Modern Systems Analysis and Design

Chapter 3

## Managing the Information Systems Project

Learning Objectives

- ✓ Explain the process of **managing an information systems project**.

- ✓ Describe the **skills required** to be **an effective project manager**.

- ✓ List **project management activities** 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**.

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Importance of Project Management

▶ **Project management** may be the **most important aspect** of systems development.

▶ Effective PM helps ensure

  ▶ Meeting **customer expectations**

  ▶ Satisfying **budget and time constraints**

▶ PM **skills** are **difficult** and **important to learn**.

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Pine Valley Application Project
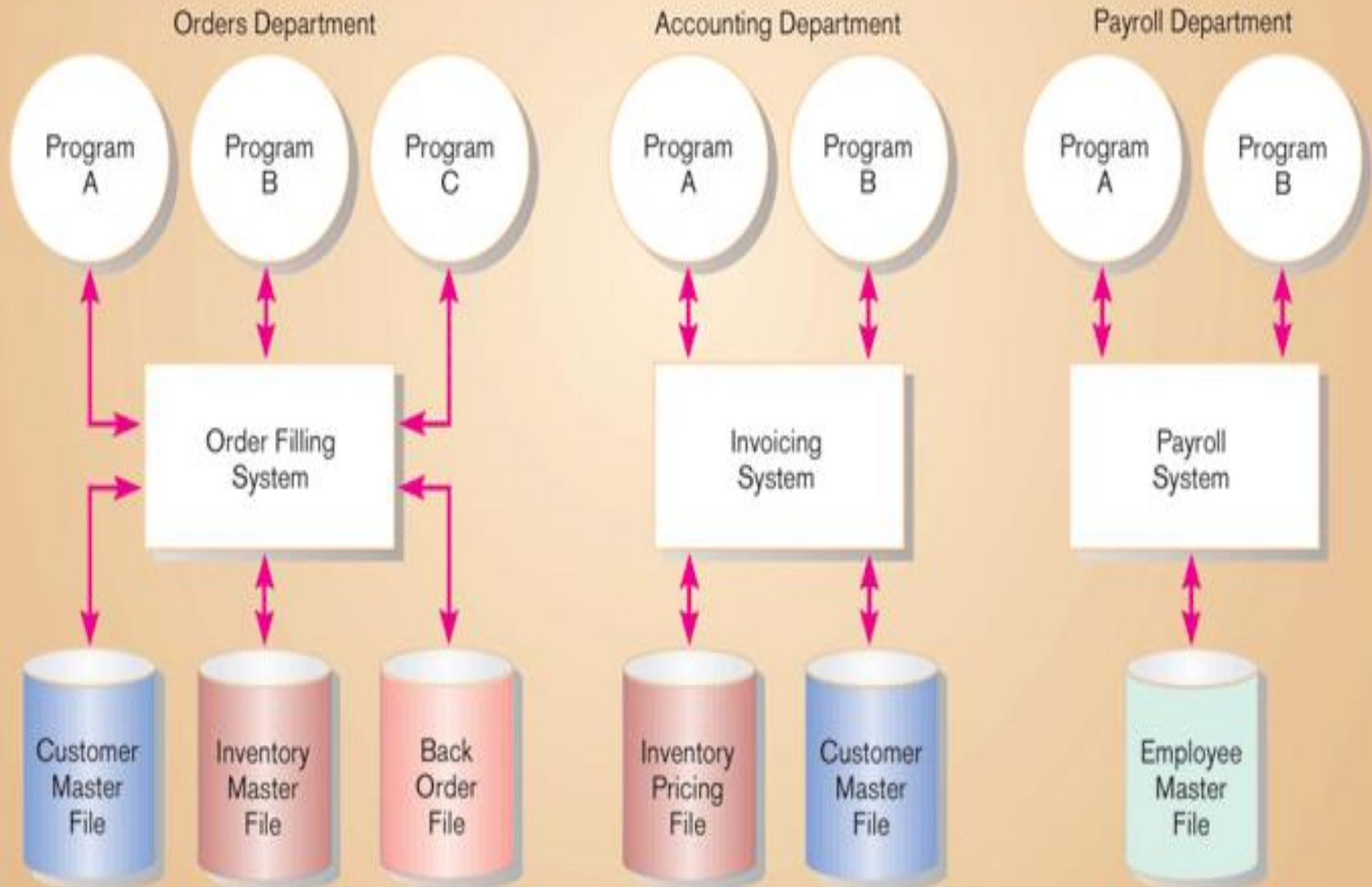
Deciding on Systems Projects

- ▶ 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.

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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   URGENCY

[X] New System   [   ] Immediate – Operations are impaired or opportunity lost

[   ] System Enhancement   [   ] Problems exist, but can be worked around
[   ] System Error Correction   [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**

Hall

Managing the Information Systems Project

- ▶ Project

  - ▶ A planned undertaking of **related activities** to **reach an objective** that has a **beginning** and an **end**

- ▶ Project management

  - ▶ A controlled process of **initiating**, **planning**, **executing**, and **closing down** a project

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Managing the Information Systems Project (cont.)

- **Project manager**

  - **Systems analyst** with **management** and **leadership skills** responsible for leading project initiation, planning, execution, and closedown

- **Deliverable**

  - The end product of an SDLC phase

Project Management Activities

Phases of Project Management Process

- ▶ Phase 1: Initiation

- ▶ Phase 2: Planning

- ▶ Phase 3: Execution

- ▶ Phase 4: Closedown

PM Phase 1: Project Initiation

- **Assess** size, scope and complexity, and establish procedures.

- Establish:

  - **Initiation team**

  - **Relationship with customer**

  - **Project initiation plan**

  - **Management procedures**

  - **Project management environment**

  - **Project workbook**

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Pine Valley Furniture
Information Systems
Development Group

