

Identification of the delaying factors on construction work completion in Jambi city according to the contractor perception

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Abstract. One of the successes in the Implementation of Construction Works is marked by the implementation of timely work. However, in the process of implementing the construction work often encountered various problems, one of which is work delays. the number of factors is the cause of delays that are often faced by parties involved, especially contractors who act as executors. This study aims to determine the main factors of the delay in the Construction Work. The questionnaire was distributed to 63 Middle-class contractors with the value of the company's assets qualified into the M1-M2 based on the Business Entity Registration List (DRBU) of the Jambi City Construction Services Development Agency (LPJK). The factors of delay in construction work are grouped into 7 factors, each of which consists of several sub-factors. The results showed that the most dominant factor in the construction work in Jambi City was environmental factors with sub-factors Heavy rain / waterlogged work location with a percentage of 15.73%, while the Time Factors namely Sub-factors Too late shop drawing agreement is the 7th most influential factor in work delay has the smallest percentage value of 13.41%.

1. Introduction

Every Implementation of a Construction Work, Wants to be successful in implementing project completion on time. In the development process it is very common to encounter various problems causing work delays, the number of factors that cause delays is a problem that is often faced by parties involved, especially contractors who act as executors.

With the existence of problems or constraints in the process of work will result in moral and material losses for parties directly related to construction activities, as the implementing party, the contractor can be said to be the party most disadvantaged for the delay in the work. Delays are things that greatly affect the success of a job, delays will be detrimental to all parties involved in a construction industry, this condition requires a good handling of the project so that the project delays can be minimized or avoided.

Delay in the completion of the project is a problem that is very undesirable by the contractor and the owner because it will always cause adverse consequences for both parties [1]. The impact of delays is conflict and debate about what and who is the cause plus the demands of time and additional costs. Not only for the contractor and owner, the loss is also experienced by the society around the project location due to activity disruption caused by the late completion of the project [2,3].

This research is only aimed at Contractors who play a role in Construction Work in Jambi city and are categorized as "Medium" class contractors with the value of the company's assets qualified into the M1-M2 based on the Business Entity Registration List (DRBU) of Jambi City Construction Services Development Institute (LPJK) period January to December 2018, focusing on the Contractor's



perception based on their experience of the most influential factors or those that dominate the delay in the work.

With the research, it is hoped that it can become a reference material for the owner or contractor in preparing a more careful project planning and scheduling, in an effort to avoid and or control the delay in project implementation.

1.1 Purposes of the Research

The Purposes of this research are:

- i. Knowing what factors influence work delays in construction projects in Jambi city in 2018
- ii. Looking for the most dominant factor in the delay in construction work in Jambi city in 2018

2. Literature Review

2.1. Construction Activities

Construction activities are an organized effort to achieve important goals, objectives and expectations by using the budget of funds and available resources, which must be completed within a certain period of time [4].

Construction activities are a series of activities which are only one time carried out and are generally short-term [5]. Construction activities can be interpreted as a temporary activity that takes place in a limited period of time, with the allocation of certain resources and intended to carry out tasks whose goals have been clearly outlined [6]. These tasks can be in the form of building factories, making new products or conducting research and development.

Construction activities are activities that must go through a long process and in which many problems must be solved. In addition, there are sequential and related sequences in construction activities [7]. Usually the series starts from the birth of an idea that arises from a need (need), the thought of possible implementation (feasibility study), a decision to build and make a more detailed explanation of the formulation (briefing), pouring in the form of a preliminary design (preliminary design), making a more detailed and definite design (design development and detail design), administrative preparation for the implementation of development by selecting procurement candidates, then implementing construction on the location provided (construction), as well as maintenance and preparation for use the building (maintenance, start-up, and implementation) [8]. The building activity ends when the building is put into use.

2.2. Delay of Construction Work

Important parameters in the implementation of projects are often used as project targets, namely budget, schedule, and quality. Success in carrying out projects on time, cost, and quality that has been planned is one of the most important goals for owners and contractors [6]. Project implementation that is not in accordance with the plan, can result in project delays. In the implementation of construction projects, project delays often occur, which can cause various kinds of losses for service providers and service users. For contractors, delays in addition to causing project cost overruns due to increased time of project implementation can also lead to a decrease in the credibility of contractors for the future. Whereas for the owner, the delay in the use or operation of the results of the construction project and often has the potential to cause disputes and claims between the owner and the contractor [9].

The delay in construction projects means increasing the time of completion of project completion that has been planned and listed in the contract document [10]. In general, in development activities there are often delays due to lack of attention to the resources involved in it. The active role of management is one of the main keys to the success of a job.

