

# Project Monitoring & Performance Reporting

## Earned Value Management (EVM)



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# EARNED VALUE MANAGEMENT

## What Is It?

- ▣ Project management technique for measuring project performance and progress in an objective manner
- ▣ Has the ability to combine measurements of scope, schedule, and cost in a single integrated system

# EARNED VALUE MANAGEMENT ... 2

**It help us answer these question:**

- **Are we ahead of or behind schedule?**
- **How efficiently are we using our time?**
- **Are we under or over budget?**
- **How efficiently are we using our resources?**
- **When is the project likely to be completed?**
- **What is the remaining work likely to cost?**
- **What is the entire project likely to cost?**
- **How much will we be under or over budget?**

# EARNED VALUE MANAGEMENT ... 3

It comprises of:

- **Earned Value Analysis (EVA)**
  - Progress tracking
  - Forecasting
  
- **Earned Value Technique (EVT)**
  - Physical works (tangible)
  - Non-physical works (in-tangible)



# Project Monitoring & Performance Reporting

## Earned Value Analysis (EVA)



# EARNED VALUE ANALYSIS

**Value of  
planned work**

- Planned Value (PV)
- Budgeted Cost of Work Scheduled (BCWS)

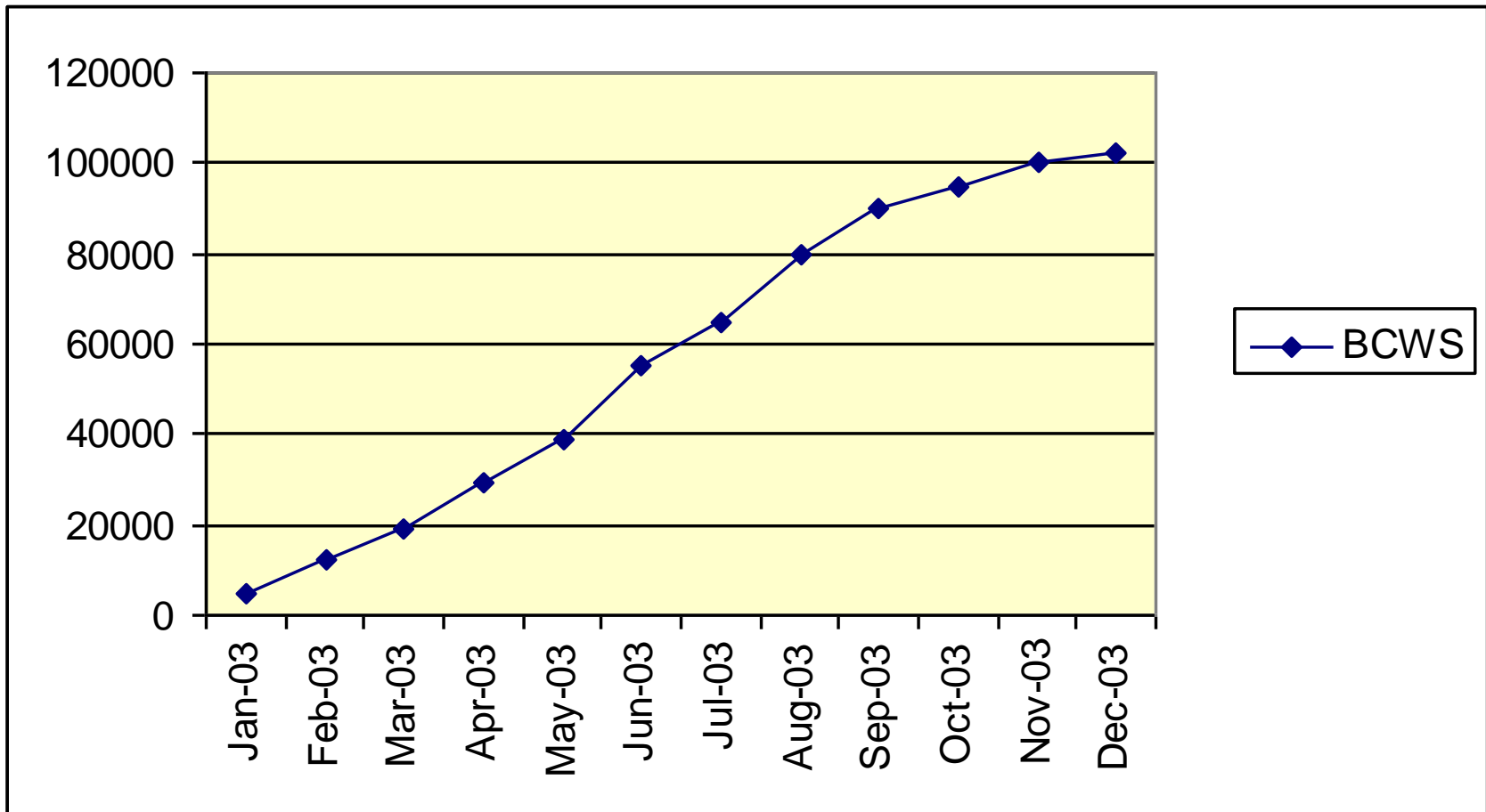
**Work  
accomplished**

- Earned Value (EV)
- Budgeted Cost of Work Performed (BCWP)

- Actual cost incurred for the work accomplished (AC)
- Actual Cost Work Performed (ACWP)