Purchasing Fulfillment System

Manager: Chris Martin

1. Project overview
2. Initiation plan and SSR
3. Project scope and risks
4. Management procedures
5. Data descriptions
6. Process descriptions
7. Team correspondence
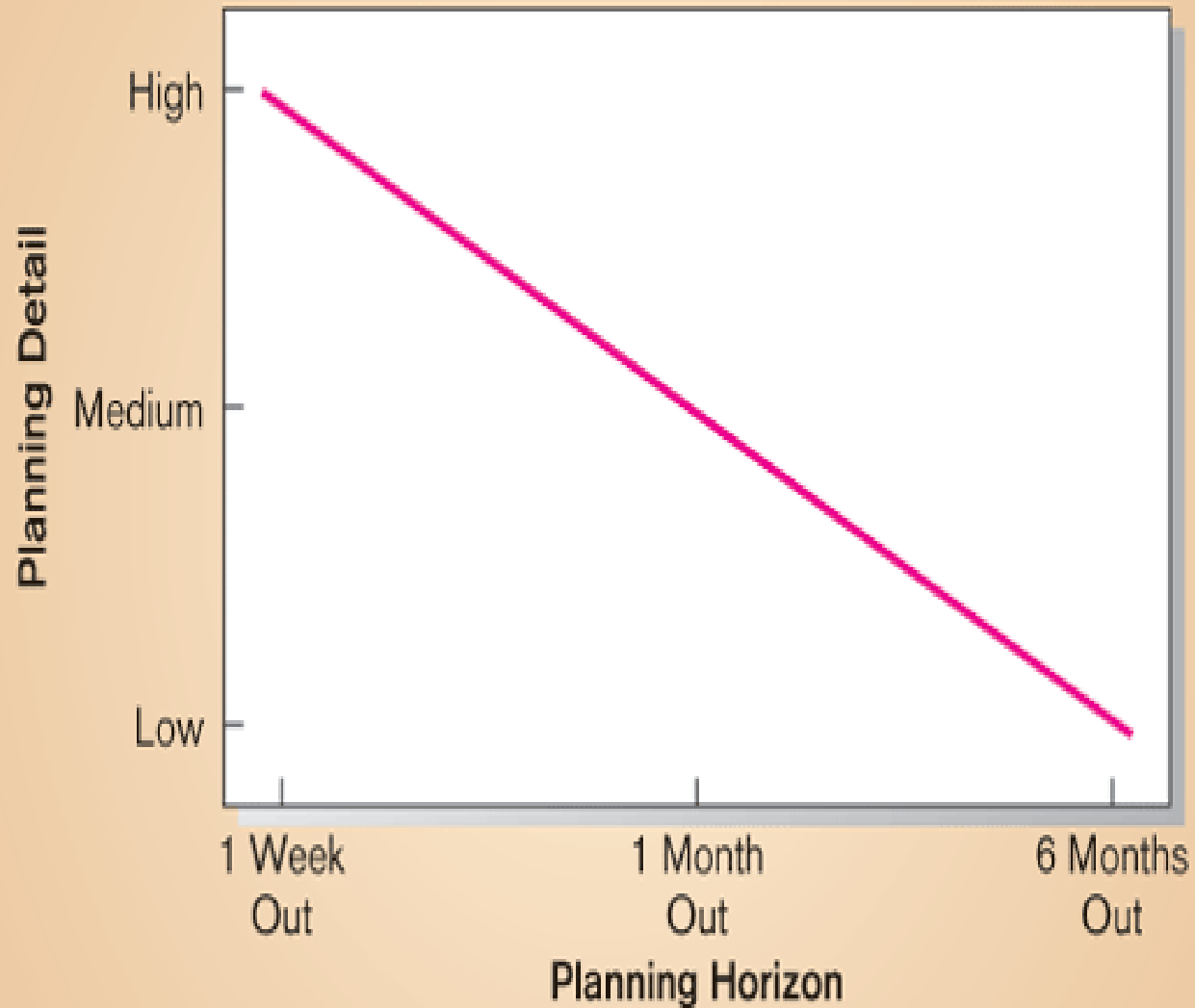8. Statement of work
9. Project schedule

Online copies of data dictionary, diagrams, schedules, reports, etc.

PM Phase 2: Project Planning

▶ Define clear, **discrete activities** and the work needed to complete each activity

▶ Tasks

  ▶ Define project scope, alternatives, feasibility

  ▶ Divide project into tasks

  ▶ Estimate resource requirements

  ▶ Develop preliminary schedule

  ▶ Develop communication plan

  ▶ Determine standards and procedures

  ▶ Risk identification and assessment

  ▶ Create preliminary budget

  ▶ Develop a statement of work

  ▶ Set baseline project plan

Planning Detail

Some Components of Project Planning

- ## Statement of Work (SOW)

  - "Contract" between the IS staff and the customer regarding deliverables and time estimates for a system development project

- ## The Baseline Project Plan (BPP)

  - Contains estimates of scope, benefits, schedules, costs, risks, and resource requirements

- ## Preliminary Budget

  - Cost-benefit analysis outlining planned expenses and revenues

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Some Components of Project Planning (cont.)
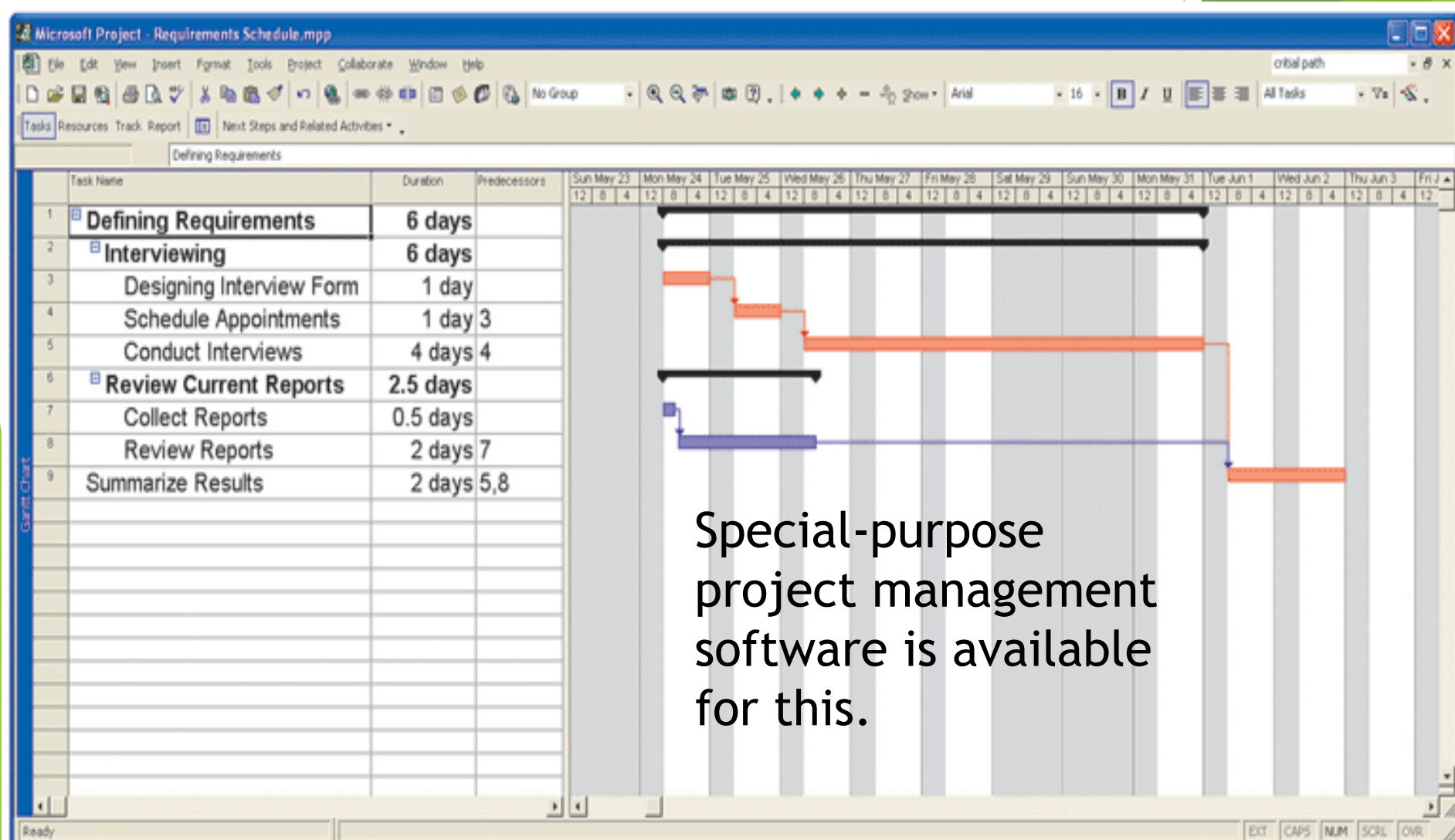
▶ **Work Breakdown Structure (WBS)**

