

ANALYSIS OF THE APPLICATION OF TIME MANAGEMENT IN THE RECONSTRUCTION PROJECT OF JALAN BINDERANG – SUNGAI IMPAT

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ABSTRACT

Time management is an important factor in ensuring the completion of a project. One of the important aspects of time management is scheduling. In this project, scheduling is based on barchart data, which is then further developed through this research using the PDM method. The data presented in the bar chart only includes the duration and sequence, therefore, a dependency analysis is required to determine the relationships between each work item according to PDM method. The duration analysis conducted based on other data as listed in the project time schedule. Through the result of analysis, scheduling with the pdm method at Binderang – Sungai Impat Road Reconstruction project resulted a critical path consisting of the following activities, Roadbed Preparation, Ordinary Excavation, Selected Piles from Excavation Sources, Class A Aggregate Foundation Layer, Class B Aggregate Foundation Layer, Fc'15 Mpa Concrete, Prime Coat – Liquid Asphalt/Work Emulsion, and Mobilization 2, and get a total duration of 98 working days, which is 22 days faster than the previous project plan duration of 120 calendar days.

Keywords: Time Management, Scheduling, PDM, Project 2019

1. INTRODUCTION

According to Clough & Scars (1991), the process of planning, drafting, and overseeing a schedule of project activities is known as time management. One of the most important aspects of time management is *scheduling*. With good scheduling, of course, the project can run faster. However, the reality is that many people do not pay attention to scheduling, resulting in delays, decreased productivity, and inefficient use of resources.

The Binderang - Sungai Impat Road Project, located in Tapin Regency, is implemented by PT. Marata Cipta Sarana is the main access for local residents. The road project has a width of 4 m and a length of about 2.08 km, with a planned time of 120 calendar days and a maintenance period of 180 days.

The 120-day project plan has been prepared and scheduled using the *Bar/Gantt Chart*, where this method displays project activities in the form of horizontal bars along the timeline, with a bar length indicating the duration of each activity. However, the bar chart method has a drawback, where the information presented is limited, especially in

the dependence between activities and critical trajectories of the project work (Febriana & Aziz, 2021). If this can be identified properly, then the project completion time can be accelerated, one of which is by using *Precedence Diagramming method/PDM*.

2. THEORETICAL FOUNDATIONS

Project

A project is a job that is considered unique and temporary. Projects are implemented in order to achieve the targets that have been set and produce the expected benefits or outputs. One of the main foundations in a project is time and cost (APM, 2019).

According to Schwalbe, a project is an activity that is carried out in a limited/certain period of time and is temporary with the aim of producing distinctive or unique results or services.

Project Management

Management comes from the English word "*managewhich* means planning, controlling, and organizing, which is necessary to ensure that the organization's work results can run efficiently (Arifin, 2020). By *Project Management Body of Knowledge* (PMBOK), project management is the application of insights, skills, tools, and techniques to design or manage activities to match project objectives.

Time Management

Time management is an important factor that plays a key role in the success of running a business, by carrying out the planning and implementation process of time allocation for certain activities (Gea, 2014). Some of the aspects that exist in time management include, planning, scheduling, control and supervision.

Project Scheduling

According to Abrar Husen (2009), Scheduling is the division of time to work on each activity in realizing a task to obtain maximum results by paying attention to various shortcomings. In the scheduling process, activity planning and the relationship between each activity are processed more in-depth or specific. This aims to support the project assessment process.

Bar Chart

This method was introduced by Henry L. Gantt from 1861 to 1919. *Bar chart* is a series of activities arranged in vertical columns. The time is displayed in a horizontal column, so that the start and finish times of an activity are clearly visible, while the duration of the activity is indicated by the length of the chart bar (Ervianto, 2005).

Critical Path

In the PDM method, the critical path or *Critical Path* is a series of activities that take the longest to complete. This path includes a series of important activities starting from the first activity to the final activity of the project, passing through all the activities with the longest implementation duration. Thus, the critical path is the path that most determines the total project completion time (Siregar & Iffiginia, 2019).

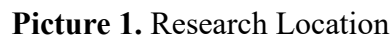
PDM

PDM is a network of work that organizes activities in a mode format (AON), where arrows are used to describe the relationships and relationships between the activities involved. In PDM, dependencies between activities are identified and described using specific relationships such as SS(*Start to Start*), SF(*Start to Finish*), FS (*Finish to Start*) and FF (*Finish to Finish*). This method can show simpler overlapping activities.(Indra Khaidir et al., 2022).

3. METHOD

Research Location

The location of this study is on Jl. Sungai Impat, Lokpaikat District, Tapin Regency, South Kalimantan. This road has a width of 5.30 m with a STA work length of 0+000 – 2+080.



In the early stages of this research, the necessary data was collected, namely primary and secondary data. Then it is continued by creating a Work Breakdown Structure (WBS) and determining the duration of each work obtained from Time *Schedule* data. Then make scheduling with *Project* 2019 by inputting work items, estimated duration into *Project* 2019 and processing the data using the PDM method, then scheduling is generated in the form of a *project* Network Diagram.

