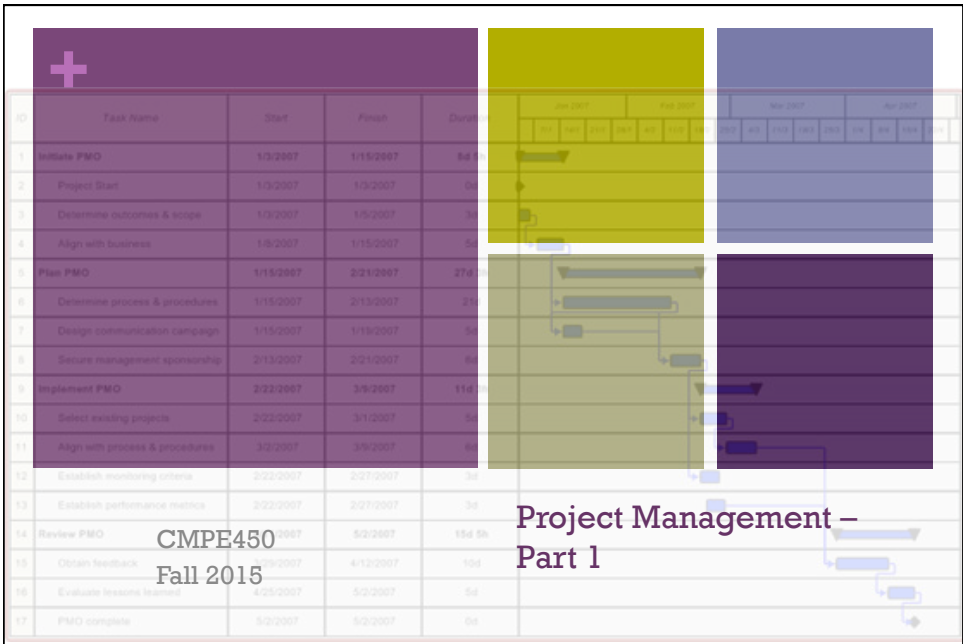

CMPE450
Fall 2015

Project Management – Part 1

What is Project Management?

- Project management is the planning, scheduling and controlling of activities to meet project objectives
- Project planning is *design* of the *work* needed in the project
- Like our engineering design process, it uses graphic artifacts to organize our thinking
  - Gantt charts, budgets, network diagrams, etc.
- Who needs to do what by when?
- Your attention needs to be on the work, not the product itself

Project Management Process

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1. Identify needs – done jointly with system engineering (operational analysis)
2. Propose solution – proposals coming Fall2016
3. Planning
4. Scheduling
5. Performing/monitoring
6. Terminate the project

Project Lifecycle

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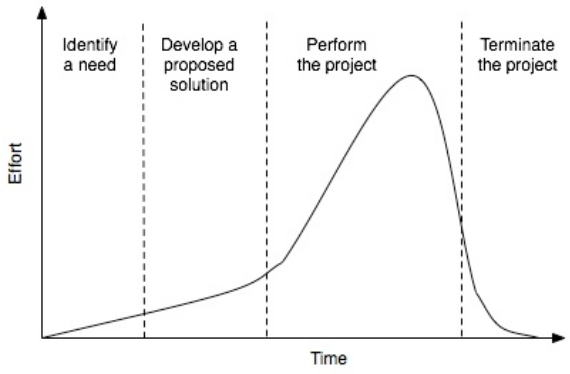
You can significantly affect the effort in this phase by what you do, or don't do earlier!



1. Identify Needs (Project Planning version of Requirements)

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- Customer/user needs
- Outside projects
  - Request for proposal (RFP)
  - Referrals
  - Unsolicited proposals
- Internal projects
  - New product/service development
  - Facility improvement
  - New design capabilities
  - R&D

2. Propose solution

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- Formal proposal
  - Technical, management, cost
  - Contracts (FP, CPFF, etc.)
- Early stage business case (idea screen, scoping)
- Sell your solution to the identified need
  - System boundary diagram
  - Functional block diagram
  - System requirements specification

System Requirements Specification

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- Describes in detail "what" the system must do, but NOT "how" it will be done
- Next level of system decomposition below a function block diagram or DFD
  - Each function must have at least one requirement! (or it's not doing anything!)
- If you can't verify it, it isn't a requirement!
  - Outline the test or verification method at the same time you write down the requirement.

3. Project Planning

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- All about identifying the specific tasks to be performed, in what sequence, and how long they will take
- Define the objective
- Divide and subdivide the project into activities ➔Work Breakdown Structure
- Detailed description of activities and deliverables ➔Statement of Work
- Project planning ➔Network diagram/Gantt chart
- Young engineers (you!) typically struggle with this because they have no frame of reference

Define the Project Objective

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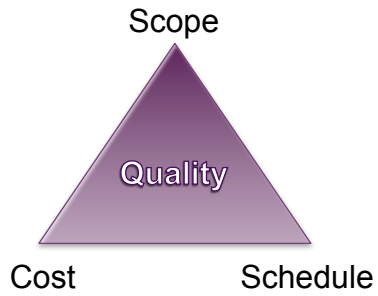
- Scope
- Schedule
- Cost
- Customer Satisfaction (Quality)
- Constraints



What is the objective for your project?