**Earned  
Value  
Analysis**

# Planned Value or BCWS

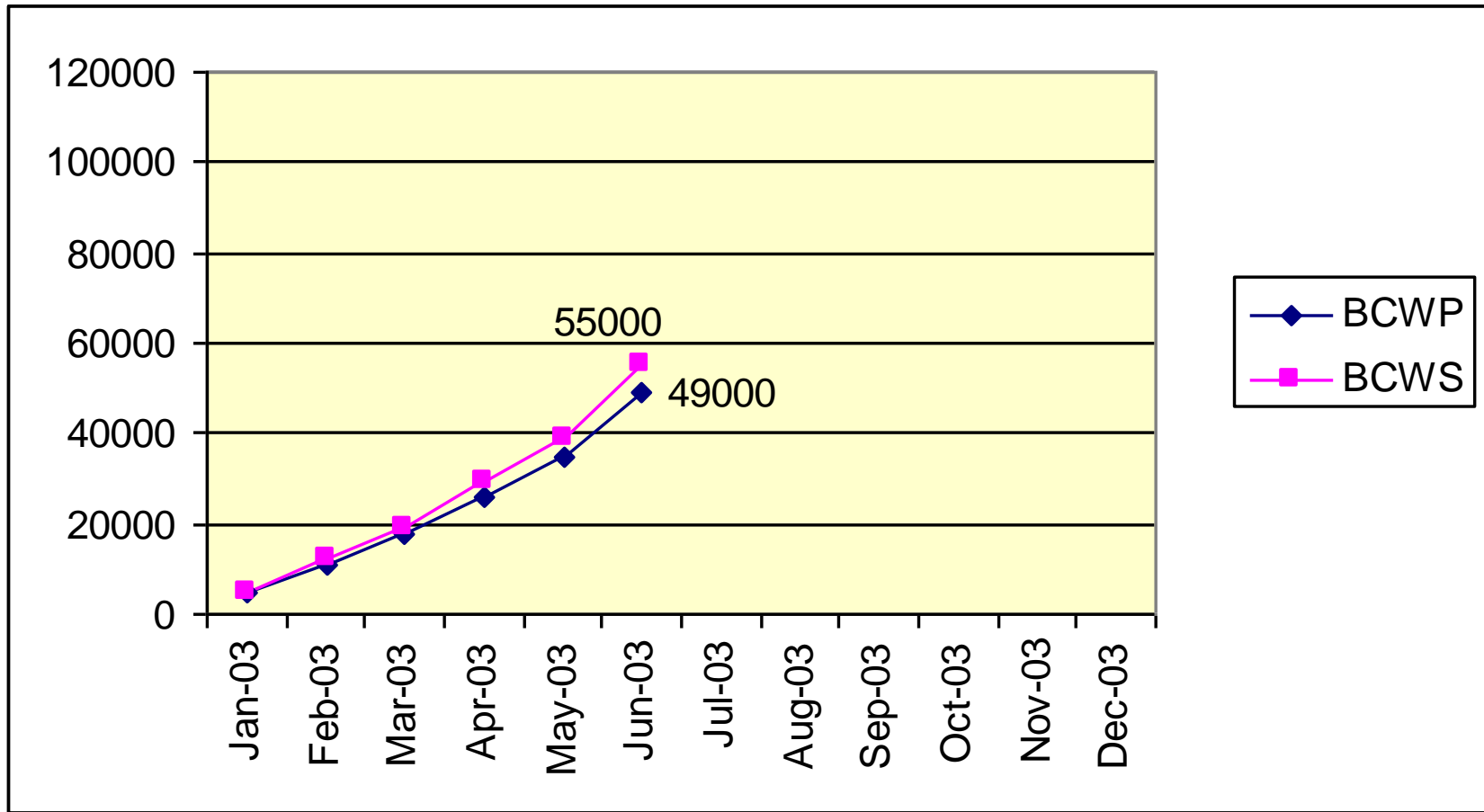


