of resources, which are limited by the dimensions of cost, quality and time. From this definition it can be concluded that a project is a one stop activity that must be carried out with appropriate and systematic planning within certain budget and time limits.

The success of a project is essentially inseparable from the role of good project management. As the level of project complexity increases and resources become scarce, it is also necessary to improve a good and integrated project management system.

Project Management

Project management is a technique used to plan, carry out, and control the activities of a project to meet project time and cost constraints. Project management is the process of planning, implementing, controlling and coordinating a project from the beginning (idea) to the completion of the project to ensure that the project is carried out on time and at the right cost.

Procurement Management

Project Procurement Management, includes: the processes required to purchase or obtain the products, services or results required from outside the project team. The key concept is that project managers do not have to be trained experts in procurement management laws and regulations, but must be familiar enough with the procurement process to make intelligent decisions regarding contracts and contractual relationships.

Time Management
A project can be said to have quality if the project can be completed according to the agreed time and end date. Project completion should not exceed the agreed time limit, therefore time management is necessary so that the project can be in accordance with planning (Gardjito, 2017).

Quality Management
Project Quality Management, includes processes for combining organizational quality policies which include planning, management, project control and product quality requirements in order to meet stakeholder objectives.
Time Performance
Based on PMBOK Guide 6th, (2021), measuring project implementation time performance is carried out in 2 (two) ways, namely: 1. Schedule variance, and 2. Schedule performance index. Measuring project time

performance is carried out by means of schedule deviations where Time Performance with schedule deviations is the process of comparing work in the field with the planned schedule (PMBOK Guide 6th, 2021).

Quality Performance

Quality Performance Quality is always related to cost and time parameters, quality parameters will increase costs and possibly also schedule. While reducing costs with a fixed scope of work and schedule, it will likely reduce quality. Quality assurance efforts including quality control aim to ensure that the predetermined quality levels or standards can be met. Planning a project has taken into account the costs and schedule to achieve it, so that the next step is proper control over the use of parameters in the form of resources which will help to avoid cost overruns or delays in producing goods that meet these standards.

Subcontractor

Subcontracting is the practice of assigning part of the obligations and duties under a main contract to another party known as a subcontractor (House, 2004). Subcontracting is mainly used on complex projects, such as construction and information technology. Subcontractors are hired by the project's main contractor to carry out specific tasks as part of the entire project, who then has overall responsibility for the work they do to complete the project and its implementation within established parameters and deadlines.

Foreman

According to Umar (2014), in the construction industry, many companies use the services of foremen. The foreman is the person who leads the casual workers. By using the foreman system, the construction company only deals with the foreman as a third party, and does not need to be related/responsible to the workers. This foreman is an individual and is not a legal entity.

Aspects of Subcontractor Selection

From the opinions of researchers in previous research, Zulainah (2016) and Tanuwijaya (2018) quoted from Presidential Regulation Number 54 of 2010 concerning Procurement of Government Goods/Services and Regulation of the Minister of Public Works concerning National Auction Qualification Guidelines for Construction Implementation Services (Charging) Number: 43 /PRT/M/2007, the criteria for selecting subcontractors can be grouped into 6 (six) groups of aspects, namely general aspects, financial aspects, technical aspects, managerial aspects, work safety aspects and reputation aspects company, which is deemed to provide sufficient information for the selection of subcontractors.

Factors in Selection of Subcontractors

The parameters that influence the main contractor's decision to select subcontractors are technical and administrative requirements that can influence trust between participants involved in collaboration on construction projects. These parameters are usually the main requirements and minimum information that must be known by the management of a company that wants to explore/establish a partnership relationship, namely company characteristics, project characteristics, bidding documents, bidding conditions and economic conditions.

III. RESEARCH METHODOLOGY

Time and Place of Research

This research was conducted from 2022 to 2023 at PT. WIKA Gedung, Tbk with coverage area of Indonesia.

