

Supervisory Consultants' Performance Influencing Completion Time and Quality of Road Maintenance Project in Malang

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ABSTRACT: As the second largest regency in Indonesia, Malang regency has wide areas which are surrounded by mountains and lowlands. Thus, roads have fundamental role in Malang. They are crucial for development plan and economic growth in Malang regency. The roads connect one area to others ensuring smooth movement of people and public goods to other areas in and outside Malang regency. In addition, smooth land transportation system will keep price of goods reasonable because low cost of transportation. Therefore, road maintenance projects are program priority for Office of Public Work of Bina Marga in Malang. One of the resources to fund the project is Special Allocation Fund (DAK). It has its own unique characteristics and potential problems. One of them is that the fund is usually transferred close to year end. It of course results in shorter period time of maintenance project. In this case, the performance of supervisory consultants is crucial to make sure that the projects are completed on time with good quality. This study aims at investigating correlation between performance of supervisory consultants to project timeline and project quality. This is a correlational study employing a survey approach. Research methods used are simple regression and multiple regression analysis. Simple regression is used to find out partial correlation between performance of supervisory consultant to project timeline and quality. While, multiple regression is for finding out simultaneous correlation between the performance and timeline and quality of project. The results of t test show that the four independent variables, namely supervisory consultants' Understanding for Contract Document, Understanding for Management system for Work Safety Health and Environment, Managerial Competence and Understanding of Technical Specification has partial positive and significant correlation to either completion time and quality of road Maintenance Project in Malang Regency.

KEYWORDS: Performance, Supervisory Consultant, Road maintenance project,

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I. INTRODUCTION

Malang regency is the second largest regency in Indonesia. Its wide area is surrounded by mountains and lowlands. Malang regency is also famous for yield crop such as coffee and others which are sent to other areas in and outside Malang. Therefore, road plays crucial role in Malang. They ensure smooth movement of people and public goods from one area to others area. Smooth land transportation system is fundamental for development plan and economic improvement in certain area. In addition, good condition of road will result in affordable and reasonable price of goods because of low cost of transportation. Road length in Malang regency is 1.668.76 km and 265,19 km is highly broken (BPS, 2020). Thus, road maintenance project is one of priority program for regional government or Malang. The project is under Public Work Office of Bina Marga of Malang Regency.

At present, one of the resources used to fund for road maintenance project is Special Allocation Fund (DAK) from central government. It has different characteristics from other resources such as regional budget and fund obtained from Cigarette Tax. Unique characteristics of Special Allocation Fund (DAK) are that the funds are transferred gradually in the middle of the year from central government, that there is always *Probity*

Audit from Inspectorate office of Malang and that the report of project completion has to be given to Head of Malang Regency and State Audit Board. Those characteristics, especially gradual transfer on middle of the year may trigger problems during project implementation due to shorter period of time for project completion.

Therefore to ensure that the road maintenance project using Special Allocation Fund could be executed properly, there is a need not only for competent contractor but also Supervisory Consultant. The latter is responsible for delivering expert service for project owner in the form of coordination and controlling task for all technical stages of the projects starting from designing stage up to maintenance stage. Supervisory Consultant is also responsible for delivering management, technology and engineering service which are related to project implementation. Due to significance role of Supervisory Consultant, it is important to evaluate performance of Supervisory Consultant for road maintenance project using Special Allocation Fund related to time completion and quality of project.

II. LITERATURE REVIEW

A. Management of Project Construction

Indonesian law no 2 of 2017 states that "construction work is whole or partial activities covering building, operating, maintaining, and rebuilding certain structure" (Government, *Pembangunan Sarana dan Prasarana Industri*, 2017). Rani (2016) states that there are two kinds of construction. They are

1. Construction of occupation structure such as house, housing complex, hotel and others.
2. Construction of civil structure such as bridges, road, tunnels, dams and other.

Project management is a process to plan, organize, lead and control organizational resources to achieve predetermined short term goal. There are two aspects that should be taken into serious consideration for project implementation namely good planning and good use of organizational resources.

It is stated in Project Body Management of Knowledge (PMBOK) that there are five process in project management. They are project initiation, project planning, project implementation project supervision and control and project completion (PMI, 2017). The five process are obligatory in all kinds of project construction including road maintenance project.

