Eduvest – Journal of Universal Studies
Volume 4 Number 12, December, 2024
p- ISSN 2775-3735- e-ISSN 2775-3727

INFLUENCE OF INTERNAL AND EXTERNAL PROJECT FACTORS ON THE PERFORMANCE OF ROAD CONSTRUCTION PROJECT IMPLEMENTERS IN WEST PAPUA PROVINCE

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ABSTRACT

The development of road construction projects in West Papua Province is very important to support regional economic development. However, these projects often face challenges that can affect the performance of project implementers. This research aims to identify the influence of internal and external factors on the performance of road construction project implementers in the region. The research method used is a descriptive method with a quantitative approach, where data is collected through questionnaires distributed to project implementers. Data analysis was carried out using regression techniques to determine the relationship between the variables studied. The research results show that internal factors such as project team competency and risk management, as well as external factors such as weather conditions and government regulations, have a significant influence on the performance of project implementers. This research concludes that to improve the performance of road construction projects in West Papua, there needs to be an increase in aspects of internal competence and management as well as adaptation to unexpected external conditions.

KEYWORDS *Internal Project Factors, External Project Factors, Performance, Road Construction*

How to cite: Marjianus Paulus Kioata Tawer, et al (2024). Influence of Internal and External Project Factors on the Performance of Road Construction Project Implementers in West Papua Province. Journal Eduvest. *4*(12): 11856-11879
E-ISSN: 2775-3727

INTRODUCTION

The construction industry is very important in the development of a country and can increase economic development (Ismail, Rahman & Memon, 2013). Construction project development involves many parties, various processes, different phases and stages of work as well as input from two sectors, namely the government and the private sector, with the main goal being project success (Takim & Akintoye, 2002). Construction projects are largely unique due to customization. No project is the same, as each one adapts the workplace environment to specific functions, design and preferences. Construction is a complex system due to the involvement of many parties from the pre-contract stage to the post-contract stage in the construction process, this will give rise to problems that will affect project completion performance (Kiew, Ismail, & Yusof, 2013).

Performance is related to many things and factors such as time, costs, quality, clients, satisfaction, productivity and safety (Abushaban, 2008). Time, cost and quality are the three most dominant dimensions of performance evaluation (Enshassi, Mohamed, & Abushaban, 2009). According to Abushaban (2008), construction project failure is closely related to problems and failures in performance. Apart from that, there are many reasons and factors that attribute to the failure of construction projects such as time performance, quality performance and cost performance and other performance indicators so that the success of construction projects is very dependent on successful performance.

In order to plan and manage a successful project, the three parameters of time, cost and quality must be considered (Bowen & Cattel, 2007). A project is considered successful if it is completed on time, according to the specified budget and quality standards (Choudhry, Nasir, & Gabriel, 2012). According to Herbsman & Ellis (1991), the main problems in the traditional approach to project completion include long delays from the planned schedule, cost overruns, serious problems in quality and an increase in the number of claims and litigation related to construction projects (Ibironke & Timothy, 2012). In general, delays in implementation time (time overrun) occur when activities in a project are not completed at the time specified according to the project plan (Ismail, Rahman, & Memon, 2013). Cost overrun occurs when the costs required to complete a project exceed the budgeted amount (Ismail, Rahman, & Memon, 2013). In the long term, poor quality can damage its reputation and if the company continues to do the same thing it will likely close the opportunity to get new projects (Jha & Iyer, 2006). Internal and external project factors in the form of factors causing time overruns, cost overruns and quality failures that affect project performance have been identified in various countries and regions in Indonesia. In several previous studies which were used as references in this research, five factors were found that influence the performance of construction projects, namely the availability of personnel who have experience and high qualifications, the quality of equipment and materials in the project, conformity to specifications, project construction planning time, availability of

labor from the owner. to the contractor as well as coordinating information between the client and the project parties (owner, consultant and contractor).

Talking about time overruns, cost overruns and quality failures are conditions that are often found in every region. This research was carried out at the research locus, namely Tambrauw district and Teluk Bintuni district as the basis for sampling because Teluk Bintuni district is a district in West Papua province which has the largest area with unique geography and a very difficult level of accessibility due to better soil conditions with water. and the availability of local materials, especially coarse aggregate which is not available. Apart from that, Bintuni is the district in West Papua that has the largest budget.

Meanwhile, the Tambrauw district locus was chosen because it is unique in that geographically it has sufficient availability of local materials, basic infrastructure breakthroughs were generally only built after regional expansion in 2008. The majority are in protected forest areas and in mountainous areas but have very small budget availability. This is where it is hoped that a comparison of the effects will be seen.

Time overruns, cost overruns and quality failures will cause losses to both internal project parties and the community. Due to the unique nature of the project and the physical conditions of different areas, it is possible that the influence of internal and external project factors on project performance will also be different. This research was conducted to determine the influence of internal and external project factors on the performance of road construction projects in West Papua Province, especially on Government construction projects implemented by the Public Works and Spatial Planning Service of Tambrauw Regency and the Public Works and Spatial Planning Service of Teluk Bintuni Regency in West Papua Province before the expansion of the province of Southwest Papua (DOB).

Literature Review

Internal and External Project Factors

The implementation of construction projects cannot be separated from various problems, both internal and external, which affect construction project performance, especially cost, time and quality performance. Internal project factors are factors that originate from within the project, whether from the owner, planner (consultant), contractor or consultant (supervisor/supervisor). Meanwhile, external factors are factors that come from outside the construction project. The internal and external factors of the project in this research are factors that cause cost overruns, time overruns and quality failures.

1. Factors Causing Cost Overrun

Cost overrun is defined as the difference between the estimated initial project costs and the actual construction costs at the time of completion of work on a commercial sector construction project (Choudhry, 2004 in Shanmugapriya and Subramanian, 2013). Cost overrun is simply defined as "when the final cost of a project

exceeds the original estimate" (Avots, 1983 in Choudhry, 2012). Cost overrun is sometimes also referred to as " cost escalation ", " cost increase ", or " budget overrun " (Zhu and Lin, 2007 in Choudhry, 2012). According to Rowland (1981) in Vidalis and Najafi (2002), cost overrun is defined as the percent difference in cost between the final project cost and the contract price.

