Project Management

Lecture 8- Project Monitoring and Control

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Agenda

Time	
5:00 pm to 6:00 pm	Project Monitoring and Control • The process • Corrective Actions • Tools and Techniques
6:00 pm to 6:10 pm	**Coffee/Tea- Break**
6:10 pm to 7:00 pm	Balancing Time Cost and Quality (TCQ) • Project Crashing • Trade Offs between TCQ
7:00 pm to 7:15 pm	**Coffee/Tea- Break**
7:15 pm to 8:00 pm	Project Tracking- Updating your Gantt Chart • Create a Baseline • Update Tasks • Reschedule Incomplete Tasks
8:00 pm to 8:15 pm	**Coffee/Tea- Break**
8:15 pm to 9:00 pm	Look at the Assignment • Reflective- where are we? • What to work on during the weekend?

Previous Lecture

- Project Planning
  - Planning Process
  - Developing Gantt Charts and CPA

In this Lecture

- Project Monitoring and Control
  - Purpose of monitoring and control
  - The process
  - Progress Monitoring- Reporting
  - Corrective Actions
  - Tools- EVA

Purpose of Monitoring and Control

- It provides the means by which the **project manager can know the progress and status** of the project at any given time

- To provide a **framework for action planning**

- To **provide the options** available to the project manager in order to respond to any deviations

- Control is based on a comparison of **baseline** plans and contracts with **actual events**
- And deciding what to do when there is a **deviation**
- Control and re-planning activities are applied to control of:
  - Cost
  - Schedule
  - Scope
  - Quality and
  - Contracts

Monitoring vs Control

- Monitoring is about **collecting sufficient data** to measure progress and making sure that the project team implements the plan correctly

- Control is the process of ensuring that the **project delivers** everything it is supposed to according to schedule , cost and quality by **taking corrective action** when necessary

What is controlled?

- Performance:
  - Unexpected technical problems
  - Client requires changes in specifications
  - Inter-functional complications

- Costs
  - Initial estimates too low
  - Reporting was poor or untimely
  - Budgeting was inadequate
  - Input price changes occurred

- Time
  - Initial time estimates incorrect
  - task sequencing incorrect
  - preceding tasks incomplete

- Quality:
  - Technical quality
  - External Quality requirements
  - Internal Quality Standards
  - Customer Expectations

What is controlled?

Scope

Control of the project scope ensures that any changes are only implemented after a thorough investigation and full awareness of their impact.

Scope change is defined as any modification to the scope as defined in approved Work Breakdown Structure.

Risk

Controlling risk involves "executing risk management plans in order to respond to risk events over the course of the project"

Risks are dynamic so risk management strategies continually monitored and also enables a response to unplanned risks that occur

Team

This involves controlling the members of the project team and often requires making sure that there is team motivation, enthusiasm, and direction are kept throughout the project"

Designing a Project Monitoring and Control System

- What control measures should be selected?

- What data should be used to estimate the current value of each control measure?

- How should raw data be collected, from which sources and in what frequency?

- How should the data be analyzed to detect current and future deviations?

- How should the results of the analysis be reported, in what format, to whom and how often?

- How much deviation from plan will be tolerated before action is required?

- What kind of interventions should be used?

Step 1 - Establish baselines

In effect, part of planning. Control needs planned benchmarks
Typical baselines include:

- Cost (budgets),

- Time (schedules),

- Performance (specifications, quality plan).

- Scope (WBS)

Changes to baselines only made after review & approval using change control system

Baseline plans updated as authorised changes occur.
All appropriate stakeholders notified of authorised changes

Step 2 - Monitor & measure performance

Project progress measured regularly to identify variances from plan

Collect accurate information related to baselines, eg:

- Percentage completion,

- Cost expended

- Quality tests,

- Scope change reports

Timely collection of this data is critical and will be an ongoing activity throughout the duration of the project lifecycle

Step 3 - Compare performance to baselines

- Contrast actual performance against planned performance -variance analysis

- Formulation of progress reports and forecasts to completion

- Tools - earned value, cash flow analysis, schedule appraisal.

