



CS 428

Creating PERT and Gantt Charts

Fall 2022

Bruce F. Webster

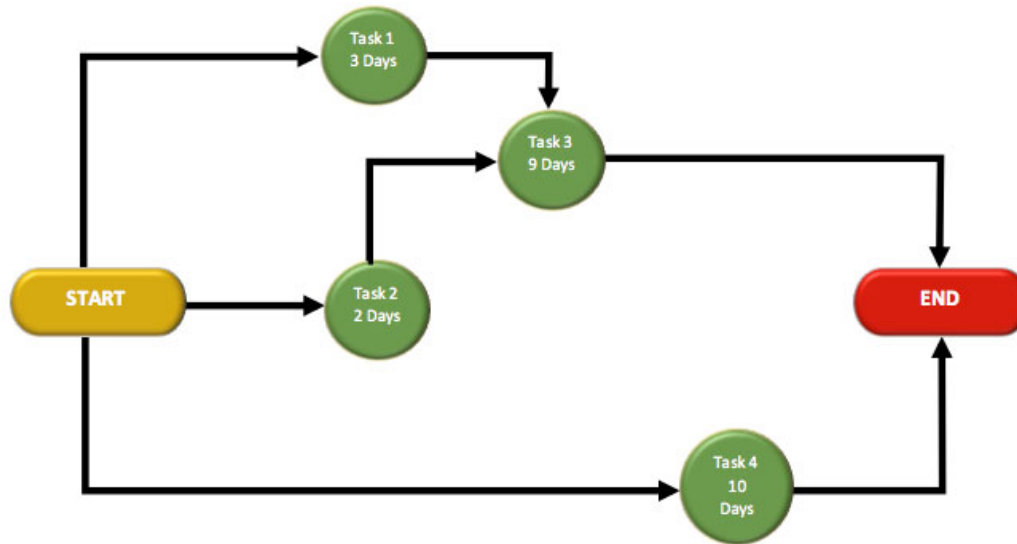
- ◇ Challenge: appropriate estimation of tasks
 - ◇ Armour: the more novel your work, the harder it is to estimate how long it will take or to predict the errors/dead ends you'll encounter
 - ◇ Plus, we're optimists
 - ◇ Knutson: "Take your estimate, double it, and add 1." e.g., 4 days really is 9 days
- ◇ 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 Charts

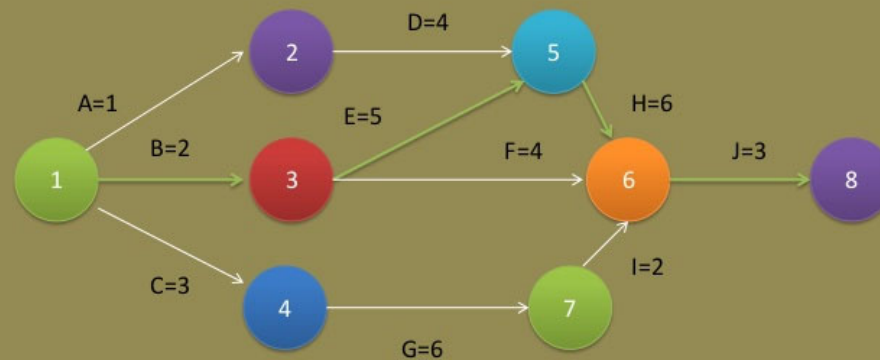
PERT Chart



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.