Research Population and Sample

In this research, the object is PT. WIKA Gedung, Tbk. The population of this research is employees of PT. WIKA Gedung, Tbk with a population of 79 people consisting of Project Managers and Head of Commercial Section/Dlat. The respondents who will be used as research subjects are samples from the existing population. The sampling technique used was the Slovin formula (Ariola et. al., 2006).

Variable Identification and Definition

There are 2 (two) types of variables used in this research, namely:

• The independent variable (X) is the subcontractor/foreman procurement management strategy

• The dependent variable (Y) is Time Performance and Quality Performance.

To make it easier to measure a research variable, the operationalization of the variable concept needs to be generalized and formulated first, because whether the measurement is good or bad depends entirely on the operational definition that is prepared. After comparing several related studies and theories, the operational definition in this research is regarding the independent variables and dependent variables used.

Independent Variable (X)

The independent variable (X) in this research is the dimension of the subcontractor/foreman procurement management strategy. Subcontractor/foreman procurement management strategies are measured using indicators based on Presidential Regulation Number 54 of 2010 concerning Government Procurement of Goods/Services and Regulation of the Minister of Public Works concerning National Tender Qualification Guidelines for Construction Implementation Services (Bounting) Number: 43/PRT/M/2007, Tanuwijaya and Sekar sari (2018), with the following indicators: Company Profile (X1), Administration (X2), Company Experience (X3), Technical Capability (X4), Finance (X5), Time (X6), Social Conditions (X7), and Quality (X8).

Dependent Variable (Y)

The dependent variable (Y1) is time performance. Time performance as an aspect of project performance is the work results achieved in order to carry out the entire series when the project activity process takes place, with the interval between the start of project activities and the completion of the project according to the agreed time or shorter.

The dependent variable (Y2) is quality performance. Quality performance as an aspect of project performance is the work result achieved in order to achieve conformity with established standards or requirements, both subjective quality standards and objective quality standards.

Measurement of the variables above is measured using a Likert scale obtained from collecting scores from questionnaires regarding statements based on respondents' assessments of each variable. This questionnaire uses 5 (five) alternative answers with the following assessment scores: Strongly disagree (STS): 1 Disagree (KS): 2 Quite agree (CS): 3 Agree (S): 4 Strongly agree (SS): 5

Data Analysis Techniques

This research uses a questionnaire instrument or a structured list of questions that will be given to respondents. Before the data was analyzed using simple linear regression using statistical methods with the help of the SPSS (Statistical Package for Social Science) statistical application computer program, the questionnaire was processed by calculating factors from several questions on each variable. Then, to obtain valid and realistic data and guarantee that the questionnaire used can capture the expected data, the quality of the questionnaire is tested using validity and reliability tests.

Validity Test

Azwar (1997) said that validity is the extent to which a measuring instrument is accurate and precise in carrying out its measuring function. The measurement itself is carried out to find out how much (in a quantitative sense) of a person's psychological aspect is expressed in the score on each measuring instrument in question. Significance testing was carried out using criteria using an r table at a significance level of 0.05 with a 2 (two) sided test (Priyatno, 2012).

Reliability Test

The Reliability Test is intended to determine the consistency of the instrument (measuring instrument) used or in other words, the instrument is said to be reliable if it is used several times to measure the same object and will produce the same data. Reliability is an index that shows the extent to which a measuring instrument is trustworthy or reliable (Uyanto, 2006). Cronbach's alpha is one of the frequently used reliability coefficients. A reliable measurement scale should have a Cronbach's alpha value of at least 0.6 (Uyanto, 2006). Cronbach's alpha can be interpreted as the correlation of the observed scale with all possible measurements of other scales that measure the same thing and use the same number of questions.

Descriptive Analysis Method

This method aims to systematically describe the facts or characteristics of a situation, in this case the data has been collected then classified, interpreted and then formulated so that it can provide a clear picture of the problem being studied. In this research, the researcher will provide a descriptive analysis regarding the influence of foreman management strategies by the main contractor on time and quality performance at PT. WIKA Gedung, Tbk as well as arriving at recommendations for the company.