- Causes & effects analysed and understood

Step 4 - Take corrective action

Control is more than just monitoring & reporting and often means evaluating consequences of deviations from plan & acting upon them

Once deviations are identified then corrective action, if necessary, is taken. The options available to the project manager include:

- No action taken if the variances are small
- Re-planning activities to recover the ambitions of the original plan
- Revising the original plan in light of the current situation
- In extreme situations terminating the project
- Causes of change and reasons for selected corrective action should be documented

Basic options for corrective action

1. Find Alternative Solution - Rearrange workload or do work in different order or alternative way whilst not impacting on TCQS

2. Compromise Cost –

    •   Put in more resources or effort, from existing resources (e.g. working overtime, increasing productivity)

    •   The input of new resources

    •   Redeploy existing resources (e.g. talented to critical area)

3. Compromise Time - Move milestone date

4. Compromise Quality

5. Compromise Scope - Lower level of ambition:

Basic options for corrective action

6.   Abort the project:

Difficult decision when project members committed to project.

Sometimes it is easy to think or suggest that:

"So much has been spent already that project must be completed".

This very often is an invalid route to take.

It can often be more effective to abort the existing project, learn from the mistakes, risks issues and successes and start afresh.

Monitoring Progress

- There are many ways in which information may be gathered and include:
  - Team meetings
  - **regular progress reports**
  - specific technical meetings
- Information required by the project manager must be:
  - timely, clear, relevant and accurate.

Periodic Reporting

Reporting Intervals

- **Event based-** at the end of a particular stage or task

- **Time based-** at the end of a particular time period

- **Deviation based-** when there has been a deviation from the plan outside agreed tolerances

- **Problem or Hazard based-** when there has been a significant unplanned event or occurrence of a known or unknown project risk

Effective Reporting

- Reports should be made against the plan
- There should be defined criteria for control
- The control tools should be simple and friendly
- Reports should be made at defined intervals
- Reports should be discussed at formal meetings
- The reports should stimulate creative discussions

What data to report and How?

- Discuss in groups using the Assignment Case study:
  - what information the project team should report to the CEO regarding the project progress?
  - what format should it be reported?
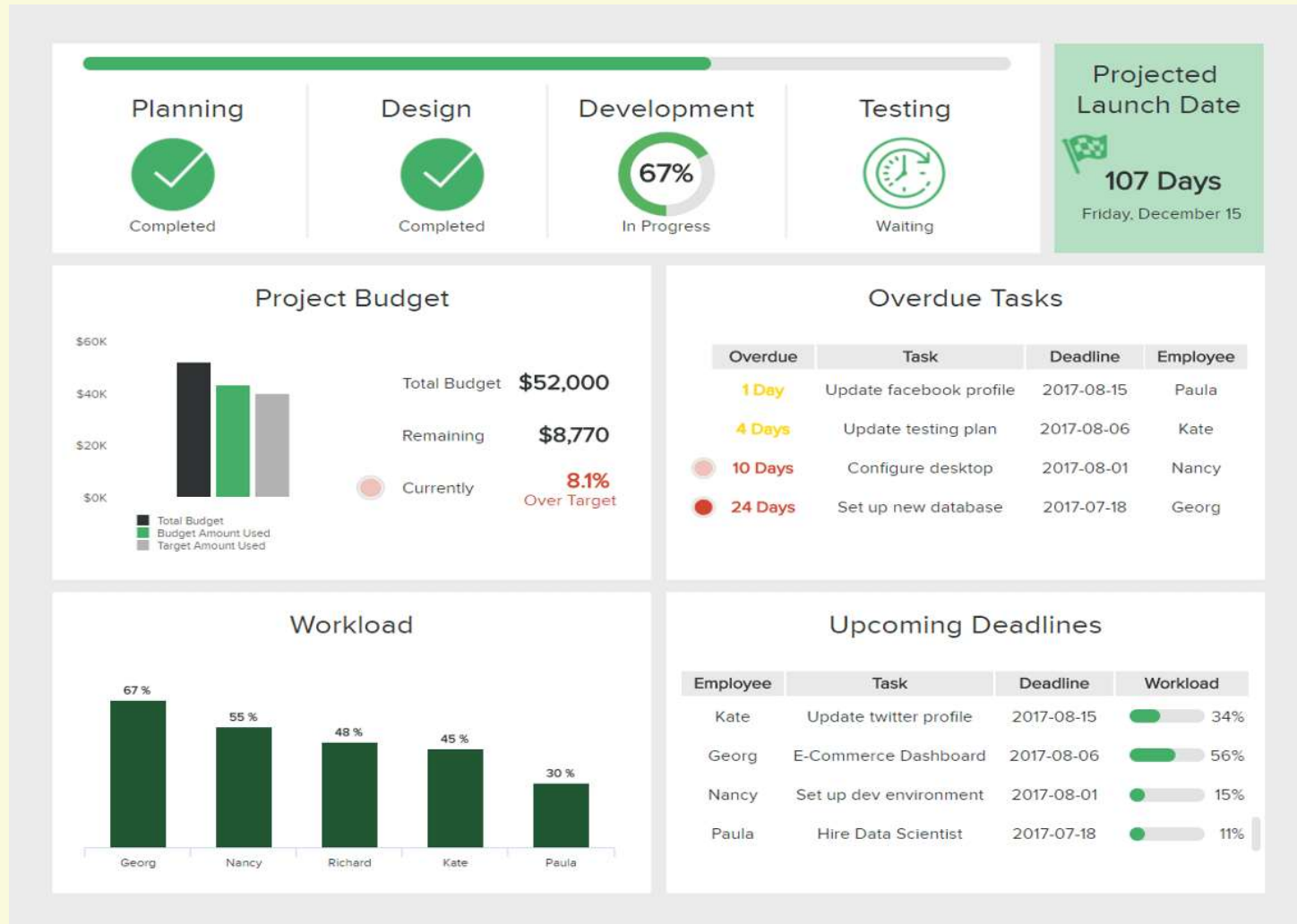
Progress Report Format

