Fall 2018

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CS 428 – Creating PERT and Gantt Charts

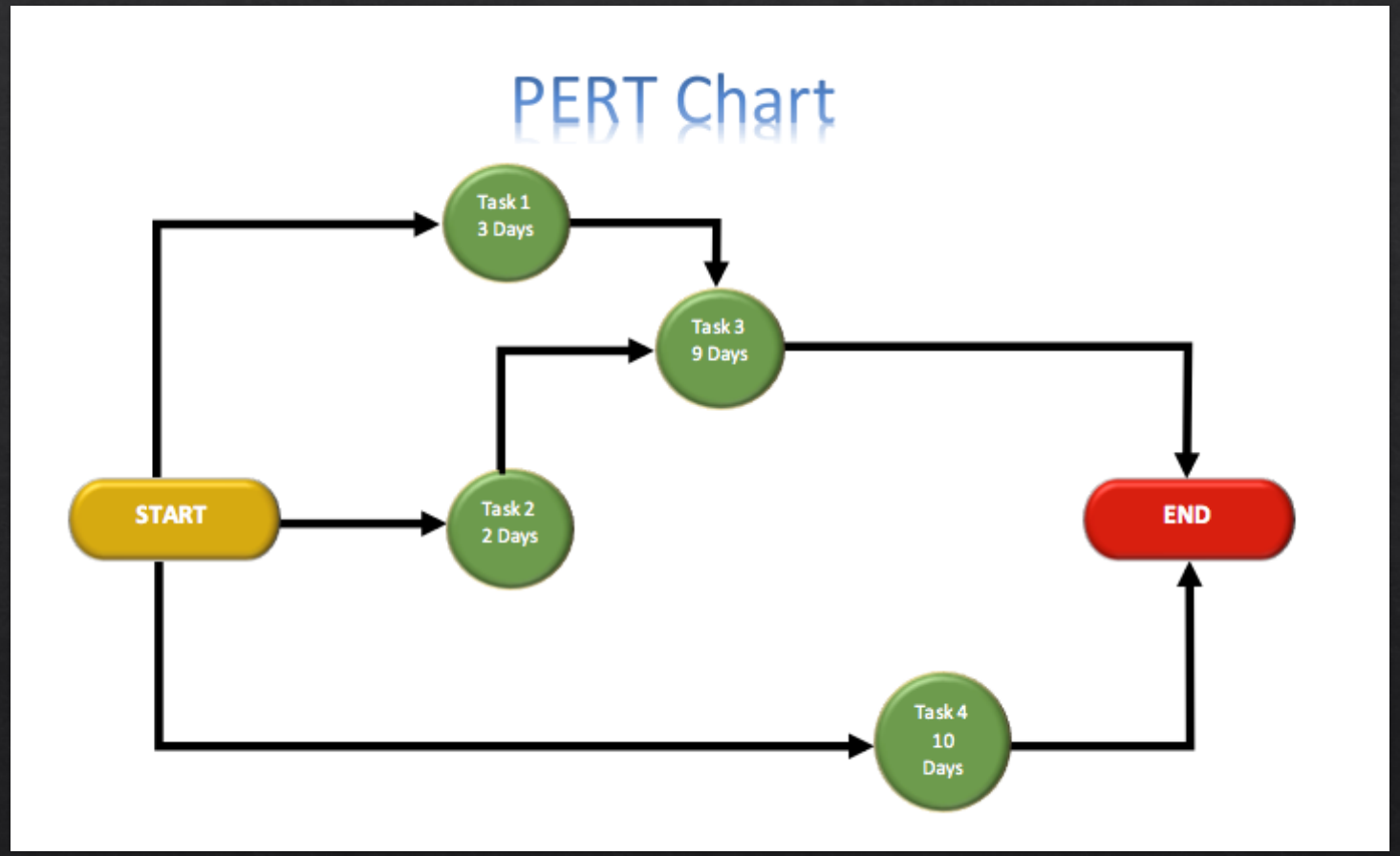
The challenges of devising a schedule

- 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)