B. Road Maintenance Project

Road maintenance activities are those to maintain and repair the road in order to function properly (Works, 2011) Road maintenance project also aims at preserving road condition to facilitate proper land transportation system. Therefore, maintenance project should be conducted continually. Government regulation no 34 of 2006 states that there are three types of road handling project (Government, 2006). There are

1. Road maintenance project. It aims at repairing small scale damage on the road and is conducted regularly.
2. Periodical maintenance. It aims at repairing anticipated damage during plan stage to preserve road function and condition.
3. Road rehabilitation. It is intended to repair damage that has not been anticipated before resulting in malfunction of road.

C. Project Supervision

(Mathis, 2006) states that project supervision is process of supervising manpower based on prevailing standard for measuring performances in order to obtain data for feedback to improve quality of project manpower. Supervision is part of management function to achieve predetermined goals. The purpose of supervision is to make sure that the project has good quality, can be completed on time, make use of project budget efficiently and the project might function properly.

Supervision for road maintenance project using Special Allocation Fund (DAK) is crucial because characteristics of the fund. In addition, the supervision is conducted by service supplier that has been selected and approved. . (Rani, 2016) states that Supervisory Consultants are responsible for

1. Conducting administration process for contract implementation.
2. Conducting routine supervision during project implementation.
3. Making report for project achievement given to project owner.
4. Giving expert suggestion to project owner.
5. Correcting and approving shop drawing proposed by contractor for project guidelines.
6. Selecting and approving type and specification of material proposed by contractors.

Complicated and importance of supervision task requires supervisory consultant to have good performance. Performance standard for Supervisory Consultant is stated on National Competence Standard for Civil Structure Supervisor no 335 of 2013. It is stated there that Supervisory Consultant should be able to

1. Implement Management system for Work Safety Health and Environment (SMK3L).
2. Interpret contract documents related to supervisory work.

3. Understand the need for equipment needed for project.
4. Make supervision plan.
5. Supervise project activities
6. Supervise documents for partial hand over (PHO).
7. Supervise the structure during maintenance period.
8. Supervise documents for Final Handover (FHO) of project.
9. Make final supervision report (Manpower, 2013).

After reviewing preliminary study, Project Body Management of Knowledge, National Competence Standard for Civil Structure Supervisor and relevant regulation, there are four performance variables that will be studied and correlated to completion time and quality of road maintenance project in Malang Regency. The four performance variables are

1. Supervisory Consultant's performance to understand the contract document.
2. Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L).
3. Supervisory Consultant's performance to manage the project
4. Supervisory Consultant's performance to understand technical specification.

The four performance variables are next elaborated into indicators and written in questionnaire.

III. RESEARCH METHOD

3.1. Research Design

This study employs correlation design. It is intended to analyse performance variables of Supervisory Consultant which influence time completion and quality of road maintenance project using Special Allocation Fund (DAK) in Malang regency. The performance variables of Supervisory Consultant studied are adopted from literature review, journal, prevailing regulation and National Competence Standard for Civil Structure Supervisor.

3.2. Types of Data

This study uses two types of data namely primary and secondary data.

- a. Primary data are those obtained from questionnaire. This data is then used to measure score of performance variable of Supervisory Consultant. In addition, it is used for the basis of analysis.
- b. Secondary data are those obtained from journal, books, and documents of regulation to support this study.

3.3. Respondents of Study

Respondents of this study are project owners from Public Work office of Bina Marga at Malang Regency. There are 30 respondents consisting of Budget User, Commitment Making Official, Technical Project Implementer Officials and member of Supporting Team.

3.4. Research Operational Variables

There are two kinds of variables that will be studied and correlated in this study namely independent and dependent variable. The independent variables are

1. Supervisory Consultant's performance to understand the contract document (X1)
2. Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L) (X2)
3. Supervisory Consultant's performance to manage the project (X3)
4. Supervisory Consultant's performance to understand technical specification (X4).

The dependent variables are

1. Time completion of project (Y1)
2. Quality of Project (Y2)

3.5. Research Instrument

In this study, questionnaire is used to gather data on Supervisory Consultant's performance for road maintenance project using Special Allocation Fund. The questionnaire uses Likert Scale ranging from 1 – 5. In addition, the questionnaire consists of three parts. They are respondents' profile, project information and questionnaire items consisting 20 items statements that should be answered by respondents.

3.6. Data Analysis

a. Test of instruments

Since this study uses questionnaire to collect data, then it should pass test of validity and reliability. Validity test makes is used to make sure that the instruments measure accurately what is supposed to measure (Sugiyono, 2019). To test instruments validity, Product moment test is used in which the score of r will be compared to score of t_{table} . If the score of calculated r is higher than that of t_{table} , then item is valid.