There are many factors that cause cost overruns . In Shanmugapriya and Subramanian's (2013) research, the causes of cost overrun were divided into 8 groups consisting of financial groups, construction parties, construction items, environmental groups, political groups, materials, labor and equipment and owner's responsibility . Research by Memon et al. (2012) stated that the factors causing cost overruns are grouped into 8 categories, namely design and documentation issues , financial resources management , project management and contract administration , contractors site management , information and communication technology , material and machinery resources , labor (human) resources and external factors . In the research of Ismail et al. (2013), the factors causing cost overrun are categorized according to the cycle of a construction project, namely the planning, design, construction and finishing stages . Apart from that, according to Santoso (1999), the causes of cost overruns are grouped into cost estimates, implementation and work relations, materials, labor, equipment, financial aspects, implementation time and political policies.

2. Factors Causing Time Overrun

In general, time overrun occurs when work during a project cannot be completed within the time specified in the project plan (Memon, Rahman, & Azis, 2012). Time overrun is simply the difference between the original project contract duration prior to bidding and the actual overall contract time at the end of construction (Vidalis & Najafi, 2002). According to Daniel & Mohan (1997) in Choudry et al. (2012), time overrun refers to a condition where a construction project cannot be completed within the planned period.

According to Dolage and Rathnamali (2013), factors causing time overrun are divided into several groups, namely client related causes , consultant related causes (designing, monitoring, and controlling, payments and others), contractor related causes (material, human resources, plant and equipment, management and other), contractual relationships and external . In research in Malaysia, it was found that the main factors that contributed to time overruns on construction projects were frequent design changes, changes in project scope, financial problems on the part of the owner , slow decision making and unpredictable ground conditions (Memon, 2014)

3. Factors Causing Quality Failure

Quality in its simplest form can be defined as “meeting customer expectations” or “adherence to customer specifications” (Jha & Iyer, 2006). Hohns (1985) in Yates and Lockley (2002) defines failure as 1) the act of being short, being lacking, or lacking 2) not achieving or not being successful 3) non-performance, neglect, negligence 4) bankruptcy 5) loss of enthusiasm or strength . According to PP no. 29/2000 article 31 concerning the Implementation of Construction Services, construction failure is a condition where the results of construction work do not comply with the work

specifications as agreed in the construction work contract, either in part or in whole, as a result of errors by the service user or service provider. Construction failure is a failure that occurs during construction and is considered a collapse or stress of a structural system to a certain degree such that it cannot carry out its stated purpose (Yates & Lockley, 2002).

Based on research by Heravitorbati et al. (2011), there are 27 factors that cause quality failure which are grouped into 4, namely managerial, technical, environmental/material/equipment and cultural/political stakeholders . According to Nguyen and Chileshe (2013), the causes of failure in construction projects consist of 4 categories, including knowledge and technical issues, management issues, financial and economic issues and social and legal issues . In his research, Mahamid (2011) grouped 44 factors that cause construction failure into 3 groups, namely financial, managerial and external .

Project Performance

Performance refers to the level of success in carrying out tasks and the ability to achieve predetermined goals. Performance is declared good and successful if the desired goals can be achieved well (Carr, 1998). Project performance is how the project works by comparing the actual work results with the estimated work methods in the work contract agreed upon by the owner and implementing contractor (Hartono, 2011). According to Cheung et al. (2004), project performance can be measured and evaluated using many performance indicators related to various dimensions such as time, cost, quality, customer satisfaction, client change, business performance, health and safety. Time, cost and quality are the dominant dimensions of performance evaluation (Omran, Abdalrahman, & Pakir, 2012).

Performance indicators are measures of project impacts, outputs and inputs that are monitored during project implementation to assess progress towards project objectives. Choosing the right performance indicators depends on a good understanding of what is important to the organization (Vyas & Kulkarni, 2013).

1. Cost Performance

Cost performance is an important criterion in the success of a construction project. Cost performance is the most important indicator of project success used by many parties. This performance not only presents the company's profitability, but also the organization's productivity at any time during the construction process. Poor cost performance of construction projects is a major concern for contractors and clients (Omran, Abdalrahman, & Pakir, 2012).

2. Time Performance

One element of the performance indicators of a construction project is construction time (Andi, 2003). Time performance is a comparison between the time agreed between the owner and contractor and the actual time for project completion (Hartono, 2011).

3. Quality Performance

Quality performance is considered to be a function of the procedures in place during the construction process (Serpell & Alarcon, 1998). Quality is an important element for sustainable customer satisfaction. In construction projects, contractor quality performance is considered important for customer satisfaction (Omran, Abdalrahman, & Pakir, 2012).

RESEARCH METHOD

Types and Sources of Research

Based on the background, problem formulation and objectives to be achieved, this research is confirmatory in nature, where concepts or theories are used to answer the problem formulation so that a hypothesis is formulated. This hypothesis was then tested through data collection in the field. Confirmatory research is also used to study and explain patterns of relationships that may occur between at least two variables. Thus, the population and research sample are important parts that have an influence in this research.

Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then draw conclusions, while the research sample is part of the number and characteristics possessed by the population (Sugiyono, 2012). Based on the objectives of this research, the research population is Project Leaders and Managers from Service Provider/Contractor Companies carrying out construction projects in the Highways Sector, Public Works and Spatial Planning Department of Tambrauw Regency and Public Works and Spatial Planning Service of Teluk Bintuni Regency in West Papua Province FY APBD funding sources. 2020 - 2023.

Determination of the sample in this study used a saturated sampling technique . Saturated sampling is a sampling technique when all members of the population are used as samples. This is done if the population is relatively small, less than 40 samples, or research that wants to make generalizations with very small errors. Another term for a saturated sample is a census, where all members of the population are sampled (Sugiyono, 2012). Therefore, the samples chosen for this research were Project Leaders and Managers from Service Provider/Contractor Companies who were considered relevant in providing perceptions about the influence of internal and external project factors on project performance and were responsible for implementing construction projects.

Data collection technique

Data collection in this research used primary data in the form of answers to research questionnaires. Primary data was obtained from a survey by distributing questionnaires which were filled in using the perceptions of predetermined respondents, namely Project Leaders and Managers who had implemented construction projects.

A questionnaire is a list of operational questions asked of selected respondents to answer hypotheses developed according to research objectives. The questions in the

questionnaire must be able to collect respondent information needed to produce indicators or fulfill the tabulation design that you want to study (Kamaruzzaman, 2012). The questionnaire in this research was designed in several parts, namely:

The first part contains an explanation of the purpose of conducting the research, researcher contact, guarantee of confidentiality.

