

COMP 4004 Quality in OO Software Development

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Course Outline

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Learning Objectives

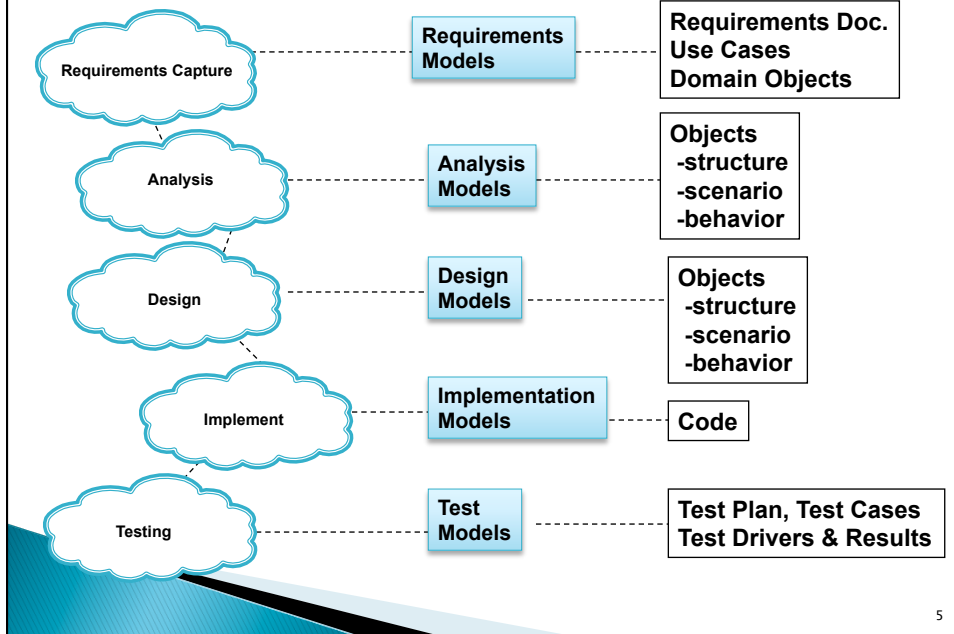
- ▶ Understand the pros and cons of TDD and of refactoring in Java
- ▶ Gain a basic understanding of metrics, xUnit patterns and Model Based Testing (MBT)
- ▶ Gain experience with JUnit and Cucumber
- ▶ Understand the pros and cons of state-based MBT (e.g., studying SpecExplorer)
- ▶ Understand the basics of scenario testing
 - Time permitting, understand the basics of scenario modeling using ACL and of corresponding scenario monitoring in Java.

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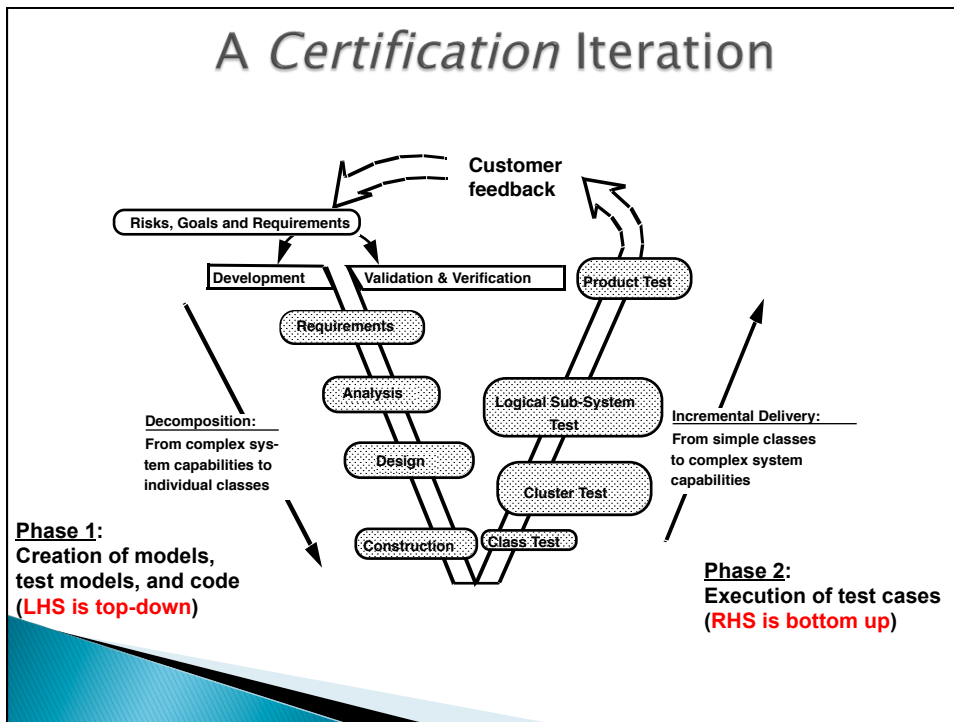
Activities, Process, and Models

