# Introduction to Project Management

ECE 480 Erik Goodman

#### What is Project Management?

- a method for organizing tasks
- a structured framework to help a group work productively
- tools to aid in task sequencing, dependency analysis, resource allocation, scheduling, etc.
- tools to track progress relative to plan

### Why Need Project Management?

- Complex project needs coordination of:
  - Multiple people
  - Multiple resources (labs, equipment, etc.)
  - Multiple tasks
    - Some must precede others
    - All must get done somehow
  - Multiple decision points approvals
  - Phased expenditure of funds
  - Matching of people/resources to tasks

#### **How Can Structured Tools Help?**

- Provide a common document shared by all
- Track actual vs. planned progress
- Enforce logical consistency of planning
  - Conservation of human energy
  - Matching of skills/knowledge to task requirements
  - Conservation of facilities/resources
  - Identification of constraints in task sequencing
- VISUAL display helps to assure consistency

### Task Dependencies and the Critical Path

- Sometimes task B cannot be started before task A is completed
- Other types of constraints calendar, lags, etc.
- Critical path any slippage slips whole project
- Helpful to know what tasks are on the critical path
- Useful to try to shorten the critical path

### Visual Tools for Project Management

#### **GANTT charts:**

- Tasks (calendar time) vs. linear time, grouped hierarchically, plus milestone events
- Classically, not person-hours or people, nor dependencies, nor critical path, nor progress
- All have been added to augmented GANTT charts

#### **PERT/CPM Charts**

- PERT = Program Evaluation and Review Technique
- Graph with nodes (events), edges (tasks) dramatizes dependency relationships
- Task durations label edges
- If add critical path emphasis in chart, called a CPM chart
- (Not linear in time... harder to track progress)

#### **State of the Art Methods**

- Best features of Gantt, PERT/CPM, and extensions to allow assignment of resources and tracking of progress typically COMBINED
- Typical example of result: Microsoft Project family

# Suggested Steps in Project Management

- Generate a formal definition of the project, with goals, deliverables, constraints, assumptions
- Identify project start/end dates, any mandatory milestones, including reports, signoffs, deliverables, etc.
- List constraints money, equipment availability, holidays, etc.

- Identify tasks to be accomplished high level (i.e., by categories), then details within each, using brainstorming method – green light
  - Diagram entire system, decomposing into meaningful subsystems
  - Identify and describe the interfaces between subsystems – then can specify as discrete parts/tasks – part of "system engineering" task. Includes partitioning decisions, choices of component types, budgeting of energy, setting of performance specifications, etc.
  - Subsystems are convenient modules for division of responsibility, setting of milestones, etc.

- Use this decomposed view to develop list of tasks, listing EVERYTHING you can think of!
- Refine detailed task list, dropping/ combining, adding things omitted

Then, for each task in list:

- Estimate time (person hours, calendar period)
- Identify dependencies among tasks
- Identify resources (people, money, parts, etc.) adding any additional tasks needed (procurement, etc.)

- Organize task groups roughly by starting date
- List dependencies that should or MUST hold
- Use MS Project to make a GANTT chart
  - First capture tasks and task groups, milestones
  - Then add dependencies use finish-to-start constraints wherever possible, for best results
  - Identify critical path, see if it can be shortened (get more "slack")
  - Assign person-hours and specific team member(s) to each task – identify "task leads"

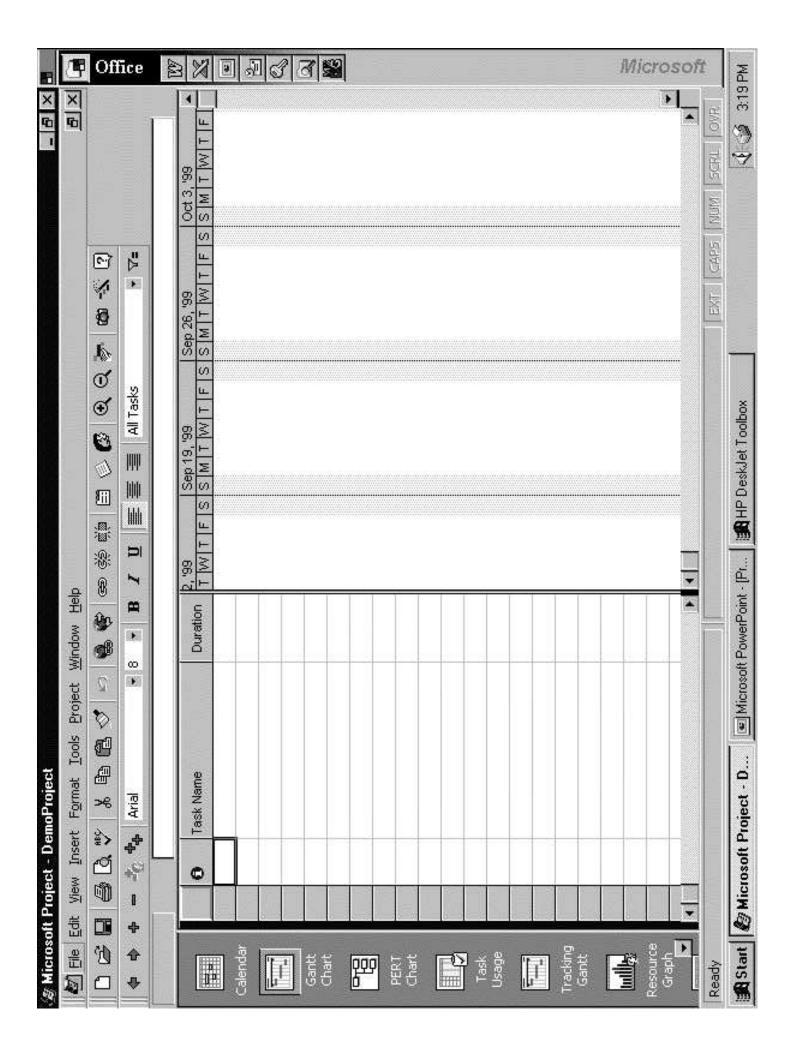
#### As project progresses:

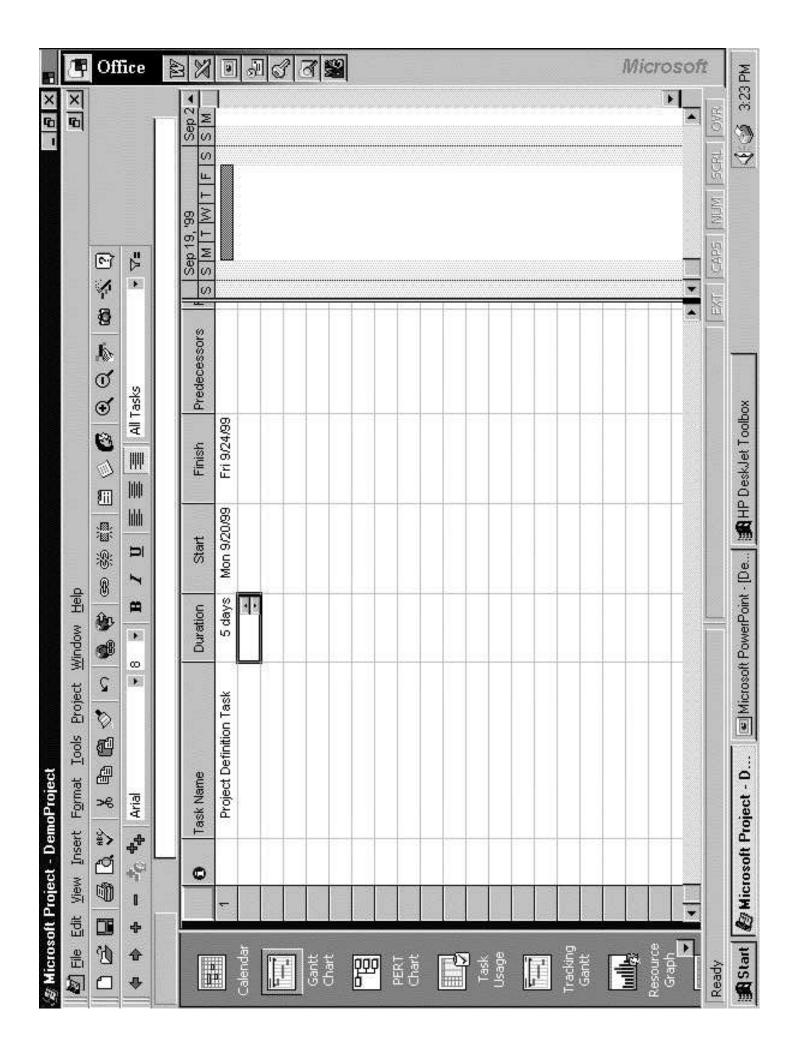
- Monitor, record progress on all tasks, at least weekly – use "Tracking Gantt Chart"
- Pay particular attention to those on critical path
- Revise plan as needed to take into account changes, adapt to meet milestones

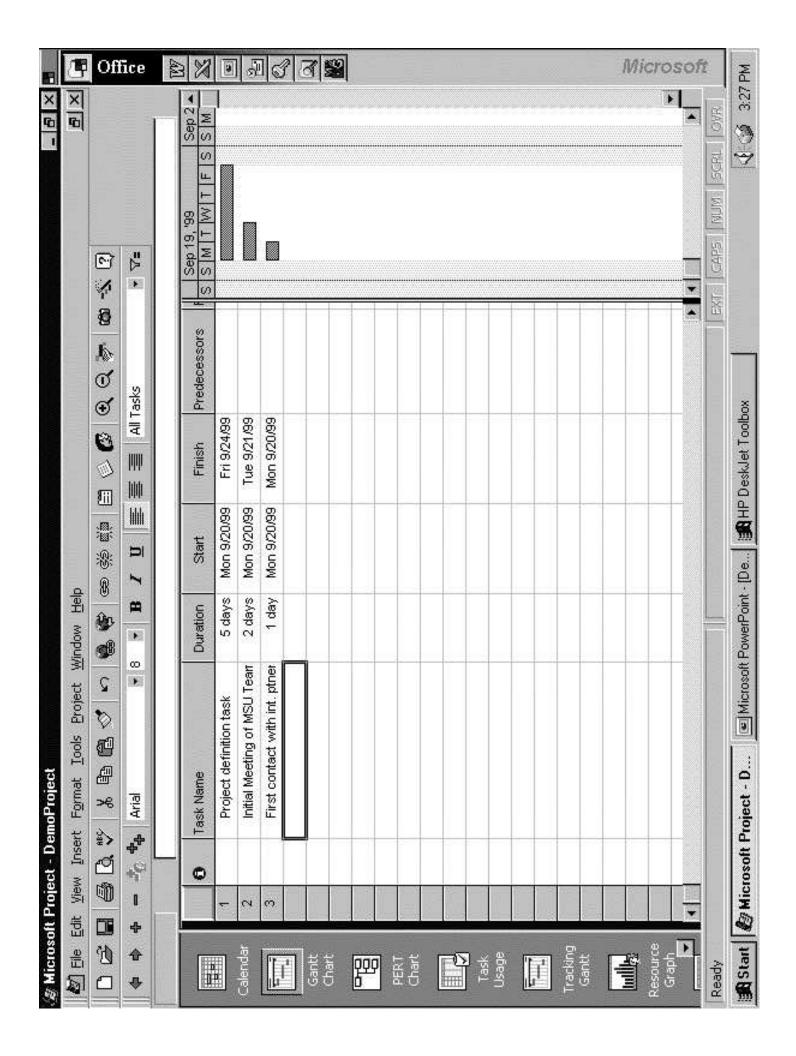
# Project Management Using Microsoft Project

- Allows many different ways of entering and observing information
- includes many features to help identify problems with a plan
- regular use can help a group refine plans to make meeting targets more realistic

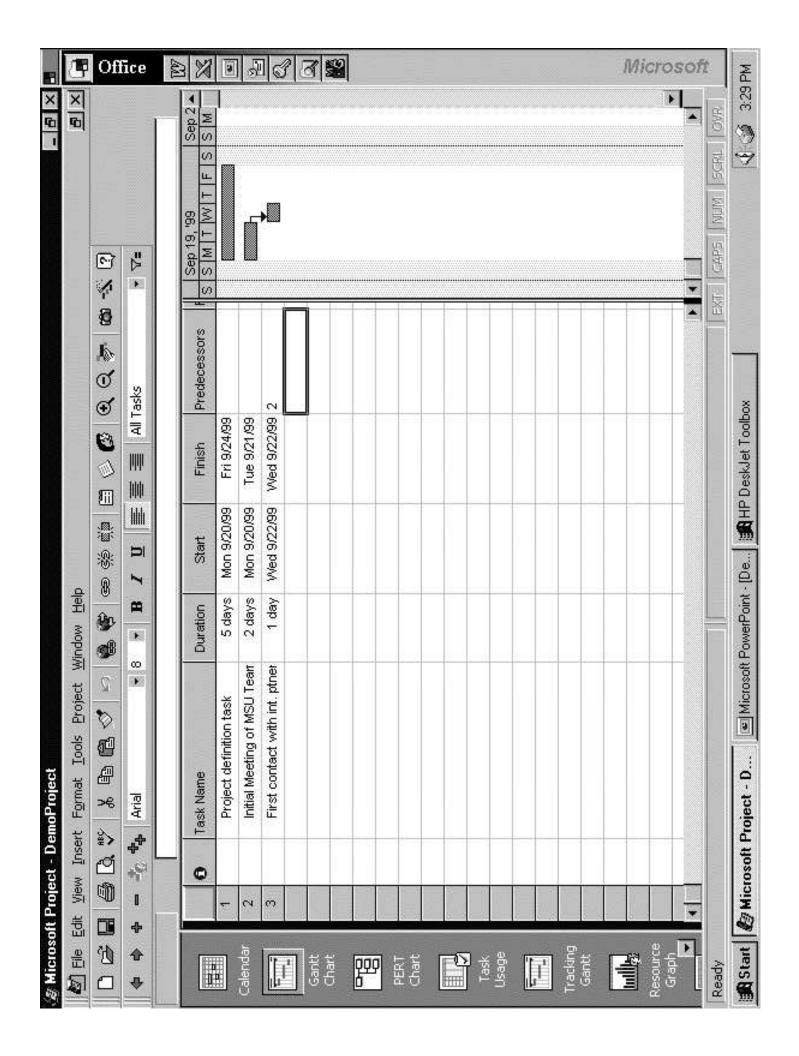
- Adding tasks, durations
- Setting dependencies
- Seeing critical path, etc.
- "Rolling up" subtasks
- Assigning resources
- Adjusting durations, time assignments, etc.

