FACTORS AFFECTING DELAYS IN THE CONSTRUCTION PROJECT OF 5 FLOOR PARKING BUILDING ROEMANI HOSPITAL, SEMARANG.

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Abstract. In the planning of a project, there have to be a time schedule that can served as a guideline in the project, this shows that scheduling can influence the activity of a project. A good time schedule in a project can make project run effectively and efficiently, but in reality the actual workof a project did not always go as planned. In this case, the construction of library of UIN Sunan Ampel Surabaya.In the process of construction of library of UIN Sunan Ampel Surabaya, there is a delay that caused by a lot of factors, resulting in a delay of 49 days, the project initial duration is 154 days but the implementation duration is 203 days. Because of this, an analysis was carried out on this matter to determine what caused this lateness on project scheduleFrom the analysis that has been done the result is that the project lateness is caused in preparation work and the usage of work system with 3 shift but using the same man power. Factors of this lateness is caused by the owner, the conctractor, and weather disturbance.

Keywords: Project Lateness, FTA, Building

1. Introduction

A construction project is an activity that aims to build facilities and infrastructure within the planned time frame. There will be a decrease in terms of quality and delay in completion of work. Delays can be minimised when their causes are identified. Identification of the factors [1] This research aims to analyze the factors causing delays in a building construction project, and identify claims that can be compensated for additional time and costs by the owner [2]. Furthermore, the previous study finds that financial problems are the main factor and coordination problems are the second most important factor causing delay in construction projects in Malaysia [3].

A construction project is an attempt to achieve an outcome in the form of infrastructure. There are three basic ways to categorize type of delays which are Critical and noncritical, Excusable and Non-excusable and Compensable and non-compensable [4]. Conducting research on the Roemani Hospital Parking Building Construction Project, Semarang, aims to find out what causes delays in the project. the. In the Roemani Hospital parking building construction project in Semarang, one example can be seen where the project implementation was not in accordance with the planned schedule. In this project, it was planned to be completed in 330 calendar days, whereas in practice the project was completed in 510 days, meaning there was a delay of 180 calendar days. review the existing activities on the project to find out where the errors occurred that caused delays. To achieve this, the Fault Tree Analysis (FTA) method can be used, which is a method used to analyze the factors that cause delays in a project.

2. Methods

This research is a type of qualitative research with a descriptive format. This research collects data from the results of several methods in the form of methods from data analysis Time Schedule and S-curve, interviews. Analysis method of the time schedule data and also the S curve to collect data and explain descriptively what jobs are experiencing delays. With the time schedule and also the s curve, we can get data about what work is delayed in what week the work starts to experience delays because the time schedule and s curve are a schedule on a project that is made to know when a project starts and when it finishes. from the analysis of the results of interviews researchers can find out what factors are the cause of the delay in the Roemani Hospital Semarang Parking Building Development project. In determining the factors of delay, we need a tool that can analyze these factors. In this study can use the Fault tree Analysis (FTA) [5]. The FTA (Fault Tree Analysis) method in which the author aims to collect information that occurs and explain it descriptively about what are the factors that most influence delays in the Roemani Hospital Semarang Parking Building Development Project

Fault Tree Analysis (FTA) method

Fault Tree Analysis (FTA) is an analysis method, in which an unwanted event occurs in the system. Then the system is analyzed with existing environmental and operational conditions to find all possible ways that lead to the occurrence of undesired events

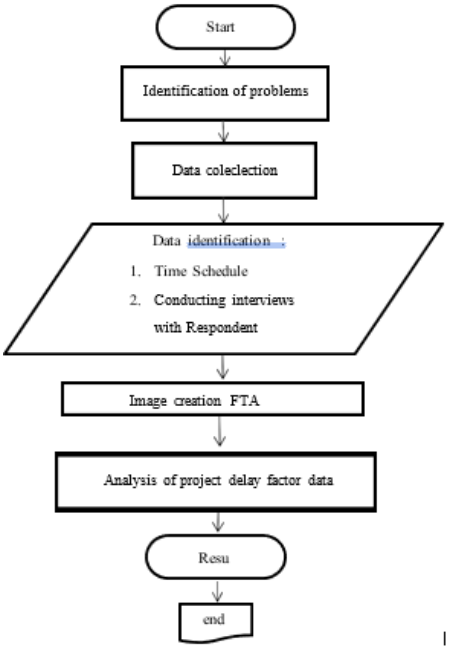


Figure 1. Research Methodology

Perform a quantitative analysis of the fault tree

Quantitative evaluation of the fault tree is carried out using a direct numerical approach which is a bottom-up approach. This numerical approach starts at the lowest level of the hierarchy and combines all the probabilities of events at this level using the appropriate logic gates where these events are associated.