Reliability test reflects the construct that it is measuring by giving the same score if used over times. Cronbach Alpha score is used to determine instrument reliability. If the score of Cronbach alpha is 0,8 – 1,0, then the instrument is highly reliable. If the score is 0,6 – 0,79 then the item is moderately reliable. In addition, Cronbach alpha score below 0,6 shows that the instrument is not reliable.

The last test of instrument is normality test. It is intended to find out whether data obtained from questionnaire is distributed normally or not. One Sample Kolmogorov-Smirnov technique is used for normality test. If significance level is higher than 0.05, then the data is normally distributed.

b. Simple Linear Regression Analysis

Simple linear regression is used to investigate whether certain independent variable influence dependent variable or not. In this kind of analysis, relationship among variables are linear in nature in which a ^{change} occurs in X variable will result in change on Y variable. Analysis of simple regression analysis is conducted by employing t-test.

T test is test of partial coefficient regression which is used to find out whether or not certain ^{independent} variable is able to influence relevant dependent variable (Ghozali, 2018). It is also able to show the extent to which independent variable influences the dependent one. In this study, t- test is used to investigate whether Supervisory Consultant's performance to understand the contract document (X1), to implement Management system for Work Safety Health and Environment (SMK3L) (X2), to manage the project (X3) and to understand technical specification (X4) influence completion time and quality project partially. The t-test will result in score of calculated r that must be compared to score of t_{table} .

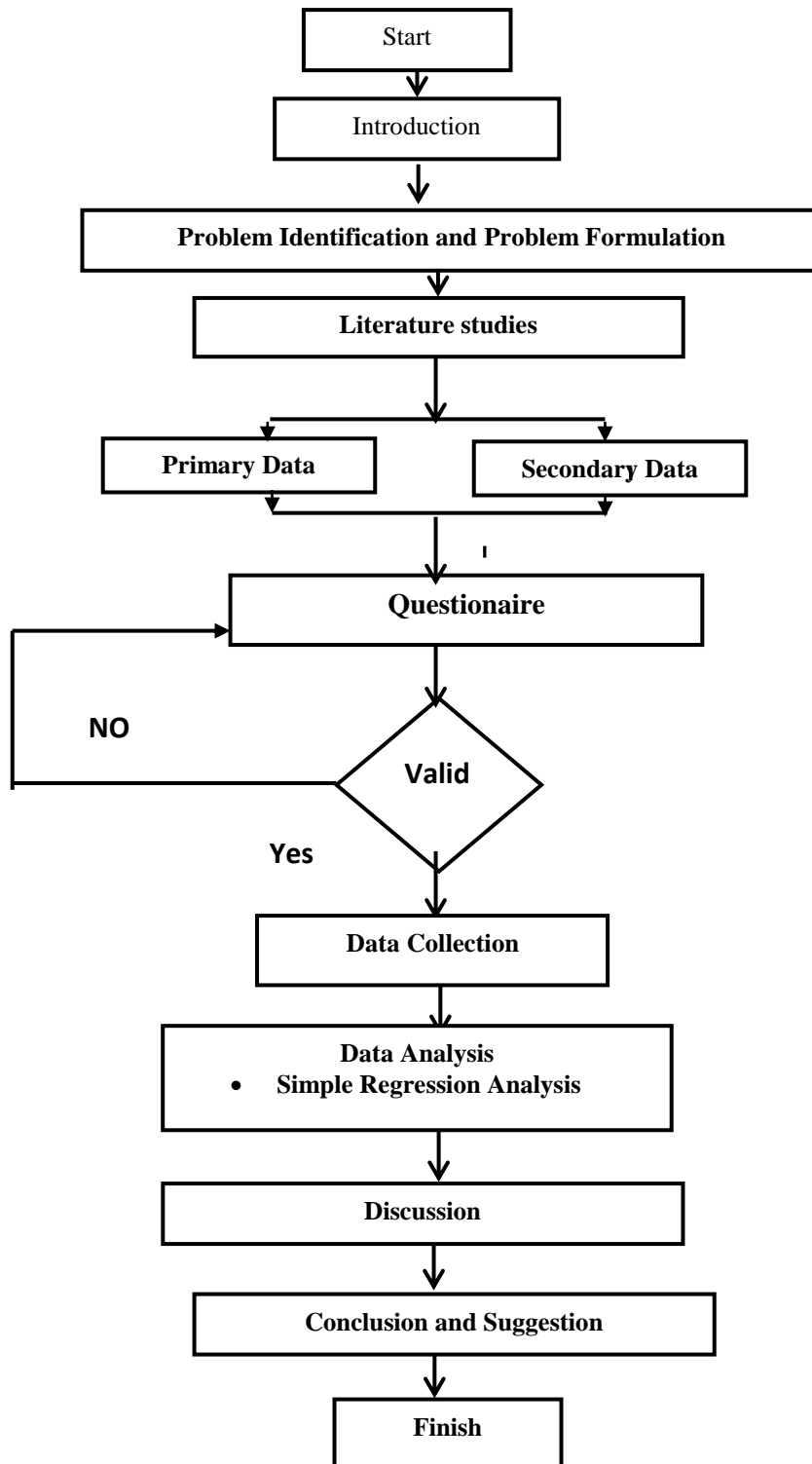
To determine whether X variable has significance influence or not, the following principles are used.

