# Lecture 10
# Chapter 9
# Project Cost Management

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# Outline

- Cost Management Basics
  - Cost & Project
  - Cost Management
- Cost Estimating
  - Types of cost estimate
  - Estimate Process vs Accuracy
  - Enterprise Environmental Factors
  - Organizational Process Assets

# Project Cost Management Basics

- Project Cost Management includes the processes involved in planning, estimating, budgeting and controlling cost so that the project can be completed within the approved budget.
- Costs is a resource sacrificed or foregone to achieve a specific objective or something given up in exchange.
- Cost are usually measured in monetary units like Rupees, Taka.
- Types Of Cost
  - Direct Cost – Cost of labor, Resource, Machinery
  - Overhead Cost – Cost of building, rent, Maintenance, Insurance, Vacation
  - Administrative Cost – Coat due to Management Expenses, HRM & HRD activities

# Product Cost VS Project Cost

- Product Cost :
  - Material Cost + Manufacturing Cost + Overhead Cost = Sales Price
  - Where,
  - Overhead Cost = Project other overhead costs + Project Cost + Profit
- Project Cost = Project’s Labor Cost + Resource Cost + Special Machinery Cost

# Basic principles of Project Cost Management

- Profits are revenues minus expenses
- Life Cycle costing is estimating the cost of a project plus the maintenance costs of the products it produces
- Cash flow analysis is determining the estimated annual costs and benefits for a project
- Benefits and costs can be tangible or intangible
- Sunk cost should not be a criteria in project costing

# Cost Management Plan can establish

- Precision Level
- Units of Measure
- Organizational procedures links
- Control thresholds
- Earned value rules
- Reporting Formats
- Process Descriptions

# Cost Estimating

- Cost estimating is a process of developing an approximation for the cost of the resources necessary to complete the project activities.
- Cost estimating also includes identifying and considering cost alternatives
- Cost estimating process is a part of “Project Planning Phase”

# Types of cost estimates

| Types of Estimates | When Done | Why Done | How Accurate |
|---|---|---|---|
| Rough order of Magnitude (ROM) | Very early in the project cycle, often 3-5 years before project completion | Provides rough ballpark of cost for selecting decisions | -25%,+75% |
| Budgetary | Early, 1-2 years cost | Puts dollars in the budget plans | -10%, +25% |
| Definitive | Laster in the project < 1 year out | Provides details for purchases, estimate actual costs | -5%, +10% |

# Cost Estimating Tools

- Analogous
  - Top-down
  - Expert Judgement
  - Comparision with other similar projects
  - Less accurate than other tools
- Data driven
  - Determine Resource Cost Rates
- Bottom- up
  - Estimate made at the work package of the WBS and then rolled up
  - Relatively more accurate
  - Need sufficient information to make an accurate estimates
- Parametric Modeling
  - Mathematical modeling
  - Similar to analogous top-down
  - Better to be used with historical info
- Project Management Software
- Vender Bid Analysis

# Cost Control Measures

- Influecning the factor that causes changes to the cost baseline
- Ensuring all requested changes are agreed upon
- Managing the actual changes when and as they occur
- Assuring that potential cost overruns do not exceed the authorized funding periodically or in total for the project
- Monitoring cost performance to detect and understand variances from the cost baseline
- Recording all appropriate changes accurately against the cost baseline.
- Acting to bring expected cost overruns within acceptable limits

# Earned Value Analysis

- Any deviation in schedule, performance or cost from the plan or from the set standard is called variance. In order to identify variances, first of all we should understand the following basic terms:
- Budgeted cost of work scheduled (BCWS)
- Budgeted cost of work performed (BCWP), which is also called Earned Value
- Actual cost of work performed (ACWP)

# Cost Variance

- Cost variance (CV) is the difference of Budgeted Cost of Work Performed (earned value) minus Actual Cost of Work Performed. It can be expressed as:

- CV = BCWP – ACWP,

  where negative variance indicates cost overrun.

# Schedule Variance

- schedule variance (SV) is the difference of Budgeted Cost of Work Performed (earned value) minus Budgeted Cost of Work Schedule. It can be expressed as:

- SV = BCWP – BCWS

  where negative variance indicates time overrun.

# Cost & Schedule Performance

Cost performance

- Cost performance can be obtained by multiplying earned value (BCWP) by Actual Cost of Work Performed (ACWP), which can be expressed as:

  Cost performance = BCWP/ACWP

Schedule performance

- Schedule performance can be obtained by multiplying earned value (BCWP) by Budgeted Cost of Work Schedule, which can be expressed as:

  Schedule performance = BCWP/BCWS

# Example

- 50 units of plantation have to be done in two weeks period. Per unit cost of plantation is estimated as Rs. 200 of which progress monitoring was done one week after the work was started. Only 40 % work was found completed and the account record showed that the actual expenditure (cost) for plantation per unit was Rs. 250.

