Software Project Management

Lecture 10

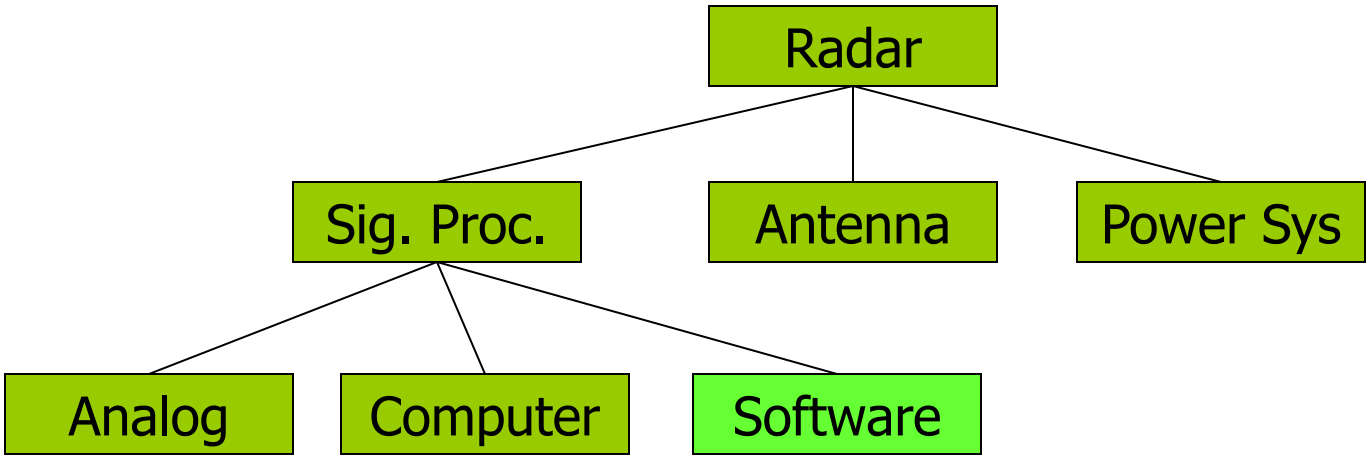
Building a WBS

- Identify the work concerning the software product
  - Separate from hardware and work processes
- Find any higher system WBS
  - Separate the software from other systems and components
- Determine the software WBS architecture
  - How to organize this software product and project?
- Populate the software WBS architecture
  - Identify all the parts and activities to produce them
- Determine cost categories for software
  - Prepare for estimation activities

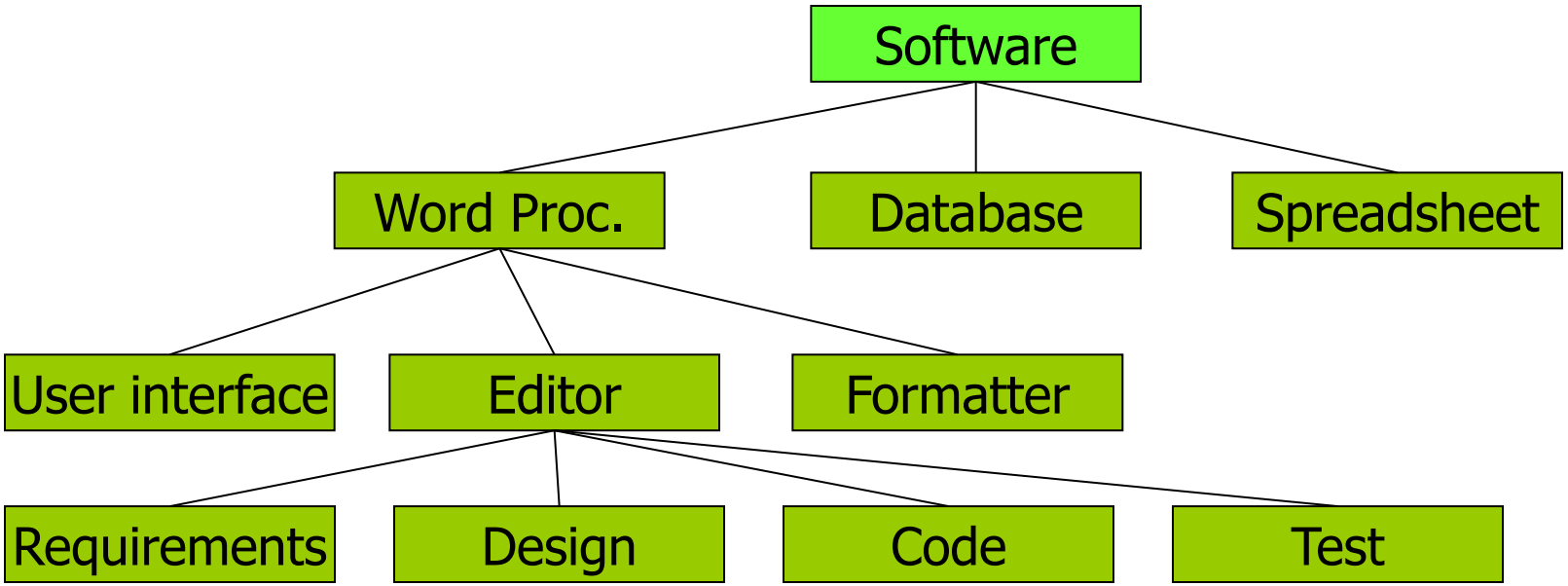
- Identify the work
  - Go through the available documentation
  - Many possible source
    - Documents
    - Brainstorming
    - Stakeholders

