Applied Software Project Management

Software Project Planning
Who needs software?

Most software is built in organizations for people with specific needs.

- A *stakeholder* is anyone who has an interest (or stake) in the software being completed.
- A *user* is someone who will need to use the software to perform tasks.
- Sometimes stakeholders will be users; but often the stakeholder will not use the software.
  - For example, a senior manager (like a CEO or CTO in a company) will usually have a stake in the software that is built (since it affects the bottom line), even if she won’t ever use it.
Who builds software?

Software is typically built by a team of software engineers, which includes:

- *Business analysts* or *requirements analysts* who talk to users and stakeholders, plan the behavior of software and write software requirements
- *Designers and architects* who plan the technical solution
- *Programmers* who write the code
- *Testers* who verify that the software meets its requirements and behaves as expected
Project Management

- The project manager plans and guides the software project
  - The project manager is responsible for identifying the users and stakeholders and determining their needs
  - The project manager coordinates the team, ensuring that each task has an appropriate software engineer assigned and that each engineer has sufficient knowledge to perform it
  - To do this well, the project manager must be familiar with every aspect of software engineering
Identifying Needs

- The project manager drives the scope of the project.
  - The project manager should identify and talk to the main stakeholder.
  - The effective way to show stakeholders that their needs are understood and that those specific needs will be addressed is with a *vision and scope document*. 
A typical vision and scope document follows an outline like this one:

1. Problem Statement
   a) Project background
   b) Stakeholders
   c) Users
   d) Risks
   e) Assumptions

2. Vision of the Solution
   a) Vision statement
   b) List of features
   c) Scope of phased release (*optional*)
   d) Features that will not be developed
The *project plan* defines the work that will be done on the project and who will do it. It consists of:

- A statement of work (SOW) that describes all work products that will be produced and a list of people who will perform that work
- A resource list that contains a list of all resources that will be needed for the product and their availability
- A work breakdown structure and a set of estimates
- A project schedule
- A risk plan that identifies any risks that might be encountered and indicates how those risks would be handled should they occur
Statement of Work

The statement of work (SOW) is a detailed description of all of the work products which will be created over the course of the project. It includes:

- A list of features that will be developed
- A description of each intermediate deliverable or work product that will be built.
- The estimated effort involved for each work product to be delivered
Resource List

The project plan should contain a list of all resources that will be used on the project.

- A resource is a person, hardware, room or anything else that is necessary for the project but limited in its availability.
- The resource list should give each resource a name, a brief one-line description, and list the availability and cost (if applicable) of the resource.
Estimates and Project Schedule

- The project plan should also include estimates and a project schedule:
  - A work breakdown structure (WBS) is defined. This is a list of tasks which, if performed, will generate all of the work products needed to build the software.
  - An estimate of the effort required for each task in the WBS is generated.
  - A project schedule is created by assigning resources and determining the calendar time required for each task.

Estimates and project schedules will be discussed in detail in later slides.
A risk plan is a list of all risks that threaten the project, along with a plan to mitigate some or all of those risks.

- The project manager selects team members to participate in a risk planning session:
  - The team members brainstorm potential risks
  - The probability and impact of each risk is estimated
  - A risk plan is constructed
Risk Plan Example

<table>
<thead>
<tr>
<th>Risk</th>
<th>Prob.</th>
<th>Impact</th>
<th>Priority</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior management will move call center offshore which</td>
<td>3</td>
<td>5</td>
<td>15</td>
<td>1. Mike will add a requirements task to the schedule for Quentin to</td>
</tr>
<tr>
<td>will require an internationalization feature to be built</td>
<td></td>
<td></td>
<td></td>
<td>begin investigating internationalization requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. If the call center is moved, Mike will call a team meeting to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>review the schedule and Barbara will inform the rest of senior</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>management of the potential delay.</td>
</tr>
<tr>
<td>Jill will be pulled off of this project for Royalty</td>
<td>4</td>
<td>3</td>
<td>12</td>
<td>1. Assign Kyle to work with Jill on the initial programming tasks to</td>
</tr>
<tr>
<td>Archive project bug fixes</td>
<td></td>
<td></td>
<td></td>
<td>make sure he is cross-trained</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. If Jill is pulled off, she will spend 10% of her time reviewing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>this project with Kyle</td>
</tr>
<tr>
<td>Reporting feature will be needed</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>If this happens, Mike will work with Sophie and Kyle to reestimate the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>programming tasks</td>
</tr>
<tr>
<td>Additional time will be needed to gather requirements</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>None</td>
</tr>
<tr>
<td>from potential users at Boston client</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will need to support tie-in to support additional</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>database vendors</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>