

ANALISIS PENJADWALAN PROYEK KLINIK SPESIALIS MATA & THT AYANI DENGAN *PERT* & *CPM*

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ABSTRACT

Clinics are one of the health facilities that are important for people's lives, for this reason the provision of health facilities is a priority scale where the construction of the Ayani Eye & ENT Specialist Clinic building in Pontianak City, West Kalimantan is one of them. Project scheduling is one of the elements of planning results, which can provide information about the planned schedule, project progress, & project delays, these things can affect the quality & quantity of work if correct implementation is not anticipated, both in terms of implementation methods, coordination between the owner and the contractor. . In this research, Time Scheduling analysis was carried out using PERT (Project Evaluation and Review Technique) & CPM (Critical Path Method) on the Ayani eye & ENT specialist clinic building project to determine the critical path and determine the probability that project work can be completed on time. Based on the analysis carried out, the critical path obtained is with the following details, A-B-C-D-E-H-Y-P-AG-AK-AN-AM-AO with a duration of 189 which is obtained from the results of calculations using the CPM method and probability using PERT calculations, namely that it can be completed in 189 with a percentage of 62% of the completion targets that have been made

Keywords: CPM, PERT, Project scheduling

INTRODUCTION

Infrastructure development for public facilities in developing countries such as Indonesia continues to be improved to support a country's progress. In essence, development itself aims to improve community welfare by building various facilities and other supporting assets in society. The development of health facilities is one part of national development. This development is not only carried out in the city center but is also carried out in various other areas of Indonesia. The building structure is one of the main components that is needed to support the establishment of a building. The building structure consists of upper structural components and lower structural components which are planned in such a way that they can distribute the load to the subgrade. To make it a quality building, it is necessary to pay attention to the aspects of the materials needed which are adjusted to the project costs. Construction development projects require time to complete, in this case many ways are needed to choose various methods so that the project being built can be completed on time. The development of public facilities in the health sector is important for the Indonesian people, there are many factors that cause development to be delayed. Delays in construction projects can be overcome by accelerating their implementation in order to achieve the planned targets, but in making decisions to speed up the implementation of work, you must of course pay attention to financing factors so that the expected results are minimum financing without ignoring quality according to the desired standards. There are many things that can be done to

overcome project time delays, namely by increasing labor hours, adding work shifts, or using more productive tools to support the success of the project. Planning activities in a development project is a very important aspect to avoid delays. In planning these activities, there are several methods, one of which is Network Planning. Using this method is very helpful in building a project such as building a clinic. Therefore, careful scheduling and planning is needed to facilitate project work as efficiently and effectively as possible. In a situation, the project owner (owner) may want the project to be completed earlier than originally planned or because of external factors such as weather factors which cause poor progress so that project implementation is not as planned or it could be said that project progress can be slower than planned. has been calculated.

METHODS

In conducting this research, the method used by the author was the Critical Path Method (CPM) and Project Evaluation Review Technique (PERT). Analyze data using the CPM method to determine each job, determine the sequence of activities because each activity is dependent on other activities, create a CPM Network Diagram with activities on the arrow/AoA (Activity on Arrow), estimate the project completion time from the initial planning carried out by PT. Nindya Perkasa's work, Determining the critical path with float/slack which has a total float value of 0 can be generated from LS-ES/LF-EF. Analyze using the PERT method for each activity with three time scopes, namely optimistic time, pessimistic time and realistic time to get an estimate of the expected time.

RESULTS AND DISCUSSION

A. CPM calculation

Table 1.1 Activities on the Critical Path

Jenis Kegiatan	Kode	float
Kantor dan Gudang Sementara	A	0
Kebersihan	B	0
Pekerjaan <i>Bor Pile</i>	C	0
Pekerjaan Tanah	D	0
Pekerjaan Pondasi	E	0
Pembesian Kolom lantai 1	H	0
Pembesian Balok Lantai 2	K	0
Pembesian Plat Lantai 2	L	0
Pekerjaan Kolom lantai 1	P	0
Pekerjaan Balok Lantai 2	S	0
Bekisting Kolom Lantai 1	Y	0
Bekisting Balok Lantai 2	AB	0
Tangga	AE	0
Instalasi Air Kotor	AG	0

<i>Finishing</i> Lantai	AK	0
Pengecatan	AM	0
Pekerjaan Pintu dan Jendela	AN	0
ACP	AO	0

