PROJECT MANAGEMENT INFORMATION SYSTEM OF CV. ABI ZAKIRA PRIMA

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ABSTRAK

CV Abi Zakira Prima *is a construction company. This company can handle projects such as road construction, fencing, viaduct construction etc. Based on interview and observation, this company faced few problems when running a project. First, delay, the cause of this problem is the schedule they use based on weekly basis. Second, inability to report the progress efficiently when this company run two or more projects at the same time, this problem caused by progress supervising system they use presently. Third, poor risk-management, this problem can delay the project's progress when a risk occcur.*

Based on this problems, the methods can be used in this risk-management information system are CPM, EVM, and EMV. CPM is a project work web analysis technique that integrate relation between time, and cost which describe the situation of the project. EVM is a method that able to supervise the risks and properties from the possibility of losses because of risks.CPM will be used to supervise schedule problem. The EVM method will be used to monitor progress of the project so that the project can be in accordance with the plan. EMV methods used to deal with the risks so that the risks that arise during the project did not inhibit his net project.

The conclusion obtained from this research is the project management information system that has been built can help overcome the problems that occurred in CV Abi Zakira Prima.

Keyword : *Project Management, Information Systems, Critical Path Method, Earned Value Management, Expected Monetary Value.*

1. INTRODUCTION

CV. Abi Zakira Prima is one of the construction companies that are located in the town of Garut,located at Kp. Sukasirna Rt 03/01 Pataruman Village sub district Tarogong kidul, Garut. The projects are usually handled by CV. Abi Zakira Prima include road construction, construction of irrigation canals, Construction of the bridge, Retaining the road and other construction projects. Projects executed by Zakira Abi CV Prima comes from dinas-service Government like Office Space and Residential with a direct procurement method.

Based on the results of interviews with the person in charge of technical CV. Abi Zakira Prima Mr. Nurrahim found the problem at the time of the project. The first problem that is a schedule that is created and used for the working of the project is perminggu this schedule resulted in often misses the time of completion of the project by the time it had planned. Person in charge of technical CV. Abi Zakira Prima also convey a shortage occurred on the surveillance system progress of current projects, namely the slowness of delivery reports from implementing technical When companies handle 2 or more projects for example, pemagaran project and road development environment is done in a time that is dated March 29, because the location of the project are far apart, the technical implementers have difficulty in supervision, that caused the delay in the submission of a report conducted by the technical implementers, companies also have to pay an additional fee for tackling those problems that resulted in time and cost of projects beyond the planning and resulted in work being impeded.

In addition to the issues previously mentioned in charge technical CV. Abi Zakira Prima *also convey the obstacles that occur during the project such as delivery delays of the material, workers who are unable to attend due to illness, damages to equipment projects, of course these things will interfere with machining process of the project and have an impact on other work processes when such risks are not immediately addressed. In addition to impeding the course of the project it will also have an impact on the costs that must be issued the company because the company must issue an additional cost to handle obstacles that occur during the project process as a result of work being impeded.*

On the basis of the problems occurred then it can be inferred that the core of the problem has not been found in the presence of the making of a daily schedule, the shortage occurred on the surveillance system project progress and risk mitigation also have not yet termanage well done company. The system to be built should be accessible regardless of the user is therefore a

system of web-based that will be built to meet the needs of the user. Then from these problems will be built a system for project management system that is expected to be built can help overcome the problems occurred in CV. Abi Zakira Prima.

2. CONTENT OF RESEARCH

2.1 Scheduling Analysis

Scheduling is one of the elements of the planning results can provide information about the schedule of the plan and the progress of the project in terms of performance resources as well as the duration of the project and the progress of time for completion of the project. In this study the scheduling method using Critical Path Method (CPM).