The second part consists of filling in the personal data of the respondent and the company as well as project data such as questions to the respondent regarding their position or position in the project, the respondent's length of experience working in the construction sector, the respondent's education, company qualifications, company ownership status, name, location, value and type of project.

The third part is a question questionnaire containing research variables regarding internal and external project factors and their influence on construction project performance.

The next survey is to conduct interviews to obtain supporting information by asking respondents directly and other parties involved in the research interests.

Data analysis technique

The analytical method used in this research is SEM PLS analysis, where:

1. Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) is a method that studies structural relationships expressed by a set of equations, which are similar to a set of multiple regression equations. This equation will describe the relationship between constructs (consisting of dependent and independent variables) involved in an analysis. Until now, multivariable techniques were classified as interdependence or dependency techniques. SEM can be categorized as a unique combination of these two things because the basis of SEM is in two main multivariable techniques, namely factor analysis and multiple regression analysis. In SEM analysis there are variables that are not directly measurable (latent variables) and variables that are directly measurable (indicators).

2. Partial Least Squares (PLS)

PLS analysis is a multivariate statistical technique that compares multiple dependent variables and multiple independent variables. PLS is a variant-based SEM (Structural Equation Modeling) statistical method designed to complete multiple regression when specific problems occur in the data, such as small research sample sizes, missing data, and multicollinearity (Jogiyanto and Abdillah, 2009).

The reasons for using PLS are:

a) This statistical method is appropriate to use in testing the predictive effect of the relationship between variables in a model,
b) PLS can be run on small samples, does not require various assumptions, and can test research models with a weak theoretical basis, and
c) information produced using PLS is more efficient and easier to interpret (Jogiyanto and Abdillah, 2009).

3. Evaluation of the Research Hypothesis Model

Model evaluation in PLS is carried out by evaluating the outer model and inner model. The outer model is a measurement model to assess the validity and reliability of the model. Meanwhile, the inner model is a structural model to predict causal relationships between variables (Jogiyanto and Abdillah, 2009).

a) Evaluation of Outer Model (Measurement Model)

The measurement model is used to test the validity of variables and the reliability of indicators. Validity tests are carried out to determine the ability of research indicators to measure what they should measure. One of the validity tests in SmartPLS is the Convergent Validity Test: related to the principle that the measures of a variable should be highly correlated. Convergent validity occurs if the scores obtained from two different instruments that measure the same variable have a high correlation. The rule of thumb used for convergent validity is outer loading > 0.7, however, for research in the initial stages of developing a measurement scale, a loading value of 0.5 to 0.6 is considered sufficient (Chin, 1998 in Ghozali, 2011) as well as the AVE value (Average variance extracted) > 0.5. In this research we determine a valid outer loading limit if the outer loading is > 0.7.

Meanwhile, the reliability test is used to measure the consistency of measuring instruments in measuring a concept. A reliability test is a measurement that shows the extent to which the measurement is without bias (error free) and therefore guarantees consistent measurement across time and across various items in the indicator. In PLS, this test can be carried out using two methods, namely:

- Cronbach's alpha : measures the lower limit of the reliability value of a variable and is acceptable if the value is > 0.6.
- Composite reliability : measures the true value of the reliability of a variable and is acceptable if the value is > 0.7 (Jogiyanto and Abdillah, 2009).

b) Structural Model Evaluation

The structural model in PLS is evaluated by measuring the coefficient of determination or test (R 2) and the path coefficient or t-value through comparison of t-statistics and t-tables. The following are the inner model measurement parameters in PLS:

1) Coefficient of Determination (R2 Test)

The value (R2) is used to measure the level of variation in changes in the independent variable towards the dependent variable. So it can illustrate how much the dependent variable can be influenced by the independent variable. The higher the value (R 2) the better the prediction model of the proposed research model (Jogiyanto and Abdillah, 2009)

2) Path coefficients or T-values

The path coefficient value shows the significance between variables in a structural model or in hypothesis testing. The hypothesis used in this research is the two -tailed hypothesis . The hypothesis is accepted if the t-statistic value is greater than 1.96, which is the t-table value for testing with an alpha of 5 percent or p-value < 0.05 (Jogiyanto and Abdillah, 2009).

RESULT AND DISCUSSION

SEM PLS Analysis Results

The following is the initial model that will be formed in analyzing questionnaire data using the SEM PLS method known as (Structural Equation Modeling (SEM) and Partial Least Square (PLS) .

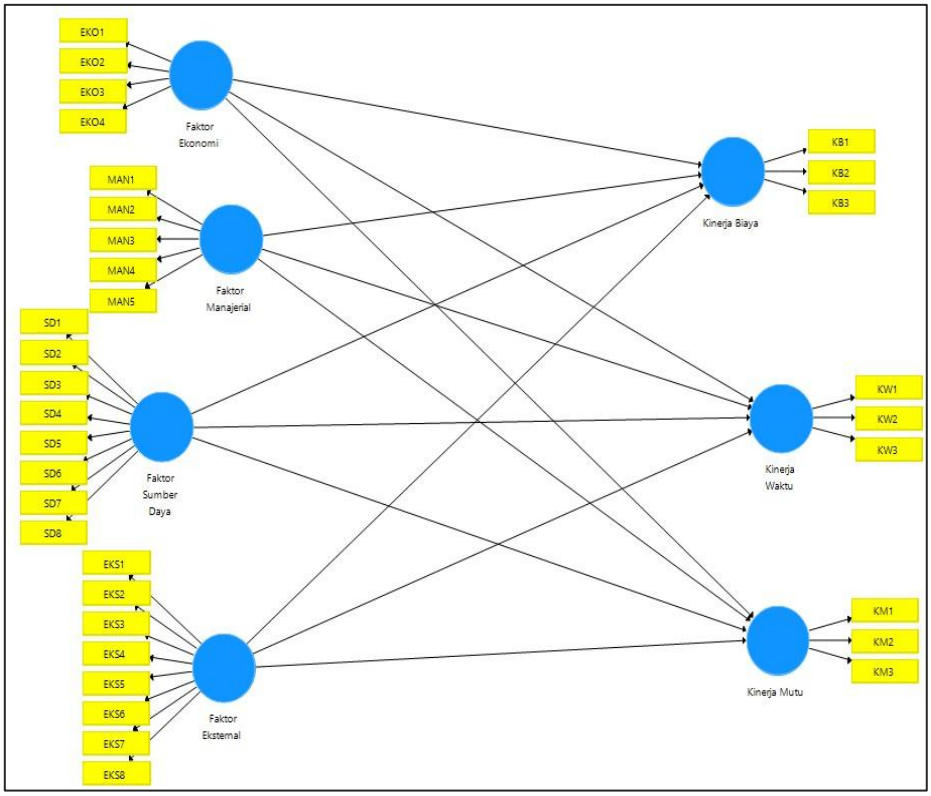

Figure 1 Initial Model Plan
Source: Analysis Results, 2024

Outer model evaluation (Measurement)

Validity test

The research model has reflective indicators. The convergent validity test was carried out using the AVE and outer loading values. In this research, an indicator is declared valid if it has a factor loading of more than 0.7 and an AVE of more than 0.5. Table 1 is the result of first order convergent validity testing.

