Software analysis and design

Module 8: Analysis and Design Overview

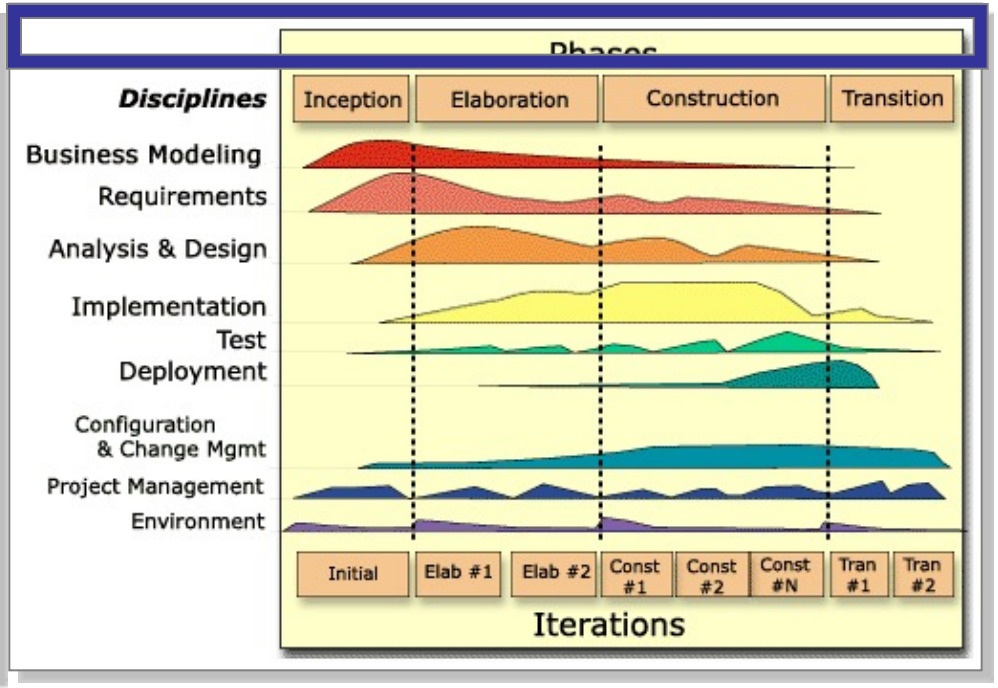
Objectives: Analysis and Design Overview

- Review the key Analysis and Design terms and concepts
- Introduce the Analysis and Design process, including roles, artifacts and workflow
- Explain the difference between Analysis and Design

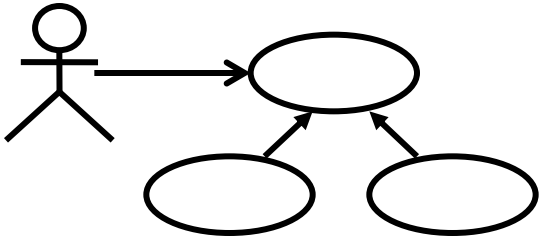
Analysis and Design in Context

The purposes of Analysis and Design are to:

- Transform the requirements into a design of the system-to-be.
- Evolve a robust architecture for the system.
- Adapt the design to match the implementation environment, designing it for performance.