Job Description

WBS (Work Breakdown Structure)

Duration of Work

Analysis of Dependency Relationships

There was no dependency relationship in the data required to compile scheduling with PDM. Therefore, in this study, a dependency relationship between activities is made based on Time Schedule. The following is a table of the results of the analysis of the dependency relationship between activities.

Table 1. Analysis of Job Dependency Relationship Based on PDM Method

NO	Activity Description	Duration	Dependency
1	Common		
2	Mobilization 1	1	6 SS
3	Mobilization 2	1	17 FS
4	Demobilization	1	16 SF, 17 SF
7	Earthworks and Geosynthetics		
8	Common Mines	1	11 FS
9	Selected Piles from Mineral Sources	2	9 FS
10	Road Body Preparation	1	
11	Granular Pavement		
12	Class A Aggregate Foundation Layer	3	14 FS
13	Class B Aggregate Foundation Layer	3	10 FS
14	Asphalt Pavement		
15	Prime Coat -Liquid Asphalt/Emulsion	3	19 FS
16	Wear-Coated Lataston (HRS-WC)	3	16 SS
17	Structure		
18	Concrete fc'15 Mpa	2	13 FS
19	Stone Pair	1	10 SS
20	Daily Jobs and Others		
21	Thermoplastic Road Markings	1	17 FS

Data Input with Project 2019

In Data input in Project 2019, there are several stages that must be done. The initial stage is the preparation stage, which includes filling in basic information, such as setting working hours, determining the project start date, compiling a work calendar to determine working days and hours. Then continue by entering a job description, duration for each job, and filling in between activities/dependency relationships. The output obtained is in the form of *network* diagrams and critical path on the project being worked on. The total duration of the project can be seen from Project 2019.

	Start	Finish
Current	Mon 8/26/24	Tue 12/17/24
Baseline	NA	NA
Actual	NA	NA
Variance	0w	0w

	Duration	Work	Cost
Current	16w	0h	\$0.00
Baseline	0w	0h	\$0.00
Actual	0w	0h	\$0.00
Remaining	16w	0h	\$0.00

Percent complete:

Duration: 0% Work: 0%

Close

Figure 2. Overall Term

Critical Path

The critical trajectory only contains the duration of work that does not overlap with other critical work.

Table 2. Critical Path on the Binderang – Sungai Impat Road Project

Job Description	Duration (Week)
Earthworks and Geosynthetics	
Road Body Preparation	1
Common Mines	1
Selected Piles from Mineral Sources	2
Granular Pavement	
Class A Aggregate Foundation Layer	3
Class B Aggregate Foundation Layer	3

Job Description	Duration (Week)
Asphalt Pavement	
Adhesive Absorbent Layer – Liquid Asphalt/Emulsion	3
Wear-Coated Lataston (HRS-WC)	
Structure	
Concrete fc'15 Mpa	
Mobilization	
Mobilization 2	1
Total	14

5. CONCLUSION

From the problems and discussions in this study, it can be concluded that:

1. Based on the analysis of the scheduling of the Binderang - Sungai Impat Road project, Lokpaikat District, Tapin Regency, South Kalimantan using *Project* 2019 using the PDM method, the total duration of work is obtained for 98 calendar days (14 weeks) with a comparison in the planned schedule of 120 calendar days.
2. The critical path in the Binderang - Sungai Impat Road Reconstruction project, Lokpaikat District, Tapin Regency, South Kalimantan is the preparation of the road body, Ordinary Excavation, Selected Piles from Excavation Sources, Class A Aggregate Foundation Layer, Class B Aggregate Foundation Layer, fc' 15 MPa Concrete, Binding Permeate Layer - Liquid Asphalt / Work Emulsion, and Mobilization 2.

BIBLIOGRAPHY

- APM. APM Body of Knowledge. In *Journal of Lesbian Studies* (Vol. 15, Issue 1).
- Arifin, Z. (2020). Introduction to Project Management. *Education*, 9–10.
- Ervianto, W. I. (2005). Construction Project Management Third Edition. *Construction Project Management-Revised Edition*, Revised Edition, Andi, Yogyakarta.
- Febriana, W., & Aziz, U. A. (2021). Analyze project scheduling with the PERT method Use Microsoft Project 2016. *ITS Journal of Science and Arts*, 5(1), 51–66.
- Gea, A. A. (2014). TIME MANAGEMENT: USING Kc. *Humanities*, 5(2), 777–785.

- Indra Khaidir, Embun Sari Ayu, & Mutiara Dwi Putri Andriani. (2022). Implementation of the Precedence Diagram Method (PDM) in Construction Project Control. *Journal of Engineering*, 12(2), 175–182.
- Siregar, A. C., & Iffiginia, I. (2019). The use of the critical path method (CPM) to evaluate the time and cost of project implementation. *Engineering: Journal of Science and Technology*, 15(2), 102.