- If the score of calculated is higher than score of t_{table} , it means that independent variable has significant influence on dependent variable.
- If the score of calculated r is lower than score of t_{table} , then it shows that independent variable does not have significant influence on dependent variable.

The result of simple regression analysis will be presented in the section no 4.3.

3.7. Study Flowchart

Stages of this study are presented in the following flowchart



Based on literature studies and observation, then questionnaire is composed. The questionnaire contains statement on supervisory consultants' performance that will be studied.

- Testing the questionnaire.
Prior to using questionnaire to gather data, it should be tested for its validity, reliability and normality. The three tests are crucial to ensure that the questionnaire will result in valid and reliable data.
- Collecting data.
Questionnaires are given to 30(thirty) respondents. Their answers are then analysed to answer research question.
- Conducting Simple Regression analysis.

After obtaining data from questionnaires, then simple regression analysis is conducted. It aims at finding out partial correlation between independent variables to dependent ones.

- Drawing conclusion and proposing suggestion.
Based on the findings, then the writer draws conclusion to answer research question and propose necessary suggestion..

IV. RESULT AND DISCUSSION

4.1. Subject of study

This study aims at analysing whether or not performance of Supervisory Consultant has significant influence on completion time and quality of road maintenance project using Special Allocation Fund (DAK) in Malang Regency. the Supervisory Consultants are PT. Skala Pilar Lima, CV. Mulia Karya, CV. Piksma Consultant and PT. Dhiratama Cipta Persada. They supervise four road maintenance project using Special Allocation Fund (DAK). The projects are

- Road maintenance project of Wagir – Gunung Kawi.
- Road maintenance project of Kregbet – Gondanglegi
- Road maintenance project of Mangliawan – Tumpang
- Road maintenance project of of Pagak- Sumbermanjing Kulon.

4.2. Test of Instruments

a. Validity test

Test of validity is conducted by using Product Moment test. The item is valid if the score of calculated r is higher than score of r table which is 0,306. The result of validity test for each item is presented in following table

Table 1 Result of Validity Test

No Item	r-tabel	r-hitung	Status
1	0,3061	0,354	Valid
2	0,3061	0,320	Valid
3	0,3061	0,332	Valid
4	0,3061	0,422	Valid
5	0,3061	0,399	Valid
6	0,3061	0,341	Valid
7	0,3061	0,668	Valid
8	0,3061	0,326	Valid
9	0,3061	0,668	Valid
10	0,3061	0,331	Valid
11	0,3061	0,404	Valid
12	0,3061	0,597	Valid
13	0,3061	0,357	Valid
14	0,3061	0,668	Valid
15	0,3061	0,324	Valid
16	0,3061	0,668	Valid
17	0,3061	0,349	Valid
18	0,3061	0,668	Valid
19	0,3061	0,768	Valid
20	0,3061	0,618	Valid
21	0,3061	0,606	Valid
22	0,3061	0,349	Valid
23	0,3061	0,508	Valid
24	0,3061	0,373	Valid
25	0,3061	0,534	Valid
26	0,3061	0,614	Valid
27	0,3061	0,683	Valid
28	0,3061	0,703	Valid
29	0,3061	0,418	Valid
30	0,3061	0,622	Valid

From the table above, we find out that all items in questionnaire are valid since their score of calculated r is higher than score of t_{table} .

b. Reliability test

Cronbach Alpha is used to test for normality of questionnaire items. If the score or Cronbach Alpha is between 0,8 – 10, then it is said that the questionnaire is highly reliable. The score of Cronbach Alpha in this study is 0,896. It shows that the questionnaire is highly reliable.

c. Normality test

Based on the result of one sample Kolmogorov-Smirnov test, it is found out that the data are distributed normally. It is because the score of significance for Kolmogorov-Smirnov is higher than 0.05. Therefore, we are convinced that the data are distributed normally.

