

CS 428

CREATING PERT AND GANTT CHARTS

Fall 2021

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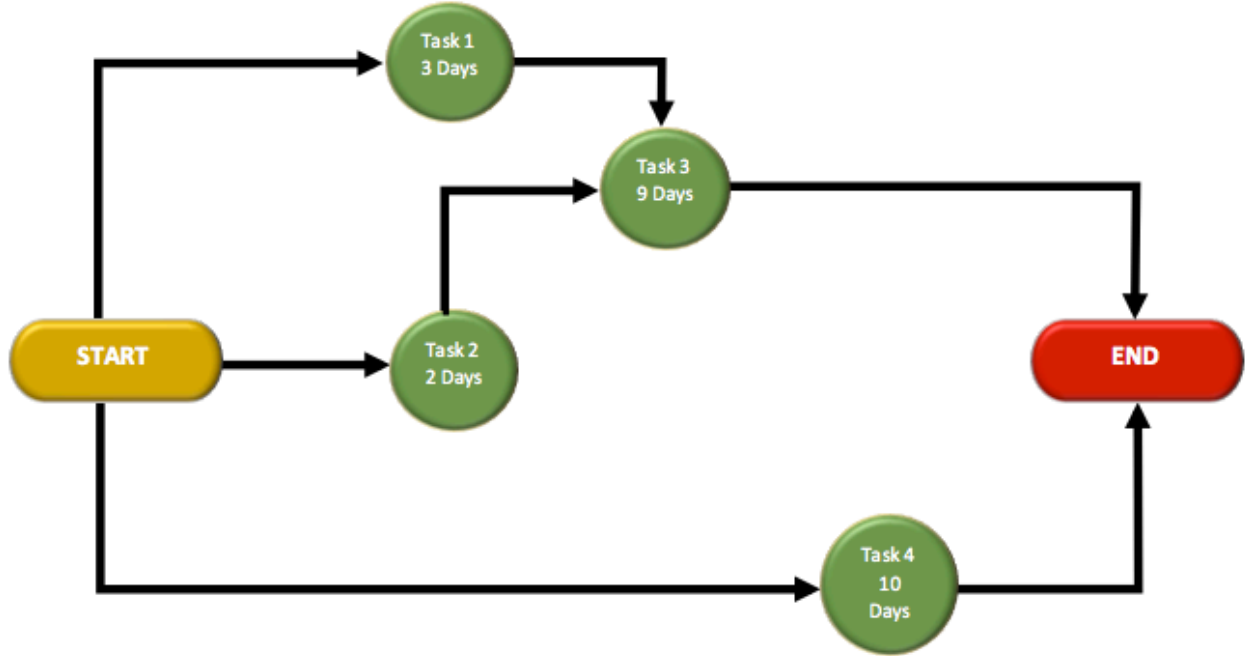
- **Challenge: appropriate estimation of tasks**
 - **Armour: the more novel your work, the harder it is to estimate how long it will take or to predict the errors/dead ends you'll encounter**
 - **Plus, we're optimists**
 - **Knutson: "Take your estimate, double it, and add 1." e.g., 4 days really is 9 days**
- **Challenge: thinking through all tasks that need to be done for the project**
- **Challenge: correctly identifying the project's critical path (and near-critical paths) at any give time**
- **Challenge: keeping the schedule up to date each week based on actual work accomplished, new tasks discovered, estimate changes**
- **Challenge: schedule tends to be linear (waterfall-ish) rather than iterative (agile-ish)**

THE CHALLENGES OF DEVISING A SCHEDULE

- PERT = Program Evaluation Review Technique (US Navy, 1950s)
- Directed graph showing expected significant tasks for the project
 - Each node (box, bubble) contains a task and an estimated duration
 - Sometimes arrow represents task + duration
 - Arrows coming in show what other tasks (nodes) must be completed before this one can start
 - Arrows going out show what other tasks (nodes) cannot start until this one is completed
 - Starts with START node, ends with FINISH or END node
- Used to identify:
 - Task dependencies: for a given task, what other tasks must be completed first
 - Critical path: longest duration path from START to FINISH

