SGS 4613 REMOTE SENSING PROJECT MANAGEMENT

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Topic 7

Monitoring and Controlling the Project

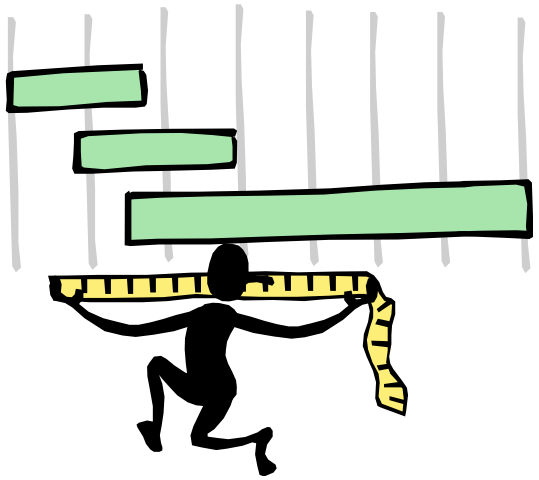
Introduction

- **Monitoring and Control are opposite sides of selection and planning**
  - bases for selection dictate what to monitor
  - plans identify elements to control
- ***Monitoring* is collection, recording, and reporting of information**
- ***Control* uses monitored information to align actual performance with the plan**