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OO Development Overview

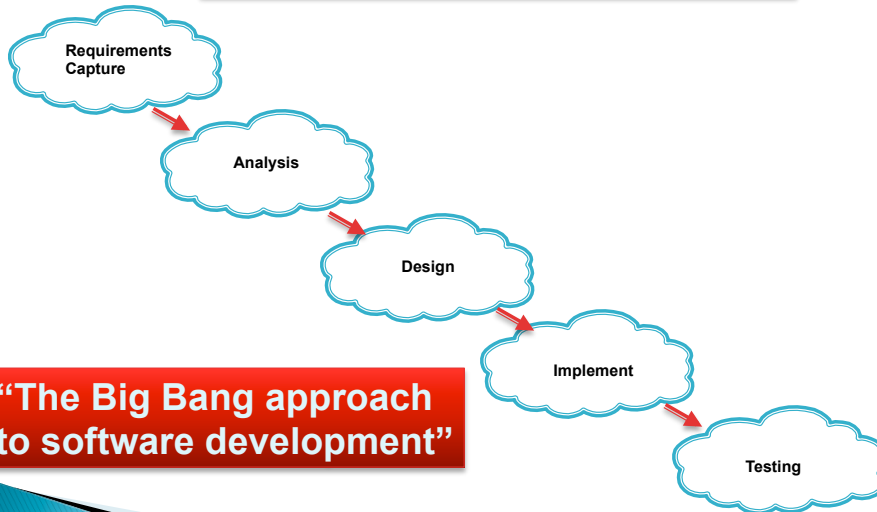


A Certification Iteration



Waterfall Development

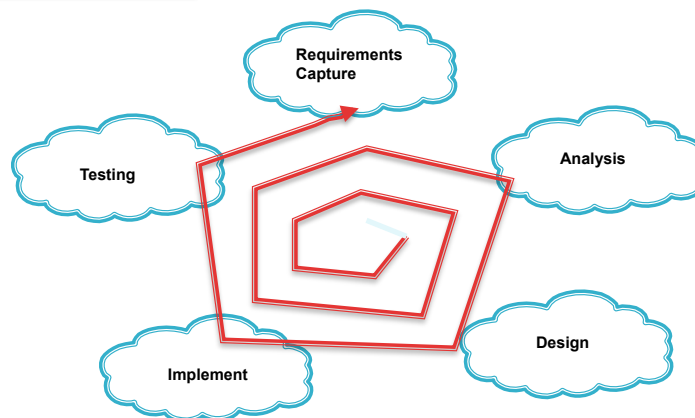
Activities carried out one after the other as steps



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Incremental-Iterative Development

The Spiral Model



Can have macro and micro iterations but needs to **converge towards a solution**

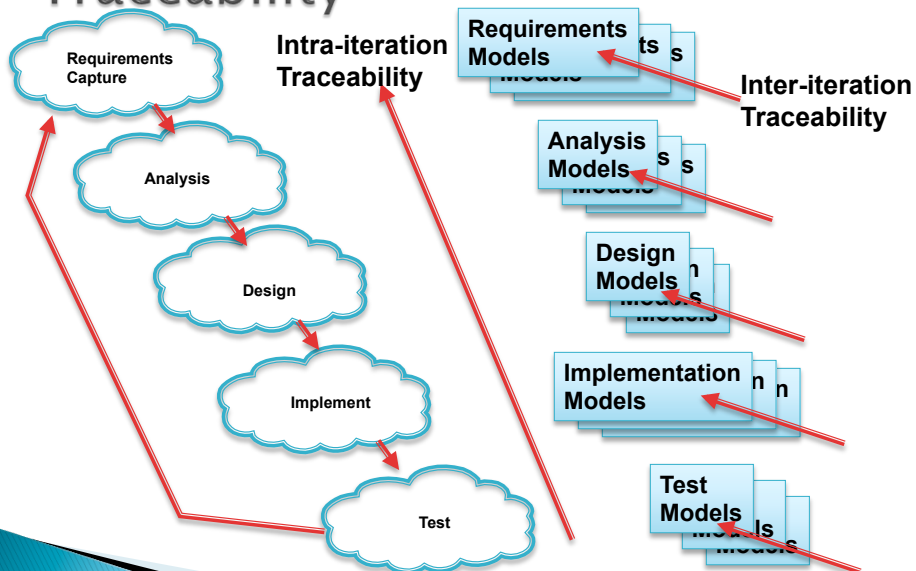
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Aiming for Traceability

