

Earned Value Analysis (EVA)

The earned value concept (some times called achieve value) compares several measures to obtain an overall picture of project status. The following are three primary data requirement:

□ BCWS:(Budgeted Cost of Work Scheduled):

This measure is also called the project plan ,is developed at the outset of the project as it involves assigning to activities the amount budgeted (estimated) for every activity .

□ BCWP: (Budgeted Cost of Work performed):

This is the earned value as it indicates what the budgets cost are for the work that has actually been performed to date. It requires making an assessment of the amount of work completed to date and then applying the appropriate budget amounts for this work

➤ BAC: (Budget cost at completion):

This is the original cost estimate of the total cost of construction

➤ EAC: (Estimated cost at completion):

This is the forecast of the total actual cost required to complete a project based on Performance to date and estimates of future conditions.

Where earned value
 $BCWP = PC * BAC$

Where Pc: is present complete

□ ACWP (Actual Cost of Work performed):

This is the measure that brings together the monitoring of both time schedule and cost records it gives the actual

Earned Value Reporting - Costs

$$CV = BCWP - ACWP$$

$$CPI = \frac{BCWP}{ACWP}$$

CPI = 1, on budget

CPI < 1, over budget

CPI > 1, under budget

Earned Value Reporting - Schedule

$$SV = BCWP - BCWS$$

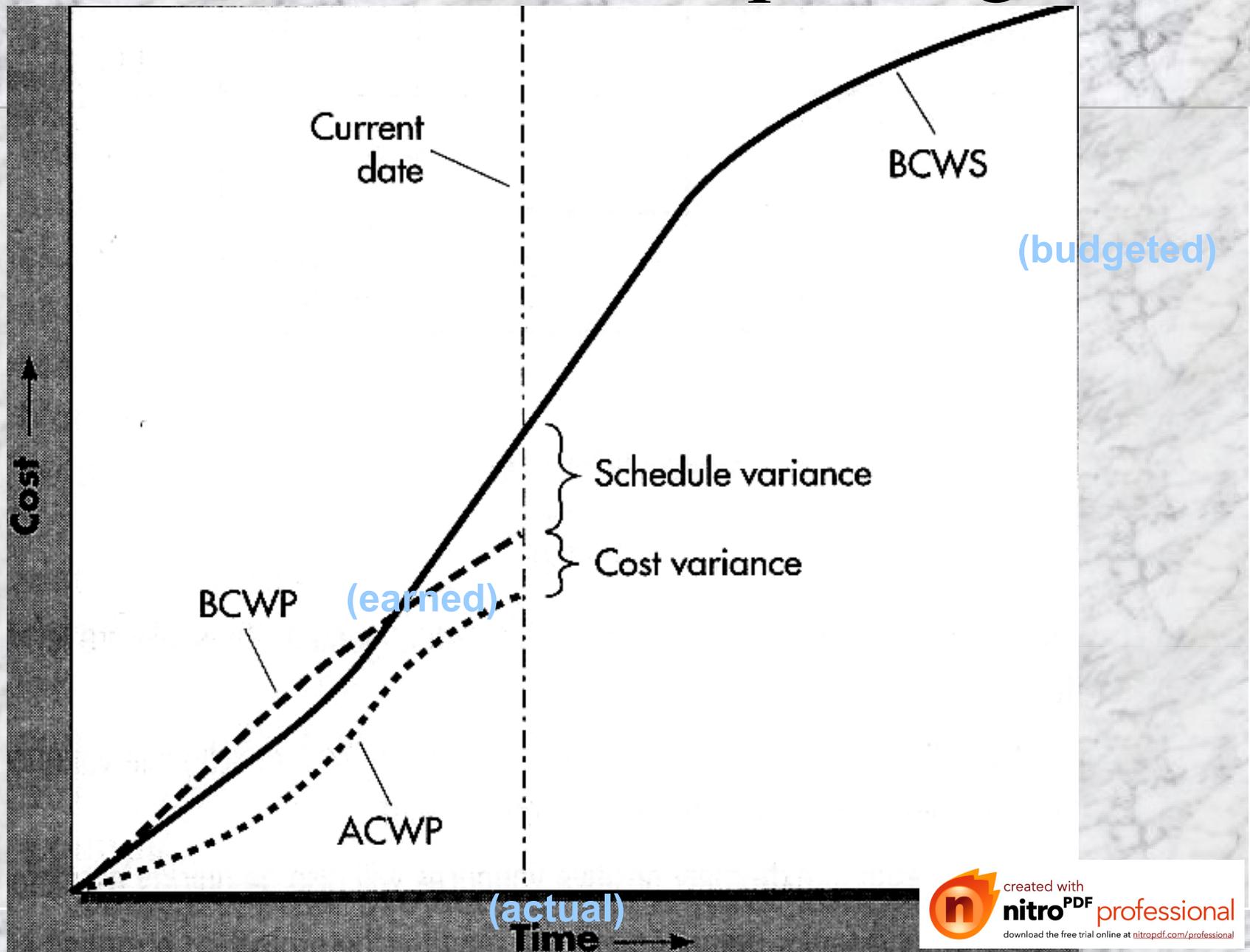
$$SPI = \frac{BCWP}{BCWS}$$

SPI = 1, on schedule

SPI < 1, behind schedule

SPI > 1, ahead of schedule

Earned Value Reporting



Example:

A simple problem will help to illustrate the application of the principles of earned value . A project has been defined that consist of 12 activities for which the estimated cost and duration have been defined see figure .

After three and a half month , the activates 1,2,4,5,7 are completed and (6) is one half complete and(8) is three –fourth complete and (3) is half complete. The incurred cost to date are 152000\$. What is the status of this project in terms of the schedule and the budget?

Activity	cost	m1	m2	m3	m4	m5	m6
1	\$22000	■					
2	\$10000		■				
3	\$18000			■			
4	\$30000		■				
5	\$50000			■			
6	\$40000				■		
7	\$6000				■		
8	\$16000				■		
9	\$13000					■	
10	\$4000					■	
11	\$34000						■
12	\$14000						■

Solution:

$$ACWP = 152000\$$$

$$BCWS = 22000 + 30000 + 50000 + 10000 + 18000 + 0.5(40000 + 6000 + 16000) = 161000\$$$

$$BCWP = 22000 + 30000 + 50000 + 10000 + 6000 + 0.5(40000) + 0.75(16000) + 0.5(18000) = 159000\$$$

$$SV = BCWP - BCWS = -2000\$ \quad \text{its behind schedule}$$

$$CV = BCWP - ACWP = 7000\$ \quad \text{below the budget}$$

$$EAC = ACWP + (BAC - BCWP) = 152000 + (257000 - 159000) = 250000\$$$