Princess Noura University
Computer Science and Information Faculty
Information Systems Department

IS321

Chapter 3

Managing the Information Systems Project

Learning Objectives

- ✓ Discuss skills required to be an effective project manager
- ✓ Describe skills and activities of a project manager during project initiation, planning, execution and closedown
- ✓ Explain critical path scheduling, Gantt charts, and Network diagrams.
- ✓ Explain the utility of commercial project management software tools.

Importance of Project Management

- Project management may be the most important aspect of systems development project

- Effective PM helps ensure
  - Meeting customer expectations
  - Satisfying budget and time constraints

Project Manager

- is a Systems Analyst responsible for
  - Project initiation
  - Planning
  - Execution
  - Closing down
- Must have a diverse set of skills
  - Management
  - Leadership
  - Technical problem solving
  - Conflict management
  - Customer relations
  - Team management
  - Risk and change management

Deciding on Systems Projects

- System Service Request (SSR)
  - A standard form for requesting or proposing systems development work within an organization
- Feasibility study
  - A study that determines whether a requested system makes economic and operational sense for an organization

Figure 3-2 System Service Request for Purchasing Fulfillment System with name and contact information of the person requesting the system, a statement of the problem, and the name and contact information of the liaison and sponsor

Pine Valley Furniture
System Service Request

REQUESTED BY Juanita Lopez DATE November 1, 2004

DEPARTMENT Purchasing, Manufacturing Support

LOCATION Headquarters, 1-322

CONTACT Tel: 4-3267 FAX: 4-3270 e-mail: jlopez

TYPE OF REQUEST

[X] New System
[ ] System Enhancement
[ ] System Error Correction

URGENCY

[ ] Immediate – Operations are impaired or opportunity lost
[ ] Problems exist, but can be worked around
[X] Business losses can be tolerated until new system installed

PROBLEM STATEMENT

Sales growth at PVF has caused greater volume of work for the manufacturing support unit within Purchasing. Further, more concentration on customer service has reduced manufacturing lead times, which puts more pressure on purchasing activities. In addition, cost-cutting measures force Purchasing to be more aggressive in negotiating terms with vendors, improving delivery times, and lowering our investments in inventory. The current modest systems support for Manufacturing/Purchasing is not responsive to these new business conditions. Data are not available, information cannot be summarized, supplier orders cannot be adequately tracked, and commodity buying is not well supported. PVF is spending too much on raw materials and not being responsive to manufacturing needs.

SERVICE REQUEST

I request a thorough analysis of our current operations with the intent to design and build a completely new information system. This system should handle all purchasing transactions, support display and reporting of critical purchasing data, and assist purchasing agents in commodity buying.

IS LIAISON Chris Martin (Tel: 4-6204 FAX: 4-6200 e-mail: cmartin)

SPONSOR Sal Divario, Director, Purchasing

TO BE COMPLETED BY SYSTEMS PRIORITY BOARD

[ ] Request approved Assigned to _____
Start date _____
[ ] Recommend revision
[ ] Suggest user development
[ ] Reject for reason _____

- System Service Request (SSR) is a form requesting development or maintenance of an information system. It includes the contact person, a problem statement, a service request statement, and liaison contact information

Project Management Phases

- Project
  - Planned undertaking of related activities to reach an objective that has a beginning and an end.

- Project management phases
  - Initiation
  - Planning
  - Execution
  - Closing down

PM Phase 1: Project Initiation

- Assess size, scope and complexity, and establish procedures to support later project activities.
- Activities:
  1- Establishing the project Initiation team
  2- Establishing a relationship with customer
  3- Establishing the project initiation plan
  4- Establishing management procedures

