Research Paper

Analysis of Implementation Delay in Road Construction Project (A Case Study of Road Improvement Project in Jayapura Regency)

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ABSTRACT : *Planning and control over time and cost are important parts of overall construction project management. Work achievement of a project can be assessed through its quality, time, cost and safety aspects. So, in completing work project, time and cost incurred are aspects that must be continously measured for its deviation from the original plan. In this study, time and cost deviations makes the management of road improvement project of Jayapura Regency getting worse. By employing several project performance indicators such as time and cost, it is possible to take preventative steps to make the road improvement project of Jayapura Regency can be proceed as planned.*

The research method applied in this research were qualitative and quantitative method where the qualitative method used a structured interview to respondents, while the quantity method involved a questionnaire distribution to total 100 respondents (10 project owners, 45 implementer contractors, and 45 consultants).

Based on the result of this study, factors causing delays in the completion of road improvement project in Jayapura Regency are: (1) labor factor with value of 3.5400, (2) equipment factor with value of 3.4400, (3) finance factor with value of 3.4200, (4) material factor with factor of 3.3900, (5) scope of work and contract/work documents with value of 3.3900, (6) site characteristic factor with value of 3.3700, (7) changes factor with value of 3.3400, (8) managerial factor with value of 3.3300, (9) situation factor with value of 3.3200, (10) planning and scheduling factor with value of 3.2900, and (11) inspection, control and work evaluation systems with value of 3.2700. As for the ranking of variables causing delays for the completion of road improvement project in Jayapura Regency are: (a) workforce discipline with value of 3.5600, (b) inadequate number of workers or in accordane with the existing work activities with value of 3.5600 and (c) workforce nationalism with value of 3.5300

KEYWORDS: *Jayapura Regency, Analysis of Implementation Delay, Road Construction Project, Road Improvement*

I.   INTRODUCTION

Since infrastructure and construction work in Indonesia flourish in very rapid development during the globalization era, the government have created so many construction project to meet the increasing demand from society. A project must have resources in forms of materials, people, costs, time and equipment or work tools.

Planning, costs, and time control are parts of overall construction project management. A work achievement is able to be measured by its quality, time, cost and safety. So, in completing a project, time and cost factors that used or incurred must be continously be measured to see how much the deviation from the original plan. Deviation in time and costs makes the management of road improvement project in Jayapura could be getting worse, and to avoid this impact, it is possible to take preventive steps to ensure the road improvement project in Jayapura Regency can proceed as planned.

Cause of delays in project is affected by several factors like labor, material, equipment, finance, site characteristic, managerial also control over project work. Since these factors able to cause project's delay, carrying out in-depth evaluation and analysis by identifying dominant causal factors of delay is necessary.

So far, discussion related to analysis of Implementation delay of the road construction project or a case study of the road improvement project in Jayapura Regency has not been carried out by many researchers,

therefore, the researchers raising study problems of (1) what factors that able to influence delay in the completion of road improvement project in Jayapura Regency?, (2) how is the rank variables that able to influence delay in road improvement project in Jayapura Regency?, (3) What is the appropriate strategy to handle delay in work implementation of road improvement project in Jayapura Regency?.

II.   LITERATURE REVIEW
2.1. Definition of Construction Management
According to Austen et al., a management process is a process held for utilizing human resources and other resources to achieve certain purposes. Management relies on clear communication, ability to convey thoughts, ideas, information and instructions quickly and effectively among people with different technical skills and interests. A management process or commonly called as management function within one unit is explained in the following lines: 1) Goal Setting, Set a goal is an initial stage of the management process where the goal is the mission target which will be achieved; 2) Planning, Planning is a process of selecting information and making assumptions about future condition to formulate necessary activities for achieving the prior determined goals; 3) Staffing, A management process related to recruitment, placement, training and development of all workforces within the organization. İn general, the basic principle of management process stages is to put the appropriate workforce in the appropriate place at the right time (right people, right position, right time); 4) Directing, İt is an effort to mobilize resources belong to the organization to make them mobilize as a unit in accordance with the plans that have been made. In directing stage, there are efforts for motivating people to work; 5) Supervising, Supervising is defined as direct interaction between individuals within an organization to attain positive workperformance and organizational goals; 6) Controlling, It consists of guidelines or rules for carrying out business activities along with its related parts to achieve the mutual goals. [1]

