ANALYSIS OF FACTORS CAUSE DELAY PROJECT CONSTRUCTION BRIDGE IN THE CITY OF BANJARMASIN

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ABSTRACT

With an area of 98.46 km2 whose territory is separated by rivers, to increase economic growth Banjarmasin City has done infrastructure development in the field of transportation of roads and bridges are quite significant. But in the process of implementation, there is often a delay in the bridge construction project. This can lead to problems within the scope of the project itself. So it is necessary to do further research to know the cause of the bridge construction project delay. This research is conducted qualitatively and quantitatively. The causative factors obtained from the literature were distributed to contractors through questionnaires to see perceptions of contractors and concessions. The data of the questionnaire were analyzed by using validity test, reliability, and descriptive statistical analysis with Pearson Moment (Bivariate Pearson) method assisted by ms. excel to get the factors causing the delay. Then the delay factors will be tested through interviews with stakeholders in the three bridge samples. Based on the results of data processing analysis, it can be concluded that the factors that greatly affect the bridge construction project delays are analyzed by descriptive analysis of material arrival delay, material arrival delay, damage due to negligence of work, and work that does not comply with operational standards

Keywords : Delays, questionnaires, Pearson Moments (Bivariate Pearson), interviews, bridges

INTRODUCTION

The city of Banjarmasin has been widely known by the nickname 1000 River City. This nickname refers to the number of rivers that divide the mainland of Banjarmasin City. This unique natural configuration when viewed from the air just shows the area of Banjarmasin city like a collection of small islands split by the river.

Many people think that the unique configuration and characteristic of Banjarmasin city that many flow by river with various sizes, is a big capital for long term development and if the commitment of governance and exploitation process can be done well and correctly, it is possible to make Banjarmasin city become a a unique and beautiful city.

With an area of 98.46 km2 of which the area is separated by rivers, to increase economic growth Banjarmasin City has done the development of infrastructure in the field of transportation of roads and bridges are quite significant with the details of APBD as follows in Table 1.

Table 1, shows the use of APBD budget for the last three years of Banjarmasin city. Roads and bridges have a large share in the use of budget over the past three years. These data show how important the construction of transportation (roads and bridges) in the city of Banjarmasin is cleaved by many rivers.

But in the process of implementation, there is often a delay in the bridge construction project. This can lead to problems within the scope of the project itself, one of which is the occurrence of cost swelling that also affects the quality of the work. Delays result in losses for project-related parties, especially contractors as executors who have to spend more to pursue the late work. Therefore more attention is required in analyzing what factors are responsible for delays in bridge construction projects.

Table 1. APBD funds Dinas Bina Marga Banjarmasin

Fiscal year	APBD	Fiscal	Percentage
2015	Secretariat	Rp 2,980,750,000	2.46%
	Program	Rp 4,046,000,000	3.34%
	Road	Rp 64,976,000,000	53.76%
	Bridge	Rp 29,661,610,000	24.54%
	Public Street Lighting	Rp 19,200,000,000	15.88%
	Total Funds	Rp 120,846,410,000	
2016	Secretariat	Rp 2,633,658,000	1.38%
	Program	Rp 3,930,000,000	1.90%
	Road	Rp 111,545,500,000	58.50%
	Bridge	Rp 51,294,110,000	26.90%
	Public Street Lighting	Rp 21,250,000,000	11.14%
	Total Funds	Rp190,653,268,000	
2017	Secretariat	Rp 5,650,207,000	3.11%
	Public Street Lighting	Rp 70,554,092,000	38.84%
	Bridge	Rp 20,498,000,000	11.28%
	River	Rp 17,978,503,000	9.89%
	Drainage	Rp 8,830,000,000	4.86%
	Contractor services	Rp 55,563,000,000	30.59%
	Spatial	Rp 2,538,038,000	1.39%
	Total Funds	Rp 181,611,840,000	

MATERIALS AND METHODS

The purpose of this study is to determine the factors causing delays in the city of Banjarmasin by distributing questionnaires and interviews to the parties related to bridge construction projects in the city of Banjarmasin which later expected useful as a reference for the contractor to avoid delays in the implementation of bridge construction project and become a reference in subsequent research.

