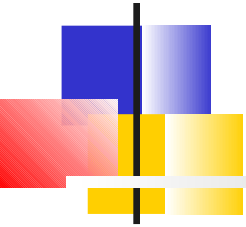
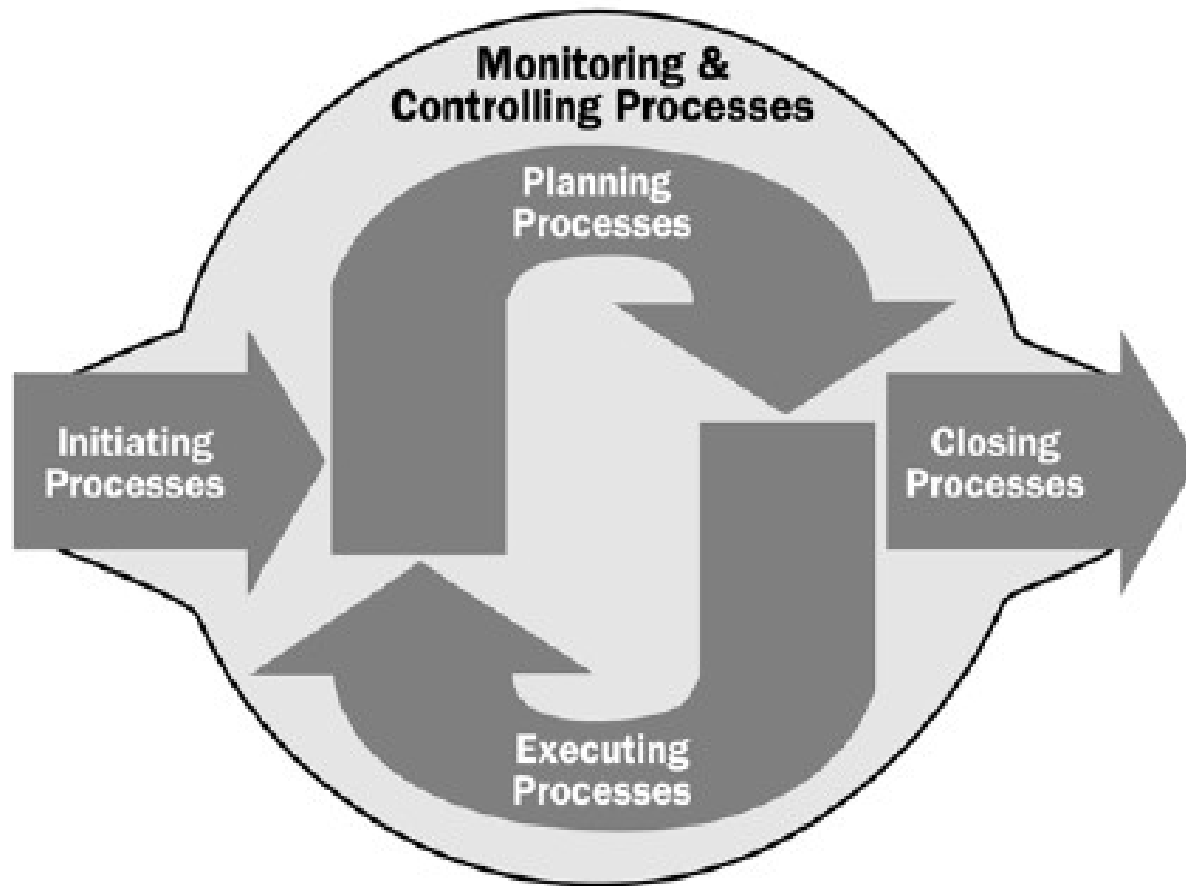


# Chapter 9

## Project Monitoring and Control



# Project Management Process Groups

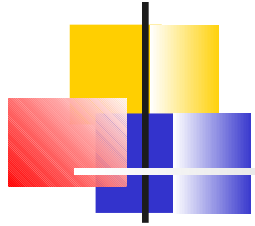




# Project Monitoring and Control

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- Monitoring – collecting, recording, and reporting information concerning project performance that project manager and others wish to know
- Controlling – uses data from monitor activity to bring **actual performance to planned performance**
- Outputs include performance reports, requested changes, and updates to various plans



# Why do we monitor?

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- Simply because we know that things don't always go according to plan (no matter how much we prepare)
- To detect and react appropriately to deviations and changes to plans



# Project Control

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- Ongoing effort to keep your project on track
- 4 primary activities:
  - 1. Planning performance
    - schedule, and a control process
  - 2. Measuring status of work performed
    - Actuals
  - 3. Comparing to baseline
    - Variances
  - 4. Taking corrective action as needed
    - Response
- Prerequisite to good control is a good plan