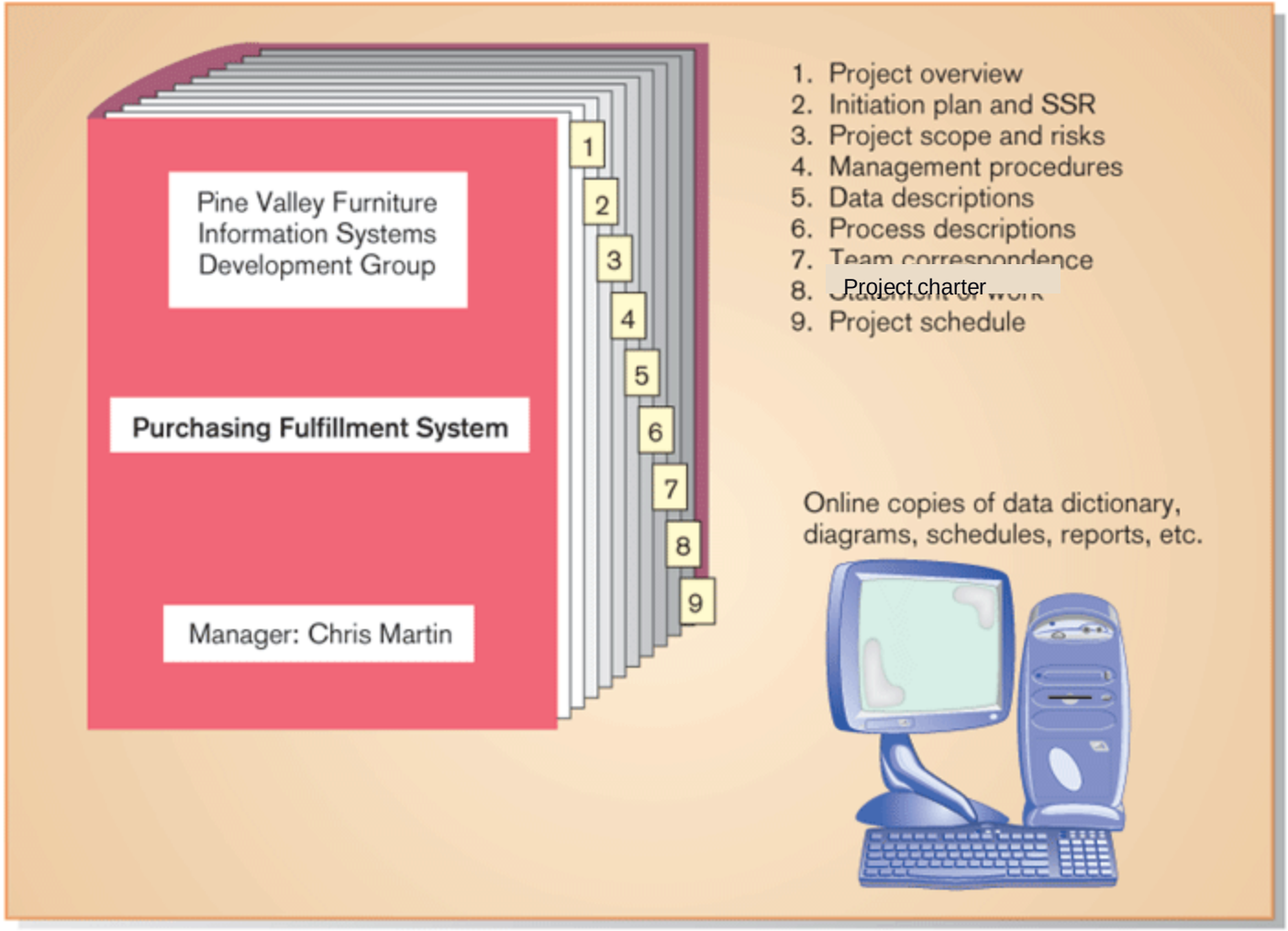
PM Phase 1: Project Initiation cont.

5- Establishing the project management environment and Project workbook

6- Developing the project charter

- A short document prepared for the customer during project initiation that describes what the project will deliver and outlines generally at a high level all work required to complete the project

Figure 3-6 The project workbook for the Purchase Fulfillment System project contains nine key documents in both hard-copy and electronic form.



PM Phase 2: Project Planning

- Define clear, discrete activities and the work needed to complete each activity within a single project.

- Activities:

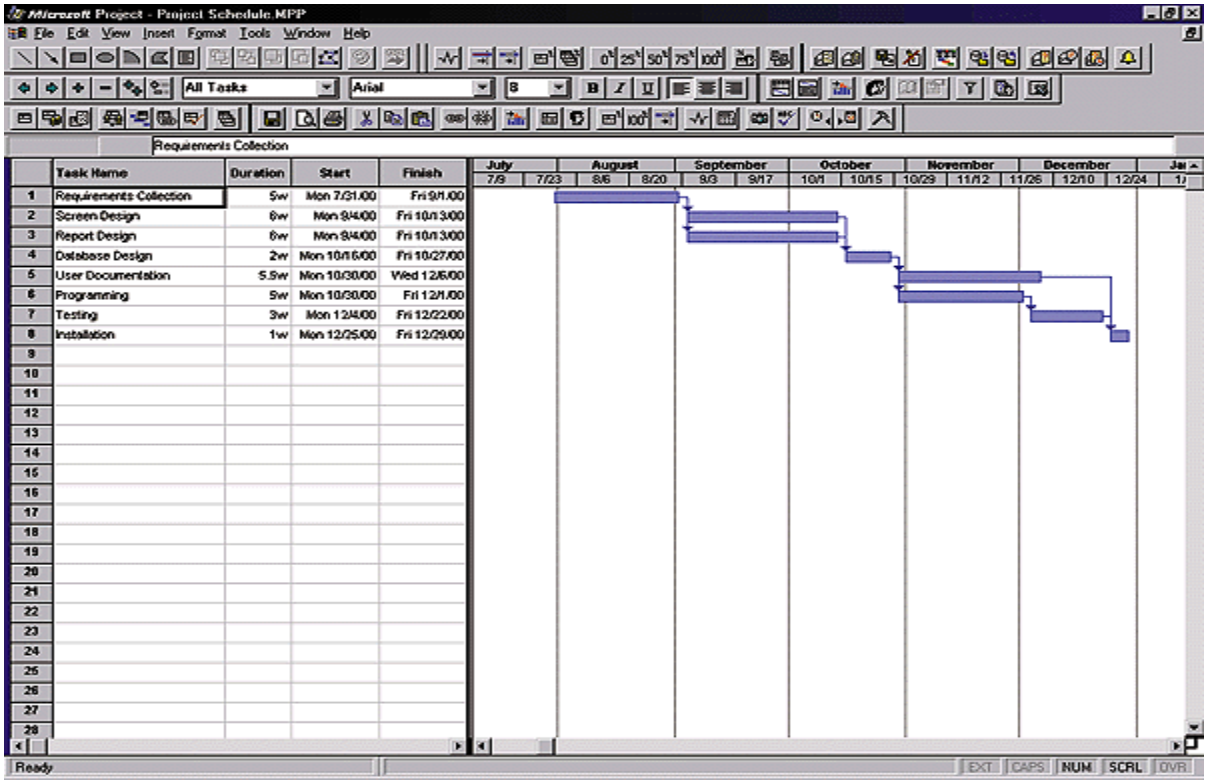
  1-Describe project scope, alternatives and feasibility

  - Understand the project
  - What problem is addressed
  - What results are to be achieved
  - Measures of success
  - Completion criteria

PM Phase 2: Project Planning cont.

2- Divide the project into manageable tasks

- Work breakdown structure (e.g. Gantt chart)

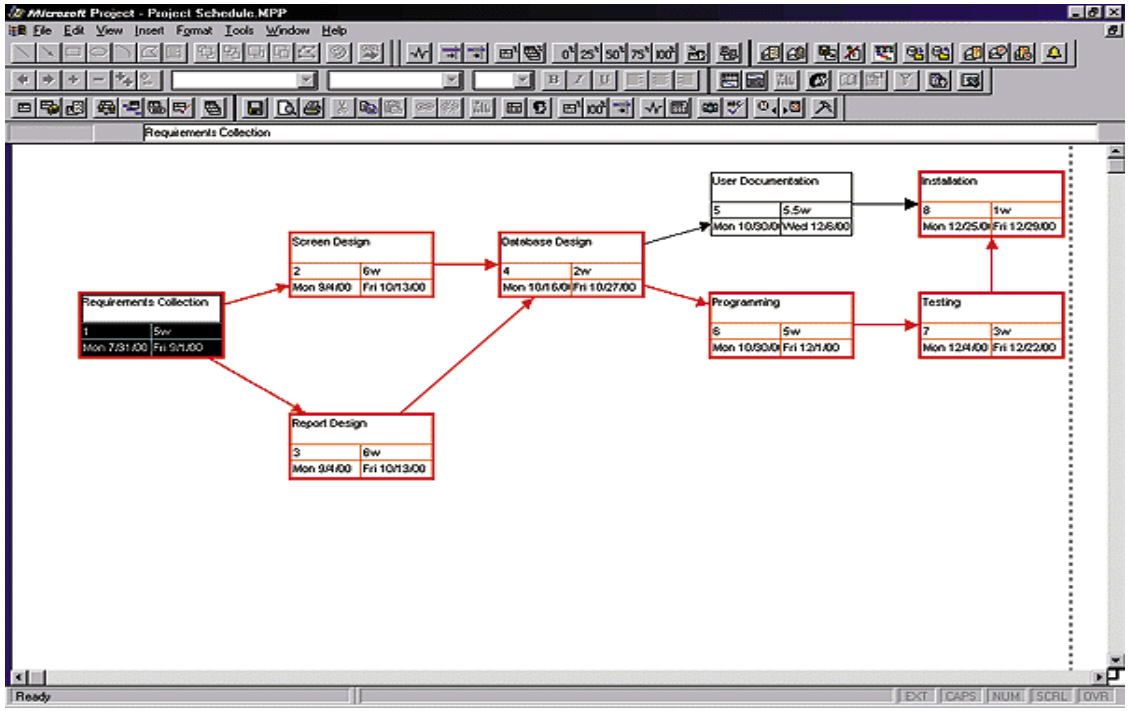


PM Phase 2: Project Planning cont.