2.2. A Delay in Project
Assaf and Al-Hejji, define delay in project as additional time extending from the agreed completion date within a contract or beyond the agreeable completion date of a project by all parties involved in it. İn support with this theory. Haseeb et al., explained delays in construction project refers to increased cost incurred due to longer work time, increased labor cost and increased cost from building material. Further, according to Putra, project delays often become source of disputes and demands between project owner and the contractor, leading to a very expensive cost both from the owner's perspective and contractor's perspective; from contractor's perspective, they will be subject to penalty according to the contract, along with some additional overhead costs while the project still on going, whereas from the project owner's perspective, project delay will bring impact of reducing income due to delays in operating the work facilities. [2,3,4]

2.3. Stage of Risk Management
According to Popescu and Charoengam as viewed based on the responsibility, delays can be classified into excuseable delay, non-excusable delay and compensable delay.   1) Non-excusable delay, this is a type of delay caused by action, omission or error from the contractor's side; 2) Excusable delay, it is a type of delay caused by events beyond control of either the owner or contractor side. İn this type of event, contractor will receive compensation in a form of time extension only; 3) Compensable delay, tt is a type of delay caused by any action, negligence or error from the owner's side. İn this event, the contractor usually receives compensation in form of time extention and additional operation costs necessary for the implementation delay. [5]

2.4. Cause of Construction Delay
In a construction project, there are many things may happen and resulted in increase of time for work activities or a delay in completion time of a project. Some of the most frequent causes are changes in the field condition, changes in work design or specifications, changes in weather, lackness or unavailability of labor, materials or equipment. Delay factors which will be examined in this research are a group of delay factors described by Proboyo, Andi et al., and Assaf & Al-Hejji that classifies into 11 factors listed in the following table. [2,6,7]

Table 1. The delay factors of construction project

No	Delay Factor
1	Workforce / labor
2	Project materials
3	Work equipment or work tool
4	Characteristic of the work site

No	Delay Factor
5	Finance
6	Situation
7	Changes
8	Scope of work and contract / work document
9	Planning and scheduling
10	Inspection system, control, and work evaluation
11	managerial

2.5. Impact of Construction Delay

According to Pourrostam and Ismail from a research on causes and impacts of construction project delays in Iran, there were 6 main effects occured as the result of project delays: time overrun, cost overrun, dispute, arbitration, project termination, and litigation. [8]

While from the research of Motaleb and Kishk in UAE regarding the causes and impacts of project delays revealed that the main impacts caused by delays in UAE were time overrun and cost overrun. [9]

According to the research of Haseeb et al., about problems and impacts of project delays in Pakistan, the consequences of delays for any parties involved will not be the same. The general consequence of delay is loss of wealth or cost, loss of time and loss of work capacity, whereas the delay consequences for the project owner will be loss of income and unavailability facilities, and the delay consequences for the contractor will be loss of money for extra expenditure on work equipments, materials, hiring labor and loss of time. [3]

Meanwhile, Sharma et al., stated that project delays will have impacts such as increase project costs, increased market risk, decrease overall efficiency, increase working time for the workers (to compensate the delay and the late production). [10]

2.6. Impact of Construction Delay

During the construction process there are many problems often arise from the aspect of delivery and order of construction materials caused by the distance, delivery duration or could be from scarcity or rarity of the demanded materials. As the offered solution, the handling method varies greatly since it depends on the ongoing project condition, starting from direct handling by the special staff from the organization until responsibility division (task delegation) between the contractor and sub-contractor; thus, the material offer for the project can come from sub-contractor, suppliers, agents, importers, or industrial producers (vendors) as long as conforming or refers to the planning documents along with technical specification which have been determined prior in time. However, there also other ways to control delays such as mobilize additional resources, release certain works wich can be postponed to get better focus on the main work to realign to the original plan, and make schedule revision to be used as basis assesment of work progress during the next project. [11]

