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CONTRACTOR SELECTION CRITERIA FACTORS PT. THE INFLUENCE OF WASIS NUGRAHA'S WORKS PERFORMANCE OF THE TLOGOMAS FAMILY BRIDGE CONSTRUCTION PROJECT, MALANG CITY

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ABSTRACT
The success of project performance is the main target for companies engaged in construction services. Considering how complicated and complex a construction project is, a good management function is needed so that it is necessary to choose the right contractor services. Therefore, a study was conducted to determine the criteria for selecting contractors that affect project performance. The method used in this research is a quantitative descriptive approach through a case study model. The sample of this research are employees of PT. Wasis Karya Nugraha who knows the conditions and is directly involved in the work of the Tlogomas Bridge construction projects Kel. Tlogomas Malang City as many as 107 people. Data collection techniques with the method of distributing questionnaires. Data management in this study uses the Partial Least Squeare (PLS) analysis tool. The results of the research show that the criteria for selecting contractors which include contextual performance, task performance, and network have an effect on project performance. The influence of the relationship between contractor selection criteria and project performance is high. The strategy that can be used in selecting a contractor according to the criteria that influence it is to consistently pay attention to the factors in selecting a contractor. For other researchers who want to research the same research, it is better to use other factors that can affect project performance.

INTRODUCTION

Infrastructure development projects are an important aspect of national development. The role of construction projects is very important in supporting the implementation of development to realize the national goals which are contained in the fourth paragraph of the 1945 Constitution, namely the welfare of the Indonesian people. According to Hendriko (2016) , a construction project is an activity that takes place in a limited time with certain resources to obtain construction results with good quality standards.

In its development, there are so many construction service business entities in Indonesia that the government as the owner and user of the budget must first select which construction service business entities have the feasibility and ability to complete the development project. The contractor is a business entity that is contracted or hired to carry out a construction project based on the contents of the contract won by the project owner. In carrying out a construction project there is a lot of work that must be completed according to the duration of the project that has been set, so the main contractor needs the services of a subcontractor as a partner to help complete a job so as to minimize the risk of failure (Tanuwijaya & Tamtana, 2018) .

The selection of a contractor in a development is very important because it determines the quality of the building itself, in selecting a contractor, high accuracy is required in selecting one contractor at a time (Sandika & Patradhiani, 2019) . Research by Sattung et al., (2019) states that the criteria for selecting a contractor consist of 3 factors, namely 1) Factor 1 which includes thoroughness, reputation, and cooperative relations, 2) Factor 2 which includes knowledge about work, work ability, initiative, and social skills and 3) Factor 3 which includes work experience, control, and commitment. According to Harianto & Susetyo (2021) , the criteria for selecting a contractor are price criteria, contractor's financial capability, contractor experience, equipment support, contractor performance and occupational safety and health (K3).

Contractor PT. Wasis Karya Nugraha, whose address is Jalan Bugisan Selatan No. 15B Tirtonirmolo Kasihan, Bantul, Yogyakarta, is in charge of implementing the Tlogomas Bridge Construction Project, Tlogomas Ward City of Malang. PT. Wasis Karya Nugraha certainly wants good performance results so that *Stakeholders can continue to be trusted* in implementing projects. Therefore, a model is needed that connects the existing variables or factors. One of the models used is SEM. SEM is a multivariate data analysis technique used to test hypotheses about the relationship between observed variables and latent variables. And the approach used is Partial Least Square (SEM-PLS). The hope is that PT. Wasis Karya Nugraha can meet the criteria for selecting a contractor in the next tender. However, based on the reality in the field, there are several factors in the selection of contractors that have not been fulfilled by PT. Wasis by Nugraha. So it is important for PT. Wasis Karya Nugraha to be able to find out and take corrective steps regarding factors in selecting contractors that are still lacking or not fulfilled by PT. Wasis by Nugraha

The success of project performance is the main target for companies engaged in construction services. The project is said to be successful is a reflection of the results of the company's performance. A project is said to be successful if the project is able to be completed at a competitive cost, able to be completed on time even faster than the scheduled time, and with quality achieved (Brahmantariguna et al., 2016) . Considering how complicated and complex a construction project is, a good management function is needed so that it is necessary to choose the right contractor services. Therefore, a study was conducted to determine the criteria for selecting contractors that affect project performance.

