

INF 111 / CSE 121: Software Tools and Methods



Lecture Notes for Fall Quarter, 2007
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Set 13

(Some slides adapted from Sommerville 2000 & Scott Miller)



Announcements

- **Still no lab on Friday**
- **Regrades for Quiz #1 – Due today**
- **Info on Regrades**
- **Grading...**
- **Review Chapter 4**



Previously in INF 111...

- **Equivalence Partitioning & Boundary Value Analysis**
- **Integration Testing**
 - Top-Down
 - Bottom Up



Today's Lecture

- **Configuration Management**



Configuration Management

- **Manages software artifacts**
- **Change happens → CM manages that change**
 - Change requests
 - Bugs fixed
 - Etc..
 - Different versions co-exist
 - What about – different configurations and versions of the system?



CM - Baseline

- **Start with a completed version of the system**

Includes all Configuration items

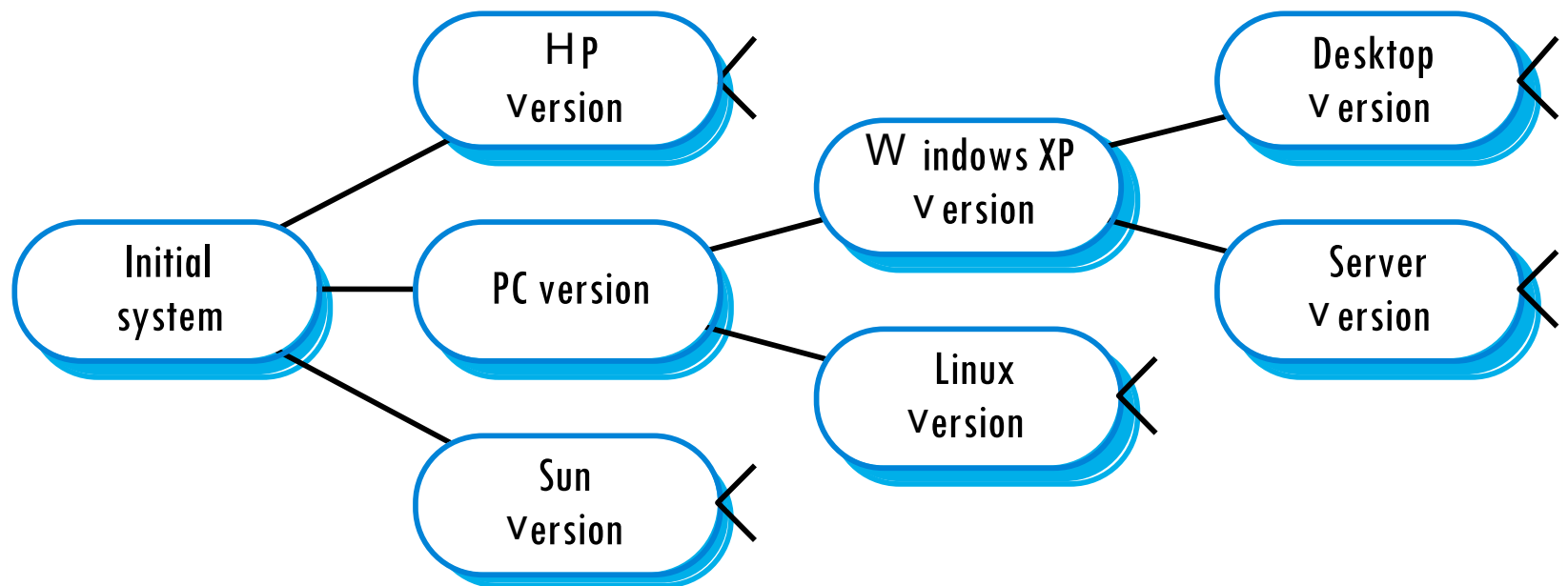
- All documentation
 - ▣ Requirements Specification
 - ▣ Design Document
 - ▣ Test Plan
 - ▣ Test Results
 - ▣ User Manual
 - Source code
 - Test Cases
 - Could include hardware
- **Thoroughly tested and completed**



CM – Different Versions

- **As change happens → new versions**
 - Different machines/OS
 - Offering different functionality
 - Tailored for particular user requirements.
- **CM Manages these changes**
 - CM is a team (sometimes assoc. w/ QA)
 - Controls
 - Costs
 - Effort
 - .. Maintains all changes & documents

System families





CM-Team

- **Creates Procedures for change**

- **Standards**

Defines..

- How items are identified
- How changes are controlled
- How new versions are managed
- May be based on external standards (DOD, IEEE)



You need a CM Plan!

○ Define:

● Documents

- What is to be managed (which docs)
- Document naming scheme

● Who is responsible for..

- Procedures
- Creation of Baselines

● Policies for...