Data to Collect

- Effort utilization by type (man hours)
- Costs
- Elapsed time by tasks
- Components completed
- Tasks completed
- Milestones achieved
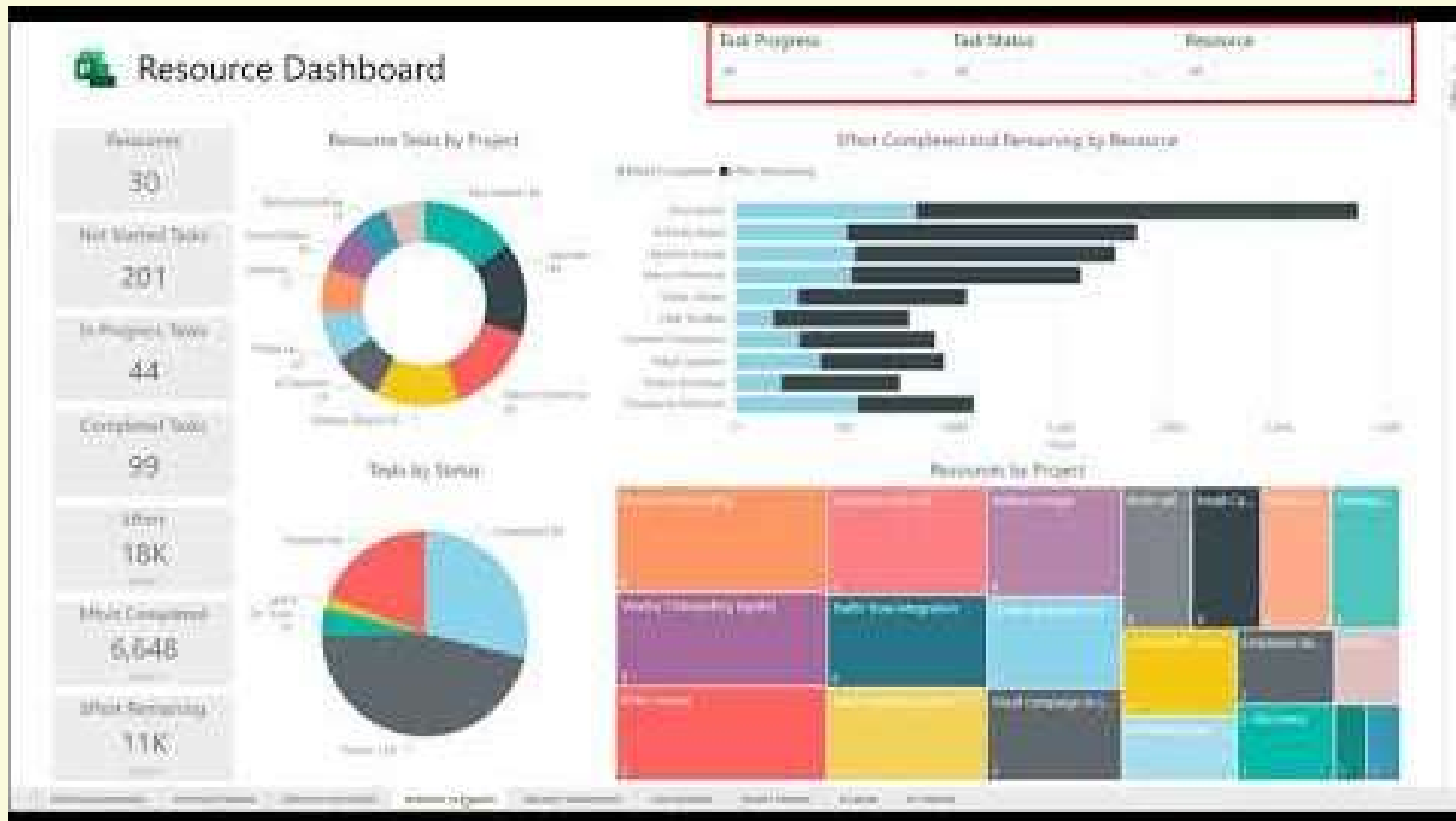- Equipment usage
- Changes
- etc