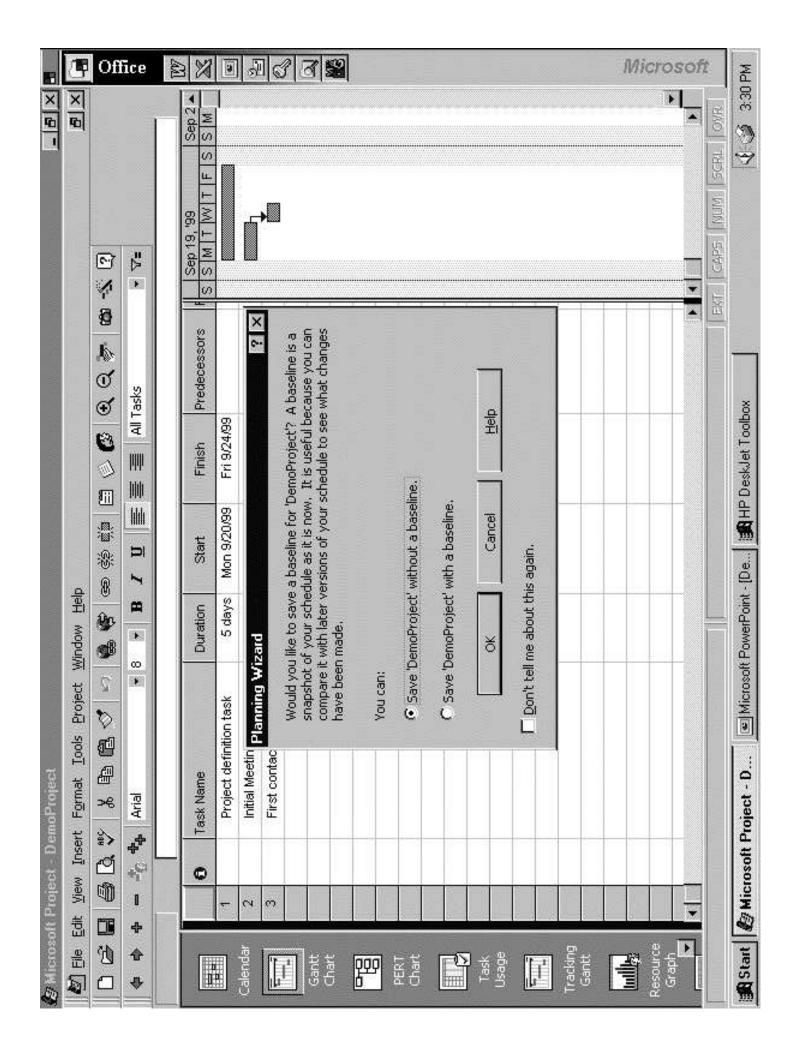


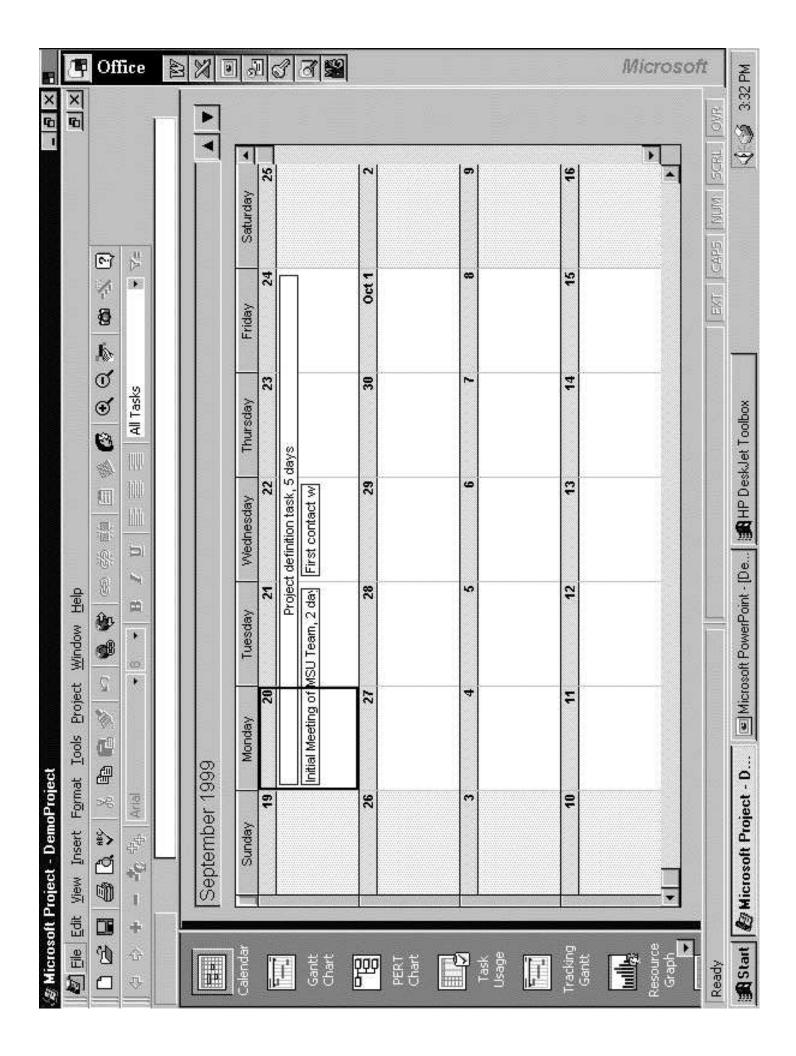




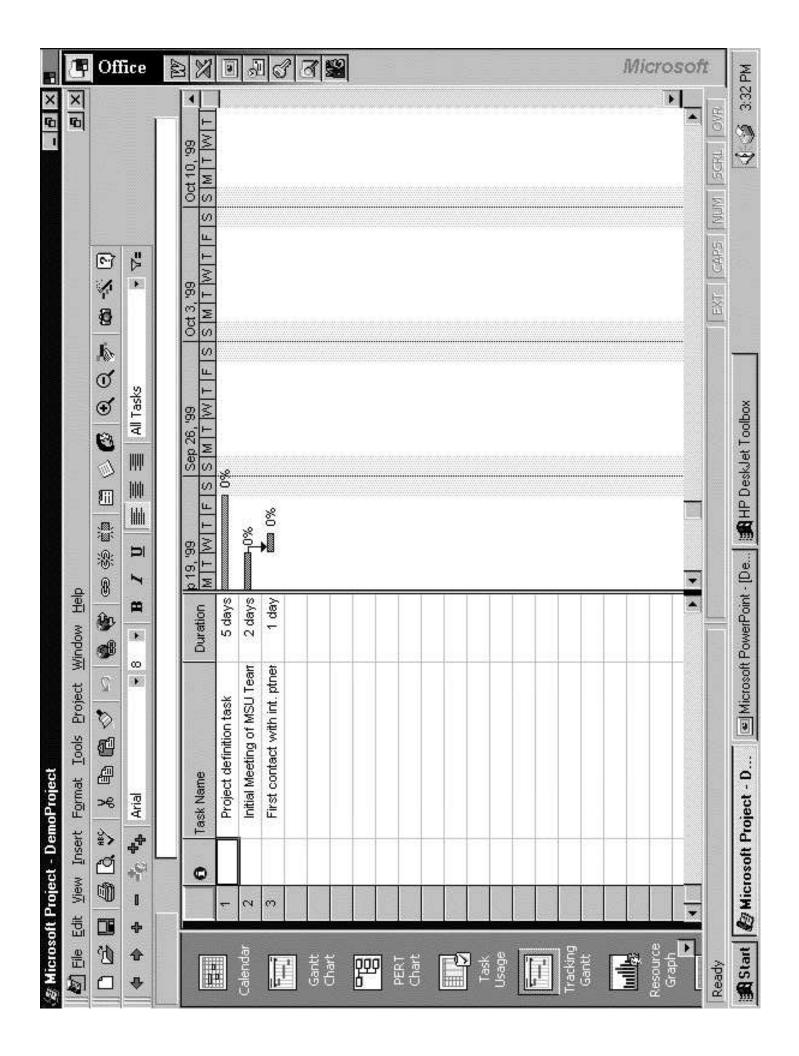
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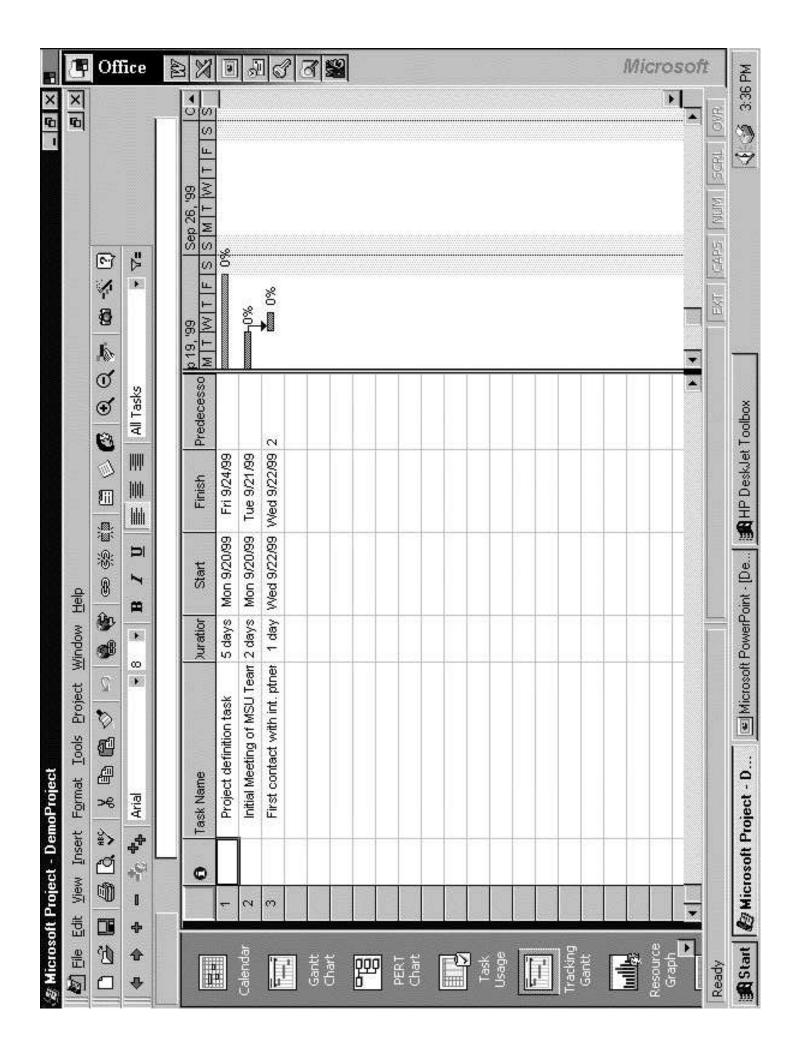


