

SEVENTH EDITION

SYSTEMS  
ANALYSIS  
& DESIGN  
METHODS

WHITTEN  
BENTLEY

مدیریت پروژه

# Measures of Project Success

- سیستم قابل پذیرش برای مشتری
- تحویل سیستم در زمان تعیین شده
- تحویل سیستم با بودجه تعیین شده
- عدم تداخل فعالیت‌های توسعه سیستم با فعالیت‌های جاری سازمان

# Causes of Project Failure

- عدم تعهد مدیران سطح بالا به پروژه
- عدم تعهد افراد به متدولوژی
- میان بر زدن یا دورزدن فعالیت‌های متدولوژی
- مدیریت ضعیف انتظارات
- **Feature creep** — افزایش غیر کنترل شده ویژگی‌های فنی به سیستم
- **Scope creep** — افزایش تدریجی و غیرپیش‌بینی شده نیازمندی‌های سیستم اطلاعاتی
- برنامه‌ریزی اشتباه برای هزینه و زمان
- خوش‌بینی بیش از حد
- مدیریت ضعیف افراد
- منابع ناکافی
- شکست در مدیریت برنامه

# Project Manager Competencies

- پیش‌بینی تاثیر
- استفاده کارآمد از قدرت
- انگیزه‌بخش
- مهارت‌های ارتباطی
- توسعه دیگران
- رصد و کنترل
- اعتماد به نفس
- مدیریت استرس
- دغدغه اعتبار
- انعطاف‌پذیری
- آگاهی از کسب و کار
- تعهد به کیفیت
- جمع‌آوری کننده اطلاعات
- ابتکار
- تفکر تحلیلی
- تفکر مفهومی
- آگاهی از روابط بین‌فردی
- آگاهی سازمانی

# Project Management Functions

- **Scoping** – تعیین مرزهای پروژه
- **Planning** – تعیین فعالیت‌های مورد نیاز برای تکمیل پروژه
- **Estimating** – تعیین منابع مورد نیاز برای تکمیل پروژه
- **Scheduling** – توسعه برنامه برای تکمیل پروژه
- **Organizing** – اطمینان از اینکه افراد نقش‌ها و مسئولیت‌های خود را درک کرده‌اند
- **Directing** – هدایت پروژه
- **Controlling** – رصد پیشرفت
- **Closing** – ارزیابی موفقیت و شکست

# Joint Project Planning Strategy

**Joint project planning (JPP)** – a strategy in which all stakeholders attend an intensive workshop aimed at reaching consensus on project decisions.

# Activity 1 – Negotiate Scope

**Scope** – مرزهای پروژه- زمینه‌های کسب‌وکار که یک پروژه در نظر دارد یا خیر. شامل پاسخ به پنج سوال پایه

- **Product**
- **Quality**
- **Time**
- **Cost**
- **Resources**

**Statement of work** – توصیف روایی کاری که باید در پروژه انجام شود.

Common synonyms include *scope statement*, *project definition*, *project overview*, and *document of understanding*.