2.3. The Causes of Work's Delay

Delays can be caused by different parties [11], namely:

- i. Owner or representative (delay caused by owner or his agent). If the owner or deputy causes a delay, for example due to late work drawings or delays in giving approval to the image, the contractor will generally be permitted to obtain an extension of time and may also submit legitimate claims to obtain extra compensation.
- ii. Allowable delay by third parties (excusable third party delay). There are often delays caused by different strengths beyond the control range of the owner or contractor. Examples that are generally not questioned include fire, floods, earthquakes and other things. Other things that are often a matter of disputes include strikes, embargoes for transportation, accidents and delays in submitting understandable ones. Also included are those that cannot be included in conditions that existed at the time the offer was made and the weather conditions were bad. In case this can be agreed upon, the type of delay of these types generally results in an extension of time but is not accompanied by additional compensation.
- iii. Contractor-caused delay. Such delays will generally result in no extension of time and no additional compensation. If in extreme situations these things will cause a contract break.

2.4. Criteria of Project Delays

Criteria for project delays in this study can be seen in Table 1 below.

Table 1. Criteria of Project Delay

No	Factor	Sub Factor
1	Materials	Lack of Construction Materials Slow Material Delivery Material Provision on Location Delay in Ordering Material The amount of Material sent by the Supplier is not appropriate Material Damage due to Storage Material Management Mistakes by the Contractor
2	Environment	Heavy Rain / Waterlogged Location Social Aspects (War, Riots) on Location Project locations that are difficult to reach Community Response That Does Not Support the Project Land conditions that are different than expected
3	Finance	Insufficient Contractor's Capital Financial Administration to Contractors Late Payment by Client Owner
4	Changed	Change in Method of Work by the Contractor Errors in Interpreting Images or Specifications Changes in Plumbing, Structure and Electrical Workshops
5	Labor/Worker	The Quality of Bad Workers Work Strikes Conducted by the Contractor Workforce who lack expertise and experience Inaccuracy of Workforce Planning Lack of Labor by the Contractor
6	Time and Control	Poorly planned scheduling by the contractor Lack of Control of Work Safety

No	Factor	Sub Factor
7	Tools	Late Approval of Shop Drawing by a Consultant Less Optimal Productivity from the Contractor Repairing Completed Work Implementation of Poor Stages of Work by the Contractor Repairing Work Damage Due to Strikes Equipment Damage Equipment Not Available On Time Productive Equipment

3. Research Methodology

In this chapter we will explain the research methods used to look for factors that cause delays in construction project work.

3.1 Data Collection

The method used in this study has several stages, starting from the study of literature to the collection of primary and secondary data. During literature study, the researcher seeks and collects supporting theories and formulas according to experts related to this research, as a reference for making questionnaires. In data collection phase, researchers use primary data and secondary data. For primary data, namely data obtained by conducting a direct survey of space which will later be carried out by researchers by distributing questionnaires to respondents as a measuring instrument. For secondary data, namely field data sourced from related institutions or institutions, here the researcher obtained secondary data through the Jambi City Construction Services Provider (LPJK) Institute regarding the list of names and addresses of contractors in Jambi City who would later be made as respondents. Next, researched data were managed and analyzed before making a summary discussion and make conclusions from the results of the study.

3.2. Sample

Simple random sampling is a method of selecting samples from populations chosen one by one randomly or randomly. All members of the population get the same opportunity to be chosen and if it has been chosen it cannot be chosen again [12].

In determining the number of samples researchers used the Slovin formula as shown in equation (1).

$$kn = \frac{N}{1 + Ne^2} \quad (1)$$

where n is the number of samples, N is the population, and e is the error tolerance, used 10%. Data in this step data is operated using simple random sampling technique as a sampling technique, because the population is homogeneous. Based on the size of the population as many as 206 companies that are registered and registered in the Jambi Province LPJK data, using the Slovin formula to get the number of samples that will be used as respondents is 63 samples of Contractor respondents in the city of Jambi.

3.3. Questionary Design

The questionnaire was designed in two groups as below:

- i. The profile of the respondent, namely the respondent's data regarding the name of the company where the respondent works, the respondent's education, the duration of experience of the respondent working and the position or position of the respondent in the company.
- ii. Delay factors, namely bullet points about factors that often cause delays.

3.4. Method Of Data Analysis

In this study the measurement scale uses an ordinal scale that shows the differences in subject levels quantitatively, such as data expressed in the form of rank or ranking. The respondent's perception can be sorted into: No effect; rather influential; take effect; and very influential. Then the quantitative data is converted into qualitative data as follows:

- i. No effect is indicated by the number 0.
- ii. Quite influential is indicated by number 1.
- iii. The effect is indicated by number 2.
- iv. Very influential is indicated by number 3.

The analysis of this study uses qualitative research methods that are transformed into quantitative, to find out how many factors are estimated to influence the delay in construction work and the factors that influence and most determine based on the ranking ranking in each assessment of each respondent. After all the data has been obtained from the respondents collected, then the descriptive statistical analysis is carried out using the excel program.

- i. Mapping respondents and respondent's answers.
- ii. Conduct an analysis of central tendencies.

4. Result and Discussion

4.1. Result

Based on data from questionnaires as many as 63 respondents of construction service companies, the following is an analysis of the sub-factors causing delays in construction work, including: Material and material factors, environmental factors, financial factors, change factors, labor factors, time factors and controls, and equipment factor. The outputs were tabulated in Table 2 until Table 10 below.