The objectives of this study include: (1) Determine the criteria for selecting contractors by project owners that have a dominant influence on project performance. (2) Analyzing the influence of the relationship between the criteria for selecting contractors on project performance. (3) Determine strategies that can be implemented in selecting contractors according to the criteria that influence them.

LITERATURE REVIEW

Project

In general, the notion of a project is a work activity that is interconnected in a chain to achieve one or several objectives with time constraints, costs and the desired end result. The project is defined as a series of unique activities that are interrelated to achieve a certain result and are carried out within a certain period of time (Ihwanudin, 2017).

Project management

According to the Indonesian Institute of Accountants (2016), project management is the management of the overall construction process which starts from the process of preparing the project initiative, namely the stage of formulating project requirements or ideas, preparing the budget and development schedule as a whole until the completion of the construction implementation process including the construction period. maintenance and procurement of building equipment and supplies. According to Schwalbe (2019), project management is the application of knowledge, skills, tools, and techniques to project activities with the intention of meeting or exceeding stakeholder needs and expectations of a project. In general, there are 3 (three) indicators that show the success of a project (Soeharto, 2001), namely: (1) On time, namely the timely completion of the project as scheduled. (2) On specification (exact specification / quality), from the specifications that have been determined, the project owner wants good quality work. (3) On budget (accurate budget / cost) The last three elements relate to project implementation that has missed the scope of the project that should have been.

Contractor

Executors or contractors are individuals or legal entities, private or government who carry out a project that is obtained by an auction, direct appointment or direct procurement (Rani, 2016) . Contractor performance is a work result that has been achieved by the contractor in carrying out the tasks assigned to him based on skills, experience, and sincerity as well as time. According to Sattung et al., (2019). Knowledge of work, especially contractor knowledge about construction projects, is contractor knowledge in understanding design and knowledge of regulations related to construction projects that affect project quality performance.

Contractor Selection

Contractor selection is the determination of decision criteria that will be used by decision makers in evaluating contractor candidates (Vidia, 2016).

Project Planning

Planning is a process that tries to lay the foundation for goals and objectives including preparing all the resources to achieve them. Planning provides guidance for implementation regarding the allocation of resources to carry out activities (Soeharto, 1997). Broadly speaking, planning functions to lay the foundation for project objectives, namely scheduling, budget and quality.

Project Execution

The purpose of the implementation phase is to realize the building required by the project owner and has been designed by the Planning Consultant within the agreed cost and time limits, as well as with the required quality. Activities carried out at this stage are planning, coordinating, and controlling all operations in the field, project planning and control in general.

Project Control

Control is carried out in line with project implementation. Project control is carried out so that the project continues to run within the time limit, cost and performance specified in the plan. There are several differences between planning and control, namely: Planning concentrates on setting direction and goals, allocating resources, anticipating problems, providing motivation to participants to achieve goals. While control concentrates on controlling work towards goals, using resources effectively, repairs/corrections, giving rewards for achieving goals. There are three steps in the

project control process, including: (1) Determining performance standards such as technical specifications, budgeted costs, schedules or resource requirements (2) Comparing actual performance with standard performance; (3) Perform corrective actions against causes of differences in actual performance against standard performance

Project Performance

Performance is a work result that is achieved by someone in carrying out the tasks assigned to him based on skills, experience, sincerity, and time (Ervianto, 2009:69). Project performance is a result of the contractor's work in carrying out project work in accordance with the agreement made. Maximum project performance in terms of cost, quality, time, productivity, occupational health and safety and environmental aspects.