PERT CHART

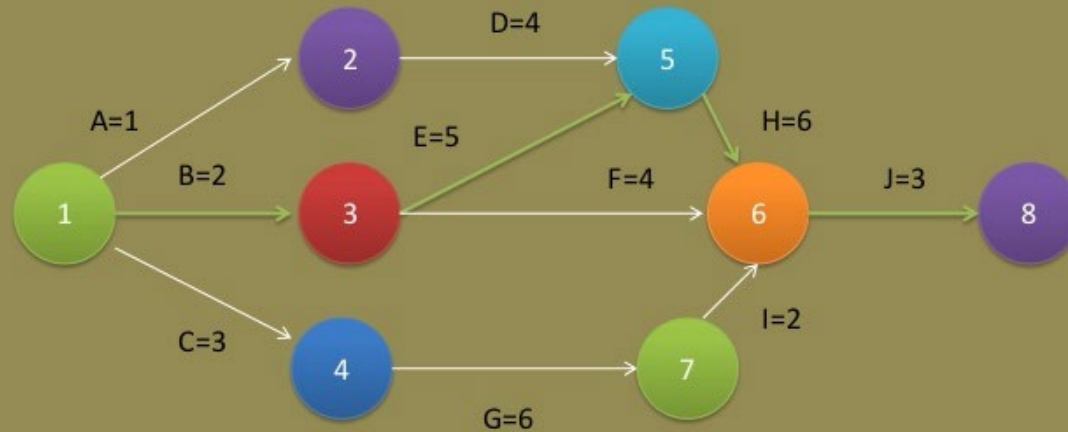
PERT Chart



SAMPLE (DUMMY) PERT CHART

Critical Path

Example



Path 1: A-D-H-J Length=1+4+6+3=14 day
Path 2: B-E-H-J Length=2+5+6+3=16 day
Path 3: B-F-J Length=2+4+3=9 day
Path 4: C-G-I-J Length=3+6+2+3=14 day

Since the critical path is the longest path through the network diagram, Path 2, B-E-H-J, is the critical path.