In support with the theories, Ahyari stated, to overcome delays, it needs a backup supplier, where in this case, the backup supplier is vendor who has been prioritized to work as the second layer for ordering the project materials. In selecting or determining who will be the main supplier and the back up supplier in a project, a periodic evaluation needs to be carried out with the aim for maintaining the vendor's quality, so in the next project, there will be no occurence of delays caused by the vendors. The quality from vendors can be found out by observing the habitual characteristic, delivery, and how to replace the damaged goods, which all of these can be known from the CV of the supplier during the tender project determination. [12]

III.   RESEARCH METHOD

3.1. Subject and Object of the Research

According to Idrus, research subject is elements of object, individual or organism acted as source of information which needed by the researchers to obtain the research data. İn addition, Sugiyono added population is a generalized area consisting by objects or subjects with certain qualities and characteristics which determined by the researchers to be studied in the effort for drawn conclution. The research population of this thesis is the parties involved in the road improvement project in Jayapura Regency that break down into the project owner, contractor, planning consultant and supervisor consultant with details presented in the following table (table 2). [13,14]

Table 2. The parties involved in road improvement project at Jayapura Regency

No	Job Position	Amount
1	Owner	10 Individuals
2	Contractor implementer	45 Individuals
3	Consultant	45 Individuals
	Total Respondent	100 Individuals

Meanwhile, the sample of study as stated by Sugiyono is a part of number and characteristics owned by the particular population, or according toArikunto, sample is a portion or representative of the studied population, and if there are less than 100 research subjects, it is better to include all the research subjects. The population of this study was 100 research subjects, so, all subjects were taken as research subjects. [15,16]

Object of the study for this thesis is the road improvement project at road of Jayapura Regency. This object was selected to be study object because the nature of the complexity of work activities of this project and engaging in a lengthy implementation time which allows to be analyzed and discussed from various aspects.

3.2. Subject and Object of the Research

For preparing the thesis, the writer employed primary and secondary data, where the primary data was obtained from direct contact to individual or groups involved in the project implementation. Primary source is data source that directly provide data to the data collector. İn this study, primary data was obtained through questionnaires consisting of several survey questions addressed to respondents.
The required primary data are include:

1. Interview
   Moeleong defines an interview as a conversation with a specific purpose, and it is carried out by two parties; the interviewer who asks questions and the interviewee who provides answers to those questions. [17]

2. Questionnaire
   According to Sugiyono a questionnaire is a technique of data collection by giving a set of questions or written statements to respondents to be answered. İn this study, the writer employed a Likert Scale as the measurement scale where in its origin, the Likert scale is used to measure attitudes, opinions and perceptions of an individual or group of people about certain social phenomena. [18]

3. Library research
   In this literature study, the writers collected and studied various theories along with the basic concepts related to the studied problem.

While, the secondary data, as stated by Sugiyono is a data source which indirectly provide data to data collectors but obtained through other people or documents related to the study. İn this reserch, the secondary data source are books, journals, articles, pictures, project's budget plan (RAB), implementation schedule, contracts, and work implementation reports related to the research topic. The required secondary data for this study are [18]:

1. Work plan / design plan
   Drawings of the planned work which used as reference for work implementation in the field. These working drawings must be made in a such easy or understandable way to be carried out in the field.

2. Project budget plan (*Rencana Anggaran Biaya*/RAB)
   The calculation of required costs for the material and workers' wage, as well as other costs related to the project implementation. RAB is used to determine the costs allocated for each project work item.

3. Work implementation schedule or time schedule
   A planning for time allocation of each work completion within one project, and as a whole defines to be the total time span requires to carry out a project.

4. Monthly report data
   It is the data about progress of the project which is useful for finding out the progress happen in the work project. The project progress report can be in form of daily report, weekly report and monthly report.

