Project Management

Sit with your project team
Access your Google™ website

ME 4054W
Spring 2010

References: Text, Chapter 16 (and 1 thru 3)
Most introductory management books
Schedule

• 3 weeks to first site visit
• 7 weeks to mid-project review
• 10 weeks to second site visit
• 13 weeks to Design Show
Get organized!

- Without clear goals and roles, little gets done
Definition

Project Management

The discipline of planning, organizing and managing resources to bring about the successful completion of specific project goals and objectives.

Wikipedia
Project Management Steps

1. Plan
2. Organize
3. Manage time and resources

Plan the work and work the plan
Definition

Project

A set of activities that end with a specific accomplishment

- Non-routine tasks
- Distinct and defined start and finish dates
- Resource constraints (time, money/people/equipment, scope)
Project Planning

• What
  – Tasks, activities

• When
  – Schedule, interconnectivity

• How
  – People, money, equipment

The goal of the planning process is to eliminate surprises
Questions for Project Managers

• What is scope of project?
• What gets delivered for time/people/$?
• What resources do I need?
• What is the status of the project?
• How do I communicate to team/outside?
Team Leader / Project Manager

• It is critical that there is continuity in the role of project manager
• In industry, the team leader and the project manager can be, but often are not, the same individual
• If your team has elected to rotate the team leader role, it is strongly suggested that you assign a project manager who will have that role for the entire semester
Definition

Statement of Work (SOW):

– Background
– Scope
– Tasks
– Deliverables

Refer to http://me.umn.edu/education/courses/me4054/assignments/sow.html
Team Activity

• On your Google site, write what you will deliver in May. Describe in terms of what it will do rather than what will be. Take 5 minutes.

Tips For Preparing the SOW
• Use simple words and sentences. No jargon.
• Be concise. No gratuitous or extraneous words.
• Use active rather than passive voice.
• Define technical terms.
• Be specific.
• Use figures, diagrams and images to make your point.
• Page numbers, document date, authors' names.
• Very carefully copy edit to eliminate typos.
• Read out loud to yourself to make sure the writing is perfect.
Definition

Task:
- Short duration relative to project
- Significant. Appropriate level of detail
- Defined start/end points
- Has (1) duration, (2) resources
- “verb-noun” name
  - "create drawings"
  - "build prototype"
  - “develop transmission”

Refer to [http://me.umn.edu/education/courses/me4054/assignments/wbsgantt.html](http://me.umn.edu/education/courses/me4054/assignments/wbsgantt.html)
Properties of a “Task”

1. Defined deliverable
   a. Document
   b. Demo
   c. Thing

2. Responsible person (one)

3. Due date
Team Activity

• On your Google site, create one real task for every team member. Take 5 minutes.

<table>
<thead>
<tr>
<th>Task Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deliverable is a document, demo, or thing</td>
</tr>
<tr>
<td>2. One person responsible</td>
</tr>
<tr>
<td>3. Due date</td>
</tr>
</tbody>
</table>
Definition

Work Breakdown Structure (WBS):
• A “to do” list, sorted by category
• Task description (what)
• Estimated time (length)
• Person responsible for task (who)
• Resources required
• Cost ($)
## Sample WBS

<table>
<thead>
<tr>
<th>Task #</th>
<th>What</th>
<th>Man-hours</th>
<th>Who</th>
<th>Resources</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Profile motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Design test stand</td>
<td>20</td>
<td>SE, JM</td>
<td>Pro/E</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Build test stand</td>
<td>15</td>
<td>SE, JM</td>
<td>Parts, machine shop</td>
<td>$35</td>
</tr>
<tr>
<td>5.3</td>
<td>Test 3 motors</td>
<td>3</td>
<td>JM, SE</td>
<td>Stroboscope</td>
<td>$75</td>
</tr>
<tr>
<td>5.4</td>
<td>Plot torque vs speed</td>
<td>2</td>
<td>JM</td>
<td>Excel</td>
<td></td>
</tr>
</tbody>
</table>
Team Activity

• On your Google site, create a draft WBS. Take 10 minutes.