Research Conceptual Framework

The conceptual framework of research is the link or relationship between one concept and another concept of the problem to be studied. The conceptual framework is obtained from the scientific concepts/theories used as the basis for research:

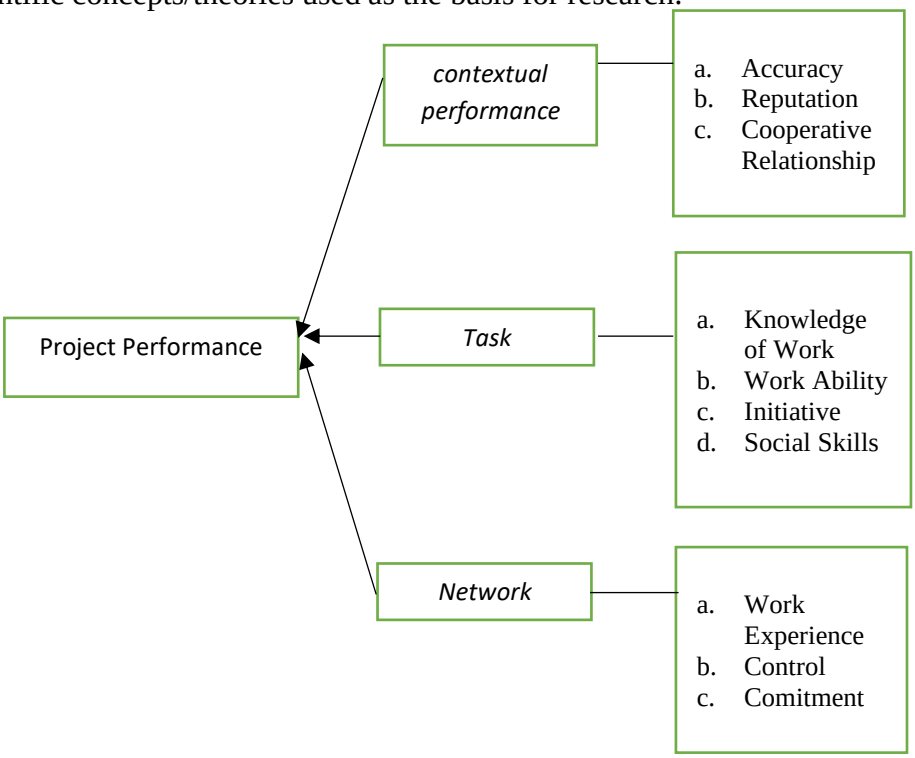

Figure 1

Research Conceptual Framework

***Partial Least Square* (PLS)**

Data management in this study uses the *Partial Least Squeare* (PLS) analysis tool. This study uses PLS to determine the relationship between latent variables consisting of Contextual Performance, Task Performance and Network on Project Performance.

In Ghozali, (2018 : 41), calculations are executed by utilizing the *Smart* software *PLS*, due to the shape of the model and the multiple paths used are reflective and formative. On the other hand, because the *sampling* did not reach 100 respondents. The

formative model is a construct that shows the direction of the relationship from parameters to latent variables. The reflective model is a construct that shows the relationship from latent variables to indicators.

Evaluation model *PLS* has a foundation in predictive calculations that have non-parametric properties. The *PLS* assessment model is run by evaluating *the inner model* and *outer model*. The outer *model* is run to determine the reliability and validity of the model, and the *inner model is* used to obtain the relationship between latent variables.

RESEARCH METHODS

Type of Research

The method used in this research is a quantitative descriptive approach through a case study model. Quantitative method as a type of research has specifications that are systematized, planned, and have a clear structure since the beginning of the research design.

Research Sites

The research location in this research is the construction project for the construction of the Tlogomas Bridge, Tlogomas Ward City of Malang. This project is carried out by PT. Wasis by Nugraha.

Population

Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then conclusions drawn (Garaika, 2019) . The population of this study are employees of PT. Wasis Karya Nugraha who knows the conditions and is directly involved in the work of the Tlogomas Bridge construction projects Kel. Tlogomas Malang City as many as 42 people.

Sample

The sample is part of the number and characteristics possessed by the population (Garaika, 2019). If the population is large and it is impossible for the researcher to study everything in the population, due to limited funds, manpower and time, the researcher can use samples taken from a representative population. In this study, sampling was carried out using the slovin method. The slovin method is used to calculate the minimum sample size because the population size is not known with certainty.

RESULTS AND DISCUSSION

Research Instrument Test

Validity test

Validity test according to Sunyoto, (2013 : 114) is a test tool and measurement using questions. Validity refers to the significance of a test that can be accurately measured and the statement obtained. Sugiyono, (2018 : 134) states that the validity test can be carried out using a correlation of values with questions with total variable values. (*correlated item–total correlation*) with the criterion if the *correlated item–total correlation value is* > 0.3, then the instrument item is said to be valid.

