

CS 428

CREATING PERT AND GANTT CHARTS

Fall 2019

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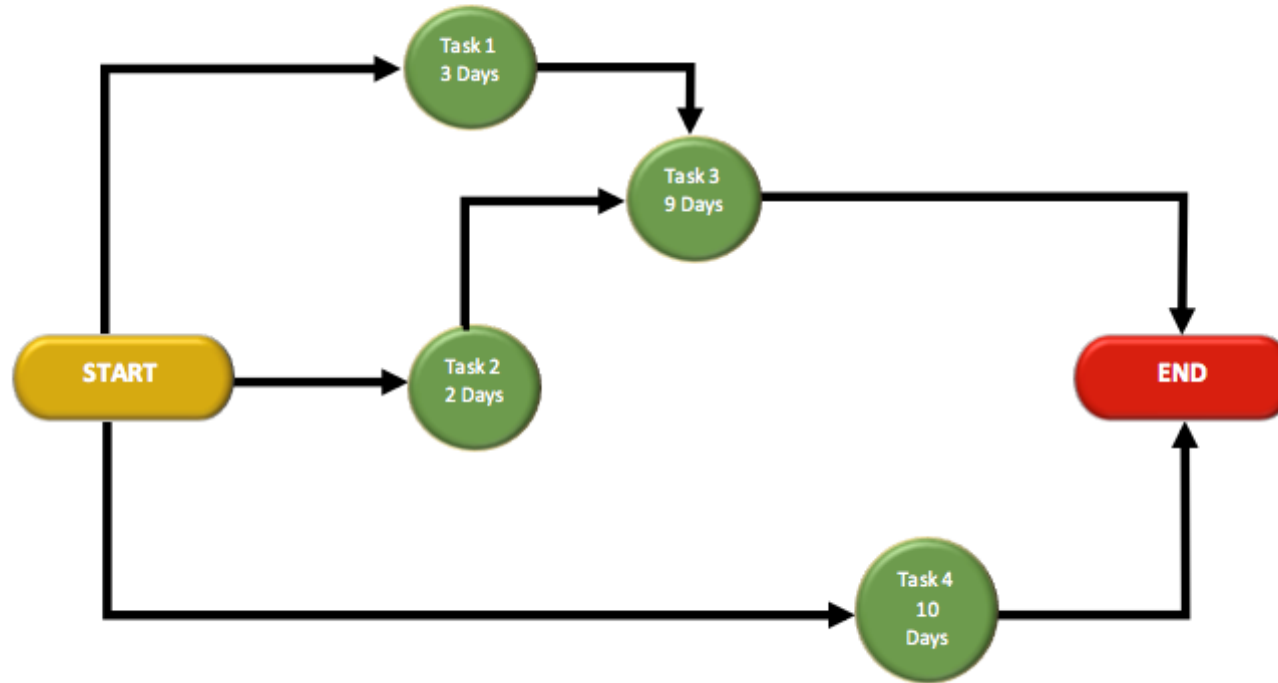
- ▶ Challenge: appropriate estimation of tasks
 - ▶ Armour: the more novel your work, the harder it is to estimate how long it will take or to predict the errors/dead ends you'll encounter
 - ▶ Plus, we're optimists
 - ▶ Knutson: "Take your estimate, double it, and add 1." e.g., 4 days really is 9 days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

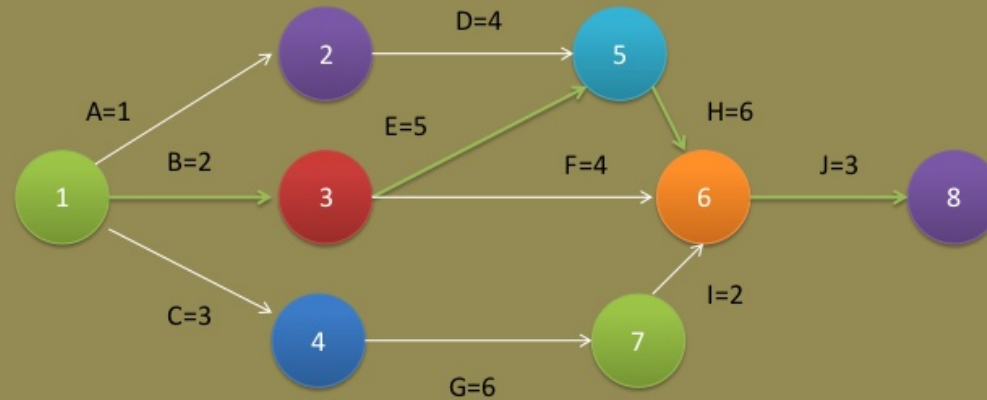
PERT Chart



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.

