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OBJECT ORIENTED SOFTWARE ENGINEERING

Chapter Four

Object Oriented Analysis

by

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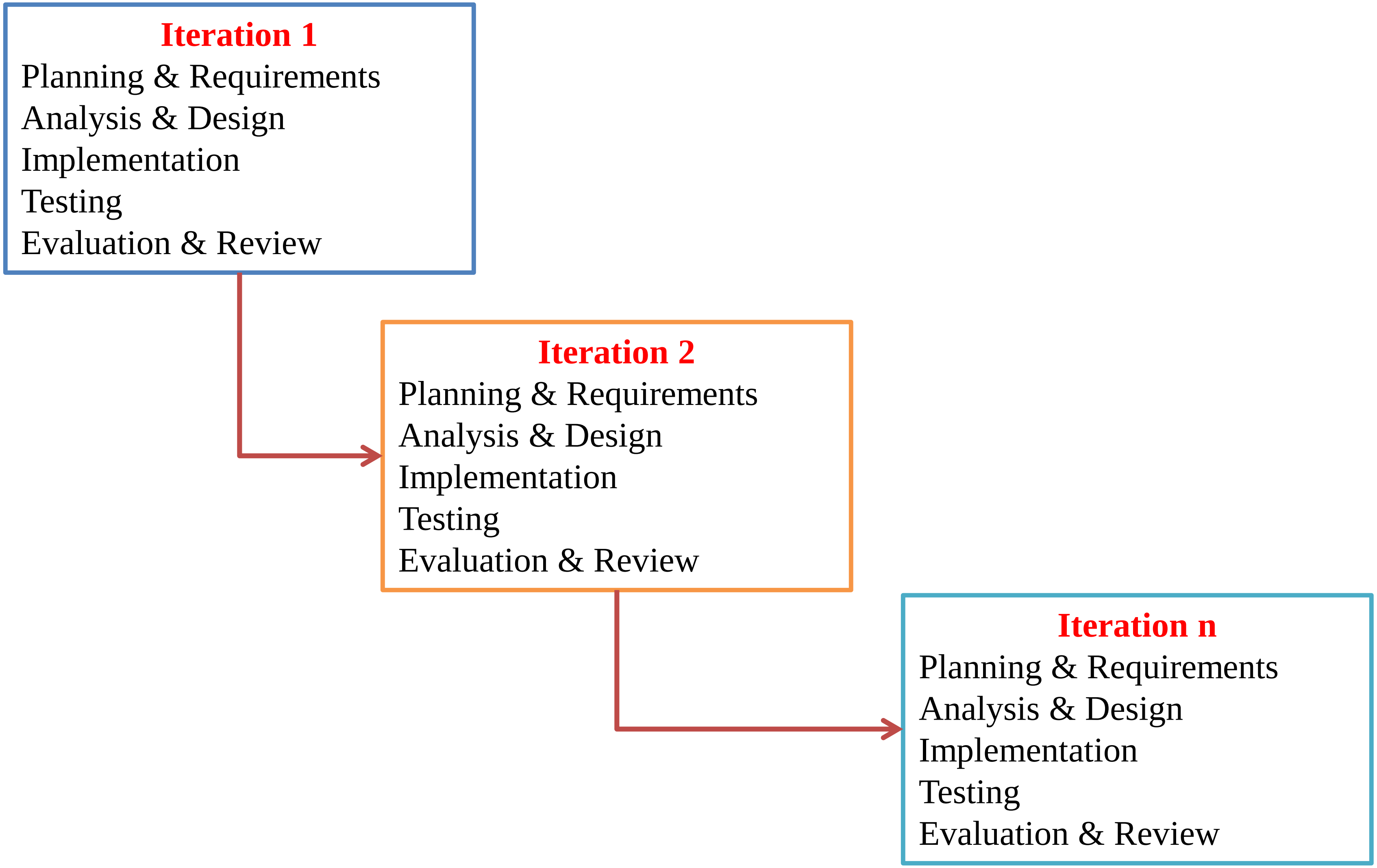
Iterative Development

Iterative Development

- The iterative process model is a cyclical process in which you make and test incremental adjustments. The iterative model is popular in technology, engineering, software development, design, qualitative research, project management (especially in Agile and Scrum), and more.