# How Are We Doing?

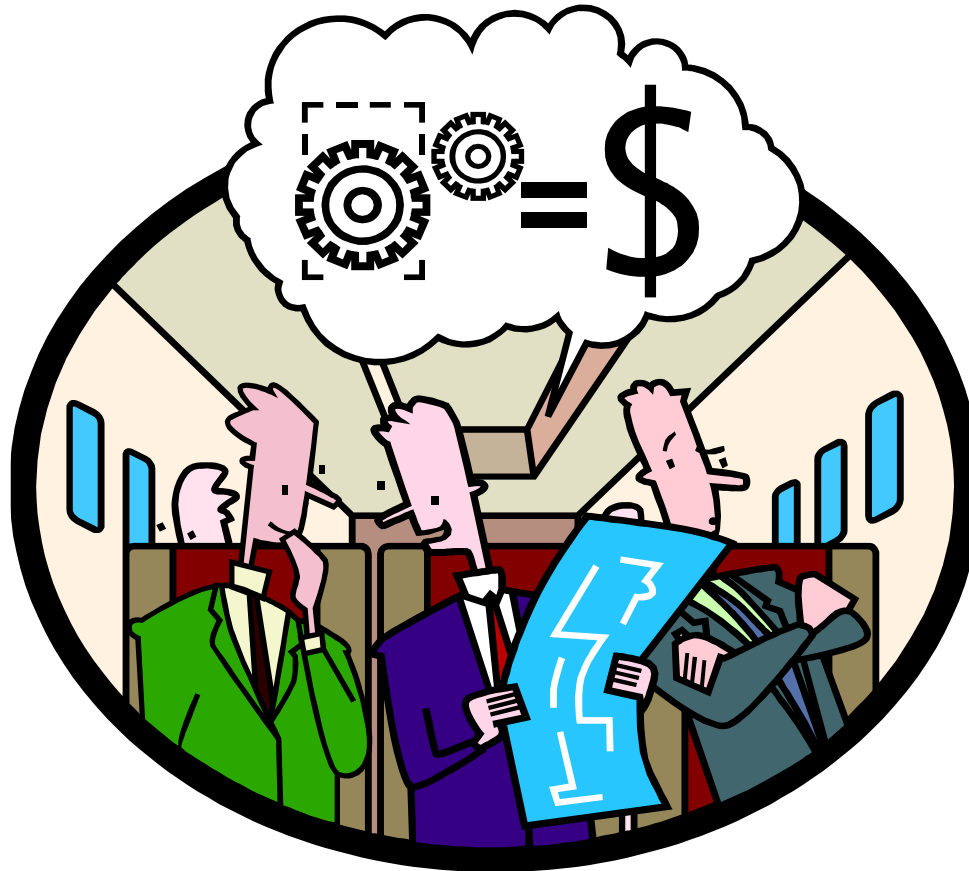