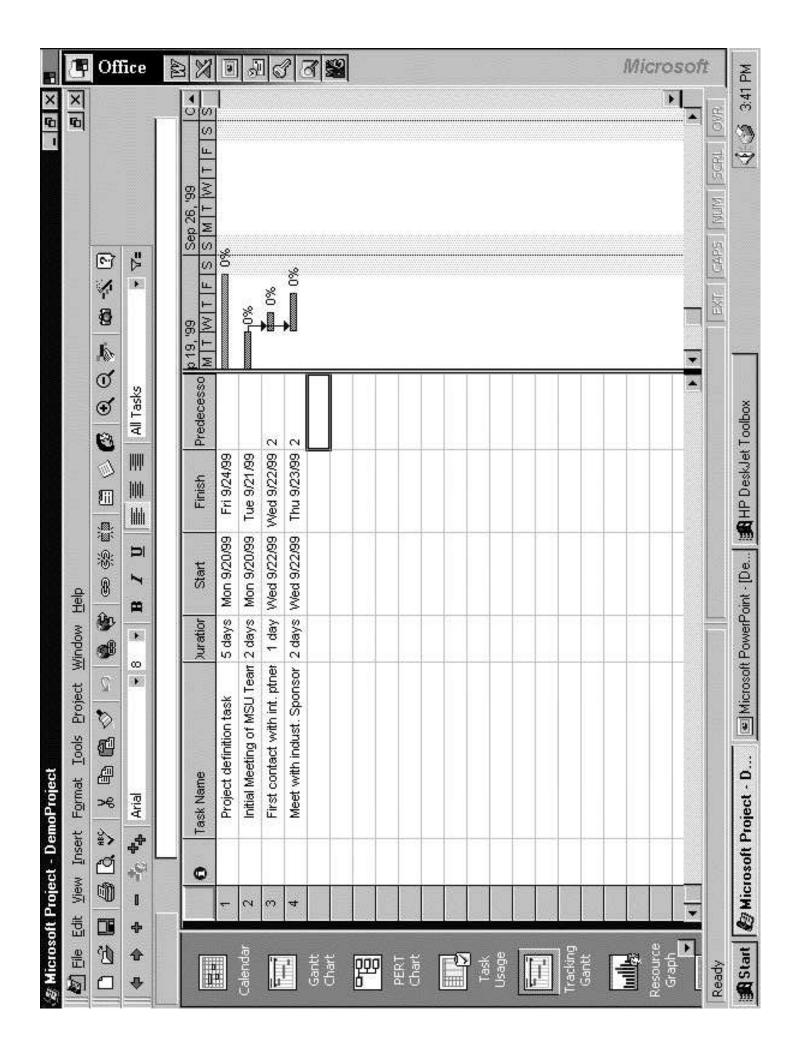


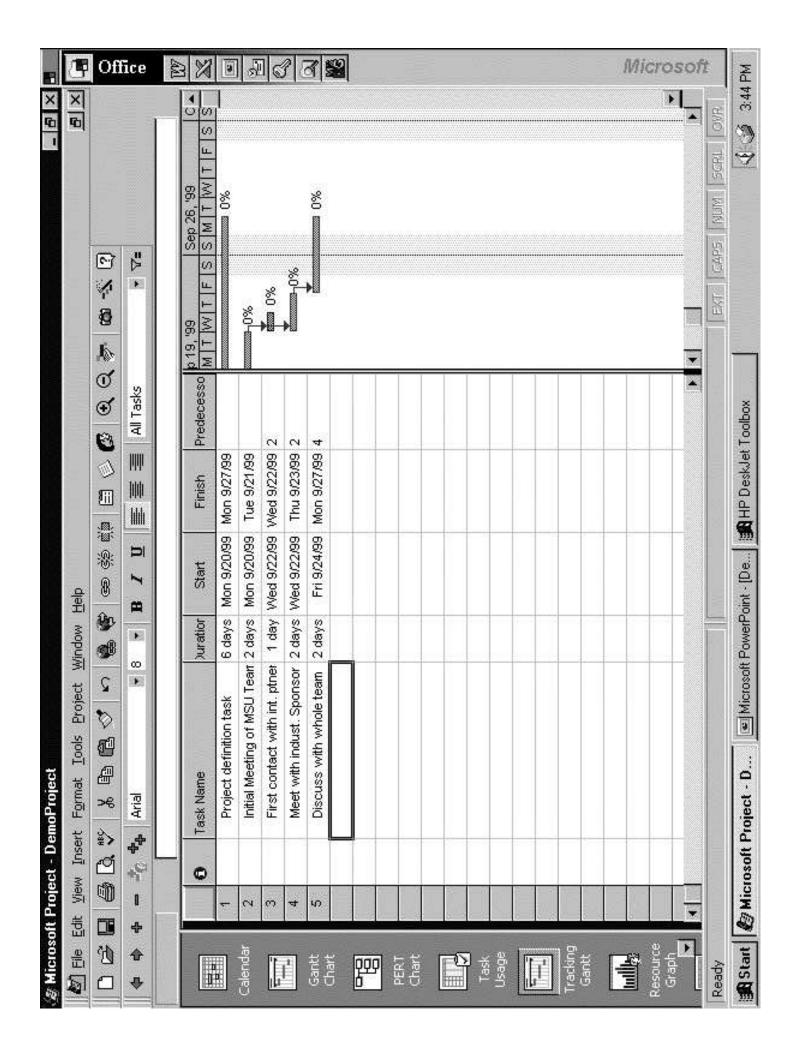


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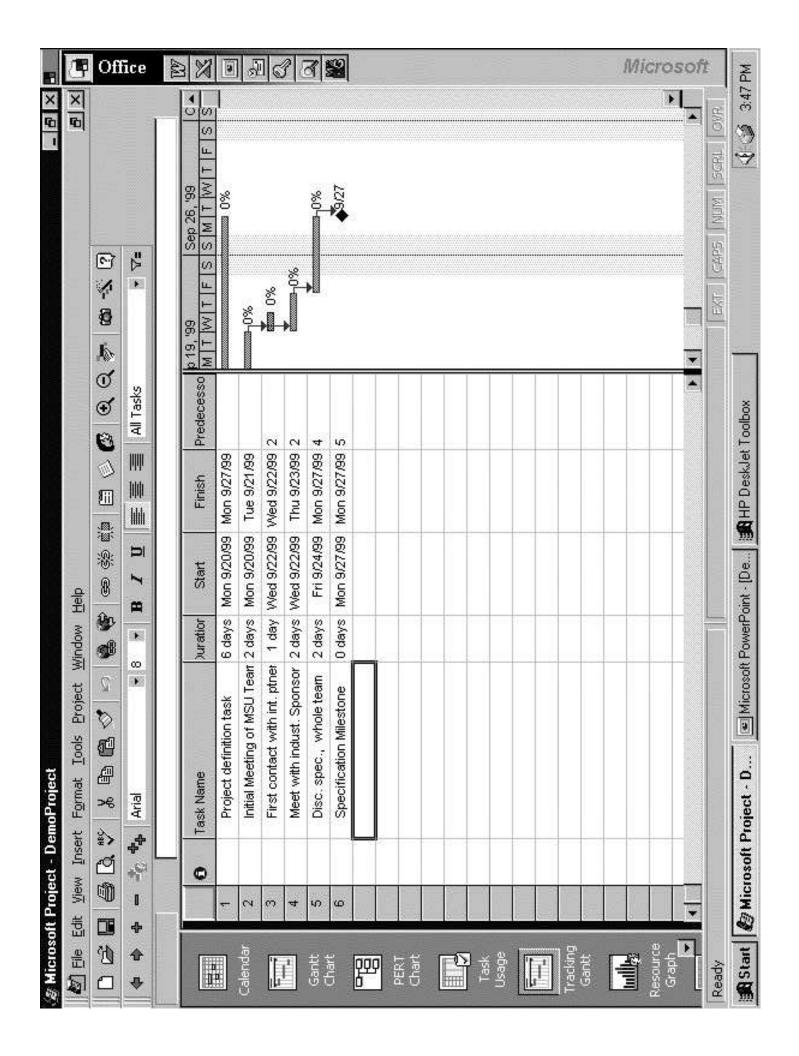


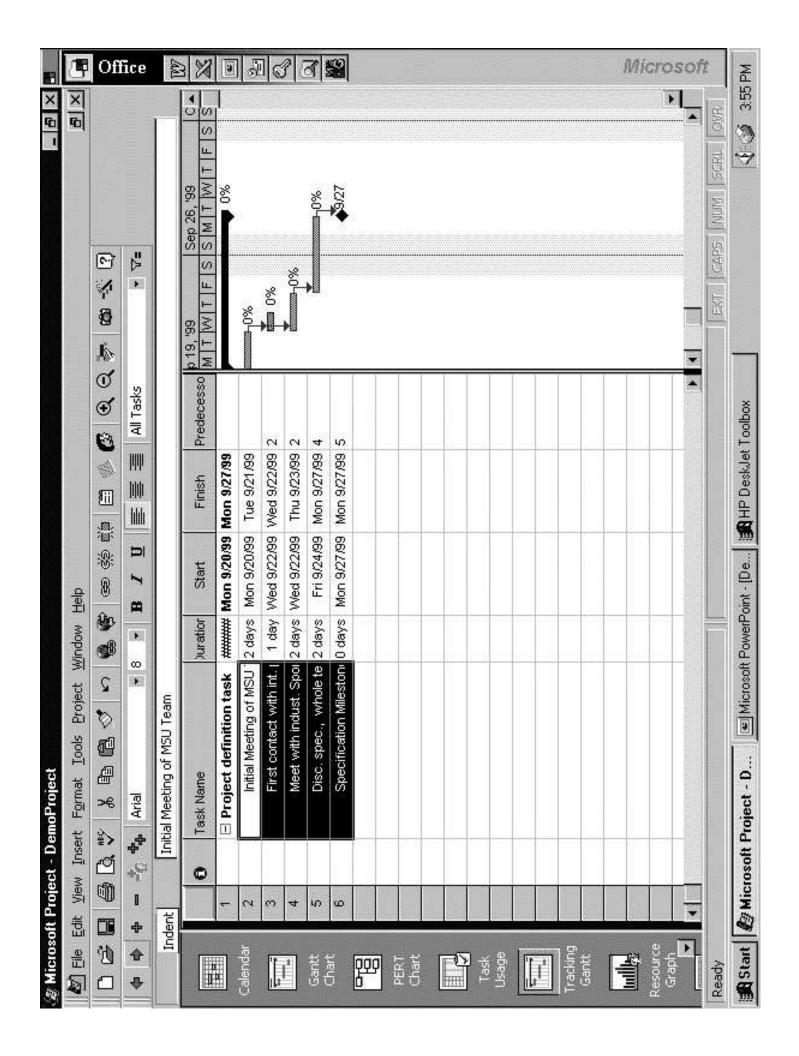


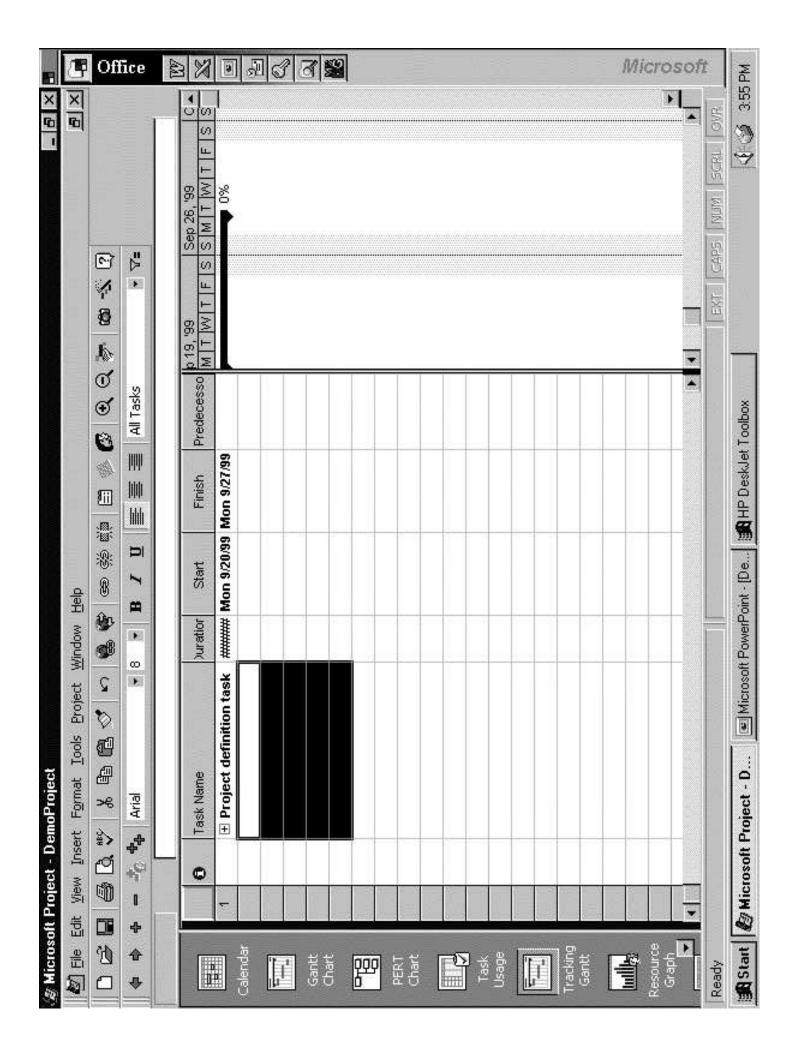
### WATCH YOUR DEPENDENCY CHOICES!!!

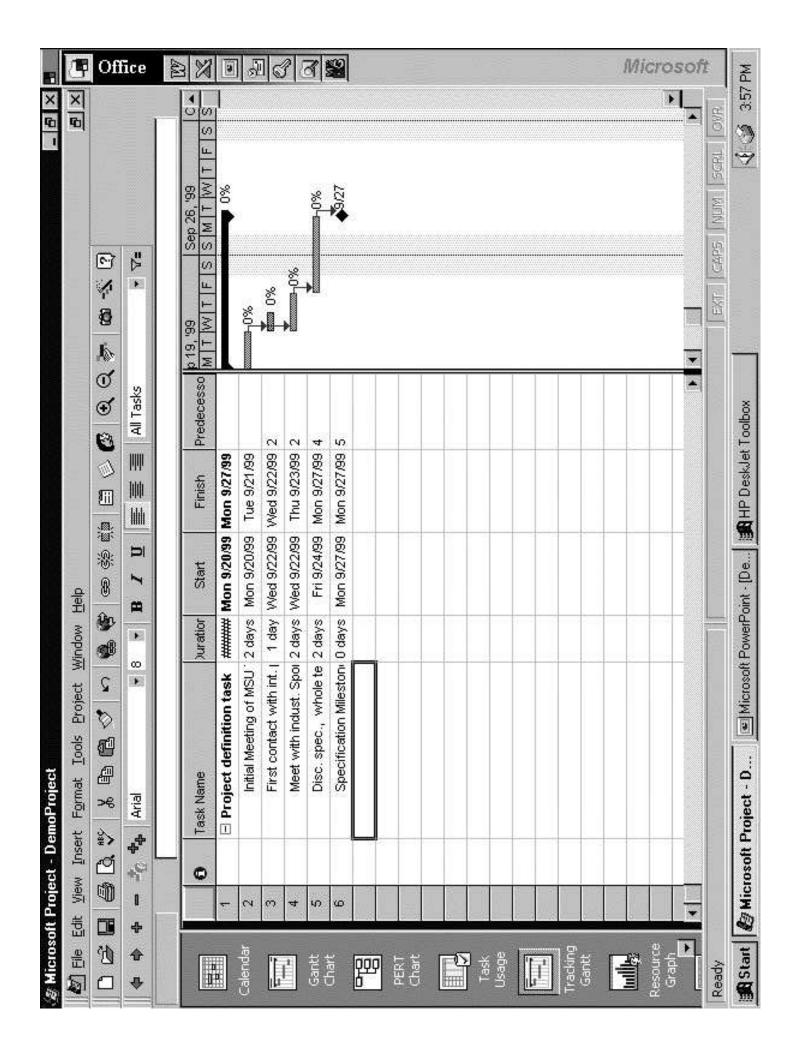
- If you choose something other than the "default" finish/start constraints, you will probably LOSE your ability to track the critical path
- So AVOID "finish by" or "start by" with particular calendar dates, or other types of constraints.
- Break tasks apart as needed, in order to make finish/start constraints realistic!

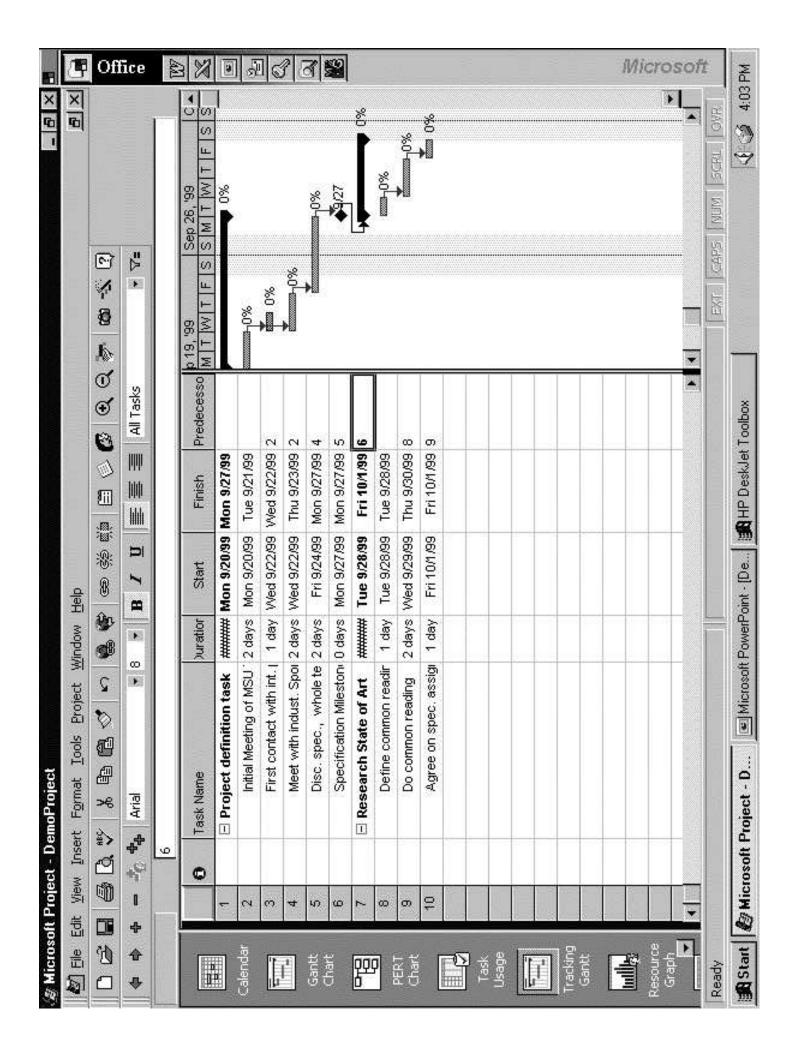
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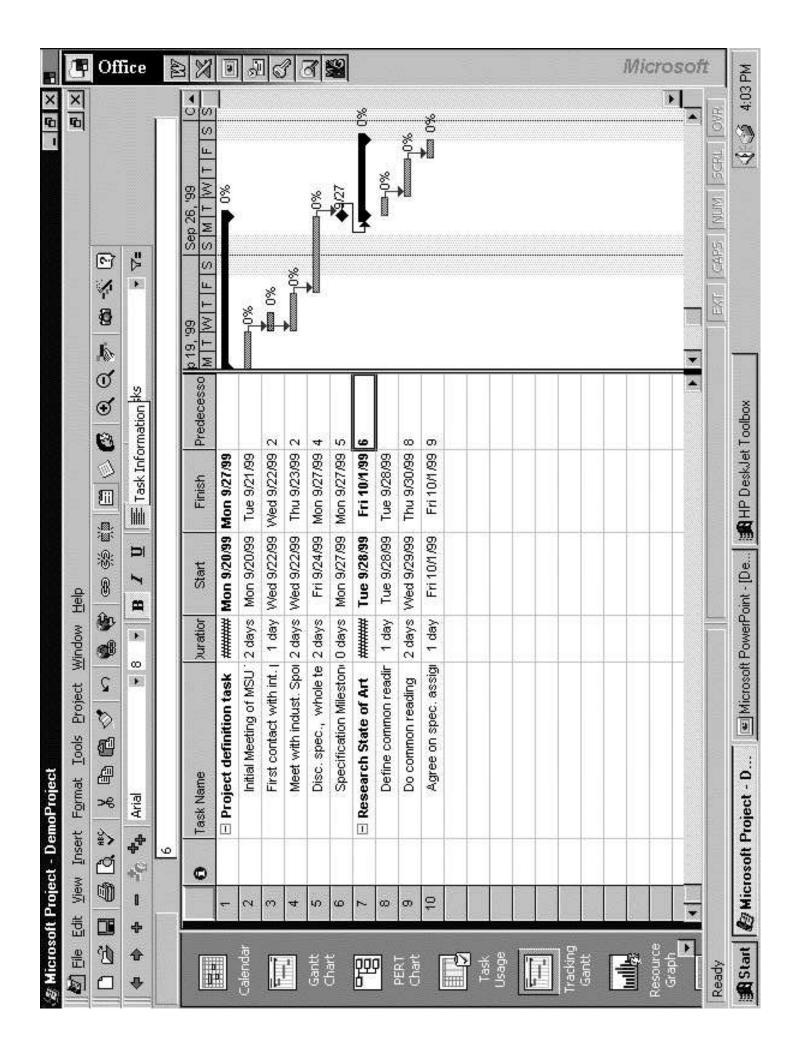