Table 1 Outer Loading and AVE

Latent Variables	Indicator	Outer Loading	AVE

Economic Factors	EKO1	0.286	0.531
	EKO2	0.651	
	EKO3	0.887	
	EKO4	0.912	
External Factors	EX1	0.699	0.597
	EX2	0.631	
	EX3	0.758	
	EX4	0.746	
	EX5	0.832	
	EX6	0.890	
	EX7	0.907	
	EX8	0.674	
Cost Performance	KB1	0.928	0.914
	KB2	0.970	
	KB3	0.970	
Quality Performance	KM1	0.960	0.931
	KM2	0.949	
	KM3	0.985	
Time Performance	KW1	0.991	0.972
	KW2	0.983	
	KW3	0.983	
Managerial Factors	MAN1	0.845	0.845
	MAN2	0.948	
	MAN3	0.901	
	MAN4	0.938	
	MAN5	0.960	
Resource Factors	SD1	0.456	0.590
	SD2	0.645	
	SD3	0.562	
	SD4	0.922	
	SD5	0.722	
	SD6	0.939	
	SD7	0.943	
	SD8	0.798	

An indicator is declared convergently valid if the AVE value is more than 0.5 and the outer value loading more than 0.7. Based on Table 1 above, it is known that all variables have an AVE value of more than 0.5 (red writing) but there are several indicators that measure a variable that has outer loading less than 0.7 (red writing). This shows that these indicators are not valid in measuring the latent variable. Next, re-estimate (re-estimate) by removing invalid indicators.

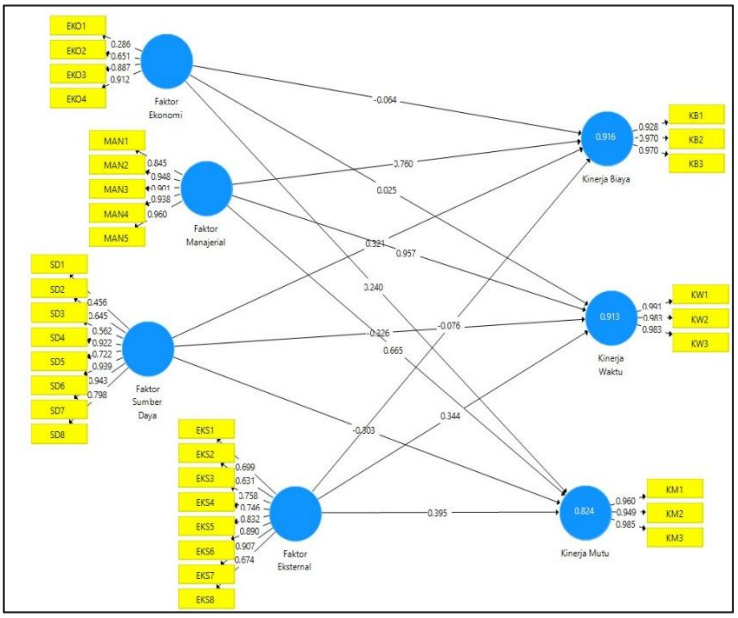

Figure 2 Results of path coefficient, outer loading and R-Square in the initial stage

Figure 2 shows the results of re-estimation with valid indicators as follows:

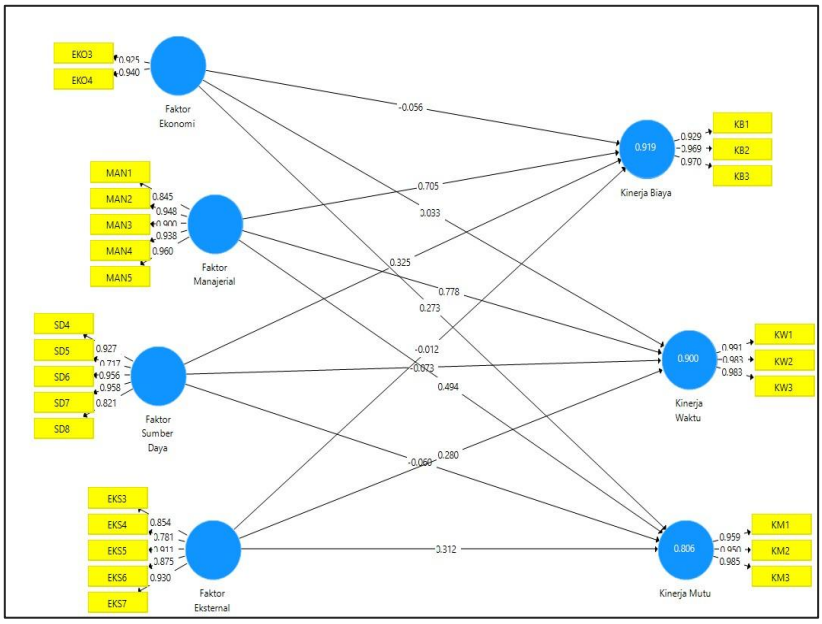

Figure 3 Results of path coefficient, outer loading, and R-Square after re-estimation

From figure 3 it can be seen that all outer loadings are greater than 0.7 after re - estimation and the complete convergent validity results are presented in table 2 Apart

from that, in Table 2 it can be seen that the AVE value after re-estimation still meets the requirements for convergent validity, namely more than 0.5.