B. PERT calculation

Table 1.2 Time estimation using the PERT method

No	Jenis Kegiatan	Kode	A	M	B
			Hari		
I	Pekerjaan Persiapan				
1	Kantor dan Gudang Sementara	A	10	14	18
2	Kebersihan	B	18	21	29
3	Pekerjaan <i>Bor Pile</i>	C	10	14	18
4	Pekerjaan Tanah	D	10	14	18
5	Pekerjaan Pondasi	E	10	14	18
II	Pekerjaan Pembesian				
6	Pembesian <i>Pilecap</i>	F	18	21	29
7	Pembesian <i>Tie Beam</i>	G	18	21	29
8	Pembesian Kolom Lantai 1	H	18	21	29
9	Pembesian Kolom lantai 2	I	18	21	29
10	Pembesian Balok Lantai 1	J	18	21	29
11	Pembesian Balok Lantai 2	K	18	21	29
12	Pembesian Plat Lantai 2	L	18	21	29
13	Pembesian Plat Lantai Atap	M	18	21	29
III	Pekerjaan Beton Bertulang				
14	Pekerjaan <i>Pilecap</i>	N	6	7	13
15	Pekerjaan <i>Tie Beam</i>	O	6	7	13
16	Pekerjaan Kolom Lantai 1	P	6	7	13
17	Pekerjaan Kolom Lantai 2	Q	6	7	13
18	Pekerjaan Balok Lantai 1	R	6	7	13
19	Pekerjaan Balok Lantai 2	S	6	7	13
20	Pekerjaan Plat lantai 1	T	6	7	13
21	Pekerjaan Plat Lantai 2	U	6	7	13
22	Pekerjaan Plat Lantai Atap	V	6	7	13
IV	Pekerjaan Bekisting				

23	Bekisting <i>Pilecap</i>	W	10	14	18
24	Bekisting <i>Tie Beam</i>	X	10	14	18
25	Bekisting Kolom Lantai 1	Y	10	14	18
26	Bekisting Kolom Lantai 2	Z	10	14	18
27	Bekisting Balok Lantai 1	AA	10	14	18
28	Bekisting Balok Lantai 2	AB	10	14	18
29	Bekisting Plat Lantai 2	AC	10	14	18
30	Bekisting Plat Lantai Atap	AD	10	14	18
31	Tangga	AE	18	21	29
32	Instalasi Air Bersih	AF	10	14	18
33	Instalasi Air Kotor	AG	6	7	13
34	Instalasi dan Pemasangan Elektrikal	AH	10	14	18
35	Pemasangan Mesin Antrian	AI	10	14	18
36	Pekerjaan <i>Furniture</i>	AJ	18	21	29
37	<i>Finishing</i> Lantai	AK	18	21	29
38	<i>Finishing</i> Dinding	AL	18	21	29
39	Pengecatan	AM	18	21	29
40	Pekerjaan Pintu dan Jendela	AN	10	14	18
41	ACP	AO	6	7	13

Table 1.3 TE Values

No	Jenis Aktivitas	Kode	te
			$\frac{a + 4m + b}{6}$
I	Pekerjaan Persiapan		
1	Kantor dan Gudang Sementara	A	37,3
2	Kebersihan	B	81,3
3	Pekerjaan <i>Bor Pile</i>	C	37,3
4	Pekerjaan Tanah	D	37,3
5	Pekerjaan Pondasi	E	37,3
II	Pekerjaan Pembesian		
6	Pembesian <i>Pilecap</i>	F	81,3

7	Pembesian <i>Tie Beam</i>	G	81,3
8	Pembesian Kolom Lantai 1	H	81,3
9	Pembesian Kolom lantai 2	I	81,3
10	Pembesian Balok Lantai 1	J	81,3
11	Pembesian Balok Lantai 2	K	81,3
12	Pembesian Plat Lantai 2	L	81,3
13	Pembesian Plat Lantai Atap	M	81,3
III	Pekerjaan Beton Bertulang		
14	Pekerjaan <i>Pilecap</i>	N	11,3
15	Pekerjaan <i>Tie Beam</i>	O	11,3
16	Pekerjaan Kolom Lantai 1	P	11,3
17	Pekerjaan Kolom Lantai 2	Q	11,3
18	Pekerjaan Balok Lantai 1	R	11,3
19	Pekerjaan Balok Lantai 2	S	11,3
20	Pekerjaan Plat lantai 1	T	11,3
21	Pekerjaan Plat Lantai 2	U	11,3
22	Pekerjaan Plat Lantai Atap	V	11,3
IV	Pekerjaan Bekisting		
23	Bekisting <i>Pilecap</i>	W	37,3
24	Bekisting <i>Tie Beam</i>	X	37,3
25	Bekisting Kolom Lantai 1	Y	37,3
26	Bekisting Kolom Lantai 2	Z	37,3
27	Bekisting Balok Lantai 1	AA	37,3
28	Bekisting Balok Lantai 2	AB	37,3
29	Bekisting Plat Lantai 2	AC	37,3
30	Bekisting Plat Lantai Atap	AD	37,3
31	Tangga	AE	81,3

