CONTROL OF SCHOOL FACILITIES AND INFRASTRUCTURE PROJECTS OF OGAN KOMERING ILIR REGENCY AND OGAN ILIR REGENCY

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ABSTRACT

The project and school infrastructure of Ogan Komering Ilir Regency and Ogan Ilir Regency aims to determine project performance. The analysis was carried out based on completed projects in the aspects of time and cost control using the Earned Value Analysis concept which consists of three indicators, namely BCWS, BCWP and ACWP. The analysis was carried out on time deviations (SV), cost deviations (CV), total budget deviations (BV) and was carried out in weeks (21 weeks). From this deviation analysis, productivity and project performance can be analyzed again, such as the time performance index (SPI) and Cost Performance Index (CPI). Based on Earned Value analysis, the schedule deviation (SV) on the project is 0. This means that in Week 21 the heavy work carried out was completed according to plan. Apart from that, the time performance index on the project is 1 (implementation completed according to schedule), while the cost performance index is 1.03 (1.3 > 1 which means expenditure is lower than planned).

Keywords: Value Yield, Cost, Time

1. PRELIMINARY

Background of Study

School facilities and infrastructure is a very vital and very important thing in supporting the smoothness or ease in the world of Education. Seeing the condition of Primary and secondary school education facilities and infrastructure in Ogan Ilir regency and Ogan Komering Ilir regency needs serious attention

considering the condition in some schools is not feasible, the Ministry of Public Works and settlements in collaboration with the Ministry of education and culture to rehabilitate and renovate educational facilities with third parties so that these facilities can function properly. With the renovation and rehabilitation, it will control the implementation of Rehabilitation and renovation of Primary and Secondary School Education Infrastructure in a quality, timely manner, within the available cost limits, and held in an orderly administration.

Construction management is a way to organize and manage a construction project from the beginning to the completion of the project. Construction management can be applied to any type of construction project to complete complex construction projects. The focus of construction management is the achievement of the final goal of the construction project with all existing constraints such as time and cost available.

To obtain a time analysis in the project stages starting from technical planning to the implementation of the revitalization of this school, a construction management is needed that affects the quality and quantity of the project. A significant application of construction management is in project scheduling and control. The application of construction management both schedule and cost estimates is very useful, because it can provide early warning about things that might happen in the future. And one of the ways to control costs and time is the earned value analysis (Atmaja, 2020).

Formulation of The Problem

Based on the background described above, the formulation of this problem is as follows:

1. What is the time deviation in the school facilities and infrastructure project of Ogan Komering Ilir regency and Ogan Ilir regency?
2. What is the deviation on the cost of the Ogan Komering Ilir and Ogan Ilir school facilities and Infrastructure Project?
3. How is the deviation of the budget expenditure on school facilities and infrastructure projects of Ogan Komering Ilir regency and Ogan Ilir regency?
4. How is the cost and Time Performance Index for all school facilities and infrastructure projects in Ogan Komering Ilir and Ogan Ilir districts?

Research Objectives

The purpose of this study was carried out is:

1. Knowing the deviation of time on school facilities and infrastructure projects of Ogan Komering Ilir regency and Ogan Ilir regency.
2. Knowing the deviation of costs on school facilities and infrastructure projects of Ogan Komering Ilir regency and Ogan Ilir regency.
3. Knowing the deviation of budget expenditure on school facilities and infrastructure projects of Ogan Komering Ilir regency and Ogan Ilir regency.
4. Knowing the cost and time performance index of all school facilities and infrastructure projects of Ogan Komering Ilir regency and Ogan Ilir regency.

Research Limitations

In writing this final report, the author limits the limits of writing so as not to happen penyimpamgan of the contents of the final report. The limits are as follows :

1. Data collection was carried out on the school facilities and infrastructure project of Ogan Komering Ilir regency and Ogan Ilir regency.
2. This study only analyzed in terms of time and cost control on school facilities and infrastructure projects of Ogan Komering Ilir regency and Ogan Ilir regency that have been completed, so the authors did not analyze the amount of the remaining budget and the remaining time to complete the project.
3. Project analysis using the Earned Value Concept method.
4. The Data used in this study from PT. Osa Putra Batom as the implementing contractor and PT. Terasis Erojaya as a supervisory consultant.
5. The Data is taken from the beginning of the project implementation to the end of the project where the beginning of the project implementation was carried out in July 2019 to December 2019.

2. THEORETICAL BASIS

Project Planning

Project planning consists of a description of how to achieve the objectives of a project, this project plan that will later be implemented in the field. In the construction environment there are terms planning (planning) and scheduling (scheduling). Both are related to each other. Because the

scheduling process is the result of the planning process.

Construction Management

Construction management is the implementation of activities ranging from simple problems, and routinely carried out by each individual to the planning and allocation of project resources that are technologically complex (Mardiaman, Construction Management, 2020).

