

Earned Value Analysis

Important Formula:

BCWS = Budgeted Cost of Work Schedule (or) PV - Planned Value.

BCWP = Budgeted Cost of Work Performed (or) EV - Earned Value.

$$BAC = \sum BCWS \text{ of task.}$$

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Budget at Completion

$$SPI = \text{Schedule Performance Index} = \frac{BCWP}{BCWS}$$

$$SV = \text{Schedule Variance} = BCWP - BCWS.$$

if $SV = 0 \Rightarrow$ On Schedule

$SV = -ve \Rightarrow$ Behind the Schedule

$SV = +ve \Rightarrow$ ahead of schedule.

$$(\text{Planned}) \text{ Percent Scheduled for Completion} = \frac{BCWS}{BAC}$$

$$(\text{Actual}) \text{ Percent Complete} = \frac{BCWP}{BAC}$$

ACWP = Actual Cost of Work Performed.

$$\text{Cost Performance Index: } CPI = \frac{BCWP}{ACWP} \left. \vphantom{\frac{BCWP}{ACWP}} \right\} +ve \Rightarrow \text{Within defined Budget.}$$

$$\text{Cost Variance: } CV = BCWP - ACWP$$

if $CV = 0 \Rightarrow$ Correct Budget

$CV = -ve \Rightarrow$ Over Budget

$CV = +ve \Rightarrow$ Less Budget.

Problem: For the following Project Calculate SV, EV, SPI & CPI at the end of Second month.

Month	1	2	3	4
Planned Value	11,10,000	6,00,000	25,00,000	8,00,000
Earned Value	10,00,000	7,50,000		
Actual Cost	12,50,000	5,00,000		

Soln:

Task	Planned Value	Earned Value	Actual Cost
1	11,10,000	10,00,000	12,50,000
2	6,00,000	7,50,000	5,00,000
3	25,00,000	—	—
4	8,00,000	—	—
		⇓	⇓
	BCWS = 17,10,000	BCWP = 17,50,000	ACWP = 17,50,000
	BAC = 50,10,000		

$$SPI = \frac{BCWP}{BCWS} = \frac{17,50,000}{17,10,000} = 1.02$$

$$SV = BCWP - BCWS$$

$$= 17,50,000 - 17,10,000$$

$$SV = 40,000$$

$$\text{Percent Schedule Completion} = \frac{BCWS}{BAC} = \frac{17,10,000}{50,10,000} = 0.34 \Rightarrow 34\%$$

$$\text{Percent Complete} : \frac{BCWP}{BAC} = \frac{17,50,000}{50,10,000} = 0.349 \Rightarrow 35\%$$

$$CPI = \frac{BCWP}{ACWP} = \frac{17,50,000}{17,50,000} = 1$$

$$CV = BCWP - ACWP = 17,50,000 - 17,50,000 = 0$$

Since, SV is +ve and SPI is > 0 , the above Project is ahead of Schedule.

CV is 0 and CPI is 1, the project is On Budget.

LOC Based Estimation

Formula

$$i) \text{ Cost of LOC} = \frac{\text{Average Labour Cost}}{\text{Average Productivity}}$$

~~Cost Per Line of Code~~

$$ii) \text{ Total Estimated Project Cost} = \text{Cost of LOC} \times \text{Total Estimation}$$

$$iii) \text{ Total Estimated Project Effort} = \frac{\text{Total Estimation}}{\text{Average Productivity}}$$

FP Based Estimation

Formula

$$i) \text{ Cost Per FP} = \frac{\text{Average Labour Rate}}{\text{Average Productivity}}$$

$$ii) \text{ Total Estimated Project Cost} = \text{Cost per FP} \times \text{Count Total}$$

$$iii) \text{ Total Estimated Project Effort} = \frac{\text{FP Estimated}}{\text{Average Productivity}}$$

Process Based Estimation

$$\text{Total Estimated Project Cost} = \text{Effort} \times \text{Labour Rate}$$