32	Instalasi Air Bersih	AF	37,3
33	Instalasi Air Kotor	AG	11,3
34	Instalasi dan Pemasangan Elektrikal	AH	37,3
35	Pemasangan Mesin Antrian	AI	37,3
36	Pekerjaan <i>Furniture</i>	AJ	81,3
37	<i>Finishing</i> Lantai	AK	81,3
38	<i>Finishing</i> Dinding	AL	81,3
39	Pengecatan	AM	81,3
40	Pekerjaan Pintu dan Jendela	AN	37,3
41	ACP	AO	11,3

Table 1.4 Standard Deviation and Variance Values

No	Jenis Aktivitas	Kode	A	B	S	V(te)
			Hari		$\frac{b-a}{6}$	s^2
1	Kantor dan Gudang Sementara	A	10	18	1,33	1,76
2	Kebersihan	B	18	29	1,83	3,34
3	Pekerjaan <i>Bor Pile</i>	C	10	18	1,33	1,76
4	Pekerjaan Tanah	D	10	18	1,33	1,76
5	Pekerjaan Pondasi	E	10	18	1,33	1,76
6	Pembesian Balok Lantai 2	K	18	29	1,83	3,34
7	Pembesian Plat Lantai 2	L	18	29	1,83	3,34
8	Pembesian Kolom lantai 1	H	18	29	1,83	3,34
9	Pekerjaan Kolom lantai 1	P	6	13	1,16	1,34
10	Pekerjaan Balok Lantai 2	S	6	13	1,16	1,34
11	Bekisting Kolom Lantai 1	Y	6	13	1,16	1,34
12	Bekisting Balok Lantai 2	AB	10	18	1,33	1,76
13	Tangga	AE	18	29	1,83	3,34

14	Instalasi Air Kotor	AG	6	13	1,16	1,34
15	Finishing Lantai	AK	18	29	1,83	3,34
16	Pengecatan	AM	18	29	1,83	3,34
17	Pekerjaan Pintu dan Jendela	AN	10	18	1,33	1,76
18	ACP	AO	6	13	1,16	1,34
	$\Sigma V(te)$	35				
	Standard Deviasi	5,91				

CONCLUSIONS AND SUGGESTION

Conclusion

From the results of the analysis above regarding the use in scheduling the construction project for the Ayani Eye & ENT Specialist Clinic Building which started from the first week on May 9 2022 to January 17 2023 using the CPM and PERT methods, the following conclusions were obtained:

1. By using the CPM method in the Yadika Clinic Building Construction project, it is known that the critical path is in the following activities:
Office and Warehouse Work (A) – Cleaning (B) – Pile Drilling Work (C) – Earthwork (D) – Foundation Work (E) – 1st Floor Column Casting (H) – 1st Floor Column Formwork (Y) – Column Work 1st floor (P) – Dirty Water Installation (AG) – Door and Window Work (AN) – Painting (AM) – ACP (AO).
2. By using the PERT method, we get a probability of 62% in completing the Yadika Clinic Building Construction project, which means it can be completed within the target that has been made, namely 62% in 189 days. In calculating the PERT method, it has the advantage of calculating the possibility or probability of success in carrying out a project.

Suggestion

Suggestions from the author in the project work process should be PT. Karya Nindya Perkasa applies the CPM/PERT method in optimizing project management so that it can know both the time and cost of good planning before starting the project and also that in scheduling this project with the alternative of adding labor to a particular activity and also adding work tools, and specifically for The logistics department and the foreman can communicate better about materials that are about to run out so that there is no delay in waiting to order materials that will be used later. The use of security equipment in this project can be more closely monitored because there are some who are reluctant to use security equipment that meets K3 standards

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