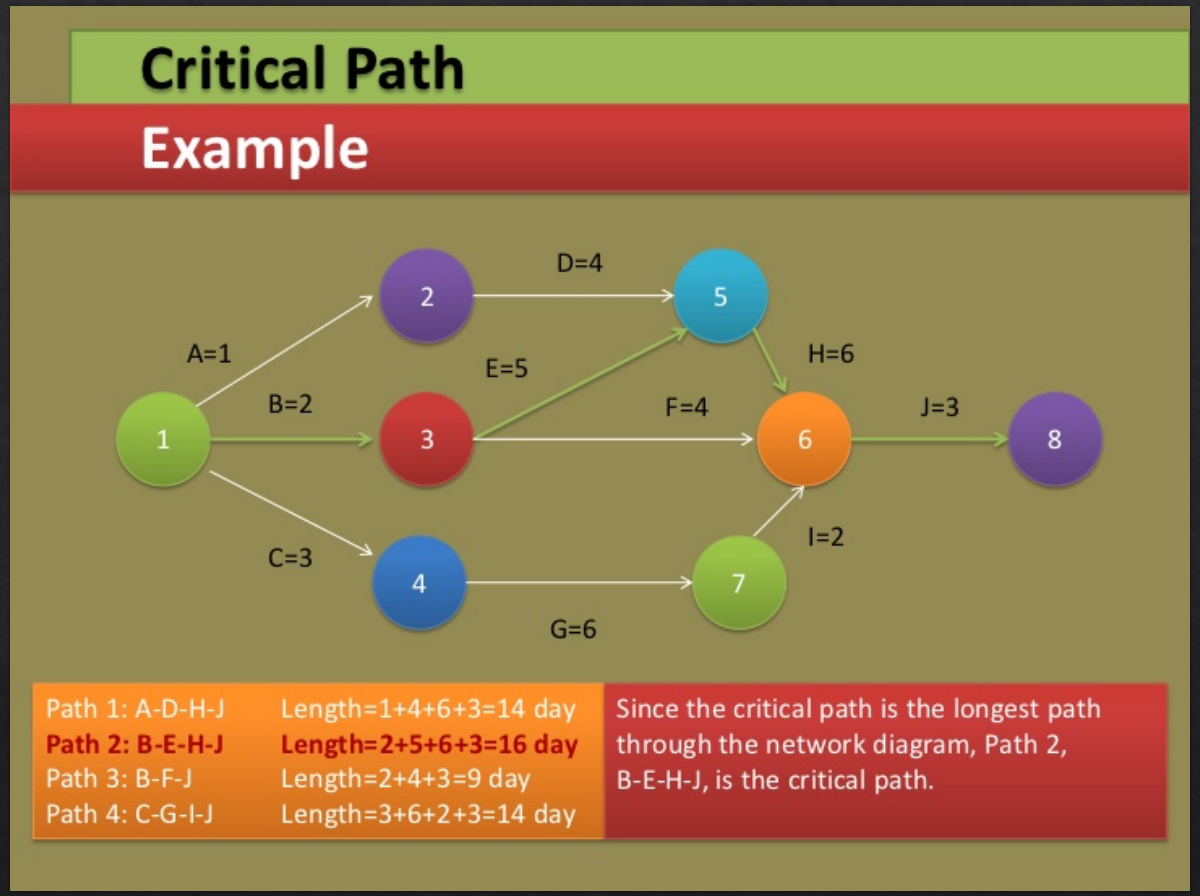
PERT Chart

- 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

Sample (dummy) PERT Chart



PERT w/critical path



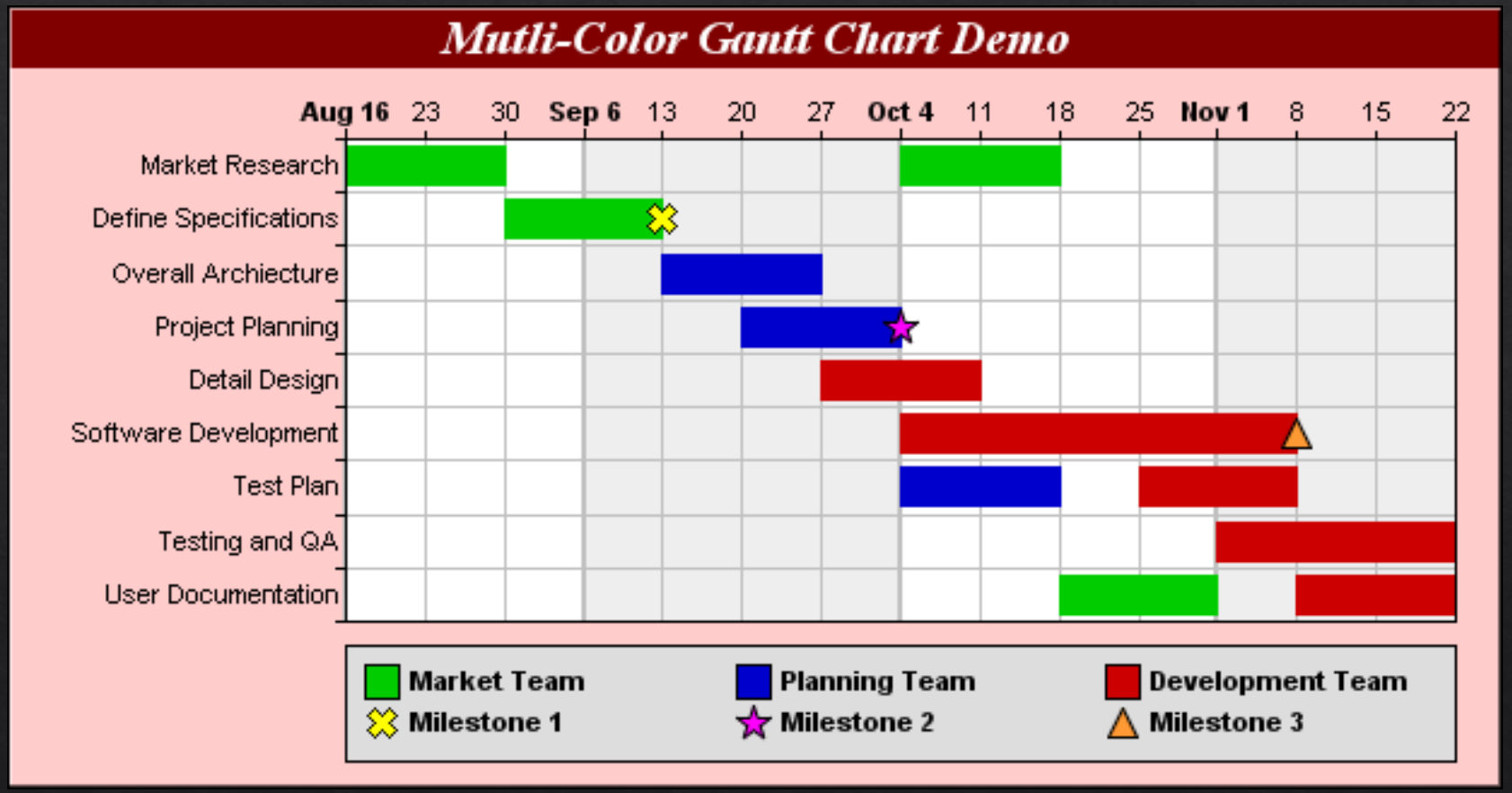
Creating your team's PERT chart

- 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

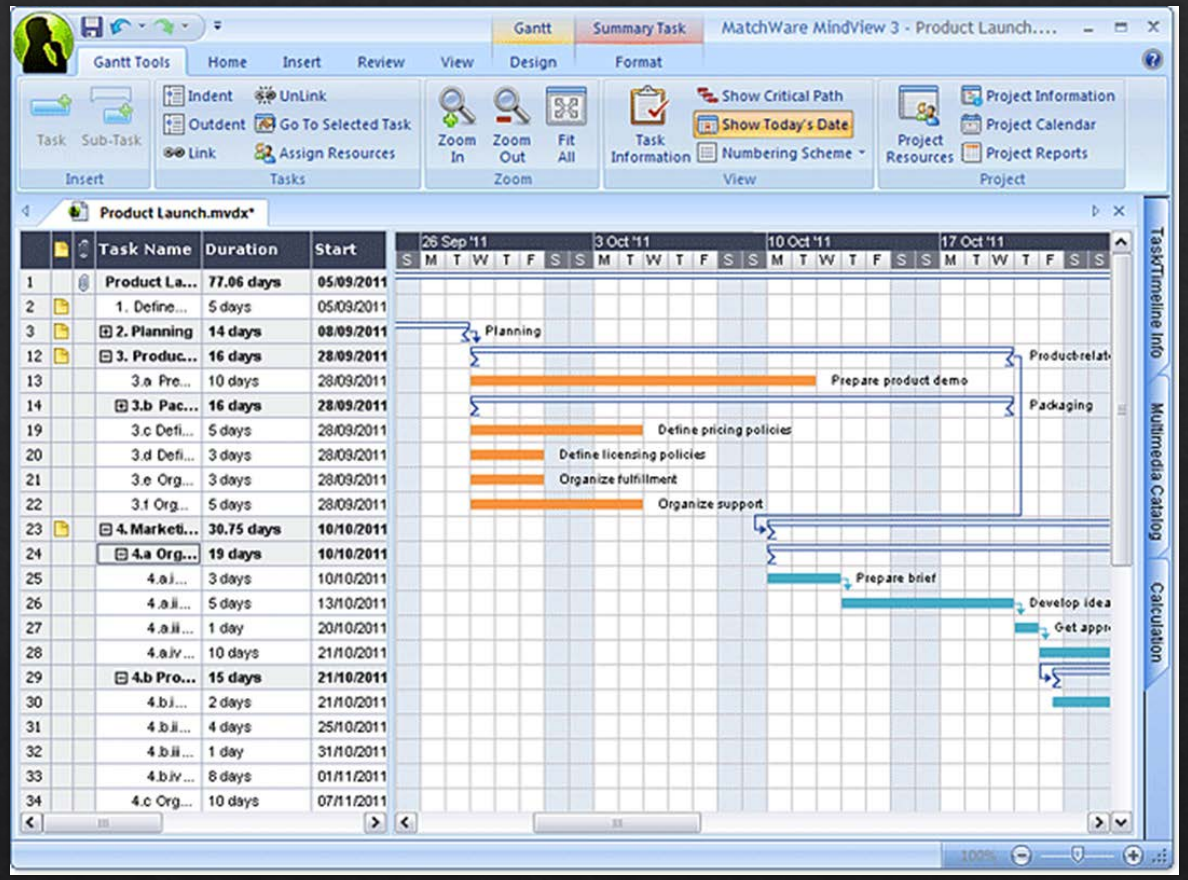
Gantt Charts

- 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 horizonal 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

Sample Gantt chart



More complex Gantt chart



Creating your team's 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
- Templates available in 'Deliverable Templates' on class wikie
- Likewise, put together and refine your Gantt chart
- 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

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

Team Assignment: create both a Pert chart and a GANTT chart for your projects

- 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 Saturday (10/13)
- You will present them in class next week (10/15)