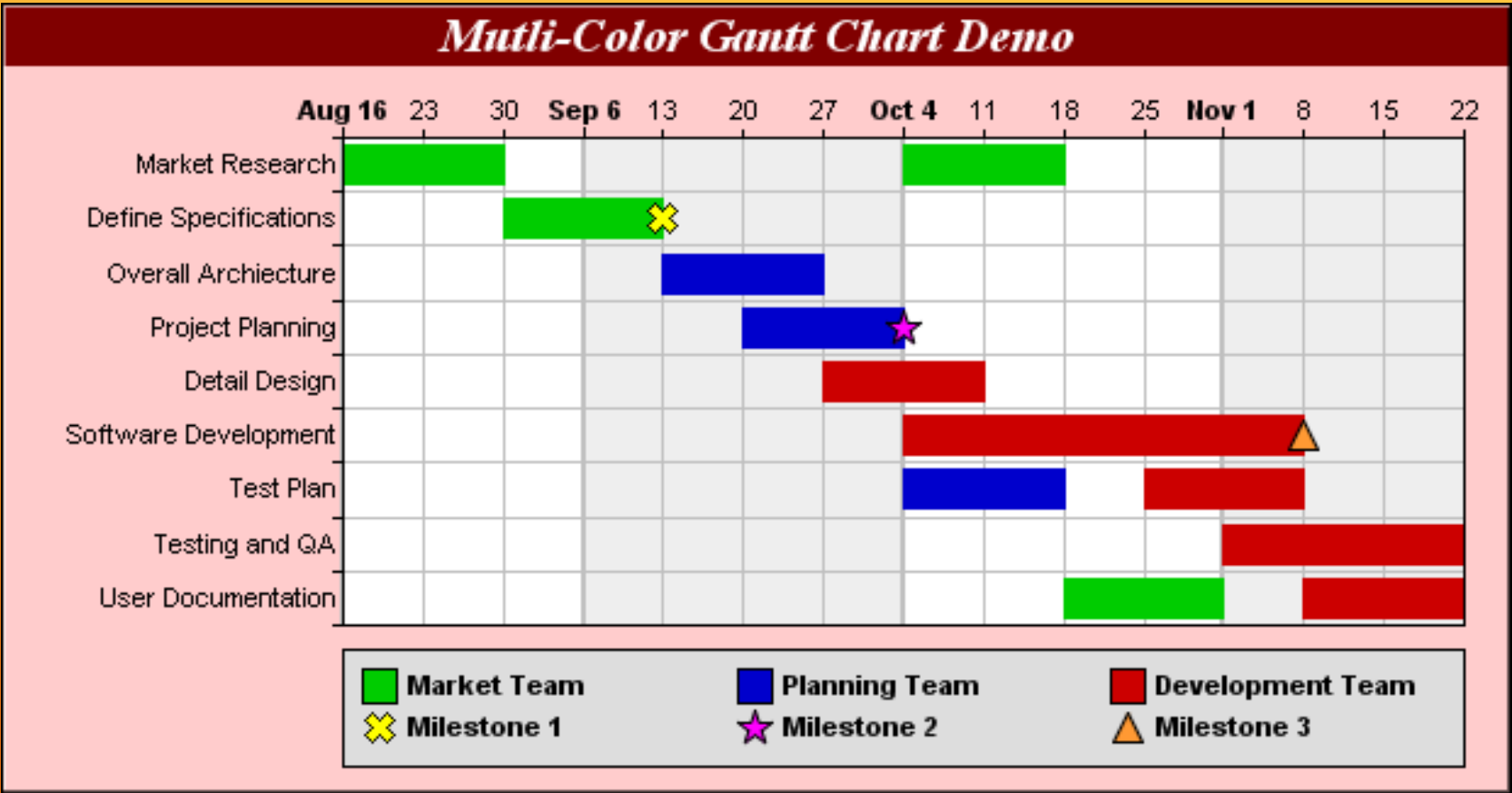
PERT W/CRITICAL PATH

- ▶ 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

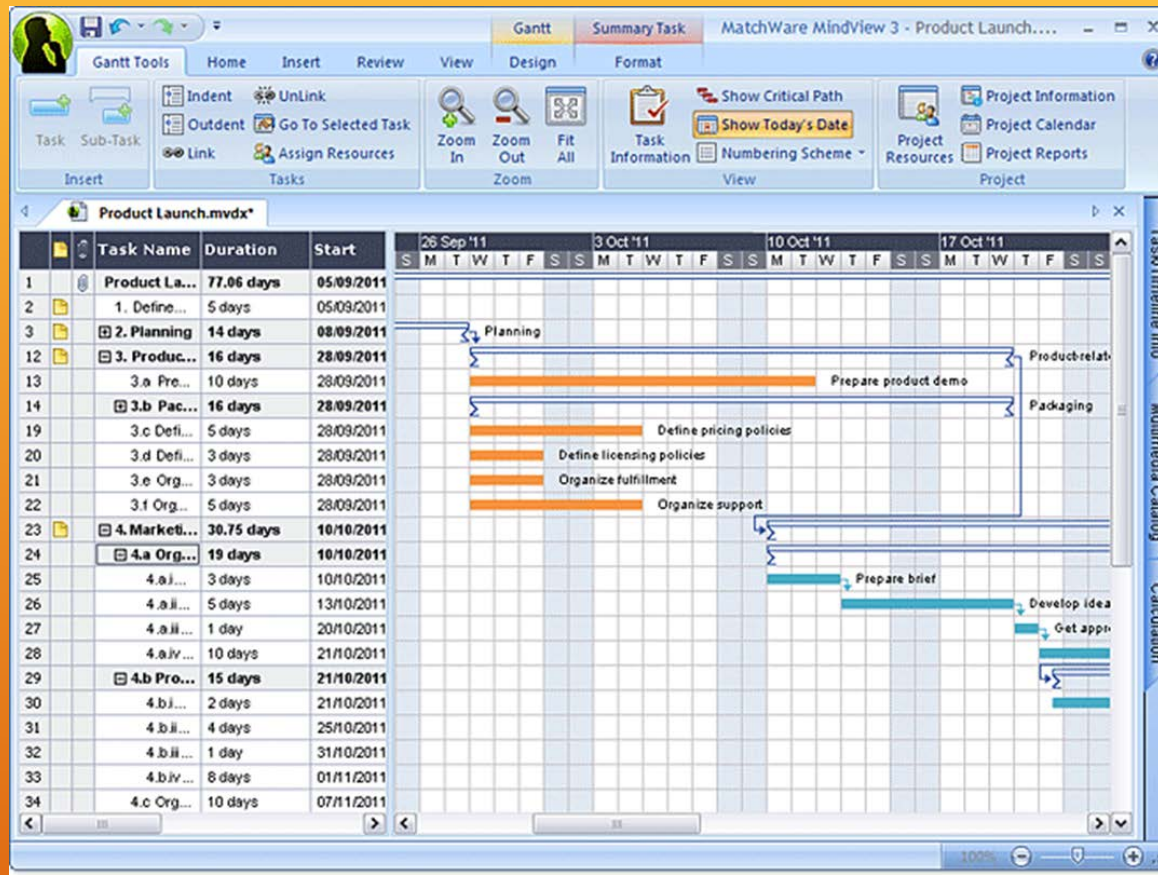
CREATING YOUR TEAM'S PERT CHART

- ▶ 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

- ▶ 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>

PODCAST: PROJECT MANAGEMENT

- ▶ 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 (10/12)
- ▶ We will go over them in class next week (10/14)

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

- ▶ By midnight on Saturday (10/12)
 - ▶ Create and post on team wiki **both** a PERT chart **and** a Gantt chart
 - ▶ Create and post on team wiki latest status report
 - ▶ Watch one podcast (#3)
- ▶ By start of next class period (10/14):
 - ▶ Read *The Mythical Man-Month*, chapter 4
 - ▶ Read *Accelerate*, chapter 5
 - ▶ Read Webster #4 (online)

ASSIGNMENTS FOR NEXT CLASS (10/14)