- Change Control
- Version Mgmt

● Which CM records must be maintained



CM Plan (2)

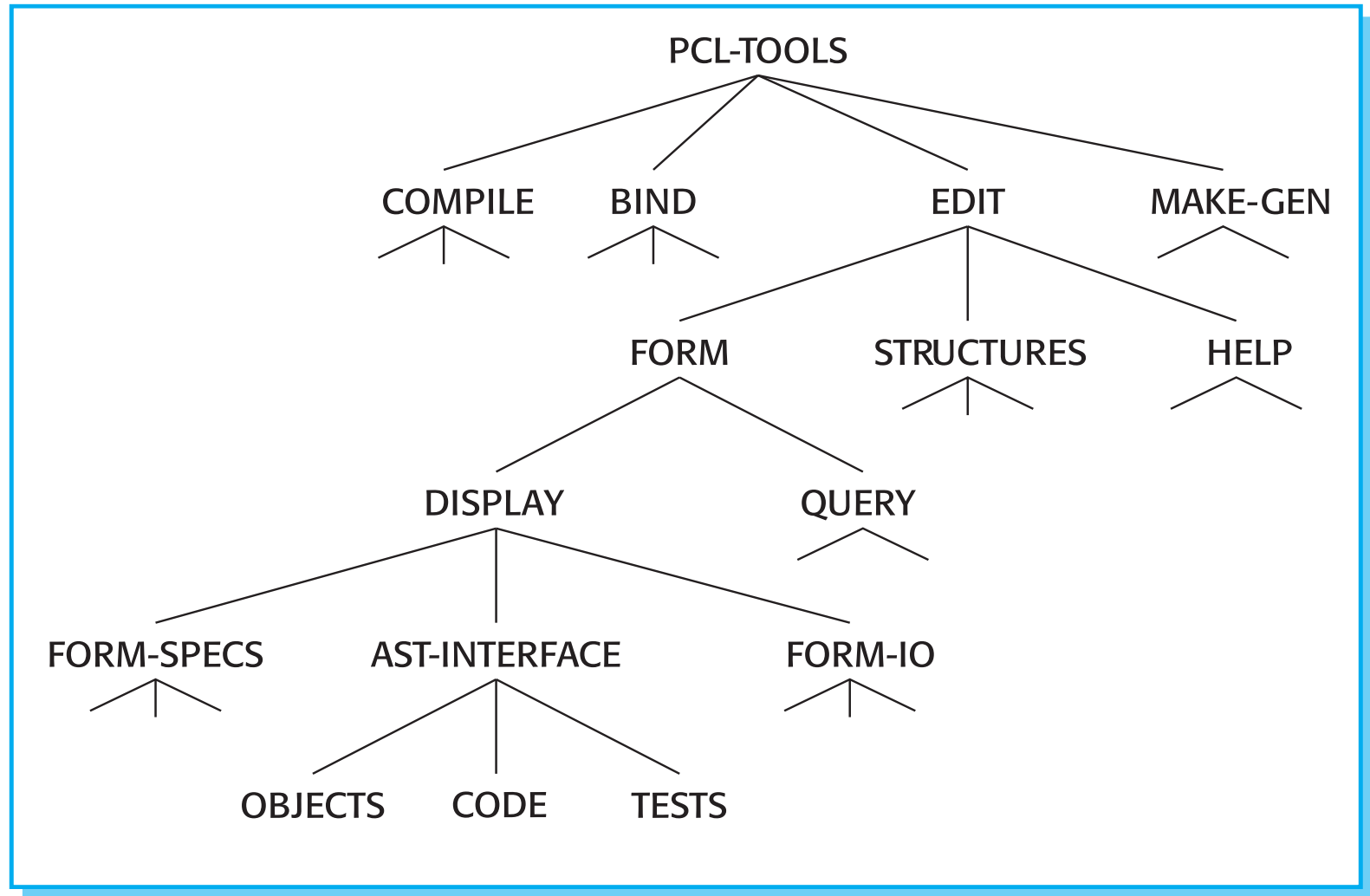
- **Describes which tools to use**
 - Limitations
- **Defines the process of tool use**
- **Defines the CM database**
 - records configuration information.
- **May include information such as..**
 - the CM of external software
 - process auditing
 - etc...



Configuration item identification

- **Large projects → thousands of documents**
- **Documents follow the code (part of the configuration)**
- **Naming convention**
 - Each document needs a unique name
 - Related docs should have related names
- **A hierarchical scheme with multi-level names is probably the most flexible approach.**
 - PCL-TOOLS/EDIT/FORMS/DISPLAY/AST-INTERFACE/CODE

Configuration hierarchy





CM database implementation

- **Might be part of a SEE**
 - The CM database and documents → maintained on the same system
- **Might be integrated with other CASE tools**
- **Generally it is maintained separately**
 - Why? Cheaper and more flexible



Software Changes Continually

- **Change requests:**

- From users
- From developers
- From market forces

- **These changes need to be...**

- Tracked
- Managed
- ... cost-effectively!



The CM Process

- **Complete change request form (CRF)**
 - Formal document
- **Check if it is valid**
 - Is it really a fault or used incorrectly?
- **Cost-Assessment**
 - How much will this change cost?
 - Is it worth it?
- **If it is approved**
 - Make change
 - Test it
- **Create new version (when testing is complete)**



Change request form

- **Defined during CM Planning Process**
- **Records**
 - Change proposed
 - Who requested it
 - Why the change was suggested
 - Urgency of change
 - According to the requestor
- **It also records..**
 - Change evaluation
 - Impact analysis
 - Cost
 - Recommendations
 - to the System maintenance staff



Change tracking tools

- **Tracking change is difficult**
- **Tools**
 - Track status of each CR
 - Lock / unlock used modules
 - Ensure requests are sent to the right people
 - Integrated with E-mail systems
 - allows electronic CR distribution.



Configuration Control Board (CCB)

- **AKA Change Control Board**
- **An external group**
 - Reviews Changes
 - Decides if the are
 - Valid
 - Cost-effective
 - From a strategic & organizational viewpoint
 - Not necessarily technical viewpoint
 - Should be independent from project
 - May include reps from client & contractor staff



Derivation History

- **A record of changes**
 - To a document *or*
 - code
- **Records:**
 - The change made
 - Rationale for the change
 - Who made the change
 - When it was implemented.
- **May be a comment in the code**
- **Tools can process this automatically**