　　▶ Division of project into **manageable and logically ordered tasks and subtasks**

▶ **Scheduling Diagrams**

　　▶ **Gantt chart**: horizontal bars represent task durations

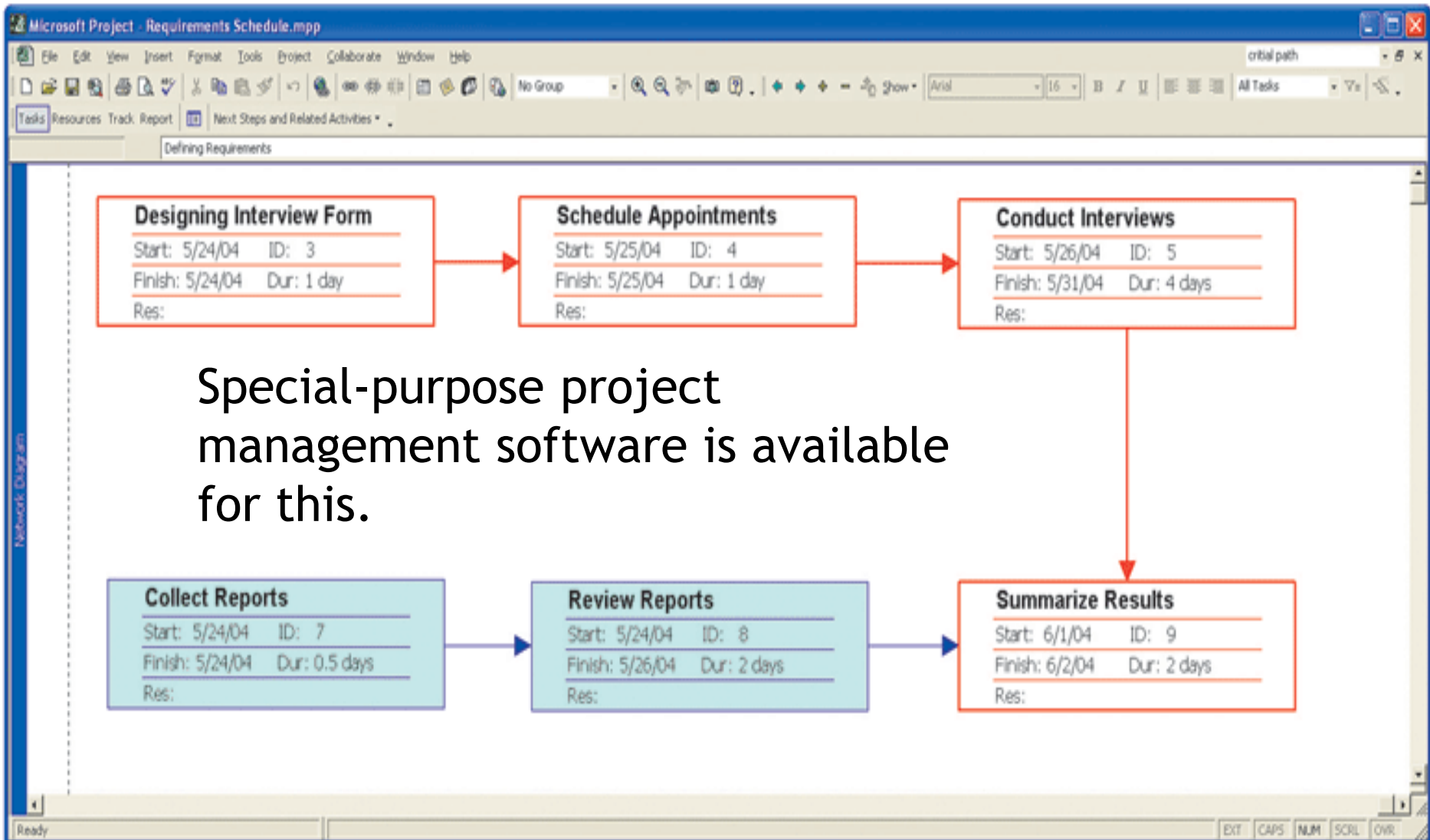　　▶ **Network diagram**: boxes and links represent task dependencies

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Scheduling Diagrams
Gantt Chart

Special-purpose project management software is available for this.

Scheduling Diagrams Network Diagram

Special-purpose project management software is available for this.

Preliminary Budget

|	A	B	C	D	E	F	G	H	I	J
1	*Economic Feasibility Analysis*									
2										
8				Years from Today						
9		*0*	*1*	*2*	*3*	*4*	*5*	*TOTALS*		
10	Build New System	$0	$85,000	$85,000	$85,000	$85,000	$85,000			
11	Discount Rate (12%)	*1.0000*	*0.8929*	*0.7972*	*0.7118*	*0.6355*	*0.5674*			
12	PV of Benefits	$0	$75,893	$67,761	$60,501	$54,019	$48,231			
13										
14	*NPV of Building New System*	$0	$75,893	$143,654	$204,156	$258,175	$306,406	**$306,406**		
15										
16	*One-time COSTS*	($75,000)								
17										
18	Continue Maintaining Existing System									
19	Recurring Costs		($35,000)	($35,000)	($35,000)	($35,000)	($35,000)			
20	Discount Rate (12%)	*1.0000*	*0.8929*	*0.7972*	*0.7118*	*0.6355*	*0.5674*			
21	PV of Recurring Costs	$0	($31,250)	($27,902)	($24,912)	($22,243)	($19,860)			
22										
23	*NPV of All COSTS*	($75,000)	($106,250)	($134,152)	($159,064)	($181,307)	($201,167)	**($201,167)**		
24										
25										
26	*Overall NPV*							$105,239		
27										
28	ROI = Overall NPV / NPV of Costs							52.31%		
29										
30	Year of Project	*0*	*1*	*2*	*3*	*4*				
31	*Break-Even Analysis*									
32	Yearly NPV Cash Flow	($75,000)	$44,643	$39,860	$35,589	$31,776	$28,371			
33	Overall NPV Cash Flow	($75,000)	($30,357)	$9,503	$45,092	$76,867	$105,239			
34										
35										
36	Break-Even Ratio = (yearly NPV cash flow - general NPV cash flow) / yearly NPV cash flow									
37	*Break Even occurs in 1.8 years*									
38										
39	Note: All dollar values have been rounded to the nearest dollar									

Spreadsheet software is good for this.