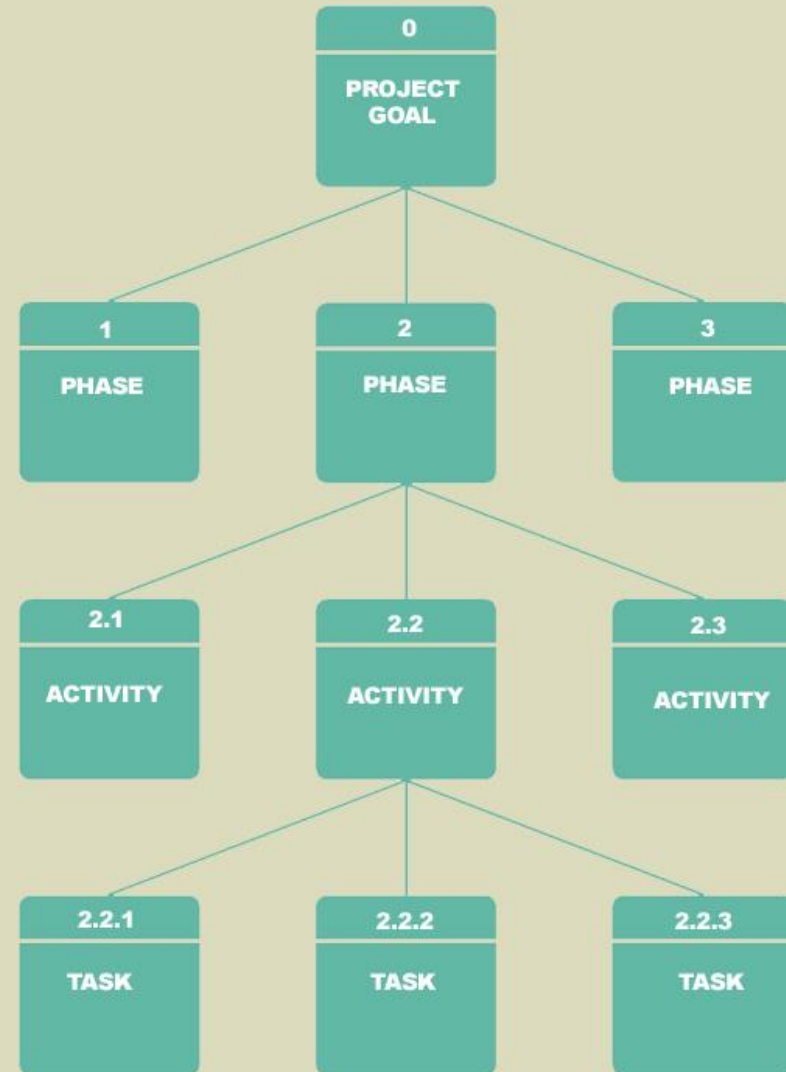


# Activity 2 – Identify Tasks

## Work breakdown structure

– (WBS) یک ابزار گرافیکی  
برای تعیین شکست سلسله‌مراتبی  
پروژه به فعالیت‌های و کارها

– **Milestone** رخدادی که  
نشان‌دهنده تکمیل یک محصول  
مهم پروژه است





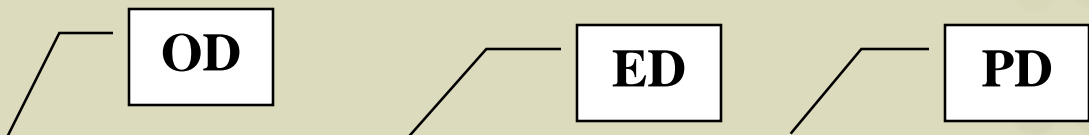
# Activity 3 – Estimate Task Durations

- Elapsed time takes into consideration:
  - **Efficiency** - no worker performs at 100% efficiency
    - Coffee breaks, lunch, e-mail, etc.
    - Estimate of 75% is common
  - **Interruptions**
    - Phone calls, visitors, etc.
    - 10-50%

# Activity 3 – Estimate Task Durations

1. Estimate the minimum amount of time it would take to perform the task – the **optimistic duration** (OD).
2. Estimate the maximum amount of time it would take to perform the task – the **pessimistic duration** (PD).
3. Estimate the **expected duration** (ED) that will be needed to perform the task.
4. Calculate a weighted average of the **most likely duration** (D) as follows:

$$D = \frac{(1 \times OD) + (4 \times ED) + (1 \times PD)}{6}$$


$$3.33 \text{ days} = \frac{(1 \times 2 \text{ days}) + (4 \times 3 \text{ days}) + (1 \times 6 \text{ days})}{6}$$

# Activity 4 – Specify Intertask Dependencies

- Finish-to-start (FS)—The finish of one task triggers the start of another task.
- Start-to-start (SS)—The start of one task triggers the start of another task.
- Finish-to-finish (FF)—Two tasks must finish at the same time.
- Start-to-finish (SF)—The start of one task signifies the finish of another task.

# Scheduling Strategies

**Forward scheduling** – روشی برای زمان‌بندی پروژه که زمان شروع پروژه را در نظر می‌گیرد و از آن زمان رو به جلو برنامه ریزی می‌کند.