4.3. Simple Linear Regression Analysis

Analysis of simple linear regression in the form of t test is used to investigate partial influence of independent variable to dependent variable. There are four independent variables and two dependent variables. The independent variables are Supervisory Consultant's performance to understand the contract document (X1), Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L) (X2), Supervisory Consultant's performance to manage the project (X3) and Supervisory Consultant's performance to understand technical specification (X4). The dependent variables are time completion of project (Y1) and quality of project (Y2).

The first t test is conducted to find out the influence of Supervisory Consultant's performance to understand contract document (X1) to time completion of project (Y1). The result of t test shows that the score of calculated r is 2,195. It is higher than score of r table which is 0,6833. It means that X1 has positive and significant influence on Y1. The score of R square is 0,147. It means that the degree of influence of X1 to Y1 is 14,7%.

For the influence of Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L) (X2) to time completion of Project (Y1), the result of t test result in score of calculated r which is 3,890. In addition, the score of R_{square} is 0,351. It shows that X2 has positive and significant influence on Y1 and the degree of influence is 35,1%.

Then t test to investigate the influence of Supervisory Consultant's performance to manage project (X3) is conducted. The result is that score of calculated r is 4,407 which is higher than 0,683 of r table and the score of R_{square} is 0,410. The results shows that Supervisory Consultant's performance to manage project (X3) has positive and significant influence on time completion of project (Y1) and the degree of influence is 41%.

For the influence of Supervisory Consultant's performance to understand technical specification (X4) on Time completion of project (Y1), the result of t test is that score of calculated r is 3,653 and score of R_{square} is 0,323. It proves that independent variable which is Supervisory Consultant's performance to understand technical specification has positive and significant influence on Time Completion of Project (Y1). In addition, the degree of influence is 32,2%. The result of t test is summed up in following table

Table 2 T test for influence of X1,X2,X3, and X4 on Y1

No	Variable	T tabel	Calculated T
1	X 1 on Y 1	0,6833	2,195
2	X 2 on Y 1	0,6833	3,890
3	X 3 on Y 1	0,6833	4,407
4	X 4 on Y 1	0,6833	3,653

The same procedure is conducted to find out the influence of the four independent variables to quality of road maintenance project using Special Allocation Fund (DAK) in Malang Regency. The results is as follows.

The first analysis is to find out the influence of Supervisory Consultant's performance to understand contract document (X1) on Quality of road maintenance project. The result of t test shows that score of calculated r is 2,852 and score of R_{square} is 0,225. It means that Supervisory Consultant's performance to understand contract document has positive and significant influence on Quality of project. The degree of influence is 22,57%.

For the influence of Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L) (X2), t test results in score of 4,433 for calculated r and 0,412 for R_{square} . It means that Supervisory Consultant's performance to implement Management system for Work Safety

Health and Environment (SMK3L) (X2) has positive and significant influence on Quality of road maintenance project and the degree of influence is 41,2%.

From the third t test, we obtain 6,676 for calculated r and 0,621 for R_{square} . it shows that Supervisory Consultant's performance to manage project (X2) has positive and significant influence on Quality of road maintenance project using Special Allocation Fund (DAK) in Malang regency. In addition the degree of influence is 62,1%.