Pegendalian time and cost

Setting the time or scheduling of the activities involved in it is intended for a project to run smoothly and effectively while Pegendalian cost is the last step of the process of managing project costs, namely trying to use and expenditure in accordance with planning, in the form of a predetermined budget. Planning and control of time and cost in the form of a detailed structure of activities and budget implementation is the most important activity in the control of cost and time. Then the planning is developed into a schedule of the main work plan which is equipped with restrictions or control points and a schedule of budget plans.

The Concept Of Yield Value

The method of the concept of the value of the results is the concept of calculating the cost according to the budget in accordance with the work that has been completed or implemented budgeted cost of work performed (Rantaung, 2014)

1. Budgeted costs for Scheduled Work (BCWS)

BCWS is a budget allocated based on a work plan that has been prepared over time. BCWS can be calculated from the accumulated budget of planned costs for work in a certain period of time.

2. Actual Cost for Work Performed (ACWP)

ACWP is a representation of the overall expenditure incurred to complete a job in a given period.

3. Budgeted Cost for Work Performed (BCWP)

BCWP represents the value received from the completion of work over a certain period of time. BCWP is called earned value. BCWP is calculated based on the accumulation of jobs that have been completed.

The relationship between BCWP, BCWS and ACWP can be seen in Figure 1
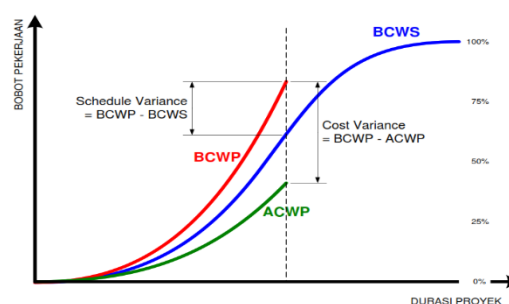
Figure 1. relationship between BCWP, BCWS and ACWP

Project Performance Assessment

The concept of Yield Value method is a concept of calculating the cost of using the earned value concept in project performance appraisal described as follows.

1. Cost Variance (CV)

Cost variance is the difference between the value obtained after completing the work packages with the actual costs incurred during the implementation of the project by the following formula:

CV = BCWP – ACWP

CV	=	the difference between the value obtained after completing the work packages with the actual cost
BCWP	=	Cost based on the completion of the

work in a period of time

ACWP = Costs incurred based on time

2. Schedule Variance (SV)

Schedule variance is used to calculate the deviation between BCWS and BCWP. A positive value indicates that the work packages obtained are greater than the costs incurred to work on these work packages and vice versa.

SV = BCWP – BCWS

SV = deviation result value between BCWS and BCWP

BCWP = Cost based on the completion of the work in the period of time)

BCWS = Cost of planning the completion of work in the period of time)

3. Schedule Performance Index (SPI)

Schedule Performance Index is a factor of performance efficiency in completing the work can be shown by the comparison between the value of the work that has been physically completed (BCWP) with the cost expenditure plan based on the work plan (BCWS).

SPI = BCWP / BCWS

SPI = performance efficiency factor in completing the work

BCWP = Cost based on the completion of the work in a period of time

BCWS = The cost of planning the completion of work in the period of time

3. RESEARCH RESULTS AND DISCUSSION

BCWS analysis

The concept of Yield Value method is the concept of calculating the cost.

BCWS can be calculated by multiplying the percentage of cumulative progress of the plan each week with the BAC value.

For work in the first week.

Total budget x BCWS weight

= 0,020% x Rp 19,979,167,003,58
= Rp3.935.895,90

For the overall calculation of BCWS up to week 21, can be seen in Table 1

Tabel 1 *Analisa Budgeted Cost of Work Schedule* (BCWS)

