MS Project

Introduction

Introduction

- Microsoft Project is a project management software program developed by Microsoft
- Designed to assist project managers in developing plans, assigning resources to tasks, tracking progress, managing budgets and analyzing workloads. They can also help to schedule a project's resources
- The application creates critical path schedules, and critical chain which can be visualized in a Gantt chart.
- The first commercial version of Project was released for DOS in 1984: First Windows version-1990: ….2003, 2007, 2010
- MS Project's proprietary file format is *.mpp.

MS Project Strength

- Good step-by-step tutorial for beginners
- Good searchable keyword help function
- Based on data entry – once configured, user enters data and Project automatically:
  - Computes all times and costs
  - Identifies Critical Path, computes late & early start dates, slack
  - Computes % complete on a task and project level
  - Identifies areas of over-tasking of resources
  - Draws a wide ranges of charts and graphs specific to the project
  - Creates a wide range of reports specific to the project
- Very customizable to meet individual user needs

Several competitors

- Primavera
- Project.net
- Basecamp
- Gantt Project
- Genius Inside
- Liquid Planner
- Micro Planner X-Pert
- Naval Plan
- Open Proj
- Open Workbench
- Etc.…

Using MS Project

- **Define the Project**
  - Build the Plan
  - Set a start date
  - Enter tasks/durations
  - Assign resources
  - Link tasks
  - Fine tune the plan
- **Track and Manage**
  - Set a baseline
  - Enter actual
  - Adjust plan
- **Close Project**

Steps

1. Set up Project Defaults:
   - Set working order. (Schedule from Start Date forward or Finish Date backwards)
   - Set a start or finish date.
   - Select/create the project calendar to use. (Controls working days and hours)
2. Enter tasks:
   - In chronological order, enter the tasks necessary to complete the project.
   - Set the task's duration.
   - When appropriate, set a task's Start / Finish date.
3. Set Task Sequencing:
   - Link tasks that must be completed sequentially.
   - Do not link tasks that can be completed simultaneously.

Steps

4. Create a Resource List:
   - Create a list of contractors, laborers, equipment rental, fees, etc. and their corresponding rates.
   - Set working hours for each resource.
5. Assign Resources to Tasks
6. Analyze/Reevaluate/Adjust Project
7. Document Task Progress

Using MS Project

- List each task necessary to complete a project in the order they should be performed.
- Assign start and finish dates to tasks or let the program set them for you by you specifying the duration of the task.
- Display the tasks graphically over a time line to get an overall view of the project.
- Assign workers, contractors, and other resources to tasks and print their schedules.
- Compute the hours and cost necessary to complete a task or the entire project.
- Monitor a project's progress and compare it to your original estimate.
- Analyze such items as cost, hours, slack time, resource allocation, etc. using tables and graphs

Example Project

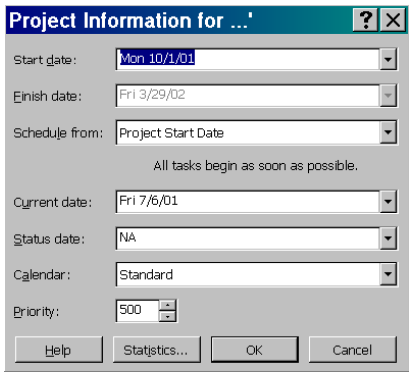
Table 1: Task, Duration, and Immediate Predecessor Information for Construction Project

TASK	DESCRIPTION	IMMEDIATE PREDECESSORS	DURATION (WEEKS)
1	START	--	0
2	Excavate and Pour Footers	1	3
3	Pour Concrete Foundation	2	1
4	Erect Rough Wall & Roof	3	4
5	Install Siding	4	6
6	Install Plumbing	4	3
7	Install Electrical	4	4
8	Install Wallboard	6,7	5
9	Lay Flooring	8	6
10	Do Interior Painting	8	3
11	Install Interior Fixtures	9,10	3
12	Install Gutters & Downspouts	5	2
13	Do Grading & Landscaping	12	3
14	FINISH	11,13	0

MS Project Setup

- Launch MS Project, click on *New, OK*
- Click on *Project, Project Information*, select a start date, *OK*
- Click on *Save* icon, type in project name, *OK*