Quantitative Analysis Methods

In this study, researchers used simple linear regression statistical analysis methods to determine the effect of subcontractor/foreman management strategies by the main contractor on time and quality performance at PT. WIKA Gedung, Tbk .Simple linear regression analysis is a linear regression analysis that only involves two variables, namely one independent variable and one dependent variable. It is called simple linear because

the dependent variable is assumed to have a linear relationship within the parameters and linearly with the independent variable. To analyze the data collected through the questionnaire in this research, a statistical analysis process was carried out using computer tools, namely the EXCEL program with the CORREL function to determine which independent variables had the most dominant influence on the dependent variable. From these results, the next stage is to determine a simple linear regression equation by sorting the results of the number of questionnaires on the independent variables that have the most dominant influence on Y1 and Y2 using the Excel program, namely Scatter Diagram. The general form of a simple linear regression model is:

$$Y_i = ß_0 + ß_1X_{1i} + \varepsilon_i$$

Hypothesis Testing

Statistical calculations are said to be statistically significant if the statistical test value meets the hypothesis, and conversely it is said to be insignificant if the statistical test value does not meet the hypothesis. In regression analysis there are 3 (three) types of accuracy criteria, namely the coefficient of determination (R2), F-test and T-test.

Coefficient of Determination (R2)

The coefficient of determination is the main way that can be used to find out whether there is a relationship between two variables. A larger R2 value (approaching one) indicates that there is a large influence of the independent variable (X) on the dependent variable (Y). On the other hand, if R2 is getting smaller (approaching zero) then the influence of the independent variable will be small on the dependent variable (Ghozali, 2007).

