The Rational Unified Process

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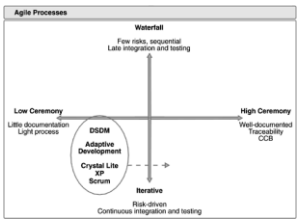
Objectives

- To present *why* and *when* to use RUP
- To present RUP *activities*
- To present RUP *roles*
- To present RUP *products*
- To *apply* RUP to develop a system

Books And Reading

1. Per Kroll and Philippe Kruchten. The Rational Unified Process Made Easy: A Practitioner's Guide to the RUP. 2003.
2. Philippe Kruchten, The Rational Unified Process: An Introduction. 2003.
3. Craig Larman, Agile and Iterative Development: A Manager's Guide. 2003.

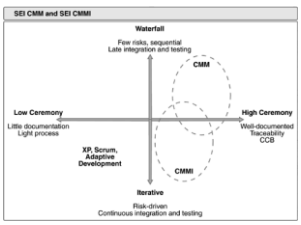
Agile Development [1]



Low-Ceremony, Iterative Approaches

Our system is too complex. Our developers are not competent.

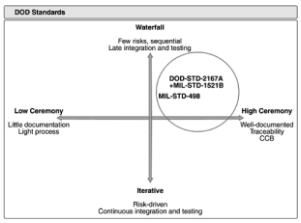
SEI CMM, SEI CMMI, ISO/IEC



High Ceremony Striving for Higher Predictability

We do NOT have enough time and budget!

DOD-STD, MIL-STD



High Ceremony Striving for Higher Predictability

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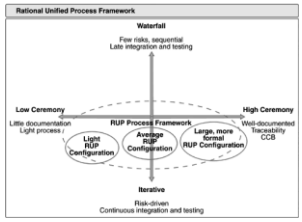
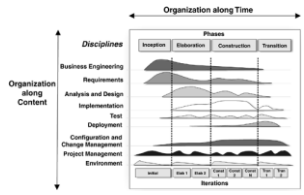
The Rational Unified Process



An Iterative Approach with an *Adaptable Level* of Ceremony

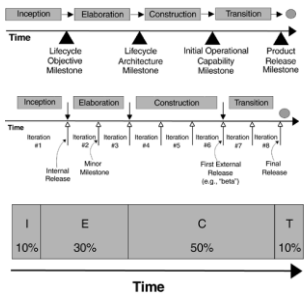
Process Structure: Two Dimensions [2]

- The *horizontal axis* represents *time* and shows the lifecycle aspects of the process as it unfolds.
  - It represents the dynamic aspect of the process as it is enacted, and it is expressed in terms of *cycles*, *phases*, *iterations*, and *milestones*.

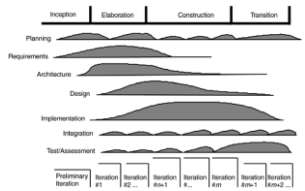


- The *vertical axis* represents core process *disciplines*, which group activities logically by nature.
  - It represents the static aspect of the process: its description in terms of process *components*, *activities*, *disciplines*, *artifacts*, and *roles*.

How to Divide the Time?

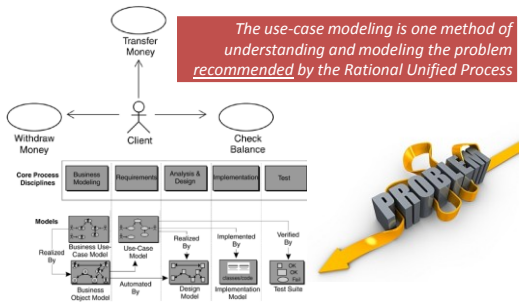


What Should We Do?



- The workflow of each iteration contains the *activities* of requirements elicitation and analysis, of design and implementation, and of integration and test, not necessarily in this order.
- From one iteration to the next and from one phase to the next, the *emphasis* on the various activities changes.

What Should We Create First?

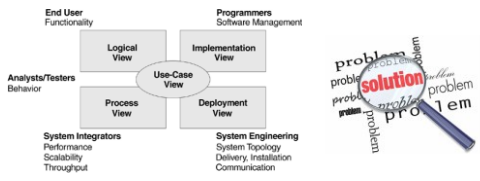


The use-case modeling is one method of understanding and modeling the problem recommended by the Rational Unified Process

The use cases defined for a system are the basis for the entire development process

What is the Second Artifact?