PM Phase 3: Project Execution

▶ Plans created in prior phases are put into action.

▶ Actions

   ▶ **Execute baseline project plan**

   ▶ **Monitor progress against baseline plan**

   ▶ **Manage changes in baseline plan**

   ▶ **Maintain project workbook**

Communicate project status

Monitoring Progress with a Gantt Chart

Red bars indicate critical path, lines through bars indicate percent complete.
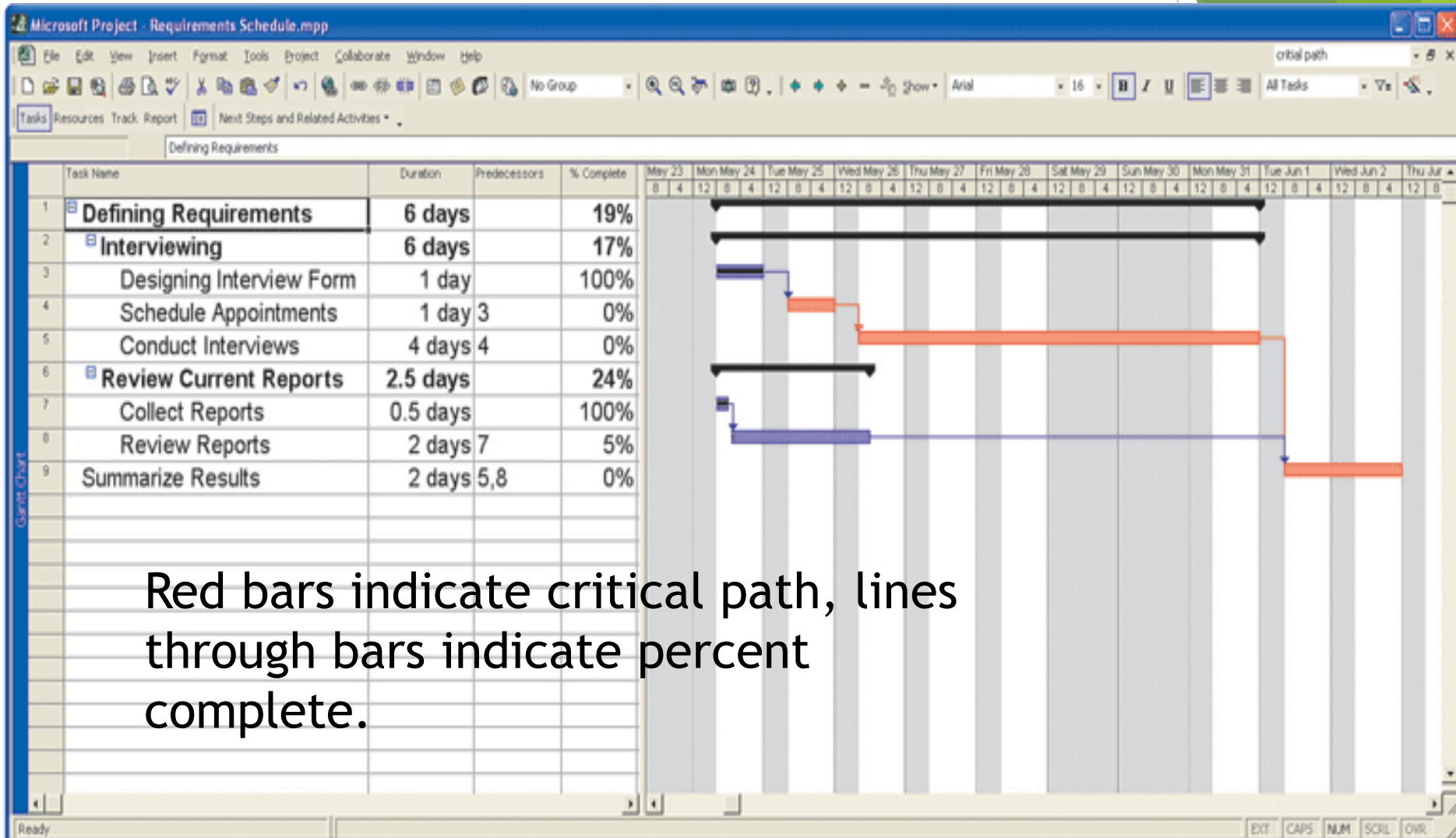
Communication Methods

- Project workbook
- Meetings
- Seminars and workshops
- Newsletters
- Status reports
- Specification documents

- Minutes of meetings
- Bulletin boards
- Memos
- Brown bag lunches
- Hallway discussions

PM Phase 4: Project Closedown

▶ **Bring the project to an end.**

▶ Actions

   ▶ **Close down the project**.

   ▶ **Conduct post-project reviews.**

   ▶ **Close the customer contract.**

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Representing and Scheduling Project Plans

▶ Gantt Charts

▶ Network Diagrams

▶ PERT Calculations

▶ Critical Path Scheduling

▶ Project Management Software

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Gantt Charts vs. Network Diagrams

- **Gantt charts**
  - Show task durations.
  - Show time overlap.
  - Show slack time in duration.
- **Network diagrams**
  - Show task dependencies.
  - Do not show time overlap, but show parallelism.
  - Show slack time in boxes.

Gantt Charts vs. Network Diagrams (cont.)