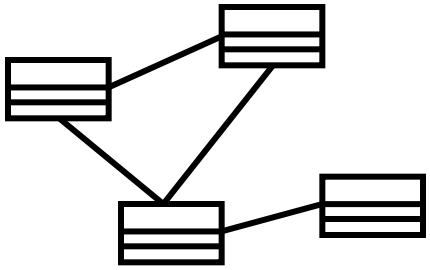


Analysis and Design Overview

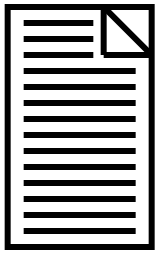


Use-Case Model

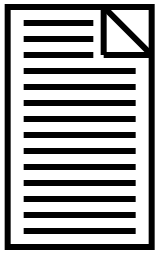
Analysis and Design



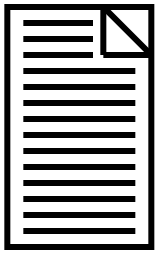
Design Model



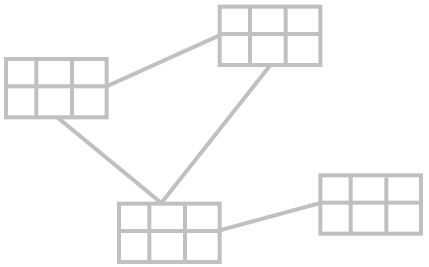
Glossary



Supplementary Specification



Architecture Document



Data Model

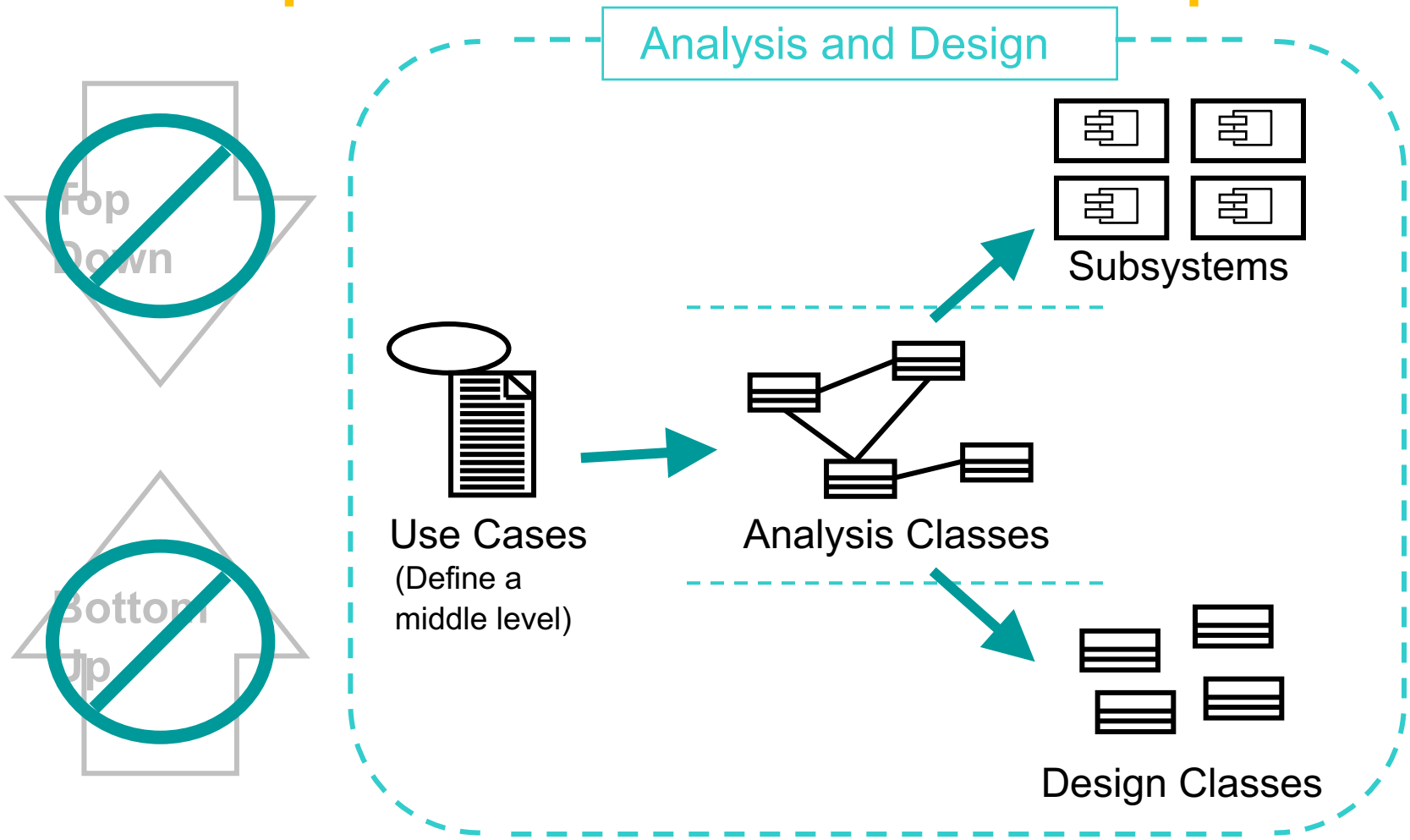