Table 1
Validity Test

Variable	Statement	Corrected item–total correlation	Sig.	Conclusion
Contextual Performance (X_1)	$X_{1.1}$	0,852	0,000	Valid
	$X_{1.2}$	0,856	0,000	Valid
	$X_{1.3}$	0,843	0,000	Valid
Task Performance (X_2)	$X_{2.1}$	0,852	0,000	Valid
	$X_{2.2}$	0,776	0,000	Valid
	$X_{2.3}$	0,861	0,000	Valid
	$X_{2.4}$	0,724	0,000	Valid
Network (X_3)	$X_{3.1}$	0,625	0,000	Valid
	$X_{3.2}$	0,839	0,000	Valid
	$X_{3.3}$	0,808	0,000	Valid
Kinerja Proyek (Y_2)	$Y_{.1}$	0,887	0.000	Valid
	$Y_{.2\_}$	0.871	0.000	Valid
	$Y_{.3\_}$	0.876	0.000	Valid

Source: Appendix 4

Based on the results in table 4, it shows that the results of testing the validity of the indicators of all independent variables and the dependent variable are valid, because they have a correlated item–total correlation value of > 0.3.

Reliability Test

The reliability of the variable is known through the Cronbach's alpha value, if the Cronbach's alpha value is higher than 0.6 it can be stated that the variable can be trusted.

Table 2
Reliability Test Results

Variable	Alpha	Alpha	Conclusion
Contextual Performance (X_1)	0.808	0.6	Reliable
Task Performance (X_2)	0.818	0.6	Reliable
Networks (X_3)	0.599	0.6	Reliable
Project Performance (Y_2)	0.845	0.6	Reliable

Source: Appendix 5

Based on Table 5 above, it shows that the results of the indicator reliability test of the independent variables are only the *Network variable* (X_3) which is unreliable, because the value of *Cronbach's Alpha if Item Delete* is smaller than *Cronbach's Alpha* , while the variables *Contextual Performance* (X_1) and *Task Performance* (X_2) and the dependent variable shows reliability, because the value of *Cronbach's Alpha if Item Delete* is greater than *Cronbach's Alpha* of 0.6 so that it is stated that the indicator is reliable.

***Partial Least Square* (PLS) Analysis Results**

In the data analysis process using the *Partial Least Square program* , testing will be carried out based on the *Outer* and *Inner* Models. The *Outer Model* test functions to test the suitability and validity of the research variable indicators to be used in the *Inner test* . While testing the *Inner* model functions to find relationships between variables. By

using PLS, you will get a model image of the relationship between variables as shown below:

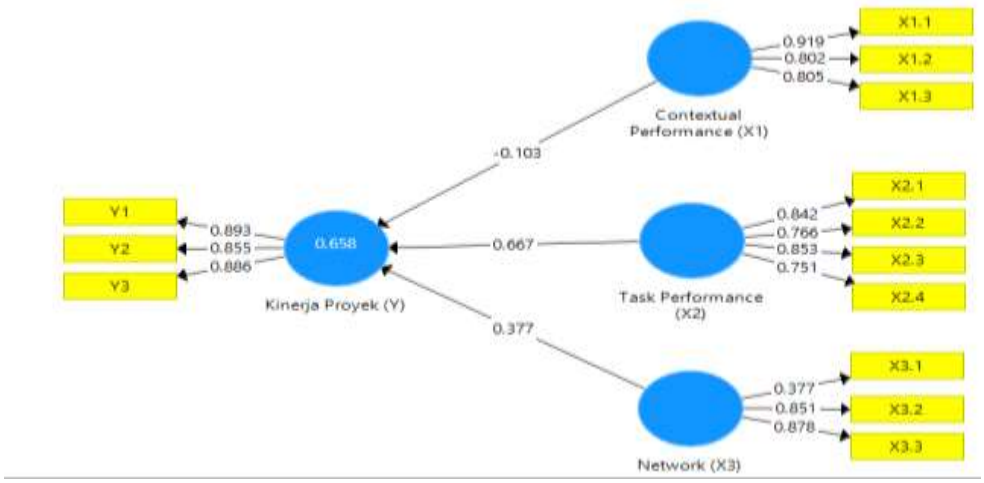

Figure 1
First Round PLS Model

Based on Figure 3 it is known that the X3.1 indicator has a value below 0.7 so it is necessary to reduce this indicator. Following are the Second Round PLS Models:

