Earned Value Management

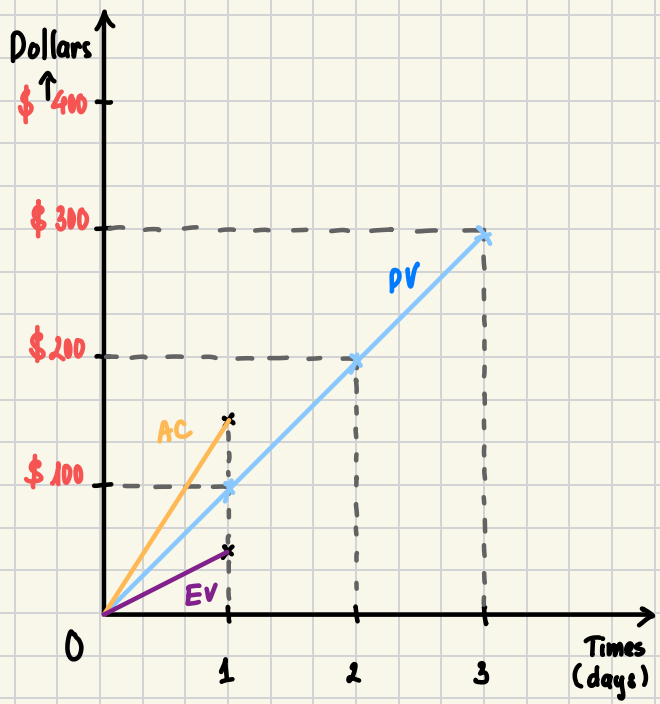
For examples:

Một dự án phần mềm được phát triển trong vòng 3 ngày với vốn đầu tư dự kiến là $300.

Day	1	2	3
planned LOC	100	200	300
Planned Cost	$100	$200	$300
Actual LOC	50		
Actual Cost	$150		
Earned Value	$50		

Planned Value ≈ Planned Cost

1. PV ☐
2. AC ☐
3. EC ☐

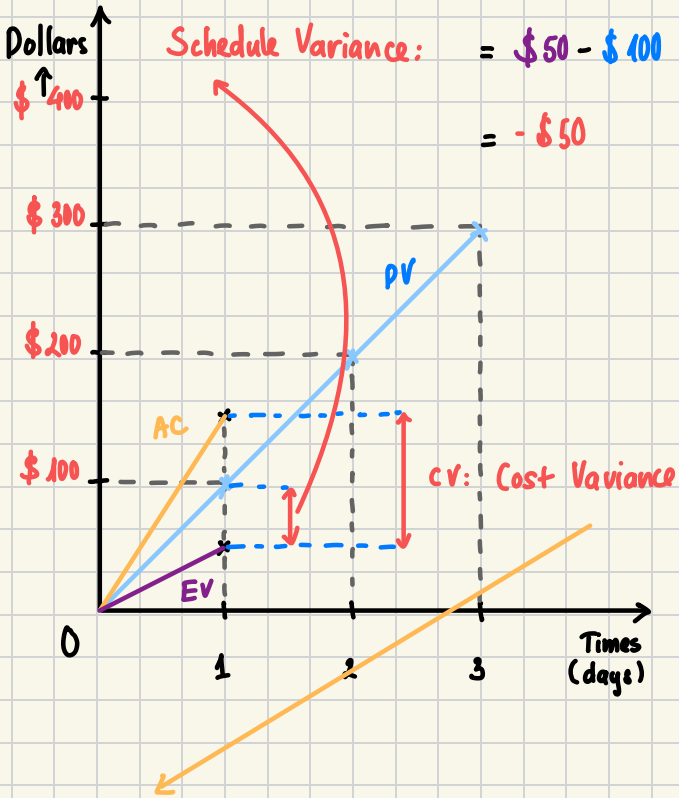


Day	1	2	3
Planned LOC	100	200	300
Planned Cost	$100	$200	$300
Actual LOC	50		
Actual Cost	$150		
Earned Value	$50		