No	PERIODE	BAC (Rp)	BCWS BOBOT %	BCWS (Rp) Mingguan	BCWS (Rp) Kumulatif	BOBOT% Kumulatif
1	Minggu 1	19.979.167.003,58	0,020	3.935.895,90	3.935.895,90	0,020
2	Minggu 2	19.979.167.003,58	0,035	6.932.770,95	10.868.666,85	0,054
3	Minggu 3	19.979.167.003,58	0,094	18.700.500,32	29.569.167,17	0,148
4	Minggu 4	19.979.167.003,58	0,163	32.486.125,55	62.055.292,71	0,311
5	Minggu 5	19.979.167.003,58	0,252	50.367.480,02	112.422.772,73	0,563
6	Minggu 6	19.979.167.003,58	0,356	71.145.813,70	183.568.586,43	0,919
7	Minggu 7	19.979.167.003,58	2,868	573.034.476,33	756.603.062,76	3,787
8	Minggu 8	19.979.167.003,58	5,261	1.051.044.038,56	1.807.647.101,32	9,048
9	Minggu 9	19.979.167.003,58	7,556	1.509.625.858,79	3.317.272.960,11	16,604
10	Minggu 10	19.979.167.003,58	6,610	1.320.622.938,94	4.637.895.899,04	23,214
11	Minggu 11	19.979.167.003,58	6,621	1.322.820.647,31	5.960.716.546,35	29,835
12	Minggu 12	19.979.167.003,58	6,622	1.323.020.438,98	7.283.736.985,33	36,457
13	Minggu 13	19.979.167.003,58	6,344	1.267.478.354,71	8.551.215.340,03	42,801
14	Minggu 14	19.979.167.003,58	14,397	2.876.302.760,88	11.427.518.100,91	57,197
15	Minggu 15	19.979.167.003,58	9,567	1.911.406.907,23	13.338.925.008,15	66,764
16	Minggu 16	19.979.167.003,58	8,560	1.710.216.695,51	15.049.141.703,65	75,324
17	Minggu 17	19.979.167.003,58	8,435	1.685.242.736,75	16.734.384.440,40	83,759
18	Minggu 18	19.979.167.003,58	7,890	1.576.356.276,58	18.310.740.716,99	91,649
19	Minggu 19	19.979.167.003,58	6,404	1.279.465.854,91	19.590.206.571,90	98,053
20	Minggu 20	19.979.167.003,58	1,500	299.687.505,05	19.889.894.076,95	99,55
21	Minggu 21	19.979.167.003,58	0,447	89.272.926,63	19.979.167.003,58	100,00

The difference in weight each week is due to the description of the work done on the Ogan Ilir and Ogan Komering Ilir school facilities and infrastructure projects have different weights each week.

BCWP analysis

Budget analysis cost of Work Performance or commonly called BCWP is the amount of budget planned up to a certain period based

on the actual work that has been completed. The amount of costs incurred in accordance with the work that has been completed. The value of BCWP per month is obtained based on the data of the schedule for the implementation of work progress is calculated as follows:

For work in the first week

Total budget x BCWP weight

BCWP Weeks 1
=1,140% x Rp 19.979.167.003,58
=Rp 227.739.542,66

For the overall calculation of BCWP up to week 21, can be seen in Table 2 the difference in weight analysis budget cost of Work Performance is based on the planning of different job descriptions on each job planned every week. From Table 2, it can be seen that there is an increase in the value of BCWp every week, which means that the cost expenditure plan every week has increased

Table 2 *Analisa Budgeted Cost of Work Performance* (BCWP)

Acwp analysis

Analysis of the Actual cost of Work Performance or commonly known as ACWP is the amount of actual expenditure of a project in a certain period of time. In addition, the value obtained in the ACWP comes from the project expenditure report every month. In this case the actual cost is the cost incurred by the contractor (PT Osa Putra Batom) every week with a record tax fee of 10% of the contract value, which is issued at the end of the project. The ACWP value was obtained from the weekly expenditure report of each school on the rehabilitation project of school facilities and infrastructure of Ogan Komering Ilir regency and Ogan Ilir regency. For the overall BCWP jewelry up to week 21 can be seen in Table 3.

Table 3. *Analisa Actual Cost of Work Performance* (ACWP)

No	PERIODE	ACTUAL	PAJAK (Rp)	ACWP (Rp)	
				Mingguan	Kumulatif
1	Minggu 1	197.185.000,00	0	197.185.000,00	197.185.000,00
2	Minggu 2	287.925.000,00	0	287.925.000,00	485.110.000,00
3	Minggu 3	307.120.000,00	0	307.120.000,00	792.230.000,00
4	Minggu 4	375.524.000,00	0	375.524.000,00	1.167.754.000,00
5	Minggu 5	439.740.000,00	0	439.740.000,00	1.607.494.000,00
6	Minggu 6	474.640.000,00	0	474.640.000,00	2.082.134.000,00
7	Minggu 7	392.625.000,00	0	392.625.000,00	2.474.759.000,00
8	Minggu 8	575.850.000,00	0	575.850.000,00	3.050.609.000,00
9	Minggu 9	1.436.135.000,00	0	1.436.135.000,00	4.486.744.000,00
10	Minggu 10	428.397.500,00	0	428.397.500,00	4.915.141.500,00
11	Minggu 11	602.374.000,00	0	602.374.000,00	5.517.515.500,00
12	Minggu 12	405.887.000,00	0	405.887.000,00	5.923.402.500,00
13	Minggu 13	586.320.000,00	0	586.320.000,00	6.509.722.500,00
14	Minggu 14	4.418.340.000,00	0	4.418.340.000,00	10.928.062.500,00
15	Minggu 15	1.387.624.000,00	0	1.387.624.000,00	12.315.686.500,00
16	Minggu 16	2.329.924.000,00	0	2.329.924.000,00	14.645.610.500,00
17	Minggu 17	577.595.000,00	0	577.595.000,00	15.223.205.500,00
18	Minggu 18	387.390.000,00	0	387.390.000,00	15.610.595.500,00
19	Minggu 19	411.820.000,00	0	411.820.000,00	16.022.415.500,00
20	Minggu 20	410.075.000,00	0	410.075.000,00	16.432.490.500,00
21	Minggu 21	1.017.509.500,00	1.997.916.700,36	3.015.426.200,36	19.447.916.700,36