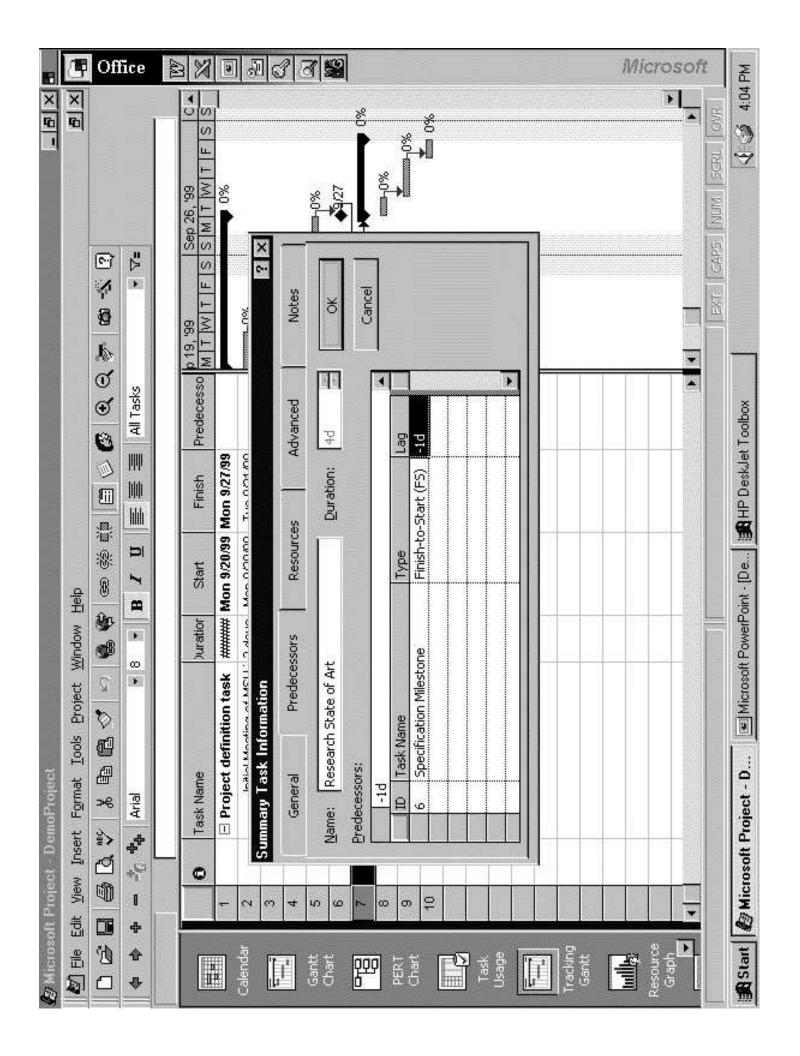


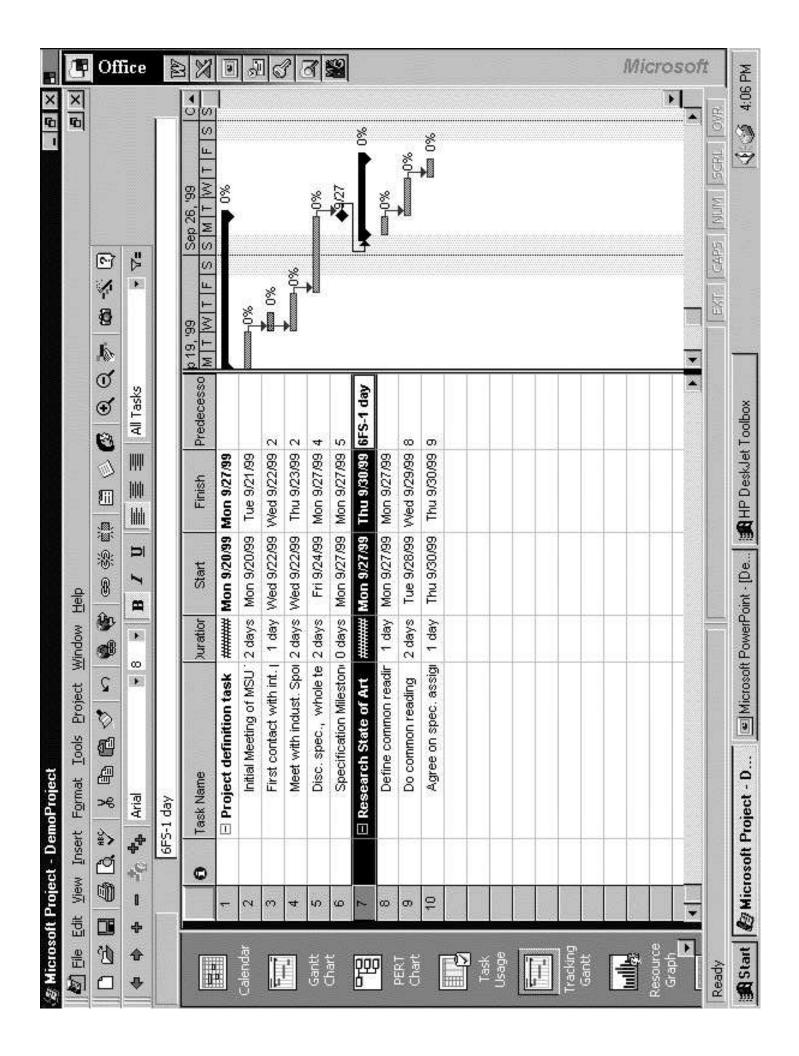


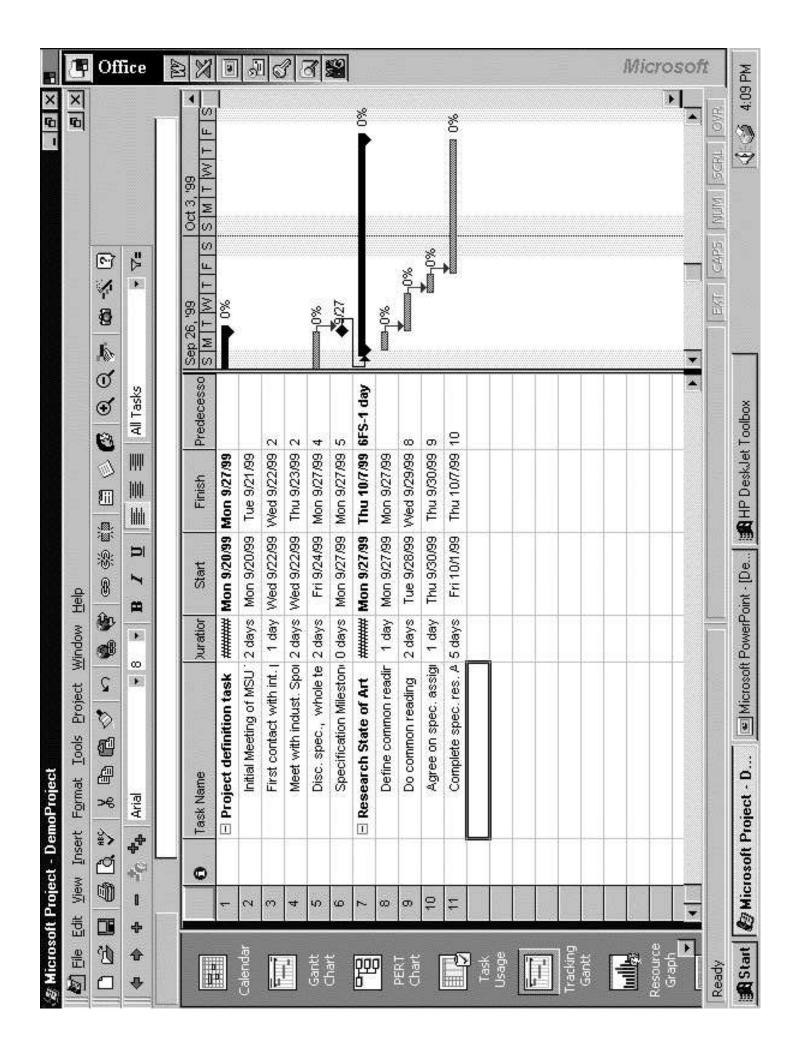


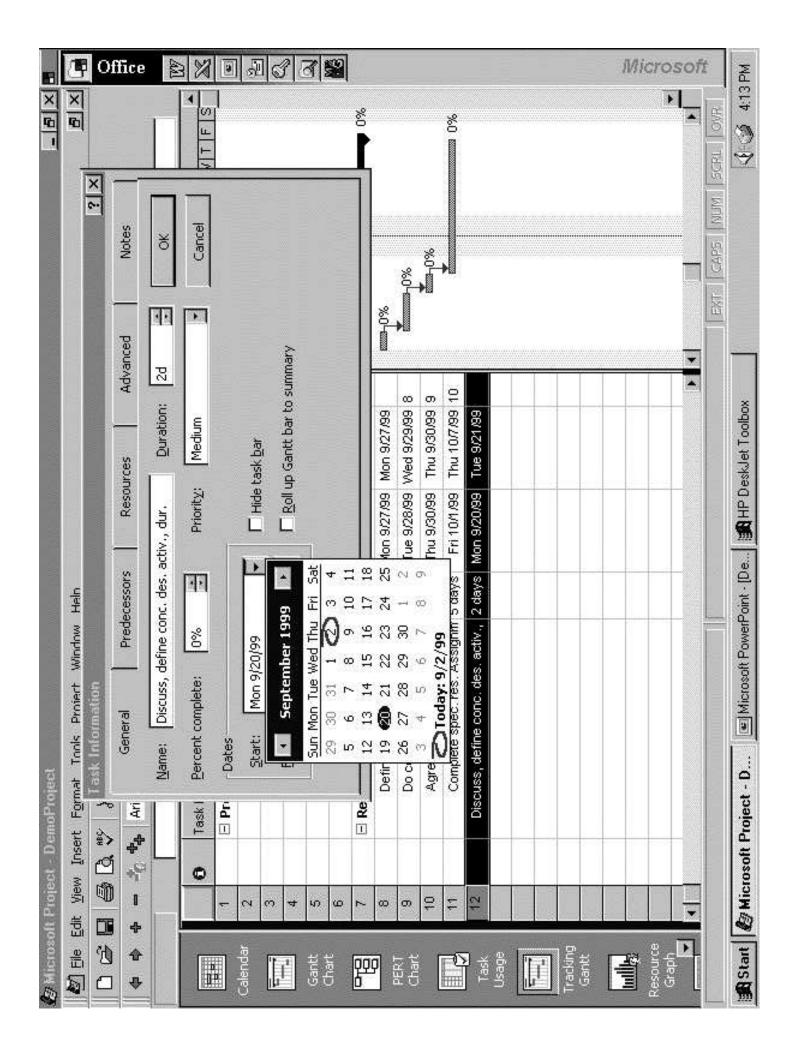


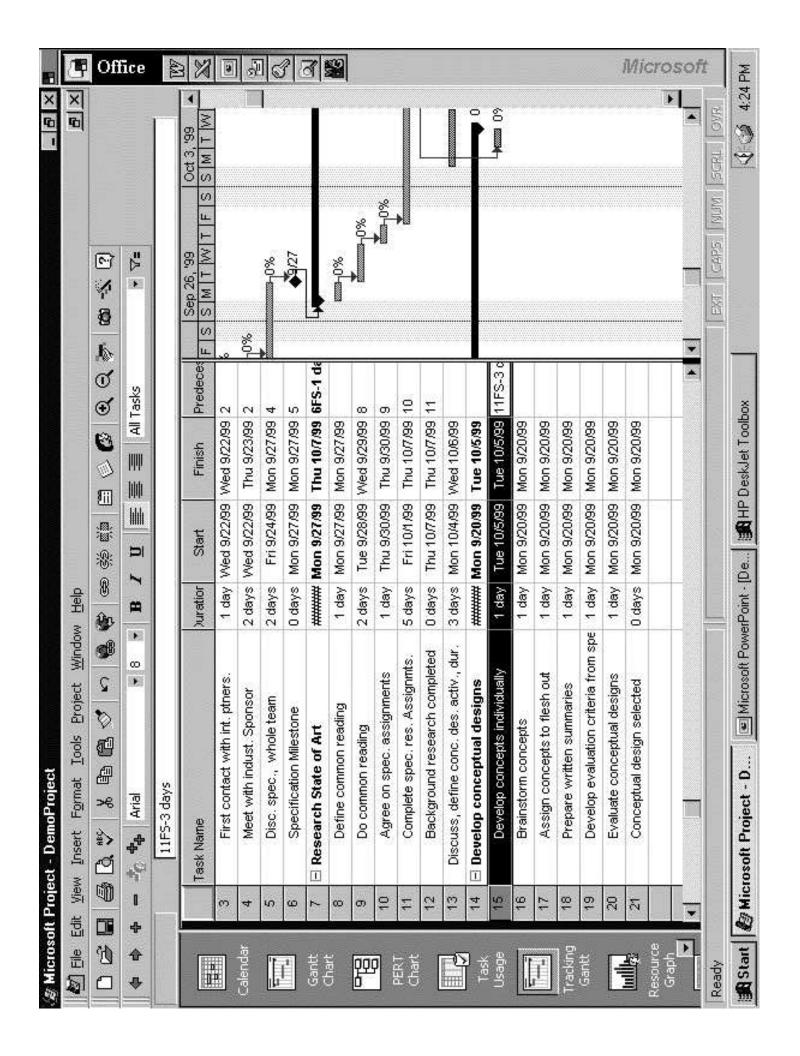


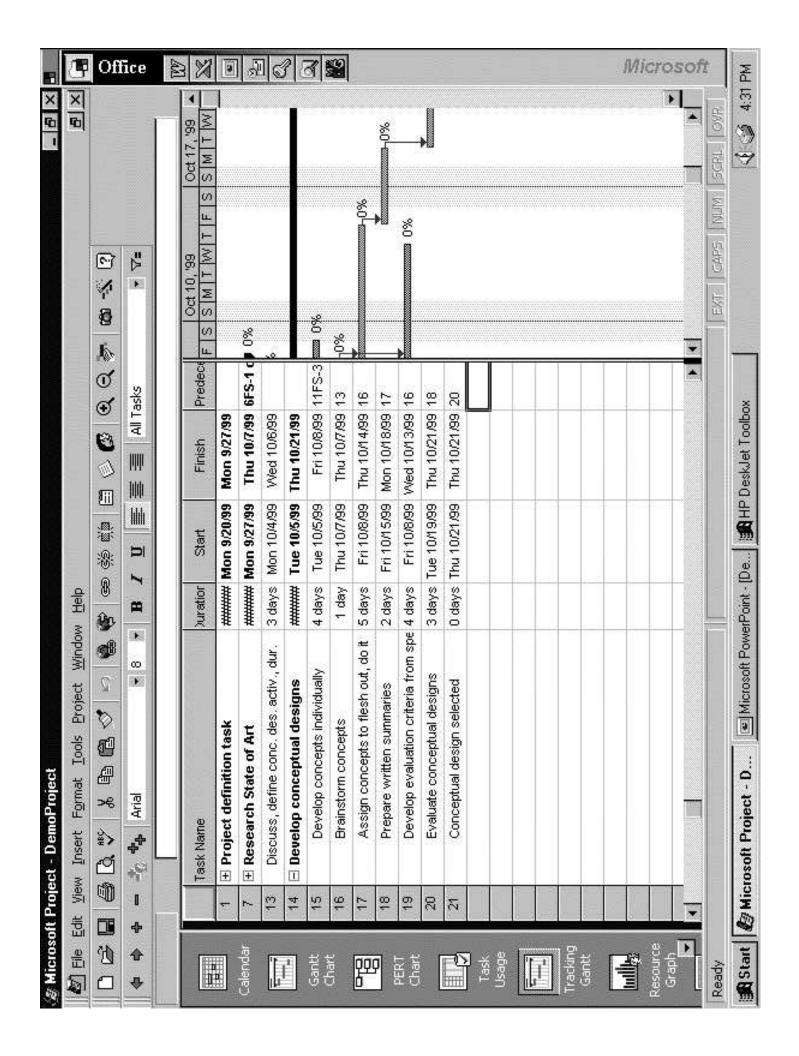


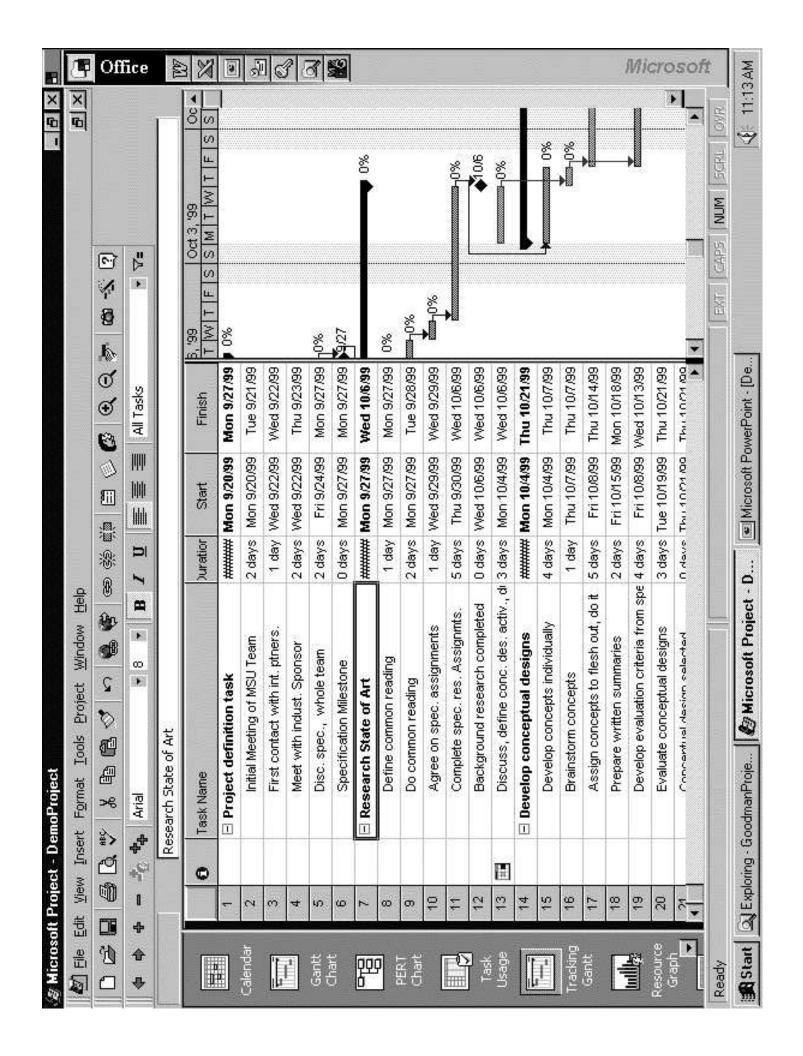