A project is declared completed when the time and quality of work are in accordance with the initial contract, to achieve this required good managerial for the executor of the bridge construction project. If a time of the work process is delayed, the implementer can take strategic steps to overcome this so that the project can be completed on time and on quality.

In this research, starting with the physical delay of work that occurred in some bridge construction project. Then followed by a study of literature related topics that will be discussed is about the bridge construction project delay, then conducted secondary data collection needed to analyze and discuss so that can be drawn conclusions.

Surveys are a systematic method of collecting data based on a sample to obtain information from similar populations. The main purpose of the survey is not to determine a specific case, but to obtain the main characteristics of the targeted population at a given time.

Implementation of this research is done in accordance with the method of questionnaire research and interviews to the parties related to the project, the research stages starting from data collection to the analysis used to process data and statistical calculations, data collection research conducted by spreading questionnaires whose variables are determined. Then the results of the results of the calculation of the questionnaire data analysis will know what factors are the cause of the delay and will be tested through interviews with the parties related to the construction project of the bridge

RESULTS AND DISCUSSION

From the analysis results obtained correlation value between the score of items with a total score. The analysis is calculated using Ms. Excel first to get the item score, the total score and the correlation value of the item score and the total score. This value is then appealed to r table value, r table is searched for significance 0.05 with 2 side test and amount of data (n) = 30.

The sample for the questionnaire test of 30 respondents who have been or are handling the bridge project with 5% significance from here obtained value df = n-2, df = 30 - 2 = 28. We see from table r moment product at 5% significance, r table = 0.361, then compare the value of r table with r calculation result. If in r arithmetic> r table, then the statement is "Valid". Conversely, if r count <r table, then the statement is "Invalid".

Table 2. Item Instrument Validation (Impact on Delay)

Code	Variable	Value r (r count)	Value (r table)	Conclusion
f1	Lack of training	0,293801457	0.361	Invalid
f2	Personnel who work are not in accordance field	-0,332307072	0.361	Invalid
f3	Lack of work experience	-0,112530209	0.361	Invalid
f4	Lack of skilled labor	-0,253111406	0.361	Invalid
f5	Human error in the execution of work	0,279477177	0.361	Invalid
f6	Schedule is not realistic	0,508011833	0.361	Valid
f7	Poor time management	-0,119191762	0.361	Invalid
f8	Work plans change	0,424436202	0.361	Valid
f9	Short project implementation period	0,338703787	0.361	Invalid
f10	Implementation methods are less precise	-0,475247253	0.361	Invalid
f11	Coordination is less clear	0,282291067	0.361	Invalid
f12	Coordination with implementation is not appropriate	0,552280183	0.361	Valid
f13	Misunderstanding in receiving information	0,312209696	0.361	Invalid
f14	Lack of communication and coordination in the field	0,427200169	0.361	Valid
f15	Submission of incomplete information	0,224090234	0.361	Invalid
f16	Low capacity and productivity of equipment	-0,092845419	0.361	Invalid
f17	Lack of material	0,474030231	0.361	Valid
f18	Material arrive delay	-0,143269424	0.361	Invalid
f19	Material quality is not appropriate	0,146167026	0.361	Invalid
f20	Inefficient use of tools	0,280799706	0.361	Invalid
f21	Unexpected weather	0,424223481	0.361	Valid
f22	Damage due to work negligence	0,236818779	0.361	Invalid
f23	Accident at work occurred	0,028723205	0.361	Invalid
f24	The existence of unexpected constraints on the work	0,218035237	0.361	Invalid
f25	There was a work error	0,533539658	0.361	Valid
f26	The physical condition of the environment is not supported	-0,279965609	0.361	Invalid
f27	Licensing is slow	0,346060199	0.361	Invalid
f28	Lack of initial capital	0,341135030	0.361	Invalid
f29	Cost estimation error	0,356775341	0.361	Invalid
f30	Late owner payment to contractor	-0,377394740	0.361	Invalid
f31	Errors in financial administration	0,118505330	0.361	Invalid
f32	Incompatibility of work agreement	0,305597830	0.361	Invalid
f33	Employee wage delays	-0,051397782	0.361	Invalid
f34	The results of the work did not reach the quality set	-0,290912435	0.361	Invalid
f35	Error in the sequence of job steps	0,189308192	0.361	Invalid
f36	Jobs that do not comply with operational standards	0,232131637	0.361	Invalid