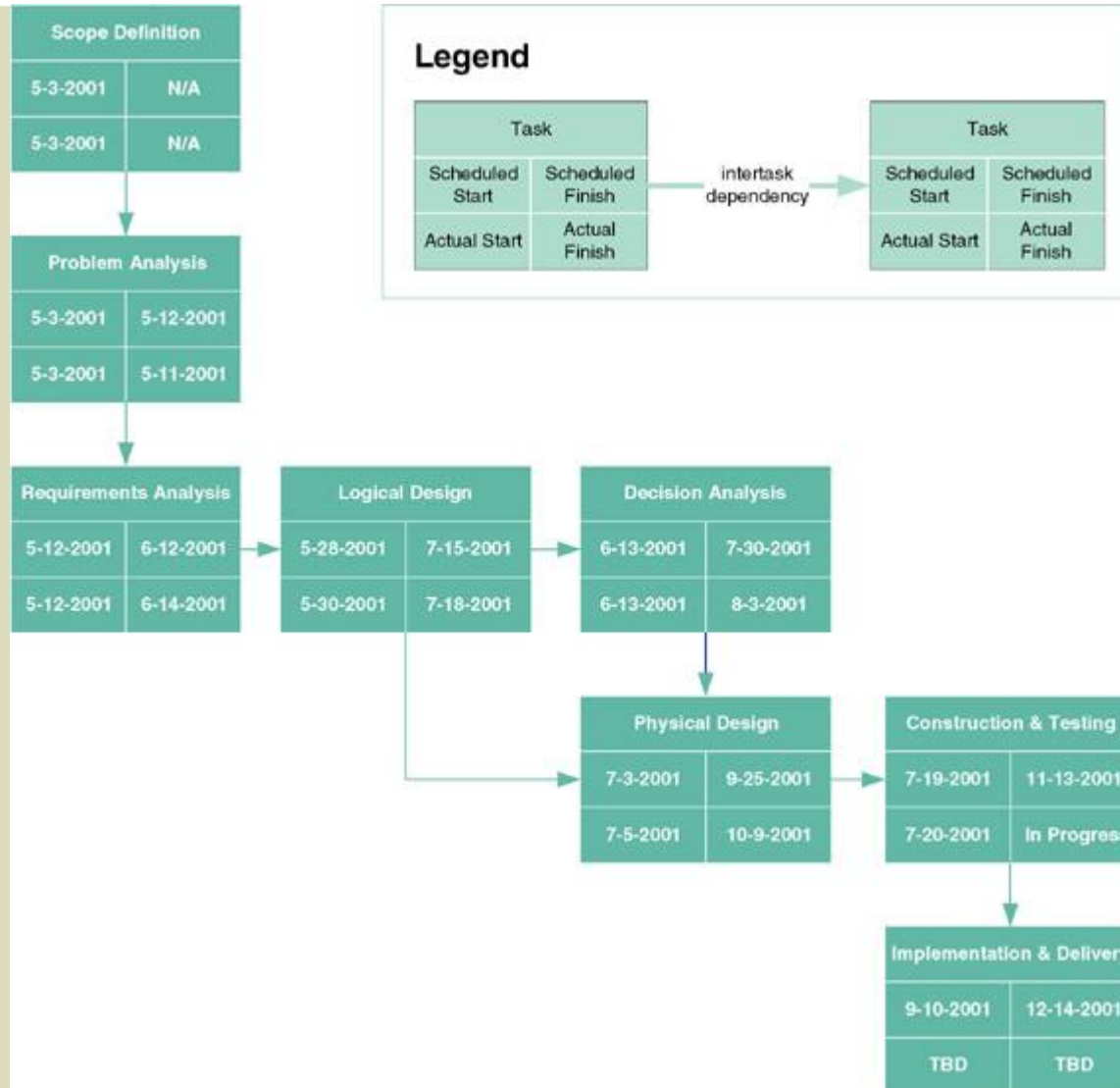
**Reverse scheduling** – استراتژی زمان‌بندی که تاریخ انتهای پروژه را برقرار کرده و رو به عقب برنامه ریزی می‌کند.

# Project Management Tools & Techniques

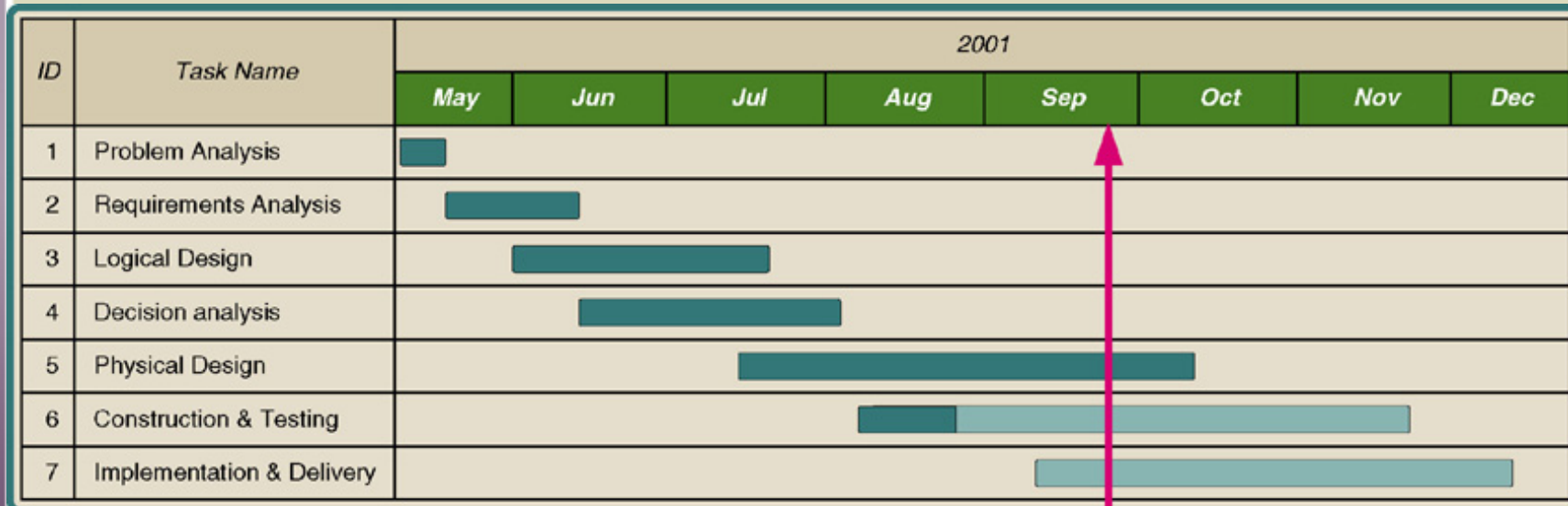
**PERT chart** – a graphical network model used to depict the interdependencies between a project's tasks.