3.3. Data Analysis
3.3.1. Descriptive analysis

A descriptive analysis is a type of data research that aids in describing, demonstrating or helping in summarizing points of the data to make these patterns develop and fulfilling all data conditions. This is a technique for identifying patterns and links by utilizing current data along with the historical data. Since it identifies patterns and associations without going any further, it is often referred as the most basic data analysis. İn this study, Mean and Standard Deviation values will be obtained and put into ranking determination to find factors causing delays in the road improvement project on Jayapura Regency.

In addition, SPSS data tabulation also employed in this study for gained results as listed below:
1. Mean shows value of the average level of each factor and variable
2. N indicates number of correlated values
3. Ranking shows order of the factors and variables causing delays

3.3.2. Descriptive analysis

Analysis section of this study uses a quantitative method and operated through SPSS (Statistical Package for the Social Sciences) software to search particular factors that able to influence delays in the project implementation, and determine them according to ranking order. After gathering all data obtained from the respondents, data results were analyzed by Mean rank (a group explanation technique based on the average value). Then, the average value will be used to determine factors and variables that able to affect delays in the work project.

The mean value is obtained by adding up data of all individuals in the group then divide by number of individuals in the group as presented in the following formula.

$$Me = \frac{\sum_{i=1}^{i=n} Xi}{n} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where:
Me : The average value or mean
n : Number of respondents
Xi : Frequency of (i) as respondent given, as percentage on total respondents for each work problem
I : Index category of respondent (I = 1, 2, 3,…..)
X1 : Frequency of 'very insignificant' answer
X2 : Frequency of "not significant" answer
X3 : Frequency of 'significant' answer
X4 : Frequency of "very significant" answer

From the data calculation result, the mean value from each factor and variable can be determined by sorting the highest average value as the first rank. İf there are factors with the same average value, then, these factors will be compared again with standard deviation value, and the factor with the lowest standard deviation value will be rank as the first rank. The standard deviation can be found by the formula of:

$$SD = \sqrt{\frac{\sum x^2 = \frac{(\sum x)^2}{N}}{N-1}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where:
SD : Deviation standard
X : Score of x
N : Amount of respondent

IV. RESEARCH METHOD

4.1. Descriptive Analysis

Data used in this research is taken from project implementation schedule which obtained from the main contractor, also monthly progress data and actual weekly cost expenditures that obtained from the finance department of the sub contractor's office.

A descriptive analysis is a type of data research that aids in describing, demonstrating or helping in summarizing points of the data to make these patterns developing and able to fulfill all data conditions. This is a technique for identifying patterns and links by utilizing current data together with the historical data. Since it only identifies patterns and associations without going any further, it is often referred as the most basic data analysis. This research will try to seek the minimum value, maximum value, mean and standar deviation values as presented in the following table (Table 1).

Table 1. Descriptive statistic data

Questions	N	Min.	Max.	Mean	Std. Deviation
TK1	100	1.00	4.00	3.5200	.62732
TK2	100	1.00	4.00	3.5600	.65628
TK3	100	1.00	4.00	3.4700	.65836
TK4	100	2.00	4.00	3.5600	.59152
TK5	100	1.00	4.00	3.5300	.67353
TK6	100	1.00	4.00	3.5300	.64283
TK7	100	1.00	4.00	3.4300	.68542
B1	100	1.00	4.00	3.3800	.63214
B2	100	1.00	4.00	3.2200	.64479
B3	100	2.00	4.00	3.4500	.64157
B4	100	2.00	4.00	3.4500	.60927
B5	100	2.00	4.00	3.4100	.63715
B6	100	2.00	4.00	3.4400	.59152
B7	100	2.00	4.00	3.3800	.58223
P1	100	1.00	4.00	3.3500	.72995
P2	100	1.00	4.00	3.3800	.67838
P3	100	1.00	4.00	3.4800	.61101
P4	100	2.00	4.00	3.4400	.65628
P5	100	1.00	4.00	3.5200	.65874
B5	100	2.00	4.00	3.4100	.63715
B6	100	2.00	4.00	3.4400	.59152
B7	100	2.00	4.00	3.3800	.58223
P1	100	1.00	4.00	3.3500	.72995
P2	100	1.00	4.00	3.3800	.67838
P3	100	1.00	4.00	3.4800	.61101
P4	100	2.00	4.00	3.4400	.65628
P5	100	1.00	4.00	3.5200	.65874
KT1	100	2.00	4.00	3.3800	.67838
KT2	100	1.00	4.00	3.4300	.63968
KT3	100	2.00	4.00	3.3900	.54855
KT4	100	1.00	4.00	3.4200	.65412
KT5	100	1.00	4.00	3.3900	.63397
KT6	100	2.00	4.00	3.3300	.66750
KT7	100	1.00	4.00	3.4200	.66939
KU1	100	2.00	4.00	3.2400	.66848
KU2	100	2.00	4.00	3.2600	.59662
KU3	100	1.00	4.00	3.1900	.72048
KU4	100	2.00	4.00	3.3400	.66999
S1	100	1.00	4.00	3.2600	.69078
S2	100	1.00	4.00	3.3800	.72167
S3	100	1.00	4.00	3.2900	.75605
PR1	100	1.00	4.00	3.3800	.67838
PR2	100	1.00	4.00	3.3700	.77401
PR3	100	1.00	4.00	3.2900	.74257