3- Estimate resources and create a resource plan.

4- Develop a preliminary schedule

- Gantt chart and network diagrams



PM Phase 2: Project Planning cont.

5 - Develop a communication plan

- Outline communication processes among customers, team members and management
- Types of reports
- Frequency of reports

6- Determine project standards and procedures

- Specify how deliverables are tested and produced

PM Phase 2: Project Planning cont.

7- Identify and assess risk

- Identify sources of risk
- Estimate consequences of risk

8- Create a preliminary budget

9- Develop a Project Scope Statement

- Outlines work that will be done and describe what the project will deliver

10- Set a Baseline Project Plan

- Estimate of project's tasks and resources requirement
- Guide to the next project phase (execution)

PM Phase 3: Project Execution

- Plans created in prior phases are put into action.

- Activities:

  1- Execute baseline project plan

  - Acquire and assign resources
  - Train new team members
  - Keep project on schedule

  2- Monitor project progress against the baseline project plan

  - Adjust resources, budget and/or activities

PM Phase 3: Project Execution cont.

3- Manage changes to baseline project plan

- Slipped completion dates
- Changes in personnel
- New activities

4- Maintain project workbook

5- Communicate project status

PM Phase 4: Project Closedown

- Bring the project to an end.
- Activities:

1- Closing down the project

- Types of termination:
  - Natural
    - Requirements have been met
  - Unnatural
    - Project stopped
- Documentation
- Personnel Appraisal

PM Phase 4: Project Closedown cont.

2- Conduct post-project reviews

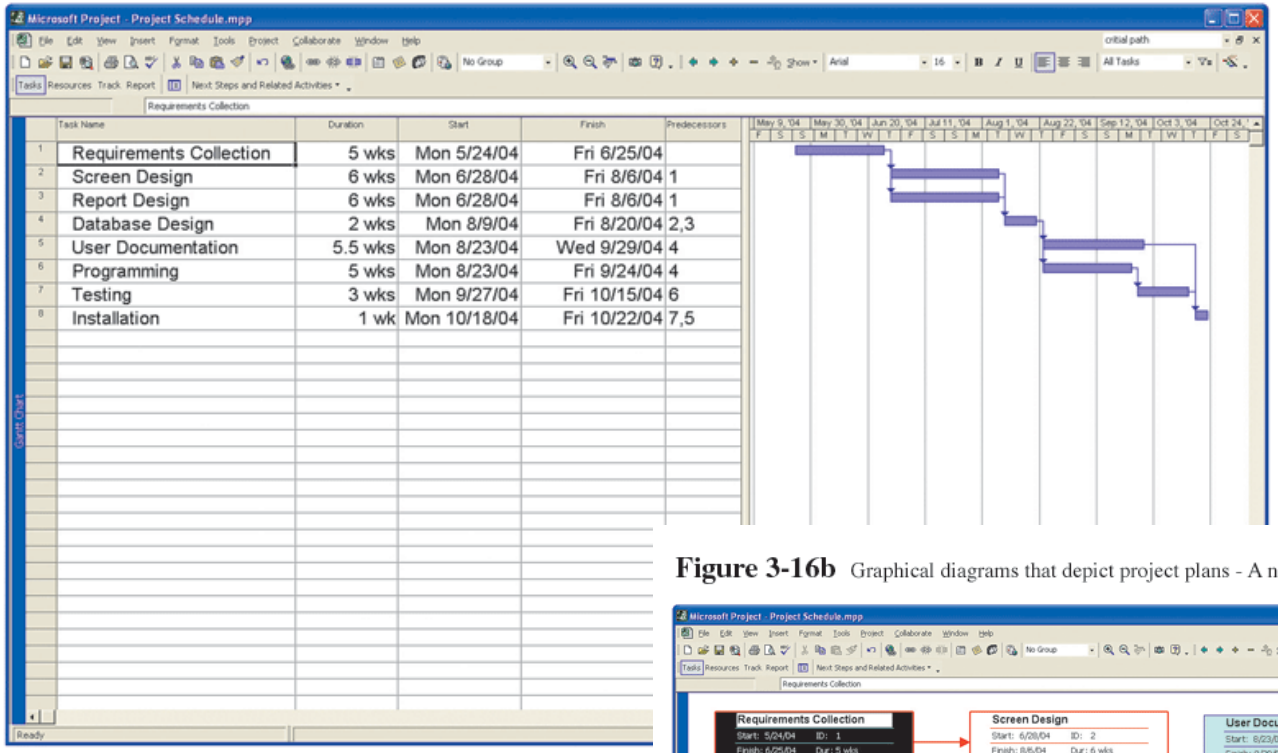
- Determine strengths and weaknesses of
  - Project deliverables
  - Project management process
  - Development process