The difference in the value of ACWP or the actual cost of a project is directly proportional to what has been done in the field, it is due to the flow of funds out to pay for materials, workers ' wages and others. The amount of ACWP value is different from

No	PERIODE	BAC (Rp)	BCWP BOBOT %	BCWP (Rp)		BOBOT% Kumulatif
				Mingguan	Kumulatif	
1	Minggu ke 1	19.979.167.003,58	1,140	227.739.542,66	227.739.542,66	1,140
2	Minggu ke 2	19.979.167.003,58	1,735	346.707.278,08	574.446.820,74	2,875
3	Minggu ke 3	19.979.167.003,58	1,776	354.829.710,59	929.276.531,33	4,651
4	Minggu ke 4	19.979.167.003,58	2,053	410.258.297,89	1.339.534.829,22	6,705
5	Minggu ke 5	19.979.167.003,58	2,494	498.203.712,83	1.837.738.542,06	9,198
6	Minggu ke 6	19.979.167.003,58	2,704	540.280.668,74	2.378.019.210,79	11,902
7	Minggu ke 7	19.979.167.003,58	2,447	488.958.686,78	2.866.977.897,58	14,350
8	Minggu ke 8	19.979.167.003,58	3,536	706.390.162,89	3.573.368.060,47	17,885
9	Minggu ke 9	19.979.167.003,58	8,235	1.645.349.655,49	5.218.717.715,95	26,121
10	Minggu ke 10	19.979.167.003,58	2,404	480.218.029,17	5.698.935.745,12	28,524
11	Minggu ke 11	19.979.167.003,58	3,629	725.078.845,67	6.424.014.590,80	32,154
12	Minggu ke 12	19.979.167.003,58	2,483	496.126.193,28	6.920.140.784,07	34,637
13	Minggu ke 13	19.979.167.003,58	3,112	621.830.549,12	7.541.971.333,20	37,749
14	Minggu ke 14	19.979.167.004,58	25,479	5.090.467.388,35	12.632.438.721,55	63,228
15	Minggu ke 15	19.979.167.005,58	7,820	1.562.403.493,63	14.194.842.215,18	71,048
16	Minggu ke 16	19.979.167.006,58	13,138	2.624.821.394,32	16.819.663.609,49	84,186
17	Minggu ke 17	19.979.167.007,58	3,312	661.643.767,09	17.481.307.376,59	87,498
18	Minggu ke 18	19.979.167.008,58	2,079	415.428.111,98	17.896.735.488,56	89,577
19	Minggu ke 19	19.979.167.008,58	2,346	468.782.596,68	18.365.518.085,24	91,923
20	Minggu ke 20	19.979.167.008,58	2,347	468.964.536,87	18.834.482.622,11	94,271
21	Minggu ke 21	19.979.167.008,58	5,729	1.144.684.381,47	19.979.167.003,58	100

the amount of BCWP value it is because the value of BCWP every week is based on the amount of contract value, while ACWP is the actual cost of expenditure during the construction process.

Result Value Analysis

Deviation with respect to time (SV)

To determine the deviation with respect to time using the formula

SV = BCWP-BCWS

SV = time deviation
BCWP = cost based on the completion of the work in a period of time
BCWS = cost based on planning in time period

Then

SV Weeks 1
= 227.739.542,66 - 3.935.895,90
= Rp 223.803.646,76

(The value of the result of bcwp reduction with BCWS shows a positive value, this can be interpreted that the implementation is ahead of schedule planned)

For the calculation of deviation schedule (SV) per week in accordance with can be seen in Table 4.

Table 4. *Analisa Schedule Vaarians* (SV)

The result of SV analysis is a representation of the progress that is running on a project. Basically, the SV value represents the actual progress of the work where the value is obtained from the reduction of the actual value (BCWP) with the Planning value (BCWS). Implementation is faster than planning if the SV value is positive, if the SV value is negative then the implementation can be delayed from the planned schedule.