**Gantt chart** – a bar chart used to depict project tasks against a calendar.

# PERT Chart



# Gantt Chart

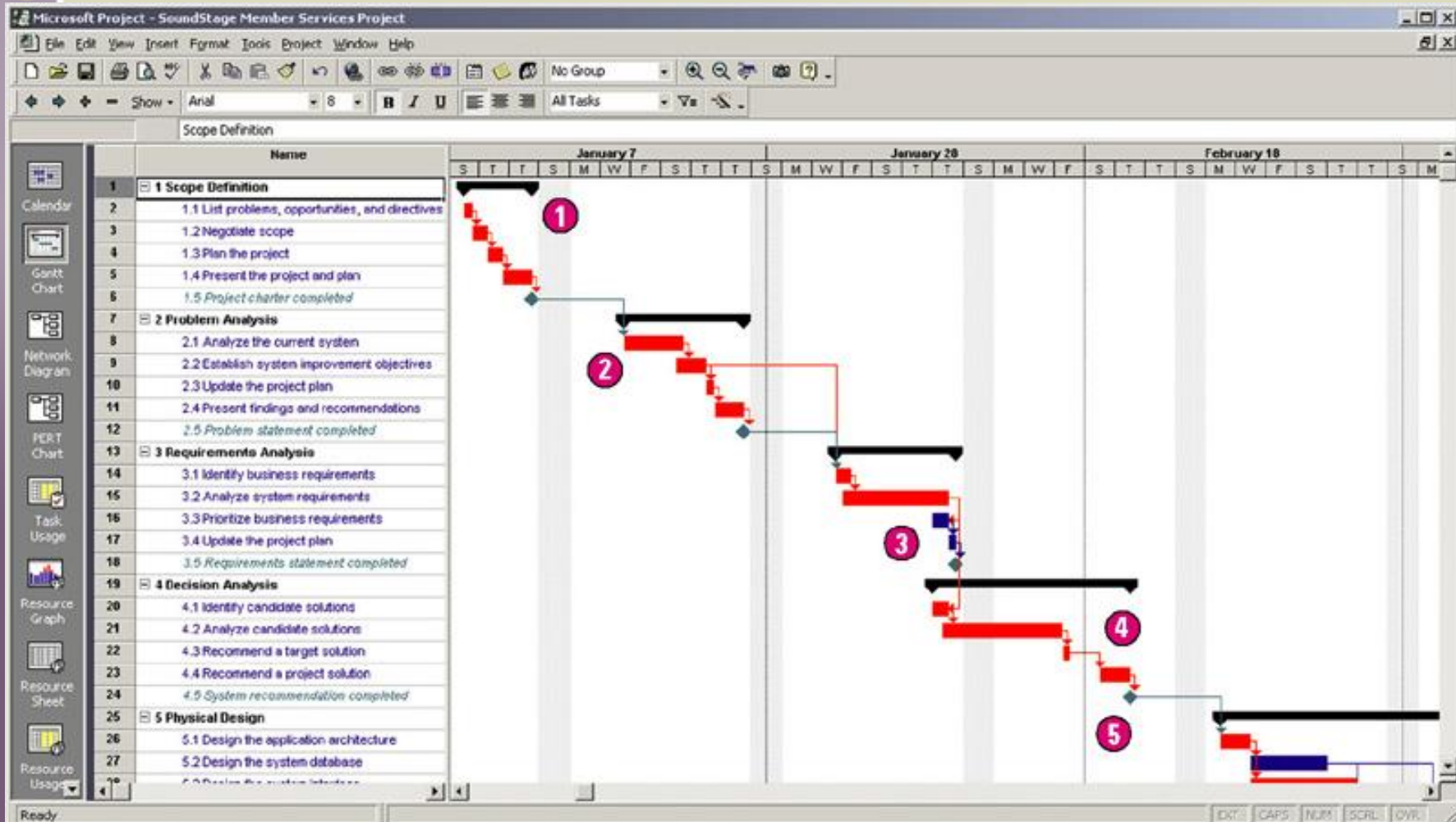


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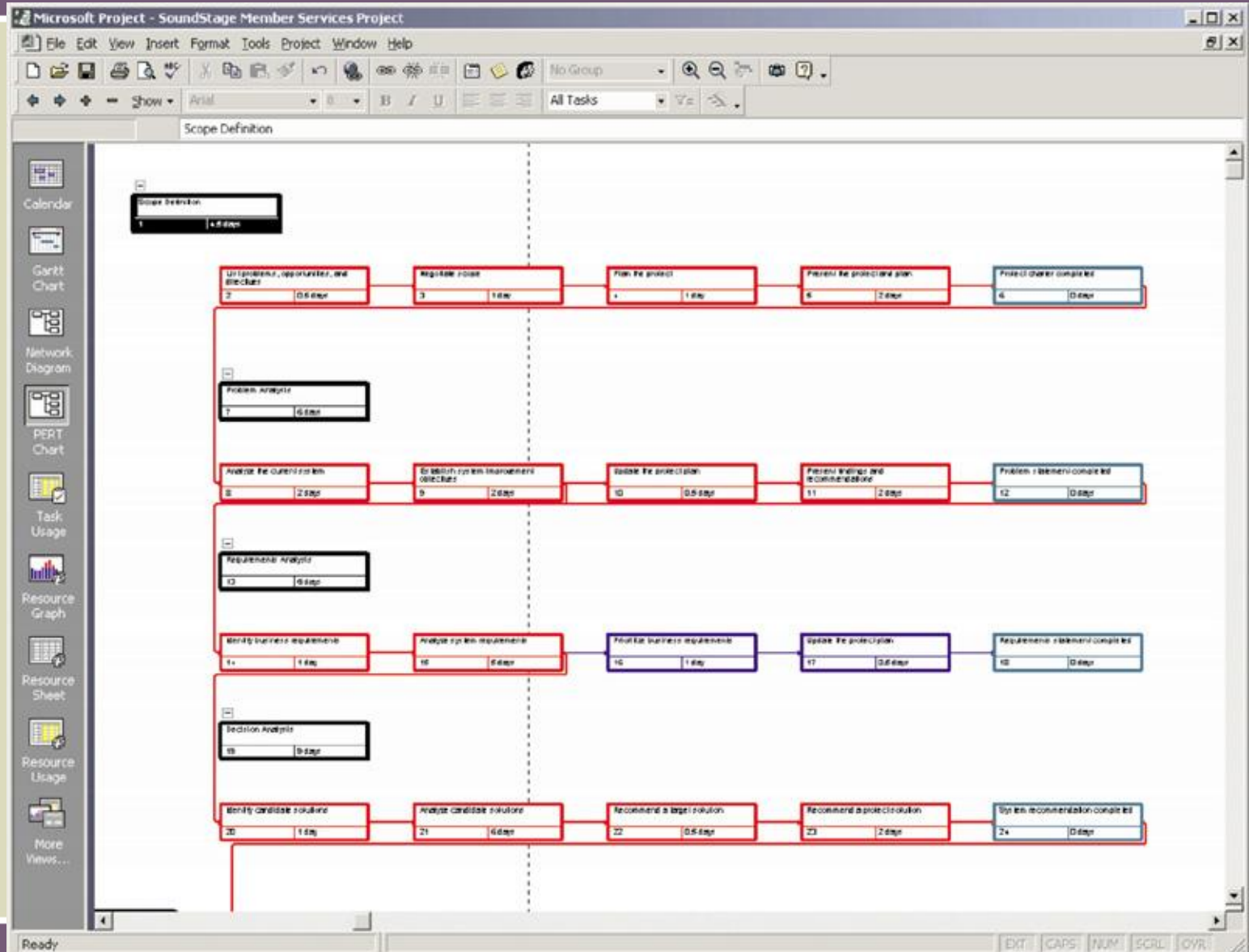




# Microsoft Project Gantt Chart



# Microsoft Project PERT Chart



# Activity 5 – Assign Resources

- **People** – includes all system owners, users, analysts, designers, builders, external agents, and clerical help involved in the project in any way.
- **Services** – includes services such as a quality review that may be charged on a per use basis.
- **Facilities and equipment** – includes all rooms and technology that will be needed to complete the project.
- **Supplies and materials** – everything from pencils, paper, notebooks to toner cartridges, and so on.
- **Money** – includes a translation of all of the above into budgeted dollars!