MS Project Setup

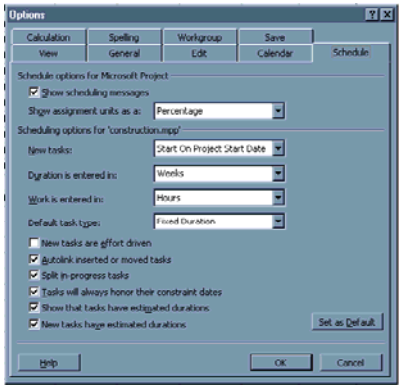


MS Project Setup

- Use *Tools, Change Working Time,* to make necessary adjustments
- *Tools, Options, click on* "Schedule" *tab*
  - select "weeks" in Duration is entered in
  - make sure New tasks are effort driven is not checked
  - default task type is "fixed duration"
  - Click *Set as Default*, OK

MS Project Setup

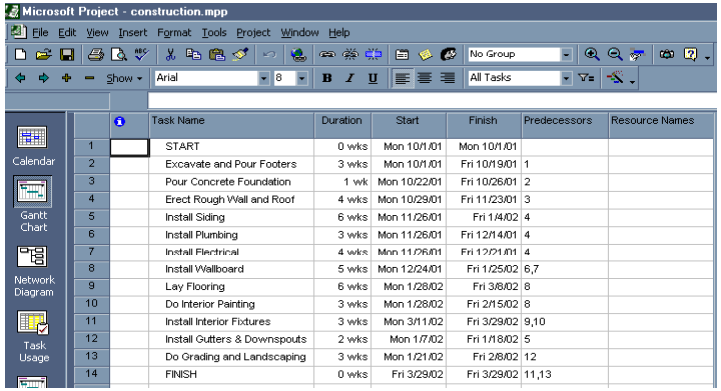
Tools, Options, Schedule



Entering Task Information

- *Gantt Chart* is the default view, *Entry* table on left, chart on right
- Type in task name in the field, tab over to enter duration (w for weeks)
- Enter predecessor task numbers in the "Predecessors" field
  - Can use *link* and *unlink* icons (see text)
- MS Project automatically gives start and finish dates based on critical path analysis (to be discussed)
- The *Task Information* icon can be used to access information about a particular task

Entering Task Information



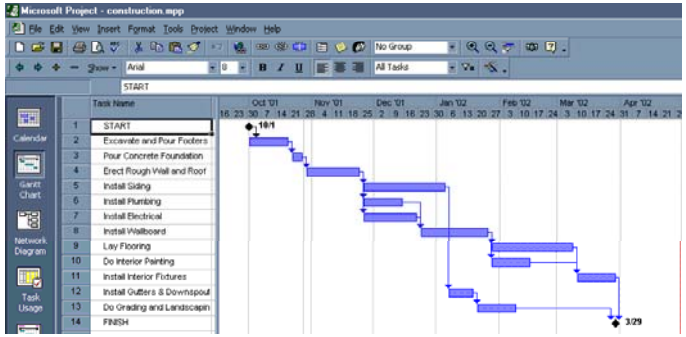
	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	START	0 wks	Mon 10/1/01	Mon 10/1/01		
2	Excavate and Pour Footers	3 wks	Mon 10/1/01	Fri 10/19/01	1	
3	Pour Concrete Foundation	1 wk	Mon 10/22/01	Fri 10/26/01	2	
4	Erect Rough Wall and Roof	4 wks	Mon 10/29/01	Fri 11/23/01	3	
5	Install Siding	6 wks	Mon 11/26/01	Fri 1/4/02	4	
6	Install Plumbing	3 wks	Mon 11/26/01	Fri 12/14/01	4	
7	Install Electrical	4 wks	Mon 11/26/01	Fri 12/21/01	4	
8	Install Wallboard	5 wks	Mon 12/24/01	Fri 1/25/02	6,7	
9	Lay Flooring	6 wks	Mon 1/28/02	Fri 3/8/02	8	
10	Do Interior Painting	3 wks	Mon 1/28/02	Fri 2/15/02	8	
11	Install Interior Fixtures	3 wks	Mon 3/11/02	Fri 3/29/02	9,10	
12	Install Gutters & Downspouts	2 wks	Mon 1/7/02	Fri 1/18/02	5	
13	Do Grading and Landscaping	3 wks	Mon 1/21/02	Fri 2/8/02	12	
14	FINISH	0 wks	Fri 3/29/02	Fri 3/29/02	11,13	

Networks in MS Project

- The *Gantt Chart* view shows task linkages
- Change view to *Network Diagram* by clicking on the icon on the panel on the extreme left
- Red activities on critical path, blue activities have slack
- Use "zoom" to focus in as desired