$SV = EV - PV$

Schedule Variance: $= \$50 - \$100$

$= -\$50$



4. CV ☐

5. SV ☐

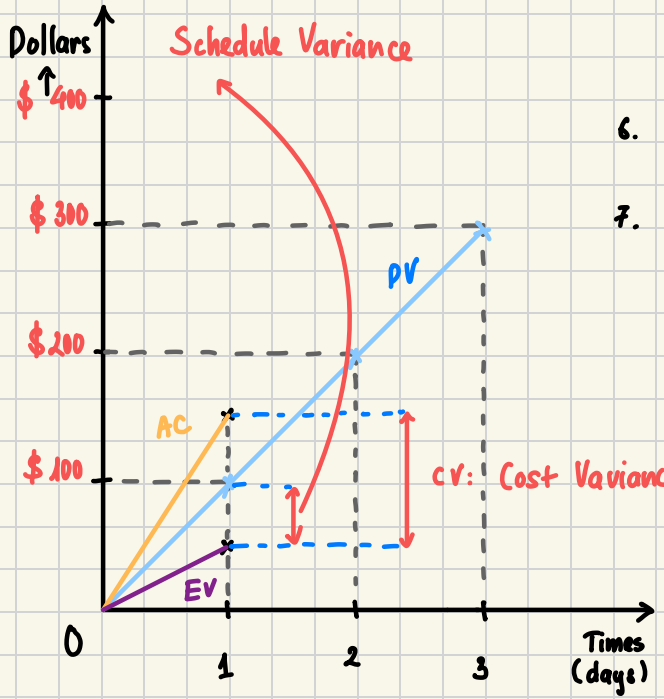
$CV = EV - AC$

$= \$50 - \$150$

$= -\$100$

↳ Conclusion: ⇢ We have cost overrun of $100

⇢ We are behind schedule by $50



6. CPI ☐

7. SPI ☐

1. Cost Performance Index

$$CPI = \frac{EV}{AC} = \frac{\$50}{\$150} \approx 0.3(3)$$

= Work done per $ spent

67% over budget

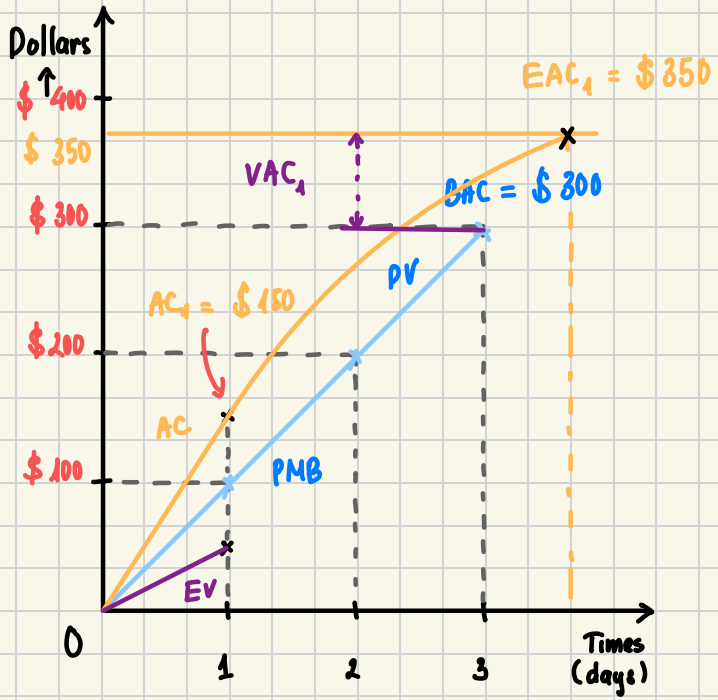
2. Schedule Performance Index

$$SPI = \frac{EV}{PV} = \frac{\$50}{\$100} = 0.5$$

= Work done against planned work

50% behind schedule

	CPI	SPI
< 1	Cost overrun	Behind Schedule
$= 1$	At par: Cost	At Par: Schedule
> 1	Cost underrun	Ahead of Schedule



1. Performance Measurement Baseline : Planned Value curve in totality

(Đường cơ sở đo lường hiệu suất)

Reference for performance check

2. Budget at Completion . Total Planned cost of the project

BAC = $300

3. Estimate at Completion : Estimated total project cost at a given point of time.

$EAC_1 = \$350$

4. **Estimate to Completion** : Additional budget required to meet the project objectives at a given point of time

