

CSC444F: Software Engineering I

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Lecture 3: Software Management

- **The Importance of Project Management: Case Study**
- **Software Project Management: Planning and Controlling**
- **Principles of Management**
- **Planning Tools**
- **Meetings**
- **Risk Management**
- **Reading: Chapters 2, 5, 8**

The Importance of Project Management: Case Study

- **Before establishing a PMO, Bombardier's project success rate was very poor. They were always late and never delivered what they were supposed to deliver. These failures included two large projects worth \$100 million and \$30 million respectively that were over budget by nearly 100%.**
- **The company's project success rate soared to 95% after implementing a PMO.**
- **According to the Project Management Institute, a year after a PMO is established, success rates on projects increase by 37%. In two years, that figure jumps to 62%, and by five years, success rates for projects have increased by 65%.**

Software Project Management: Planning and Controlling (1/2)

■ Project Plan

1. Introduction
2. Process model
3. Organization of the project
4. Standards, guidelines, procedures
5. Management activities
6. Risks
7. Staffing
8. Methods and techniques
9. Quality assurance
10. Work packages
11. Resources
12. Budget and schedule
13. Changes
14. Delivery

Software Project Management: Planning and Controlling (2/2)

- **Controlling**
 - Time**
 - Information**
 - Organization**
 - Quality**
 - Money**

