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Project Planning Documenting Development Decisions

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From Process to Plan

- Process definition 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 should be one of the first products but expect it to evolve

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Project Plan

- Minimal plan contents
 - Risks and mitigation strategies
 - Should evolve with progress and understanding
 - Tasks to be performed
 - Person(s) assigned to roles and tasks
 - Deadline for each task
 - Sequencing among tasks
 - Task dependencies
 - Allocation of labor
- Usually owned by team manager
- Updated as project proceeds

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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

*Is this true of your Project Plans now?

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Project Planning Tools

Work Breakdown Structure (WBS)
PERT Chart
Gantt Chart

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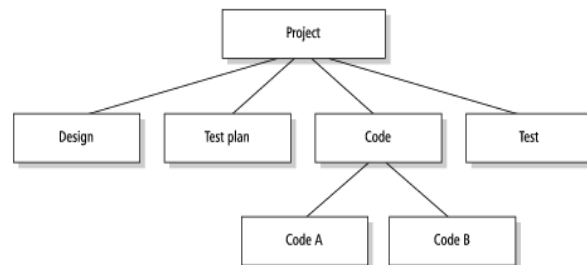
Work Breakdown Structure

- This is a technique to analyze the content of work and cost by decomposing it into its component parts. It is produced by:
 - Identifying the key elements
 - Decomposing each element into component parts
 - Continuing to decompose until manageable work packages have been identified. These can then be allocated to the appropriate role/person
- The WBS is used to allocate responsibilities
- For the software, the WBS depends on the software architecture (discuss next)

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Work Breakdown Structure



SE, Cost planning and control, Hans van Vliet, ©2008

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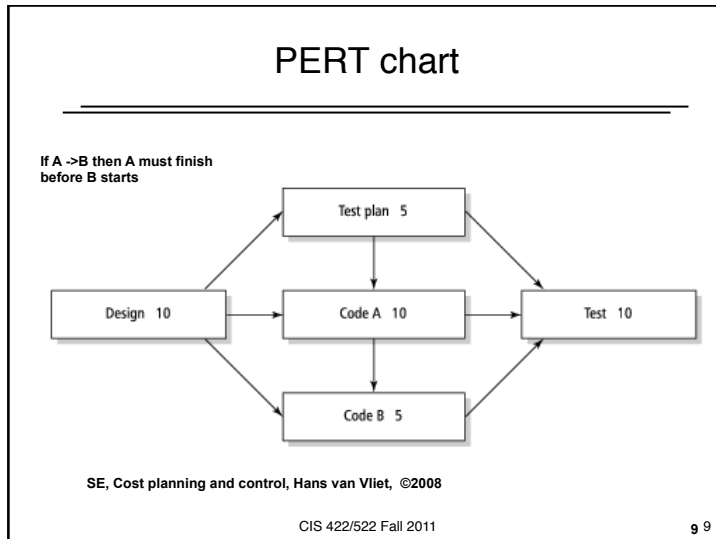
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Pert Chart

