CSSE 372 Software Project Management: Earned Value Analysis (EVA) Exercises

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COURAGE
When force of will overpowers personal limitations
Create a plan for an intermediate size software project and manage to the plan. Maintain a software project schedule.

- Do some Earned Value Analysis
- Examine Estimated to Complete Values
- Determine good and bad Trends in the progress
You have the WBS and have identified the activities. Where do you start with Earned Value Analysis?

- Think for 15.11 seconds...
- Turn to a neighbor and discuss it for a minute
- Then can we talk?
Task – Develop and install ten printer drivers.

- **Budget** - $100,000 ($10K per printer driver)
- **Time** – 10 weeks (1 printer driver per week)

At week 5:

- 4 printer drivers developed and installed
- $47,500 spent to date

\[ PV = \$??? \]
\[ AC = \$??? \]
\[ EV = \$??? \]
Derived EVA Metrics: CV and SV

**Cost Variance**
- Comparison of the budgeted cost of work performed with actual cost
- Negative CV means the project is over budget

**Schedule Variance**
- Comparison of work performed during a period of time to what was scheduled to be performed
- Negative SV means the project is behind schedule

CV = EV–AC
SV = EV–PV
Earned Value Exercise (CV)

Cost Variance (CV)

\[ CV = EV - AC \]

= $???

**Good News**: If CV value is **positive**, the project is currently under budget (spending less than planned for the work)

**Bad News**: If CV value is **negative**, the project is currently over budget (spending more than planned for the work)
Cost Performance Index (CPI) 

\[ CPI = \frac{EV}{AC} \]

**Good News**: If CPI value is >1 or =1, the project cost trend is currently under or at planned budget

**Bad News**: If CPI value <1, the project cost trend is currently over budget
Good News: If CV% value is positive, the project is currently under budget by the CV%

Bad News: If CV% value is negative, the project is currently over budget by the CV%
Awkward!!!

OUR SON IS MISSING. HAVE YOU SEEN HIM ANYWHERE?
Schedule Variance (SV)

SV = EV - PV

Good News: If SV value is positive, the project is currently ahead of schedule

Bad News: If SV value is negative, the project is currently behind schedule
Earned Value Exercise (SPI)

Schedule Performance Index (SPI)

$$SPI = \frac{EV}{PV}$$

Good News: If SPI value is $>1$ or $=1$, the project schedule trend is currently ahead or on planned schedule

Bad News: If SPI value $<1$, the project schedule trend is currently behind schedule
Earned Value Exercise (SV%)

Schedule Variance % (SV%)

\[ SV\% = \frac{SV}{PV} \]

= ???%

**Good News**: If SV value is **positive**, the project is currently ahead of schedule.

**Bad News**: If SV value is **negative**, the project is currently behind schedule.
Earned Value Exercise

Task – Develop and install ten printer drivers.

- **Budget** - $100,000 ($10K per printer driver)
- **Time** – 10 weeks (1 printer driver per week)

At week 5:

- 4 printer drivers developed and installed
- $47,500 spent to date

**Values at Week 5:**

- **PV** = $50,000
- **AC** = $47,500
- **EV** = $40,000
- **CV** = -$7,500
- **CPI** = 0.84
- **SV** = -$10,000
- **CV%** = -19%
- **SPI** = 0.80
- **SV%** = -20%
But, when will we complete?

Estimate at Completion (EAC)

Actual costs to date plus a new estimate for all remaining work (original plan no longer valid)

\[ EAC = AC + ETC \]

(ETC \(\Rightarrow\) Estimate to Complete)
Well, it’s a little involved...

**Estimate at Completion (EAC)**

Actual costs to date plus remaining budget (current variances viewed as atypical of future variances)

Actual costs to date plus remaining budget modified by a performance factor (CPI) (current variances are viewed as typical of future variances)

$$EAC = AC + [(BAC - EV) / CPI]$$

$$\sim EAC = \frac{BAC}{CPI}$$
Earned Value – Performance Indices

Project: Alpha

Good Progress

Under budget
Ahead of schedule

Over budget
Behind schedule

Project Week
Earned Value – Performance Indices

Project: Beta

Divergent Progress

Under budget
Ahead of schedule

Over budget
Behind schedule

Project Week
Earned Value – Performance Indices

Project: Charlie

Losing Ground

Under budget
Ahead of schedule

Over budget
Behind schedule

Project Week

1.6
1.4
1.2
1.0
0.8
0.6
0.4

1 2 3 4 5 6 7 8 9
Recall: PV, EV and AC Curves
Cost and Schedule Variance

- Progress
- Actual
- Baseline
- Cost variance
- Schedule variance
- Update Date
- Time
Another View of Cost and Schedule Variance

- **PV** (Planned Value)
- **AC** (Actual Cost)
- **EV** (Earned Value)

**Progress** vs. **Time**

- **Schedule Variance**
- **Cost Variance**
I worry that Facebook is killing meaningful communication.

Like.
Homework and Reading Reminders

- Read ahead with Chapter 9 of text for Monday
- Complete Homework 5 – Software Schedule
  - Due by 11:55pm, Tuesday, October 9th, 2012
- Final Project – SW Proj. Mgt. Plan (SPMP)
  - Completed by team…
  - Due by 11:55pm, Friday, November 2nd, 2012.
  - No late days – review swap with another team
- Complete Homework 6 – Earned Value Analysis
  - Due by 11:55pm, Tuesday, October 16th, 2012

- Have a great Fall break!