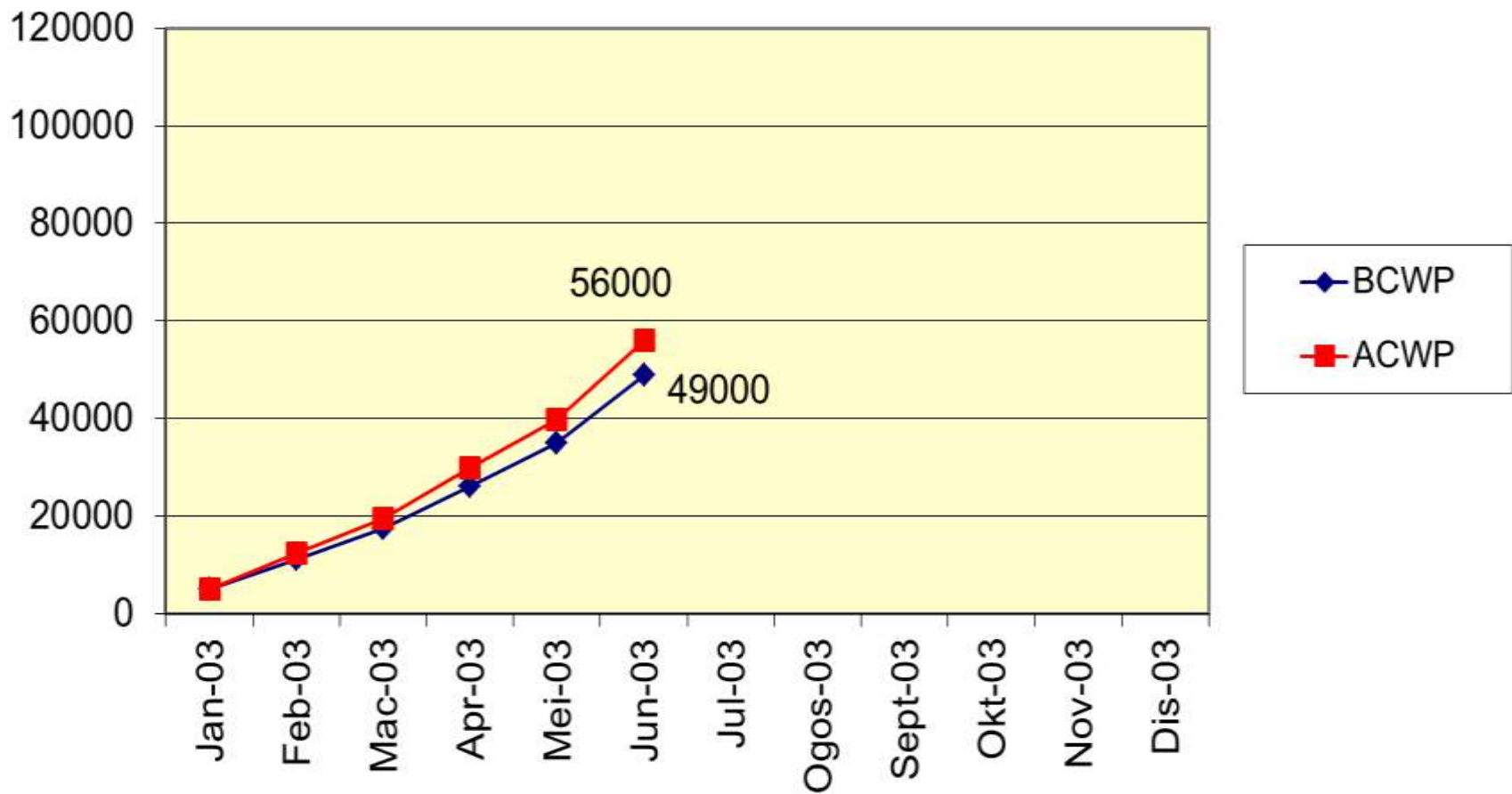
# Earned Value or BCWP