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- Example (Capstone 2012): Design and build a system in 6 months with a budget of $500 that will point an antenna at a low earth orbiting satellite with an accuracy of +/- 5 degrees

- Take 2 minutes and come up with an objective for your project.

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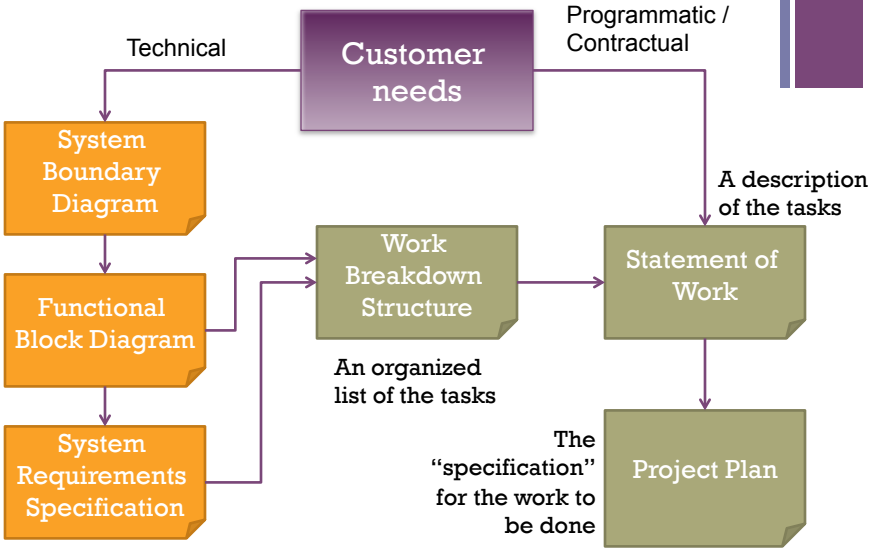
Overall Flow



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Divide and Subdivide the Project

- Create the Work Breakdown Structure (WBS)
  - Hierarchy of activities identified through system functional decomposition and requirements definition
  - Break down each activity into smaller parts until one person/group is responsible for it ==> "work package"
  - There can be multiple activities in each work package
- Thing of the WBS as an outline of the Statement of Work

Define the Activities

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- Use your systems engineering artifacts!
- Break each work package down into the individual tasks that are required for its completion
- Decide what order they need to be completed
- Assign someone to be responsible for each task ==> responsibility matrix
- Formalize into a Statement of Work (SOW)

Statement of Work (SOW)

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- SOW is the expanded text version of the WBS
  - Describe each task and who is responsible for it
  - Include deliverables and contractual requirements
  - The WBS is the outline
  - May include compliance methods
- SOW does NOT include implementation details
- SOW does NOT include system requirements, but should reflect how they will be accomplished
  - For example, if your system must comply with a particular standard, the WBS and SOW must include tasks associated with demonstrating compliance.
- May (should?) include contingencies or risk management activities

Create a Network Diagram

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- Combine each task in the WBS/SOW into a sequence of activities
  - Series and parallel paths
  - Must reflect the logical progression of tasks
- Will enable you to identify execution risks and opportunities to accelerate the project
- Planning isn't fun…
- …but it is necessary for a successful project

The Network Diagram

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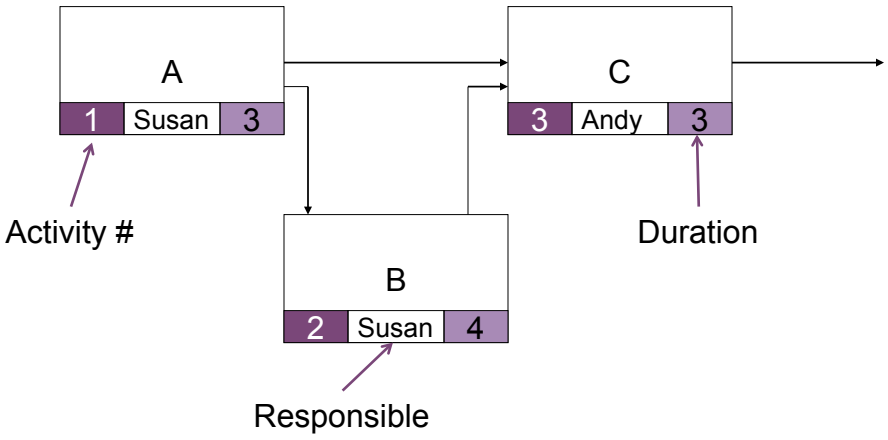

Project Chart

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#	Activity	Predecessor	Duration	Responsible
1.0	Design	-	20	Steve
2.1	Prototype component A	1.0	60	Bill
2.2	Prototype component B	1.0	20	Steve
2.3	Prototype system integration	2.1, 2.2	20	Bill
3.1	End user testing	2.3	30	Mary
3.2	System administrator testing	2.3	20	Sue
4.0	Implementation	3.1, 3.2	40	Steve
5.0	Closeout	4.0	30	Steve

PM Process Summary (so far)

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- Project Management is about **who** needs to do **what** by **when**
- Work breakdown structure organizes activities into packages of activities
  - This will translate into your Statement of Work (SOW)
- Next time
  - Network diagram and Gantt chart to show sequence of activities and durations; critical path

Next Time

- Project scheduling and monitoring