Analysis & Design Overview Topics

- Key Concepts
- Analysis and Design Workflow

Analysis Versus Design

Analysis	Design
▪ Focus on understanding the problem ▪ Idealized design ▪ Behavior ▪ System structure ▪ Functional requirements ▪ A small model	▪ Focus on understanding the solution ▪ Operations and attributes ▪ Performance ▪ Close to real code ▪ Object lifecycles ▪ Nonfunctional requirements ▪ A large model

Analysis and Design Are Not Top-Down or Bottom-Up



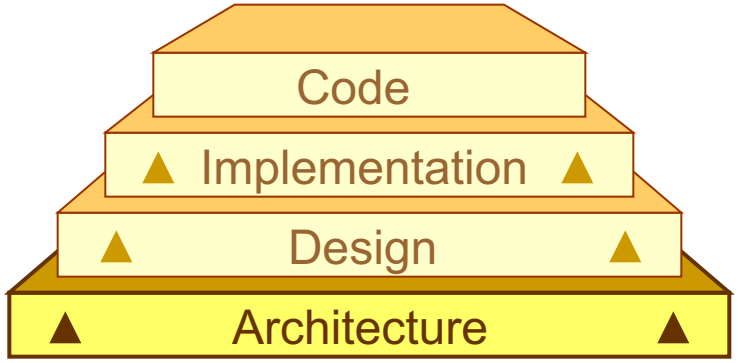
What Is Architecture?

- Software architecture encompasses a set of significant decisions about the organization of a software system
- The architecture for similar systems should be similar

Architecture = Elements + Form + Rationale

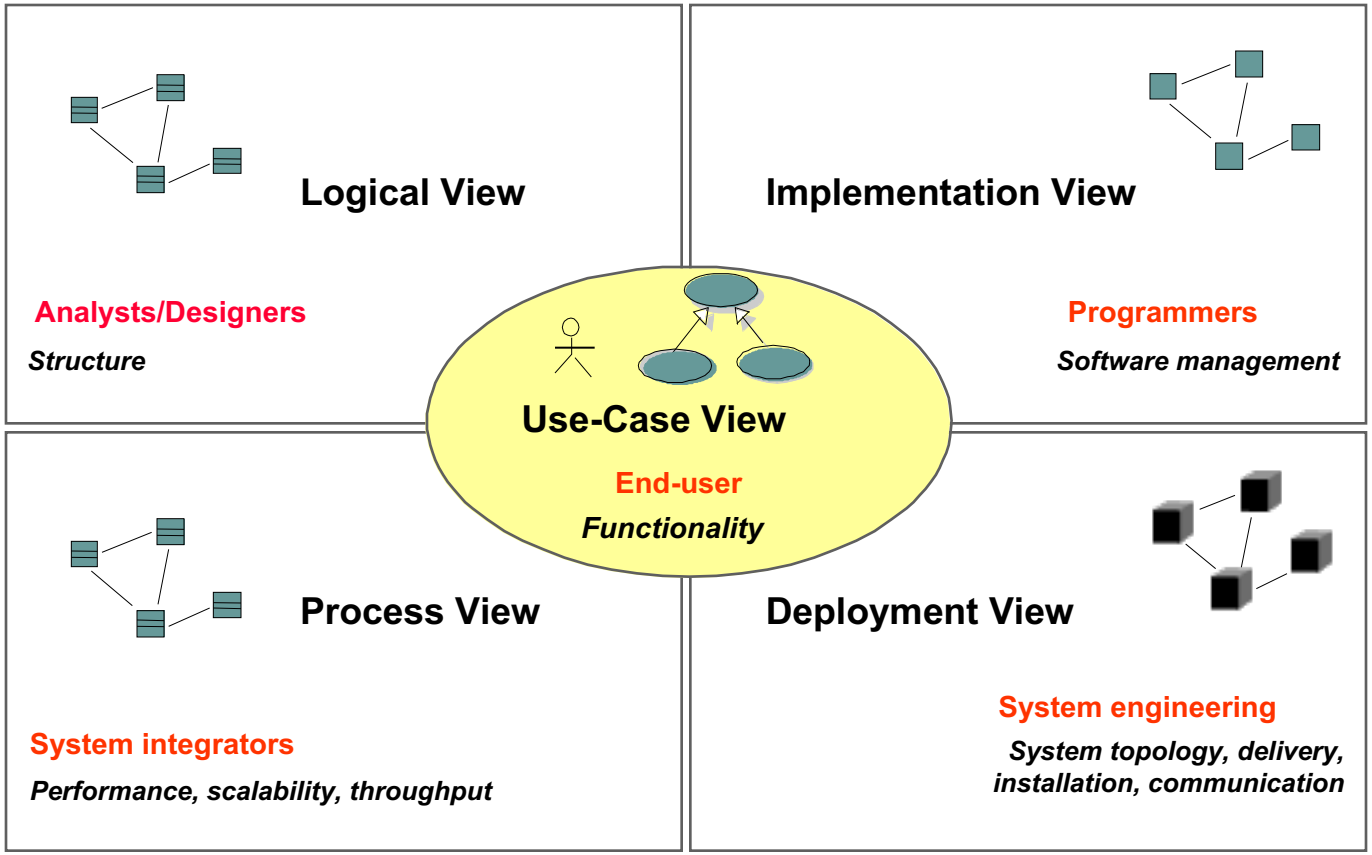
Architecture Constrains Design and Implementation