Document	Paragraph	Description
SOW	1.3.4	Design Software Compiler
…		
Contract	7.13.2.a	Follow ISO Standard 54321
Requirements Doc	3.4	Use Data Compression
…		
Customer	6-Sep-2002 Mtg	Code All software in C++

- Find any higher system WBS
  - Is there a WBS for any higher system and how software fits in
  - e.g., software as an embedded item under hardware project



- Determine WBS architecture
  - Determine a logical structure
  - Process oriented or product oriented



- Populate the WBS
  - Populate the chosen WBS structure with activities that address the work identified
- Cost categories
  - The cost category determines how the cost for each item will be estimated
    - Equipment – Rs
    - Effort - Hours

WBS Guidelines

- Should be easy to understand
- Some companies have corporate standards for these schemes
- Some top-level items, like Project Management are in WBS for each project
  - Others vary by project
- What often hurts most is what's missing
- Break down until you can generate accurate time and cost estimates
- Ensure each element corresponds to a deliverable

WBS Guidelines

- How detailed should it be?
  - **Not as detailed** as the final MS-Project plan
  - Each level should have no more than 7 items
  - It can evolve over time
- What tool should you use?
  - Excel, Word, Project
  - Org chart diagramming tool (Visio, etc)
  - Specialized commercial apps
- Re-use a “template” if you have one

WBS and Methodology

- PM must map activities to chosen lifecycle
- Each lifecycle has different sets of activities
- Integral process activities occur for all
  - Planning, configuration, testing
- Operations and maintenance phases are not normally in plan (considered post-project)
- Some models are “straightened” for WBS
  - Spiral and other iterative models
  - Linear sequence several times
- Deliverables of tasks vary by methodology

Adapting Life Cycle Activities

- IEEE 1074 – 17 processes and 65 activities
- A road map to carry out the work of software engineering
- Development activities
  - Analysis, high-level design, low-level design, coding, testing
- Managerial activities
  - Project planning, tracking, control, risk management
- Support activities
  - User's manual, operations guide
- Integral activities = managerial + support

IEEE 1074

- Software Life Cycle Model Planning
- Project Management
- Predevelopment
- Development
- Postdevelopment

IEEE 1074 - Software Life Cycle Model Planning

- Map the SLCM to project needs
  - Identify candidate SLCMs
  - Select project model

IEEE 1074 - Project Management

- Project Initiation
  - Map activities to the SLCM
  - Allocate project resources
  - Establish project environment
  - Plan project management
- Project Monitoring and control
  - Analyze risks
  - Perform contingency planning
  - Manage the project
  - Retain records
  - Implement problem reporting method
- Software quality management
  - Plan software quality management
  - Define metrics
  - Manage software quality
  - Identify quality improvement needs

IEEE 1074 - Predevelopment

- Concept exploration
  - Identify ideas or needs
  - Formulate potential approaches
  - Conduct feasibility studies
  - Plan system transition (if applicable)
  - Refine and finalize the idea or need
- System allocation
  - Analyze functions
  - Develop system architecture
  - Decompose system requirements