$$Qs = P\ (C_1 \cup C_2 \ldots \cup C_i \ldots \cup C_n) = \sum_{i=1}^{n} P(CCC) - \sum_{i=1}^{n} \sum_{cc=1}^{i=1} P(ccc \cap ccc) + \sum_{cc=1}^{n} \sum_{cc=1}^{i-1} \sum_{k-1}^{i-1} P(ccc \cap ccc \cap Ck) + \ldots + (-1)^{n-1} P(C_1 \cap C_2 \cap \ldots \cap C_n) \quad (1)$$

3. Results and Discussion

The object of research in this study is the Roemani Hospital Semarang Parking Building Project. The Roemani Hospital Project is planned to be completed in 47 weeks while there is a delay in implementation so that the duration of the work becomes 72 weeks. The field supervisor stated that delays in the Roemani Hospital Semarang Parking Building Project occurred in the Column Formwork work and also the project environment and also in the use of the 2 shift work method but using the same workforce.

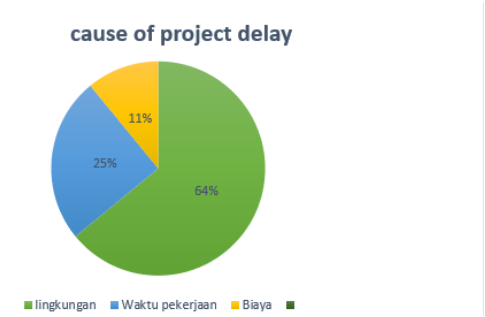
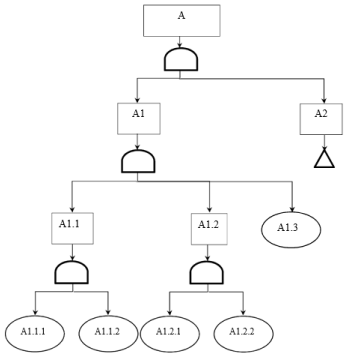


Figure 2. Projcet delay pie chart

The probability with a result of 0.00128 shows the probability of a 2-shift work system is 1, then this event is at risk of occurring. For a probability with a result of 0.0000256, it indicates that the probability of fill and column formwork is close to 1, so the event is low.



Event	Keterangan
A	Pekerjaan bekesting kolom
A1	Faktor stakeholder
A2	Faktor kontraktor
A1.1	Faktor covid 19
A1.2	Kurangnya SDM
A1.3	Tidak adanya lahan untuk material
A1.1.1	Lingkungan berdampingan RS Roemani
A1.1.2	Pekerja yang kurang mematuhi protokol kesehatan
A1.2.1	Kurangnya koordinasi yang baik
A1.2.2	Mobilisasi yang sulit

FTA diagram of delays in the Roemani Hospital Semarang Project

Event A is a column formwork work that experienced delays in the Roemani Hospital Semarang Parking Building project, which was caused by event A1 stakeholder work and event A2 contractor factors, in event A1 stakeholder work there were also factors that caused delays in work, namely event A1.1 the covid factor 19 and event A1.2 lack of human resources, in event A1.1 the covid 19 factor was caused by event A1.1.1 the project environment adjoining the hospital and event A1.1.2 workers who did not comply with the protocol making it difficult for work to run smoothly. In event A1.2, the lack of human resources was caused by event A1.2.1, the lack of good coordination between contractors and workers in their work and event A1.2.2 due to poor coordination and causing difficulty in mobilization due to the need for coordination with those in charge of the surrounding villages. In event A1.3, due to project development in a village area with inadequate roads, it was difficult for the project party to mobilize tools and land for materials.

4. Conclusions

Based on the results of research that has been carried out on the Roemani Hospital Semarang Parking Building Development project, regarding the factors causing the delay, several conclusions can be drawn from the results of this study, among others. Work that experienced delays in the construction project

for the parking building at Roeamani Hospital, Semarang. Column formwork for the construction of the parking building at Roemani Hospital, Semarang.
The suggestions that can be conveyed from the research that has been conducted and analyzed are as follows.
1. Further research.
a. In the analysis of the causes of delays in the project, it can optimize the first intermediate event level so that the research becomes more specific.
b. For further research, it is better to do research with more variables in terms of delays that occur and can also conduct research from interviews with the owner to find out the owner's point of view.
c. In addition to qualitative research, FTA can also conduct quantitative research in order to determine the factors of delay more specifically

5. References

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