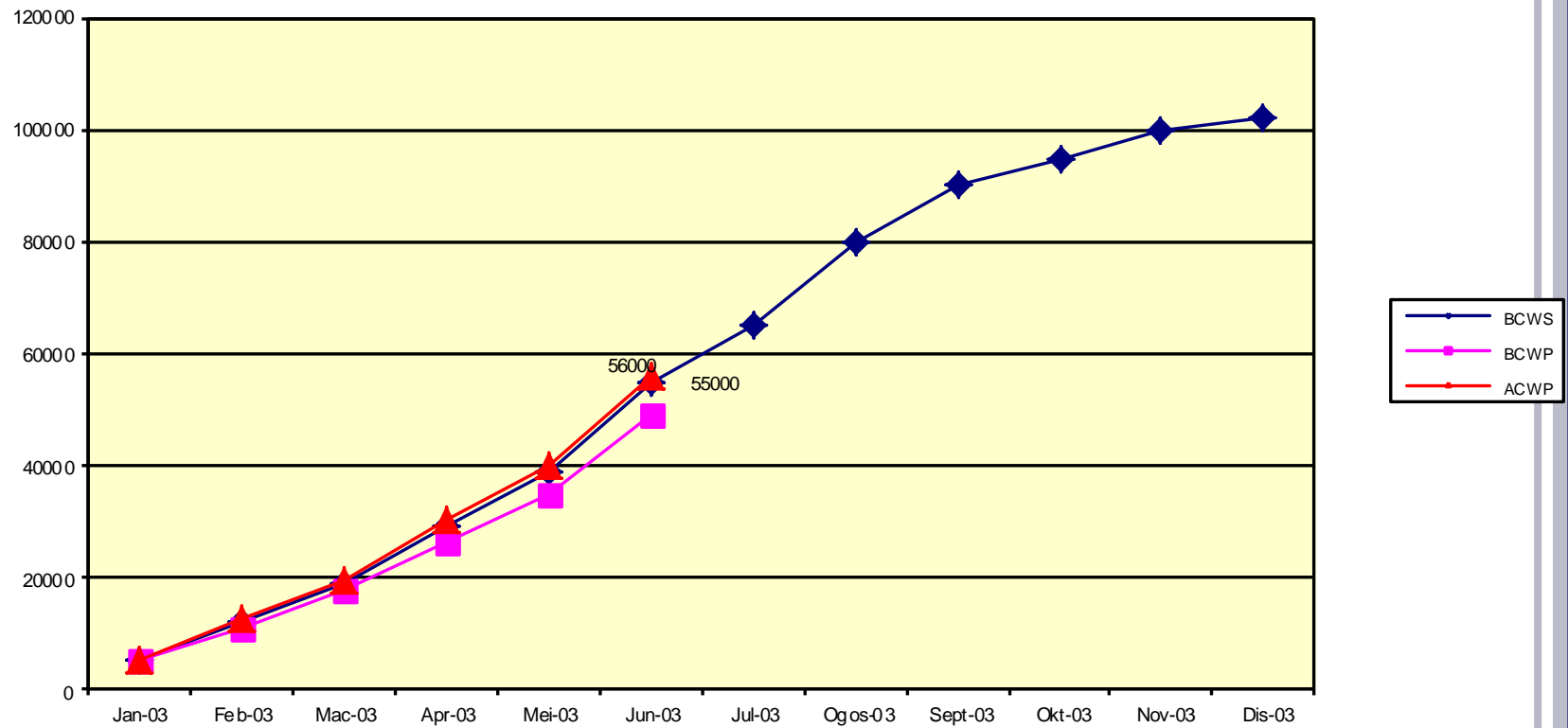
# Are We Under or Over Budget ?