# Project Control

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- “Control”
  - Power, authority, domination. No.
  - Guiding a course of action to meet an objective. Yes.
- Principles
  - Work is controlled, not workers
    - Control helps workers be more effective & efficient
  - Control based on work completed
  - Balance
    - Appropriate level between too much and too little
    - Includes:
      - Micro-managing vs. neglect
      - Too much tracking detail vs. too little



# Progress Monitoring

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- The 3 key Progress Monitoring Questions
  - What is the actual status?
  - If there's a variance, what is cause?
  - What to do about it?
- Possible responses
  - 1. Ignore
  - 2. Take corrective action
  - 3. Review the plan



# Progress Monitoring

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- Monitoring rates
  - Daily, weekly, monthly
  - If problems occur – then adjust
    - You may have to monitor problem areas more closely
    - For some period of time
    - Almost always there's one or more areas under closer scrutiny
- Status Reporting
  - Part of the communications management plan





# Status Reports

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- From team to PM, from PM to stakeholders
- Typical format for letter
  - Summary
  - Accomplishments for this period (done)
    - Tasks, milestones,
    - Plans for next period (to-do)
  - Risk analysis and review
  - Issues & Actions
- Shoot for weekly updates
  - Email notes, then hold brief meeting
  - More frequently during crises



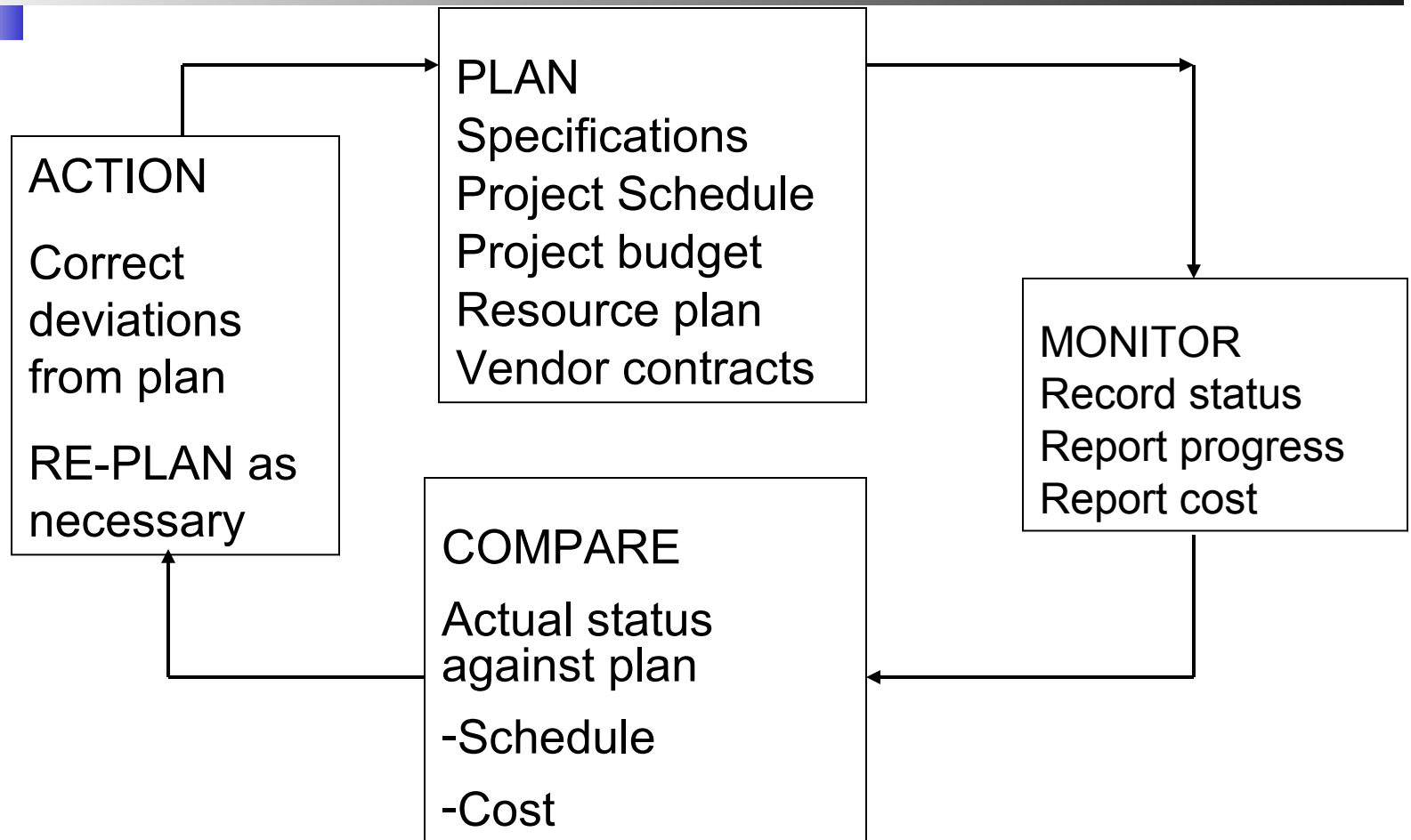
# Traffic Light Assessment

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- Identify the key element
- Break these key element in constitute element
- Access each second level element
  - Green (on target)
  - Amber (not on target but recoverable)
  - Red (not on target but recoverable with difficulties)
- Review all the second level assessment to arrive at first level assessment