# Defining Project Resources

Microsoft Project - SoundStage Member Services Project

File Edit View Insert Format Tools Project Window Help

Database Administrator

	Resource Name	Group	Max. Units	Std. Rate	Out. Rate	Accrue At	Base Calendar
1	Project Sponsor	System Owner	10%	\$60.00/hr	\$0.00/hr	Prorated	Administrative
2	Executive sponsor	System Owner	5%	\$90.00/hr	\$0.00/hr	Prorated	Administrative
3	Steering Body	System Owner	5%	\$1,200.00/hr	\$0.00/hr	Prorated	Administrative
4	Chief Information Officer	System Owner	5%	\$100.00/hr	\$0.00/hr	Prorated	Administrative
5	Management Representative	System User	120%	\$60.00/hr	\$0.00/hr	Prorated	Administrative
6	Auditor	System User	10%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
7	Business Analyst	System User	50%	\$45.00/hr	\$0.00/hr	Prorated	Standard
8	User Representative(s)	System User	340%	\$30.00/hr	\$45.00/hr	Prorated	Standard
9	Other User(s)	System User	100%	\$30.00/hr	\$45.00/hr	Prorated	Standard
10	Project manager	System Analyst	25%	\$60.00/hr	\$0.00/hr	Prorated	Administrative
11	JAD Facilitator	System Analyst	30%	\$150.00/hr	\$200.00/hr	Prorated	Contract
12	Data Analyst	System Analyst	20%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
13	Process Analyst	System Analyst	20%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
14	Object Analyst	System Analyst	10%	\$60.00/hr	\$0.00/hr	Prorated	Administrative
15	Interface Analyst	System Analyst	10%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
16	Technical Consultant	System Designer	5%	\$50.00/hr	\$100.00/hr	Prorated	Contract
17	Database Designer	System Designer	25%	\$75.00/hr	\$0.00/hr	Prorated	Administrative
18	Network Designer	System Designer	10%	\$75.00/hr	\$0.00/hr	Prorated	Administrative
19	System Architect	System Designer	25%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
20	Software Engineer	System Designer	10%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
21	Interface Designer	System Designer	25%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
22	Test Analyst	System Designer	25%	\$50.00/hr	\$0.00/hr	Prorated	Administrative
23	Systems Programmer	System Builder	20%	\$60.00/hr	\$0.00/hr	Prorated	Administrative
24	Application Programmer	System Builder	250%	\$45.00/hr	\$60.00/hr	Prorated	Contract
25	Database Programmer	System Builder	100%	\$55.00/hr	\$65.00/hr	Prorated	Contract
26	Interface Programmer	System Builder	125%	\$50.00/hr	\$60.00/hr	Prorated	Contract
27	Network Technician	System Builder	5%	\$60.00/hr	\$0.00/hr	Prorated	Standard
28	Technical Writer	System Builder	45%	\$40.00/hr	\$0.00/hr	Prorated	Standard
29	Trainer	System Builder	45%	\$40.00/hr	\$0.00/hr	Prorated	Administrative
30	Capacity Analyst	System Builder	10%	\$55.00/hr	\$0.00/hr	Prorated	Administrative

Ready

Microsoft Project - So... Paint Shop Pro

2:58 PM



# Assigning Project Resources

The screenshot displays the Microsoft Project interface for a project titled "SoundStage Member Services Project". The main window shows a Gantt chart with tasks listed in a table. A "Task Information" dialog box is open, showing the "Resources" tab for the task "Analyze system requirements".

ID	Name	Predecessors
8	2.1 Analyze the current system	6FS+4 days
9	2.2 Establish system improvement objectives	8FS-0.5 days
10	2.3 Update the project plan	9
11	2.4 Present findings and recommendations	10
12	2.5 Problem statement completed	11
13	<b>3 Requirements Analysis</b>	
14	3.1 Identify business requirements	9,12FS+4 days
15	3.2 Analyze system requirements	14FS-0.5 days
16	3.3 Prioritize business requirements	15FF
17	3.4 Update the project plan	16
18	3.5 Requirements statement completed	17
19	<b>4 Decision Analysis</b>	
20	4.1 Identify candidate solutions	
21	4.2 Analyze candidate solutions	
22	4.3 Recommend a target solution	
23	4.4 Recommend a project solution	
24	4.5 System recommendation completed	
25	<b>5 Design</b>	
26	5.1 Design the application architect	
27	5.2 Design the system database	
28	5.3 Design the system interface	
29	5.4 Design the application logic	
30	5.5 Update the project plan	