How to present?

- Statement of Work
- End of stage reports
- Exception reports
- Project Log
- Change control form
- Etc

Project Management Dashboard

Planning	Design	Development	Testing	Projected Launch Date
✓ Completed	✓ Completed	67% In Progress	🕐 Waiting	🏁 107 Days Friday, December 15

Project Budget

$60K
$40K
$20K
$0K

- Total Budget
- Budget Amount Used
- Target Amount Used

Total Budget	$52,000
Remaining	$8,770
Currently	8.1% Over Target

Overdue Tasks

Overdue	Task	Deadline	Employee
1 Day	Update facebook profile	2017-08-15	Paula
4 Days	Update testing plan	2017-08-06	Kate
10 Days	Configure desktop	2017-08-01	Nancy
24 Days	Set up new database	2017-07-18	Georg

Workload

Georg	Nancy	Richard	Kate	Paula
67 %	55 %	48 %	45 %	30 %

Upcoming Deadlines

Employee	Task	Deadline	Workload	
Kate	Update twitter profile	2017-08-15		34%
Georg	E-Commerce Dashboard	2017-08-06		56%
Nancy	Set up dev environment	2017-08-01		15%
Paula	Hire Data Scientist	2017-07-18		11%

Microsoft Project for the web – Power BI Template

Tools for monitoring and Control

- List of tools from various Methodologies

Definition of EVA

- EVA evaluates the projects progress by merging the cost and time constraints together
- EVA breaks down the project task by task or by work packages and allocates a dollar value to each
- Progress is measured in terms of dollar value earned not in days
- It allows project managers to assess the percentage of completeness a project using quantitative analysis

- EVA monitors progress by comparing the value earned from completing a task to the planned value that should have been derived from that task
- If the actual value earned is less than the value that should have been derived then the project is in jeopardy
- If the actual value earned is greater than the planned earned value then the project is in a good situation

Objectives of EVA

- To determine schedule variance
- To determine cost variance

- Variances must be tracked and reported
- They should be mitigated through corrective actions

Pre-requisites

- A detailed work breakdown structure

- A correspondingly detailed cost coding sytsem

- Timely and accurate collection and reporting of cost data

- A method for monitoring and quantifying the amount of work done, including work in progress