Network Diagram

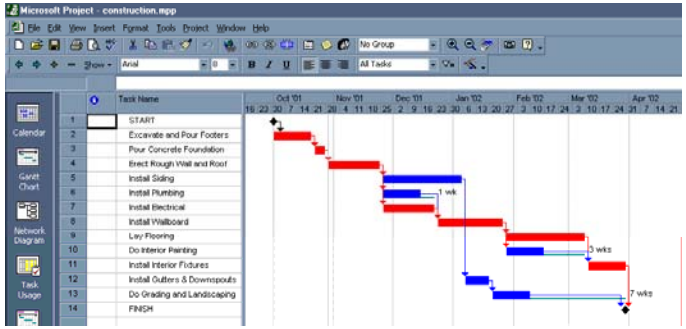
Gantt Charts in MS Project



Critical Path Analysis

- MS Project automatically computes the critical path and the earliest and latest start and finish times and slack
- *Project, Project Information, Statistics* shows the critical path is 26 weeks in our project

Critical Path Analysis

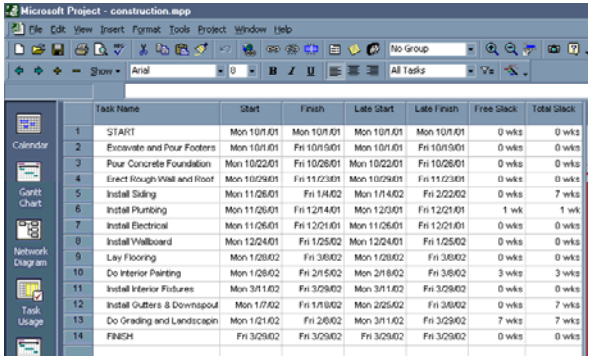


Critical Path Analysis

- Critical path tasks can be identified as those have zero *total slack (TS)* or *float*
  - TS = LF – EF = LS – ES
  - The TS of only 1 task can be used if we want to be certain about not delaying the project
- Free slack (FS) of a task is the difference between the smallest of the ES's of the task's immediate successors and the task's EF.
  - Using FS does not affect the start times of a task's successors
  - FS <= TS
  - FS of of multiple tasks can be used without delaying the project

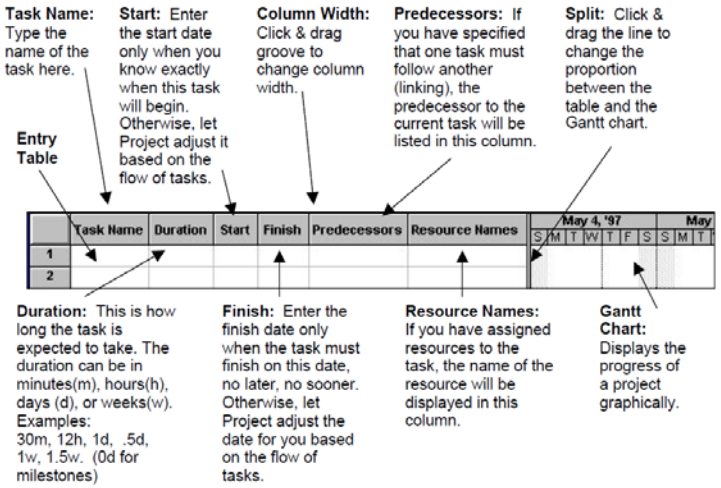
Critical Path Analysis

- To display the results just shown in MS Project, in the *Gantt Chart* view, click *Views*, select *Table: Entry*, and click on *Schedule*