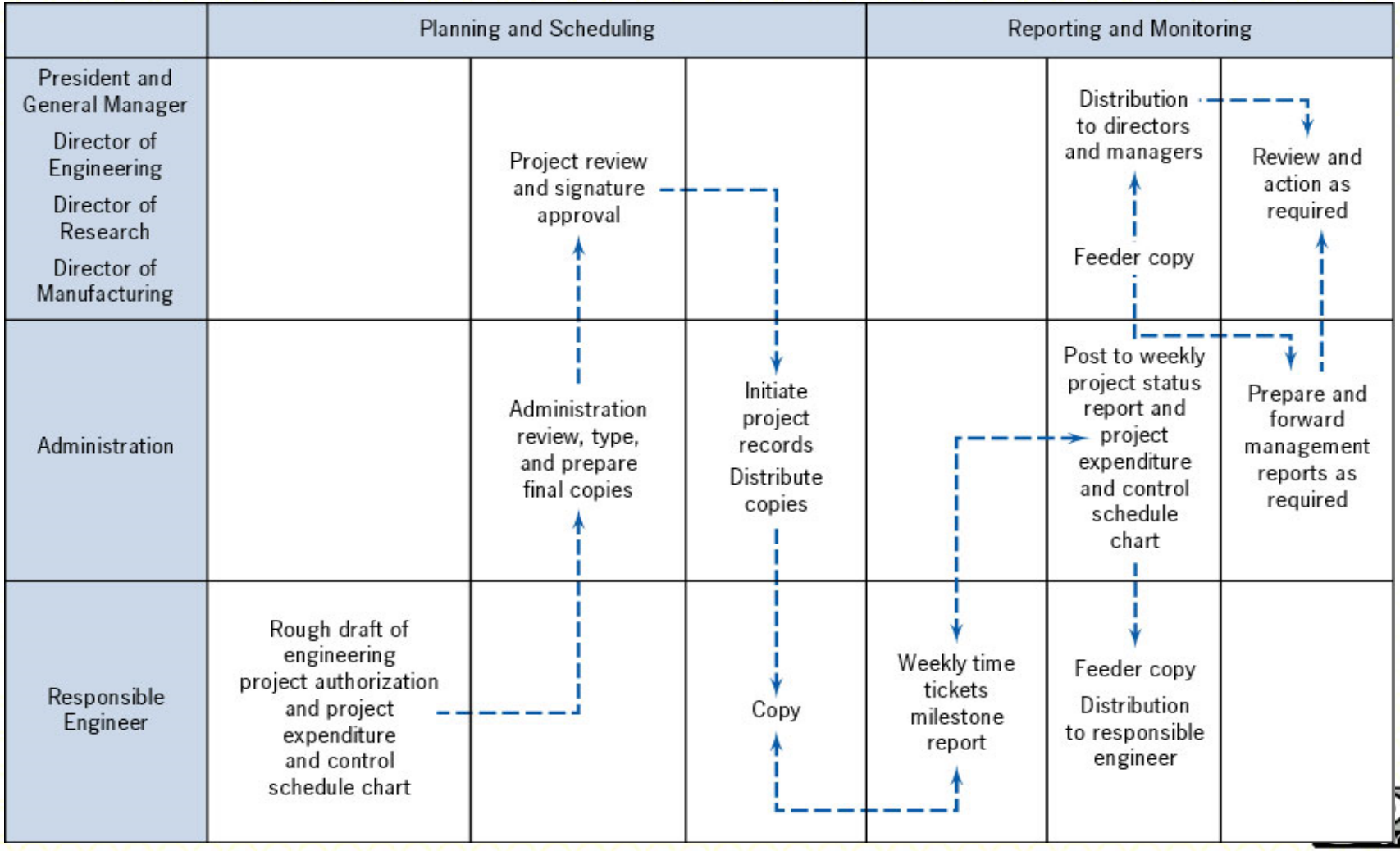
THE PLAN-MONITOR-CONTROL CYCLE

Plan-Monitor-Control Cycle

- **Closed loop process**
- **Planning-monitoring-controlling effort often minimized to spend time on "the real work"**



Project Authorization and Expenditure Control System Information Flow

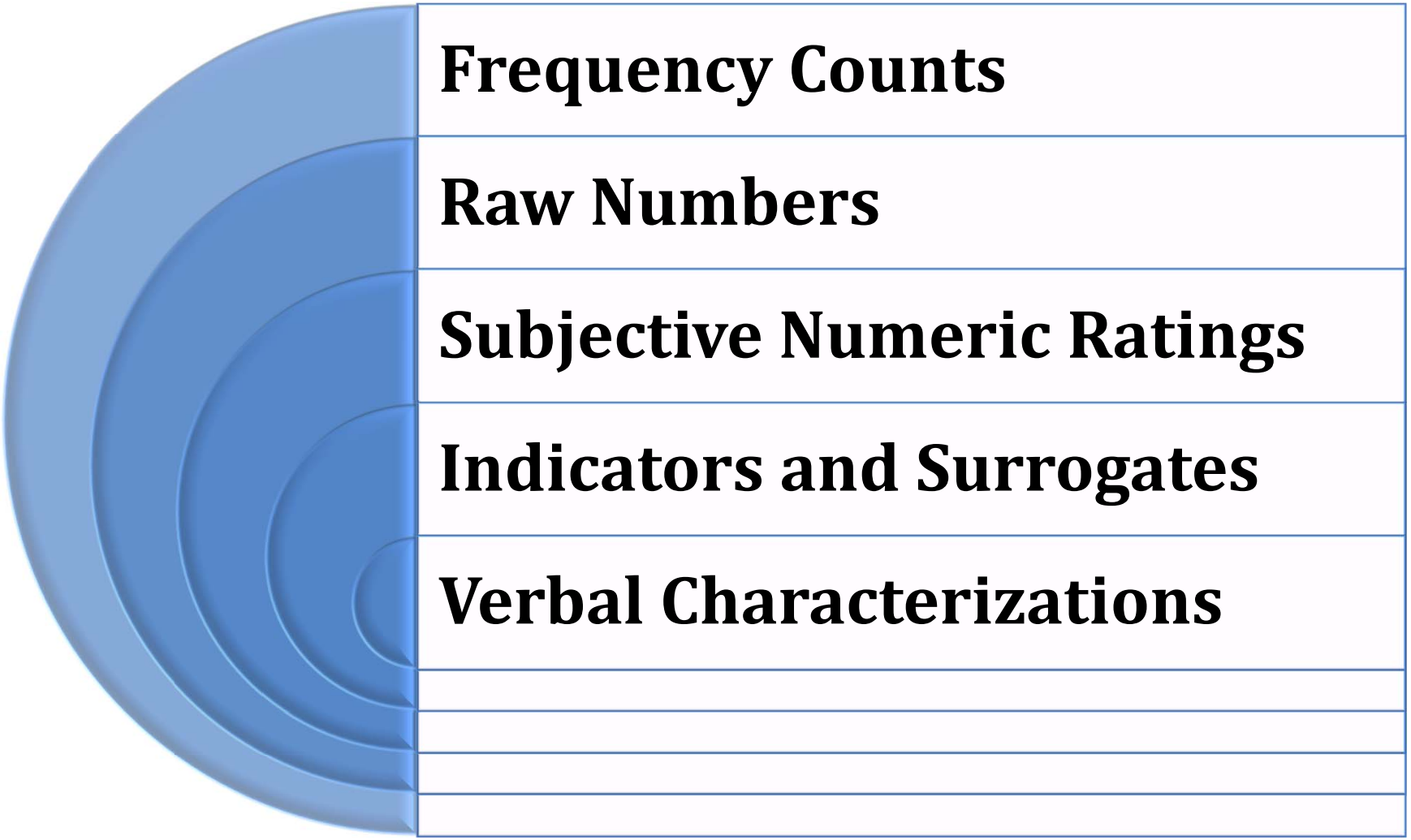


Designing the Monitoring System

- **Identify special characteristics of performance, cost, and time that need to be controlled**
  - performance characteristics should be set for each level of detail in the project
- **Real-time data should be collected and compared against plans**
  - mechanisms to collect this data must be designed
- **Avoid tendency to focus on easily collected data**