Deviation from cost (CV)

No	PERIODE	BCWP (Rp)	BCWS (Rp)	SV	
				Mingguan (Rp)	Kumulatif (Rp)
1	Minggu 1	227.739.542,66	3.935.895,90	223.803.646,76	223.803.646,76
2	Minggu 2	346.707.278,08	6.932.770,95	339.774.507,13	563.578.153,89
3	Minggu 3	354.829.710,59	18.700.500,32	336.129.210,28	899.707.364,17
4	Minggu 4	410.258.297,89	32.486.125,55	377.772.172,34	1.277.479.536,51
5	Minggu 5	498.203.712,83	50.367.480,02	447.836.232,82	1.725.315.769,33
6	Minggu 6	540.280.668,74	71.145.813,70	469.134.855,04	2.194.450.624,36
7	Minggu 7	488.958.686,78	573.034.476,33	-84.075.789,55	2.110.374.834,82
8	Minggu 8	706.390.162,89	1.051.044.038,56	-344.653.875,67	1.765.720.959,15
9	Minggu 9	1.645.349.655,49	1.509.625.858,79	135.723.796,70	1.901.444.755,85
10	Minggu 10	480.218.029,17	1.320.622.938,94	-840.404.909,77	1.061.039.846,08
11	Minggu 11	725.078.845,67	1.322.820.647,31	-597.741.801,63	463.298.044,45
12	Minggu 12	496.126.193,28	1.323.020.438,98	-826.894.245,70	-363.596.201,25
13	Minggu 13	621.830.549,12	1.267.478.354,71	-645.647.805,58	-1.009.244.006,84
14	Minggu 14	5.090.467.388,35	2.876.302.760,88	2.214.164.627,47	1.204.920.620,63
15	Minggu 15	1.562.403.493,63	1.911.406.907,23	-349.003.413,60	855.917.207,03
16	Minggu 16	2.624.821.394,32	1.710.216.695,51	914.604.698,81	1.770.521.905,84
17	Minggu 17	661.643.767,09	1.685.242.736,75	-1.023.598.969,66	746.922.936,18
18	Minggu 18	415.428.111,98	1.576.356.276,58	-1.160.928.164,61	-414.005.228,42
19	Minggu 19	468.782.596,68	1.279.465.854,91	-810.683.258,23	-1.224.688.486,65
20	Minggu 20	468.964.536,87	299.687.505,05	169.277.031,82	-1.055.411.454,84
21	Minggu 21	1.144.684.381,47	89.272.926,63	1.055.411.454,84	0,00

To display the CV value of each period used the formula :

CV = BCWP-ACWP

CV = cost deviation
BCWP = cost based on the completion of the work in a period of time
ACWP = time spent

Then :
CV Weeks 1

= 227.739.542,66 - Rp 197.185.000,00
= Rp 30.554.542,66

(This value indicates that the work has been carried out, completed by swallowing the budget under the implementation budget excluding tax. Due to taxes on inputs at the end of the project). For the calculation of deviation schedule (CV) per week in the same way as above, can be seen in Table 5.

Table 5. *Analisa Schedule Vaarians* (SV)

No	PERIODE	BCWP (Rp)	ACWP (Rp)	CV Mingguan (Rp)	CV Kumulatif (Rp)
1	Minggu 1	227.739.542,66	197.185.000,00	30.554.542,66	30.554.542,66
2	Minggu 2	346.707.278,08	287.925.000,00	58.782.278,08	89.336.820,74
3	Minggu 3	354.829.710,59	307.120.000,00	47.709.710,59	137.046.531,33
4	Minggu 4	410.258.297,89	375.524.000,00	34.734.297,89	171.780.829,22
5	Minggu 5	498.203.712,83	439.740.000,00	58.463.712,83	230.244.542,06
6	Minggu 6	540.280.668,74	474.640.000,00	65.640.668,74	295.885.210,79
7	Minggu 7	488.958.686,78	392.625.000,00	96.333.686,78	392.218.897,58
8	Minggu 8	706.390.162,89	575.850.000,00	130.540.162,89	522.759.060,47
9	Minggu 9	1.645.349.655,49	1.436.135.000,00	209.214.655,49	731.973.715,95
10	Minggu 10	480.218.029,17	428.397.500,00	51.820.529,17	783.794.245,12
11	Minggu 11	725.078.845,67	602.374.000,00	122.704.845,67	906.499.090,80
12	Minggu 12	496.126.193,28	405.887.000,00	90.239.193,28	996.738.284,07
13	Minggu 13	621.830.549,12	586.320.000,00	35.510.549,12	1.032.248.833,20
14	Minggu 14	5.090.467.388,35	4.418.340.000,00	672.127.388,35	1.704.376.221,55
15	Minggu 15	1.562.403.493,63	1.387.624.000,00	174.779.493,63	1.879.155.715,18
16	Minggu 16	2.624.821.394,32	2.329.924.000,00	294.897.394,32	2.174.053.109,49
17	Minggu 17	661.643.767,09	577.595.000,00	84.048.767,09	2.258.101.876,59
18	Minggu 18	415.428.111,98	387.390.000,00	28.038.111,98	2.286.139.988,56
19	Minggu 19	468.782.596,68	411.820.000,00	56.962.596,68	2.343.102.585,24
20	Minggu 20	468.964.536,87	410.075.000,00	58.889.536,87	2.401.992.122,11
21	Minggu 21	1.144.684.381,47	3.015.426.200,36	-1.870.741.818,89	531.250.303,22