Principles of Management

- **Approach (applies to any management)**

Understand the goals and objectives

quantify them where possible

Understand the constraints

if there is uncertainty, use probability estimates

Plan to meet the objectives within the constraints

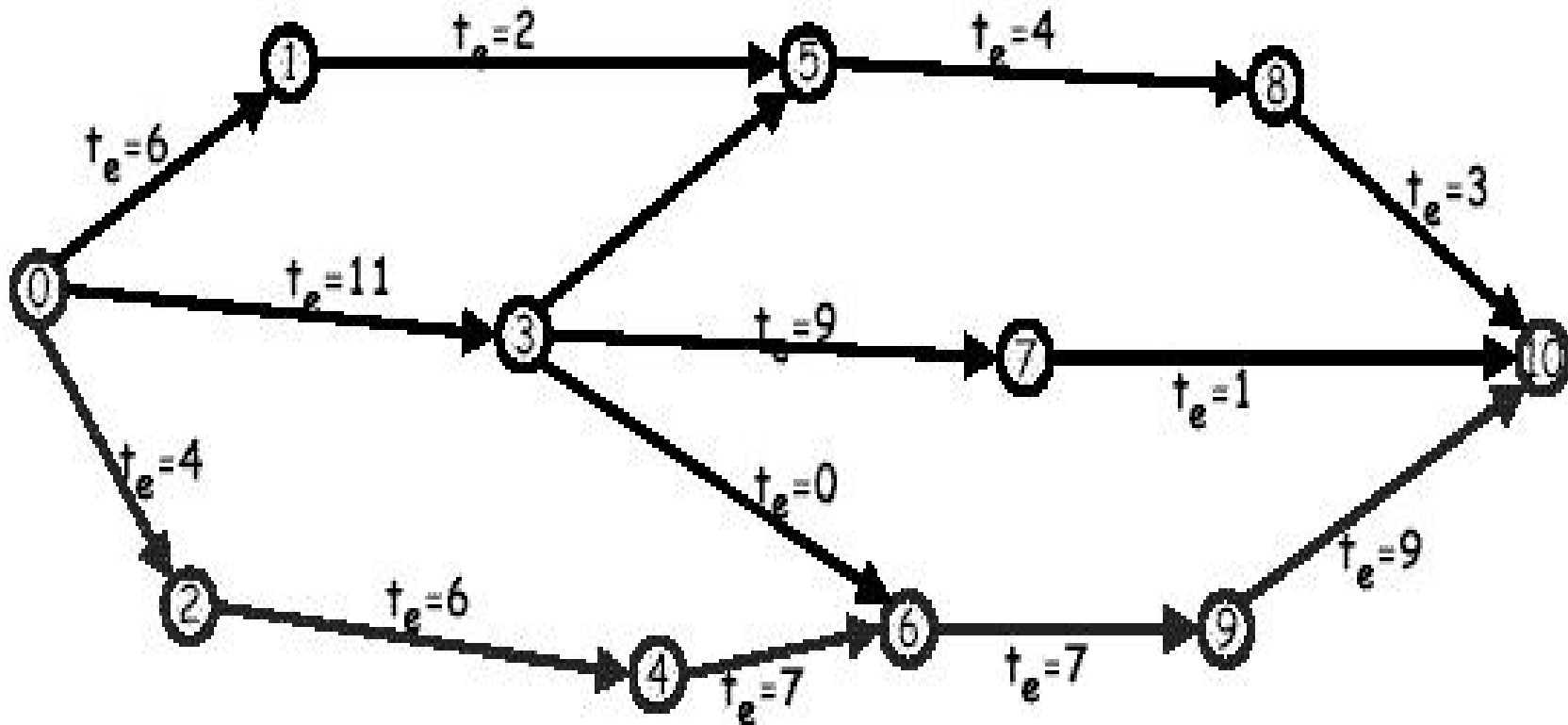
Monitor and adjust the plan

Preserve a calm, productive, positive work environment

- **Note:**

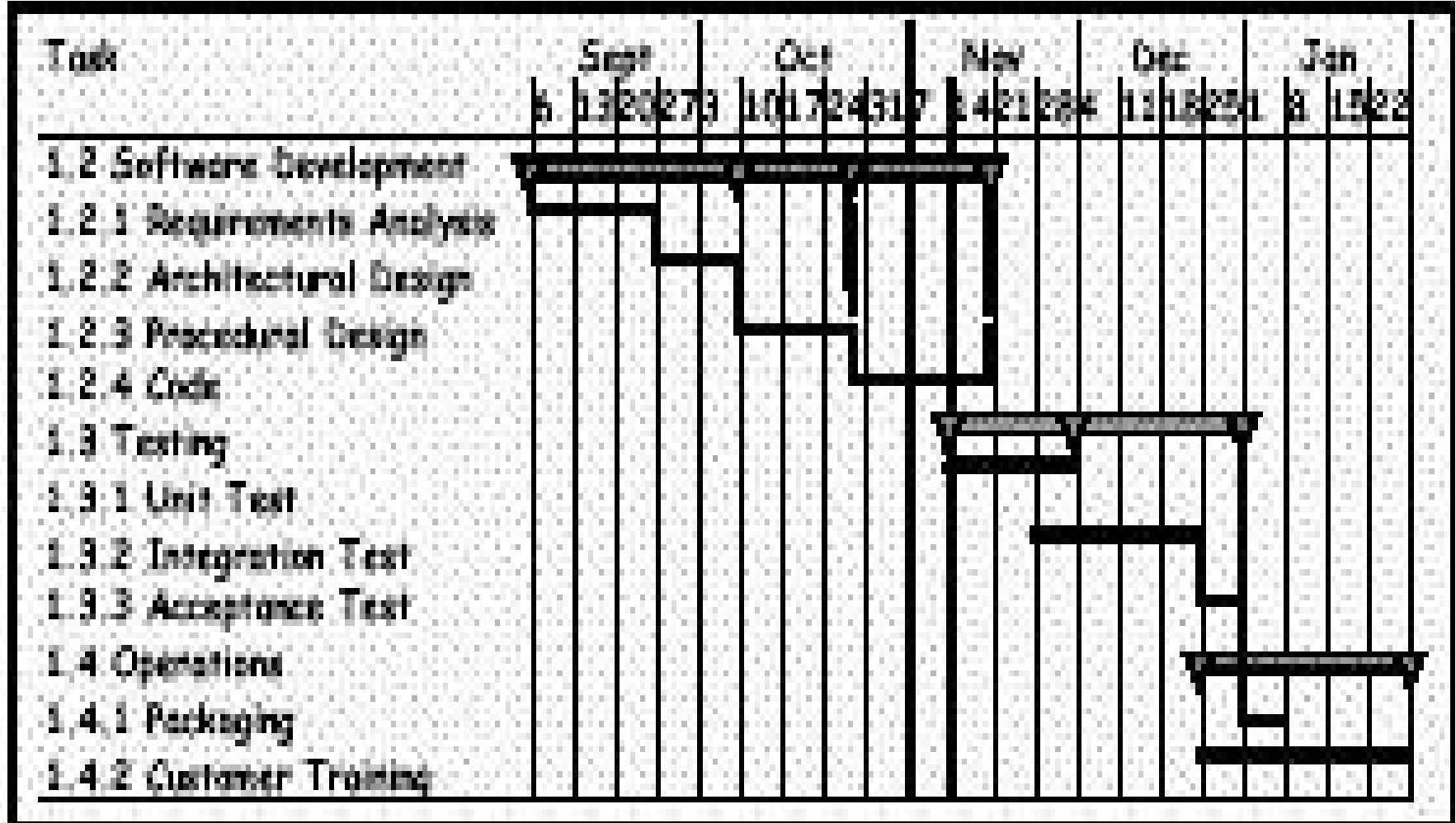
You cannot control what you cannot measure!