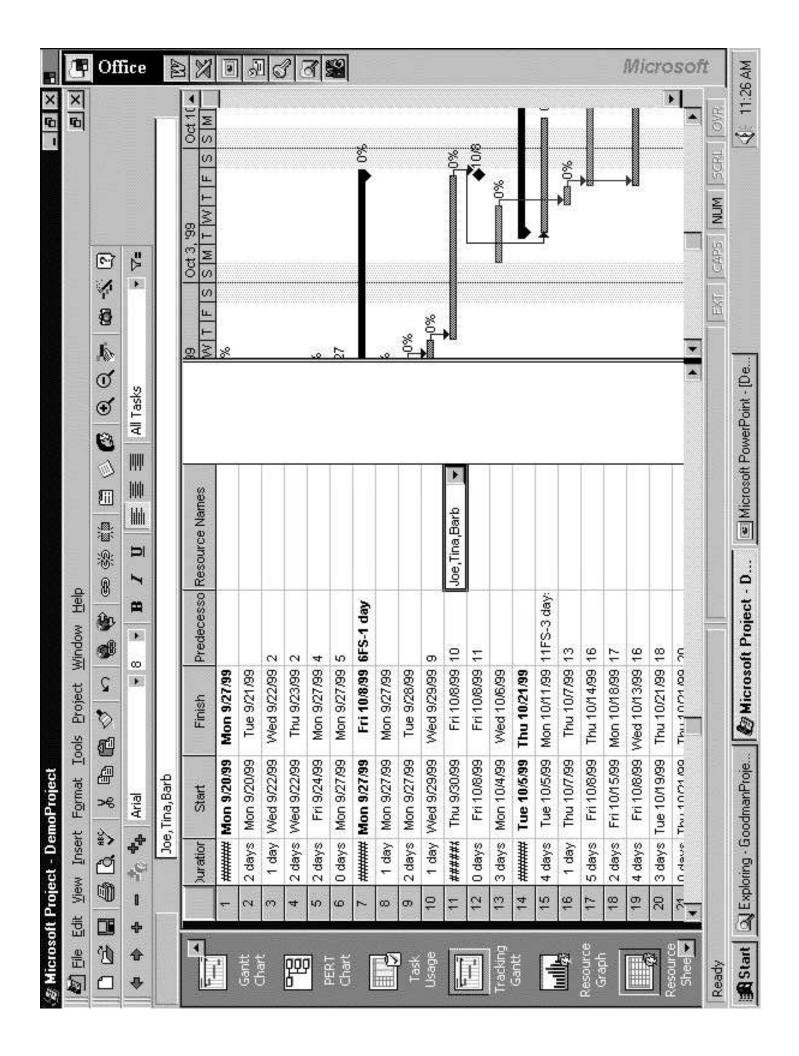


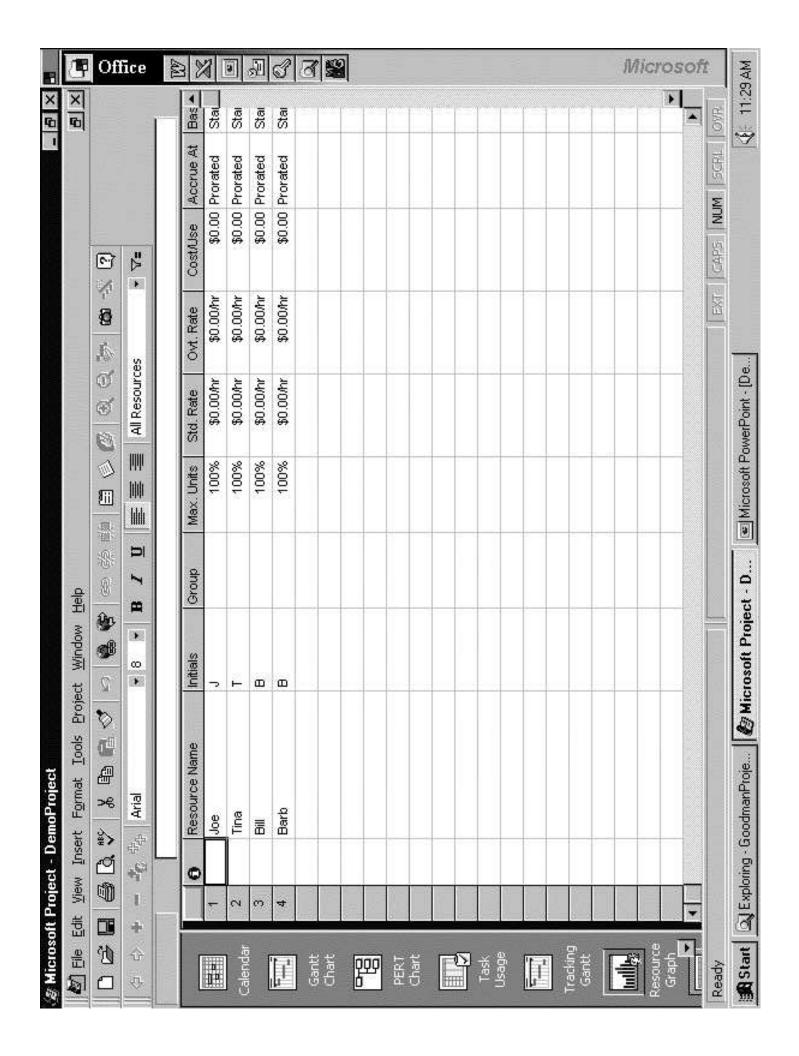


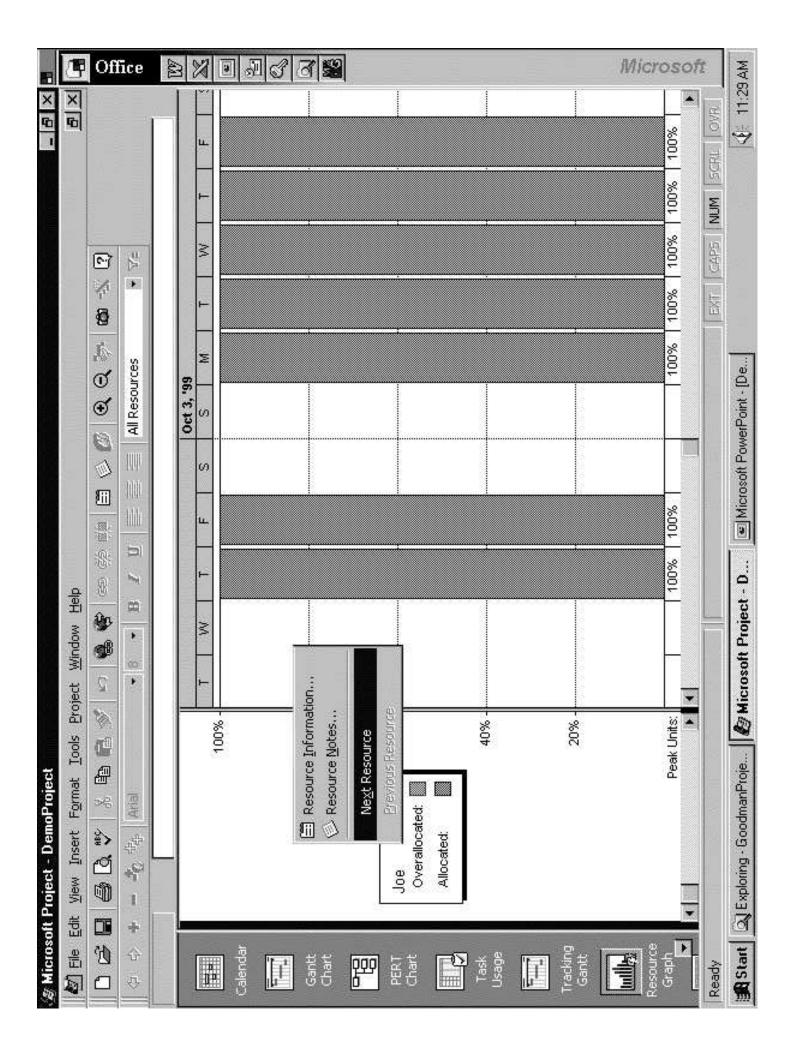


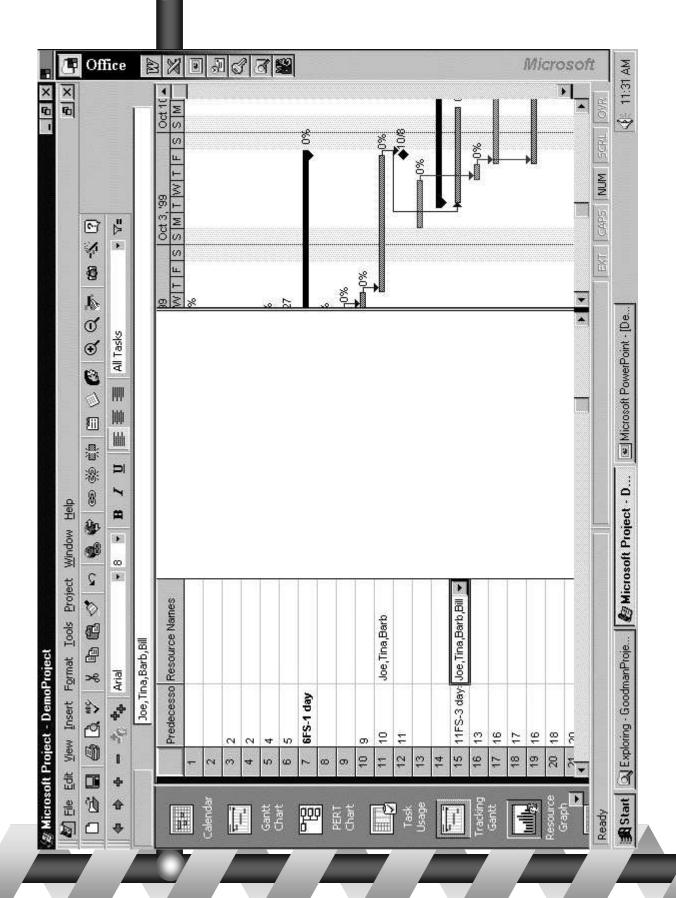
## Our "Flyover" of Project 98

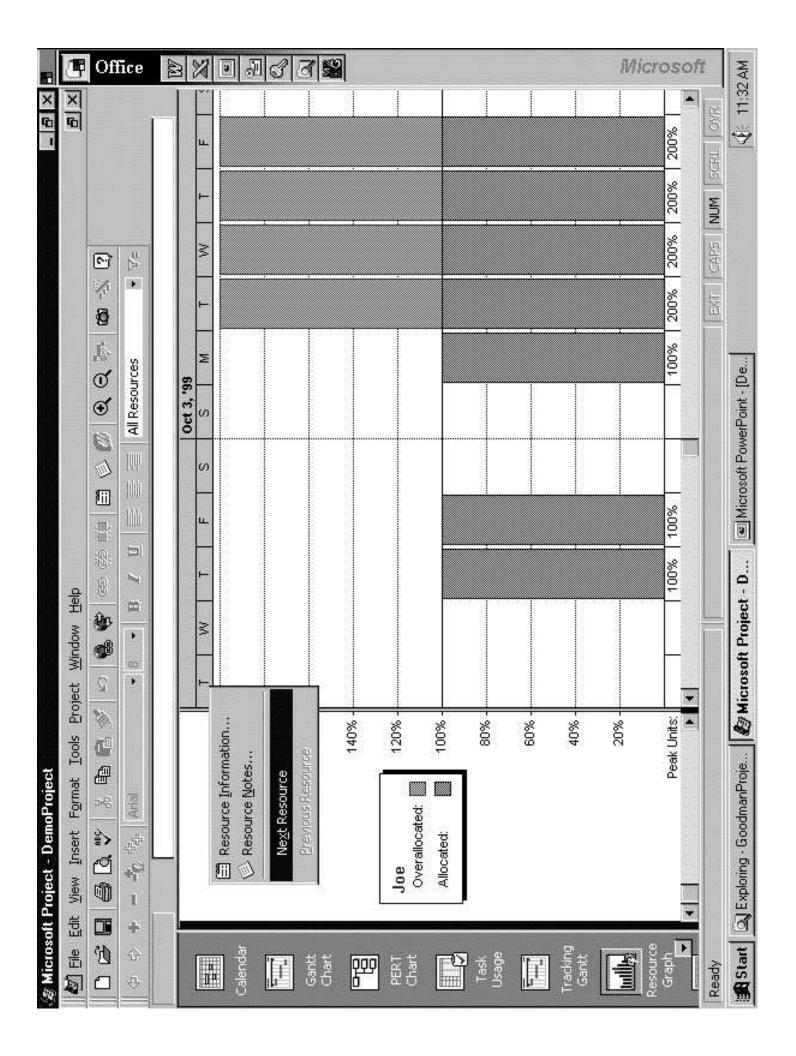
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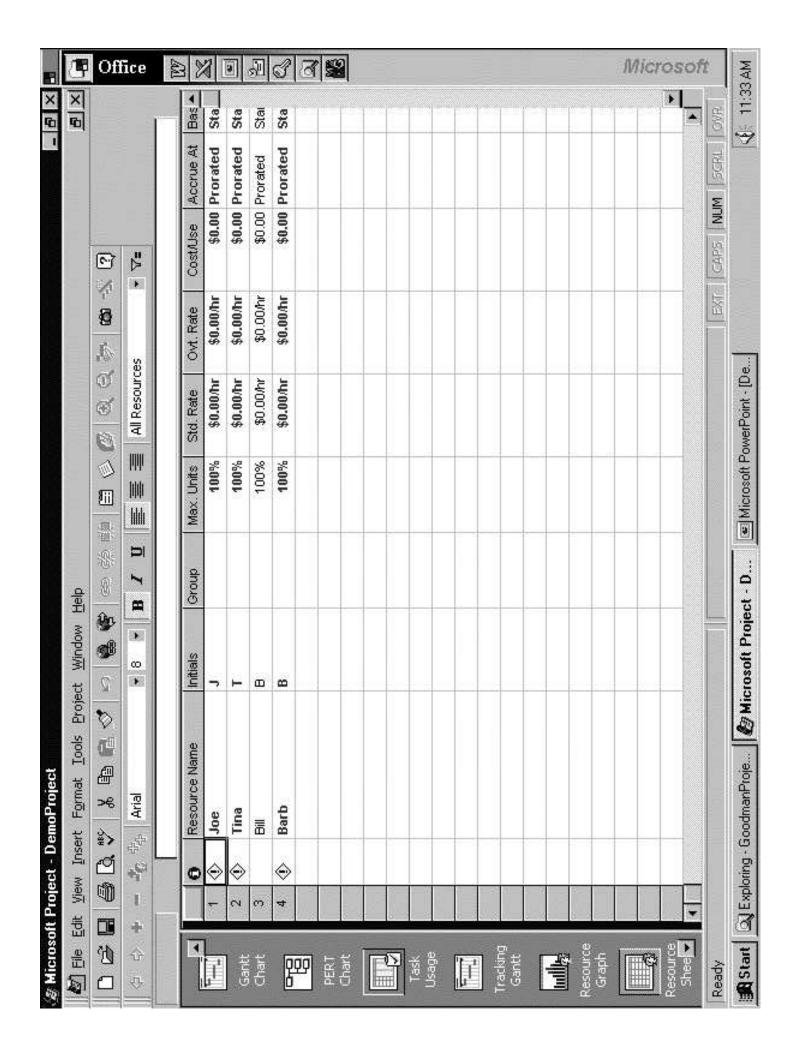


