CS 390 – Lecture 27
Software Project Management Plans

- Components of a software project management plan
  - The work to be done
  - The resources with which to do it
  - The money to pay for it

Resources
- Resources needed for software development:
  - People
  - Hardware
  - Support software

Use of Resources Varies with Time
- Rayleigh curves accurately depict resource consumption:
  \[ R_c = \frac{t}{k^2} e^{-t^2/2k^2} \]
- The entire software development plan must be a function of time

Work Categories
- Project function
  - Work carried on throughout the project
  - Examples:
    - Project management
    - Quality control

Work Categories (2)
- Activity
  - Work that relates to a specific phase
  - A major unit of work,
  - With precise beginning and ending dates,
  - That consumes resources, and
  - Results in work products like the budget, design, schedules, source code, or users’ manual

Work Categories (3)
- Task
  - An activity comprises a set of tasks
  (the smallest unit of work subject to management accountability)
Completion of Work Products

- **Milestone**: The date on which the work product is to be completed
- It must first pass reviews performed by
  - Fellow team members
  - Management
  - The client
- Once the work product has been reviewed and agreed upon, it becomes a baseline
  - Changeable only through formal procedure

Work Package

- Work product, plus
- Staffing requirements
- Duration
- Resources
- The name of the responsible individual
- Acceptance criteria for the work product
- The detailed budget as a function of time, allocated to
  - Project functions
  - Activities

Software Project Management Plan Framework

- There are many ways to construct an SPMP
- One of the best is IEEE Standard 1058.1
  - The standard is widely accepted
  - It is designed for use with all types of software products
  - It supports process improvement
    - Many sections reflect CMM key process areas
  - It is ideal for the Unified Process
    - There are sections for requirements control and risk management

IEEE Software Project Management Plan (Figure 9.9)

- Overview
  - Project summary
  - Assumptions and constraints
  - Project deliverables
  - Schedule and budget summary
  - Evolution of the project management plan
- Reference materials
- Definitions and acronyms
- Project organizations
- External interfaces
- Internal structure
- Roles and responsibilities

IEEE Software Project Management Plan (2)

- Managerial process plans
  - Start-up plan
  - Staffing plan
  - Resource acquisition plan
  - Project staff training plan
  - Work plan
  - Work activities
  - Schedule allocation
  - Resource allocation
  - Budget allocation

- Managerial process plans (cont’d)
  - Control plan
  - Requirements control plan
  - Schedule control plan
  - Budget control plan
  - Quality control plan
  - Reporting plan
  - Metrics collection plan
  - Risk management plan
  - Project close-out plan

IEEE Software Project Management Plan (3)

- Technical process plans
  - Process model
  - Methods, tools, and techniques
  - Infrastructure plan
  - Product acceptance plan
- Supporting process plans
  - Configuration management plan
  - Testing plan
  - Documentation plan
  - Quality assurance plan
  - Reviews and audits plan
  - Problem resolution plan
  - Subcontractor management plan
  - Process improvement plan
- Additional plans
Software Project Management Plan Framework (2)

- Some of the sections are inapplicable to small-scale software
  - Example: Subcontractor management plan

Planning Testing

- Often overlooked
- The SPMP must explicitly state what testing is to be done
- Traceability is essential, e.g. number and reference each aspect of requirements
- All black box test cases must be drawn up as soon as possible after the specifications are complete

Planning Object-Oriented Projects

- An object-oriented product consists of largely independent pieces
- Consequently, planning is somewhat easier
- The whole is more than the sum of its parts
- We can use COCOMO II (or modify Intermediate COCOMO) estimators

Planning Object-Oriented Projects (2)

- However, reuse induces errors in cost and duration estimates
  - Reuse of existing components during development
  - Production of components for future reuse (up to 3x longer to do)
- These work in opposite directions
- Newer data: The savings outweigh the costs

Training Requirements

- "We don't need to worry about training until the product is finished, and then we can train the user"
- Training is generally needed by the members of the development group, starting with training in software planning
- A new software development method necessitates training for every member of the group

Training Requirements (2)

- Introduction of hardware or software tools of any sort necessitates training
- Programmers may need training in the operating system and/or implementation language
- Documentation preparation training may be needed
- Computer operators require training
Documentation Standards
- IBM internal commercial product (50 KDSI)
  - 28 pages of documentation per KDSI
- Commercial software product of the same size
  - 66 pages per KDSI
- IMS/360 Version 2.3 (about 166 KDSI)
  - 157 pages of documentation per KDSI
- [TRW] For every 100 hours spent on coding activities, 150–200 hours were spent on documentation-related activities

Types of Documentation
- Planning
- Control
- Financial
- Technical
- Source code
- Comments within source code

Documentation Standards (2)
- Reduce misunderstandings between team members
- Aid SQA
- Only new employees have to learn the standards
- Standards assist maintenance programmers
- Standardization is important for user manuals

Documentation Standards (3)
- As part of the planning process
  - Standards must be set up for all documentation
- In a very real sense, the product is the documentation

CASE Tools for Planning and Estimating
- It is essential to have
  - A word processor; and
  - A spreadsheet
- Tools that automate intermediate COCOMO and COCOMO II are available
- Management tools assist with planning and monitoring
  - MacProject
  - Microsoft Project

Testing the Software Project Management Plan
- We must check the SPMP as a whole before release to client
  - Done by inspection
  - Paying particular attention to the duration and cost estimates