3- Close customer contract

Representing and Scheduling Project Plans

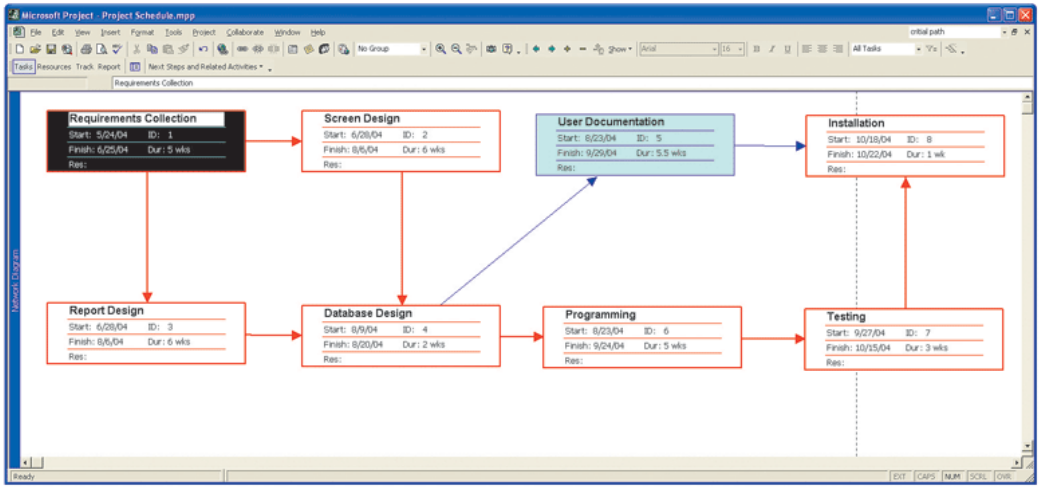
- Gantt Charts
  - Useful for depicting simple projects or parts of large projects
  - Show start and completion dates for individual tasks
- Network Diagram
  - Show order of activities

Figure 3-16a Graphical diagrams that depict project plans - A Gantt chart



	Task Name	Duration	Start	Finish	Predecessors
1	Requirements Collection	5 wks	Mon 5/24/04	Fri 6/25/04	
2	Screen Design	6 wks	Mon 6/28/04	Fri 8/6/04	1
3	Report Design	6 wks	Mon 6/28/04	Fri 8/6/04	1
4	Database Design	2 wks	Mon 8/9/04	Fri 8/20/04	2,3
5	User Documentation	5.5 wks	Mon 8/23/04	Wed 9/29/04	4
6	Programming	5 wks	Mon 8/23/04	Fri 9/24/04	4
7	Testing	3 wks	Mon 9/27/04	Fri 10/15/04	6
8	Installation	1 wk	Mon 10/18/04	Fri 10/22/04	7,5

Figure 3-16b Graphical diagrams that depict project plans - A network diagram



Comparison of Gantt chart and Network diagram

Gantt chart	Network diagram
Visually shows duration of tasks	Visually shows dependencies between tasks
Visually shows time overlap between tasks	Visually shows which tasks can be done in parallel
Visually shows slack time	Shows slack time by data in rectangles

Calculating Expected Time Duration Using PERT

- PERT: Program Evaluation Review Technique
- Technique that uses optimistic (*o*), pessimistic (*p*), and realistic (*r*) time estimates to determine expected task duration
- Formula for Expected Time for each activity:
  - ET = (o + 4r + p)/6

Example PERT Analysis

Figure 3-19 Estimated time calculations for the SPTS project

ACTIVITY	TIME ESTIMATE (in weeks) o	r	p	EXPECTED TIME (ET) $\frac{o + 4r + p}{6}$
1. Requirements Collection	1	5	9	5
2. Screen Design	5	6	7	6
3. Report Design	3	6	9	6
4. Database Design	1	2	3	2
5. User Documentation	3	6	7	5.5
6. Programming	4	5	6	5
7. Testing	1	3	5	3
8. Installation	1	1	1	1

Constructing a Gantt Chart and Network Diagram

- Steps:
  1- Identify each activity
  - Requirements Collection
  - Screen Design
  - Report Design
  - Database Design
  - User documentation
  - Software programming
  - Installation and testing

Constructing a Gantt Chart and Network Diagram cont.