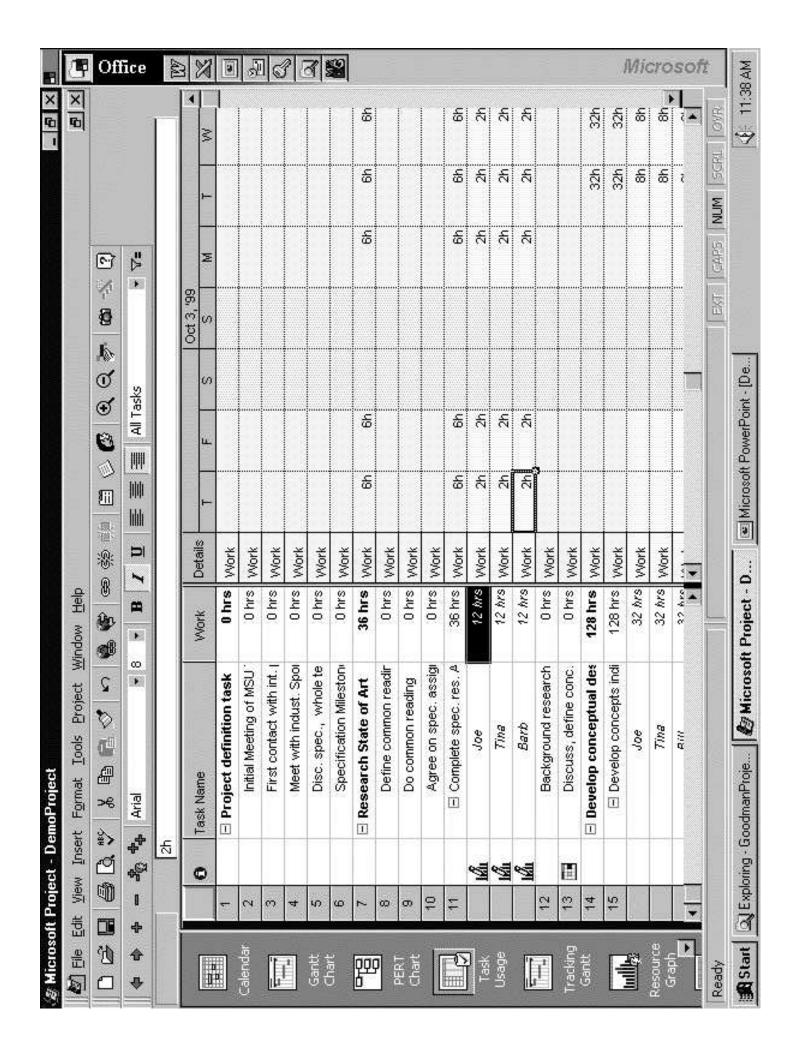


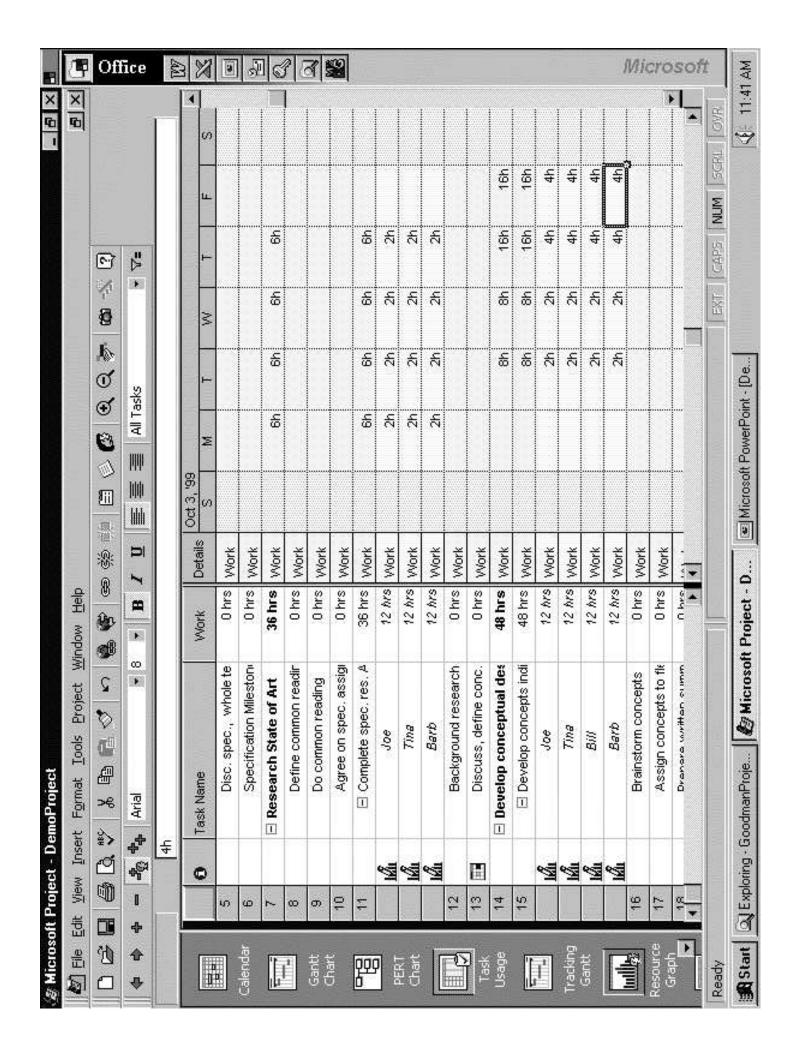


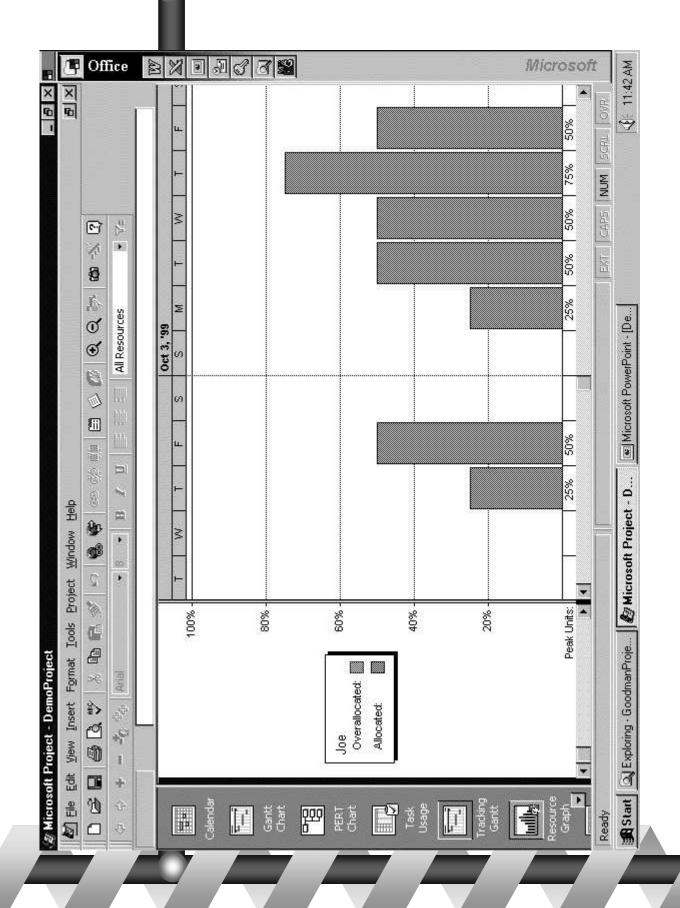


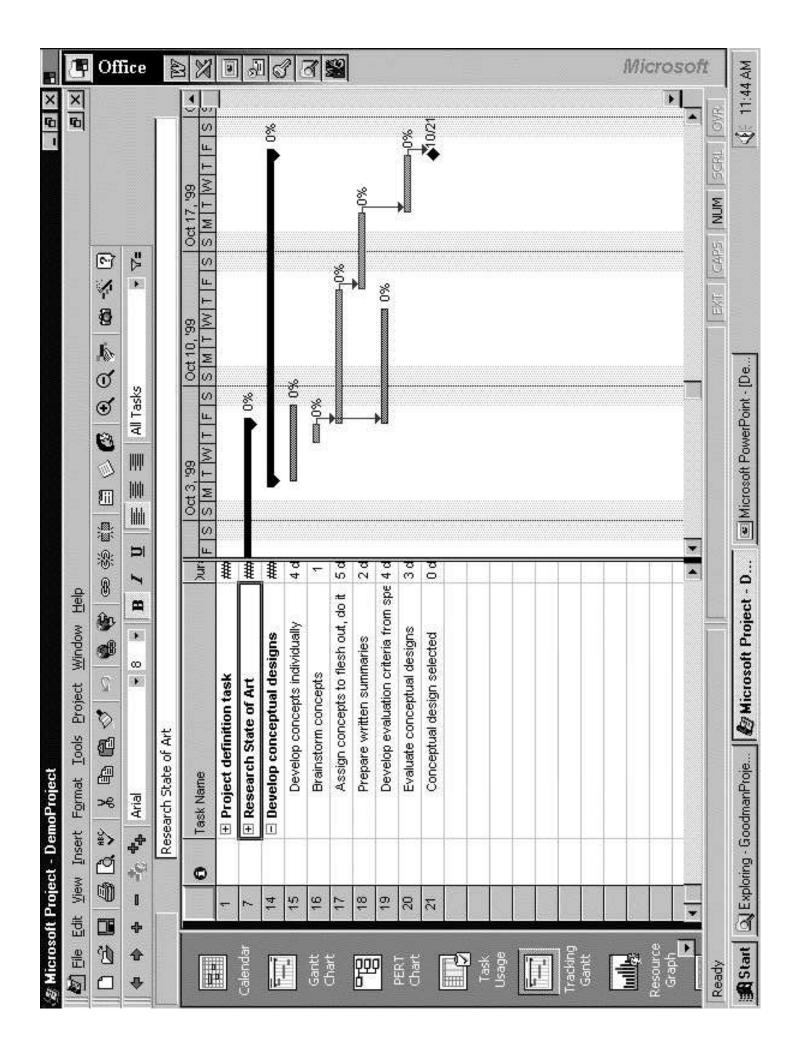


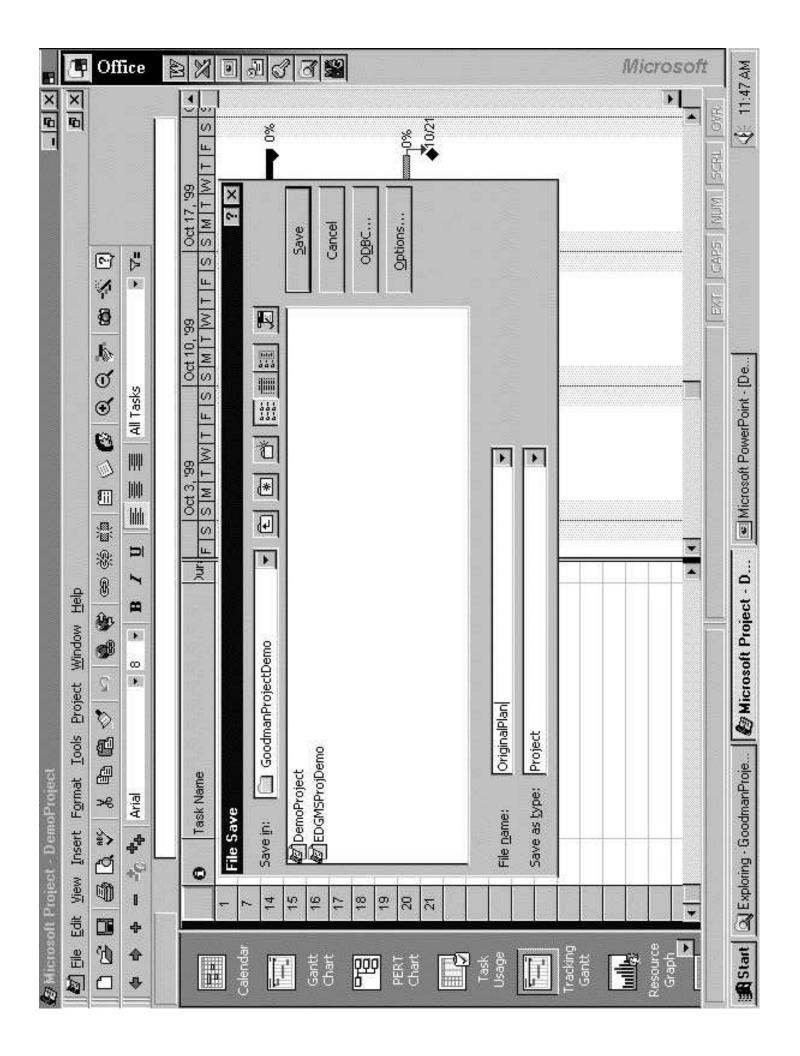






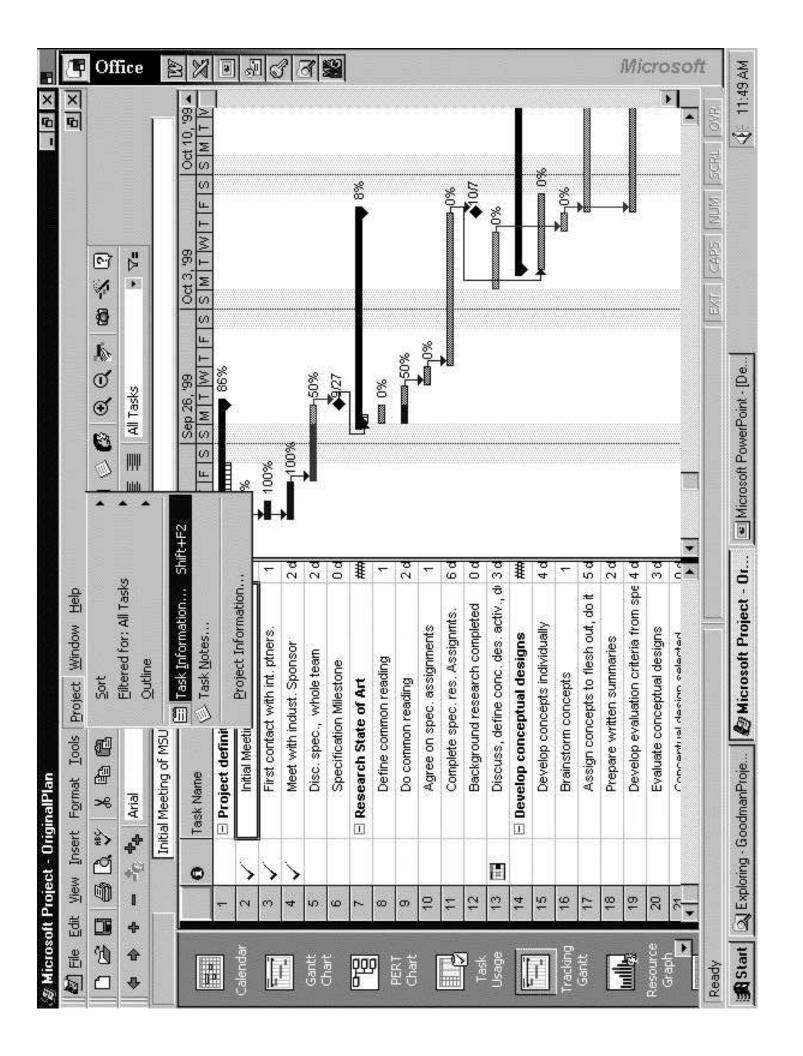


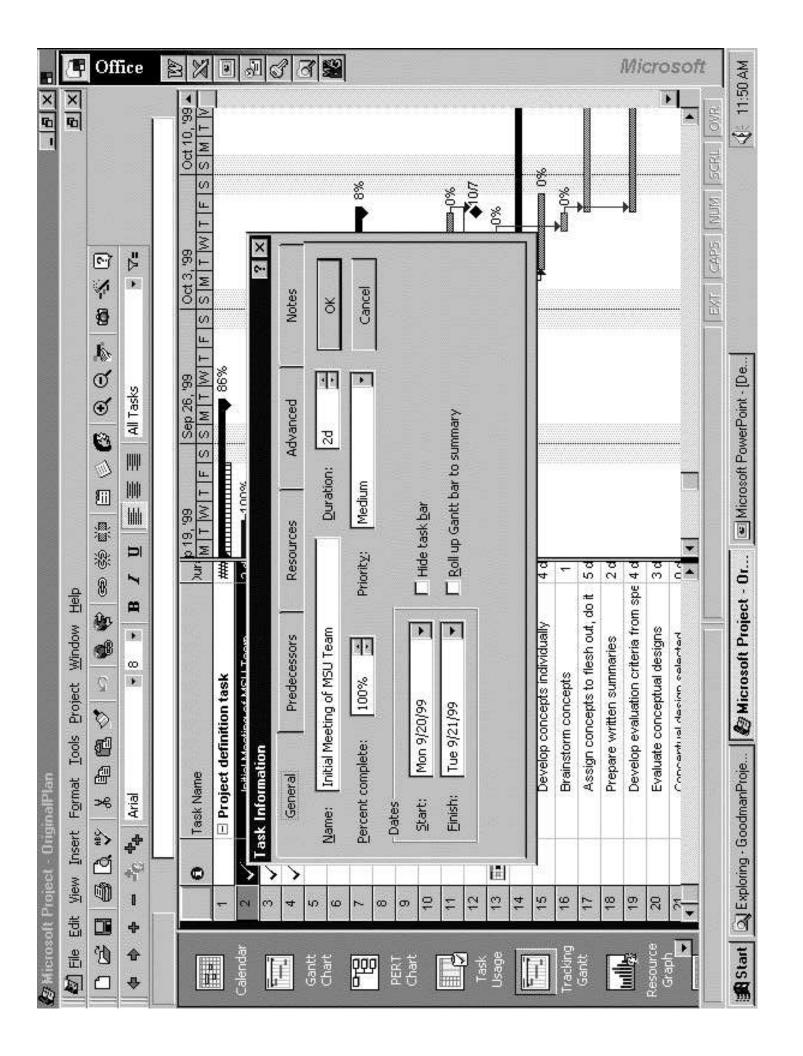


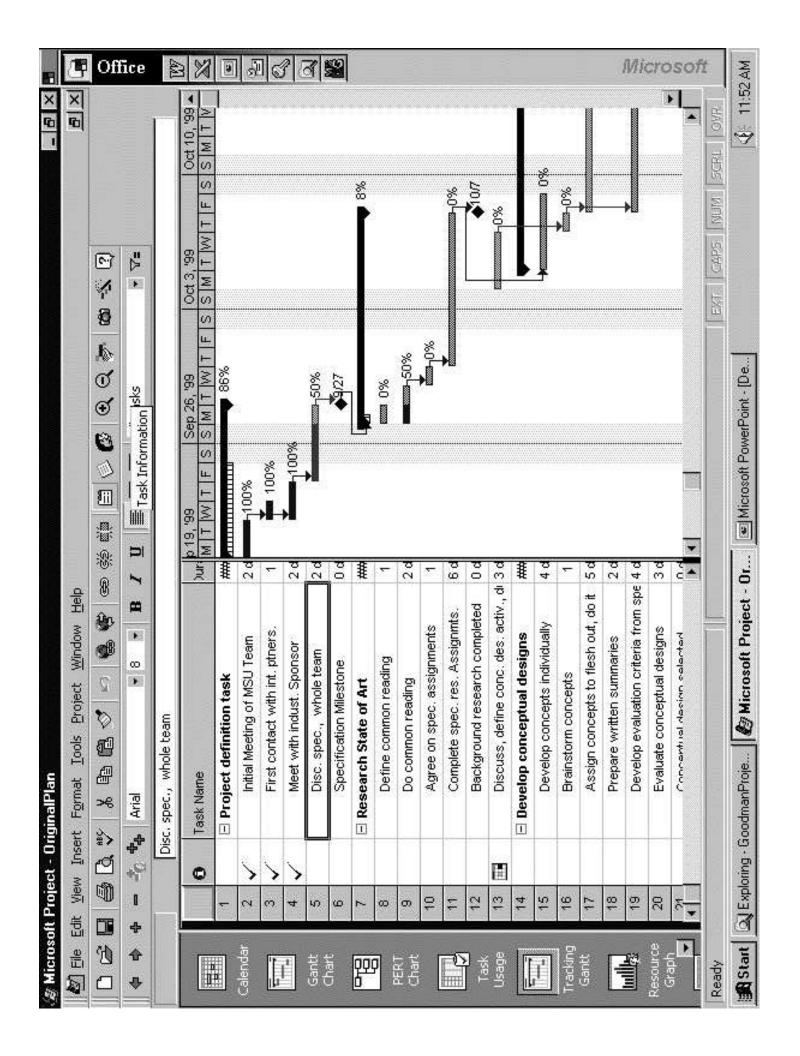