System architecture is used in the Rational Unified Process as a primary artifact for conceptualizing, constructing, managing, and evolving the system under development.



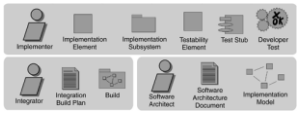
Architecture is a complex concept that is best represented by multiple, coordinated architectural views.

Any More Artifacts?

An artifact is a piece of information that is produced, modified, or used by a process. Artifacts are the tangible products of the project: the things the project produces or uses while working toward the final product.

- Business Vision
- Software Requirement
- Software Architecture Document
- Test Plan
- Configuration Management Plan
- Risk Management Plan
- Iteration Plan
- Iteration Assessment

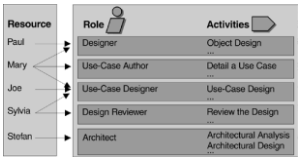
Artifacts are used as *input* by roles to perform an activity and are the result or *output* of such activities.



Who Will Create the Artifacts?

A role defines the behavior and responsibilities of an individual or of a group of individuals working together as a team.

The behavior is expressed in terms of activities the role performs
The responsibilities of each role are usually expressed in relation to certain artifacts that the role creates, modifies, or controls.

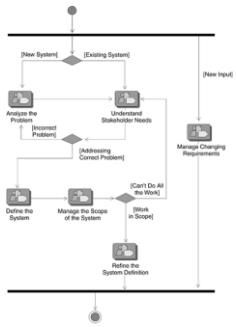


An activity is a unit of work that an individual in that role may be asked to perform and that produces a meaningful result in the context of the project.

RUP Roles

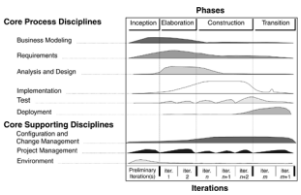
- *Analyst* roles
  - Business-Process Analyst
  - System Analyst
  - Requirements Specifier
- *Developer* roles
  - Software Architect
  - Designer
  - Implementer
- *Tester* roles
  - Test Designer
  - Tester
- *Manager* roles
  - Project Manager
  - Process Engineer
  - Management Reviewer
- Production and *support* roles
  - System Administrator

How to Create An Artifact?



A workflow is a sequence of activities that produces a result of observable value.

How Detailed Should a Workflow Be?



1. *Core workflows*, associated to each discipline
2. *Workflow details*, to refine the core workflow
3. Iteration plans

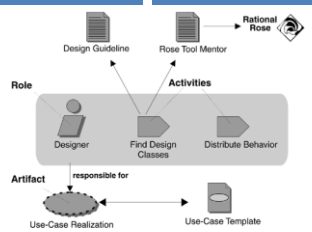
Disciplines are natural groupings of process activities, roles, and artifacts.

I Still Do Not Know How to Do It

Guidelines are rules, recommendations, or heuristics that support activities and steps, describe well-formed artifacts.

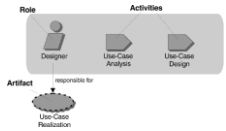
Tool mentors show you how to perform the steps using a specific software tool.

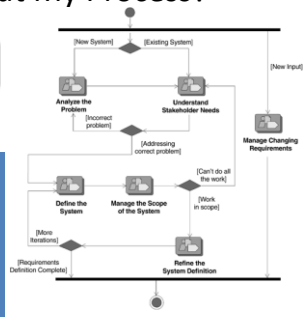
- Guidelines
- Templates
- Tool mentors
- Concepts



Guidelines, templates, and tool mentors *complement* the description of the process by providing detailed guidance to the practitioner.

How About My Process?





The Rational Unified Process model is built on five fundamental elements:

1. *Roles: the who*
2. *Activities: the how*
3. *Artifacts: the what*
4. *Workflows: the when*
5. *Disciplines: the "container" for the preceding four kinds of element*

What Is the RUP?