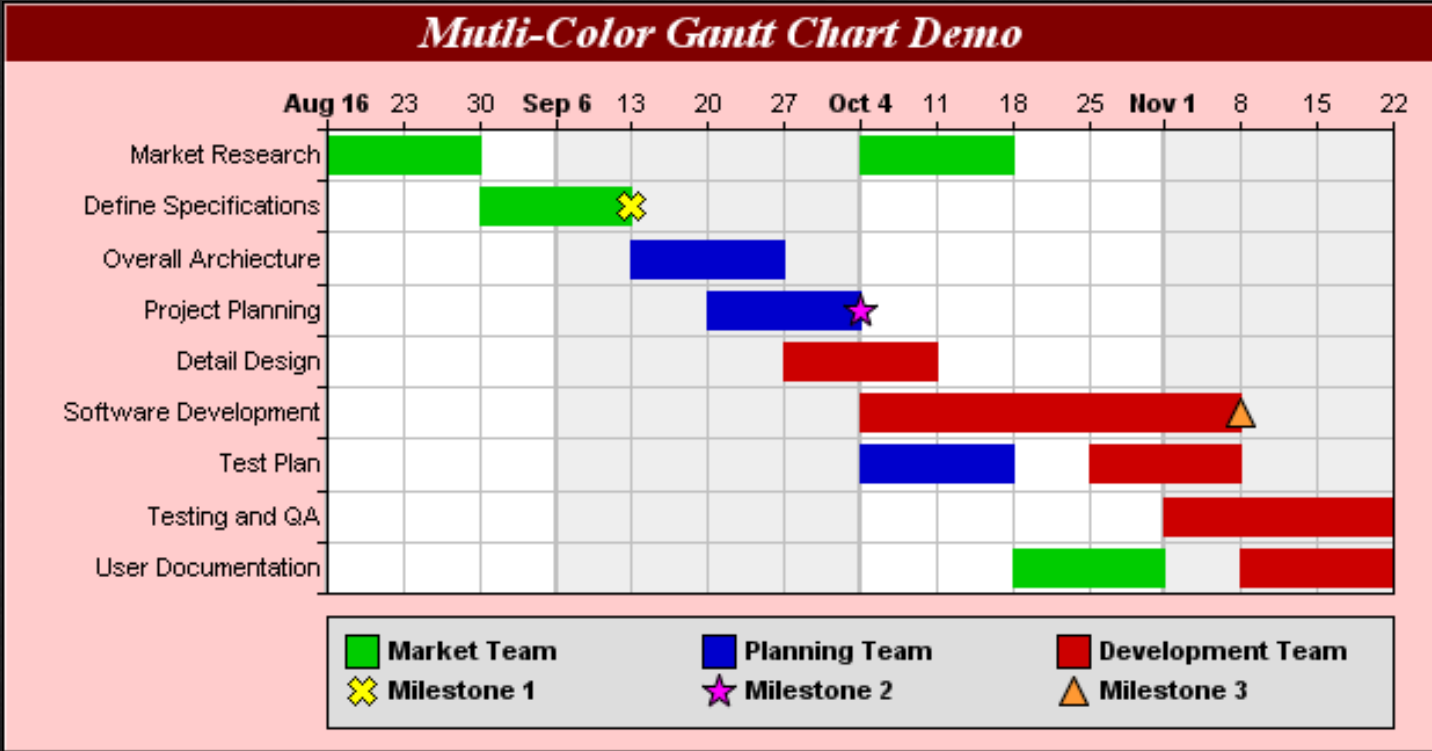
PERT w/critical path

- ◇ 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

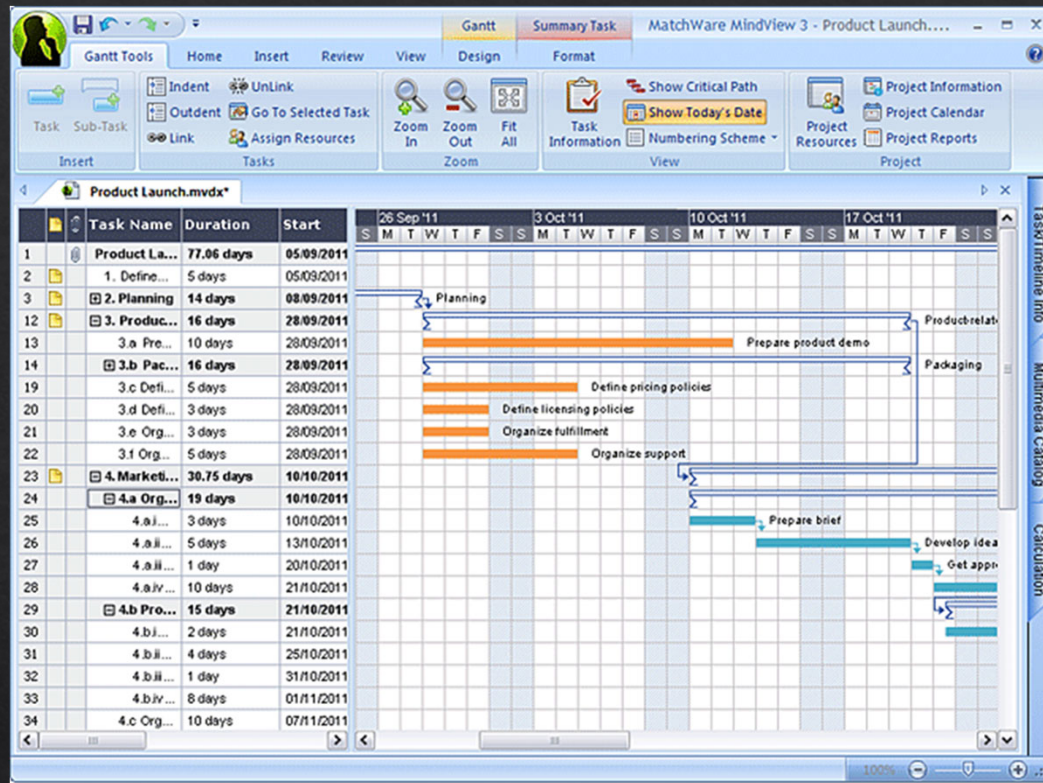
Creating your team's PERT chart

- ◇ 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)

create **both** a Pert chart **and** a GANTT chart
for your projects

- ◇ By midnight on Saturday (10/08)
 - ◇ 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 (10/10):
 - ◇ Read *Peopleware*, Part III (chapters 14-20)
 - ◇ Read Webster #4 (online)
- ◇ REMINDER: Prototype demo in THREE weeks (10/24)

Assignments for the coming week