The last is t test for investigating the influence of Supervisory Consultant's performance to understand technical specification (X4) on quality of road maintenance project. The result is 5.205 for calculated r and 0,492 for R_{square} score. It means that Supervisory Consultant's performance to understand technical specification has positive and significant influence on quality of road maintenance project. In addition, the degree of influence is 49,2%. The result of t test is summed in following table

Table 3 T test for influence of X1,X2,X3, and X4 on Y2

No	Variable	t tabel	Calculated t
1	X 1 on Y 1	0,6833	2,852
2	X 2 on Y 1	0,6833	4.433
3	X 3 on Y 1	0,6833	6,676
4	X 4 on Y 1	0,6833	5,205

Based on the result of t test, we can also draw conclusion on equation of simple linear regression using the following formula.

$$Y = a + bX$$

The followings are resulting equation and its interpretation for each dependent variable

a. $Y1 = a + bX1$

$$Y1 = 2,798 + 0,391$$

From the equation above, we found out that the constant score is 2,798 meaning that score of completion time of project is 2,798 in the absence of X1 variable which is Supervisory Consultants' Performance to Understand Contract Document. Regression coefficient score of 0,391 shows that score of Completion time of project will improve at 0,391 for every 1% increase for score of Understanding Contract documents.

b. $Y1 = a + bX2$

$$Y1 = 2,404 + 0,492$$

The constant score is 2,404 showing that that consistent score of project completion time is 2,404 in the absence of X2 which is Supervisory Consultants' performance to understand Management system for Work Safety Health and Environment. Score of 0,492 for regression coefficient score shows that variable of project completion time will improve for 0,492 for every increase of 1% for variable of Understanding Management system for Work Safety Health and Environment.

c. $Y1 = a + bX3$

$$Y1 = 1,222 + 0,737$$

In the absence of X3 variable which is supervisory consultants' performance to manage project, score of project completion time is 1,222. Variable of project completion time will increase by 0,737 for every 1% increase of Supervisory Consultants' performance to manage the project.

d. $Y1 = a + bX4$

$$Y1 = 2,295 + 0,496$$

Score of project completion time is 2,295 shown by constant score of 2,295 in the absence of X4 which is supervisory consultants' performance to understand technical specification. Project completion time will increase by 0,496 for every 1% increase for supervisory consultants' performance to understand technical specification.

e. $Y2 = a + bX1$

$$Y2 = 2,392 + 0,467$$

For quality of road maintenance project (Y2), the score is 2,392 in the absence of X1 which is supervisory consultants' understanding to Understand Contract Document (X1). Y2 will increase by 0,467 for every 1% increase of X1.

f. $Y2 = a + bX2$

$$Y2 = 2.241 + 0,514$$

Constant score of 2.241 shows score of Project Quality (Y2) in the absence of X2 which is Supervisory Consultants' performance to understand Management system for Work Safety Health and Environment. Y2 also increase by 0,514 for every 1% increase of X2

g. $Y2 = a + bX3$

$$Y2 = 0,532 + 0,875$$

Score of project quality (Y2) is 0,532 in the absence of X3 which is supervisory consultants' performance to manage the project. The score of Y2 will increase by 0,875 for every 1% increase of X3.

h. $Y2 = a + bX4$

$$Y2 = 1.800 + 0,590$$

Constant score of 0,532 shows score of project quality (Y2) in the absence of supervisory consultants' performance to understand technical specification (X4). Score of Y2 will also increase by 0,590 for every 1% improvement of X4

V. CONCLUSION

There are four independent variables and two dependent variables that we investigated for the influence between the two. The independent variables are Supervisory Consultant's performance to understand the contract document (X1), Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L) (X2), Supervisory Consultant's performance to manage the project (X3) and Supervisory Consultant's performance to understand technical specification (X4). The dependent variables are time completion of project (Y1) and quality of project (Y2).

From the result of analysis, we come to conclusion that each independent variable has positive and significant influence on either dependent variable 1 or dependent variable 2. It shown that the scores of calculated r of independent variable to dependent ones which are is always higher than score of t_{table} . Thus, we are confident to say that partially Supervisory Consultant's performance has positive and significant influence on Time completion and Quality of road maintenance project using Special Allocation Fund (DAK). Specifically, we believe that Supervisory Consultant's performance to understand the contract document, Supervisory Consultant's performance to implement Management system for Work Safety Health and Environment (SMK3L) Supervisory Consultant's performance to manage the project and Supervisory Consultant's performance to understand technical specification have positive and significant influence on Time Completion of Project. In addition the Supervisory Consultant's performances partially also have positive and significant influence on Quality of road maintenance project using Special Allocation Fund (DAK) in Malang regency.

However the degrees of influence are different from one independent variable to another. Supervisory Consultant's performance to manage road maintenance project using Special Allocation Fund (DAK) is the most influential for either variable of time completion and quality of project. Performance to manage the project on the part of Supervisory Consultant gives 41% influence on variable of completion time of project. Furthermore, the degree of influence given by performance to manage project on Quality of Project is 62.1%.

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