The difference of Rp 47,709,710.59 in the first week due to the money out at the time of implementation is lower than the planned weight. This is because the tax expense paid at the end of the project affect the deviation in the analysis of CV

Deviation to budget (BV)

To display the value of BV each period used the formula :

BV = BCWS-ACWP

BV = budget deviation
BCWS = cost of planning work in the period of time
ACWP = time spent

Then:

CV Week 1

= 3.935.895,90 - 191,950,000.00

= Rp -193.249.104,10

(This value indicates that the budget spent is greater than the planned budget). For the calculation of schedule deviations (BV) per week can be seen in Table 6.

Chart 6. Schedule variance analysis (BV)

Productivity and project performance

No	PERIODE	BCWS (Rp)	ACWP (Rp)	BV Bulanan (Rp)	BV Kumulatif (Rp)
1	Minggu 1	3.935.895,90	197.185.000,00	-193.249.104,10	-193.249.104,10
2	Minggu 2	6.932.770,95	287.925.000,00	-280.992.229,05	-474.241.333,15
3	Minggu 3	18.700.500,32	307.120.000,00	-288.419.499,68	-762.660.832,83
4	Minggu 4	32.486.125,55	375.524.000,00	-343.037.874,45	-1.105.698.707,29
5	Minggu 5	50.367.480,02	439.740.000,00	-389.372.519,98	-1.495.071.227,27
6	Minggu 6	71.145.813,70	474.640.000,00	-403.494.186,30	-1.898.565.413,57
7	Minggu 7	573.034.476,33	392.625.000,00	180.409.476,33	-1.718.155.937,24
8	Minggu 8	1.051.044.038,56	575.850.000,00	475.194.038,56	-1.242.961.898,68
9	Minggu 9	1.509.625.858,79	1.436.135.000,00	73.490.858,79	-1.169.471.039,89
10	Minggu 10	1.320.622.938,94	428.397.500,00	892.225.438,94	-277.245.600,96
11	Minggu 11	1.322.820.647,31	602.374.000,00	720.446.647,31	443.201.046,35
12	Minggu 12	1.323.020.438,98	405.887.000,00	917.133.438,98	1.360.334.485,33
13	Minggu 13	1.267.478.354,71	586.320.000,00	681.158.354,71	2.041.492.840,03
14	Minggu 14	2.876.302.760,88	4.418.340.000,00	-1.542.037.239,12	499.455.600,91
15	Minggu 15	1.911.406.907,23	1.387.624.000,00	523.782.907,23	1.023.238.508,15
16	Minggu 16	1.710.216.695,51	2.329.924.000,00	-619.707.304,49	403.531.203,65
17	Minggu 17	1.685.242.736,75	577.595.000,00	1.107.647.736,75	1.511.178.940,40
18	Minggu 18	1.576.356.276,58	387.390.000,00	1.188.966.276,58	2.700.145.216,99
19	Minggu 19	1.279.465.854,91	411.820.000,00	867.645.854,91	3.567.791.071,90
20	Minggu 20	299.687.505,05	410.075.000,00	-110.387.494,95	3.457.403.576,95
21	Minggu 21	89.272.926,63	3.015.426.200,36	-2.926.153.273,73	531.250.303,22

Time Performance Index (SPI)

To determine the efficiency of the project time, the next calculation is the time performance index or commonly known as (SPI) to display the SPI value of each period, the following formula is used :

SPI = BCWP / BCWS

SPI = efficient use of resources
BCWP = cost based on the completion of the work in a period of time
BCWS = cost of planning the completion of work in the period of time

If the value of the SPI performance index < 1 means that the time in the implementation of the project is slower than planning. If the value of the performance index SPI > 1 then it means the time in the implementation faster than planning. The greater the difference from the number 1, the greater the deviation from the plan.

Then:

SPI Week 1

= 227.739.542,66 / 3.935.895,90

= 57,86

SPI Week 2

= 346.707.278,08/ 6.932.770,95

= 50,01

(This value shows SPI (57.86) > 1, meaning the implementation of the project faster than planning). For the calculation of schedule deviation (SPI) per week in the same way as above, can be seen in Table 7.