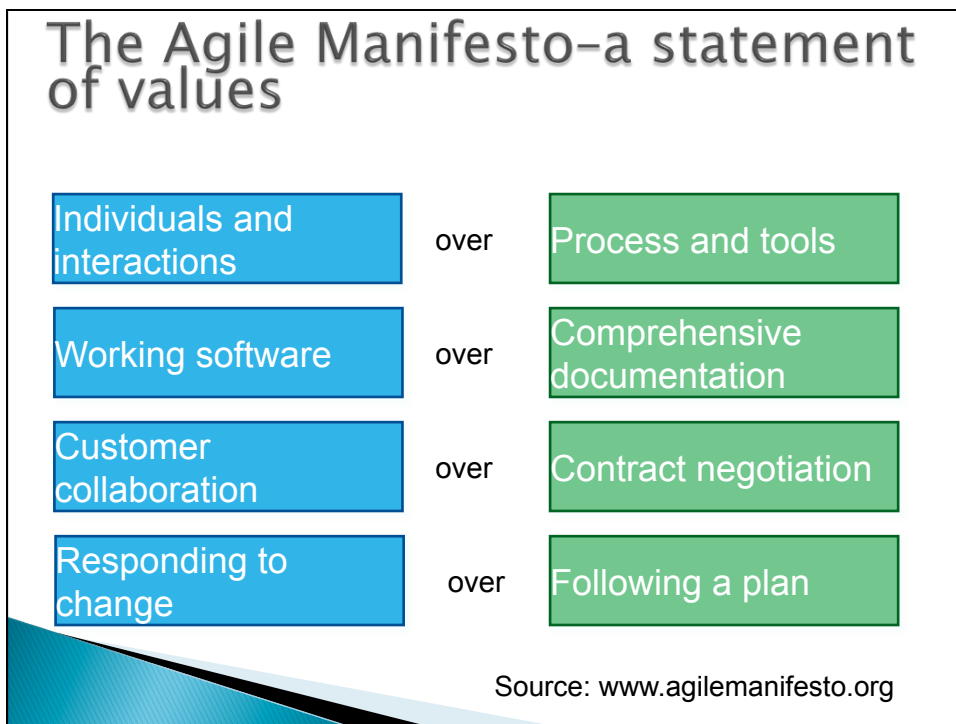
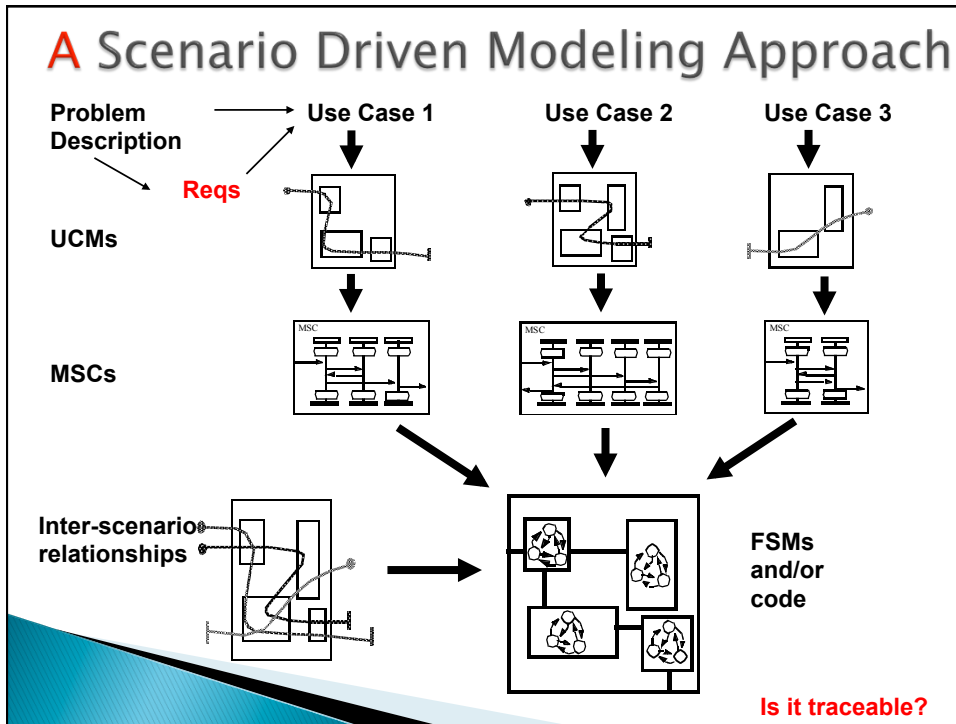
- ▶ Traceability is required to achieve convergence:
 - We must document the *continuity* that must exist between the work-products of different activities.
 - At least required for **regression testing**
 - In turn, continuity enables completeness and consistency checks.
- ▶ Within a particular activity, the work-products must be **consistent**.
 - e.g., the structural, scenario and behavior models must be consistent
 - For example, if an interaction diagram shows an object receiving a message, then the FSM of this object must reflect this possibility
- ▶ Work-products must also be **complete** with respect to the current requirements.

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Traceability



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The Core of Agile Modeling

Some Core Principles

- Assume Simplicity
- Expect Incremental Change
- Enabling the Next Effort is Your Secondary Goal
- Model With a Purpose
- Use Multiple Models
- Maximize Stakeholder Investment
- **Value Quality first**
- Get Rapid Feedback
- **Software Is Your Primary Goal**

Some Core Practices

- Active Stakeholder Participation
- Apply the Right Artifact(s)
- **Collective Ownership**
- Create Several Models in Parallel
- Create Simple Content
- Depict Models Simply
- Display Models Publicly
- **Model in Small Increments**
- Model With Others
- **Prove it With Code**
- Use the Simplest Tools

Scrum