2.1.1 Critical Path Method Analysis

Analsis on the stage will be used for scheduling method of Critical Path Method or also called with a Critical Path Analysis is a technical analysis of the network project that is used to predict the total duration of the project through critical path formed

Nomor	Uraian Pekerjaan	Kode	Keg. Pendahulu	Durasi(hari)
1	Pas. Papan Bowplank Propil	A	-	1
2	Bongkaran dan pembersihan lokasi	B	1	2
3	Pek.Galian Tanah	C	2	6
4	Pek.Buangan Sisa Galian	D	2	4
5	Pek.Urugan Sirtu	E	4	4
6	Pek.Urugan Pasir Urug	F	3,4	4
7	Pek.Bekisting	G	5,6	2
8	Pek.Beton Mutu fc 9,8 Mpa k-125	H	7	3
9	Pek.Rabat Beton Tumbuk 1:3:5	I	7	3
10	Pek.Pas.Lantai Paving Blok Natural 6 cm (manual)	J	8,9	6

Figure 1. Activity* PJL Kp. Cigerentel *project

Of the measures that has been presented before, then a series of activities to the project will Cigerentel. Kp PJL *represented becomes a work network diagram that will be seen in Figure 2. Job network diagram*

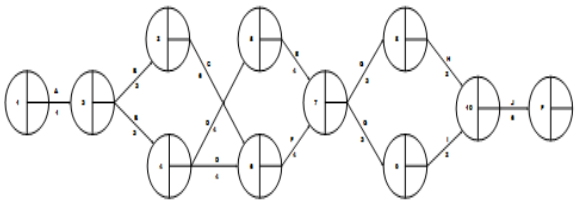


Figure 2. network Diagram

The calculation to determine the time of completion in the CPM method consists of two phases, namely calculation of forward and backward calculation. The following description of each of these stages.

1. Forward Calculation

Advanced calculations performed starting early network moving towards the end of the network by doing the calculations.
ES (Early Start)

$ES_{1-2}= 0$
$ES_{2-3} = 0+1 = 1$
$ES_{2-4} = 0+1 = 1$
$ES_{3-6} = 1+2 = 3$
$ES_{4-5} = 1+2 = 3$
$ES_{4-6} = 1+2 = 3$
$ES_{5-7} = 3+4 = 7$
$ES_{6-7} = 6+3 = 9$
$ES_{7-8} = 9+4 = 13$
$ES_{7-9} = 9+4 = 13$
$ES_{8-10} = 13+2 =15$
$ES_{9-10} = 13+2 = 15$
$ES_{10-F}=15+3=18$

EF (Early Finish)
$EF_{1-2}= ES_{1-2} + t_{1-2} = 0 + 1 = 1$
$EF_{2-3} = ES_{2-3} + t_{2-3} = 1 + 2 = 3$
$EF_{2-4} = ES_{2-4} + t_{2-4} = 1 + 2 = 3$
$EF_{3-6} = ES_{3-6} + t_{3-6} = 3 + 6 = 9$
$EF_{4-5} = ES_{4-5} + t_{4-5} = 3 + 4 = 7$
$EF_{4-6} = ES_{4-6} + t_{4-6} = 3 + 4 = 7$
$EF_{5-7} = ES_{5-7} + t_{5-7} = 7 + 4 = 11$
$EF_{6-7} = ES_{6-7} + t_{6-7} = 9 + 4 = 13$
$EF_{7-8} = ES_{7-8} + t_{7-8} = 13 + 2 = 15$
$EF_{7-9} = ES_{7-9} + t_{7-9} = 13 + 2 = 15$
$EF_{8-10} = ES_{8-10} + t_{8-10} = 15 + 3 = 18$
$EF_{9-10} = ES_{9-10} + t_{9-10} = 15 + 3 = 18$
$EF_{10-F} = ES_{10-F} + t_{10-F} = 18 + 6 = 24$

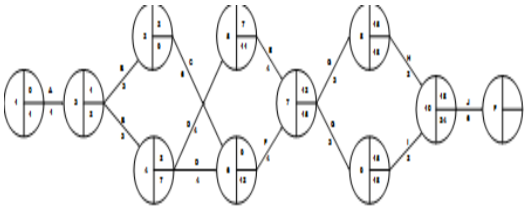
as shown in Figure 3. The image calculation ES and EF