Variables for calculating variances

- **Budgeted Cost of Work Scheduled (BCWS)-** this is budgeted amount of cost for work scheduled to be accomplished in a given time period

- **Budget Cost of work Performed (BCWP)-** is the budgeted amount of cost for completed work within a given time period referred to as "earned value"

- **Actual Cost of Work Performed (ACWP)-** is the amount reported as actually expended in completing the work accomplished within a given time period

Methods of Assessing Progress

- Activity not started- earned value is therefore zero

- Activity completed- earned value is therefore equal to the activity's cost budget

- Activity in progress- can be assessed by measuring actual quantities of work done. Or estimate the proportion or percentage of work done and then take the same proportion of the current authorized cost estimate as the actual value of work performed/completed

Calculating Variances

- Cost Variance (CV) = BCWP - ACWP
- Cost Variance % (CVP) = CV / BCWP
- Cost Performance Index (CPI) = BCWP / ACWP

- Schedule Variance (SV) = BCWP – BCWS
- Schedule Variance % (SVP) = SV / BCWS
- Schedule Performance Index (SPI) = BCWP / BCWS

Example- Software Project

- Budgeted Cost at Completion (BC)- $ 5 million over a time period of 24 months
- BCWS after nine months- $ 600,000.00
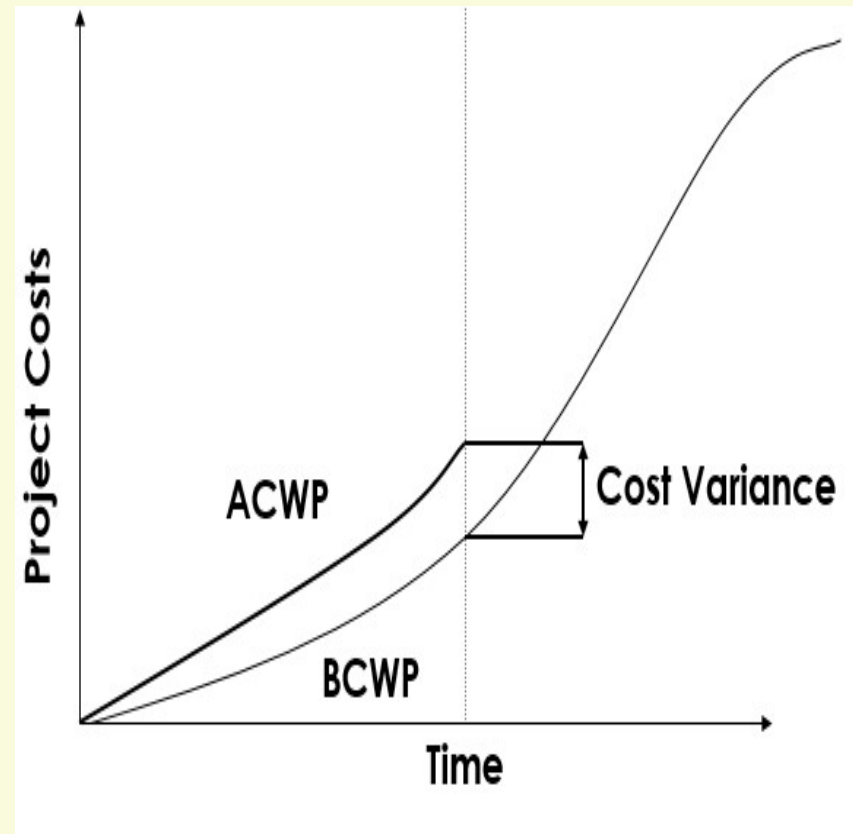- BCWP- $ 400,000.00
- ACWP- $ 700,000.00
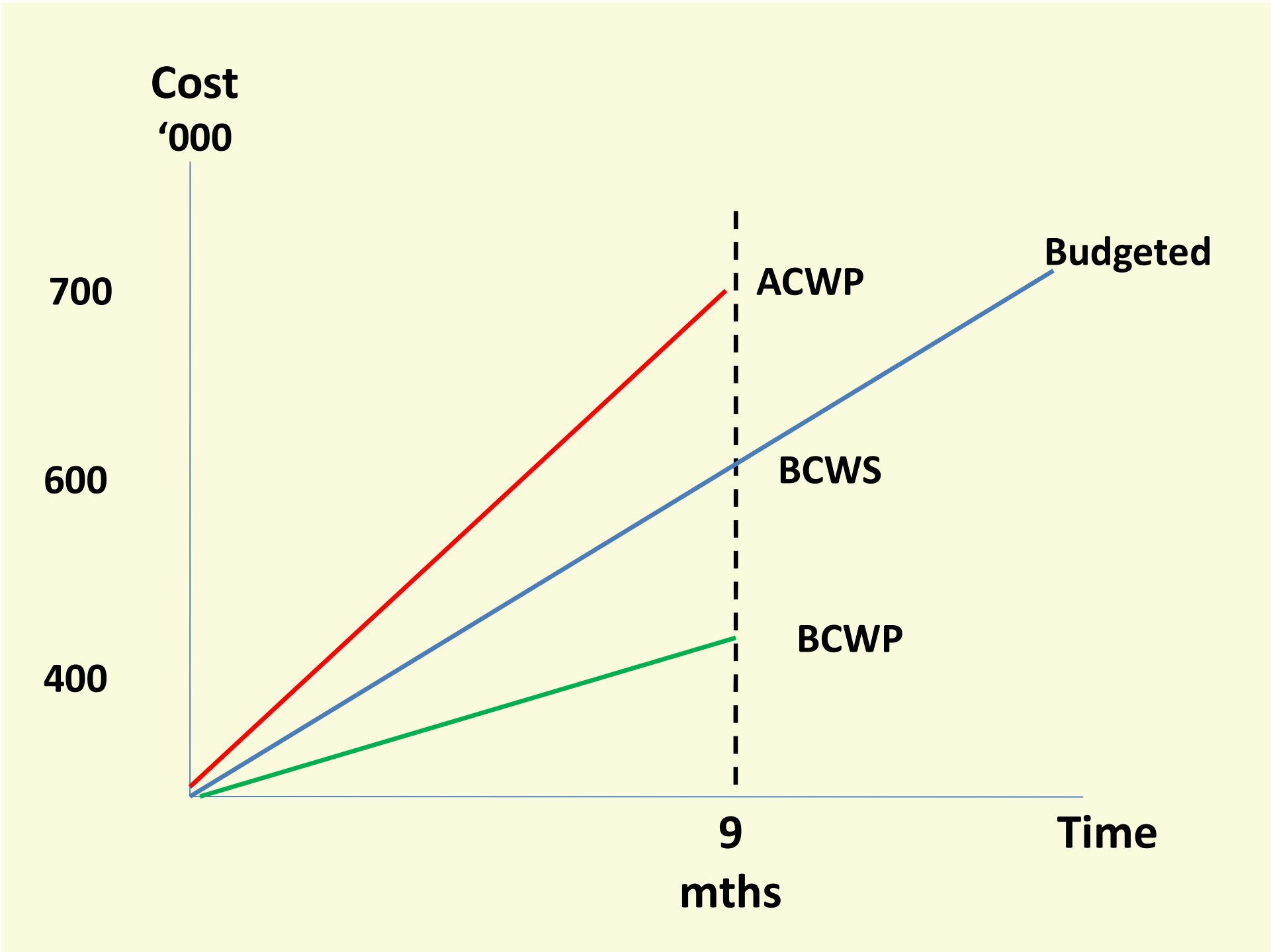
Cost Variance

CV = BCWP − ACWP

   = 400,000.00 − 700,000.00

   = (300,000.00)

CVP = - 300,000.00 / 400,000.00

   = -75%

CPI = 400,000.00 / 700,000.00

   = 0.57

Schedule Variance

SV = BCWP − BCWS

= 400,000.00 − 600,000.00

= (200,000.00)