3-26
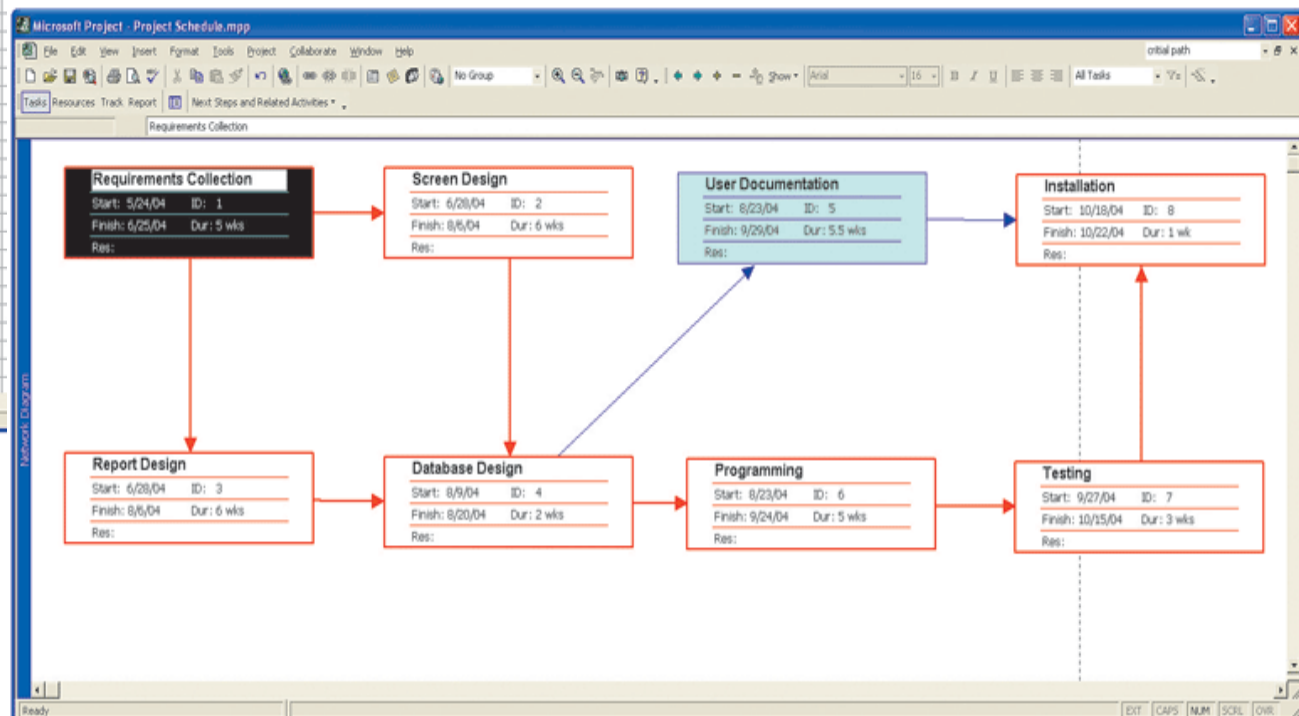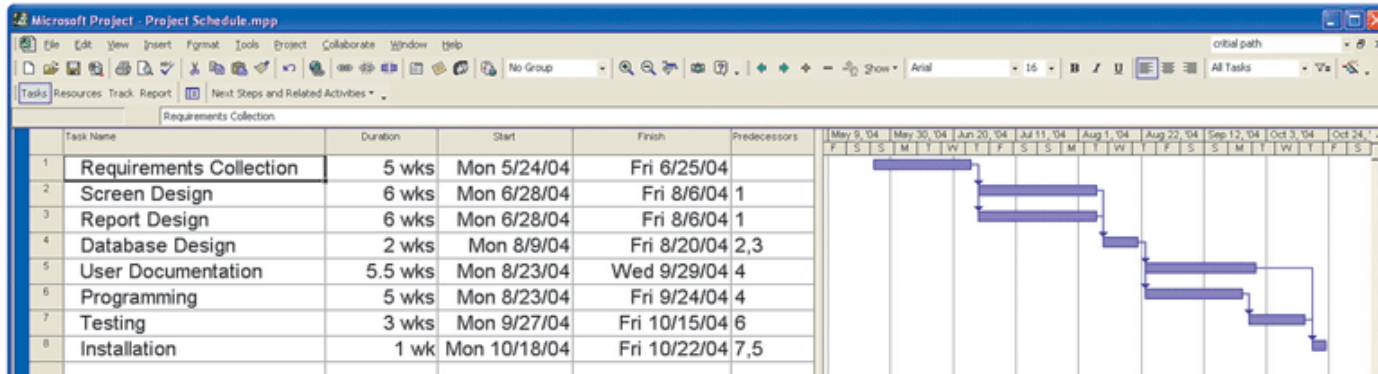
Estimating Task Duration

▶ PERT: **Program Evaluation Review Technique**

▶ Technique that uses optimistic (*o*), pessimistic (*p*), and realistic (*r*) time estimates to determine expected task duration

▶ Formula for Estimated Time:

  ▶ **ET = (o + 4r + p)/6**

Example PERT Analysis

ACTIVITY	TIME ESTIMATE (in weeks)			EXPECTED TIME (ET) $\dfrac{o + 4r + p}{6}$
	o	r	p	
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

Critical Path Scheduling

▶ A scheduling technique whose order and duration of **a sequence of task activities directly affects the completion date of a project.**

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

▶ **Slack time**: the time an activity can be delayed without delaying the project

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Critical Path Example (dependencies between tasks)

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

PRECEDING ACTIVITIES indicate the activities that must be completed before the specified activity can begin

Critical Path Example
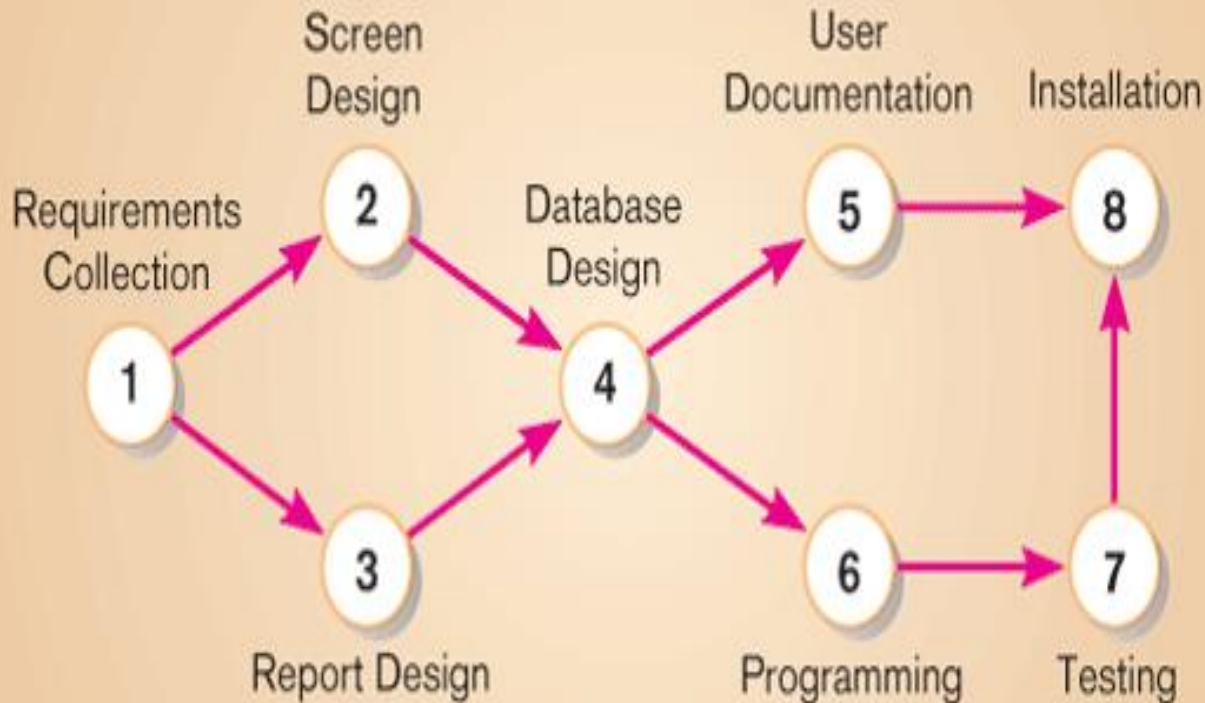
Network diagram provides graphical illustration of dependencies between activities (see previous slide).