- Here,
  - BCWS = 25 * 200 = Rs. 5000
  - BCWP = 20 * 200 = Rs. 4000
  - ACWP= 20 * 250 = Rs. 5000

Now,
Cost variance (CV) = BCWP – ACWP
= 4000 – 5000 = - 1000 (Indicating cost overrun)

Schedule variance (SV) = BCWP – BCWS
= 4000 – 5000 = - 1000 (Indicating time overrun)

One of the key parameters used in variance analysis, said Harold Kerzner, is the “earned value” concept, which is the same as BCWP.

Earned value is a forecasting variable used to predict whether the project will finish over or under the budget.

Cost performance = BCWP/ACWP

= 4000/5000 = 0.80

Schedule performance = BCWP/BCWS

= 4000/5000 = 0.80

Since the cost performance is 0.80, the final cost would be:

50 units * Rs 200)/0.80 = Rs. 12500 (instead of estimated Rs. 10,000)

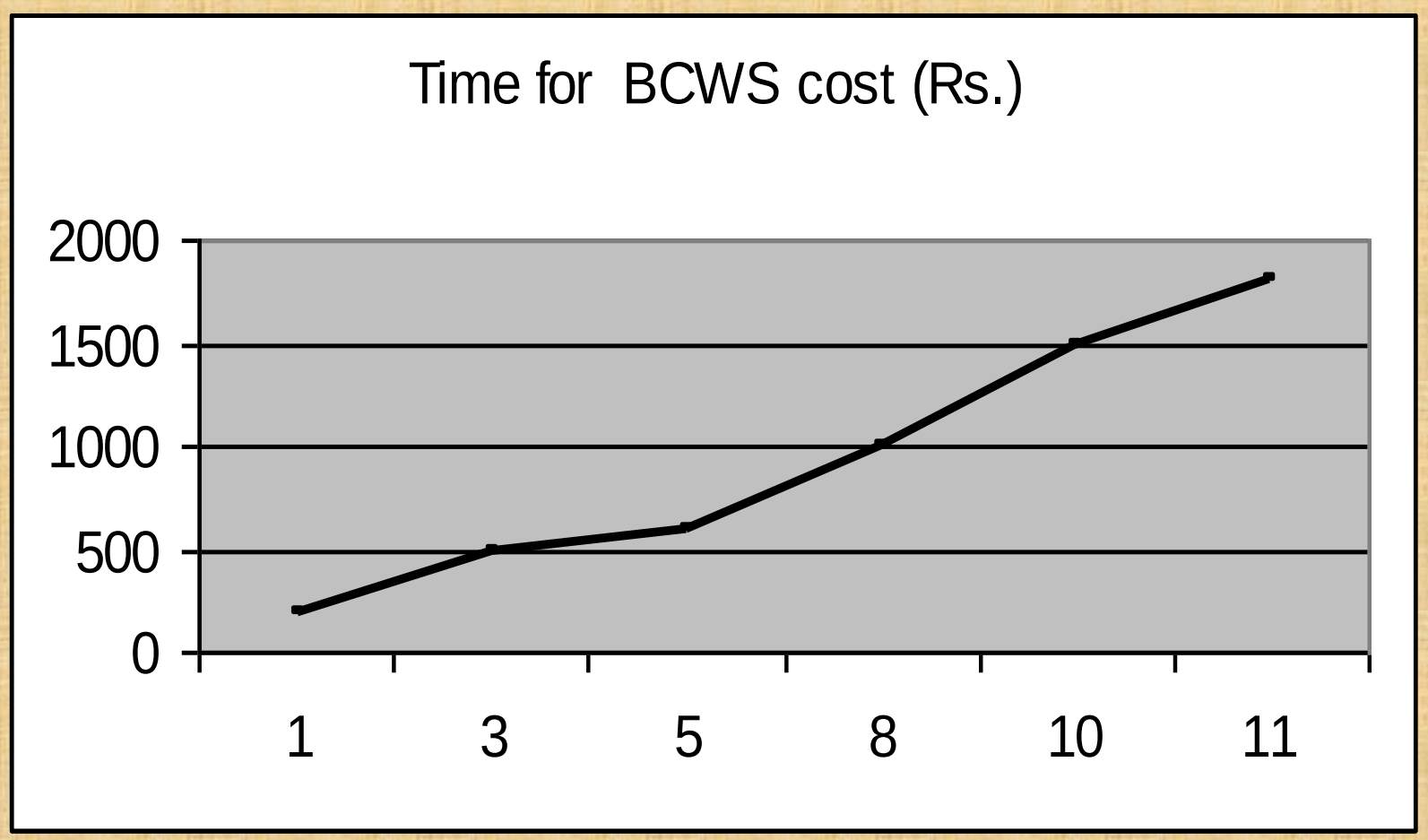
Since the schedule performance is 0.80, the time it requires for completion would be:

2 weeks/0.80 = 2.5 weeks (instead of scheduled time 2 weeks)

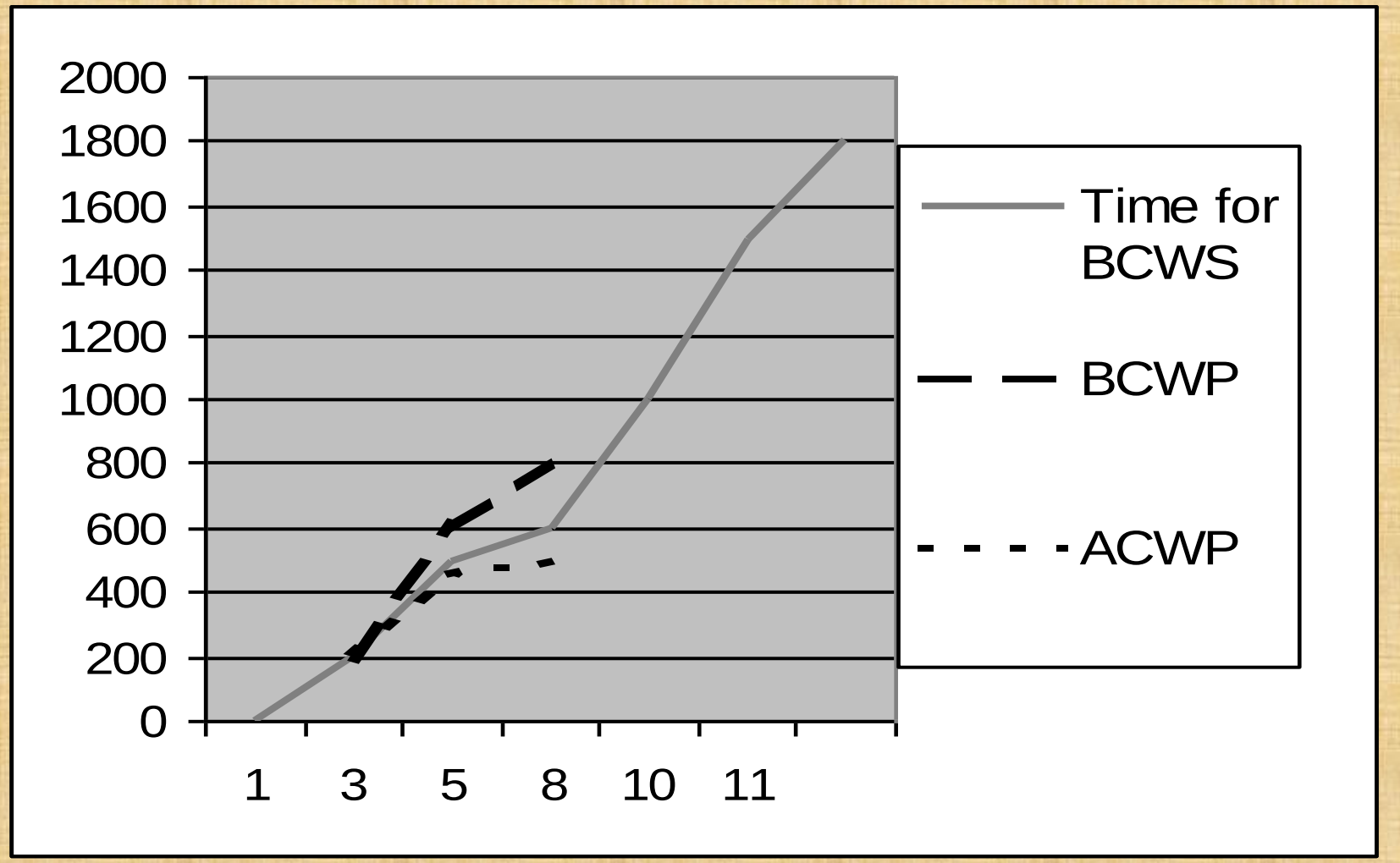
We can graphically present both the cost and schedule variances by using **S – Curve**, which is also used as one of the effective tool in project control.