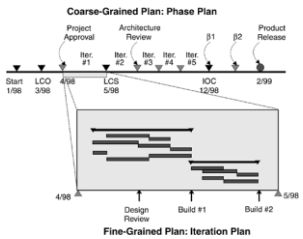
- The Rational Unified Process is a *software engineering process*.
  - It provides a disciplined approach to assigning tasks and responsibilities within a development organization.
- The Rational Unified Process is a *process product*.
  - It is developed and maintained by Rational Software and integrated with its suite of software development tools.
- The Rational Unified Process is also a *process framework*
  - that can be adapted and extended to suit the needs of an adopting organization.

The Project Management Discipline

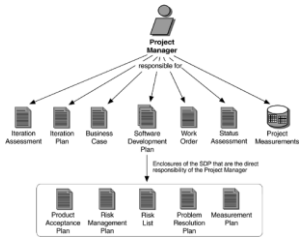
Purpose

- To provide a *framework* for managing software-intensive projects
- To provide *practical guidelines* for planning, staffing, executing, and monitoring projects
- To provide a framework for managing *risk*

Planning an Iterative Project

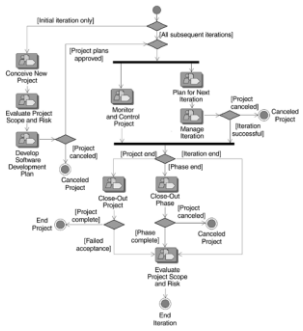


Roles and Artifacts

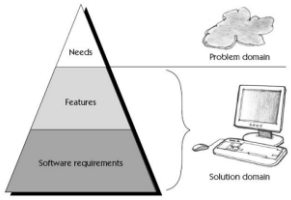


Roles and Artifacts

Workflow in Project Management



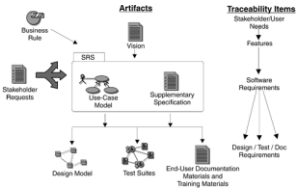
The Requirements Discipline



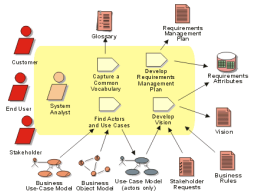
Purpose

- To establish and maintain agreement with the customers and other stakeholders on *what* the system should do—and *why*!
- To provide system developers with a better understanding of the *system requirements*
- To define the *boundaries* of (delimit) the system
- To provide a basis for *planning* the technical contents of iterations
- To provide a basis for *estimating* cost and time to develop the system
- To define a *user interface* for the system, focusing on the needs and goals of the users

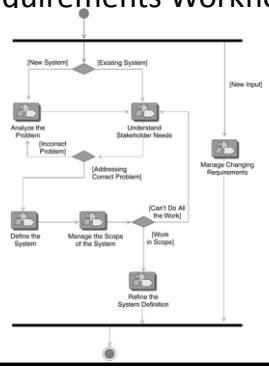
Capturing and Managing Requirements



Roles and Artifacts



Requirements Workflow

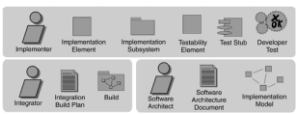


The Implementation Discipline

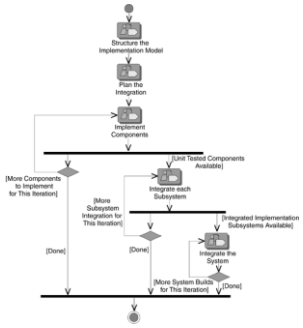
Purpose

- To define the *organization* of the code in terms of implementation subsystems organized in layers
- To *implement* classes and objects in terms of components (source files, binaries, executables, and others)
- To *test* the developed components as units
- To *integrate* into an executable system the results produced by individual implementers or teams

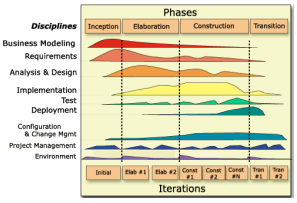
Roles and Artifacts

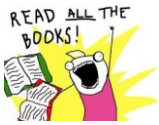


Implementation Workflow



Any More Disciplines?





RUP Practices

- *Iterative* development
- *Requirements* management
- *Architecture* and use of components
- *Modeling* and the UML
- Configuration and *change* management
- *Use-Case-Driven* development
- *Process* configuration
- *Tools* support

RUP Values

- Project-oriented
- Risk and value-driven
- Clear vision
- Well-defined process

Pitfalls

- There's a lot of really good stuff here. We need to do it ALL.

Thank You for Your Time