ETC at time T

$$ETC_T = EAC_T - AC_T$$

$$ETC_1 = EAC_1 - AC_1$$

$$= \$350 - \$150$$

$$= \$200$$

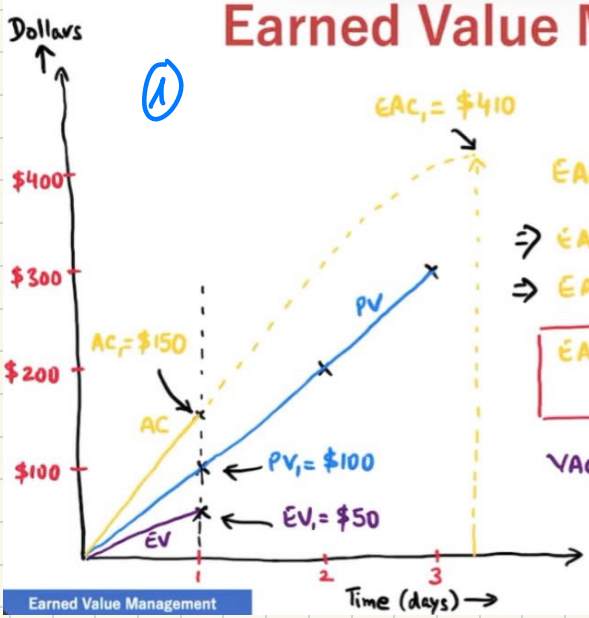
5. **Variance at Completion** : Gap between planned and estimated project cost at a given point of time

$$VAC_1 = BAC - EAC_1$$

$$= \$300 - \$350$$

$$= -\$50$$

Earned Value Management



Scenario 1

$EAC_1 = AC_1 +$ \$ Re-estimate of remaining work

$\Rightarrow EAC_1 = \$150 + \$260$

$\Rightarrow EAC_1 = \$410$

$EAC_T = AC_T +$ \$ Re-estimate at time T (Bottom-up ETC_T)

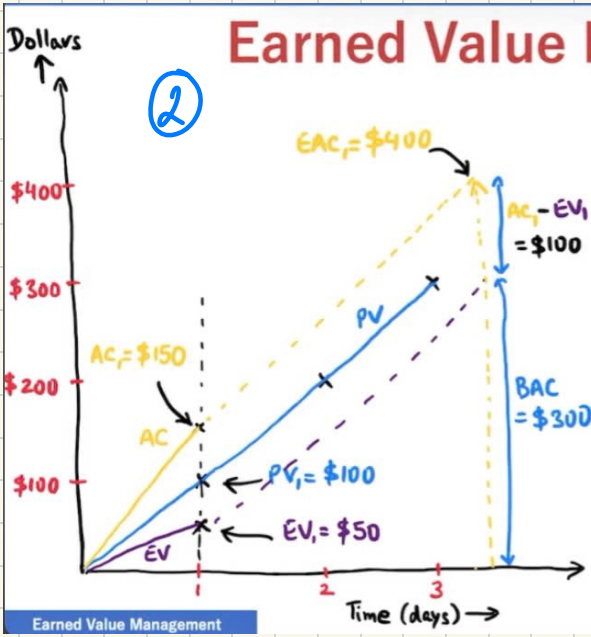
$VAC_1 = BAC - EAC_1$
$= \$300 - \$410$
$= -\$110$

$ETC_1 = EAC_1 - AC_1$
$= \$410 - \$150$
$= \$260$

Earned Value Management

Sunny Sensei

Earned Value Management



Work Remaining
$BAC - EV_T$

Scenario 2

$EAC_T = AC_T +$ Cost of remaining work at budgeted rate (as per the plan)