- Network analysis or PERT is used to analyze the relationships between the tasks identified by the work breakdown structure and to define the dependencies between tasks
- Helps identify where ordering of tasks may cause problems because of precedence or resource constraints
 - 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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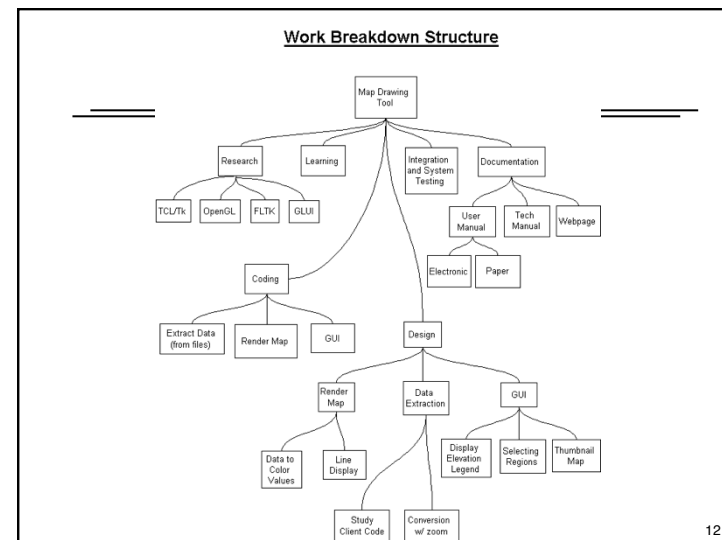
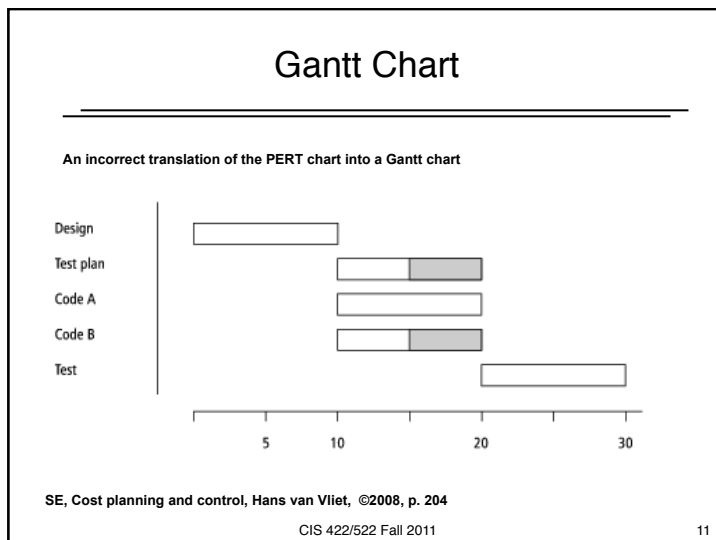
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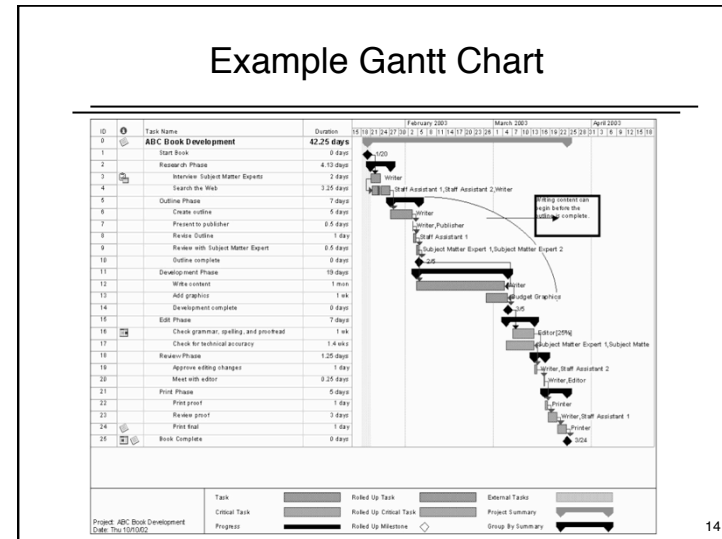
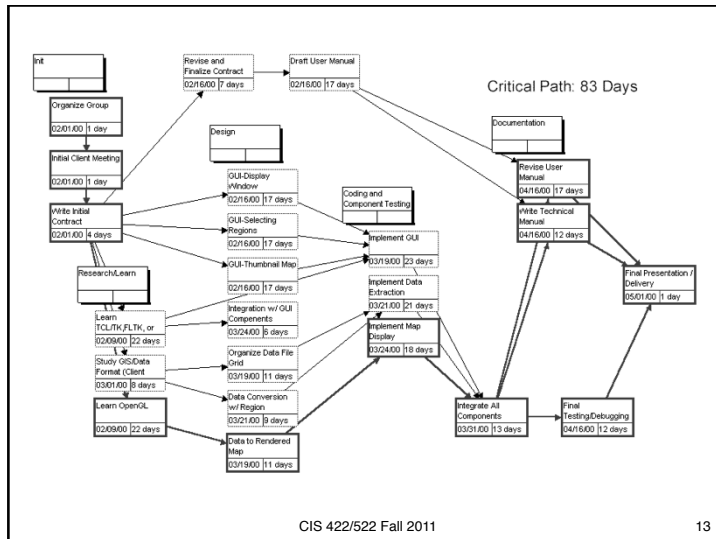


Gantt Charts

- Method for visualizing a project schedule showing
 - The set of tasks
 - Start and completion times
 - Task dependencies
 - Responsibilities
- PERT charts can be reformatted as Gantt charts

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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

A Simple Alternative

View Edit Page History Comments Version 31, last updated by Christine Nguyen at Dec 01 12:37 2011

Project Schedule and Milestones

Project Plan for Phase 2 of Project (Finished)

Blue means that it was completed
Red means that it was not completed
Green means that it wasn't completed in the previous iteration and is set for completion in the current iteration

Week 1 (11/6-11/12)

- Create splash screen to display a selection of game rules to choose from (Zeyu and Jasmine)
- Implement functionality of storing and displaying several different game rules (Chris)
- Create another xml file for a new game manual (Chris)**"Since we're creating a writer, we'll wait for the writer to be functional to create new xml files**"
- Test and fix bugs of multi-game rule functionality (Sean)
- Update Software Documentation, Software Requirements Use-Cases, and ConOps to include information on multi-game functionality. (Christine)

Week 2 (11/13-11/19)

- Create UI prototype for writer. Nothing has to be functional. (Zeyu and Jasmine)
- Implement image enlarger (Zeyu)
- In the xml parser, add interface for writer in parser. (Chris)
- Test the prototype (Sean)
- Update ConOps to include writer functionality (Christine)
- Include another Subset in Software Requirements (Christine)
- Update ConOps to include information on multi-game functionality (Christine)

How much planning?