Table 7. Analisa *Schedule Performance Index* (SPI)

No	PERIODE	BCWP (Rp)	BCWS (Rp)	SPI % Mingguan (Rp)	Keterangan
1	Minggu 1	227.739.542,66	3.935.895,90	57,86	Lebih Cepat
2	Minggu 2	346.707.278,08	6.932.770,95	50,01	Lebih Cepat
3	Minggu 3	354.829.710,59	18.700.500,32	18,97	Lebih Cepat
4	Minggu 4	410.258.297,89	32.486.125,55	12,63	Lebih Cepat
5	Minggu 5	498.203.712,83	50.367.480,02	9,89	Lebih Cepat
6	Minggu 6	540.280.668,74	71.145.813,70	7,59	Lebih Cepat
7	Minggu 7	488.958.686,78	573.034.476,33	0,85	Terlambat
8	Minggu 8	706.390.162,89	1.051.044.038,56	0,67	Terlambat
9	Minggu 9	1.645.349.655,49	1.509.625.858,79	1,09	Lebih Cepat
10	Minggu 10	480.218.029,17	1.320.622.938,94	0,36	Terlambat
11	Minggu 11	725.078.845,67	1.322.820.647,31	0,55	Terlambat
12	Minggu 12	496.126.193,28	1.323.020.438,98	0,37	Terlambat
13	Minggu 13	621.830.549,12	1.267.478.354,71	0,49	Terlambat
14	Minggu 14	5.090.467.388,35	2.876.302.760,88	1,77	Lebih Cepat
15	Minggu 15	1.562.403.493,63	1.911.406.907,23	0,82	Terlambat
16	Minggu 16	2.624.821.394,32	1.710.216.695,51	1,53	Lebih Cepat
17	Minggu 17	661.643.767,09	1.685.242.736,75	0,39	Terlambat
18	Minggu 18	415.428.111,98	1.576.356.276,58	0,26	Terlambat
19	Minggu 19	468.782.596,68	1.279.465.854,91	0,37	Terlambat
20	Minggu 20	468.964.536,87	299.687.505,05	1,56	Lebih Cepat
21	Minggu 21	1.144.684.381,47	89.272.926,63	12,82	Lebih Cepat

4. EQUATION

Cost Performance Index (CPI)

In knowing the cost efficiency of the project, the next calculation is the cost performance index or commonly known as (CPI) to display the CPI value of each period, the following formula is used:

CPI = BCWP / ACWP

With:

CPI	=	cost efficiency
BCWP	=	cost based on the completion of the work in a period of time
ACWP	=	time spent

Then:

CPI Week 1

= 214,376,461.95 / 191,950,000.00

= 1,15

This value shows CPI > 1, meaning spending is smaller than the planned budget. For the calculation of the deviation schedule (CPI) per week in the same way as above, can be seen in Table 4.8.

Cost Performance Index (CPI)analysis

Table 9. Analisa *Cost Performance Index* (CPI)

No	PERIODE	BCWP (Rp)	ACWP (Rp)	CPI % Mingguan (Rp)	CPI % Kumulatif (Rp)	Keterangan
1	Minggu 1	227.739.542,66	197.185.000,00	1,15	1,15	Pengeluaran Lebih Kecil
2	Minggu 2	346.707.278,08	287.925.000,00	1,20	2,36	Pengeluaran Lebih Kecil
3	Minggu 3	354.829.710,59	307.120.000,00	1,16	3,51	Pengeluaran Lebih Kecil
4	Minggu 4	410.258.297,89	375.524.000,00	1,09	4,61	Pengeluaran Lebih Kecil
5	Minggu 5	498.203.712,83	439.740.000,00	1,13	5,74	Pengeluaran Lebih Kecil
6	Minggu 6	540.280.668,74	474.640.000,00	1,14	6,88	Pengeluaran Lebih Kecil
7	Minggu 7	488.958.686,78	392.625.000,00	1,25	8,12	Pengeluaran Lebih Kecil
8	Minggu 8	706.390.162,89	575.850.000,00	1,23	9,35	Pengeluaran Lebih Kecil
9	Minggu 9	1.645.349.655,49	1.436.135.000,00	1,15	10,50	Pengeluaran Lebih Kecil
10	Minggu 10	480.218.029,17	428.397.500,00	1,12	11,62	Pengeluaran Lebih Kecil
11	Minggu 11	725.078.845,67	602.374.000,00	1,20	12,82	Pengeluaran Lebih Kecil
12	Minggu 12	496.126.193,28	405.887.000,00	1,22	14,04	Pengeluaran Lebih Kecil
13	Minggu 13	621.830.549,12	586.320.000,00	1,06	15,10	Pengeluaran Lebih Kecil
14	Minggu 14	5.090.467.388,35	4.418.340.000,00	1,15	16,26	Pengeluaran Lebih Kecil
15	Minggu 15	1.562.403.493,63	1.387.624.000,00	1,13	17,38	Pengeluaran Lebih Kecil
16	Minggu 16	2.624.821.394,32	2.329.924.000,00	1,13	18,51	Pengeluaran Lebih Kecil
17	Minggu 17	661.643.767,09	577.595.000,00	1,15	19,65	Pengeluaran Lebih Kecil
18	Minggu 18	415.428.111,98	387.390.000,00	1,07	20,73	Pengeluaran Lebih Kecil
19	Minggu 19	468.782.596,68	411.820.000,00	1,14	21,86	Pengeluaran Lebih Kecil
20	Minggu 20	468.964.536,87	410.075.000,00	1,14	23,01	Pengeluaran Lebih Kecil
21	Minggu 21	1.144.684.381,47	3.015.426.200,36	0,38	23,39	Pengeluaran Lebih Besar