| Activity | Cost (Rs.) | Duration (Week) | BCWS (Rs.) | BCWP (Rs.) | ACWP (Rs.) |
|---|---|---|---|---|---|
| A | 200 | 1 | 200 | 200 | 200 |
| B | 300 | 3 | 500 | 600 | 450 |
| C | 100 | 5 | 600 | 800 | 500 |
| D | 400 | 8 | 1000 | | |
| E | 500 | 10 | 1500 | | |
| F | 300 | 11 | 1800 | | |

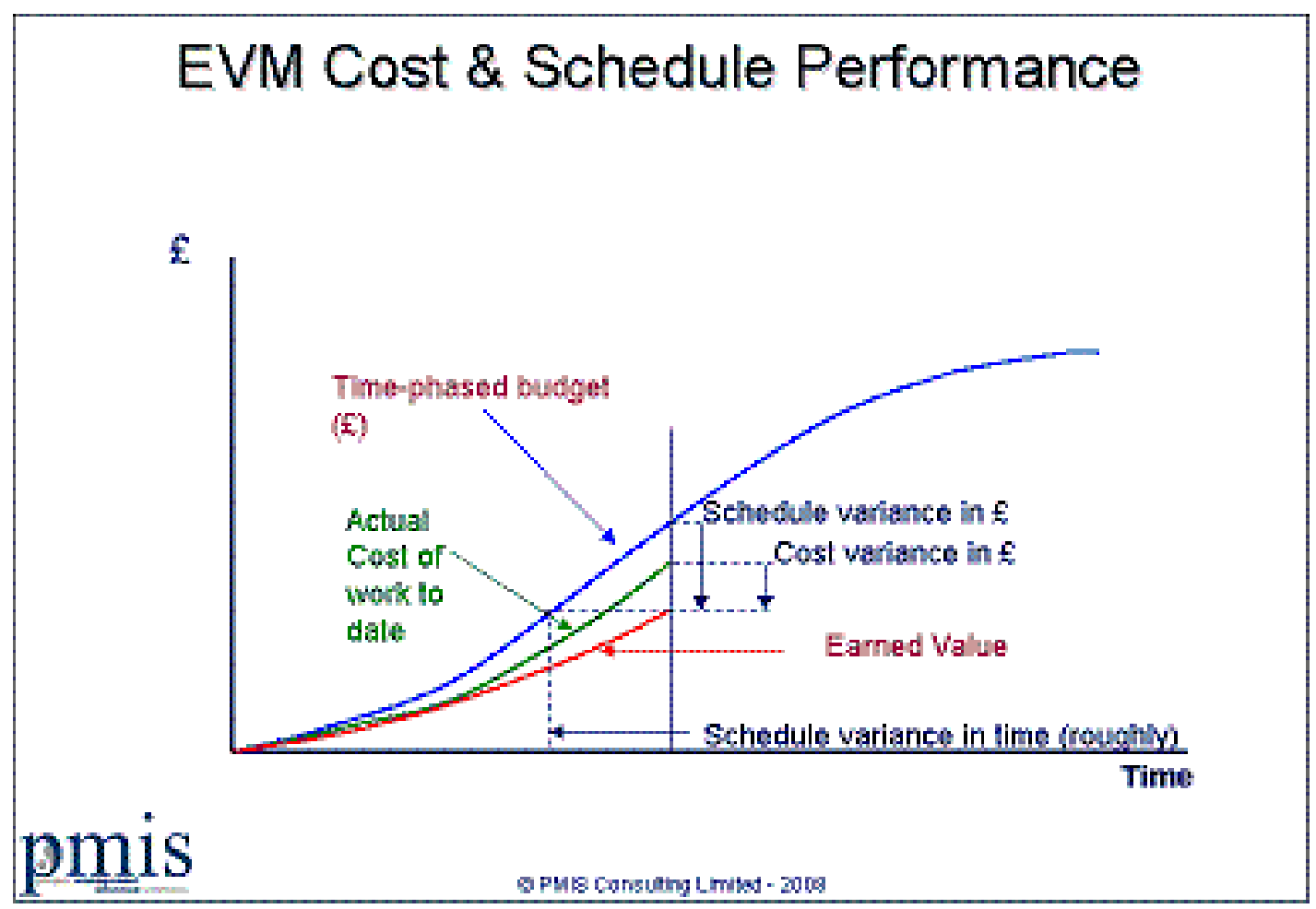
# S Curve



# S Curve


2000
1800
1600
1400
1200
1000
800
600
400
200
0
1
3
5
8
10
11
Time for BCWS
BCWP
ACWP

# Earned Value Mangement



# Thank You

You can teach a student a lesson for a day; but if you can teach him to learn by creating curiosity, he will continue the learning process as long as he lives.

~Clay P. Bedford