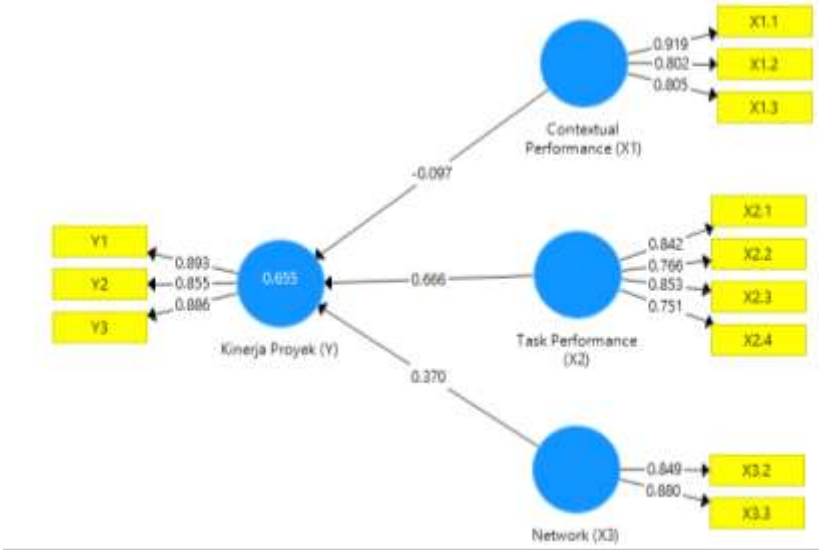

Figure 2
Second Round PLS Model

Outer Model Test

Outer model is often also called (*Outer relation* or *measurement model*) specifies the relationship between the variables studied and the indicators.

1. *Convergent Validity*

Testing the measurement model through the *loading factor was carried* out to determine the validity of the indicators by looking at the *convergent validity values* of the indicators in the model. Each indicator in the model must meet *convergent validity*, which has a value of > 0.7. If each indicator already has a *loading factor value* > 0.7, the

evaluation step can be continued. The following are the results of *convergent validity* testing :

Table 3
Validity Test (*Convergent Validity*)

Variable	Original Sample (O)	P Values	Keterangan
X1.1 <- Contextual Performance (X1)	0.859	0.000	Valid
X1.2 <- Contextual Performance (X1)	0.880	0.000	Valid
X1.3 <- Contextual Performance (X1)	0.870	0.000	Valid
X2.1 <- Task Performance (X2)	0.764	0.000	Valid
X2.2 <- Task Performance (X2)	0.788	0.000	Valid
X2.3 <- Task Performance (X2)	0.790	0.000	Valid
X2.4 <- Task Performance (X2)	0.710	0.000	Valid
X3.2 <- Network (X3)	0.725	0.000	Valid
X3.3 <- Network (X3)	0.828	0.000	Valid
Y1 <- Project Performance (Y)	0.766	0.003	Valid
Y2 <- Project Performance (Y)	0.872	0.003	Valid
Y3 <- Project Performance (Y)	0.610	0.002	Valid

Source: PLS Appendix

Based on the *convergent validity* test shown in the table above is known that all indicators declared feasible or valid for used and can be used for further analysis, because throughout have score *convergent validity* above 0.7.

2. *Discriminant Validity*

Discriminant validity test aims to test block validity indicator. The *discriminant validity test* for indicators can be seen in the *cross loadings* between the indicators and their constructs as shown in Table 7. The indicator block is called valid if the value of each indicator in measuring its construct variable (= indicator block) is dominantly higher when compared to the value of each indicator in measuring other construct variables.