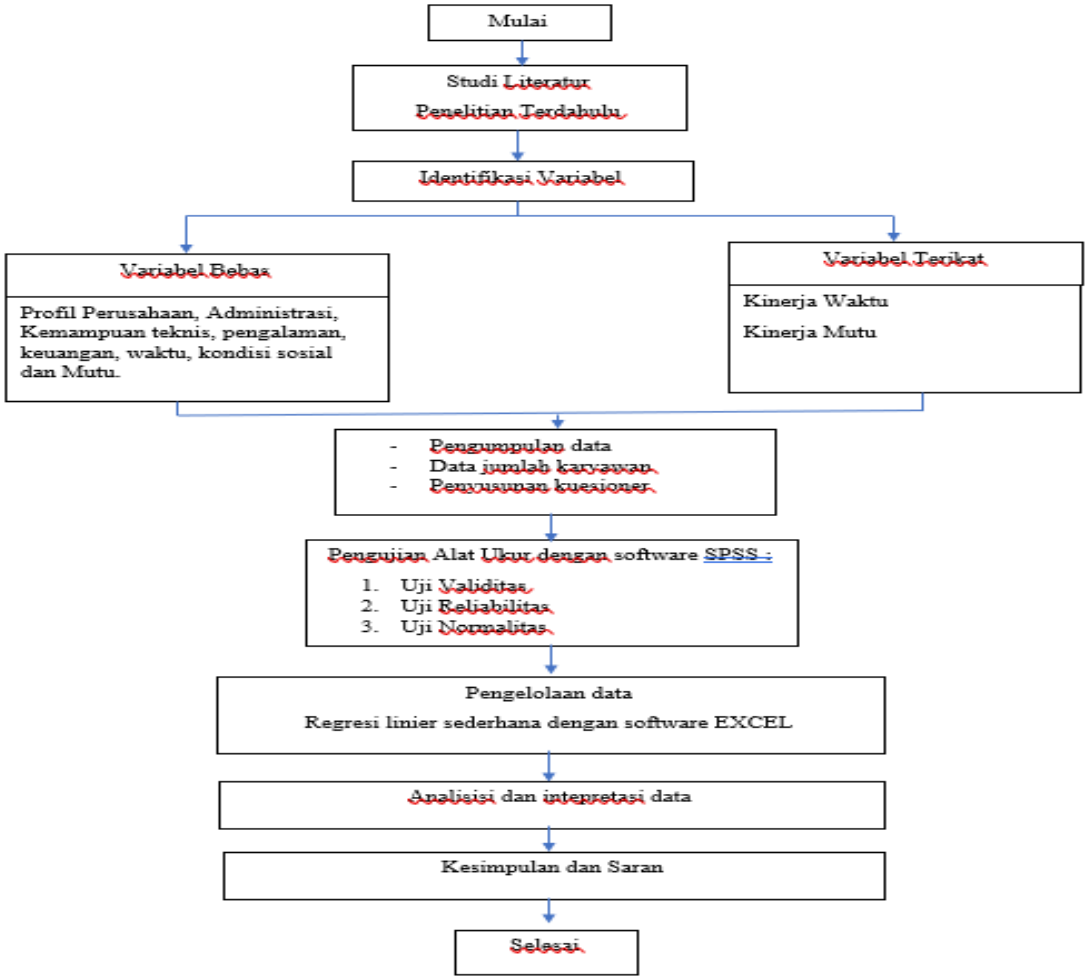
F-test

The F-test is carried out to determine the effect of all independent variables on the dependent variable together or simultaneously. If F count > F table then there is a significant influence of the independent variables on the dependent variable together. This test is used to determine whether all independent variables simultaneously have a significant influence on the dependent variable. By using the significance probability value F with a significance degree (α) = 5%. If the significance probability value F < α then the independent variable simultaneously has a meaningful influence on the dependent variable.

T-test

The T-test was carried out to determine the effect of all independent variables on the dependent variable partially. The T test was carried out to determine the effect of each independent variable individually on the dependent variable. If t count > t table, then there is a significant influence of the independent variables on the partially dependent variable, conversely if t count < t table, then there is no significant influence of the independent variables on the partially dependent variable. Look at the t table value at the degree of freedom (df) of n-k-1 (where n = number of samples, k = number of independent variables) and compare the calculated t value of each independent variable with the t table or by using the significance probability value of t with the degree significance (α) = 5%. If t count > t table or the probability value t< α then the independent variable has a significant influence on the dependent variable.

Research Method Flowchart



IV. DISCUSSION

WIKA Gedung is one of six subsidiaries of PT Wijaya Karya (Persero) Tbk. which is the partner of choice for companies in the fields of construction, investment, concessions and property that prioritize quality & safety in creating space for a better human life.

Description of Research Results

The description of the research results is the result of respondents' answers to the demographic questions in the first part of the questionnaire. Based on data obtained from respondents, the following is an explanation of the characteristics of respondents consisting of gender, age, highest level of education, length of service and position.

Jenis Kelamin	Frekuensi (F)	Presentase (%)
Laki-laki	71	89,87%
Perempuan	8	10,13%
Total	**79**	**100%**

Table 1. Gender

Usia	Frekuensi (F)	Presentase (%)
Usia 31-40 tahun	36	45,56%
Usia 41-50tahun	40	50,63%
Usia 51-60 tahun	3	3,79%
Total	**79**	**100%**

Table 2. Age

Tingkat Pendidikan	Frekuensi (F)	Presentase (%)
Diploma atau sarjana Terapan	10	12,65%
Strata 1	59	74,68%
Srtata 2	10	12,65%
Total	**79**	**100%**

Table 3. Education level

Masa Kerja dan Jabatan	Frekuensi (F)	Presentase (%)
Manajer Proyek	47	59,49%
Kasie kom/Danlat	32	40,51%
Total	**79**	**100%**

Table 4. Work Period and Position

Independent Variable (X)

The independent variable of this research is the strategy in managing the procurement of subcontractors/foremen which consists of eight variables, namely company profile variables, administration, technical capabilities, experience, finances, time, social conditions and quality. The following is the frequency distribution of each independent variable based on the results of respondents' answers to the research questionnaire.