2- Determine time estimates and expected completion times for each activity.

ACTIVITY	TIME ESTIMATE (in weeks) o	r	p	EXPECTED TIME (ET) $\frac{o + 4r + p}{6}$
1. Requirements Collection	1	5	9	5
2. Screen Design	5	6	7	6
3. Report Design	3	6	9	6
4. Database Design	1	2	3	2
5. User Documentation	3	6	7	5.5
6. Programming	4	5	6	5
7. Testing	1	3	5	3
8. Installation	1	1	1	1

Constructing a Gantt Chart and Network Diagram cont.

3- Determine sequence of activities

ACTIVITY	PRECEDING ACTIVITY
1. Requirements Collection	—
2. Screen Design	1
3. Report Design	1
4. Database Design	2,3
5. User Documentation	4
6. Programming	4
7. Testing	6
8. Installation	5,7

Construct a Gantt chart and network diagram using the estimated time and activity sequencing.

Constructing a Gantt Chart and Network Diagram cont.

4- Determine the critical path.

- Critical path: the shortest time in which a project can be completed

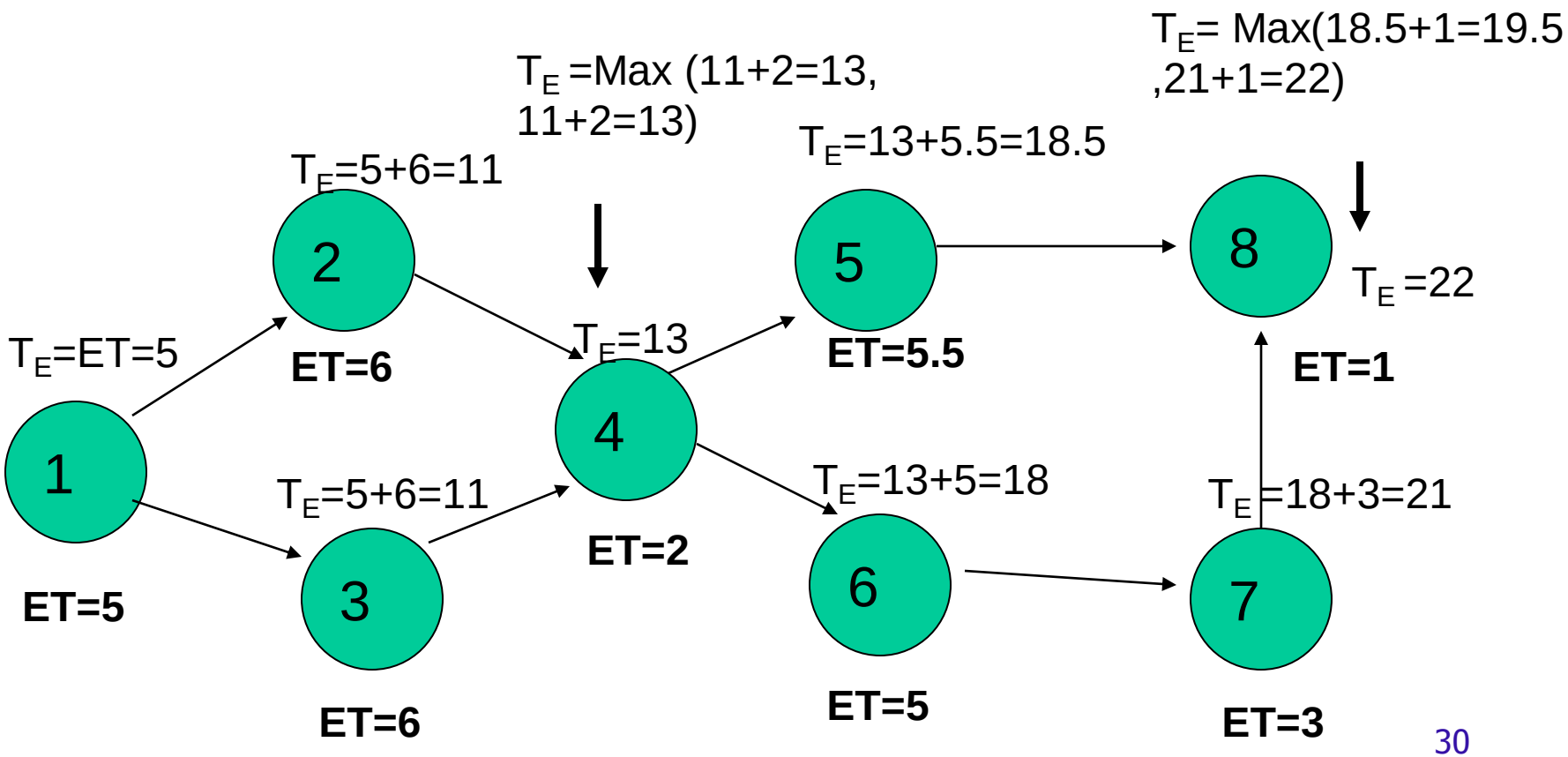
- Slack time: the amount of time that an activity can be delayed without delaying the project