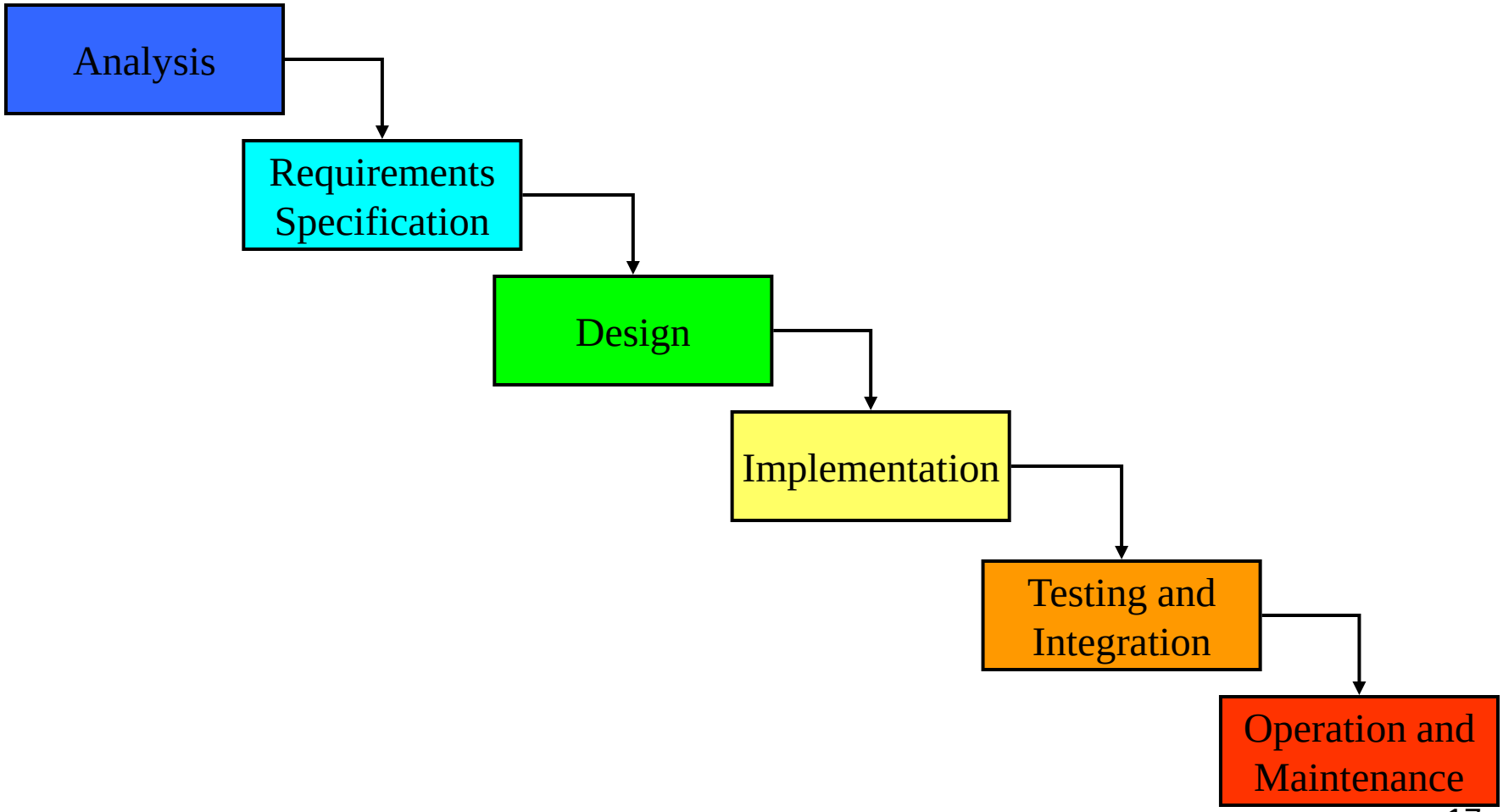
IEEE 1074 - Development

- Requirements
  - Define and develop software requirements
  - Define interface requirements
  - Prioritize and integrate software requirements
- Design
  - Perform architectural design
  - Design database (if applicable)
  - Design interfaces
  - Select or develop algorithms (if applicable)
  - Perform detailed design
- Implementation
  - Create test data
  - Create source code
  - Generate object code
  - Create operating documentation
  - Plan integration
  - Perform integration

IEEE 1074 - Post-Development

- Installation
  - Plan Installation
  - Distribute Software
  - Install Software
  - Accept Software in Operational Environment
- Operation and Support
  - Operate the System
  - Provide Technical Assistance and Consulting
  - Maintain Support Request Log
- Maintenance
  - Identify Software Improvement Needs
  - Implement Problem Reporting Method
  - Reapply SLC
- Retirement
  - Notify User
  - Conduct Parallel Operations (If Applicable)
  - Retire System

Waterfall Model



Potential Activities

- Concept exploration: Examining requirements at the system level to determine feasibility
  - Identify ideas or needs
  - Formulate potential approaches
  - Conduct feasibility studies
  - Plan system transition (if applicable)
  - Refine and finalize the idea or need
- System allocation process: Mapping functions to software or hardware based on the overall system architecture
  - Analyze functions
  - Develop system architecture
  - Decompose system requirements

- Requirements process — Defining software requirements for the system's information domain and function, behavior, performance, and interfaces
  - Define and develop software requirements
  - Define interface requirements
  - Prioritize and integrate software requirements
- Design process — Developing and representing a coherent, technical specification of the software system, including data structures, software architecture, interface representations, and procedural (algorithmic) detail
  - Perform architectural design
  - Design the database
  - Design interfaces
  - Select or develop algorithms
  - Perform detailed design

- Implementation process —Transforming the software design description into a software product, producing source code, databases, and documentation, whether developed, purchased, or a blend
  - Create test data
  - Create source code
  - Generate object code
  - Create operating documentation
  - Plan integration
  - Perform integration
- Installation process —Installing and checking out the software in the operational environment and getting formal customer acceptance of the software
  - Plan installation
  - Distribute software
  - Install software
  - Accept software in operational environment

- Operation and support process—Involving user operation of the system and ongoing support, including providing technical assistance, consulting with the user, and recording user requests for enhancements and changes, and handling corrections or errors
  - Operate the system
  - Provide technical assistance and consulting
  - Maintain support request log
- Maintenance process—Resolving requests to address software errors, faults, failures, enhancements, and changes generated by the support process
  - Reapply a software life cycle (initiate a development project)

Q&A