Table 2 Outer Loading and AVE after re-estimation

Latent Variables	Indicator	Outer Loading	AVE
Economic Factors	EKO3	0.925	0.869
	EKO4	0.940	
External Factors	EX3	0.854	0.760
	EX4	0.781	
	EX5	0.911	
	EX6	0.875	
	EX7	0.930	
Cost Performance	KB1	0.929	0.914
	KB2	0.969	
	KB3	0.970	
Quality Performance	KM1	0.959	0.931
	KM2	0.950	
	KM3	0.985	
Time Performance	KW1	0.991	0.972
	KW2	0.983	
	KW3	0.983	
Managerial Factors	MAN1	0.845	0.845
	MAN2	0.948	
	MAN3	0.900	
	MAN4	0.938	
	MAN5	0.960	
Resource Factors	SD4	0.927	0.776
	SD5	0.717	
	SD6	0.956	
	SD7	0.958	
	SD8	0.821	

From table 2 it can be seen that all outer loading values for each indicator are greater than 0.7 after re-estimation. Not only that, all variables have an AVE (Average variance extracted) value that remains greater than 0.5 after being re-estimated. In other words, each indicator is convergently valid in measuring each latent variable.

Reliability

The parameters used to assess reliability are Cronbach alpha and composite reliability. According to Jogiyanto and Abdillah (2009), based on Chin (1995), an

indicator is said to be reliable if the Cronbach alpha value is more than 0.6 and composite reliability is more than 0.7. The composite reliability results are presented in Table 3 as follows:

Table 3 Composite Reliability Values

	Cronbach's Alpha	Composite Reliability
Economic Factors	0.850	0.930
External Factors	0.920	0.940
Managerial Factors	0.954	0.965
Resource Factors	0.927	0.945
Cost Performance	0.953	0.970
Quality Performance	0.963	0.976
Time Performance	0.986	0.991

Based on Table 4.12 above, it is known that the variables used in this research all latent variables have a Cronbach alpha value of more than 0.6 and a composite reliability value of more than 0.7. So it can be concluded that the indicators that measure the variables used in this research are reliable.

Inner Model Evaluation (Structural)

After passing the validity and reliability tests, the inner model evaluation is then carried out . The parameters used to evaluate the inner model in smartPLS are the determinant coefficient (R2 Test) and the path coefficient or t-value. The R 2 value is used to measure the level of variation in changes in the independent variable towards the dependent variable. The R 2 value is shown in Table 4 as follows:

Table 4 R-Square Values

Variable	R Square
Cost Performance	0.919
Time Performance	0.900
Quality Performance	0.806

From table 4 it can be seen that:

a) The R 2 value of the Cost Performance variable is 0.919 or 91.9%. In other words, the variation in Cost Performance can be explained by the independent variables by 91.9%. The rest is explained by other variables that are not included in the model.
b) The R value of 2 Time Performance variables is 0.900 or 90%. In other words, the diversity of Time Performance can be explained by the independent variables by 90%. The rest is explained by other variables that are not included in the model.

c) The R value of 2 Quality Performance variables is 0.806 or 80.6%. In other words, the diversity of Quality Performance can be explained by the independent variables by 80.6%. The rest is explained by other variables that are not included in the model.

The Q^2 is used to calculate the overall Goodness of Fit (GOF). The GOF value is used to indicate whether a model is fit as a whole . GOF reflects how much the dependent variable can be explained by the variable. Goodness of Fit (GOF) in this study can be measured with the following calculations:

Q 2 = 1-(1-R 1 2)(1-R 2 2) (1-R 3 2)

Q 2 = 1-(1-0.919)(1-0.900) (1-0.806)

Q 2 = 0.998

Based on these calculations, a Q 2 value of 0.998 is produced. This means that the variables in the model can explain 99.8% of the model and the rest is explained by other variables that are not included in the model. Thus, it can be concluded that this research model is quite good because the Q 2 value is more than 60%.

After calculating Goodness of Fit (GOF) , the next step is hypothesis testing with path coefficients . The path coefficient is a coefficient that shows the level of significance in hypothesis testing. The hypothesis used in this research is the two - tailed hypothesis . Therefore, the hypothesis is accepted if it has a t-statistic value of more than 1.96 or a p-value of less than 0.05. Table 5 shows the test results (t) and the magnitude of the effect. Figure 4.4. shows the magnitude of the t-statistic .

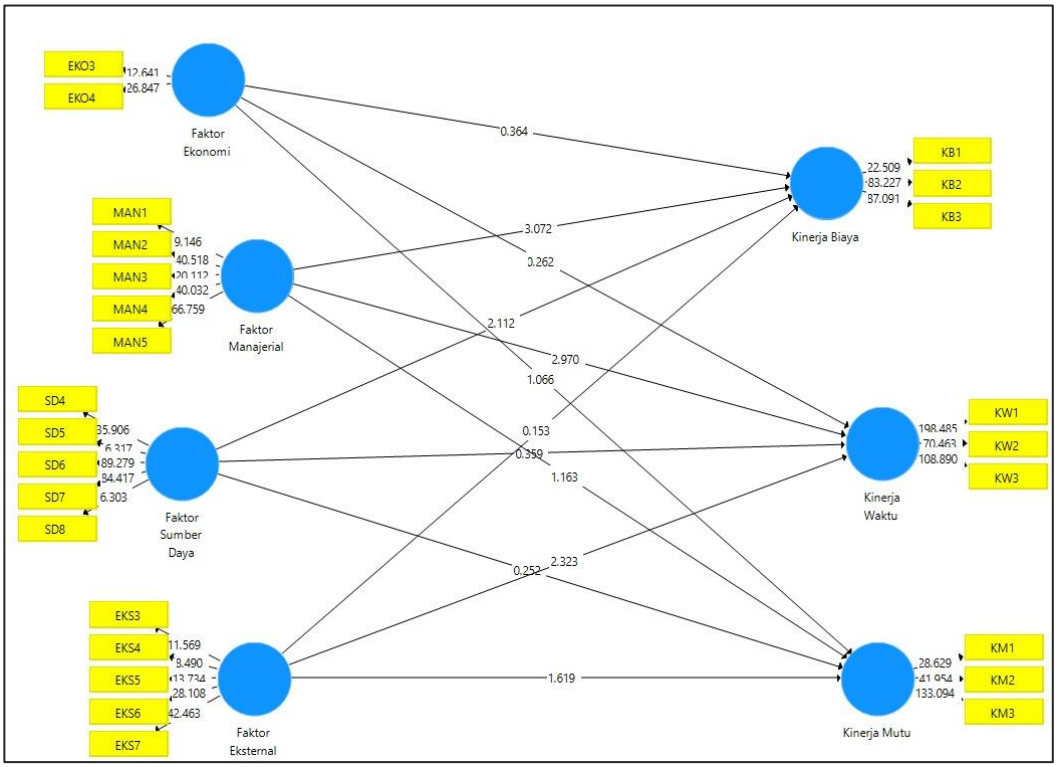

Figure 4 T-statistics

The following are the hypotheses that will be tested:

1) H0: Economic factors have no effect on cost performance
   H1: Economic factors influence cost performance
2) H0: Economic factors have no effect on time performance
   H1: Economic factors influence time performance
3) H0: Economic factors have no effect on quality performance
   H1: Economic factors influence quality performance
4) H0: External factors have no effect on cost performance
   H1: External factors influence cost performance
5) H0: External factors have no effect on time performance
   H1: External factors influence time performance
6) H0: External factors have no effect on Quality Performance
   H1: External factors influence Quality Performance
7) H0: Managerial factors have no effect on cost performance
   H1: Managerial factors influence cost performance
8) H0: Managerial factors have no effect on time performance
   H1: Managerial factors influence time performance
9) H0: Managerial factors have no effect on Quality Performance
   H1: Managerial factors influence Quality Performance

10) H0: Resource factors have no effect on Cost Performance
    H1: Resource factors influence cost performance
11) H0: Resource factors have no effect on Time Performance
    H1: Resource factors influence time performance
12) H0: Resource factors have no effect on Quality Performance
    H1: Resource factors influence Quality Performance

Table 5 Test Results (T) Direct Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Economic Factors -> Cost Performance	-0.056	0.004	0.154	0.364	0.716
Economic Factors -> Quality Performance	0.273	0.266	0.256	1,066	0.287
Economic Factors -> Time Performance	0.033	0.031	0.128	0.262	0.793
External Factors -> Cost Performance	-0.012	-0.026	0.080	0.153	0.879
External Factors -> Quality Performance	0.312	0.394	0.193	1,619	0.106
External Factors -> Time Performance	0.280	0.320	0.120	2,323	0.021
Managerial Factors -> Cost Performance	0.705	0.645	0.229	3,072	0.002
Managerial Factors -> Quality Performance	0.494	0.439	0.425	1,163	0.245
Managerial Factors -> Time Performance	0.778	0.762	0.262	2,970	0.003
Resource Factors -> Cost Performance	0.325	0.339	0.154	2,112	0.035
Resource Factors -> Quality Performance	-0.060	-0.085	0.240	0.252	0.801
Resource Factor -> Time Performance	-0.073	-0.101	0.204	0.359	0.720

Based on Table 5 it can be explained as follows:

1) The t-statistic value for the influence of economic factors on cost performance is 0.364 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of Economic Factors on Cost Performance.

2) The t-statistic value on the influence of economic factors on quality performance is 1.066 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of economic factors on quality performance.
3) The t-statistic value on the influence of Economic Factors on Time Performance is 0.262 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of economic factors on time performance.
4) The t-statistic value on the influence of external factors on cost performance is 0.153 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of external factors on cost performance.
5) The t-statistic value on the influence of external factors on Quality Performance is 1.619 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of external factors on quality performance.
6) The t-statistic value on the influence of external factors on time performance is 2.323 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected. In other words, there is a significant influence of external factors on time performance. The magnitude of the positive influence is 0.280, meaning that the greater the value of External Factors, the greater the Time Performance value.
7) The t-statistic value on the influence of Managerial Factors on Cost Performance is 3.072 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected. In other words, there is a significant influence of Managerial Factors on Cost Performance. The magnitude of the positive influence is 0.705, meaning that the greater the value of the Managerial Factor, the greater the value of Cost Performance.
8) The t-statistic value on the influence of Managerial Factors on Quality Performance is 1.163 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of Managerial Factors on Quality Performance.
9) The t-statistic value on the influence of Managerial Factors on Time Performance is 2.970 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected. In other words, there is a significant influence of Managerial Factors on Time Performance. The magnitude of the positive influence is 0.778, meaning that the greater the value of the Managerial Factor, the greater the Time Performance value.
10) The t-statistic value on the influence of Resource Factors on Cost Performance is 2.112 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected. In other words, there is a significant influence of resource factors on cost performance. The magnitude of the positive influence is 0.325, meaning

that the greater the value of the Resource Factor, the greater the value of Cost Performance.

11) The t-statistic value on the influence of resource factors on quality performance is 0.252 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of Resource Factors on Quality Performance.
12) The t-statistic value on the influence of Resource Factors on Time Performance is 0.359 and the value is smaller than 1.96 (p-value > 0.05) so that H0 is accepted. In other words, there is no significant influence of Resource Factors on Time Performance.

Discussion

The Influence of Internal and External Project Factors on Construction Project Performance in West Papua Province

This research aims to determine the influence of internal and external project factors on the performance of road construction projects in West Papua Province from the contractor's perspective. Based on the results of the SEM PLS analysis, it was found that the t-statistical value was very significant for the positive influencing variables. This loading value provides an illustration of the influence of internal and external project factors on construction project performance. Which shows that internal factors in the form of managerial/organizational factors and resource factors have the closest relationship to project performance, especially cost performance and time performance. Below we will discuss the influence of internal and external project factors on construction project performance.

The Influence of Managerial/Organizational Factors on Project Performance

The results of SEM PLS analysis show that managerial/organizational factors have a strong influence on project time performance with the first highest t-statistic value of 3.072 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected with a positive influence value of 0.705 . Then the results of the analysis also show that managerial/organizational factors have a strong influence on project cost performance with the second highest t-statistic value for the influence of managerial factors on time performance of 2,970 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected with a positive influence value of 0.325.

In other words, there is a delay or amount of time for the physical implementation of road work which often increases the contractor's ability to complete the road construction project according to the planned implementation time in the West Papua Province region and results in/influences the cost of the road construction project due to managerial/organizational factors. Project management is the most important thing in implementing a construction project. Management functions to manage resources appropriately. In implementing a construction project, the activities that will be faced are very complex. The construction process involves organization and communication from all sources. The influence of managerial/organizational factors on construction

project performance has a unidirectional relationship, this shows that good project management will result in good project performance, whereas if project management is bad this will have a negative impact on project performance. Good management is very necessary so that the project can run according to plan. One of the important parts of project management is project organization. A project will be successful if there is good organization.

Managerial/organizational problems that often occur in construction projects in West Papua Province are communication and coordination of project elements that do not run well, poor project management and supervision, poor construction planning and implementation, inexperienced and inexperienced project managers and experts. competent, and Frequent errors and design changes. Therefore many parties are involved in the project, communication between the parties is very important for the success of the project. Poor communication and coordination between parties involved in a project leads to alienation between parties and misunderstanding of contract terms. This illustrates the importance of awareness among contractors to ensure a culture of teamwork and to achieve their desires with a work climate that is minimally hostile.