Tabel 3.6 Perhitungan Maju

No	Kode Kegiatan	Kegiatan		Waktu (t) dalam hari	Paling awal	
		i-node	j-node		Mulai(ES)	Selesai(EF)
1	A	1	2	1	0	1
2	B	2	3	2	1	3
2	B	2	4	2	1	3
3	C	3	6	6	3	9
4	D	4	5	4	3	7
4	D	4	6	4	3	7
5	E	5	7	4	7	11
6	F	6	7	4	9	13
7	G	7	8	2	13	15
7	G	7	9	2	13	15
8	H	8	10	3	15	18
9	I	9	10	3	15	18
10	J	10	F	6	18	24

Figure 2. ES and EF calculation

From Figure 3. Calculation of the ES and EF produces the picture diagram calculations forward as shown in Figure 4. Advanced calculation work diagram



Gambar 3.4 Diagram Jaringan Kerja Perhitungan Maju

figure 3. Network of Forward Calculation

2. *Backward Calculation*

Backward calculations is used to calculate the slowest start time (LS) and the slowest completion time (LF) by performing the following calculation:

LS(i-j) = LF(i-j) – t

$LS_{10-F} = LF_{10-F} - t_{10-F} = 24 - 6 = 18$
$LS_{9-10} = LF_{9-10} - t_{9-10} = 18 - 3 = 15$
$LS_{8-10} = LF_{8-10} - t_{8-10} = 18 - 3 = 15$
$LS_{7-9} = LF_{7-9} - t_{7-9} = 15 - 2 = 13$
$LS_{7-8} = LF_{7-8} - t_{7-8} = 15 - 2 = 13$
$LS_{6-7} = LF_{6-7} - t_{6-7} = 13 - 4 = 9$
$LS_{5-7} = LF_{5-7} - t_{5-7} = 13 - 4 = 9$
$LS_{4-6} = LF_{4-6} - t_{4-6} = 9 - 4 = 5$
$LS_{4-5} = LF_{4-5} - t_{4-5} = 9 - 4 = 5$
$LS_{3-6} = LF_{3-6} - t_{3-6} = 9 - 6 = 3$
$LS_{2-4} = LF_{2-4} - t_{2-4} = 3 - 2 = 1$
$LS_{2-3} = LF_{2-3} - t_{2-3} = 3 - 2 = 1$
$LS_{1-2} = LF_{1-2} - t_{1-2} = 1 - 1 = 0$

As well as the calculation of LF
LF = LF – t

$LF_{10-F} = 24$
$LF_{9-10} = 24 - 6 = 18$
$LF_{8-10} = 24 - 6 = 18$
$LF_{7-9} = 18 - 3 = 15$
$LF_{7-8} = 18 - 3 = 15$
$LF_{6-7} = 15 - 2 = 13$
$LF_{5-7} = 15 - 2 = 13$
$LF_{4-6} = 13 - 4 = 9$
$LF_{4-5} = 13 - 4 = 9$
$LF_{3-6} = 13 - 4 = 9$
$LF_{2-4} = 9 - 4 = 5$
$LF_{2-3} = 9 - 6 = 3$
$LF_{1-2} = 3 - 2 = 1$

as shown in Figure 5. The image calculation of LS and LF

No	Kode Kegiatan	Kegiatan		Waktu (t) dalam hari	Paling awal	
		i-node	j-node		Mulai(LS)	Selesai(LF)
1	A	1	2	1	0	1
2	B	2	3	2	1	3
2	B	2	4	2	1	5
3	C	3	6	6	3	9
4	D	4	5	4	5	9
4	D	4	6	4	5	9
5	E	5	7	4	9	13
6	F	6	7	4	9	13
7	G	7	8	2	13	15
7	G	7	9	2	13	15
8	H	8	10	3	15	18
9	I	9	10	3	15	18
10	J	10	F	6	18	24

figure 5. calculation of LS and LF

From Figure 5. Calculation of LS and LF produces a picture diagram of the calculations backwards as shown in Figure 6. The working diagram calculations.