DATA COLLECTION AND REPORTING

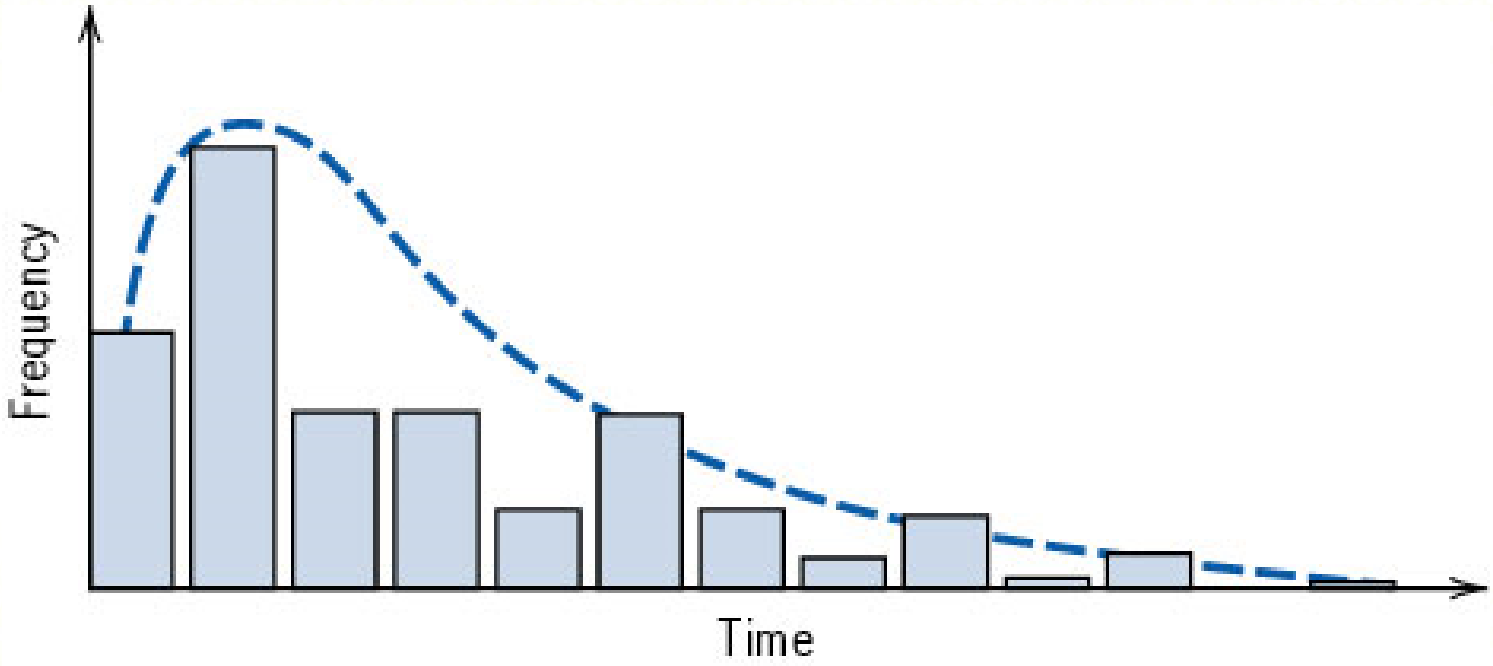
Formats of Data



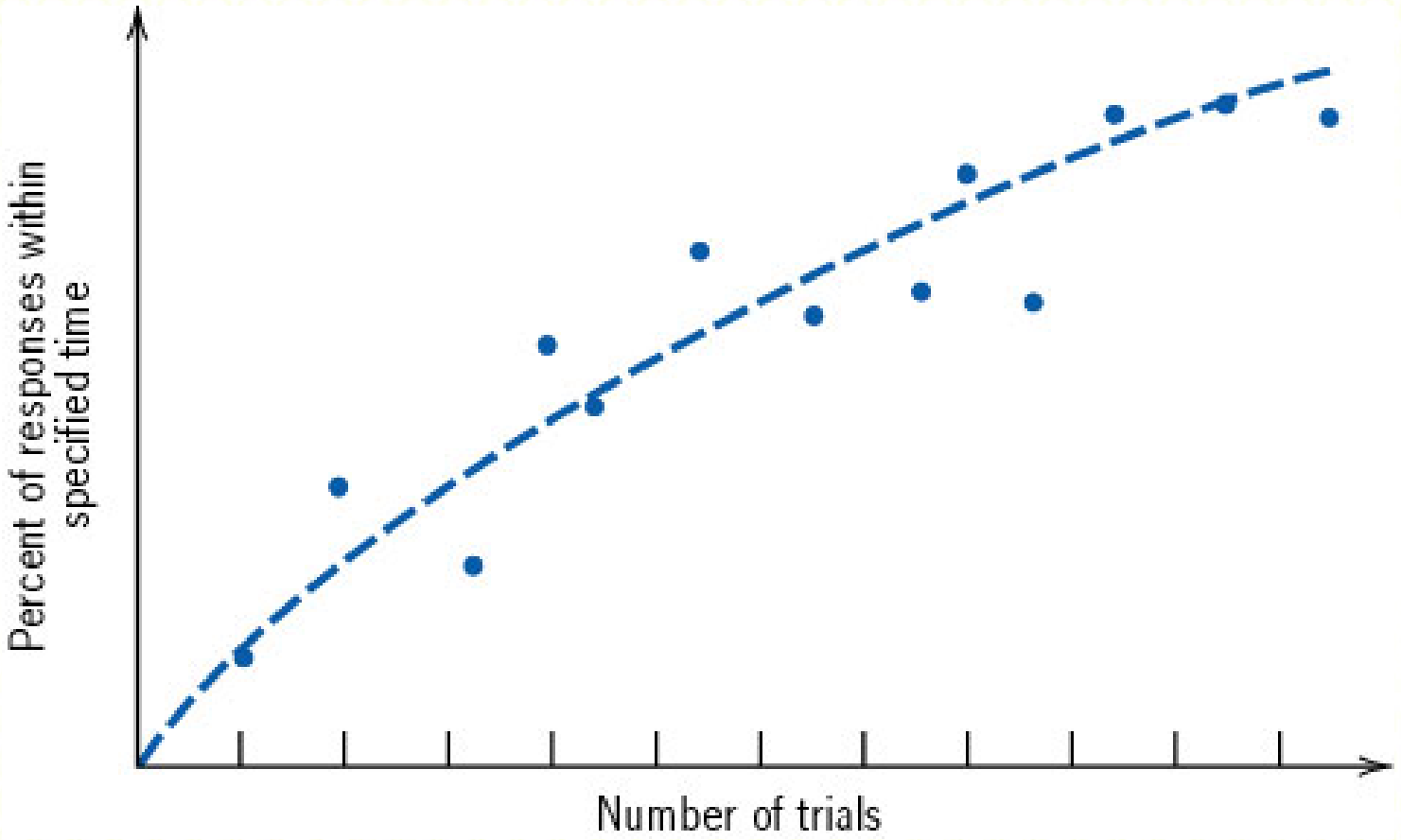
Data Analysis

- Aggregation Techniques
- Fitting Statistical Distributions
- Curve Fitting
- Quality Management Techniques