Research by Sambasivan and Soon (2006) states that of the 10 main factors causing delays is a lack of communication between parties in the project. Lack of communication and coordination can have an impact on project implementation, such as implementation errors and design changes which will then result in defects or quality that does not comply with predetermined requirements as well as giving rise to rework which requires additional direct and indirect costs. This is also in line with research by Sahusilawane et al (2011), which states that lack of coordination and communication between contractors and sub-contractors and lack of coordination between construction managers - planners - contractors are the causes of cost overruns on construction projects in the city of Ambon. According to Andi (2005), increasing and improving communication and coordination in the design and construction phase is an effective way to reduce rework and its impact on project performance.

The Influence of External Factors on Project Performance

The results of SEM PLS analysis show that external factors have a third level influence on project performance with a t-statistic value on the influence of external factors influencing time performance of 2.323 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected with a large positive influence of 0.280. The influence of external factors on construction project performance has a significant influence on time performance. The contractor considers that external factors are not the main factor influencing project performance in West Papua Province. External factors are outside the company and beyond the contractor's ability to control.

Land acquisition problems, bad weather conditions, unstable socio-political situations, Force Majeure conditions, difficult access to project locations, unstable land conditions and monetary or fiscal policies are external problems that sometimes occur in West Papua Province. Land provision carried out by the Government is a

determining factor for the smooth running of development and there are almost no development activities that do not require land. The land acquisition process takes a lot of time and is not an easy process, because not all residents immediately agree to land acquisition. Delays in the land acquisition process will result in delays in the work implementation process. Extreme and unpredictable climate/weather problems really disrupt the smoothness of the work implementation process which results in work implementation activities not running as planned especially other obstacles such as rain, landslides, floods, very steep and slippery slopes because they are still based on subgrade which can hinder the road of work implementation activities in the field or delays in the distribution of materials imported from Java via sea transportation have an impact on the target time for completion of the work.

On the other hand, in order to meet the implementation schedule, contractors sometimes continue to carry out work in unfavorable weather conditions, this will result in a decrease in quality performance. The unstable socio-political situation means that work implementation often has to be postponed due to worker safety reasons, thereby disrupting the situation or conditions of the project implementation process. This causes the value of existing contracts to experience a deficit and affects the costs of work being carried out so adjustments need to be made. The unidirectional nature of the relationship between the influence of external factors on project performance shows that good management of external factors will have a positive influence on project performance and vice versa.

The Influence of Resource Factors on Project Performance

The results of SEM PLS analysis show that resource factors have a strong influence on project cost performance with the t-statistic value at the fourth level of influence, namely 2.112 and the value is greater than 1.96 (p-value < 0.05) so that H0 is rejected with a positive influence of 0.325 . A resource is an entity that contributes to meeting the needs of project activities such as labor, materials, money, equipment, time or space. An important factor in the successful implementation of a construction project does not only depend on the quantity and quality of work, but also depends heavily on the availability of resources. Each activity involved in a construction project requires a certain amount of resources. Each activity is allocated certain resources and must be completed within a time limit. The unidirectional nature of the relationship between the influence of resource factors on project performance shows that the better resource management, the better project performance will be and vice versa.

The best combination of resources to be used to perform construction activities is based on the contractor's ability to identify the interdependencies of the various resources. Poor material quality control, poor labor quality, labor shortages, high labor wages and high equipment rental prices in West Papua Province are resource factors that affect project performance. The majority of skilled workers are workers from outside the Land of Papua so this has a big influence on higher wages. This is of course due to the availability of skilled local labor. This problem causes additional costs to be incurred and becomes overhead costs which reduce efficiency values and have an

impact on poor project implementation. Research by Kaming et al. (1997) stated that one of the factors influencing project performance is poor labor productivity.

Another problem related to resources that often occurs in West Papua Province is the limited availability of main or special materials in areas where unbalanced supply and demand often occurs, especially during bad weather or when the rainy season arrives. As a result, the supply of materials, most of which are imported from outside the region via sea transportation, often experiences delays so that the supply of materials to the project becomes disrupted and does not run smoothly. This causes material prices to be expensive and not in accordance with the basic price in the work budget and ultimately has an impact on project performance. Several previous studies from Fahirah (2005) and Shanmugapriya & Subramanian (2013) stated that the increase in material prices was the main factor causing cost and time overruns .

The limited availability of project equipment (heavy equipment) in the area to meet needs in accordance with the scope of work carried out so that meeting project needs is also one of the problems in West Papua Province. Equipment is often mobilized from outside the area which requires high mobilization costs and has an impact on project work costs. Apart from that, the limited equipment (heavy equipment) owned by the contractor often causes the contractor to use equipment that is not suitable for its intended purpose both in terms of the tool's work function and capacity so that the tool cannot work effectively and efficiently. Previous research by Mahamid (2013) stated that lack of equipment efficiency was the main factor causing time overruns in Palestine based on the contractor's perspective. This will have an impact on the results of the work carried out not meeting the job specifications. The equipment used also often does not meet the standards that have been set, especially when the working capacity of the equipment is low and does not meet the needs so that work productivity decreases and cannot meet the planned implementation time targets, which ultimately results in delays.

CONCLUSION

Based on the results of research data analysis with the aim of proving several hypotheses in this research regarding the influence of road project characteristics on the performance of road construction projects in West Papua Province, it can be concluded that: a) The identification results of this research show that internal factors have a strong influence on the performance of road construction projects where the managerial/organizational factors variable influences the Cost Performance variable and the Time Performance variable where the influence is positive. Then the resource factor variable influences the Cost Performance variable where the influence is positive. From this description, it is known that the independent variable that has the most influence is the managerial/organizational factor variable, while the dependent variable that is influenced is the Time and Cost variable. On the other hand, there are also paths that have no effect in this research. b) The results of this research identification showed that the External Factor variable had an influence on the Time

Performance variable, where the influence was positive. In other words , there is a significant influence of external factors on time performance. This means that the greater the value of External Factors, the greater the Time Performance value. c) The results of the analysis have a very positive influence from internal and external factor variables on time performance variables and cost performance variables in the implementation of road construction projects in West Papua Province where they are dominated by managerial/organizational factors and resource factors respectively and followed by external project factors. which is the main cause of time overrun and cost overrun which results in quality failure which will cause losses to both internal project parties and the community. Problems with communication and coordination between stakeholders, quality control and high material prices, quality and wages for skilled workers and availability/acquisition of land are the main problems that affect project performance. Therefore, correct project organization, appropriate resource allocation and good financial management are important factors that determine the performance of construction projects.