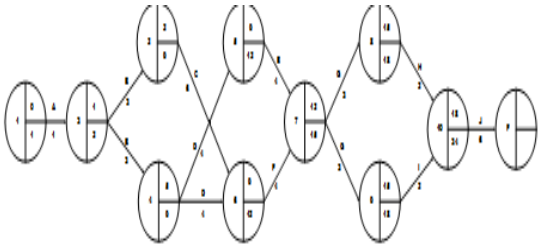


Figure 6. network of backward calculation

1. *Total Float Calculation*

Slack or float is the time delay that is possible without affecting the total implementation time of the project. Total Float (TF is the amount of time allowed an activity can be postponed, with the formula

TF = LF- EF,

as shown in Figure 7. The image calculation of TF.

No	Kegiatan		Waktu (t) dalam hari	Paling awal		Paling akhir		Total Float (TF)
	i-node	j-node		Mulai (ES)	Selesai (EF)	Mulai (LS)	Selesai (LF)	
1	1	2	1	0	1	0	1	0
2	2	3	2	1	3	1	3	0
2	2	4	2	1	3	1	5	2
3	3	6	6	3	9	3	9	0
4	4	5	4	3	7	5	9	2
4	4	6	4	3	7	5	9	2
5	5	7	4	7	11	9	13	2
6	6	7	4	9	13	9	13	0
7	7	8	2	13	15	13	15	0
7	7	9	2	13	15	13	15	0
8	8	10	3	15	18	15	18	0
9	9	10	3	15	18	15	18	0
10	10	F	6	18	24	18	24	0

Figure 7. Calculation Of TF

Based on the analysis method of the table's activities concluded that have CPM value total float or TF = 0 is the critical path. Refer to table 3.9 obtained a critical path i.e. 1-2-3-6-7-8-10-F that will be depicted on Figure 8..

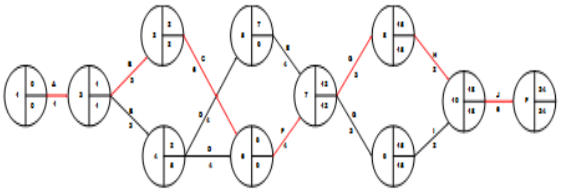


Figure 8. Network Critical Path Method

2.2 Project Risk Management Analysis

Project risk management is a very important activity to do when going to work on a project. Project risk management serves to identify the likelihood of the risk happening when the project progresses to later dealt so as not to lead to shortages or even failure of the project. The following are the stages for identifying risks and responses using Expected Monetary Value (EMV).

1. Risk Identification

The identification of risk, namely how to make a list of the usual risk occurs when project. This identification process is done using interviews with the person in charge of technical analysis, the results of the identification of the risks has been done can be seen in Figure 9. Identification Of Risk

Jenis Resiko	Deskripsi Resiko
Estimasi	1. Perkiraan jadwal dan biaya yang tidak sesuai perencanaan
Personal	2. Karyawan sakit yang akan mengganggu pelaksanaan proyek.
	3. Kemampuan SDM yang tidak sesuai standar
	4. Pengunduran diri karyawan lapangan
Keselamatan kerja	5. Kecelakaan kerja
Alat penunjang konstruksi	6. Kerusakan alat penunjang proyek
	7. Hilangnya bahan baku proyek dan alat proyek
Jenis Resiko	**Deskripsi Resiko**
	8. Pengiriman barang terlambat
Eksternal	9. Terjadinya hujan / banjir / bencana alam