$\Rightarrow EAC_T = AC_T + (BAC - EV_T)$

$EAC_1 = \$150 + (\$300 - \$50)$

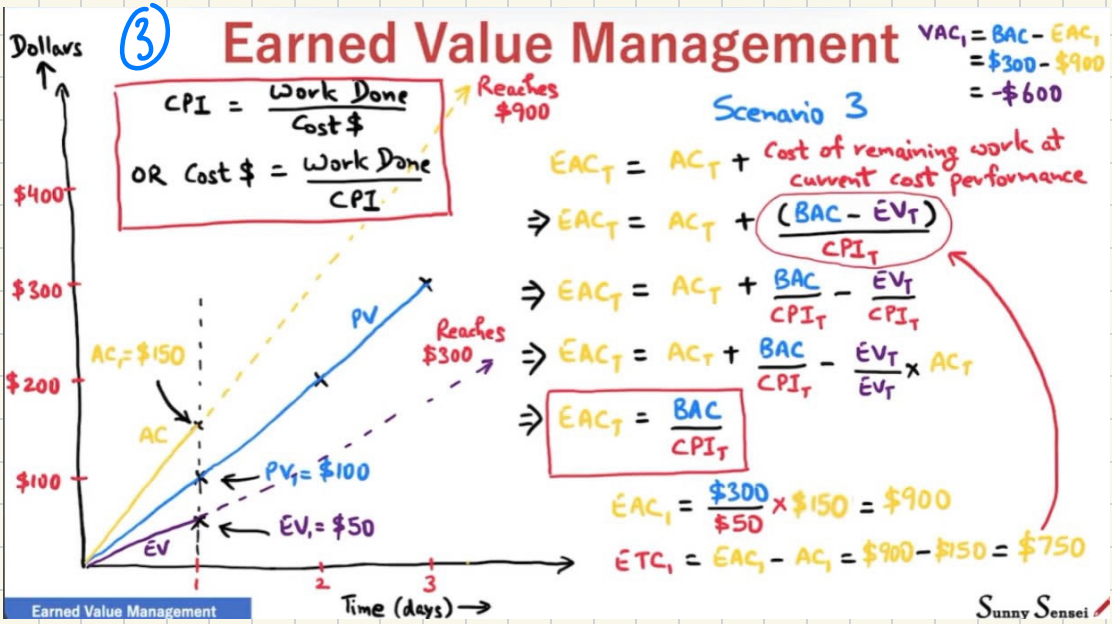
$\Rightarrow EAC_1 = \$150 + \$250 = \$400$

$VAC_1 = BAC - EAC_1$
$= \$300 - \$400$
$= -\$100$

$ETC_1 = EAC_1 - AC_1 = \$400 - \$150 = \$250$

Earned Value Management

Sunny Sensei



4 Earned Value Management

Scenario 4

$VAC_1 = BAC - EAC_1$
$= \$300 - \$1,650$
$= -\$1,350$

$ETC_1 = EAC_1 - AC_1$
$= \$1,650 - \$150$
$= \$1,500$

$EAC_T = AC_T +$ Cost of remaining work at current cost and schedule performance levels

$\Rightarrow EAC_T = AC_T + \dfrac{(BAC - EV_T)}{CPI_T \times SPI_T}$

$EAC_1 = \$150 + \dfrac{(\$300 - \$50)}{\$50/\$150 \times \$50/\$100}$

$= \$150 + \$250 \times 6$

$= \$150 + \$1,500 = \$1,650$

Earned Value Management

To Complete Performance Index (TCPI)

$TCPI_T$ = Cost Performance to achieve the cost target of BAC

$$\Rightarrow TCPI_T = \frac{\text{Remaining Work}}{\text{Remaining Budget}}$$

$$\Rightarrow \boxed{TCPI_T = \frac{BAC - EV_T}{BAC - AC_T}}$$ BAC is cost target

$$\boxed{TCPI_T = \frac{BAC - EV_T}{EAC_1 - AC_T}}$$ EAC is cost target

$BAC = \$300$ $EV_1 = \$50$ $AC_1 = \$150$

$$TCPI_1 = \frac{\$300 - \$50}{\$300 - \$150} = \frac{\$250}{\$150} = \frac{5}{3} \approx 1.67$$

BAC Based

$EAC_1 = \$900$

$$TCPI_1 = \frac{\$300 - \$50}{\$900 - \$150} = \frac{\$250}{\$750} = \frac{1}{3} \approx 0.33$$

EAC Based

Note: Expected Duration $= \dfrac{\text{Planned Duration}}{SPI}$