Table 2. Interpretation of Mean Values, Modes

Value	Interpretation
0	No effect
0,1 – 1	Quite influential
1,1 – 2	Take effect
2,1 – 3	Very influential

Table 3. Results of Material and Material Analysis

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	Lack of Construction Materials	120	2,26	3	16,48	1
2	Slow Material Delivery	104	1,96	2	14,29	4
3	Material Provision on Location	107	2,02	3	14,70	3
4	Delay in Ordering Material	92	1,74	2	12,64	7
5	The amount of Material sent by the Supplier is not appropriate	113	2,13	2	15,52	2
6	Material Damage due to Storage	94	1,77	2	12,91	6
7	Material Management Mistakes by the Contractor	98	1,85	2	13,46	5
	Total	728			100	

Table 4. Results of Analysis of Environmental Factors

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	Heavy Rain / Waterlogged Location	129	2,43	3	25,00	1
2	Social Aspects (War, Riots) on Location	98	1,85	2	18,99	3
3	Project locations that are difficult to reach	94	1,77	1	18,22	4
4	Community Response That Does Not Support the Project	91	1,72	2	17,64	5
5	Land conditions that are different than expected	104	1,96	2	20,16	2
Total		526			100	

Table 5. Results of Financial Factor Analysis

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	Insufficient Contractor's Capital	101	1,91	3	33,78	2
2	Financial Administration to Contractors	85	1,60	2	28,43	3
3	Late Payment by Client Owner	113	2,13	3	37,79	1
Total		299			100	

Table 6. Results of Change Factor Analysis

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	Change in Method of Work by the Contractor	84	1,58	2	27,72	2
2	Errors in Interpreting Images or Specifications	111	2,09	2	36,6	1
3	Changes in Plumbing, Structure and Electrical	108	2,04	2	35,6	3
Total		303			100	

Table 7. Results of Labor Factor Analysis

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	The Quality of Bad Workers	125	2,36	3	22,28	1
2	Work Strikes Conducted by the Contractor	110	2,08	3	19,61	2
3	Workforce who lack expertise and experience	109	2,06	2	19,43	4
4	Inaccuracy of Workforce Planning	107	2,02	2	19,07	5
5	Lack of Labor by the Contractor	110	2,08	2	19,61	3

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
	Total	561			100	

Table 8. Results of Time and Control Factor Analysis

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	Poorly planned scheduling by the contractor	98	1,85	2	14,24	4
2	Lack of Control of Work Safety	107	2,02	2	15,55	2
3	Late Approval of Shop Drawing by a Consultant	110	2,08	3	15,99	1
4	Less Optimal Productivity from the Contractor	95	1,79	2	13,8	6
5	Repairing Completed Work	74	1,40	2	10,76	7
6	Implementation of Poor Stages of Work by the Contractor	106	2,00	2	15,41	3
7	Repairing Work Damage Due to Strikes	98	1,85	2	14,24	5
	Total	688			100	

Table 9. Results of Equipment Factor Analysis

No.	Factor	Total	Mean	Modus	Percentage %	Delay Rating
1	Equipment Damage	112	2,11	3	34,04	1
2	Equipment Not Available On Time	109	2,06	2	33,13	2
3	Productive Equipment	108	2,04	2	32,83	3
	Total	329			100	

Table 10. Data Comparison of the Causes of Delay Factors

No.	Factor	Total	Mean	Percentage %	Delay Rating
1	Heavy rain / waterlogged work location	129	2,43	15,73	1
2	Poor quality of labor	125	2,36	15,24	2
3	Lack of Construction Materials	120	2,26	14,63	3
4	Late Payment by Client Owner	113	2,13	13,78	4
5	Equipment Damage	112	2,11	13,66	5
6	Errors in Interpreting Images or Specifications	111	2,09	13,54	6
7	Late Approval of Shop Drawing by a consultant	110	2,08	13,41	7
	Total	820		100	

5. Conclusion

From the results of the research, the causes of the delay in construction work in the city of Jambi according to the perceptions of the contractor, some conclusions can be drawn including:

- i. Environmental Factors namely Heavy Rain Sub-factors / locations of waterlogged work are the most influential factors in work delay with a percentage of 15.73%
- ii. Labor Factors namely Sub-factors Poor quality of labor is the second most influential factor in work delays with a percentage of 15.24%
- iii. Material / material factors, namely Sub-factors The lack of construction materials is the third most influential factor in work delay with a percentage of 14.63%
- iv. Financial factor, namely Sub-factor Delay in payment by the client / owner is the fourth most influential factor in work delay with a percentage of 13.78%
- v. Equipment Factors namely Sub-factor damage Equipment is the most influential factor to 5 in the work delay with a percentage of 13.66%
- vi. Change Factors, namely Sub-factors Errors in interpreting images / specifications are the most influential factors to 6 in work delays with a percentage of 13.54%
- vii. Time Factors namely Sub-factors Too late shop drawing agreement is the 7th most influential factor in work delay with a percentage of 13.41%

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