CS 428 – Creating PERT and Gantt Charts

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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 (agileish)

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

	Q.	Gantt Tools	Home In	sert Revie	w	View	De	sign	Format	
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/		Product Launch	h.mvdx*			Seo 1	1	-	30411	k0.0+11 k7.0+11
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1	0	Product La	77.06 days	05/09/2011			1.1.			
2		1. Define	5 days	05/09/2011						
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13		3.a Pre	10 days	28/09/2011			-			Prepare product demo
14		3.b Pac	16 days	28/09/2011		Σ		1. She		Packaging
19		3.c Defi	5 days	28/09/2011					Define	e pricing policies
20		3.d Defi	3 days	28/09/2011				Defi	ne licensing polici	6
21		3.e Org	3 days	28/09/2011				Orga	nize fulfillment	
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24		🗄 4.a Org	19 days	10/10/2011						Σ
25		4.o.j	3 days	10/10/2011						Prepare brief
26		4.a.ii	5 days	13/10/2011						Develop idea
27		4.a.ii	1 day	20/10/2011						Get appi-
28		4.a.iv	10 days	21/10/2011						
29		🗄 4.b Pro	15 days	21/10/2011						45
30		4.bj	2 days	21/10/2011						
31		4.b.ii	4 days	25/10/2011						
32		4.b.ii	1 day	31/10/2011						
33		4.b.iv	8 days	01/11/2011						
34		4.c Org	10 days	07/11/2011						
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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 '<u>Deliverable Templates</u>' on class WIKI
- 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

- <u>https://www.smartsheet.com/pert-101-charts-analysis-and-templates-more-accurate-project-time-estimates</u>
- <u>http://www.gantt.com/creating-gantt-charts.htm</u>

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 on Saturday 02/16 (two weeks)
- You will present them in class in two weeks (Tuesday 02/19)