Questions	N	Min.	Max.	Mean	Std. Deviation
LK1	100	1.00	4.00	3.3900	.72328
LK2	100	1.00	4.00	3.2000	.80403
LK3	100	1.00	4.00	3.4100	.73985
LK4	100	1.00	4.00	3.2500	.75712
LK5	100	1.00	4.00	3.1900	.82505
LK6	100	1.00	4.00	3.2500	.78335
PP1	100	1.00	4.00	3.3800	.74914
PP2	100	1.00	4.00	3.2500	.75712
PP3	100	1.00	4.00	3.2000	.72474
PP4	100	1.00	4.00	3.3800	.69311
PP5	100	1.00	4.00	3.3100	.72048
SKE1	100	1.00	4.00	3.3700	.74745
SKE2	100	1.00	4.00	3.2000	.63564
SKE3	100	1.00	4.00	3.3300	.56951
SKE4	100	1.00	4.00	3.2300	.60059
SKE5	100	1.00	4.00	3.3600	.73195
SKE6	100	1.00	4.00	3.3700	.73382
SKE7	100	1.00	4.00	3.2500	.79614
M1	100	1.00	4.00	3.3000	.77198
M2	100	1.00	4.00	3.2800	.81749
M3	100	1.00	4.00	3.2700	.78951

From Table 1, the descriptive statistic data from each question to reveal causal factor of delays in road improvement project in Jayapura regency are displayed.

4.2. Rank Analysis

Rank analysis is used to select or determine which factor that influence delays in the work project. From the mean calculation result, then, the mean value was sorted from the highest average value which placed as the first ranking and if there are factors that have same mean value, then these values will be compared again with the standard deviation value by condition that factor with the lowest standard deviation value will be ranked first

Table 2. Rank analysis according to factors

Code	Factors	Mean	Std. Deviation	Ranking
X1	Workforce / Labor	3.5400	0.64228	1
X2	Project Materials	3.3900	0.52982	4
X3	Work Equipments or Work Tool	3.4400	0.60836	2
X4	Characteristic of the Work site	3.3700	0.58006	6
X5	Finance	3.4200	0.58913	3
X6	Situation	3.3200	0.64948	9
X7	Changes	3.3400	0.68490	7
X8	Scope of Work and Contract / Work Documents	3.3900	0.70918	5
X9	Planning and Scheduling	3.2900	0.59110	10
X10	Inspection System, Control and Work Evaluation	3.2700	0.56595	11
X11	Managerial	3.3300	0.75284	8
X9	Planning and Scheduling	3.2900	0.59110	10

From the result of rank analysis in this study, the main and subsequent causes of delays of the road improvement project in Jayapura Regency are able to be identified as follow:

1. Work force or labor

Labor becomes the first factor causing delay in the road improvement project of Jayapura Regency. Wrong or unsuitable workforce to handle project activities are causing work project run slower than the expected time. Apart from the labor quality, low discipline level from the workforce also delays the work flow and disrupt the overall project schedule. Moreover, lack of skills or experience of the workforce in managing complex construction tasks were leading to work errors, or worse, leading to repeating/redo the work, thereby, the project completion time must be extended. A lack of coordination and work communication between workers also causing inefficient implementation of many work tasks which ultimately slowing down the project completion.