- Architecture involves a set of strategic design decisions, rules or patterns that constrain design and construction.



Architecture decisions are the most fundamental decisions, and changing them will have significant effects.

Software Architecture: The “4+1 View” Model



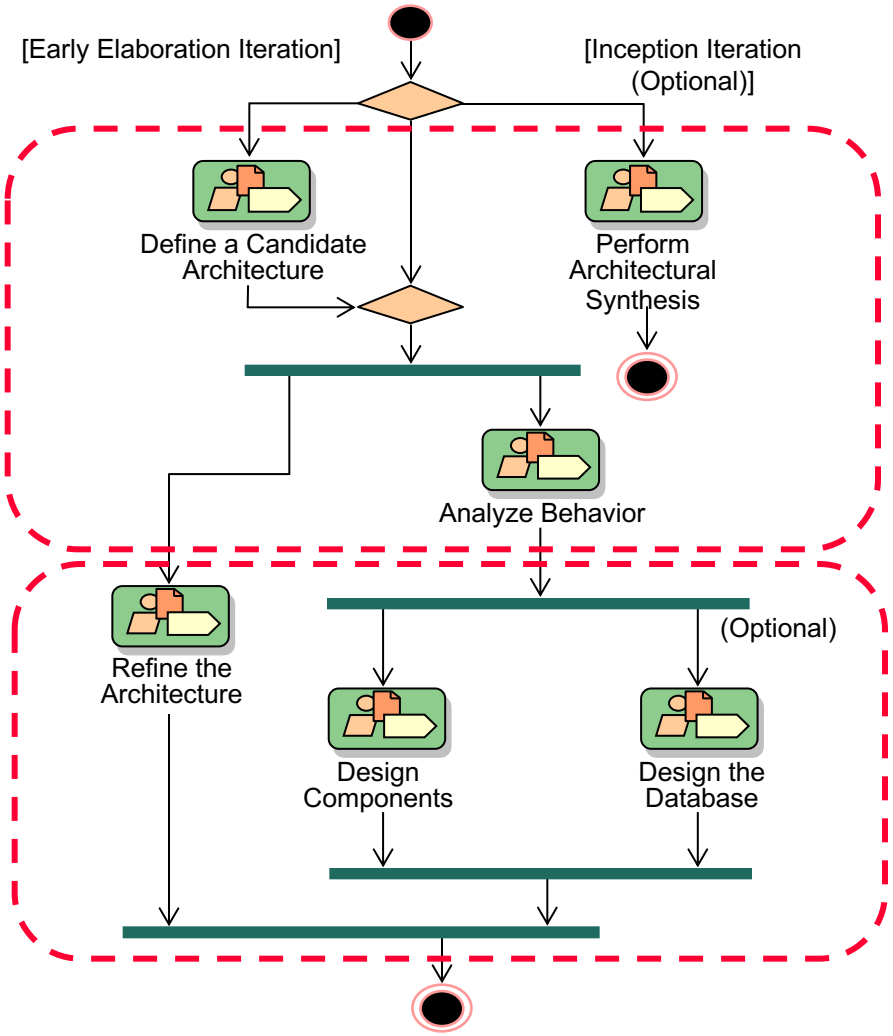
Analysis & Design Overview Topics

- Key Concepts
- Analysis and Design Workflow

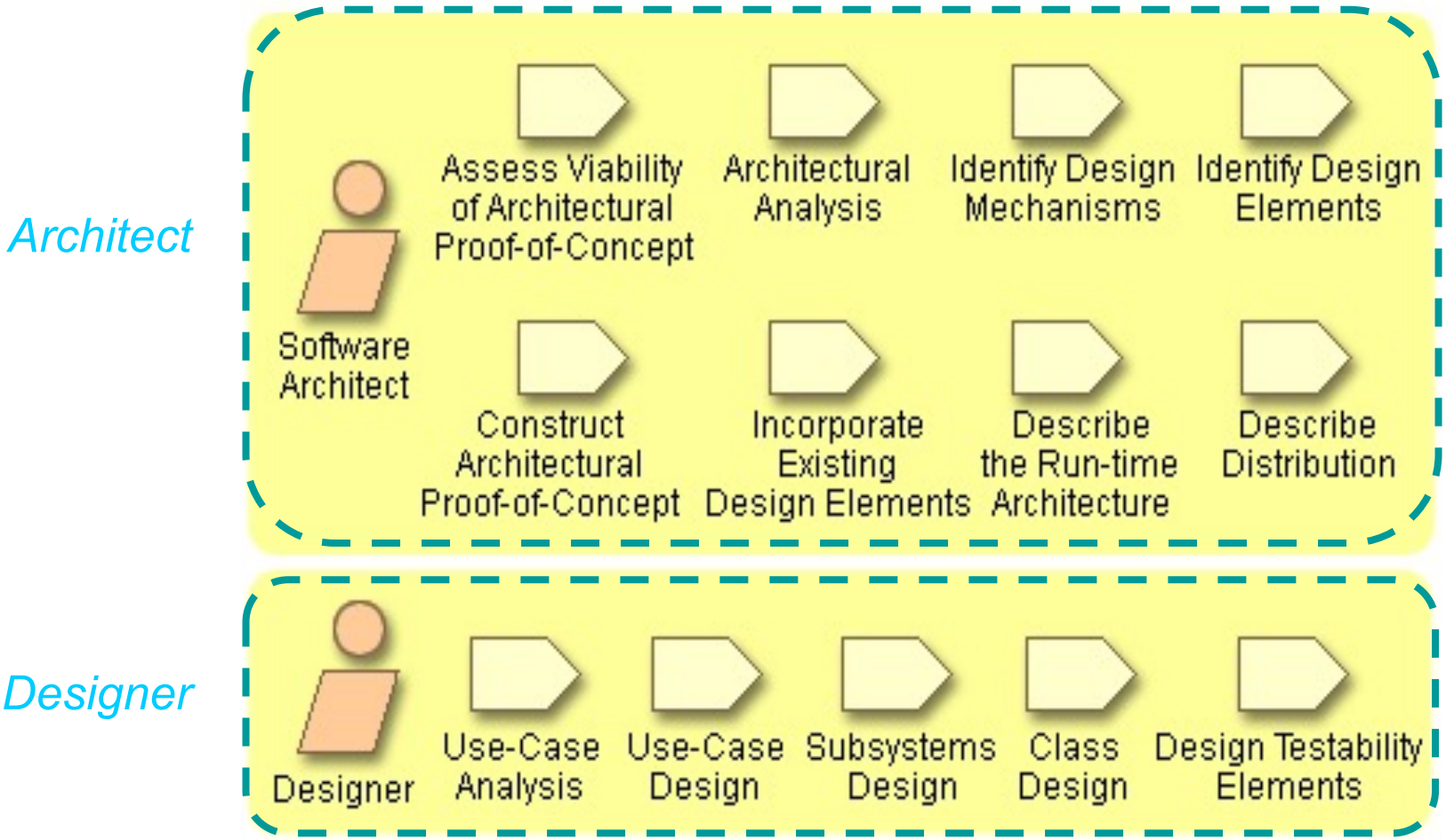
Analysis and Design Workflow

Analysis

Design