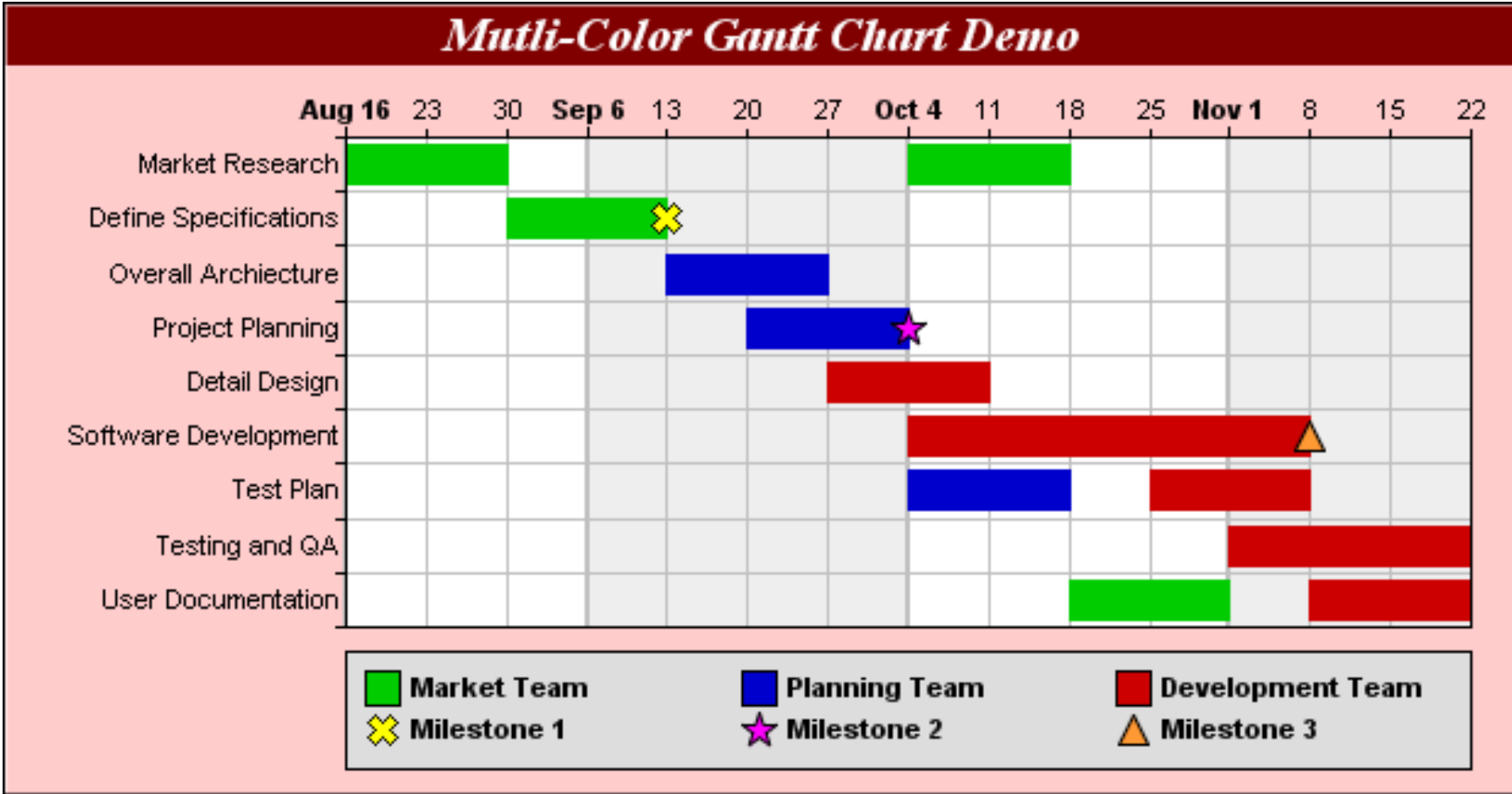
PERT W/CRITICAL PATH

- Identify major tasks and key events that will lead you to project completion
- Establish dependencies for each item
 - What must be done before it can be started
 - NOTE: in some cases, a task can be started before but not completed until another task is finished
 - What other tasks cannot be started until it is completed
- Agree upon first-order estimates of how long each task will take
- Draft your first PERT chart on the above information
 - Using whatever drawing/design tool you can agree upon
 - **Lots of free templates available online**
 - **NOTE: MUST VISUALLY INDICATE CRITICAL PATH**
- Revise and refine until done