2. Work equipment

Work equipment becomes the second factor causing delay in the road improvement project of Jayapura Regency. İncapability to get work tools also to maintain adequate work equipment was the reason to make the project delayed. İf the necessary equipment is not available in sufficient quantity or the work equipment does not function properly or the work equipment is damaged, it will bring negative impact to process of the project completion, or could make the construction activities stop temporarily. İn particular, work equipment that has been used for a long time has potential of declined work efficiency and will need longer time to complete work tasks which can be finished more quickly by better (modern) equipment. So, an effective planning and management for the work equipment, including routine maintenance, timely procurement, and use of appropriate technology are essential matters to avoid project delays and a key to ensure the work project can be completed on time.

3. Finance

Finance becomes the third factor causing delays in the road improvement project of Jayapura Regency. This factor often occurs when there is a problem in the financial flow that needed to support the project implementation process. For example, a delay in the finance disbursement from the funding souce will affect in the material purchasing, or equipment paying or labor wage payment. Lack of financial budget can also force contractor to delay or even stop the project work until the necessary fund is available. This reason can make the project completion time run longer than the expected time. Therefore, financial management is an important aspect to avoid project delays and ensure all activities can continue according to predetermined working plan.

4. Project material

Materials becomes the fourth factor causing delays in the road improvement project of Jayapura Regency. Materials are important component for every construction project and delay in purchasing or providing materials can cause the work process at halt or slowing down. Moreover, when there is a failure in obtaining the correct material specification or conform the project design will force the contractor to seek alternatives which requires more or additional time to test and to approve the alternative material. Even though materials are available, bad or poor or substandard quality will result in repair or re-work the construction which automatically will extend the time duration of the project.

5. The scope of work and contract / work documents

This factor becomes the fifth factor causing delays in the road improvement project of Jayapura Regency. Scope of work and contract or work documents plays important basis for determining the progress of a construction project. İf the work objectives or work targets were not clear since the start of the project (about the works that need to be accomplished), it can lead to confusion among the parties involved (including contractor and subcontractor). As a result, work can be delayed due to different interpretation of responsibility, also about the tasks that must be carried out. Moreover, incomplete detailed contract and work documents such as unclear technical specification, unrealistic deadlines, or uncertain payment term able to elicit disputes between the parties involved.

6. Work site characteristic

Work site or location characteristic becomes the sixth factor causing delays in road improvement project of Jayapura Regency. The characteristic of project location often include easy access for logistic and construction work implementation. İf the project site is located in a remote location or having difficult access to enter the area, transporting material and equipment can be more complicated and requires longer time which able to delay several work stages. Bad weather condition also able to disrupt the project schedule by temporarily interrupting work or

damaging the finished works. Not only that, the presence of local community with its strict customs may add complexity to the work project and causes unexpected delay.

7. Changes

Changes become the seventh factor causing delays in road improvement project of Jayapura Regency. Changes in project often include changes in design modification, addition or reduction to the scope of work, or revision to technical specification that occur during the project implementation. İf changes in project are not well managed, their impact will be huge and affect the schedule and the budget of the project. Changes of work design or work specification that made after the work has begun often resulted in additional time needed for adjustment and approval which lead to delay in work process. İn implementation process, changes also requires more time or additional time for coordination between various related parties including the contractor and consultant.

8. Managerial

Managerial becomes the eighth factor causing delay in road improvement project of Jayapura Regency. Less optimum project management in several keys area can delay the project completion. Lack of detailed planning including accurate time estimation and proper resource allocation can lead to labor, material or equipment shortages which eventually lead to slower project implementation. Furthermore, a poor or ineffective coordination between various teams or parties involved will often result in delay in work completion or work error that need to be corrected. Apart from it, when important decisions are not quickly made and not efficiently taken, it able to make the progress of the project slowing down or worse put at halt.