Based on the results of the analysis and conclusions, the suggestions that can be put forward in this research are as follows: a) For further research, it is recommended to use secondary data in the form of project reports that have been completed as research data. b) Expands the set of variables used. For example, by adding a set of project performance variables, it is not limited to cost, quality and time performance but is added to other project performance variables such as client, satisfaction, productivity and work safety. c) Increasing the samples used so that the results are more representative of the selected population.

REFERENCES

Abushaban, S. S. (2008). *Factors Affecting the Performance of Construction Projects in The Gaza Strip.* Thesis, The Islamic University of Gaza, Construction Management, Palestine.

Andi. (2005). Faktor-Faktor Penyebab Rework Pada Pekerjaan Konstruksi. *Civil Engineering Dimension*.

Bowen, P., & Cattel, K. (2007). Perceptions of Time, Cost and Quality Management. *The Australian Journal of Construction Economics and Building, Vol. 2*.

Carr, R. I. (1998). Cost, Schedule and Time Variances and Integration. *Journal of Construction Engineering and Management*.

Choudhry, R., Nasir, A., & Gabriel, H. (2012). Cost and Time Overruns in Highway Projects in Pakistan. *Pakistan Engineering Congress, Centenary Celebration Proceedings*, 353-369.

Dolage, D., & Rathnamali, D. (2013). Causes of Time Overrun in Construction Phase of Building Projects. *ENGINEER, Vol. XXXXVI, No. 03*, 9-18.

Enshassi, A., Mohamed, S., & Abushaban, S. (2009). Factors Affecting The Performance of Construction Projects in The Gaza Strip. *Journal of Civil Engineering and Management*.

Fahirah, F. (2005). Identifikasi Penyebab Overrun Biaya Proyek Konstruksi Gedung. *Smartek, Volume 3; No. 3*, 160-168.

Hartono. (2011). *Pengaruh Aspek Pelaksanaan Konstruksi Terhadap Biaya dan Waktu Proyek (Studi Kasus di Dinas Cipta Karya dan Tata Ruang Provinsi Jawa Tengah)*. Universitas Diponegoro Semarang, Semarang.

Heravitorbati, Amirhossein, Coffey, Vaughan, Trigunarsyah, Saghatforoush, B., & Ehsan. (2011). Examination of Process to Develop a Framework For Better Implementation of Quality Practices in Building Projects. *2nd International Conference on Construction and Project Management (ICCPM 2011)*.

Ibironke, & Timothy, O. (2012). Impact of Non-Implementation of Time, Cost, and Quality Management Procedures in The Nigerian Construction Industry. *Journal of Building Performance, 3*.

International Conference on Construction and Project Management, 15 (2011).

Ismail, I., Rahman, I. A., & Memon, A. H. (2013). Study of Factors causing Time and Cost Overrun Trroughout Life Cycle of Construction Project. *Proceedings of Malaysian Technical Universities Conference on Engineering & Technology*.

Jha, K., & Iyer, K. (2006). Critical Factor Affecting Quality Performance in Construction Projects. *Total Quality Management, 17, No. 9*, 1155-1170.

Jogiyanto, Willy Abdillah. (2009). Partial Least Square (PLS), Alternatif Structural Equation Modeling (SEM) dalam Penelitian Bisnis (Buku). Andi Yogyakarta.

Kamaruzzaman. (2012). Studi Keterlambatan Penyelesaian Proyek Konstruksi (Study of Delay in the Completion of Construction Projects). *JURNAL TEKNIK SIPIL UNTAN*, 175-190.

Kaming, P., Olomolaiye, P., Holt, G., & Harris, F. (1997). Factor Influencing Construction Time and Cost Overrun on High-Rise Projects in Indonesia. *Construction Management and Economics*.

Kiew, P. N., Ismail, S., & Yusof, A. M. (2013). Key Performance Indicators in Construction Quality Management System. *The Second International Conference on Engineering Business Management 2013 (ICEBM 2013)*. Kuala Lumpur: Universiti Teknologi Malaysia Kuala Lumpur.

Mahamid, I. (2011). Causes of Constructions Failure : Contrator's View. *2nd*

Mahamid, I. (2013). Frequency of Time Overrun Causes in Road Construction in Palestine : Contractor's View. *Organization, Technology and Technology, An International Journal*, 720-729.

Memon, A. H. (2014). Contractor Perspective On Time Overrun Factors in Malaysian Construction Projects. *International Journal of Science, Environment and Technology*.

Memon, A., Rahman, I., & Azis, A. (2012). Time and Cost Performance in Construction Projects in Southern and Central Regions of Penisular Malaysia. *International Journal of Advances in Applied Sciences (IJAAS), Vol. 1, No. 1*, 45-52.

Nguyen, A., & Chileshe, N. (2013). Revisiting of The Critical Factors Causing Dailure of Construction Projects in Vietnam. 929-938.

Omran, A., Abdalrahman, S., & Pakir, A. K. (2012). Project Performance in Sudan Construction Industry : A Case Study. *Global Journal of Accounting and Economic Reseacrh*.

Sambasivan, M., & Soon, Y. W. (2006). Causes and Effects of Delays in Malaysian Construction Industry . *International Journal of Project Management* .

Shanmugapriya, S., & Subramanian, D. (2013). Investigation of Significant Factors Influencing Time and Cost Overruns in Indian Construction Projects. *International Journal of Emerging Technology and Advanced Engineering*.

Sugiyono. (2012). *Metode Penelitian Kuantitatif dan Kualitatif.* PT. ALFABETA.

Takim, R., & Akintoye, A. (2002). Performance Indicators For Succesful Construction Project Performance. *18th Annual ARCOm Conference, 2*, 545-555.

Vidalis, S., & Najafi, F. (2002). Cost and Time Overrun in Highway Construction. *4th Transportation Specialty Conference of the Canadian Society For Civil Engineering*, 1-10.

Vyas, G. S., & Kulkarni, S. S. (2013). Performance Indicators for Construction Project. *International Journal of Advanced Electrical and Electronics Engineering (IJAEEE)*.

Yates, J., & Lockley, E. (2002). Documenting and Analyzing Construction Failures. *Journal of Construction Engineering and Management*, 8-17.