Integrated Cost & Schedule Control

TCM 545/645 – Project Control Systems Week 2

Basic Control Processes

- Like most business and engineering systems, basic project control is based upon:
 - The definition and establishment of key measures, And
 - The comparison of those measurements against a desired value or standard
- These comparisons are then used algebraically to determine if and when corrective actions may be needed

What To Measure and Control?

- Once the decision is made that control processes will be implemented, it is very important to select key items for analysis
- Project performance typically involves trade-offs between
 - What is done (e.g., scope and quality)
 - Quality involves built-in and inspected quality
 - What resources are consumed (e.g., time and cost)
 - Resources are also concerned with external factors that may affect productivity
 - Risks and satisfaction levels are also measures to observe

What To Measure and Control (2)

- A list of possible things to measure when designing a control systems includes:
 - Scope (percent complete)
 - Time (calendar)
 - Cost
 - Risk
 - Quality
 - Satisfaction
 - Project team, customer, and other stakeholders

Earned Value Analysis (or Earned Value Management)

- One possible solution to the control system problem is the utilization of EVA (or EVM depending on which organization you cite)
- EVA utilizes a combination of <u>Cost</u> and <u>Schedule</u> parameters to monitor and control project performance
- To perform and EVA, the following information is needed:
 - Budgeted cost and original (baseline) schedule
 - Actual cost (to date)
 - Percent complete

EVA Information Needs/Details

- Budgeted cost and original (baseline) schedule
 Estimated cost and original schedule are combined to
 - Estimated cost and original schedule are combined to make a cost-loaded schedule commonly referred to as the "Baseline"
 - All future project status reports are compared to baseline
- Actual cost (to date)
 - A tally of the actual money spent in a given time period
 - Should be a sum of all completed and started (not completed) work plus the associated overhead



- Percent Complete Data
 - Subjective assessment of performance vs. schedule
 - Assessed regularly for every work package
 - Requires <u>competency</u>, <u>candor</u>, and <u>trust</u>
 - These are critical success factors for implementing a "good" earned value system within an organization

Earned Value Definitions

- PV = planned value (also called BCWS: budgeted cost of work scheduled)
- AC = actual cost (or ACWP: actual cost of work performed)
- EV= earned value (or BCWP: budgeted cost of work performed)











Earned Value Example 2

- Second example
 - Assess not only current state of the project, but also
 - The project's likely completion cost

F	Ea	rn	ee	1	Va	ılı	ıe	Exa	mple	2			
								Budget	% Scheduled	PV	% Complete	EV	AC
A		-						A 220	100	220	100	220	240
в		-						B 190	100	190	100	190	180
С	-	_						C 250	100	250	50	125	150
D	-							D 90	100	90	100	90	110
E				-	1			E 350	100	350	50	175	190
F								F 400	50	200	100	400	380
G						_		G 250	0	0	0	0	0
н						_		H 140	0	0	0	0	0
ı.								I 240	0	0	0	0	0
_	1	2	3	4	5 we	6 eks	7	2,130		1,300		1,200	1,250

Earned Value Example 2

Status summary analysis, end of week 4:

- 1. Project Cost to date \$1,250
- 2. Value of work completed, EV = \$1,200
- 3. Value of work remaining,
 - \$2,130 \$ 1,200 = \$930
- 3. CPI = 1,200/1,250 = 0.96
- 4. Likely cost to complete project 930/0.96 = \$969

Earned Value Example 2

Second Example (cont'd)

- Likely project cost at completion
 - □ \$1,250 **+** \$969 **=** \$2,219
- Project cost variance
 - □ \$2,130 \$2,219 = -\$89 (4.2% overrun)



- Earned value is assessed continually
- Actual expenditures (AC) and actual work completed (EV) are assessed vs. budget and schedule (PV)







Value of Earned Value ?

Enables

- simultaneous assessment of % completion, schedule, and cost performance
- information about work packages to be rolled up to provide a project-wide assessment
- forecasts of cost and date at completion

Assumes

- valid estimates of % complete (key!!!)
- actual expenditures coincide with work performed (no delayed or advance payment)