Determining the Critical Path

- Calculate the earliest expected completion time (T_E) for each activity
  - For first activity T_E = ET
  - For other activities:
    - T_E = MAX(T_E(predecessor) + ET(current))
- The T_E for the last activity represents the amount of time the project should take to complete.

ACTIVITY	TIME ESTIMATE (in weeks) o	r	p	EXPECTED TIME (ET) $\frac{o+4r+p}{6}$
1. Requirements Collection	1	5	9	5
2. Screen Design	5	6	7	6
3. Report Design	3	6	9	6
4. Database Design	1	2	3	2
5. User Documentation	3	6	7	5.5
6. Programming	4	5	6	5
7. Testing	1	3	5	3
8. Installation	1	1	1	1

ACTIVITY	PRECEDING ACTIVITY
1. Requirements Collection	—
2. Screen Design	1
3. Report Design	1
4. Database Design	2,3
5. User Documentation	4
6. Programming	4
7. Testing	6
8. Installation	5,7

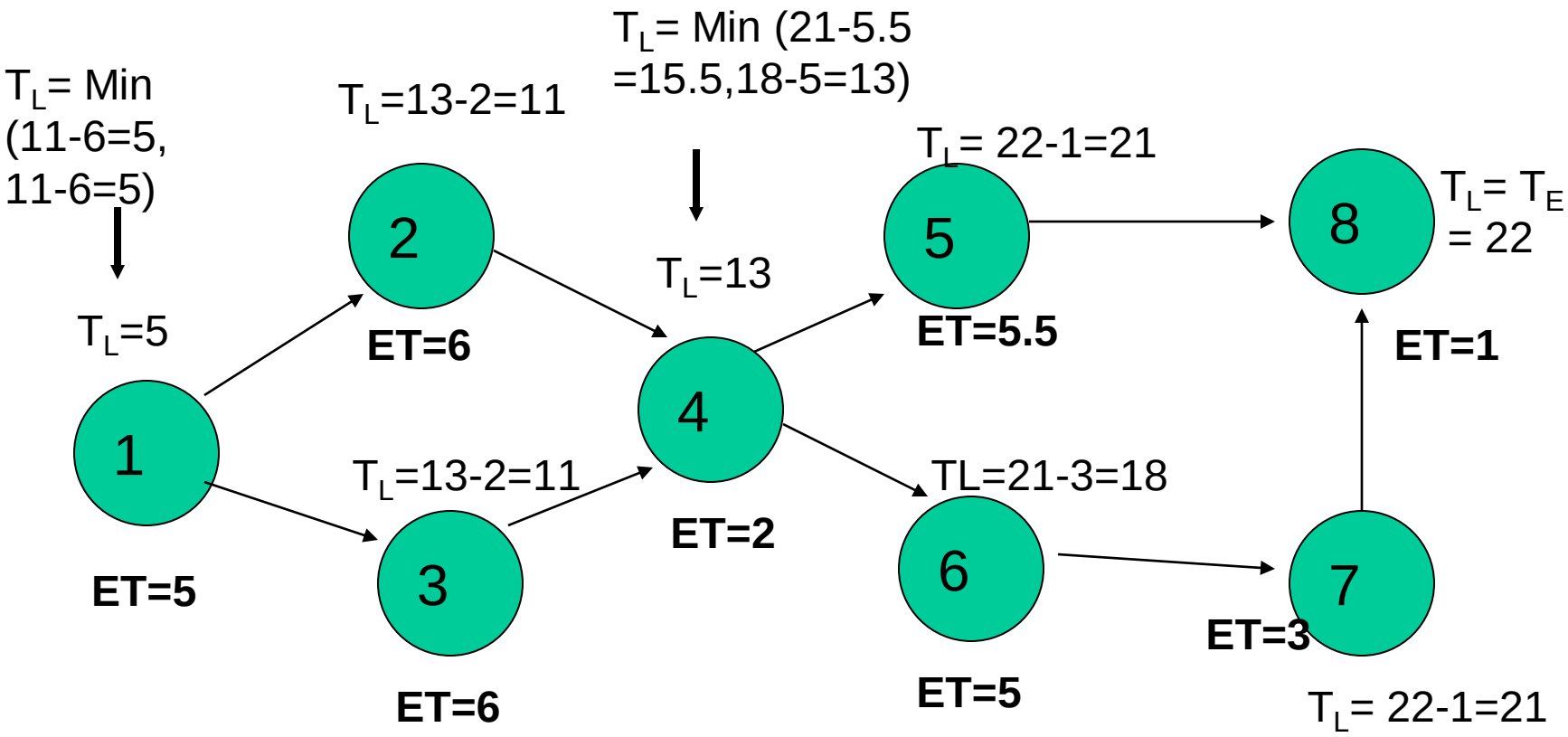


Determining the Critical Path cont.

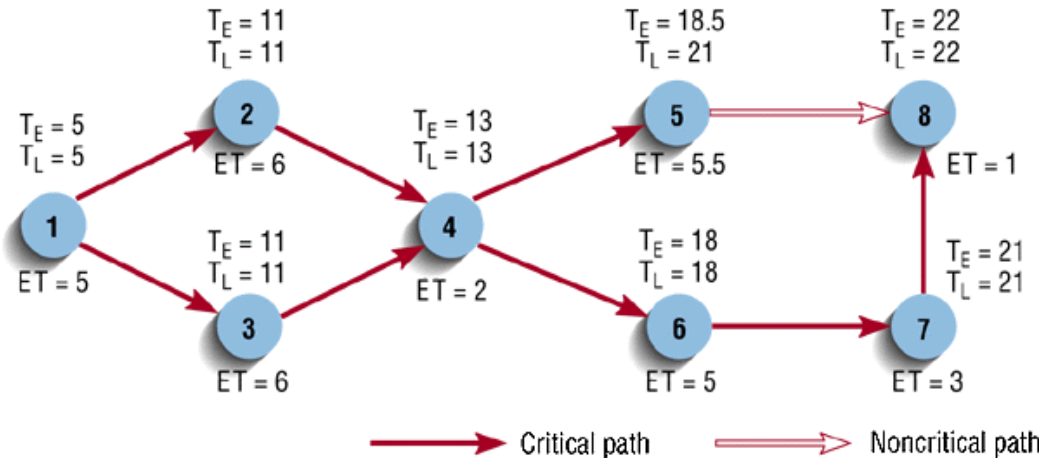
- Calculate the latest expected completion time (T_L) for each activity
  - For last activity $T_L = T_E$
  - For other activities:
    - T_L = MIN(T_L(successor) - ET(successor))