# Actual Cost or ACWP



# The Whole Story



# Some Derived Metrics

## ➔ **SV: Schedule Variance (EV - PV)**

- A comparison of amount of work performed during a given period of time to what was scheduled to be performed.
- A negative variance means the project is behind schedule

## ➔ **CV: Cost Variance (EV - AC)**

- A comparison of the budgeted cost of work performed with actual cost.
- A negative variance means the project is over budget.

# Schedule Variance & Cost Variance

**Schedule Variance = EV - PV**

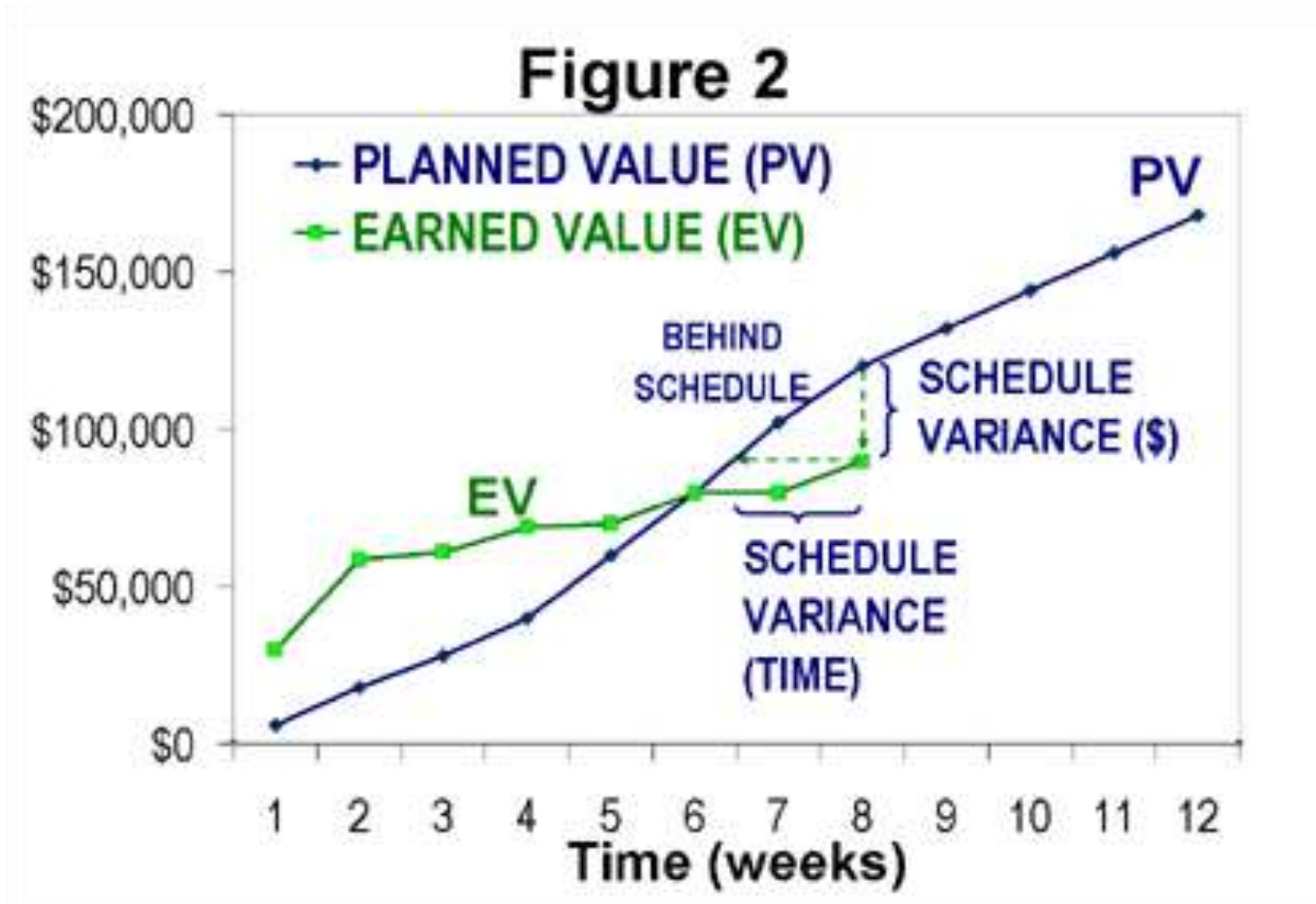
$$\begin{array}{r} \$49,000 \\ - \underline{55,000} \\ \text{SV} = - \$ 6,000 \end{array}$$