	Task Name	Start	Finish	Late Start	Late Finish	Free Slack	Total Slack
1	START	Mon 10/1/01	Mon 10/1/01	Mon 10/1/01	Mon 10/1/01	0 wks	0 wks
2	Excavate and Pour Footers	Mon 10/1/01	Fri 10/19/01	Mon 10/1/01	Fri 10/19/01	0 wks	0 wks
3	Pour Concrete Foundation	Mon 10/22/01	Fri 10/26/01	Mon 10/22/01	Fri 10/26/01	0 wks	0 wks
4	Erect Rough Wall and Roof	Mon 10/29/01	Fri 11/23/01	Mon 10/29/01	Fri 11/23/01	0 wks	0 wks
5	Install Siding	Mon 11/26/01	Fri 1/4/02	Mon 1/14/02	Fri 2/22/02	0 wks	7 wks
6	Install Plumbing	Mon 11/26/01	Fri 12/14/01	Mon 12/3/01	Fri 12/21/01	1 wk	1 wk
7	Install Electrical	Mon 11/26/01	Fri 12/21/01	Mon 11/26/01	Fri 12/21/01	0 wks	0 wks
8	Install Wallboard	Mon 12/24/01	Fri 1/25/02	Mon 12/24/01	Fri 1/25/02	0 wks	0 wks
9	Lay Flooring	Mon 1/28/02	Fri 3/8/02	Mon 1/28/02	Fri 3/8/02	0 wks	0 wks
10	Do Interior Painting	Mon 1/28/02	Fri 2/15/02	Mon 2/18/02	Fri 3/8/02	3 wks	3 wks
11	Install Interior Fixtures	Mon 3/11/02	Fri 3/29/02	Mon 3/11/02	Fri 3/29/02	0 wks	0 wks
12	Install Gutters & Downspout	Mon 1/7/02	Fri 1/18/02	Mon 2/25/02	Fri 3/8/02	0 wks	7 wks
13	Do Grading and Landscapin	Mon 1/21/02	Fri 2/8/02	Mon 3/11/02	Fri 3/29/02	7 wks	7 wks
14	FINISH	Fri 3/29/02	Fri 3/29/02	Fri 3/29/02	Fri 3/29/02	0 wks	0 wks

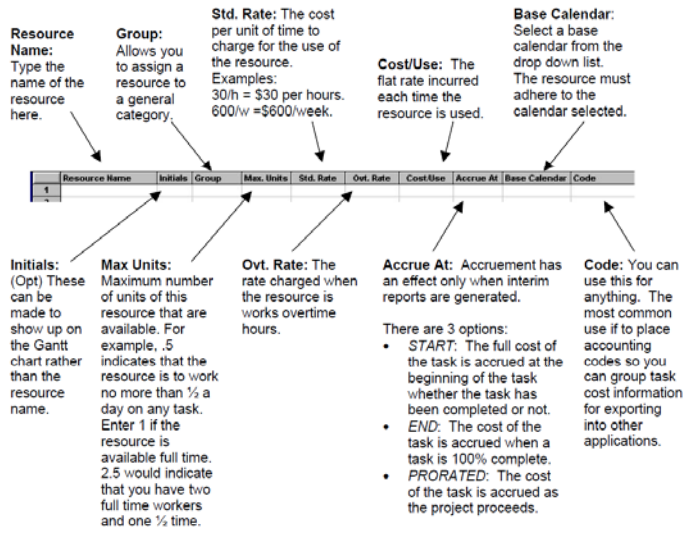
Build the Plan



Schedule a Task

When tasks must either end on a specific date or begin on a specific date, you can create constraints.

Constraint Type & Description	Description
As Soon As Possible	This is the default setting. Starts the task ASAP based upon other constraints and relationships. Do not enter a date for this constraint.
As Late As Possible	Starts the task as late as possible based upon other constraints and relationships. Use when scheduling a project from the project finish date. Do not enter a date for this constraint.
Finish No Earlier Than	Finishes the task on or after the date you specify.
Start No Earlier Than	Starts the task on or after the date you specify.
Finish No Later Than	Finishes the task on or before the date you specify.
Start No Later Than	Starts the task on or before the date you specify.
Must Finish On	Finishes the task on the specified date.
Must Start On	Starts the task on the specified date.



Track and manage the project

As the project proceeds, you may wish to record its progress, noting any deviations from your planned schedule.

Creating a Baseline

- **A baseline is a snapshot of you project before actual work begins and changes are made to the schedule.**
- **The baseline includes task start and finish dates, resources, and costs.**
- **Compare the actual project to the baseline.**

Creating a Crash table

- **Identify the critical path and the corresponding tasks.**
- **Export the work package tasks (ID and Task Name fields), the original duration (Duration field), and the original cost (Cost field) from your MS Project schedule, and open that file in Excel.**
- **You must calculate the potential crash duration for each critical path task and the cost to crash each task.**
- **On the Excel worksheet, add a column to calculate crash reduction, which is how many weeks you can crash each task. Crash reduction is simply the original duration minus the crash duration.**
- **Add another column to calculate the crash cost per week, which is the crash cost divided by the crash reduction value.**