Table 3
Cross Loadings

	Contextual Performance (X1)	Task Performance (X2)	Network (X3)	Kinerja Proyek (Y)
X1.1	0,919	0,609	0,581	0,573
X1.2	0,802	0,494	0,395	0,287
X1.3	0,805	0,376	0,331	0,319
X2.1	0,720	0,842	0,363	0,598
X2.2	0,414	0,766	0,194	0,526
X2.3	0,359	0,853	0,318	0,587
X2.4	0,435	0,751	0,298	0,661
X3.2	0,651	0,244	0,849	0,459
X3.3	0,310	0,386	0,880	0,512
Y1	0,419	0,608	0,441	0,893
Y2	0,394	0,704	0,378	0,855
Y3	0,512	0,645	0,646	0,886

Source: PLS Appendix

The *cross loading values* in Table 7 are obtained as a whole from the forming construct which is stated to have a good discriminant. Where the correlation value of the indicator to the construct must be greater than the correlation value between the indicator and the other constructs.

3. *Average Variance Extracted (AVE)*

AVE aims to test the reliability of construct variables. AVE aims to establish that the construct variable has a good *Discriminant validity* value. The AVE value is declared satisfactory if > 0.5. The results of the AVE test appear in Table 8 as follows:

Table 4
AVE value

	AVE
Contextual Performance (X1)	**0.712**
Task Performance (X2)	**0.647**
Networks (X3)	**0.748**
Project Performance (Y)	**0.772**

Source: PLS Appendix

The results of the AVE values for the indicator blocks that measure constructs can be stated to have discriminant *validity* values good because all research variables have an AVE value greater than 0.5.

4. *Composite Reliability*

Another test is the *composite reliability* of the indicator blocks that measure constructs (Ghozali & Latan, 2012). The condition is that if the *composite reliability value is* > 0.6 0 it is interpreted as very satisfactory (Ghozali & Latan, 2012).

Table 5
Composite Reliability

	Composite Reliability
Contextual Performance (X1)	0.881
Task Performance (X2)	0.880
Networks (X3)	0.855
Project Performance (Y)	0910

Source: PLS Appendix

Based on Table 9 it can be explained that from the provisions of *composite reliability* it can be stated that all the constructs studied meet the criteria of *composite reliability*, so that each construct can be positioned as a research variable. So compositely all variables have adequate internal consistency in measuring the latent/construct variables measured so that they can be used in further analysis.

5. *Cronbach Alpha*

Reliability Test with *composite reliability* in on could strengthened by using *cronbach a alpha value*. A variable can be declared reliable or Fulfill *cronbach alpha* if have score *cronbach alpha* >0.6. Following this is score *Cronbach alpha* from each variable:

Table 6
Cronbach Alpha

	Cronbach Alpha
Contextual Performance (X1)	0.808
Task Performance (X2)	0.817
Networks (X3)	0.663
Project Performance (Y)	0.852

Source: PLS Appendix

Based on the test results in the table above, it can be seen that the *Cronbach alpha value* of each research variable is > 0.60. Thus these results can show that each variable research has met the requirements of the *Cronbach alpha value*, so it can be concluded that whole variable have level reliability which tall.

***Inner* Model Test**

1. Structural Equation

This test is used to evaluate the relationship between latent constructs as hypothesized in the study, based on the PLS *output*, the following figure is obtained:

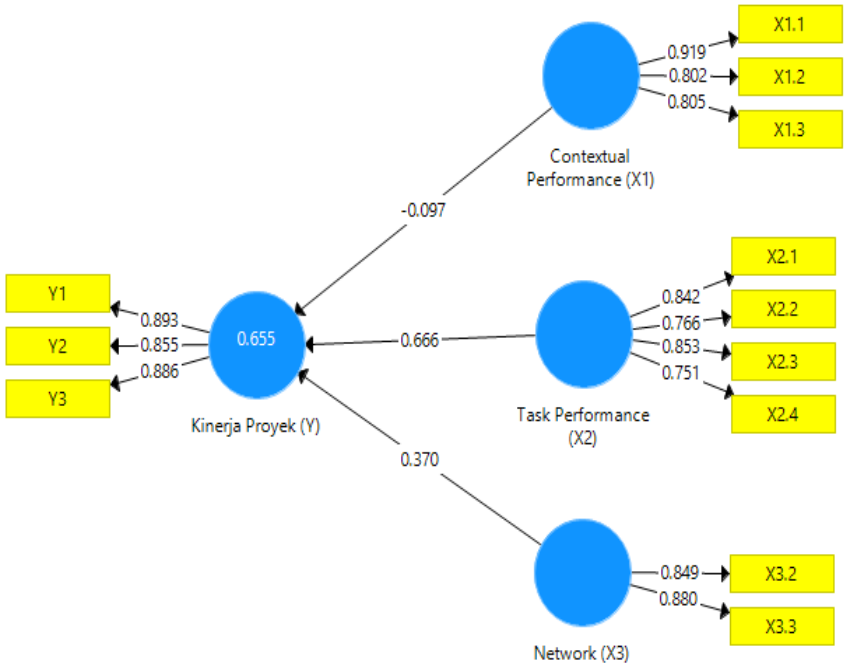

Figure 3
PLS Research Model
Source: Appendix PLS

Inner *weight* values in Figure 5 above show that Project Performance (Y) is influenced by *Contextual Performance* (X1), *Task Performance* (X2) and *Network* (X3) as shown in the following equation:

Y = -0.097 X1 + 0.666 X2 + 0.370 X3

2. Hypothesis test

To answer the existing hypotheses in this study, hypothesis testing was carried out where the hypothesis was declared accepted if the t-statistic value was greater than 1.96, the results of which can be seen in Table 11 below:

Table 7
Hypothesis Testing Results

	Original Sample (O)	Sample Means (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Contextual Performance (X1) -> Project Performance (Y)	-0.097	-0.078	0.133	0.731	**0.465**
Task Performance (X2) -> Project Performance (Y)	0.666	0.662	0.119	5,606	**0.000**

Network (X3) -> Project Performance (Y)	0.370	0.356	0.105	3,525	**0.000**

Source: PLS Appendix

The results of the hypothesis testing shown in Table 11 above show that: (1) The statistical T value between *Contextual Performance* and Project Performance is 0.731 which means smaller from 1.96. Apart from that, the Original Sample value is -0.097 indicating a negative relationship. This shows that *Contextual Performance* **has a significant negative effect** on Project Performance (2) Statistical T value between *Task Performance* and Project Performance is 5, 606 which means greater than 1.96. Apart from that, the Original Sample value of 0.666 indicates a positive relationship. This shows that *Task Performance* **has a significant positive effect** on Project Performance. (3) The statistical T value between *Network* and Project Performance is 3.525 which means greater than 1,96. Apart from that, the Original Sample value of 0.370 indicates a positive relationship. This shows that *Network* **has a significant positive effect** on Project Performance.

3. Structural Model Testing (*Inner* Model)

In assessing the model with PLS begins by looking at *the R-square* for each dependent latent variable. Changes in the *R-square value* can be used to judge the influence of certain independent latent variables on the dependent latent variable whether it has a *substantive effect.* For endogenous latent variables in *a structural model* that has an R^2 of 0.75 indicating that the model is "good", an R^2 of 0.50 indicates that the model is "moderate", an R^2 of 0.25 indicates that the model is "weak" (Ghozali & Latan, 2012) . The PLS output is as explained below:

Table 8
R-Square Value

	R Square
Project Performance (Y)	0.655

Source: PLS Appendix

For free variables *Contextual Performance, Task Performance* and *Network that affect the* Project Performance variable in the structural model has an R2 value of 0.655 which indicates that the model is "Moderate". suitability *the structural model* can be seen from Q^2, as follows:

$$Q^2 = 1 - [(1 - R1)]$$
$$= 1 - [(1 - 0.655)]$$
$$= 1 - [(0.345)]$$
$$= 0.655$$

Based on the calculation results above, a *Q-Square* value of 0.655 is obtained. This shows that the diversity of the research data that can be explained by the research model is 65.5 %. While the remaining 34.5 % is explained by other factors that are outside this research model. Thus, from these results, the research model can be stated to have a weak *goodness of fit.*

CONCLUSION

Based on the results of the analysis obtained, it can be taken several conclusion following these: (1) Factors of contractor selection criteria which include contextual

performance, task performance, and network affect project performance. (2) The influence of the relationship between the criteria for contractor selection criteria on project performance is high. (3) The strategy that can be used in selecting contractors according to the criteria that influence them is to consistently pay attention to the factors in selecting contractors.

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