Figure 9. Risk Identification

2. Risk Assessment

Risk assessment is done to memastikaan risk variable objectivity by way of assessing the level of importance, analyze risk categories as well as assess the portion of risk by providing criteria – certain criteria. Risk analysis based on probability of occurrence and the consequences that should be done, the probability value is determined by the frequency of occurrence, while the value of the consequences are determined based on cost or other compensation must be issued, the value of these consequences is the approximate figures for a risk. as seen in Figure 10 the following risk assessment

Kode Resiko	Probabilitas (%)	Konsekuensi (Rp.)	EMV
1	50	(-5.000.000)	-2.500.000
2	25	(-3.000.000)	-750.000
3	10	(-900.000)	-90.000
4	25	(-1.500.000)	-375.000
5	10	(-2.000.000)	-200.000
6	30	(-1.000.000)	-300.000
7	15	(-1.000.000)	-150.000
8	5	(-2.250.000)	-112.500
9	5	(-2.500.000)	-125.000
Total			-4.752.500

figure 10. risk assessment

3. Risk handling

Based on the results of the analysis of the likelihood of the risks has been carried out ditahap 2, then the required handling against the risks that have been identified. Risk handling information obtained from the results of the discussion with the technical person in charge in CV. Abi Zakira Prima. *Handling actions for each risk can be seen in Figure 11. risk handling actions*

Kode Resiko	Deskripsi Resiko	Penanganan Resiko
1	Perkiraan jadwal dan biaya yang tidak sesuai perencanaan	Menambah jam kerja karyawan dan menyiapkan dana cadangan unntuk menambah kekurangan biaya
2	Karyawan sakit yang akan mengganggu pelaksanaan proyek	Menambah jam kerja karyawan
3	Kemampuan SDM yang tidak sesuai standar	Diawasi karyawan berpengalaman dan suruh mempelajari cara kerja karyawan
4	Pengunduran diri karyawan lapangan	Menambah jam kerja karyawan dan segera merekrut karyawan baru
5	Kecelakaan kerja	Menggunakan alat standar keselamatan kerja
6	Pengiriman barang terlambat	Upayakan untuk menggunakan Supplier yang terpercaya yang dapat meminimalisir keterlambatan
7	Terjadinya hujan / banjir / bencana alam	Tetap mempertahankan kelangsungan proyek, dan segera mengejar keterlambatan dengan penambahan jam kerja karyawan
8	Kerusakan alat penunjang proyek	Sewa alat untuk sementara, lalu memperbaiki alat yang akan digunakan dan lebih ditingkatkan pengawasan terhadap alat kerja
9	Hilangnya bahan baku proyek dan alat proyek	Menitipkan kepada warga sekitar yang dapat dipercaya atau menyewa keamanan bila perlu

figure 11. risk handling

2.3 Analysis Of Cost Control

Analysis of the Monitoring Project progress information showing how the cost and schedule of the project. This indicator controls the position and inform the project progress within a certain period during the project progress. For an analysis of this research project on monitoring method using Earned Value Management (EVM).

2.3.1 Analisis Earn Value Management (EVM)

EVM is a method that integrates the relationships between costs and time as well as give an overview about the condition of the continuity of the project. Based on issues raised about the slow pace of delivery of project progress reports so the author will analyze the condition of the road construction Environment Kp. Cigerentel method of using Earned Value Method (EVM). Based on the report of the construction project Environmental Road Kp. Cigerentel on Figure 12 project work plan.

Uraian Pekerjaan	Bobot %	pengerjaan (%) / hari											
		1	2	3	4	5	6	7	8	9	10	11	12
Pas. Papan Bowplank Propil	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Bongkaran dan Pembersihan Lokasi	1.73		0.87	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Pek.Galian Tanah	1				0.17	0.34	0.51	0.68	0.85	1	1	1	1
Pek.Buangan Sisa Galian	0.6				0.15	0.3	0.45	0.6	0.6	0.6	0.6	0.6	0.6
Pek.Urugan Sirtu	0.63								0.16	0.32	0.48	0.63	0.63
Pek.Urugan Pasir Urug	3.73										0.93	1.86	2.79
Pek.Bekisting	1.33												
Pek.Beton Mutu fc 9,8 Mpa K-125	21.53												
Pek.Rabat Beton Tumbuk 1:3:5	5.7												
Pek.Pas.Lantai Paving Blok Natural 6 cm (manual)	62.6												
Jumlah Bobot	100	1.15	2.02	2.88	3.2	3.52	3.84	4.16	4.49	4.8	5.89	6.97	7.9

