Chapter 16
Cost Schedule Control System Criteria
CPM is generally used for controlling time
- It can also be effectively used to control quality, safety, and costs

Time and costs are typically tracked separately
- If a project is ahead of schedule it may not be on budget
  - Excessive use of equipment, workers, etc.

How do we measure progress by considering both time and costs?
- Cost/Schedule Control System Criteria (C/SCSC)
Three key performance measures:

- **Budgeted cost of work scheduled (BCWS) - original budgeted or planned cost of the work scheduled to be accomplished through the analysis date**
  - Could be a percent complete if the activity is not finished

- **Budgeted cost of work performed (BCWP) – original planned cost of the actual work that has been accomplished**
  - Could be a % complete
  - Total amount of money that the owner owes

- **Actual cost of work performed (ACWP) – cost of the work that has been accomplished**
Variance-
- Deviation from the planned costs or schedule to the actual costs or schedule
- Can be favorable or unfavorable

Three types
- Cost variance (CV)
- Schedule variance (SV)
- Total variance (TV)
Cost Variance

CV – comparison between the budgeted cost of the work performed and the actual cost of work performed
- CV = BCWP – ACWP
  - Positive CV = costs under budget
  - Negative CV = costs over budget

Percent cost variance (PCV)
- CV / BCWP or PCV = (BCWP – ACWP) / BCWP
Schedule Variance

- **SV** – comparison between the budgeted cost of the work performed and the budgeted cost of the work scheduled
  - **SV = BCWP – BCWS**
  - Used when activity progress is measured based on the budget (50% of budget expended, activity is 50% complete)
    - Positive variance is good
  - Does not indicate the number of days the project is ahead or behind

- Percent schedule variance (PSV) = SV / BCWS
Total Variance

- TV – comparison between the budgeted cost of work scheduled and the actual cost of work performed
  - TV = BCWS – ACWP
    - Positive TV is favorable, but this could be because the project is behind schedule
- Percent total variance (PTV) = TV / BCWS
  - Or PTV = (BCWS – ACWP) / BCWS
Cost performance index (CPI) –
- Alternate form of comparison for the project
  - $\text{CPI} = \frac{\text{BCWP}}{\text{ACWP}}$
  - If the CPI is $> 1$ the project is under budget

Schedule performance index (SPI) –
- $\text{SPI} = \frac{\text{BCWP}}{\text{BCWS}}$
- If the SPI $> 1$ the project is ahead of schedule
The C/SCSC data can be represented in graphical form

See pg 191

Works well with a computer
- Excel, Project
The Cost/Schedule Control System Criteria helps the management to analyze time and costs together
- Costs and time streams are kept separate
  - Actual costs are compared to budgeted costs
  - Actual durations are compared to budgeted durations

Action can be taken when variances become unacceptable

Gives the manager another tool for analyzing the progress of the project