Table 3. Item Instrument Validation (Impact on Quality of Work Quality)

Code	Variable	Value r (r count)	Value (r table)	Conclusion
f1	Lack of training	0.145911	0.361	Invalid
f2	Personnel who work are not in accordance field	0.252423	0.361	Invalid
f3	Lack of work experience	0.352889	0.361	Invalid
f4	Lack of skilled labor	0.109758	0.361	Invalid
f5	Human error in the execution of work	0.343289	0.361	Invalid
f6	Schedule is not realistic	0.077583	0.361	Invalid
f7	Poor time management	0.297266	0.361	Invalid
f8	Work plans change	0.555698	0.361	Valid
f9	Short project implementation period	0.341355	0.361	Invalid
f10	Implementation methods are less precise	0.203677	0.361	Invalid
f11	Coordination is less clear	0.574652	0.361	Valid
f12	Coordination with implementation is not appropriate	0.304949	0.361	Invalid
f13	Misunderstanding in receiving information	0.208115	0.361	Invalid
f14	Lack of communication and coordination in the field	0.278034	0.361	Invalid
f15	Submission of incomplete information	-0.018770	0.361	Invalid
f16	Low capacity and productivity of equipment	-0.159989	0.361	Invalid
f17	Lack of material	0.304901	0.361	Invalid
f18	Material arrive delay	0.172644	0.361	Invalid
f19	Material quality is not appropriate	0.372044	0.361	Valid
f20	Inefficient use of tools	0.049389	0.361	Invalid
f21	Unexpected weather	0.028717	0.361	Invalid
f22	Damage due to work negligence	0.394293	0.361	Valid
f23	Accident at work occurred	0.316865	0.361	Invalid
f24	The existence of unexpected constraints on the work	0.296790	0.361	Invalid
f25	There was a work error	0.542379	0.361	Valid
f26	The physical condition of the environment is not supported	-0.309161	0.361	Invalid
f27	Licensing is slow	0.235397	0.361	Invalid
f28	Lack of initial capital	-0.107563	0.361	Invalid
f29	Cost estimation error	0.207844	0.361	Invalid
f30	Late owner payment to contractor	0.141998	0.361	Invalid
f31	Errors in financial administration	0.324388	0.361	Invalid
f32	Incompatibility of work agreement	0.101518	0.361	Invalid
f33	Employee wage delays	-0.049237	0.361	Invalid
f34	The results of the work did not reach the quality set	0.216376	0.361	Invalid
f35	Error in the sequence of job steps	0.171474	0.361	Invalid
f36	Jobs that do not comply with operational standards	0.169731	0.361	Invalid

Based on correlation analysis result obtained correlation value for:

1. Invalid items (project delays) items f1,f2, f4, f5,f7, f9, f10, f11, f13, f15, f16, f18, f19, f20, f22, f23, f24, f26, f27, f28, f30, f31, f32, f33, f34, f35, dan f36..
2. Invalid items (impact on quality) items f1, f2, f3, f4, f5, f6, f7, f9, f10, f12, f13, f14, f15, f16, f17, f18, f20, f21, f23, f24, f26, f27, f28, f29, f30, f31, f32, f33, f34, f35, dan f36.

Because the value of r count is less than 0.361 (r table), it can be concluded that the items are not correlated significantly with the total score and declared invalid, so it must be issued. While on other items value more than 0.361 and can be concluded that the instrument is valid.

The values for reliability testing come from valid item scores. Invalid items are not involved in reliability testing.

