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Project Planning

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"Standup" Progress Report

- *Standup Meeting*: efficiency technique promoted by XP/agile methods
  - Goal of reducing time spent in meetings
  - Daily status meeting on project
    - What did I accomplish since the last meeting
    - What do I plan to do next?
    - What obstacles are impeding my progress?
    - Questions? E.g., project 1
- For projects: same questions on a weekly basis

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Review: Need to Organize the Work

- Nature of a software project
  - Software development produces a set of interlocking, interdependent work products
    - E.g. Requirements -> Design -> Code -> Test
  - Implies dependencies between tasks
  - Implies dependencies between people
- Must organize the work such that:
  - Every task gets done
  - Tasks get done in the right order
  - Tasks are done by the right people
  - The product has the desired qualities
  - The end product is produced on time

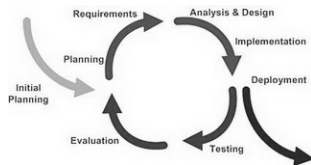CIS 422/522 Fall 2013   3

Projects Use Iterative Process

- Process viewed as a sequence of iterations
  - Essentially, a *series of waterfalls*
  - Each iteration builds on the previous one
  - Each iteration produces complete set of work products including deliverable software
- Addresses key risks (provides feedback, have something to deliver)

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From Process to Plan

- Process manifests itself in the project plan
  - Process definition is an abstraction
  - Many possible ways of implementing the same process
- *Project plan makes process concrete*, it assigns
  - People to roles
  - Artifacts to deliverables and milestones
  - Activities to tasks over time
- *Project plan* is itself a product of the process
  - Activity: project planning
  - Artifact: the Project Plan
  - Roles: Project Manager (owner), team members
- Evolves as the project proceeds

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Project Plan

- Purpose: specifies how project resources will be organized to:
  - Create each deliverable
  - Meet quality goals
  - Address developmental goals (e.g., mitigate risk)
- Audience: answers specific kinds of questions for specific types of users, e.g.:
  - Customers: When will the product be delivered?
  - Stakeholders: What is the development approach? How does it address project risks?
  - Managers: When will tasks be completed? What is the current progress against the plan?
  - Developers: What should I be working on and when?

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Plan Outline

- Plan contents (template)
  - Purpose and audience
  - Project background
  - Team roles and responsibilities
  - Risks and risk mitigation
    - What are the key risks?
    - Which mitigation strategies will the project deploy
  - Process: development process being used and its rationale
  - Mechanisms, methods, and techniques
    - What kinds of methods and tools will be used?
    - E.g., planning tools, requirements method, design method IDEs, etc.
  - Detailed schedule and milestones
  - Resources and references

Detailed Schedule and Milestones

- Maps people to tasks over time such that
  - Delivery meets schedule
  - Personnel are fully engaged (time is not wasted)
- Answers: "Who is working on which tasks and when will they be finished?"
- Inputs
  - Set of artifacts to be created (superset of deliverables)
  - Precedence between tasks
  - People filling roles that perform tasks
  - Time budget for each task
- Output
  - Current project schedule
  - Deadline for each task
  - Sequencing among tasks
  - Allocation of people to tasks

Project Plan Template

- Use the template provided in your Assembla team workspace (under the Wiki tab)
- This should be a *living document*
  - Changed as the project progresses
  - Ideally, always gives a current view of the *progress against the plan*
    - Shows planned activities
    - Gives snapshot of the current project state
    - This is what I should see on your assembla site

Project Planning Tools

Work Breakdown Structure (WBS)
PERT Chart
Gantt Chart

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Work Breakdown Structure

- Structured technique for decomposing work into individual tasks with the goals:
  - Identify the complete set of tasks in the project
  - Provide units of work (for individuals or teams)
  - Provide units of work for scheduling and costing
- Identify hierarchy of tasks and subtasks
  - Identify major tasks in project
  - Decomposing each element into component parts
  - Continuing to decompose until manageable work packages can be mapped to roles
- Works best when:
  - Tasks correspond to key deliverables
  - Sum of tasks is 100% of the work
  - Tasks do not overlap
  - Each leaf task takes about the same amount of time

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Work Breakdown Structure

1. Software Development
   1. Project Management
   2. Analysis
      1. Glossary
      2. Requirements Specification
         1. Use Cases
         2. Supplementary Specs...

   Equivalent list format

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Pert Chart

- Network analysis or PERT is used to identify dependencies between the tasks in the work breakdown structure
- Helps identify where ordering of tasks may cause problems because of precedence or resource constraints
  - Where task B cannot begin before task A ends
  - Where one person cannot do two tasks at the same time
  - Where adding a person can allow tasks to be done in parallel, shortening the project

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PERT Chart Example

- Which tasks can we start on?
- Which tasks can be done concurrently?
- Which tasks depend on which other tasks?
- *Critical Path*: which path has the longest duration?
  - Gives minimum length of project

http://www.conceptdraw.com/samples/project-chart
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Gantt Charts

- Method for *visualizing a project schedule* in one chart showing
  - The set of tasks
  - Start and completion times
  - Task dependencies
  - Responsibilities
- PERT charts can be reformatted as Gantt charts
- Typically requires a tool, e.g.,
        http://www.ganttproject.biz/

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Example Gantt Chart

Project Milestone Planning

- Milestone planning is used to show the major steps that are needed to reach the goal on time
- Milestones typically mark completion of key deliverables or establishment of baselines
  - Baseline: when a work product is put under configuration management and all changes are controlled
- Often associated with management review points
  - E.g., Requirements baseline, project plan complete, code ready to test
- Can use Gantt or PERT charts to show milestones

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A Simple Alternative

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How much planning?

- Planning itself consumes resources; how much planning is enough?
- Enough that:
  – Everyone knows what they should be doing
  – Everyone knows what other people are supposed to be doing
  – Everyone knows when specific tasks should be finished
    • Can track dependencies between their tasks and others
    • Know when task inputs will be available
  – It is easy to determine the current status of the project against plan

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Walkthrough

- Consider: What kinds of questions should your documents answer?
  – Assume a manager unfamiliar with the project is reviewing your status
  – Would your documents answer key questions about the project goals and current status?
- Team page: Who is on the team?
- Project plan
  – Who is responsible for which tasks?
  – What are the anticipated risks and what are you doing about them?
  – What is your development process and how does it help address the risks?
  – What is the project schedule of tasks and deliverables?
  – What is the current status relative to schedule?
- ConOps: What capabilities will the software provide the user or customer?
- SRS: What are the detailed technical requirements?

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Project Requirements: Iteration 1

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Project Requirements

- Goal for this week: be clear on what you plan to build
  - Extend, revise Address Book requirements
  - Generate questions for instructor
  - Plan interations
- Think in terms of *useful subsets*
  - Build the smallest useful subset first: think about which capabilities will be needed by any future enhancements
  - Plan how you will add to it each increment

Questions?