Network diagram shows dependencies

Determining the Critical Path

▶ Calculate the **earliest possible completion time** for each activity by summing the activity times in the longest path to the activity. This gives total expected project time.

▶ Calculate the latest possible completion time for each activity by subtracting the activity times in the path following the activity from the total expected time. This gives slack time for activities.

▶ Critical path – contains no activities with slack time.

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Critical Path Calculation
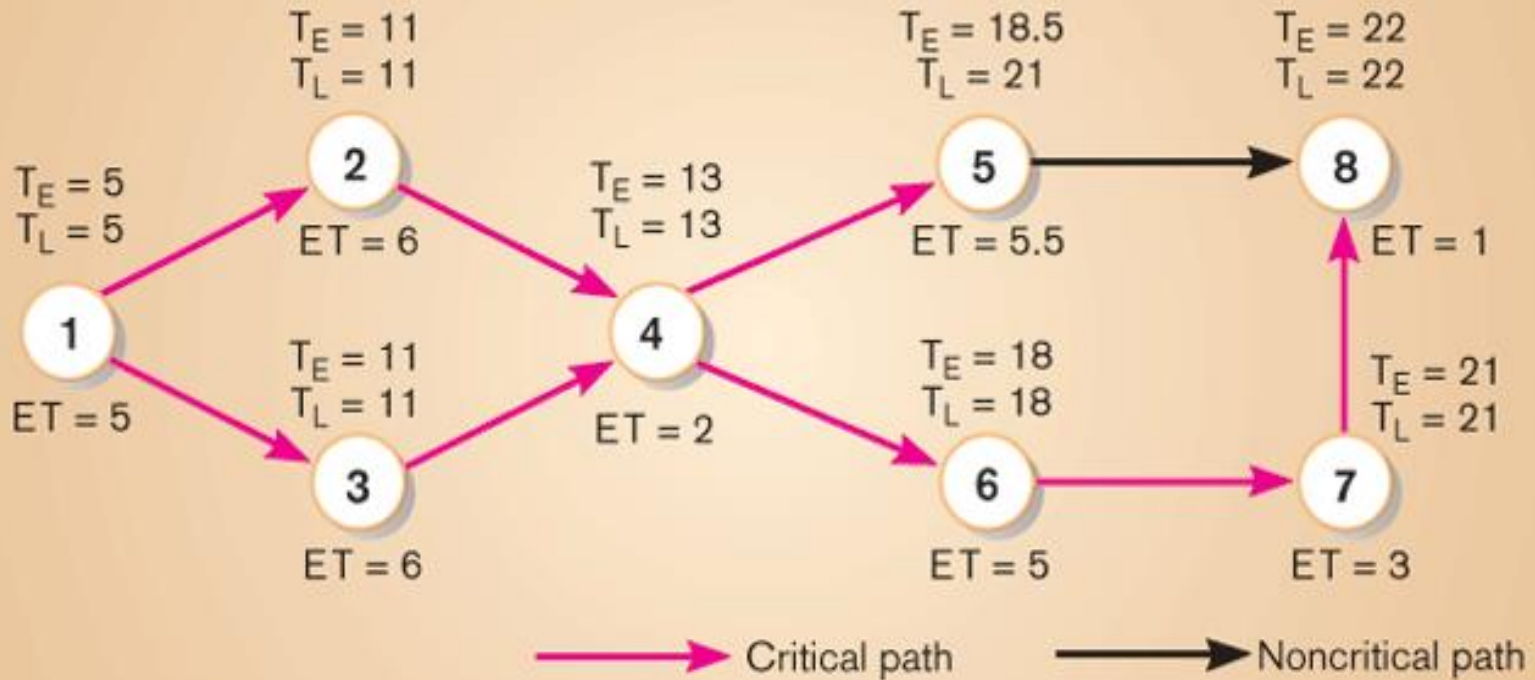
Early and late time calculations are determined and critical path established. (Note: Activity #5 can begin late without affecting project completion time).

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Critical Path Calculation (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	✓

Note the slack time in Activity #5.

Using Project Management Software

- ▶ Many powerful software tools exist for assisting with project management.