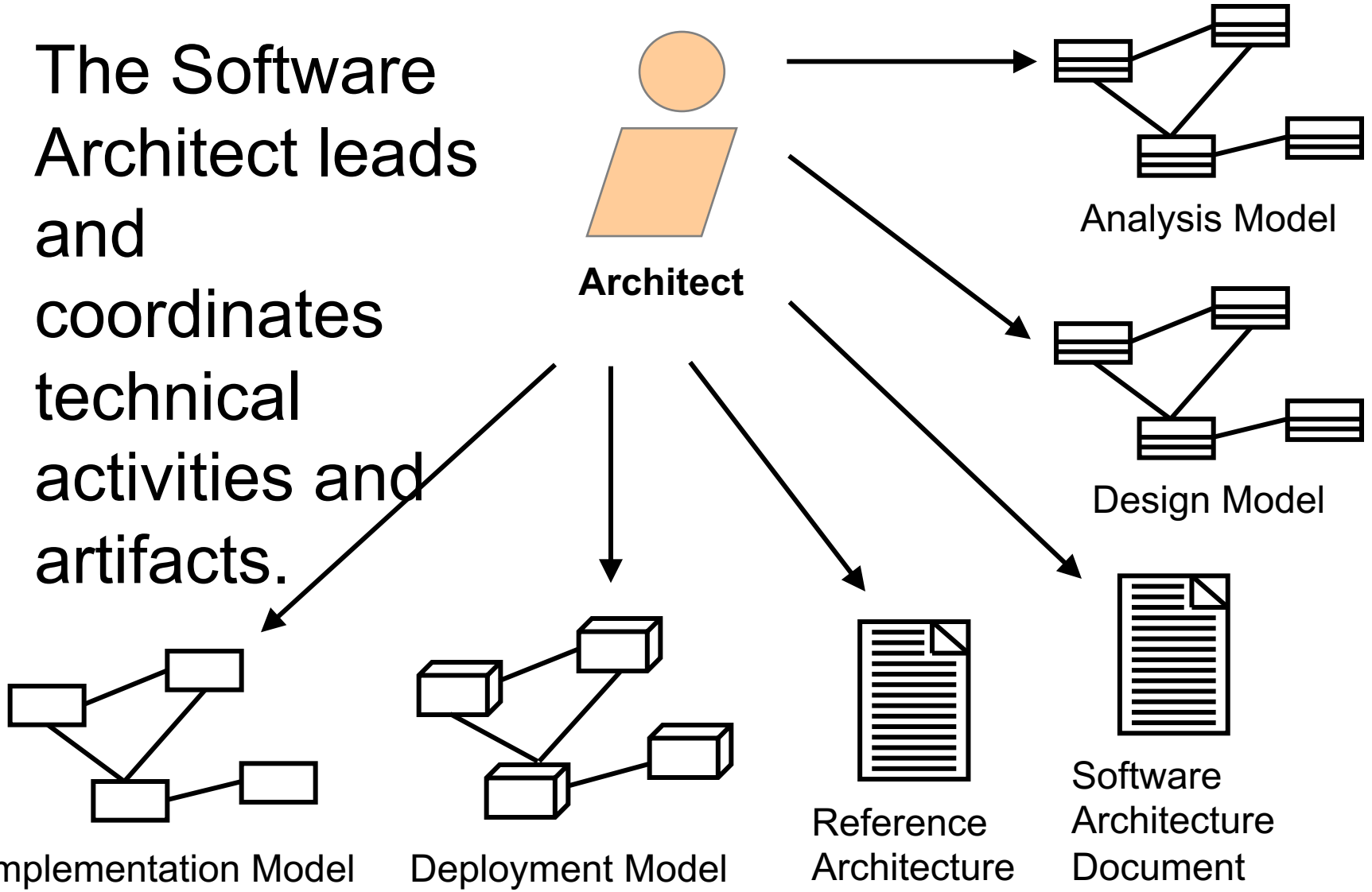


Analysis and Design Activity Overview



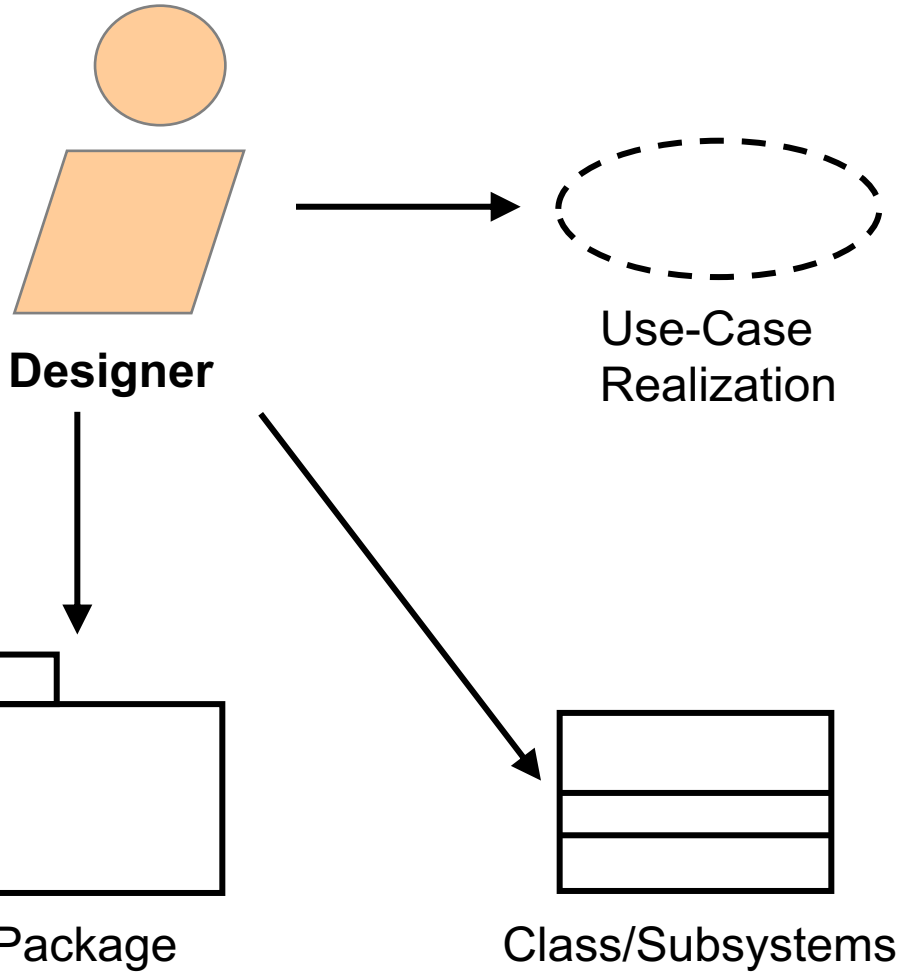
Software Architect's Responsibilities

- The Software Architect leads and coordinates technical activities and artifacts.