- Calculate the slack time for each activity
  - Slack time = $T_L - T_E$
- All activities with a slack time equal to zero are on the critical path.

ACTIVITY	TIME ESTIMATE (in weeks) o	r	p	EXPECTED TIME (ET) $\frac{o+4r+p}{6}$
1. Requirements Collection	1	5	9	5
2. Screen Design	5	6	7	6
3. Report Design	3	6	9	6
4. Database Design	1	2	3	2
5. User Documentation	3	6	7	5.5
6. Programming	4	5	6	5
7. Testing	1	3	5	3
8. Installation	1	1	1	1

ACTIVITY	PRECEDING ACTIVITY
1. Requirements Collection	—
2. Screen Design	1
3. Report Design	1
4. Database Design	2,3
5. User Documentation	4
6. Programming	4
7. Testing	6
8. Installation	5,7



Determining the Critical Path cont.



ACTIVITY	T_E	T_L	SLACK $T_L - T_E$	ON CRITICAL PATH
1	5	5	0	✓
2	11	11	0	✓
3	11	11	0	✓
4	13	13	0	✓
5	18.5	21	2.5	
6	18	18	0	✓
7	21	21	0	✓
8	22	22	0	✓

Using Project Management Software

- Many systems are available

- Three activities required to use:
  - Establish project start or end date
  - Enter tasks and assign task relationships
  - Select scheduling method to review project reports