9. Situation

Situation becomes the ninth factor causing delay in the road improvement project of Jayapura Regency. Type of situation which often causing delays are political situation and government policies. Changes in law or regulation from local government concerning about enviromental or land regulation able to affect permit and causing delay, especially if the project must wait for approval or must fufills new requirements. Social situation or community situation can also influence the project, such as local community protests or opposition to a construction project can cause delays. Economic instability also able to cause delay in project implementation such as unexpected cost increases that able to affect material purchasing. In addition, bad weather condition also able to cause project schedule to be delayed and requires extra time for repairs or adjustments.

10. Planning and scheduling

Planning and scheduling aspect becomes the tenth factor causing delays in road improvement project of Jayapura Regency. Delay can occur when planning and scheduling are not conducted through a detail and careful management. Below adequate planning or unrealistic planning can lead to various problem during work implementation. Such as, if the time estimation for each work stage is innacurate or misses some factors or do not include all factors that can influence the work implementation, then the project plan will not be realistic. Planning that excludes or does not include the potential risks of the project also can resulted in gaps within the work scheduled that has been prepared. Furthermore, not flexible scheduling or inadequate handling of unexpected changes or delays also able to cause delay for the project.

11. System of ınspection, control and evaluation of work

Systems of inspection, control and evaluation to work implementation becomes the last factor causing delay in road improvement project of Jayapura Regency. These systems play important role to ensure the work project is carried out in conforming to specification, quality standard, and run according to the predetermined schedule. Incapability of running these systems can bring significant impact to the smoothness and timeliness of the project because lack of inspection can lead to quality problems which only able to discover in the later stages of project, or worse, can be found after project completion. İf inspection performed inconsistent or incomplete during the work process, defects or errors in the work process may go without notice and later require correction and potentially able to delay the project progress. Moreover, from another aspect of poor control in the work implementation, it can result in deviations from initial project plan. İneffective control in resource utilization also compliance with the operational standard can lead to a gap between the planned work and the actual performed work. İt able to cause delay in certain project stages which going to affect the overall project schedule.

Meanwhile, a delay in systematic task assessment can slowing down the decision-making process and work improvement process. Assessment that not carried out regularly or not based on accurate data can result in wrong or inappropriate decision regarding the necessary corrective action or type of adjustment which must be taken. Lack of punctual and effective feedback regarding work progress or any problem encountered during work progress also can cause delays for resolving issues when these problems are arise.

V. CONCLUSION

From discussion and research result, the writers withdraw several conclusions as explained in the following paragraph:

1. The causal factors for delay in road improvement project completion of Jayapura Regency are listed from the highest rank (first rank) to the lowest rank (11th rank) where the 1st rank is labor factor with value of 3.5400, the 2nd rank is equipment factor with value of 3.4400, 3rd rank is finance factor with value of 3.4200, 4th rank is materials factor with value of 3.3900, 5th rank is scope of work and contract/work documents factor with value of 3.3900, 6th rank is site characteristics factor with value of 3.3700, 7th rank is changes factor with value of 3.3400, 8th rank is managerial factor with value of 3.3300, 9th rank is situation factor with value of 3.3200, 10th rank is planning and scheduling factor with value of 3.2900, and the last rank, 11th rank is inspection, control, and work evaluation systems factor with value of 3.2700.

2. As for the ranks from variables causing delays for completing road improvement project of Jayapura Regency are listed to be: (a) workforce discipline with value of 3.5600, (b) inadequate number or not suitable workers for the existing work activities with value of 3.5600, and (c) workforce nasionalism with value of 3.5300.

3. Appropriate strategies for overcoming delays in relation to the factors causing delays in the work field are by employing technical managers who have good managerial experiences so they can exercise a maximum control over work process in the field, and using work equipment with adequate economic life run by qualified operators so these mechanism do not disrupt the smoothness of work progress in the field. Also a stable financial cash flow that utilized in wise manner can have positive impact to the smoothness work implementation in the field.

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