Uraian Pekerjaan	Bobot %													
		13	14	15	16	17	18	19	20	21	22	23	24
Pas. Papan Bowplank Propil	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Bongkaran dan Pembersihan Lokasi	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Pek.Galian Tanah	1	1	1	1	1	1	1	1	1	1	1	1	1
Pek.Buangan Sisa Galian	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Pek.Urugan Sirtu	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Pek.Urugan Pasir Urug	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73
Pek.Bekisting	1.33		0.67	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Pek.Beton Mutu fc 9,8 Mpa K-125	21.53				7.18	14.36	21.53	21.53	21.53	21.53	21.53	21.53	21.53
Pek.Rabat Beton Tumbuk 1:3:5	5.7				1.9	3.8	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Pek.Pas.Lantai Paving Blok Natural 6 cm (manual)	62.6							10.43	20.86	31.29	41.72	52.15	62.6
Jumlah Bobot	100	8.84	9.51	10.17	19.25	28.33	37.4	47.83	58.26	68.69	79.12	89.55	100

figure 12. *Project Work Plan*

Uraian Pekerjaan	Bobot %						
		13	14	15	16	17	18
Pas. Papan Bowplank Propil	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Bongkaran dan Pembersihan Lokasi	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Pek.Galian Tanah	1	1	1	1	1	1	1
Pek.Buangan Sisa Galian	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Pek.Urugan Sirtu	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Pek.Urugan Pasir Urug	3.73	3.73	3.73	3.73	3.73	3.73	3.73
Pek.Bekisting	1.33		0.5	1.26	1.33	1.33	1.33
Pek.Beton Mutu fc 9,8 Mpa K-125	21.53				7	11.48	19.72
Pek.Rabat Beton Tumbuk 1:3:5	5.7				1.7	3.6	5.6
Pek.Pas.Lantai Paving Blok Natural 6 cm (manual)	62.6						
Jumlah Bobot	100	8.65	9.34	10.1	18.87	25.25	35.49
Biaya Aktual		Rp 14,317,739	Rp 15,530,319	Rp 16,791,353	Rp 31,564,122	Rp 42,654,882	Rp 58,213,856

Uraian Pekerjaan	Bobot %						
		19	20	21	22	23	24
Pas. Papan Bowplank Propil	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Bongkaran dan Pembersihan Lokasi	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Pek.Galian Tanah	1	1	1	1	1	1	1
Pek.Buangan Sisa Galian	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Pek.Urugan Sirtu	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Pek.Urugan Pasir Urug	3.73	3.73	3.73	3.73	3.73	3.73	3.73
Pek.Bekisting	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Pek.Beton Mutu fc 9,8 Mpa K-125	21.53	21.53	21.53	21.53	21.53	21.53	21.53
Pek.Rabat Beton Tumbuk 1:3:5	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Pek.Pas.Lantai Paving Blok Natural 6 cm (manual)	62.6	10.40	18.64	31.10	41.22	52.25	62.60
Jumlah Bobot	100	47.8	56.04	68.5	78.62	89.65	100
Biaya Aktual		Rp 79,888,741	Rp 92,746,831	Rp114,237,277	Rp130,846,112	Rp148,585,812	Rp166,280,513

figure 13. Report On The Work Of The Project

From Figure 12 and Figure 13 later obtained some of the variables that must be counted in EVM namely planned value (PV), earned value (EV), schedule a Variant (SV), cost variance (CV), schedule performance index (SPI), cost performance index (CPI), estimate the actual cost (EAC) and the estimate time to complete (ETC).