- At the most basic level, the process relies on a continual cycle of planning, analysis, implementation, testing, and evaluation. The iterative process starts with initial planning and overall requirements. Then the first, prioritized portion of the project becomes the initial cycle of development. That segment is refined by trial and error. Once finished, it forms the basis for the next chunk of the project. Each cycle improves on the overall product or project. The pace of this process is related to how effectively you work through the cycle. The iterative development process is a five steps process.

Iterative Development



Iteration 1

Planning & Requirements
Analysis & Design
Implementation
Testing
Evaluation & Review

Iteration 2

Planning & Requirements
Analysis & Design
Implementation
Testing
Evaluation & Review

Iteration n

Planning & Requirements
Analysis & Design
Implementation
Testing
Evaluation & Review

Iterative Development

© **Planning and Requirements:**

In this stage, map out the initial requirements, gather the related documents, and create a plan and timeline for the first iterative cycle.

© **Analysis and Design:**

Finalize the business needs, database models, and technical requirements based on the plan. Create a working architecture, schematic, or algorithm that satisfies your requirements.

© **Implementation:**

Develop the functionality and design required to meet the specifications.

© **Testing:**

Identify and locate what’s not working or performing to expectations. Stakeholders, users, and product testers weigh in with their experience.

© **Evaluation and Review:**

Compare this iteration with the requirements and expectations.

Iterative Development

© After we complete these steps, it’s time to tackle the next cycle. In the iterative process, the product goes back to step one to build on what’s working. Identify what you learned from the previous iteration.

© This iterative development, sometimes called circular or evolutionary development, is based on refining the first version through subsequent cycles, especially as you gather and include requirements.

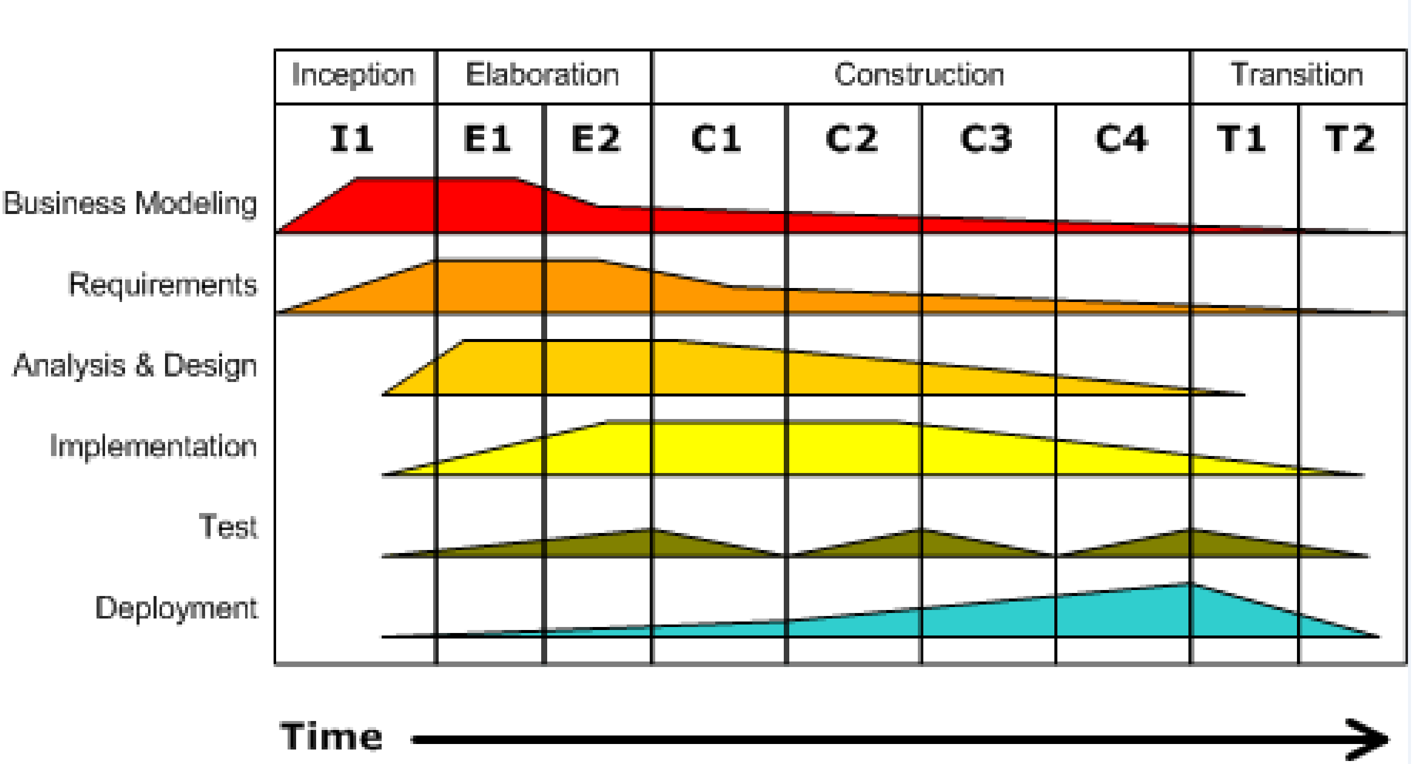
© It allows you to remain flexible as you identify new needs or unexpected business issues.