Validity Test

Significance testing was carried out using criteria using an r table at a significance level of 0.05 with a 2-sided test. A high correlation coefficient indicates suitability between the item function and the research as a whole (Priyatno, 2012). If the r value produced by each question item is a total score > 0.227 (based on the r table), then the question item is declared valid. Validity testing was carried out using SPSS 23.0 software with 79 respondents. The following are the results of validity testing for each question item on the independent variable (X):

Variabel		Item Variabel	Koefisen Korelasi Person	Information
Independent Variable	Company Profile (X1)	X.1.1	0,974	Valid
		X.1.2	0,896	Valid
		X.1.3	0,940	Valid
		X.1.4	0,922	Valid
	Administration (X2)	X.2.1	0,929	Valid
		X.2.2	0,976	Valid
		X.2.3	0,893	Valid
		X.2.4	0,921	Valid
		X.2.5	0,912	Valid
	Company Experience (X3)	X.3.1	0,918	Valid
		X.3.2	0,968	Valid
		X.3.3	0,914	Valid
	Technical Capability (X4)	X.4.1	0,936	Valid
		X.4.2	0,949	Valid
		X.4.3	0,947	Valid
		X.4.4	0,912	Valid
		X.4.5	0,938	Valid
	Financial (X5)	X.5.1	0,865	Valid
		X.5.2	0,942	Valid
		X.5.3	0,952	Valid
	Time (X6)	X.6.1	0,927	Valid
		X.6.2	0,952	Valid
		X.6.3	0,940	Valid
	Social Condition (X7)	X.7.1	0,903	Valid
		X.7.2	0,928	Valid
		X.7.3	0,933	Valid
	Quality (X8)	X.8.1	0,954	Valid
		X.8.2	0,966	Valid
Dependent Variable	Time Performance (Y1)	Y.1.1	0,961	Valid
		Y.1.2	0,962	Valid
	Quality Performance (Y2)	Y.2.1	0,941	Valid
		Y.2.2	0,957	Valid

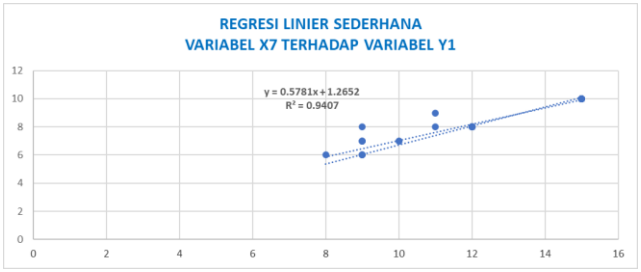
Reliability Test

To measure reliability, the Cronbach alpha value is used. If the research instrument has a reliability level of > 0.70, then the research instrument (questionnaire) is considered reliable (Ghozali, 2007).

	Research Variable	Cronbach's Alpha	Critical Value	Information
Independent Variable	Company Profile (X1	0,950	0,7	Valid
	Administration (X2)	0,957	0,7	Valid
	Company Experience (X3)	0,922	0,7	Valid
	Technical Capability (X4)	0,963	0,7	Valid
	Financial (X5)	0,905	0,7	Valid
	Time (X6)	0,933	0,7	Valid
	Social Condition (X7)	0,908	0,7	Valid
	Quality (X8)	0,910	0,7	Valid
Dependent Variable	Time Performance (Y1)	0,958	0,7	Valid
	Quality Performance (Y2)	0,919	0,7	Valid

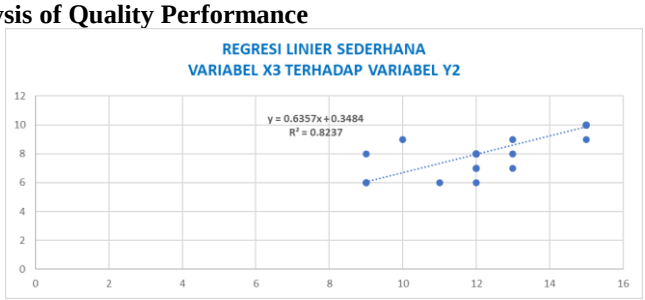
In the table above, it can be seen that for each independent variable and dependent variable, the question items for each variable have a Cronbach alpha value greater than 0.7. So it can be concluded that the research instrument is reliable.