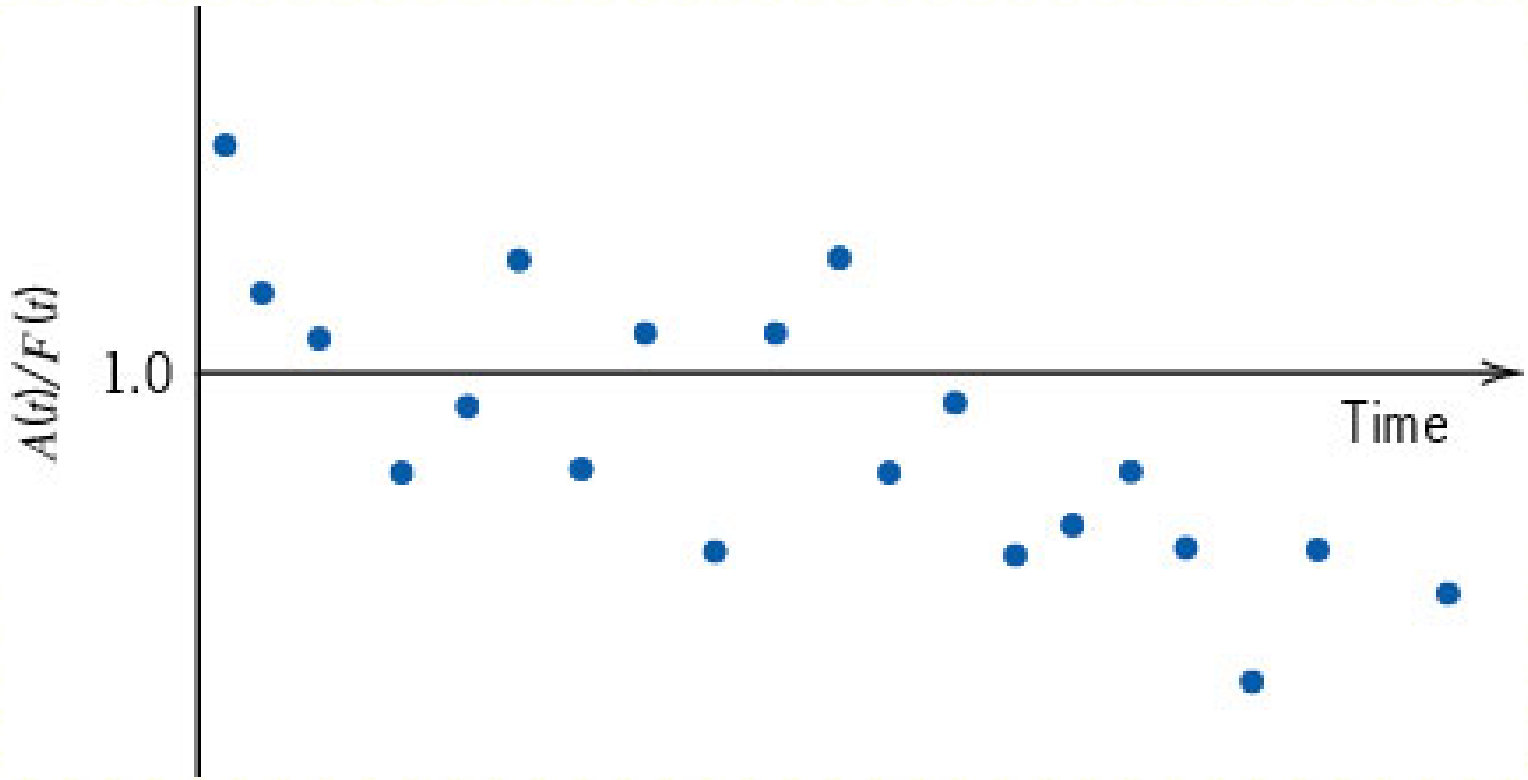
Number of Bugs per Unit of Test Time



Percent of Specified Performance Met During Successive Repeated Trials



Ratio of Actual Material Cost to Estimated Material Cost



Reporting

- **Reports**
  - Project Status Reports
  - Time/Cost Reports
  - Variance Reports
- **Not all stakeholders need to receive same information**
- **Avoid periodic reports**
- **Impact of Electronic Media**
- **Relationship between project's information system and overall organization's information system**

Report Types

- Routine
- Exception
- Special Analysis

Meeting Guidelines

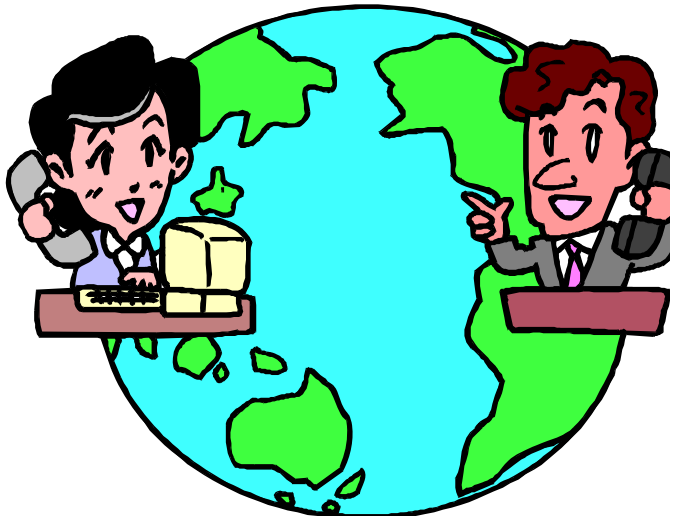
- **Meetings should be help primarily for group decision making**
  - avoid weekly progress report meetings
- **Distribute written agenda in advance of meeting**