# Project Control Cycle





# Project Control

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- Control – process and activities needed to correct deviations from plan
- Control the triple constraints
  - time (schedule)
  - cost (budget, expenses, etc)
  - performance (specifications, testing results, etc.)



# Techniques for monitoring and control


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- Earned Value Analysis
- Critical Ratio



# Earned Value Analysis (EVA)

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- Earned Value analysis is a method of performance measurement
- EVA is also called Variance Analysis 
- Metric of project tracking
- “What you got for what you paid”
  - Physical progress
- Pre-EVA ‘traditional’ approach
  - 1. Planned time and costs
  - 2. Actual time and costs
  - Progress: compare planned vs. actual
- EVA adds third dimension: value
  - Planned, actual, earned



# Earned Value Analysis

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- If total value of the work accomplished is in balance with the planned (baseline) cost, and actual cost then top mgmt has no particular need for a detailed analysis of individual tasks
- Old models include cost & expenditure
- EVA adds schedule estimation
- Measured in dollars or hours



# Earned Value Analysis

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- 3 major components
  - BCWS: Budgeted Cost of Work Scheduled
    - Now called “Planned Value” (PV)
    - “Yearned”
    - How much work should be done?
  - BCWP: Budgeted Cost of Work Performed
    - Now called “earned value” (EV)
    - “Earned”
    - How much work is done?
    - $BCWS * \% \text{ complete}$
  - ACWP: Actual Cost of Work Performed
    - Now called “Actual Cost” (AC)
    - “Burned”
    - How much did the work done cost?





# Derived EVA Variances

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- SV: Schedule Variance
  - $BCWP - BCWS$
  - Planned work vs. work completed
- CV: Cost Variance
  - $BCWP - ACWP$
  - Budgeted costs vs. actual costs
  - Negatives are termed 'unfavorable'
- "What is the project status"?
  - You can use variances to answer this



# Derived EVA Ratios

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- **SPI: Schedule Performance Index**
  - $BCWP / BCWS$
- **CPI: Cost Performance Index**
  - $BCWP / ACWP$
- **Interpretation of Indexes**

<b>Index</b>	<b>Cost (CPI)</b>	<b>Schedule (SPI)</b>
$>1.00$	Under cost	Ahead of schedule
$=1.00$	On cost	On schedule
$<1.00$	Over cost	Behind schedule



# Earned Value Analysis

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- Other Derived Values
  - BAC: Budget At Completion
    - Sum of all budgets (BCWS). Your original budget.
    - Planned Value (PV) at the end of the project
  - EAC: Estimate At Completion
    - Forecast total cost at completion
    - $EAC = ((BAC - BCWP)/CPI) + ACWP$
    - Unfinished work divided by CPI added to sunk cost
    - If  $CPI < 1$ , EAC will be  $> BAC$
  - CR: Critical Ratio
    - $SPI \times CPI$
    - 1: everything on track
    - $> .9$  and  $< 1.2$  ok
    - Can be charted



# EVA Example-1

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- You have a project to be completed in 12 months and total cost of project is \$100,000. Six months have been passed (and schedule says that 50% of work should be completed).
- Six months have been passed and \$60,000 is spent but on closer look you find that only 40% of work is completed so far.
- Planned Value (BCWS)
  - Project duration – 12 months
  - Project Cost (BAC) = \$100,000
  - Percent complete – 50% (as per the schedule)
  - Planned Value = 50% of value of total work
  - = 50% of BAC
  - = 50% of \$100,000
  - =  $(50/100) \times \$100,000$
  - = \$50,000



# EVA Example-1

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- **Earned Value (BCWP)**
  - Hence, Earned Value is = 40% of value of total work
  - = 40 % of BAC
  - = 40% of \$100,000
  - =  $0.4 \times \$100,000$
  - = \$40,000
  - Therefore, Earned Value (EV) is \$40,000
- **Actual Cost (ACWP)**

And in our question, you have spent \$60,000 on the project so far.
- Hence, Actual Cost is \$60,000
- Calculate SPI and CPI?



# Earned Value Analysis

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- Benefits
  - Consistent unit of measure for total progress
  - Consistent methodology
    - Across cost and completed activity
    - Apples and apples comparisons
  - Ability to forecast cost & schedule
  - Can provide warnings early
- Success factors
  - A full WBS is required (all scope)