Unified process and UP phases

Unified Process

Unified Process

- The most successful approach for object oriented software development is Unified process/ Rational Unified Process (UP/ RUP).
- It is an approach that combines iterative and risk driven development into a well documented process description.



UP Phases *(Abstract)*

- **Inception:**
  - © The idea for the project is stated. The development team determines if the project is worth pursuing and what resources will be needed.
- **Elaboration**
  - © The project's architecture and required resources are further evaluated. Developers consider possible applications of the software and costs associated with the development.
- **Construction**
  - © The project is developed and completed. The software is designed, written, and tested.
- **Transition**
  - © The software is released to the public. Final adjustments or updates are made based on feedback from end users.

UP Phases *(description)*

- **Inception**
  - © The requirements are gathered.
  - © Feasibility study and scope of the project are determined.
  - © Actors and their interactions are analyzed.

- **Elaboration**
  - © Project plan is developed.
  - © Risk assessment is performed.
  - © Non-functional requirements are elaborated.
  - © Software architecture is described.
  - © Use case model is completed.

UP Phases

- **Construction**
  - All the components are developed and integrated.
  - All features are tested.
  - In each iteration, refactoring (clarifying and simplifying the design of existing code, without changing its behavior) is done.
  - Stable product should be released.

- **Transition**
  - Software product is launched to user.
  - Deployment baseline should be complete.
  - Final product should be released.

- **UP Conclusion:**
  - © Input to a process is the needs or requirements of the system.
  - © Process is the set of activities to reach goal.
  - © Output is the software product.

UP Disciplines

There are nine disciplines in Unified process, they are:

- **Model**

  The goal of this discipline is to understand the business of the organization, the problem domain being addressed by the project, and to identify a viable solution to address the problem domain.

- **Requirements**

  The goal of this discipline is to elicit stakeholder feature/function requirements in order to define the scope of the project.

- **Analysis and Design**

  The goal of this discipline is to define the requirements into actionable and executable designs and models.

UP Disciplines

- **Implementation**

  The goal of this discipline is to transform your model(s) into executable code and to perform a basic level of testing, in particular unit testing.

- **Test**

  The goal of this discipline is to perform an objective evaluation to ensure quality. This includes finding defects, validating that the system works as designed, and verifying that the requirements are met.

- **Deployment**

  The goal of this discipline is to plan for the delivery of the system and to execute the plan to make the system available to end users.

UP Disciplines

- **Configuration Management**

  The goal of this discipline is to manage access to your project artifacts. This includes not only tracking artifact versions over time but also controlling and managing changes to them.

- **Project Management.**

  The goal of this discipline is to direct the activities that takes place on the project. This includes managing risks, directing people (assigning tasks, tracking progress, etc.), and coordinating with people and systems outside the scope of the project to be sure that it is delivered on time and within budget.

UP Disciplines

- Environment

  The goal of this discipline is to support the rest of the effort by ensuring that the proper process, guidance (standards and guidelines), and tools (hardware, software, etc.) are available for the team as needed.

Agile Unified Process

→Assignment