- 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
 - Specifically, they can track dependencies between their tasks and other peoples
 - It is easy to determine the current status of the project against plan

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Documenting Development Decisions

Why document?

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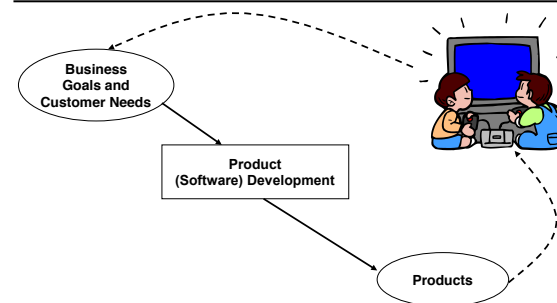
Project Documentation

- Many kinds identified
 - Project plan, schedule, meeting notes
 - Software Requirements
 - Software Architecture
 - Software documentation
- Why document (when agile methods don't)?

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10,000 ft. View



What should the development process accomplish?

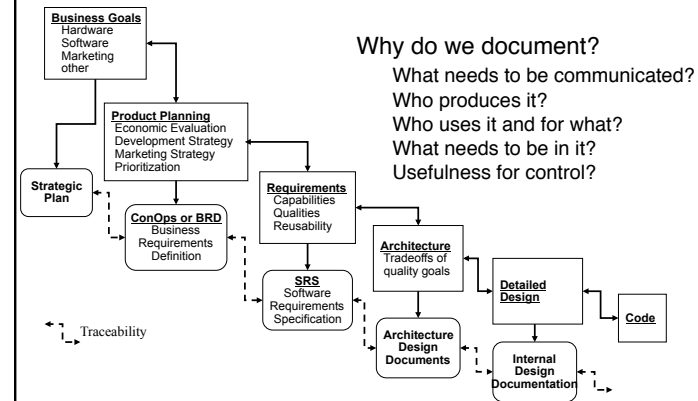
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Role of Documentation

- To understand what kind of documentation is useful, helps to understand the “why”
- Consider
 1. Goal is to turn an idea into a product
 2. Software engineering is a decision making process
 3. We decompose a complex development process into distinct concerns (requirements, design, code, test, deployment, maintenance, etc.)
- Why document?
 - What purpose does it play?
 - What kinds of things should be documented?

Product Development Cycle and Documentation



Document Types and Purposes

- Management documents
 - Basis for project management (managerial control of resources)
 - Calendar time, skilled man-hours budget
 - Other organizational resources
 - Project plan, WBS, Development schedule
 - Use: allows managers to track actual against expected consumption of resources
- Development documents
 - Basis for product management (intellectual control)
 - ConOps, Requirements (SRS), Architecture, Detail design, etc.
 - Uses:
 - Making and recording development decisions
 - Allows developers to track decisions from stakeholder needs to implementation

Meeting Developmental Goals Means...

- We have a clear understanding of customer needs and product goals
- External view: We develop products the customer’s wants, on time and within budget
- Internal view: We create process and product infrastructures supporting our business goals
- For most developments, these are “document” driven

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?

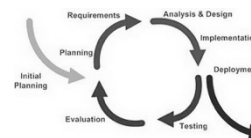
Questions?

Choosing a Process (Review)

- Goal: proceed as rationally and systematically as possible from a statement of goals to a design that meets those goals with development constraints
- Choose a process to provide an appropriate level of control for the given product and context
 - Sufficient control to achieve results
 - No more than necessary to contain cost and effort
- Development goals: want to choose a process that supports project development and addresses risks
 - Schedule
 - Failure to deliver working software
- Instructional goals: process must also support learning software engineering
 - Provide experience with a range of artifacts for all team members
 - Support teacher evaluation

Which process for projects?

- Process viewed as a sequence of iterations, each iteration produces an increment of the working software
 - Build minimal useful subset, test, validate
 - After first iteration, always have working software
 - Document requirements, design, etc.
- Process viewed as nested sequence of builds (sprints)
 - Each build adds small feature set
 - Customer in loop, code centered (little or no documentation)
 - Problem detection and correction through daily team meetings (scrum)



Course Approach

- Will learn a document-driven approach
- Provides broader experience with development roles, activities, and artifacts
- Supports external tracking and review
- Appropriate for a broader range of development situations
- Nothing additional is needed to switch to agile

Focus on Disciplined Process

- Focus on a disciplined development process
 - “Disciplined” means as systematic and rigorous as is **practical**
 - Basis for maintaining intellectual and managerial control
- Process: we define a process in terms of a set of *artifacts*, *activities*, *roles* and the *relationships* between them
 - Artifact: any product of the development
 - Activity: the set of tasks performed
 - Roles: set of responsibilities associated with a set of skills
 - Relationships: roles produce artifacts by performing activities
 - A designer produces a design document as part of creating the design
- Example:
http://en.wikipedia.org/wiki/Scrum_%28development%29

Project Planning