SVP = -200,000.00 / 600,000.00

= - 33%

SPI = 400,000.00 / 600,000.00

= 0.66
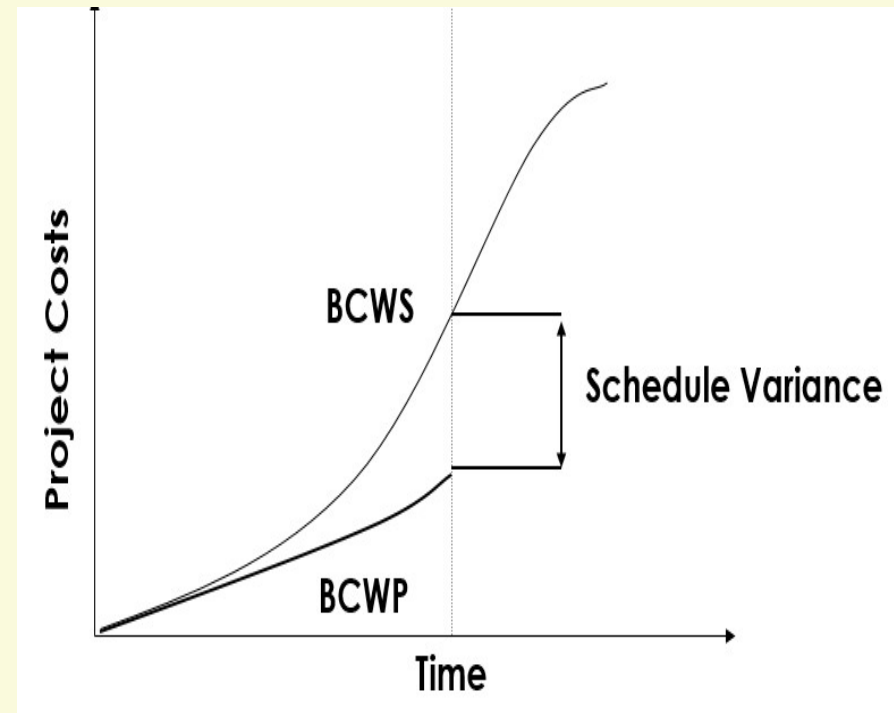
EVA answers the following:

- What % of the project has been completed?
- How much should we have spent so far?
- Are we ahead or behind schedule?
- How far ahead or behind schedule are we?
- Are we on or off budget?
- How far on or off budget are we?
- At the rate going, how much will all of this cost?
- How much over or under budget will we be?
- How long will the project really take?