**Task Information Dialog - Resources Tab:**

Resource Name	Units
Business Analyst	20%
JAD Facilitator	30%
Management Representative	100%
User Representative(s)	100%
Data Analyst	20%
Process Analyst	20%

# Assigning People to Tasks

- استفاده از افراد بامهارت و با انگیزه
- انتخاب بهترین فعالیت برای هر فرد
- ارتقاء هارمونی تیم
- برنامه ریزی برای آینده
- کوچک نگه داشتن اندازه تیم

# Resource Leveling

**Resource leveling** – a strategy for correcting resource over-allocations.

Two techniques for resource leveling:

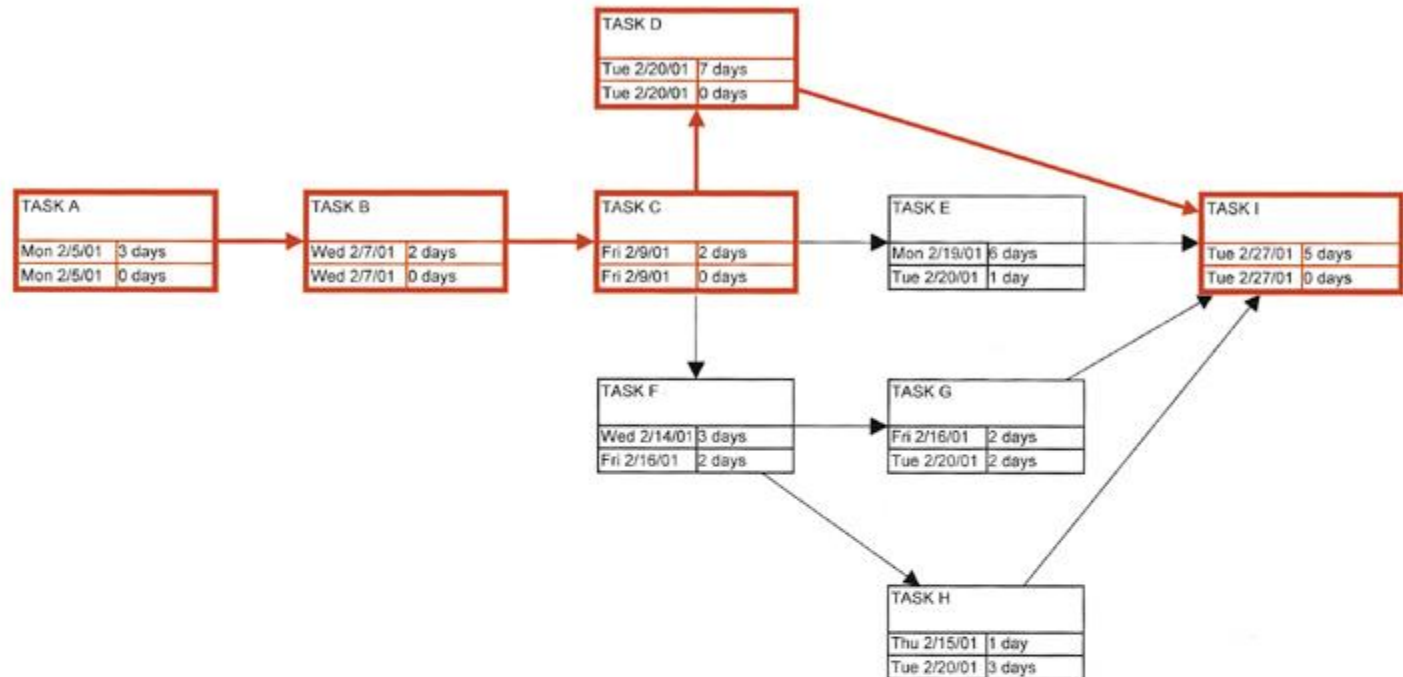
- *task delaying*
- *task splitting*



# Task Splitting and Task Delaying

- **Critical path** – دنباله فعالیت‌های به هم وابسته که زودترین زمان تکمیل پروژه را مشخص می‌کند.
- کارهایی که روی مسیر بحرانی قرار دارند اگر به تاخیر افتند پروژه به تاخیر می‌افتد. این فعالیت‌ها تنها می‌توانند تقسیم شوند.
- **Slack time** – میزان تاخیری که بین زمان شروع و اتمام یک فعالیت قابل تحمل است بدون ایجاد تاخیر در کل پروژه
- کارهایی که slack time آنها غیر صفر است می‌توانند به تاخیر افتند.