Categories of reliability coefficients are as follows:

- 0.80 - 1.00: reliability is very high
- 0.60 - 0.80: High reliability
- 0.40 - 0.60: moderate reliability
- 0.20 - 0.40: Low reliability
- -1.00 - 0.20: very low reliability (not reliable)

Reliability testing using Pearson method, used to assess whether the data of the questionnaire can be trusted or not.

From Excel calculations for questionnaire reliability:

- Impact on the delay obtained (R) of 0.58.
- Impact on quality quality obtained (R) of 0.63.

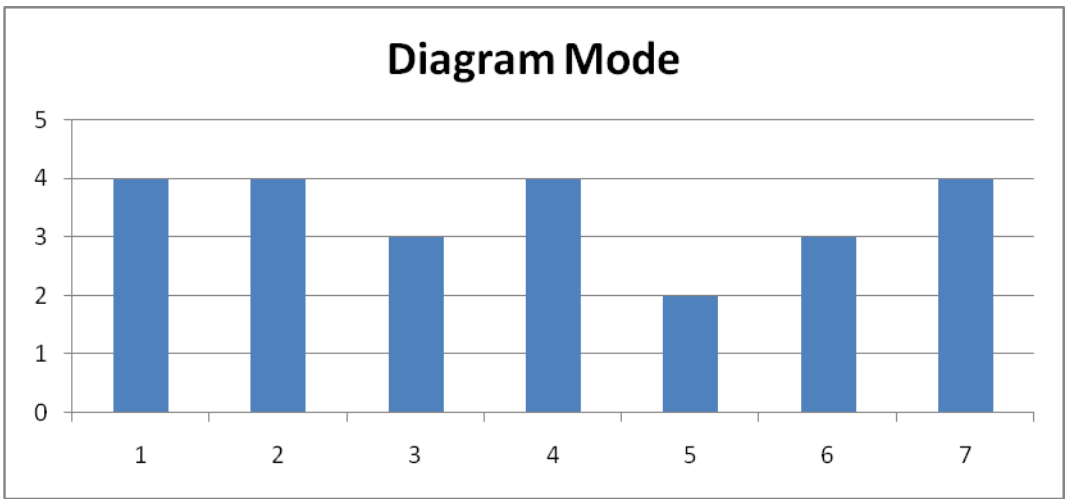
Then proceed with the next test, that is by entering the correlation value into the Spearman Brown formula:

1. R = 2r / 2 + r = 2 (0,58) / 2 + 0,58 = 0,45

2. R = 2r / 2 + r = 2 (0.63) / 2 + 0.63 = 0.48

Thus instruments for:

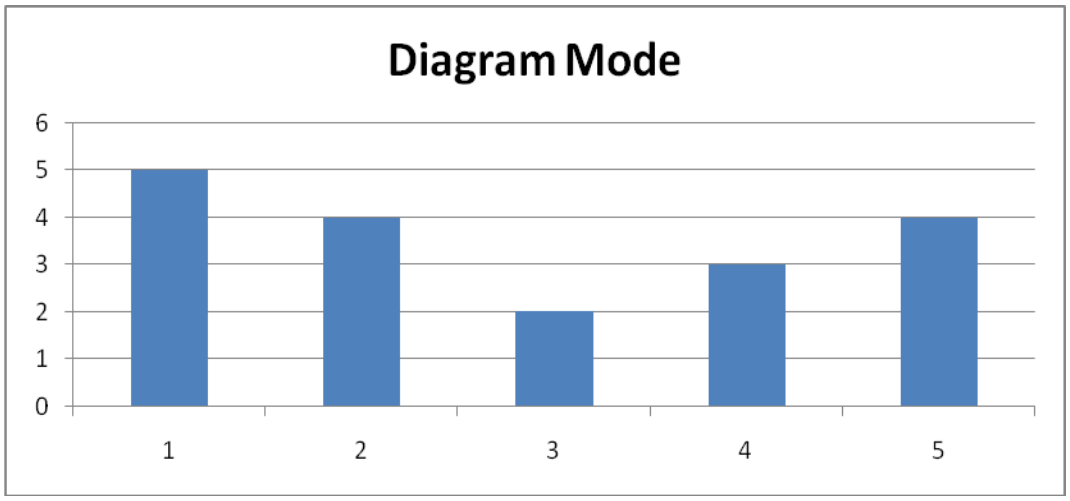
1. Impacts on delays have moderate reliability due to 0.45> 0.40 and meet criteria due to 0.45> r table (0.361). So this comparison shows significant results, or in other words reliability of the instrument can be trusted.
2. Impact on the quality of work has moderate reliability due to 0.48> 0.40 and meets the criteria due to 0.48> r table (0.361). So this comparison shows significant results, or in other words reliability of the instrument can be trusted.