1. ***Planned Value (PV) Calculation***

The calculation of planned value i.e. identify% weighting plan each day and the costs that would be incurred, planned value obtained from the% weighting plan each day of the planned budget multiplied by the actual cost (BAC), Planned Value i.e. the portion of the total estimated cost of already approved planned to spend on an activity over a given period.

Perhitungan PV pada hari ke 1 :
PV= (%progress rencana) x BAC
= 1.15% x 166280513
= Rp. 1912226

Perhitungan PV pada hari ke 2 :
PV= (%progress rencana) x BAC
= 2.02% x 166280513
= Rp. 3358866

Perhitungan PV pada hari ke 3 :
PV= (%progress rencana) x BAC
= 3.2% x 166280513
= Rp. 5320976

2. ***Earned Value (EV) Calculation***

Earned Value which is an estimation of the value of the physical completion of a job. % actual weights each week and costs that will be incurred, earned value to actual weight% of daily budget multiplied by the level of actual cost (BAC).

Perhitungan EV pada hari ke 1 :

EV= (%progress aktual) x BAC
= 1.15% x 166.280.513
= Rp. 1.912.226

Perhitungan EV pada hari ke 2 :
EV= (%progress aktual) x BAC
= 2.02% x 166.280.513
= Rp. 3.358.866

Perhitungan EV pada hari ke 3 :
EV= (%progress aktual) x BAC
= 2.88% x 166.280.513
= Rp. 4.788.879

3. *Cost Variance (CV) Analysis and Schedule Variances (SV) Analysis*

Analysis of the variants consists of Cost Variant (CV) and Schedule a Variant (SV). CV i.e. variable to identify the costs that have been incurred are larger or smaller than the costs that had been planned earlier. Whereas SV is variable to identify the time has been used, does time have used faster or slower than the time that has been planned in advance, the calculation of sv obtained from ev – pv.

CV dan SV pada hari ke 1

CV= EV – AC
= 1.912.226 – 1.915.280
= -3.054
SV= EV – PV
= 1.912.226 – 1.912.226
= 0

CV dan SV pada hari ke 2
CV= EV – AC
= 3.358.866 – 3.359.608
= -742
SV= EV – PV
= 3.358.866 – 3.358.866
= 0

CV dan SV pada hari ke 3
CV= EV – AC
= 4.788.879 – 4.787.280
= 1.599
SV= EV – PV
= 4.788.879 – 4.788.879
= 0

4. *Analysis performance index*

Analysis of performance index consists of 2 parts, namely cost performance index (CPI) and schedule performance index (SPI). the CPI shows the weighted values obtained against the costs were excluded, the cpi gained from ev/ac, the spi showed how much work that is able to be resolved against the planned work, the spi obtained from ev/pv.

CPI dan SPI pada hari ke 1
CPI= EV / AC
= 1912226 / 1915280
= 0.9984
SPI= EV / PV
= 1912226/ 1912226
= 1.0000
CPI dan SPI pada hari ke 2
CPI= EV / AC
= 3358866 / 3359608
= 0.9998
SPI= EV / PV
= 3358866 / 3358866
= 1.0000
CPI dan SPI pada hari ke 3
CPI= EV / AC
= 4788879/ 4787280
= 1.0003
SPI= EV / PV
= 4788879/ 4788879
= 1.0000

5. *Estimate at Completion Analysis (EAC) Analysis and Estimated Time to Complete (ETC) Analysis.*

Calculation of the eac, namely how to calculate cost estimates based on bac/contract value divided by the cost-performance (cpi), calculation of time etc contract agreed upon divided by the performance schedule (spi).