Meeting Guidelines *continued*

- **Ensure everyone is properly prepared for meeting**
- **Chair of meeting should take minutes**
  - avoid attributing remarks to individuals in the minutes
- **Avoid excessive formality**
- **If meeting is held to address specific crisis, restrict meeting to this issue alone**

Virtual Reports, Meetings, and Project Management

- Use of the Internet
- Use of Software Programs
- Virtual Project Teams



EARNED VALUE

Earned Value

$$\sum_{\text{all tasks}} \text{task budgeted cost} \times \text{task \% completition}$$

- **Percent of task's budget actually spent not good indicator of percent completion**

Conventions Used to Estimate Progress on Tasks

- **50-50**
  - 50% complete when task started and other 50% added when task finished
- **100%**
  - 100% complete when finished and zero percent before that
- **Ratio of Cost Expended to Cost Budgeted**

Variances

- **Cost/Spending Variance**

  EV - AC

- **Schedule Variance**

  EV - PV

- **CPI**

  EV/AC

- **SPI**

  EV/PV

Additional Items of Interest

- **Estimated (Remaining Cost) to Completion**

  ETC = (BAC - EV)/CPI

- **(Total Cost) Estimated at Completion**

  EAC = ETC + AC

PROJECT CONTROL

Background

- **Acts which seek to reduce differences between plan and actuality**
- **Difficult Task**
  - human behavior involved
  - problems rarely clear cut

Purposes of Control

- **Stewardship of Organizational Assets**
  - physical asset control
  - human resources
  - financial control
- **Regulation of Results Through the Alteration of Activities**

DESIGNING THE CONTROL SYSTEM

Background

- Purpose is to correct errors, not punish the guilty
- Investments in control subject to diminishing returns
- Must consider impact on creativity and innovation
- Be careful not emphasize short-run results at the expense of long-run objectives
- Dangers of across the board cuts

Primary Mechanisms by Which PM Exerts Control

- Process Reviews
- Personnel Assignments
- Resource Allocations

Components of a Control System

1. Sensor
2. Standard
3. Comparator
4. Decision Maker
5. Effector

Types of Control Systems

- **Go/No-Go Controls**
  - predetermined standard must be met for permission to be granted to continue

- **Post-Control**
  - done after project completed
  - purpose is to allow future projects to learn from past project experience

Sample Project Milestone Status Report

Task	Project		
	#1	#2	#3
Priorities set	C	C	C
PM selected	C	C	C
Key members briefed on RFP	C	C	C
Proposal sent	C	C	C
Proposal accepted as negotiated	C	C	C
Preliminary design developed	C	W/10	C
Design accepted	C	W/12	C
Software developed	C	NS/NR	N/A
Product test design	C	W/30	W/15
Manufacturing scheduled	C	NS/NR	W/8
Tools, jigs, fixtures designed	W/1	NS/NR	W/2
Tools, jigs, fixtures delivered	W/2	NS/NR	W/8
Production complete	NS/HR	NS/HR	NS/HR
Product test complete	NS/HR	NS/HR	NS/HR
Marketing sign-off on product	NS/HR	NS/HR	NS/HR

Notes:

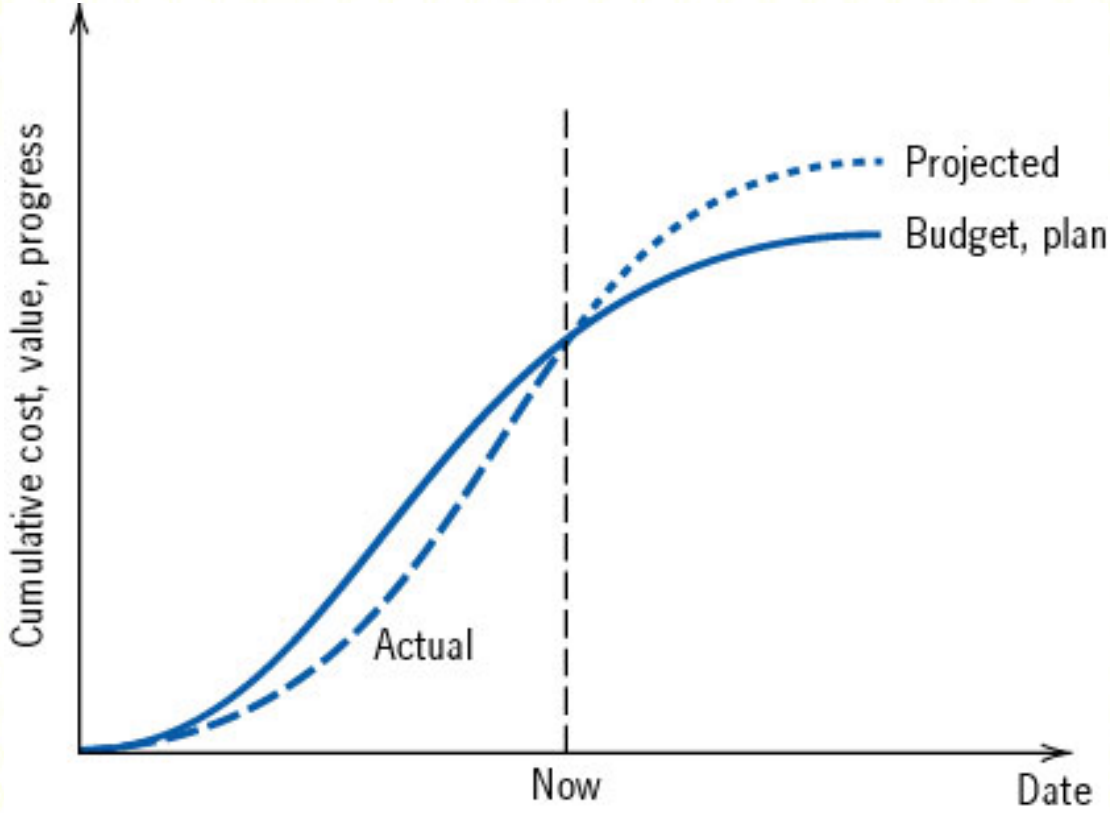
N/A—Not applicable
C—Completed
W—Work in progress (number refers to month required)
NS—Not started
NR—Need resources
HR—Have resources

Tools for Control

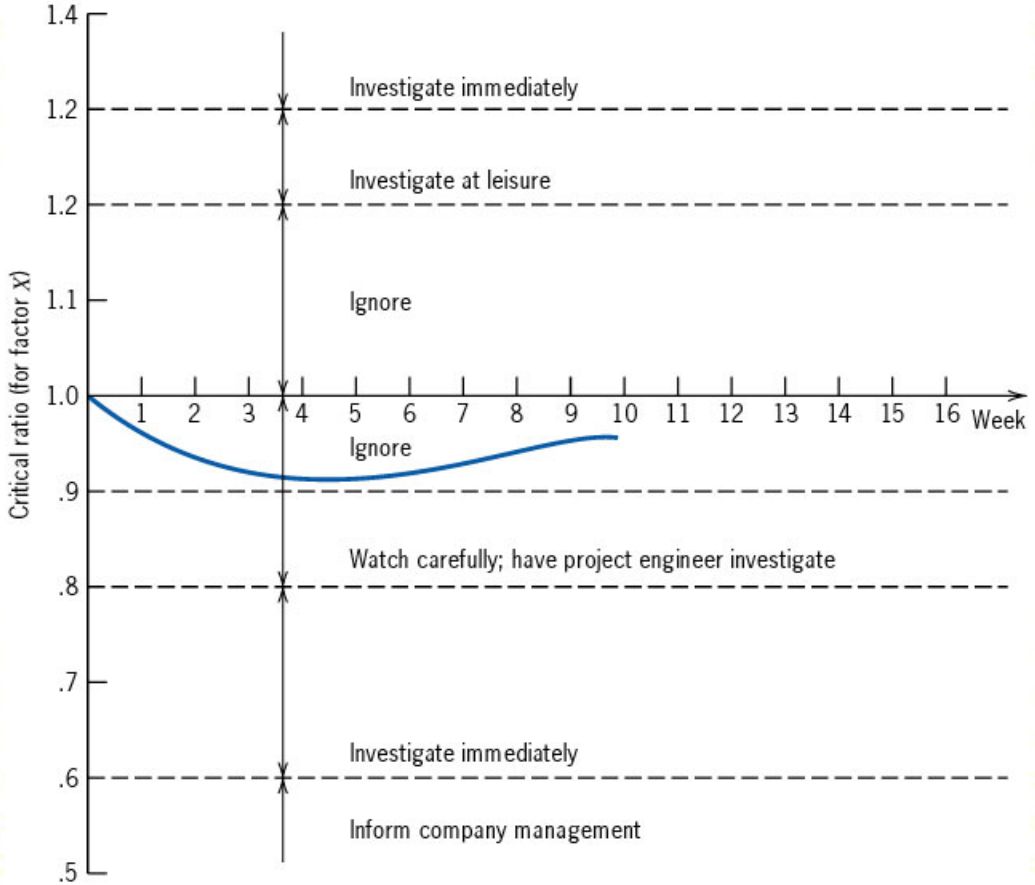
- **Variance Analysis**
- **Trend Projections**
- **Earned Value Analysis**
- **Critical Ratio**

$$\frac{\text{actual progress}}{\text{scheduled progress}} \times \frac{\text{budgeted cost}}{\text{actual cost}}$$