Tool 1: PERT Charts



Notation: Nodes indicate milestones; Edges indicate dependencies; Edges are labeled with time to complete
Shows Critical Path: Longest path from start to finish; Any slippage on the critical path will cause project delay

Tool 2: Gantt Charts



Notation: Bars show duration of tasks; Triangles show milestones; Vertical dashed lines show dependencies

Meetings (1/2)

- **Meetings are expensive**

E.g. 8 people on \$40k. Meeting costs \$320 per hour

- **Meetings are necessary**

Can save money by averting misunderstandings and coordination errors

- **Time wasters:**

Purpose of meeting unclear

Attendees unprepared

Essential people missing

Discussion gets sidetracked

Dominance by one or two people argumentative

Meetings (2/2)

■ Meetings advice:

Announce details in advance

who should attend; start and end times; goals of meeting

Written agenda, distributed in advance

Identify a chairperson who:

keeps the discussion on track; resolves arguments

Identify a secretary who:

keeps track of decisions taken; records action items

ensures action items are carried out

Associate a responsible person with each action item

Risk Management (1/2)

- **Two Parts:**

- Risk Assessment and Risk Control**

- **Definitions**

- Risk Exposure (RE) = p(possibility of risk occurrence) x l(possible loss caused by risk)**

- Risk Reduction Leverage (RRL) = (REbefore - REafter) / cost of intervention**

- **In practice, we may use the following method to assess the risk:**

- p and l can be rated as 3 (high), 2 (medium), 1 (low).**

- RE = p x l, if RE = 9 or 6, the risk is high, if RE = 4 or 3, the risk is medium, if RE = 2 or 1, the risk is low**

Risk Management (2/2)

■ Principles

If you don't actively attack risks, they will attack you

Risk prevention is cheaper than risk detection

Degree and Cause of Risk must never be hidden from decision makers

“The real professional ... knows the risks, their degree, their causes, and the action necessary to counter them, and shares this knowledge with [her] colleagues and clients”

Top Ten Risks (with Countermeasures) (1/2)

■ Personnel Shortfalls

use top talent; team building; training

■ Unrealistic schedules and budgets

multi-source estimation; designing to cost; requirements scrubbing

■ Developing the wrong Software functions

better requirements analysis; organizational/operational analysis

■ Developing the wrong User Interface

prototypes, scenarios, task analysis

■ Gold Plating

requirements scrubbing; cost benefit analysis

Top Ten Risks (with Countermeasures) (2/2)

- **Continuing stream of requirements changes**
high change threshold; information hiding;
incremental development
- **Shortfalls in externally furnished components**
early benchmarking; inspections, compatibility analysis
- **Shortfalls in externally performed tasks**
pre-award audits; competitive designs
- **Real-time performance shortfalls**
targeted analysis; simulations, benchmarks, models
- **Capability shortfalls**
technical analysis; checking scientific literature