Linear Regression Analysis of Time Performance



Based on the table above, the regression model equation can be formulated as follows:
Y1 = 0,5781X7 + 1,2652

Linear Regression Analysis of Quality Performance



Based on the table above, the regression model equation can be formulated as follows:
Y2 = 0,6357X3 + 0,3484

Hypothesis Testing

Coefficient of Determination (R^2)

In the regression model with the dependent variable of time performance (Y1) has an R2 value of 0.9407. This shows that the influence of the independent variable X7, namely social conditions on time performance, is 94.07%, while the remaining 5.93% are other variables not included in this model. In the regression model with the dependent variable of quality performance (Y2) has an R2 value of 0.8237. This figure shows the influence of the independent variable on courtesy of 82.37% and the remaining 7.63% are other variables not included in this model.

F-test

Dependent Variable	F count	Sig.T
Time Performance (Y1)	502,050	0,000
Quality Performance (Y2)	120,847	0,000

The respective calculated F values are time performance of 502.050, and quality performance of 120.847 with a significance level of <0.05 respectively. Meanwhile, the F table value is 2.073. This means that there is a joint influence between the independent variable and the dependent variable.

T-test

Variable X influences Time Performance		t count		t tabel	Level of signification			Information
X1	Company Profile	2,328	>	1,994	0,023	<	0,05	There is influence, significant
X3	Company Experience	7,686	>	1,994	0,0001	<	0,05	There is influence, significant
X6	Time	3,186	>	1,994	0,002	<	0,05	There is influence, significant
X7	Social Condition	5,151	>	1,994	0,0001	<	0,05	There is influence, significant
X8	Quality	3,547	>	1,994	0,001	<	0,05	There is influence, significant

Variable X consisting of Company Profile/foreman, Company experience, Time, Social Conditions & Quality which has a calculated t value > t table and significance < 0.05.

Variable X influences Quality Performance		t count		t tabel	Level of signification			Information
X1	Company Profile	6,292	>	1,994	0,0001	<	0,05	There is influence, significant
X2	Administration	3,996	>	1,994	0,0001	<	0,05	There is influence, significant
X4	Company Experience	5,742	>	1,994	0,0001	<	0,05	There is influence, significant
X5	Financial	3,441	>	1,994	0,001	<	0,05	There is influence, significant
X6	Time	6,767	>	1,994	0,0001	<	0,05	There is influence, significant
X7	Social Condition	4,946	>	1,994	0,0001	<	0,05	There is influence, significant
X8	Quality	2,333	>	1,994	0,023	<	0,05	There is influence, significant

The X variable consisting of all X variables has a calculated t value > t table and significance < 0.05, except for variable X3.

V. CONCLUSION

1.There is a significant influence between procurement management strategies in selecting subcontractors/foremen on time and quality performance as indicated by the significance value in the F test with a significance of less than 0.05 (5%).

2. Management strategy factors in selecting subcontractors/foremen that affect time and quality performance factors:

a. The time performance factor is partially (directly) and significantly influenced by the procurement management strategy factor in selecting subcontractors/foremen on the independent variable X7, namely social conditions.

b. The quality performance factor is partially (directly) and significantly influenced by the procurement management strategy factor in selecting subcontractors/foremen on the independent variable X3, namely company experience.

VI. SUGGESTION

1. Increasing the integration of subcontractor/foreman experience factors with subcontractor/foreman adaptability.

2. The importance of innovation and adaptability in selecting subcontractors/foremen.

3. Anticipating the application of subcontractor/foremen classification in areas outside Java or tribute areas (remote).

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