Relationship between Planning and Control
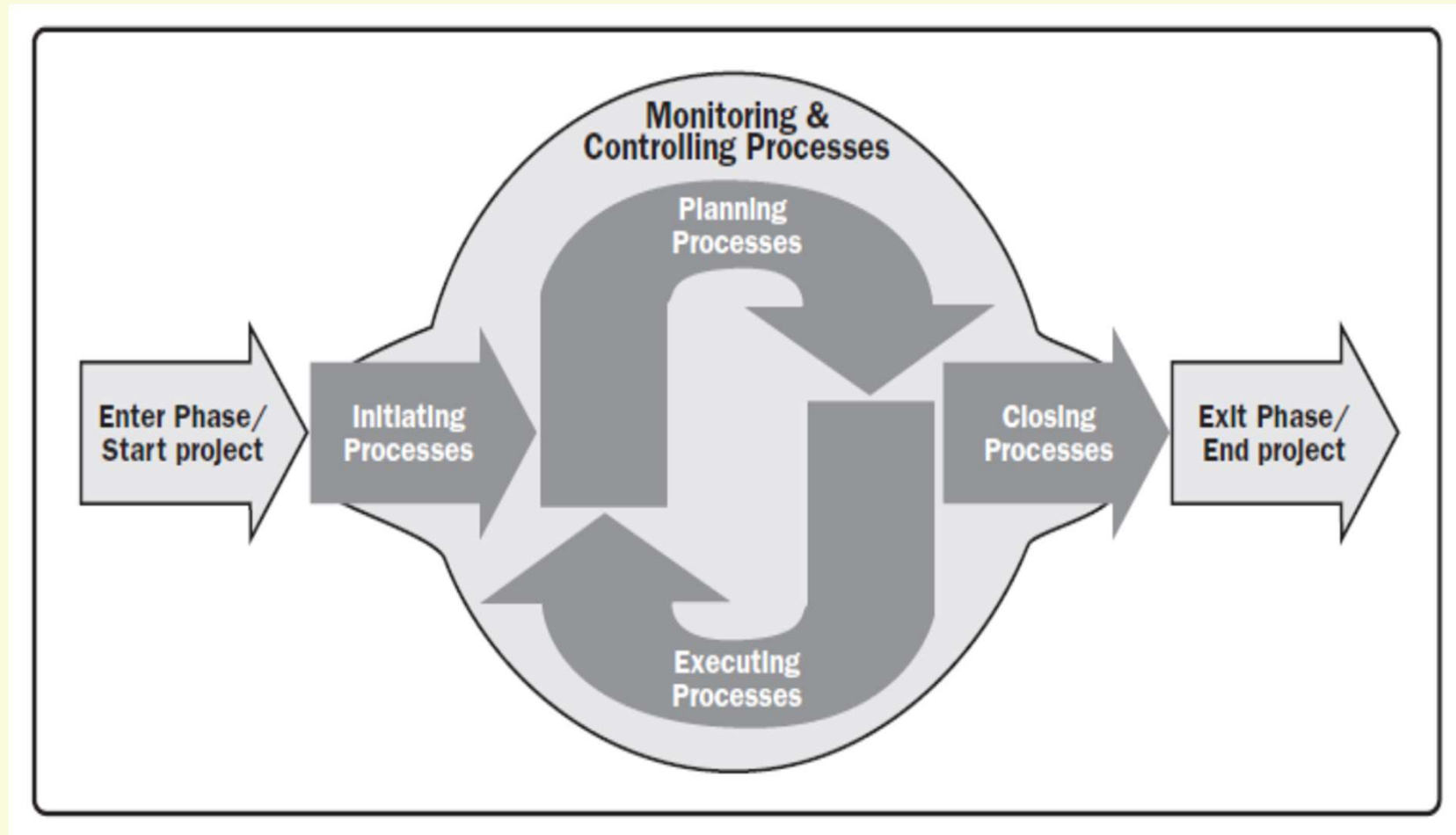
Project Management Process Groups. PMI (2013, pg. 50)

- The integrative nature of project management requires the Monitoring and Controlling Process Group to interact with the other Process Groups

- Monitoring and Controlling processes occur at the same time as processes contained within other Process Groups.

- Thus, the Monitoring and Controlling Process is pictured as a "background" Process Group for the other four Process Groups

- The Planning processes develop the **project management plan** and the project documents that will be used to carry out the project.
- The project management plan and project documents developed will explore all aspects of the scope, time, cost, quality, communications, human resources, risks, procurements, and stakeholder engagement
- The Project management plan serves as the **input** into the Monitoring and control process

- Updates arising from approved changes during the project generally during Monitoring and Controlling may significantly impact parts of the project management plan and the project documents.
- Updates to these documents provide greater precision with respect to schedule, costs, and resource requirements to meet the defined project scope
- In other words the **output** of Monitoring and Control during the project serves as the input to each planning iteration

- The monitoring and control process is applied to that end and has two objectives:
    1. to ensure that the plan is followed
    2. to ensure the plan remains credible
    Simpsons (2010)
- Without control all the planning is fruitless because control consists of the steps taken to ensure that the performance of the organization conforms to the plans.
- In other words control is concerned with the actual performance in relation to the standards set in advance and the correction of deviations to ensure attainment of objectives.
- Planning is required at the very outset of management whereas control is required at the last stages.

Key Points

- Planning & controlling interlinked: control is the act of reducing the difference between plan and reality

- Plans can never be perfect so control is inevitable

- Control identifies changes to plan that may require re-planning

References

- PMI (2013) A Guide to the Project Management Body of Knowledge, 5th Edition, Pennsylvania. PMI
- Simpson, W (2010) Project Planning and Control When Time Matters: Focus on Process to Synchronize and Drive Results, Production and Inventory Management Journal Vol 42 Issue 2. Available at https://www.prochain.com/pm/articles/P&IM_Journal_2010_2_PM_simpson.pdf