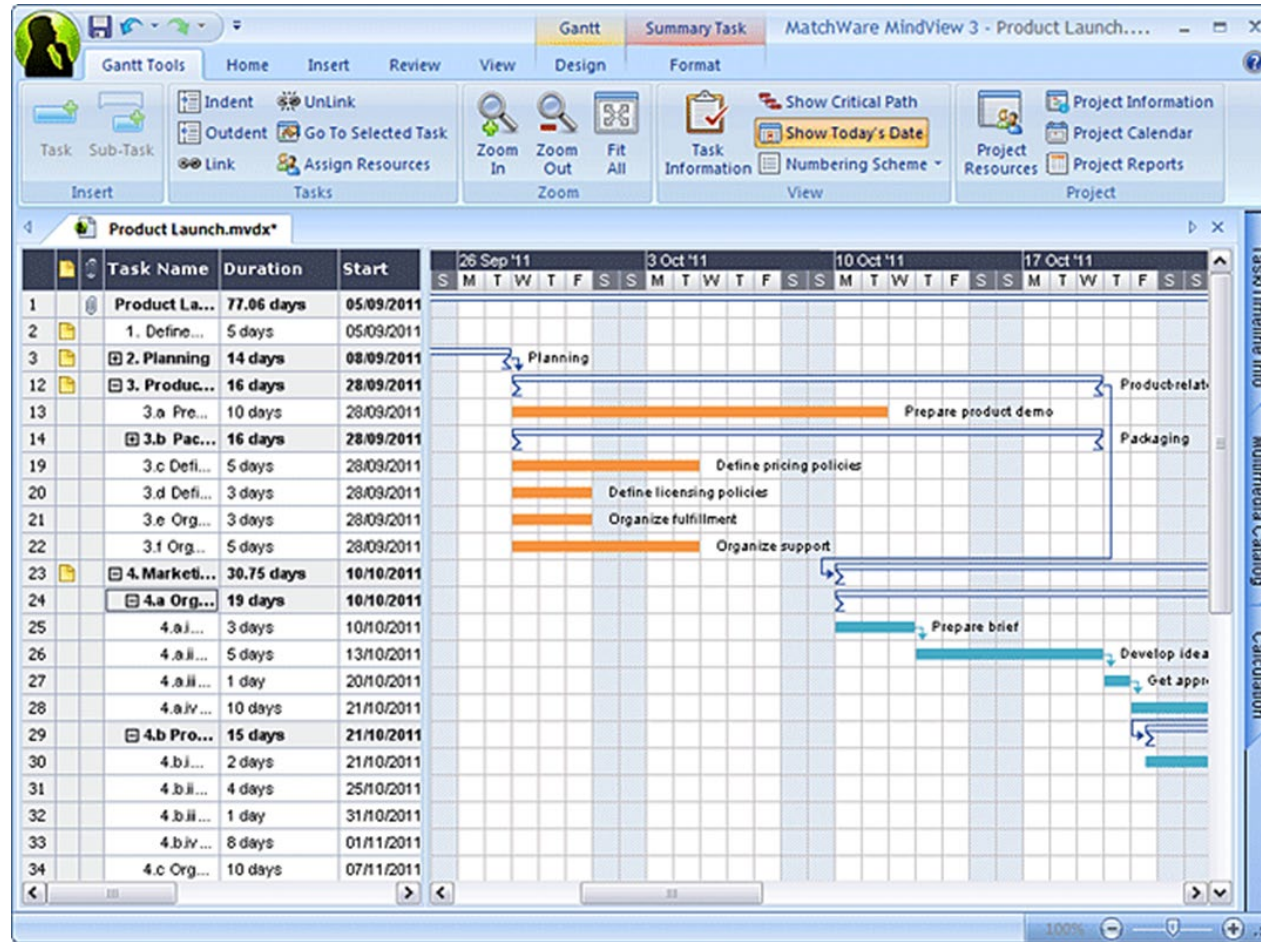
CREATING YOUR TEAM'S PERT CHART

- Created by Henry Gantt in the 1910-15 timeframe
- Uses a two-dimensional layout
 - Vertical axis: list of tasks to be completed
 - Horizontal axis: estimated timeline of project (calendar layout)
 - Each task duration represented by horizontal length
 - Dependences often indicated by drop-down arrows from the end of one task to the start of the next
- Give more of an immediate graphical sense of actual task and project duration
- But less compact than PERT and harder to see critical path

GANTT CHARTS



SAMPLE GANTT CHART



MORE COMPLEX GANTT CHART

- Same data you came up with for your PERT chart: tasks, dependencies, duration
- Gantt chart often identified specific people or teams responsible for tasks
- Word and Excel Gantt templates available under “Deliverable Templates” heading on main class WIKI page
- Make sure your PERT and Gantt charts agree with each other, at least in broad details
 - Gantt makes it easier to break major tasks down into smaller ones
 - Deadlines and dependences should still match

CREATING YOUR TEAM'S GANTT CHART

PODCAST: PROJECT MANAGEMENT

- Strongly, strongly recommended first step: watch podcast on Project Management (warning: very long [~2 hrs] but extremely worthwhile)
 - 1st video, starting at around 63:20 to end of video
 - 2nd video: first 20 minutes or so
 - NOTE: Can count doing this as 'billable hours'
- Online resources
 - <https://www.smartsheet.com/pert-101-charts-analysis-and-templates-more-accurate-project-time-estimates>
 - <http://www.gantt.com/creating-gantt-charts.htm>

- A task table (described in the podcast) may be useful to you but does not have to be created and won't be reviewed (except by request)
- PERT chart (required) **should visually identify critical path**
- Gantt chart (also required) should somehow tie to your team members
- Be sure that what you produce can be posted and shared on your project wiki
- Due by midnight on Saturday (10/09)
- We will go over them in class next week (10/11)

TEAM ASSIGNMENT: CREATE **BOTH** A PERT CHART **AND** A GANTT CHART FOR YOUR PROJECTS

- By midnight on Sunday (10/09)
 - Create and post on team wiki **both** a PERT chart **and** a Gantt chart
 - Create and post on team wiki latest status report (#3)
- By start of next class period (10/11):
 - Read *Peopeware*, Part III (chapters 14-20)
 - Read Webster #4 (online)

ASSIGNMENTS FOR THE COMING WEEK