EAC dan ETC pada hari ke 1 :
EAC= BAC / CPI
= 166.280.513 / 0.9984
= Rp.166.546.087
ETC = OD / SPI
= 24 / 1
= 24 hari

EAC dan ETC pada hari ke 2 :
EAC= BAC / CPI
= 166.280.513 / 0.9998
= Rp.166.317.227
ETC = OD / SPI
= 24 / 1
= 24 hari
EAC dan ETC pada hari ke 3 :
EAC= BAC / CPI
= 166.280.513 / 1.0003
= Rp. 166.225.000
ETC = OD / SPI
= 24 / 1
= 24 hari

6. *Results Of The Analysis Methods Of EVM*

Following are the results of the analysis methods of recap Earn Value Management (EVM) as shown in Figure

14. The Results Of The Analysis Of The Recap EVM

Hari	Analisa Varian		Analisa Kerja		Analisa Estimasi	
	Waktu	Biaya	Waktu	Biaya	Waktu	Biaya
	SV (Rp)	CV (Rp)	SPI	CPI	ETC	EAC
1	0	-3054	1	0.9984	24	166546087
2	0	-742	1	0.9998	24	166317227.7
3	0	1599	1	1.0003	24	166225000
4	-33256	1937	0.9938	1.0004	25	166218591.2
5	-182909	302744	0.9688	1.0564	25	157402375.4
6	-266049	31148	0.9583	1.0051	26	165434103.3
7	-182909	3616	0.9736	1.0005	25	166191254.6
8	-83140	8319	0.9889	1.0011	25	166093153.2
9	33256	5050	1.0042	1.0006	24	166175746.9
10	-66512	619	0.9932	1.0001	25	166269931.6
11	-99768	23406	0.9914	1.002	25	165941780
12	-315933	-9948	0.9759	0.9992	25	166409546
13	-349189	32269	0.9762	1.0023	25	165906593.3
14	-282677	281	0.9821	1	25	166277505.4
15	-116396	2979	0.9931	1.0002	25	166251019.8
16	-631866	-186989	0.9803	0.9941	25	167271446.7
17	-5121440	-649052	0.8913	0.9848	27	168851017.8
18	-3175958	799098	0.9489	1.0137	26	164028898.3
19	-49884	-406656	0.9994	0.9949	25	167131257.3
20	-3691427	436768	0.9619	1.0047	25	165501126
21	-315933	-335126	0.9972	0.9971	25	166769747.4
22	-831403	-116373	0.9937	0.9991	25	166428532.2
23	166281	484668	1.0011	1.0033	24	165738890.7
24	0	0	1	1	24	166280513

figure 14. Results Of The EVM Analysis

From the results of the analysis with the method of calculation that is done to EVM today to work on the project 24 PJL Kp. Cigerentel it can be concluded that:

1. *In the early days up to 3 days to work on the project, project performance is assessed whether it is marked with the cost and time that has been issued in accordance with the planning.*
2. *when the working of the project entered the day 4 to day 22, project performance rated poorly because of the cost and time incurred in excess with which have been planned. It is marked from the resulting index value < 1.* 3.
3. *The end of the day the final project time and expenses were in accordance with the planning and can be concluded that the project is not experiencing delays.*

4. CLOSING

After doing the analysis, design and testing, then a conclusion can be obtained as follows:

1. *Information systems project management CV. Abi Zakira Prima built the technical person in charge can help in making the daily schedule of the project.*
2. *Management information systems project at CV Abi Zakira Primed can help the technical person in charge overseeing the progress of the project*
3. *Information systems project management CV. ABI ZAKIRA PRIMA can help the technical person in charge of managing the risks.*

Information systems project management CV. Abi Zakira Prima still had some shortcomings, therefore needs to be done to further development and refinement. As for the recommendations to make information systems project management CV. ABI ZAKIRA PRIMA became better, the following suggestions are presented:

1. *to further the development of this application is expected to be able to count the number of workers needed in estimation of each project.*
2. *For the development of the next expected this app can automatically calculate the amount of material needed in every project.*
3. *for the future development of this application can calculate the expected profits of the company at any level of the project.*

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