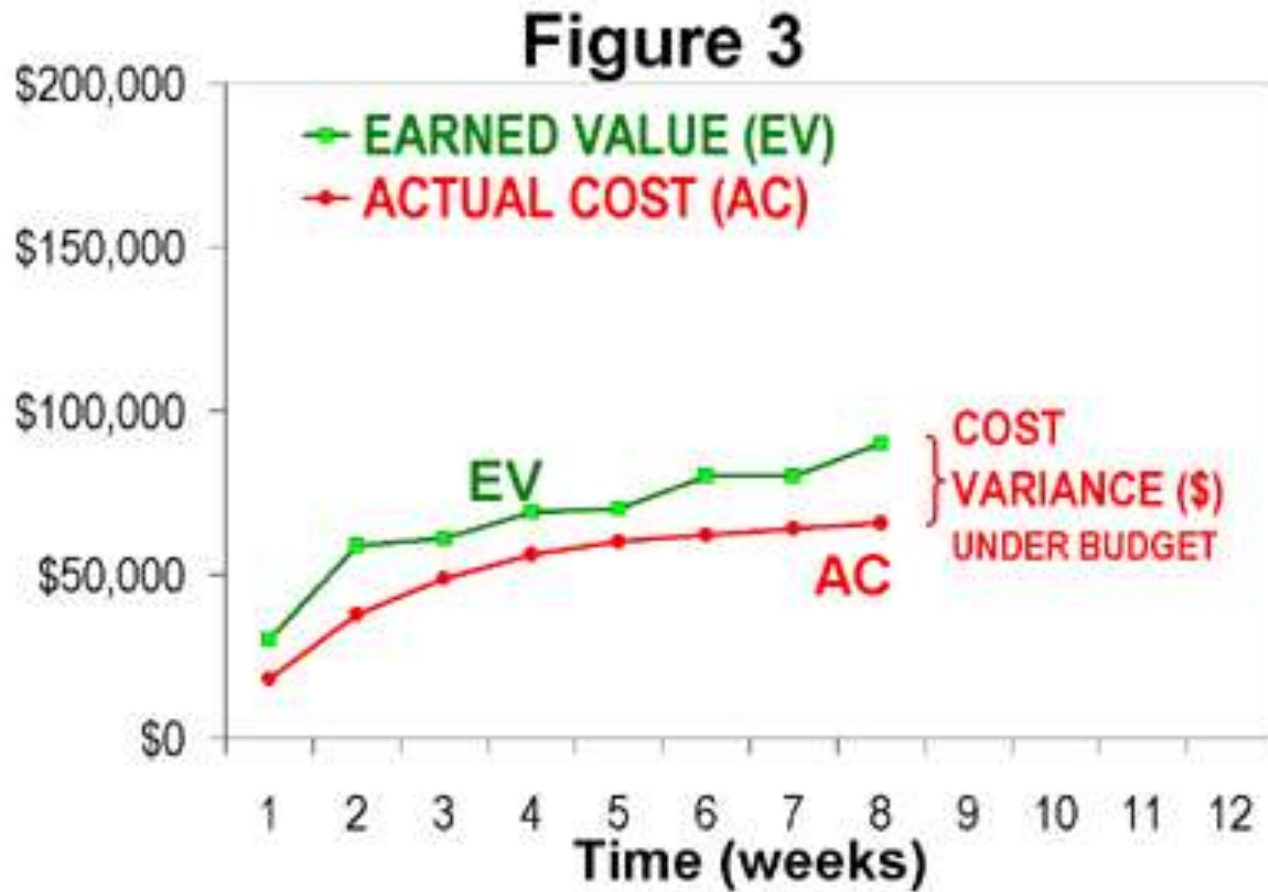
**Cost Variance = EV - AC**

$$\begin{array}{r} \$49,000 \\ \underline{56,000} \\ \text{CV} = - \$7,000 \end{array}$$