- ▶ Example: **Microsoft Project** can help with

  - ▶ **Entering project start date.**

  - ▶ **Establishing tasks and task dependencies.**

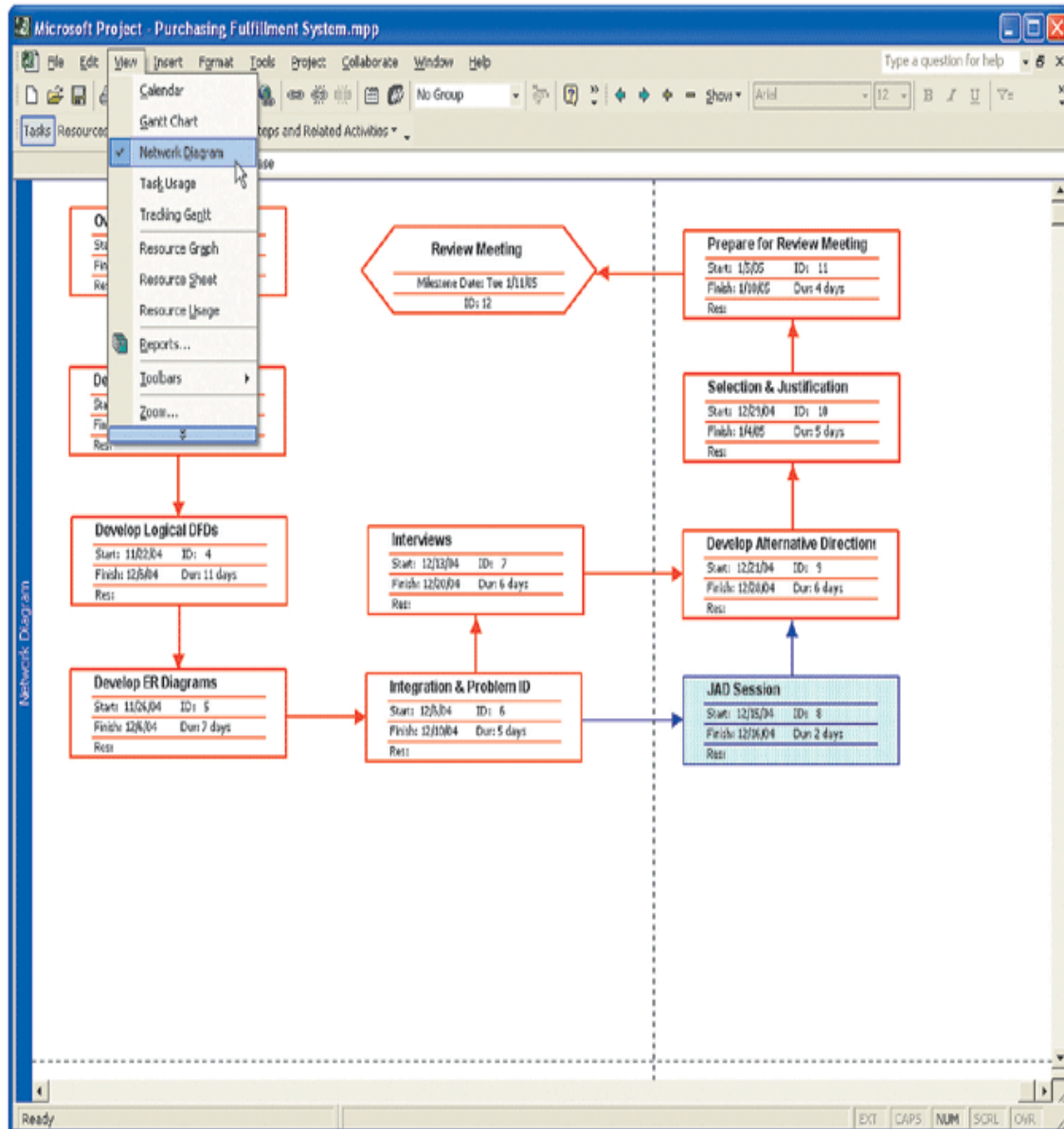 - ▶ **Viewing project information as Gantt or Network diagrams.**