Picture 1. Diagram of factor values for project delays

The diagram above shows the most common value (mode) in the questionnaire:
Highest mode value:

- Schedule is not Realistic (f6)
- The work plan is fickle (f8)
- Lack of communication and coordination in the field (f14)
- There was a work error (f25)



Picture 2. Diagram of Factor Values Against Working Quality

The diagram above shows the most common value (mode) in the questionnaire:
Highest mode value:

- The work plan is fickle (f8)
- Coordination is less clear (f11)
- There was a work error (f25)

Comparison of Questionnaire and Interview Results

The variable of valid questionnaire result will be compared with the result of interview to the related parties of the three bridge project samples. The factors that cause the delay of

the results of the distribution of questionnaires and interview results are listed in Table 4.

Table 4. Comparison of Questionnaire Results and Interview Result of Bridge Samples (Delays)

Questionnaire results (valid item)	Interview result
Schedule is not realistic	Coordianation is less clear
Work plans change	Lack of communcation and coordination in the field
Coordination with implementaion is not appropriate	Material arrival delay
	Unexpected weather
Lack of communcation and coordination in the field	The exixtence of unexpected constraints on the work process
Lack of material	Licensing is low
Unexpected weather	
There was a work error	

When compared between the results of the questionnaire distribution test and the interview results differ and not all the same, this is possible because based on the experience of each company that handles different bridges. The delay factors of the questionnaire distribution were broader in sampling, but the authors could not ascertain who filled the questionnaire. Interviews were drawn from three bridge samples, but the authors made sure that the resource person was the right person or person who witnessed the on-the-job process in the field and became the source in knowing the delay factors that occurred in the work process.

Influence of Delays on Quality

Based on the results of interviews with related parties on the above three bridge project samples, the delay of the work faced by the contractor does not affect the quality of the quality test, because the work in the field is done in accordance with the work procedures or comply with the SNI standards so the delay is considered not to affect the quality of the test quality. But it is more influential on costs because the contractor has to spend more for the overtime wages of workers in the field. However, the source persons from related parties bridge samples justify some of the factors that often cause low quality in the work process, among others:

Table 5. Comparison of Questionnaire Results and Interview Results of Bridge Samples (Quality of Quality)

Questionnaire results (valid item)	Interview result
Work plans change	Coordianation is less clear
Coordination is less clear	Material quality is not appropriate
Material quality is not appropriate	There was a work error
Damage due to work negligence	The physical condition of the environment is not supportive
Accident at work occurred	Error in the sequence of jobs steps
	Jobs that do not comply with operational standards

CONCLUSION

Based on the results of the analysis of the questionnaire and interview results, it can be concluded that:

a. The factors causing the delay in bridge construction project in Banjarmasin are Unrealistic schedule; The work plan is fickle; Unclear coordination with implementation; Lack of communication and coordination in the field; Shortage and delay of material arrival; Unexpected weather; There was a work error and Licensing is slow
b. Factors that are the cause of the quality of bridge construction project in Banjarmasin are Fluctuating work plans and work sequence errors; Coordination is less clear; Material quality is not appropriate; Damage due to work negligence; There was a work error; Lack of material; The physical condition of the environment does not support and Jobs that do not comply with operational standards

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