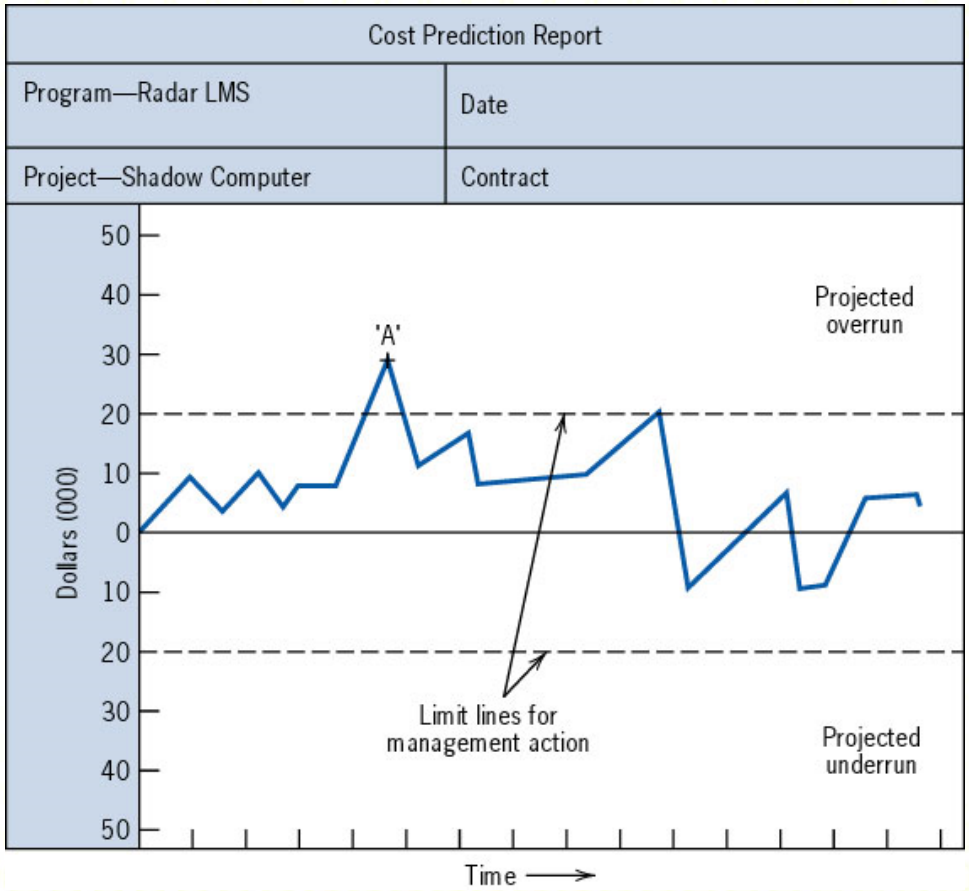
Trend Projection



Critical Ratios with Control Limits



Cost Control Chart



SCOPE CREEP AND CHANGE CONTROL

Scope Creep

- **Coping with changes frequently cited by PMs as the single most important problem**

- **Common Reasons for Change Requests**
  - Client
  - Availability of new technologies and materials

Purpose of Change Control System

- Review all requested changes
- Identify impact of change
- Evaluate advantages and disadvantages of requested change
- Install process so that individual with authority may accept or reject changes

Purpose of Change Control System

continued

- Communicate change to concerned parties
- Ensure changes implemented properly
- Prepare reports that summarize changes made to date and their impact

Rules for Controlling Scope Creep

1. Include in contract change control system
2. Require all changes be introduced by a change order
3. Require approval in writing by the client's agent and senior management
4. Consult with PM prior to preparation of change order
5. Amend master plan to reflect changes

Reference

- **Meredith, R. J. & Mantel, J. S. (1995). *Project Management – A Managerial Approach*. John Wiley & Sons, 5th Edition.**