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Project Start Date
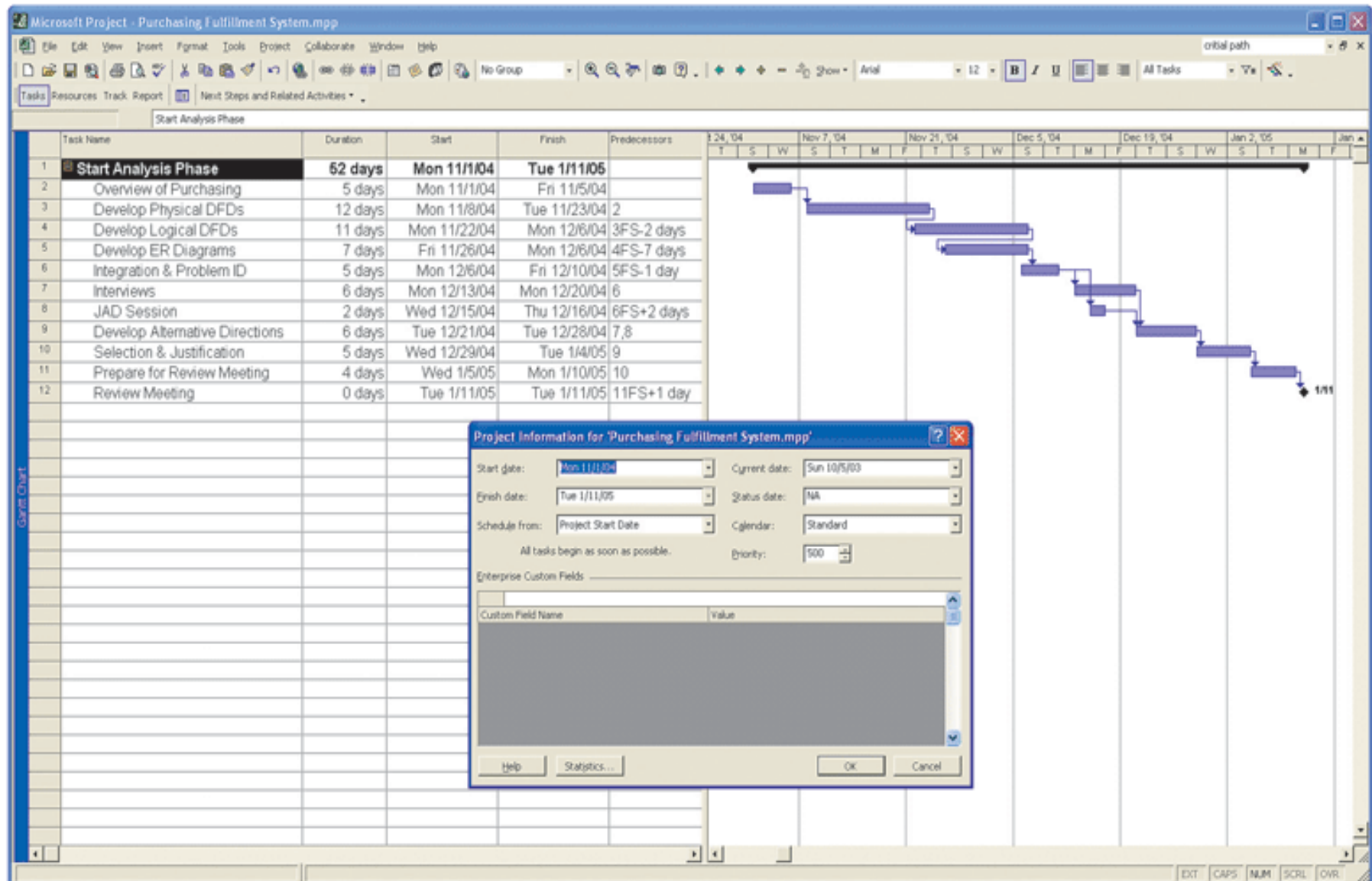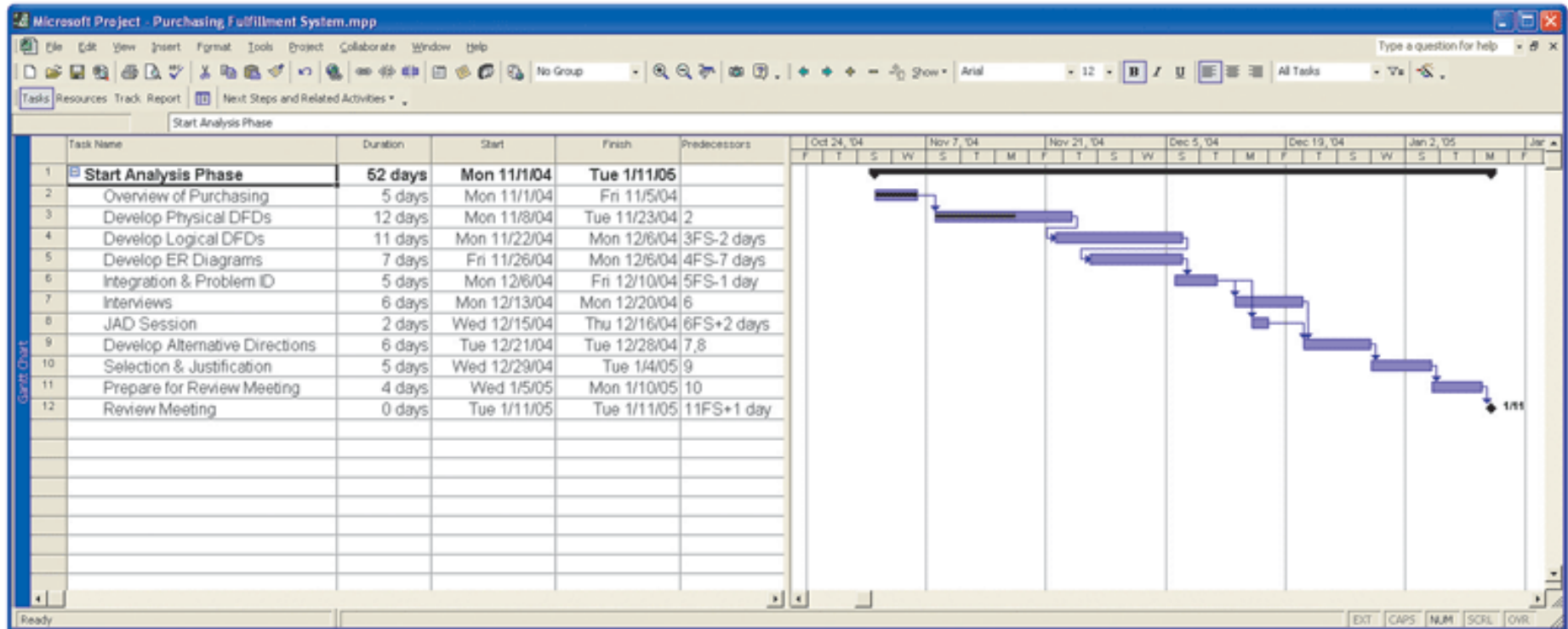
Entering Tasks
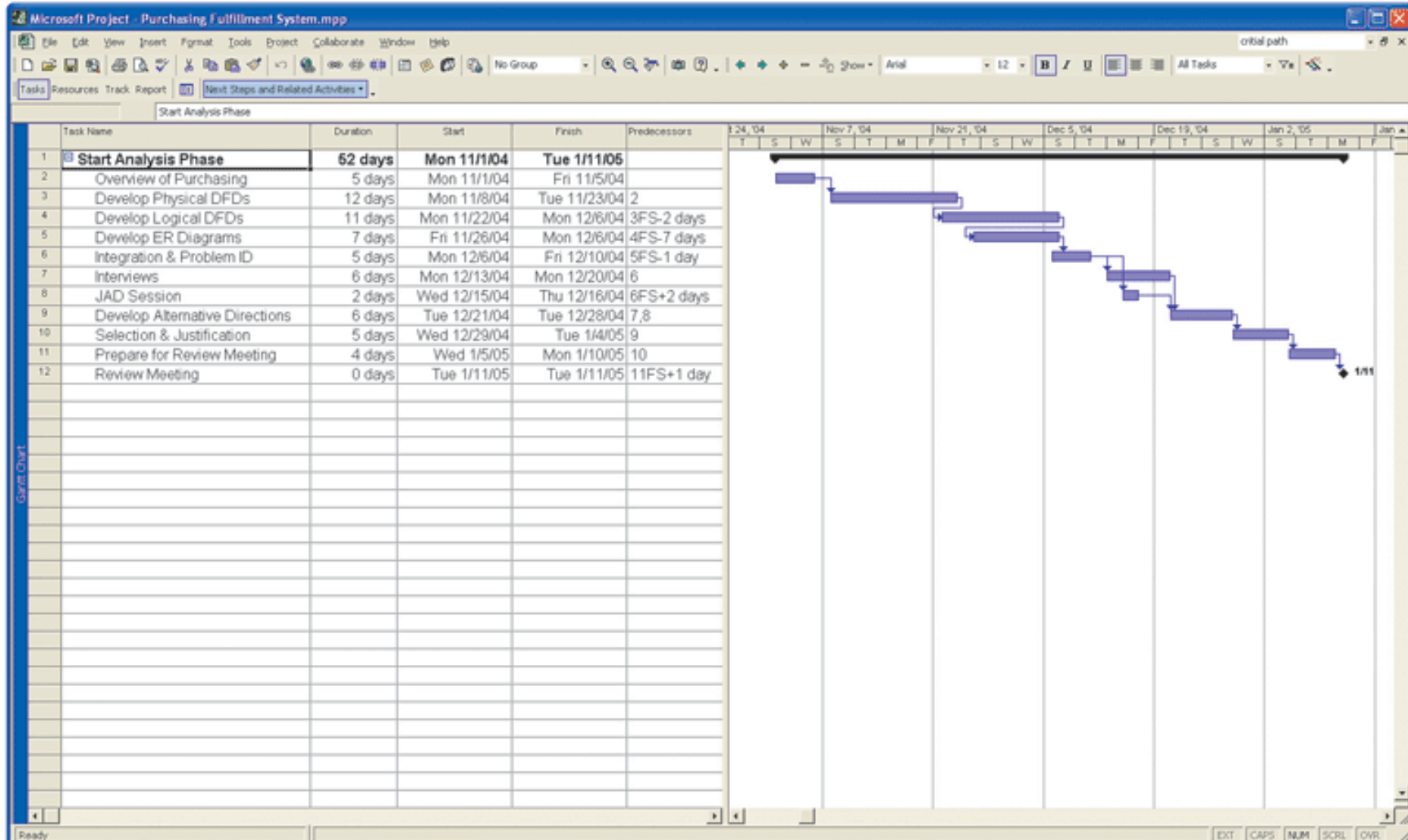
Viewing Network Diagram

Hexagon shape indicates a milestone.

Red boxes and arrows indicate critical path (no slack).

Viewing Gantt Chart

Black line at top indicates a summary activity (composed of subtasks). Diamond shape indicates a milestone.

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Summary

▶ In this chapter you learned how to:

✓ Explain the process of managing an information systems project.

✓ Describe the skills required to be an effective project manager.

✓ List project management activities 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.