Project Analysis Results

From the project data and the results of the previous analysis, the following data were obtained :

1.   Time Of Work = 150 Days

2.   Total (BAC) = Rp 19,979,167,003.58

3.   21st week BCWP = Rp 19,979,167,003. 58

4.   21st week ACWP = Rp 19,447,916,700. 32

5.   BCWS 21st week = Rp 19.979.167.003,58

Time and cost performance analysis

From the project data and the results of the previous analysis, the following data were obtained :

1.   Deviations to the schedule :

SV = BCWP – BCWS

=   Rp   19,979,167,003.   58-Rp 19,979,167,003.58

= 0 (work completed with a budget not exceeding that of planning)

2.   Deviation to cost :

CV = BCWP-ACWP

=   Rp   19,979,167,003   .   58-Rp 19,447,916,700. 32

= Rp 531.250.308, 22 (implementation costs less than planning)

3.   Time performance index

SPI = BCWP / BCWS

=   Rp   19,979,167,003.   58   /   Rp 19,979,167,003.58

= 1 = 1 (execution completed according to schedule)

4.   Cost performance index

CPI = BCWP / ACWP

=   Rp   19,979,167,003.   58   /   Rp 19,447,916,700. 32

= 1.03 > 1 (expenditure is lower than planning)

5.   CONCLUSION

Based on the analysis of data management carried out on the revitalization project of school facilities and infrastructure of Ogan Komering Ilir regency and Ogan Ilir regency, it can be concluded as follows :

1.   The cumulative deviation over time (SV) at Week 21 was 0. Then it can be concluded that the project is completed according to the planned schedule.

2.   Deviation of cumulative cost (CV) in Week 21 amounted to Rp 531,250,303.22. This value represents the difference in costs incurred is lower than the value that should be spent on the same weight of work.

3.   Deviation from the cumulative budget (BV) in Week 21 amounted to Rp 531,250,303.22. It can be concluded that the budget spent is smaller than the cost of planning.

4.   Cost and Time Performance Index

a.   Cost Performance Index

1) in the Cost Performance Index or what can be called CPI, the value of 1.03 > 1 is obtained. It can be concluded that the costs incurred for the completion of ptoyek revitalization of school facilities and infrastructure of Ogan Komering Ilir regency and Ogan Ilir regency are smaller than the planned budget.

2) based on the analysis in the rehabilitation project of facilities and infrastructure kabupanten Ogan Komering Ilir and Ogan Ilir experienced a profit of Rp 531,250,308. 22 from the planned budget, including VAT 10%

b.   Time Performance Index

Beerdasarkan anailis against the cost of the revitalization project of school facilities and infrastructure Ogan Komering Ilir and Ogan Ilir obtained Time Performance Index (SPI) of 1 = 1 it can be concluded that the implementation of the project is completed according to the planning schedule of 150 days (21 weeks)

Advices

1. Project management should conduct more rigorous and comprehensive monitoring of cost and schedule deviations towards the use of initial costs. If the work has a cost deviation that is not directly proportional to the work that has been completed. Then the project manager must evaluate and control costs in the next job so that deviations in terms of cost and schedule can be controlled.

2. To be more effective, cost control and schedule are carried out on a daily scale in order to minimize the occurrence of large cost and schedule deviations. Which will later lead to cost control and schedule increasingly difficult. This is because the control of cost and time have mutual dependence.

3. The use of the Earn Valua method or the value of the results is very effective in controlling costs and project costs, which can help the implementation of the project so that the project can be completed on time. In addition, the executor must make sure they understand the value of the results to be effective.

4. It is expected that the thesis of Project control of school facilities and infrastructure of Ogan Ilir regency and Ogan Komering Ilir regency can contribute to the construction world, especially in terms of project control, so that the implementation of the project in accordance with the planned time. By using the analysis of the value of the results, it can be estimated the extent to which the project implemented in accordance with the plan. to estimate the time and cost at the end of the project experienced gains or losses in terms of cost and delay or acceleration in terms of time.

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