<table>
<thead>
<tr>
<th>A “to do” list, sorted by category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task description (what)</td>
</tr>
<tr>
<td>Estimated time (length)</td>
</tr>
<tr>
<td>Person responsible for task (who)</td>
</tr>
<tr>
<td>Resources required</td>
</tr>
<tr>
<td>Cost ($)</td>
</tr>
</tbody>
</table>
Definition

Milestone:
• Tasks with Ø duration
• Mark significant project checkpoints
• Use to motivate
• Use to check progress
• Name by “noun-verb”
  – “report due”
  – “parts ordered”
  – “concept selected”
Definition

Gantt Chart:

• Bar chart with
  – Tasks
  – Durations
  – Dependencies

• Most basic (and most common) planning tool
Sample Gantt Chart (segment)

<table>
<thead>
<tr>
<th>WBS</th>
<th>Task Name</th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Identify customers</td>
<td>1/8</td>
<td>1/11</td>
</tr>
<tr>
<td>1.2</td>
<td>Interview 10 customers</td>
<td>1/12</td>
<td>1/13</td>
</tr>
<tr>
<td>1.3</td>
<td>Interpret requirements</td>
<td>1/14</td>
<td>1/18</td>
</tr>
<tr>
<td>1.4</td>
<td>Benchmark products</td>
<td>1/19</td>
<td>1/21</td>
</tr>
<tr>
<td>1.5</td>
<td>Define target PDS</td>
<td>1/20</td>
<td>1/21</td>
</tr>
<tr>
<td>1.6</td>
<td>Target PDS Released</td>
<td>1/22</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Review comp products</td>
<td>1/23</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Search patents</td>
<td>1/24</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Brainstorm concepts</td>
<td>1/25</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Select top 2 concepts</td>
<td>1/26</td>
<td>1/28</td>
</tr>
<tr>
<td>4</td>
<td>MQ Presented</td>
<td>1/29</td>
<td>2/2</td>
</tr>
<tr>
<td>5.1</td>
<td>Design test stand</td>
<td>1/30</td>
<td>1/27</td>
</tr>
<tr>
<td>5.2</td>
<td>Build test stand</td>
<td>1/28</td>
<td>2/5</td>
</tr>
</tbody>
</table>
Project Management Triangle

- Also known as the “triple constraint” of project management
Software Tools

• **Microsoft Project**
  – Most popular project management software
  – Easy to use
  – Available in IT labs
  – Web tutorials available

• **GanttProject** ([www.ganttproject.biz](http://www.ganttproject.biz))
  – Open source
  – Free download to your computer
Effective Project Management

• Get buy-in from stakeholders
  – Advisor
  – Team
• Keep your plan up to date

Plan the work and work the plan
Effective Meetings

• Have an agenda
  – Review agenda at start of meeting asking for additional items
• Stick to the agenda
• Participation by all
• Assign a scribe
  – Record decisions and tasks
• Have a defined end time
The available forms can make your job easier

ME4054 -- Forms

Project Management Forms
• Meeting agenda form (Word, PDF)
• Work breakdown form (Excel, PDF)

Administrative Forms
• Project preference application. (Now done on-line.)
• Petty cash reimbursement form (PDF)

Evaluation Forms
• Site visit evaluation (PDF)
• Mid-Project Design Review Evaluation (PDF)
• Mid-Semester Grade Report (PDF)
• Design notebook evaluation form (PDF, Word)
• Final report scoring criteria (PDF, Word)
• Final report evaluation form (PDF, Word)
• Design show evaluation form (PDF)
• Advisors evaluation of deliverables (PDF)
• Advisors evaluation of project form (PDF, Word)
• Advisors evaluation of course form (Word)
• Final grade form (PDF, Word)

Refer to http://me.umn.edu/education/courses/me4054/forms/index.html
Team Activity

• Create the agenda for today’s meeting. Take 10 minutes.

<table>
<thead>
<tr>
<th>Agenda</th>
<th></th>
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<tbody>
<tr>
<td>Team:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Start time:</td>
<td>Length (min):</td>
</tr>
<tr>
<td>Facilitator:</td>
<td>Minutes:</td>
</tr>
<tr>
<td>Purpose:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agenda items:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Action items</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What</td>
<td>Who</td>
</tr>
<tr>
<td>--------</td>
<td>-----</td>
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<tr>
<td></td>
<td></td>
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