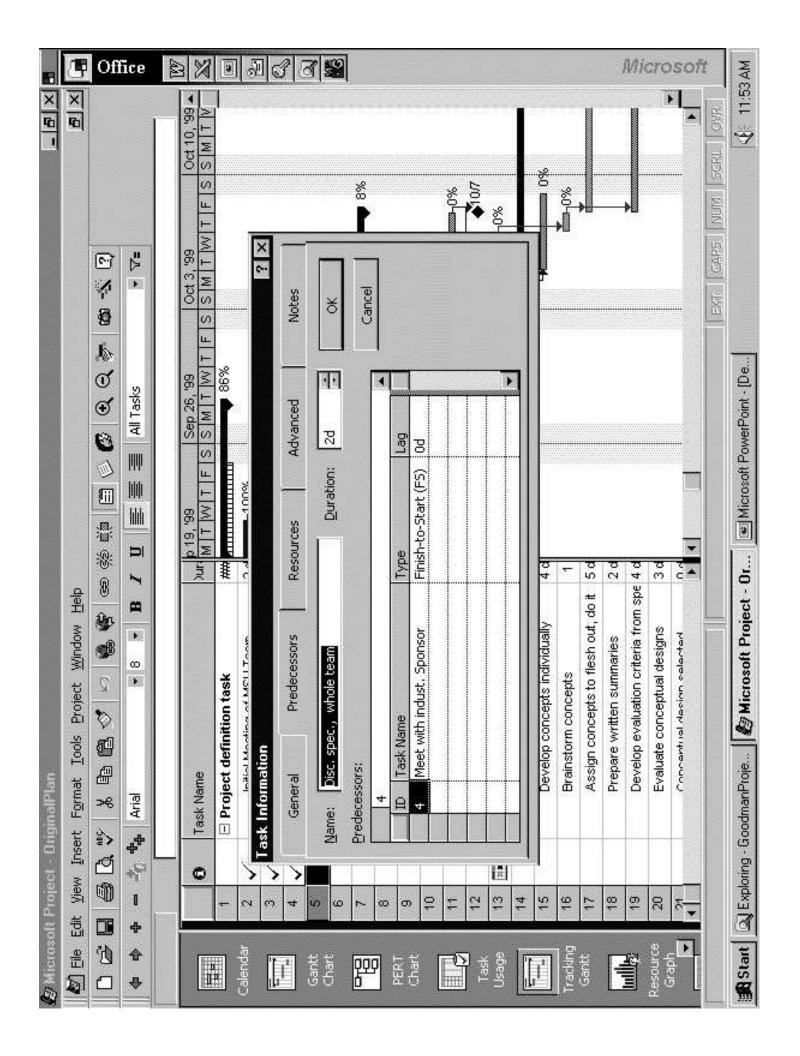
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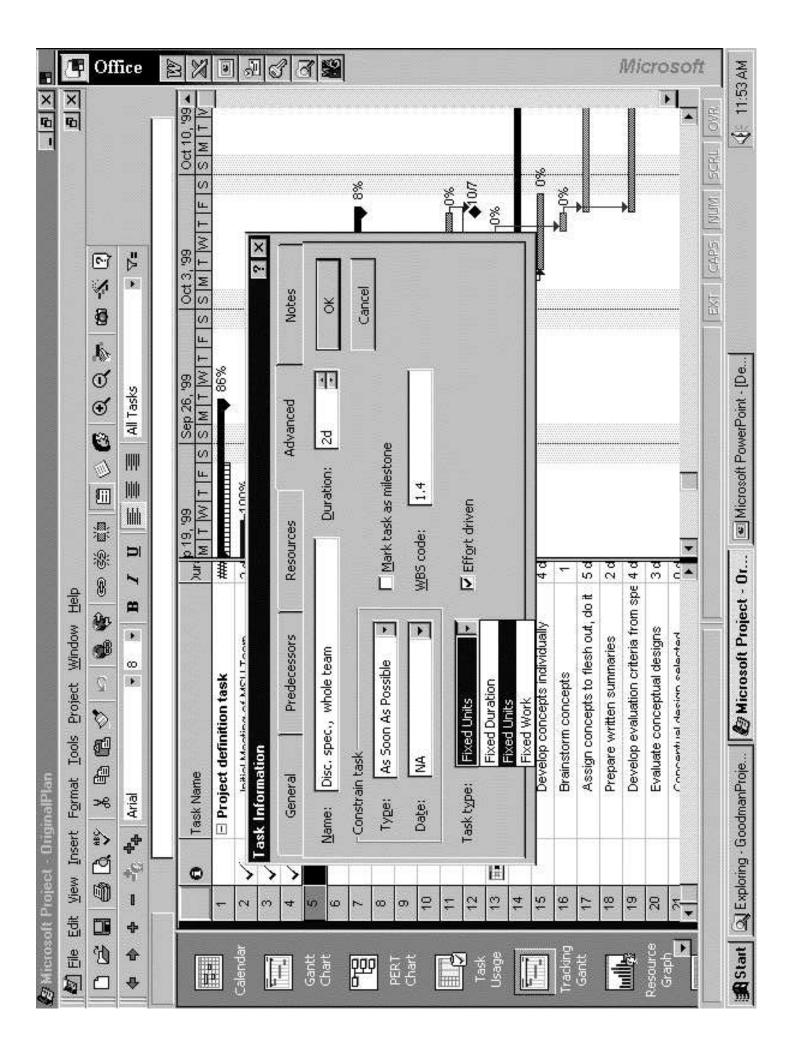
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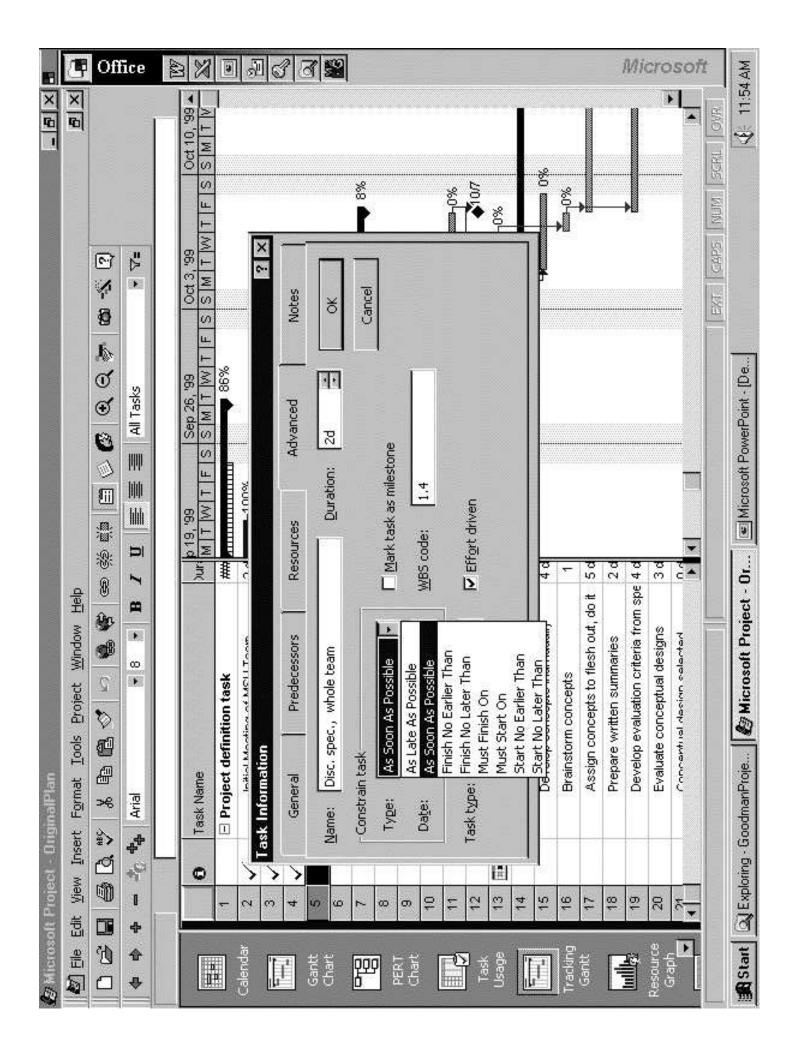


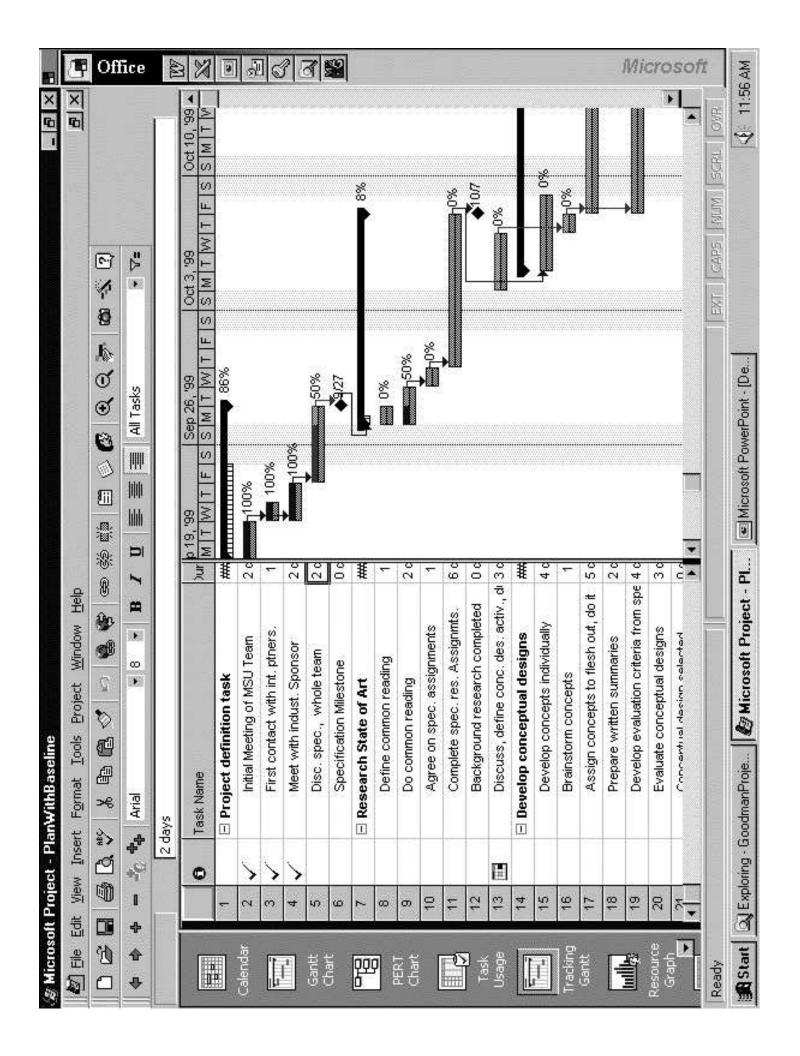


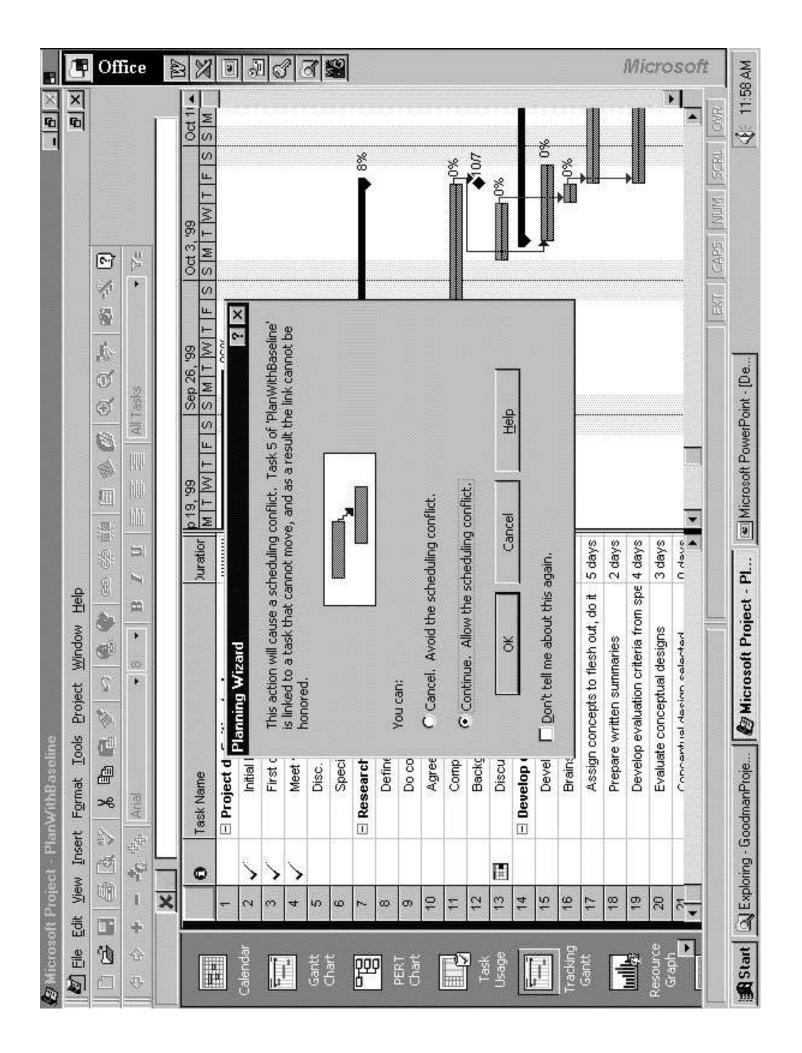


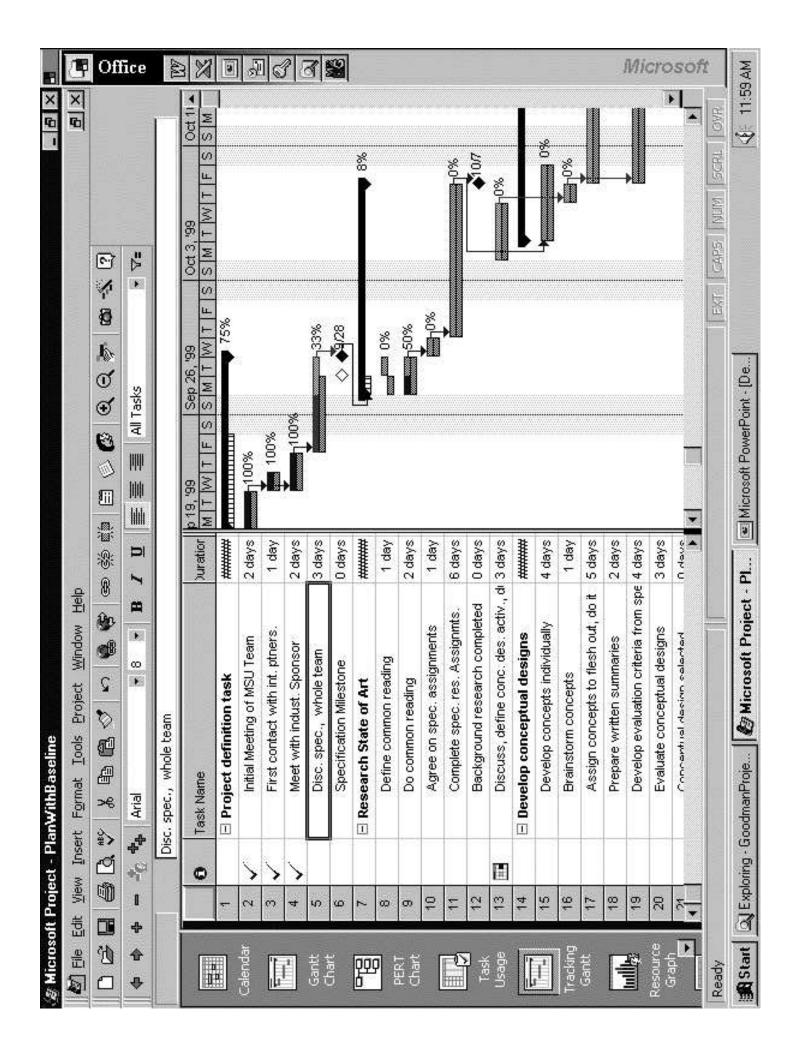












## **Management of YOUR Project**

## With your team members

- Create a plan for the entire project
- Set milestones for tracking progress
- Provide more detail for near-term tasks
- Use with your facilitator to report progress and revise/add detail to plan
- Assign specific tasks to team members
- Revise plan and activities as required to achieve objectives