# Schedule Variance



# Cost Variance





# Progress Tracking

- Schedule Performance Index (SPI):

$$EV/PV$$

$$49,000/55,000 = 0.891$$

If  $> 1$  = Ahead;  $< 1$  = Behind

- Cost Performance Index (CPI):

$$EV/AC$$

$$49,000/56000 = 0.875$$

If  $> 1$  = Under budget;  
 $< 1$  = Over budget



# How to Answer Other Questions?

- ✘ Are we ahead of or behind schedule?
- ✘ How efficiently are we using our time?
- ✘ Are we under or over budget?
- ✘ How efficiently are we using our resources?
- ✘ When is the project likely to be completed?
- ✘ What is the remaining work likely to cost?
- ✘ What is the entire project likely to cost?
- ✘ How much will we be under or over budget?



# Forecasting

- **Time Estimate at Completion ( $EAC_t$ )**

= Project duration/SPI

= 12 months/0.891

= 13.5 months

- **Time Variance at Completion ( $VAC_t$ )**

=  $EAC_t$  - Project duration

= 13.5 - 12 months

= 1.5 month



# Forecasting ... 2

- **Estimate at Completion (EAC)**  
= Budget at Completion/CPI  
= \$102,000/0.875  
= \$116,571
- **Variance at Completion (VAC)**  
= EAC - Budget at Completion  
= \$116,571 - \$102,000  
= \$14,571
- **Estimate to Complete (ETC)**  
= EAC - AC  
= \$116,571 - 56,000  
= \$60,571



# Project Monitoring & Performance Reporting

## Earned Value Technique (EVT)

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# EV Technique



- ◆ EV is a measure of work performed
- ◆ Techniques for measuring are selected during project planning stage
- ◆ Techniques selected will be the basis for performance measurement during project execution and control
- ◆ Techniques should be selected based on the characteristic of the work

# EV Technique



## 2 types of EV Techniques

PHYSICAL WORKS (TANGIBLE)	NON PHYSICAL WORKS (INTANGIBLE)
1. FIXED FORMULA	1. APPORTIONED EFFORT
2. WEIGHTED MILESTONE	2. LEVEL OF EFFORT (LOE)
3. % COMPLETE	

# Physical Works (Tangible)

FIXED FORMULA	WEIGHTED MILESTONE	% COMPLETE
<ul style="list-style-type: none"><li>• Works with short duration</li></ul>	<ul style="list-style-type: none"><li>• Suitable for longer duration tasks that have intermediate products</li></ul>	<ul style="list-style-type: none"><li>• Long duration works</li></ul>
<ul style="list-style-type: none"><li>• A fixed % of work performance is credited at the start of work and the remaining % at the completion of work</li></ul>	<ul style="list-style-type: none"><li>• Work is divided into segments with a clear milestone</li></ul>	<ul style="list-style-type: none"><li>• Worker/Manager makes estimate of % of work complete</li></ul>
	<ul style="list-style-type: none"><li>• Assign value to achievement of each milestone</li></ul>	<ul style="list-style-type: none"><li>• Pay according to work done</li></ul>



# Non- Physical Works (Intangible)

APPORTIONED EFFORT	LEVEL OF EFFORT
<ul style="list-style-type: none"><li>• Work that run concurrently with physical work that has its own EV</li></ul>	<ul style="list-style-type: none"><li>• Based on schedule progress</li></ul>
<ul style="list-style-type: none"><li>• Work that has relationship with a physical work</li></ul>	<ul style="list-style-type: none"><li>• For supporting works such as maintenance site office, work program</li></ul>
<ul style="list-style-type: none"><li>• Work such as quality assurance or inspection activities</li></ul>	