# Critical Path Analysis



Name	
Early Finish	Duration
Late Finish	Total Slack

Critical
Noncritical

Critical Milestone
Noncritical Milestone

Critical Summary
Noncritical Summary

Critical Subproject
Noncritical Subproject

Critical Marked
Noncritical Marked

# Activity 6 – Direct the Team Effort

1. سازگار باشید
2. پشتیبانی کنید.
3. تعهدی که نمی‌توانید عملی کنید ندهید
4. تشویق در جمع و انتقاد در خفا
5. توجه به نقاط حساس اخلاقی
6. تعیین زمان‌های تحویل واقع‌بینانه
7. تعیین اهداف مشخص
8. توضیح دهید و نشان دهید به جای اینکه انجام دهید
9. تنها به گزارشات وضعیت تکیه نکنید
10. روح خوبی در تیم ایجاد کنید

# Activity 7 – Monitor and Control Progress

- Progress reporting
- Change management
- Expectations management
- Schedule adjustments—critical path analysis (CPA)

# Optional: Sample Outline for Progress Report

## **I. Cover Page**

- A. Project name or identification
- B. Project manager
- C. Date or report

## **II. Summary of progress**

- A. Schedule analysis
- B. Budget analysis
- C. Scope analysis  
*(changes that may have an impact on future progress)*
- D. Process analysis  
*(problems encountered with strategy or methodology)*
- E. Gantt progress chart(s)

## **III. Activity analysis**

- A. Tasks completed since last report
- B. Current tasks and deliverables
- C. Short term future tasks and deliverables

(continued)

# Sample Outline for a Progress Report (concluded)

## **IV. Previous problems and issues**

- A. Action item and status
- B. New or revised action items
  - 1. Recommendation
  - 2. Assignment of responsibility
  - 3. Deadline

## **V. New problems and issues**

- A. Problems  
*(actual or anticipated)*
- B. Issues  
*(actual or anticipated)*
- C. Possible solutions
  - 1. Recommendation
  - 2. Assignment of responsibility
  - 3. Deadline

## **VI. Attachments**

*(include relevant printouts from project management software)*

# Optional: Expectations Management

**Expectations management matrix** – a tool used to understand the dynamics and impact of changing the parameters of a project.

PRIORITIES →				
↓ MEASURES OF SUCCESS		Max or Min	Constrain	Accept
Cost				
Schedule				
Scope and/or Quality				

The most important

The second most important

The least important

Can have only one X in each row and each column



# Typical, Initial Expectations for a Project

PRIORITIES →	Max or Min	Constrain	Accept
↓ MEASURES OF SUCCESS			
Cost		<b>X</b>	
Schedule			<b>X</b>
Scope and/or Quality	<b>X</b>		

# Adjusting Expectations

PRIORITIES →	Max or Min	Constrain	Accept
↓ MEASURES OF SUCCESS			
<b>Cost</b> <ul style="list-style-type: none"> <li>Adjusted budget</li> </ul>		<b>X+</b> Increase budget	
<b>Schedule</b> <ul style="list-style-type: none"> <li>Adjusted deadline</li> </ul>			<b>X-</b> Extend deadline
<b>Scope and/or Quality</b> <ul style="list-style-type: none"> <li>Adjusted scope</li> </ul>	<b>X+</b> Accept expanded requirements		

# Changing Priorities

PRIORITIES →	Max or Min	Constrain	Accept
↓ MEASURES OF SUCCESS			
Cost	<b>X</b> ← <b>Step 1</b> → <b>X</b>		
Schedule			<b>X</b>
Scope and/or Quality	<b>X</b> → <b>Step 2</b> → <b>X</b>		

# Activity 8 – Assess Project Results and Experiences

- Did the final product meet or exceed user expectations?
  - Why or why not?
- Did the project come in on schedule?
  - Why or why not?
- Did the project come in under budget?
  - Why or why not?

# Statement of Work

- I. **Purpose**
- II. **Background**
  - A. Problem, opportunity, or directive statement
  - B. History leading to project request
  - C. Project goal and objectives
  - D. Product description
- III. **Scope**
  - A. Stakeholders
  - B. Data
  - C. Processes
  - D. Locations
- IV. **Project Approach**
  - A. Route
  - B. Deliverables
- V. **Managerial Approach**
  - A. Team building considerations
  - B. Manager and experience
  - C. Training requirements

Notice the use of  
information system  
building blocks

# Statement of Work (concluded)

## **V. Managerial Approach (continued)**

- D. Meeting schedules
- E. Reporting methods and frequency
- F. Conflict management
- G. Scope management

## **VI. Constraints**

- A. Start date
- B. Deadlines
- C. Budget
- D. Technology

## **VII. Ballpark Estimates**

- A. Schedule
- B. Budget

## **VIII. Conditions of Satisfaction**

- A. Success criteria
- B. Assumptions
- C. Risks

## **IX. Appendices**