Lecture 17 – Initial Project Planning

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Objectives

- To understand the role of “projects” in software engineering
- To understand the importance of project initiation activities
- (Not covered so well in Sommerville but large body of literature on Project Management)

Our Project Now Has:

- Agreed goals / objectives
- Identified stakeholders
- Defined and agreed scope
- Risks identified & understood

- All documented and signed of in the Statement Of Work (SOW)

- Next stage:
  - Break project down into tasks

Why Tasks?

- May appear self-evident, but:

- Allows work to be put in logical order
- Breaks project into manageable segments
- Allows identification of skills / resources required
- Allows easy communication to team / others
- Ensures all work identified and understood

What is a Task?

- May also appear self-evident(!), but:
  - Tasks sometimes known as activities

- (Initially) described in one or two sentences
- Cohesive (no possible intervening tasks)
- Consistent (requires same resources throughout)
- Co-located (multi-site tasks often better separate)

How Big is a Task?

- One guideline (8/80 rule)
  - Not less than 8 hours (1 day)
  - Not more than 80 hours (2 weeks)
- Another guideline (reporting period rule)
  - No task longer than the reporting period
  - If status is “in progress” for two reports then there is a problem
- These are just guidelines
  - Use common sense!

First stage in planning

- Make a list of tasks
- Produce 2 sentence description of each
- Group related tasks into milestones
- Get someone else to check it!
- What have you forgotten?

- Some industries have standard tasks & timescales
  - E.g. construction, some engineering

The Work Breakdown Structure

- Structured, hierarchical, top-down view of your project
- (Note this is a methodology for identifying tasks, not scheduling)
- Identify high level milestones
- Break these down into lower level tasks
- Repeat as necessary (q.v. task guidelines)
  - Probably not more than 5 levels deep
- Can be represented as a tree or an outline

Creating the WBS

- Can be divided in particular ways
  - By function or technology
  - In line with the structure of the organisation
  - By physical location
  - By system design (if high level design available)
- Can try “bottom up”, grouping tasks
  - Easier to miss tasks
- Don’t forget management tasks
  - Creating reports
  - Carrying out appraisals
  - Recruitment activity

The Network Diagram

- Defines sequence of work
- Shows relationships amongst tasks
  - In particular relationships between tasks in different parts of the WBS
- Reveals the workflow, not just the work
- Is a foundation for project scheduling
  - But does give the schedule itself
- Is based on precedence between tasks
  - The fact that some tasks must be completed before others can be started
  - (Other types of precedence possible – see later)

Diagram Conventions

- Tasks in square boxes
- Milestones in rounded boxes
- Precedence indicated by arrows
- Concurrent (unrelated) tasks shown by vertical relationship

Creating the Network Diagram

1. Take the existing task list or WBS
2. Determine relationship between tasks
3. Identify any milestones (if not in WBS)
4. Layout network
5. Review network logic
   - Proper sequence & precedence?
   - Unnecessary tasks or precedence?
   - Missing tasks?
   - Do these tasks accomplish all project goals?

Other Tasks Relationships

- Start to Start
  - Two tasks that should start at same time
- End + Lag to Start
  - Must be a gap between tasks
- Finish to Finish
  - Task cannot finish until another also finished
- Finish + lead to Finish
  - Tasks cannot finish until another finished some time earlier
  - (MS Project defines even more! Most are rarely used)

PERT / CPM Diagrams

- Project Evaluation & Reporting Technique (PERT)
- Developed in 1950's
- Slightly different diagramming techniques
  - May use arrows & circles
  - Sometimes activities on arrows, milestones on circles
  - Known as activity on arrow (AOA)
  - Or precedence on arrows, activities in circles
  - Known as activity on nodes (AON)
- Includes estimating & scheduling techniques
- Supported by most Project Management SW

GANNT Charts (Refresher)

- Show activities along a timeline / calendar
- Clearly shows parallel tasks
- Can be used to show progress
  - Bar “internal” to a task bar
- Can be used to show “float”
  - “T bar” lines outside task bar
- Can be used to show precedence
  - Arrows between task bars
- Can be used to show allocated resource
  - In additional columns

Version Control

- All project plan documentation should be under version control
  - To ensure latest version in use
  - For use in post-project evaluation (“washup”)
- Usually same version control scheme as other project items

Key points

- Create a task list
- Or a WBS
- Build a network diagram

- Next week:
  - Taking account of resource constraints