Designer's Responsibilities

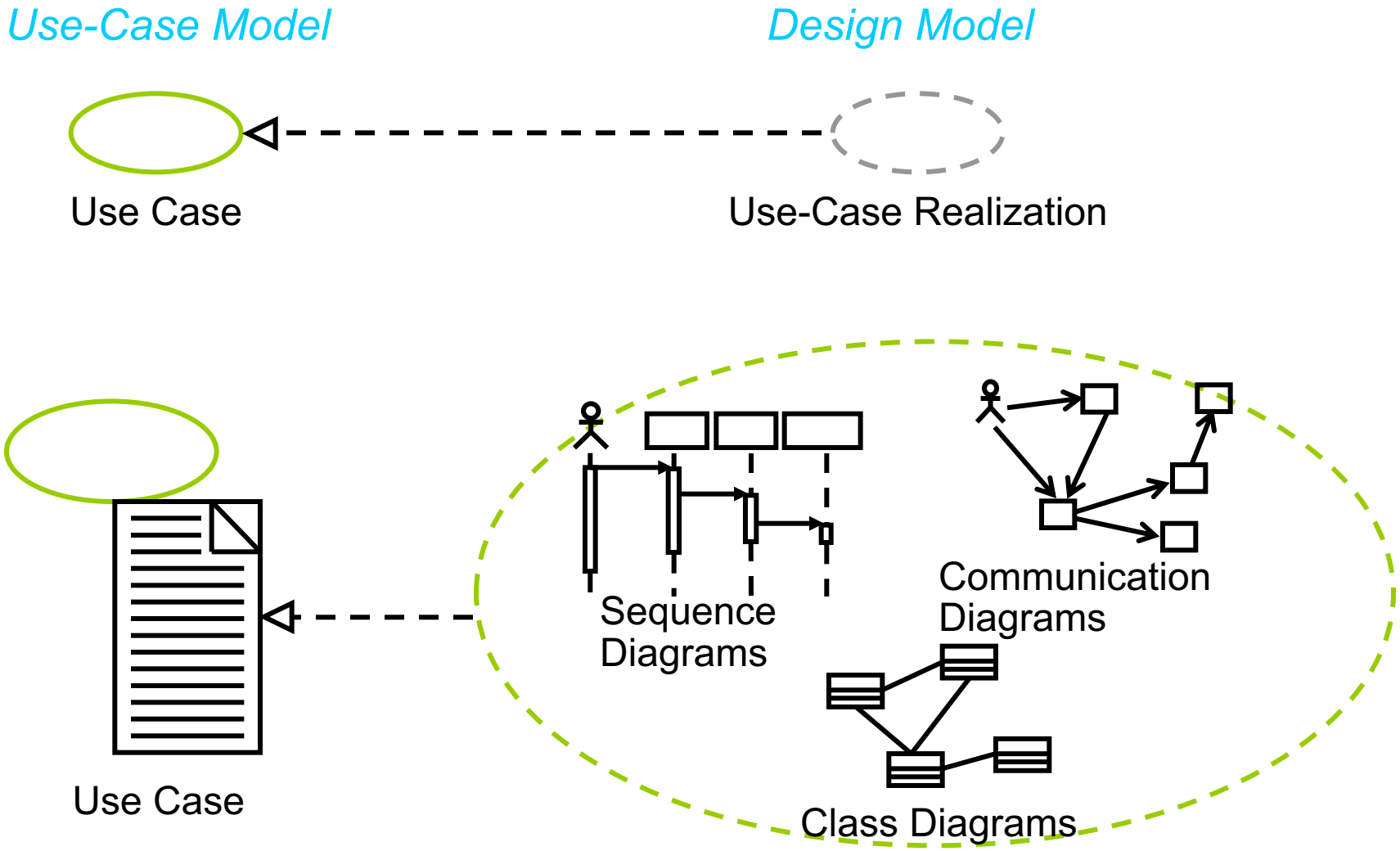
- The designer must know use-case modeling techniques, system requirements, and software design techniques.



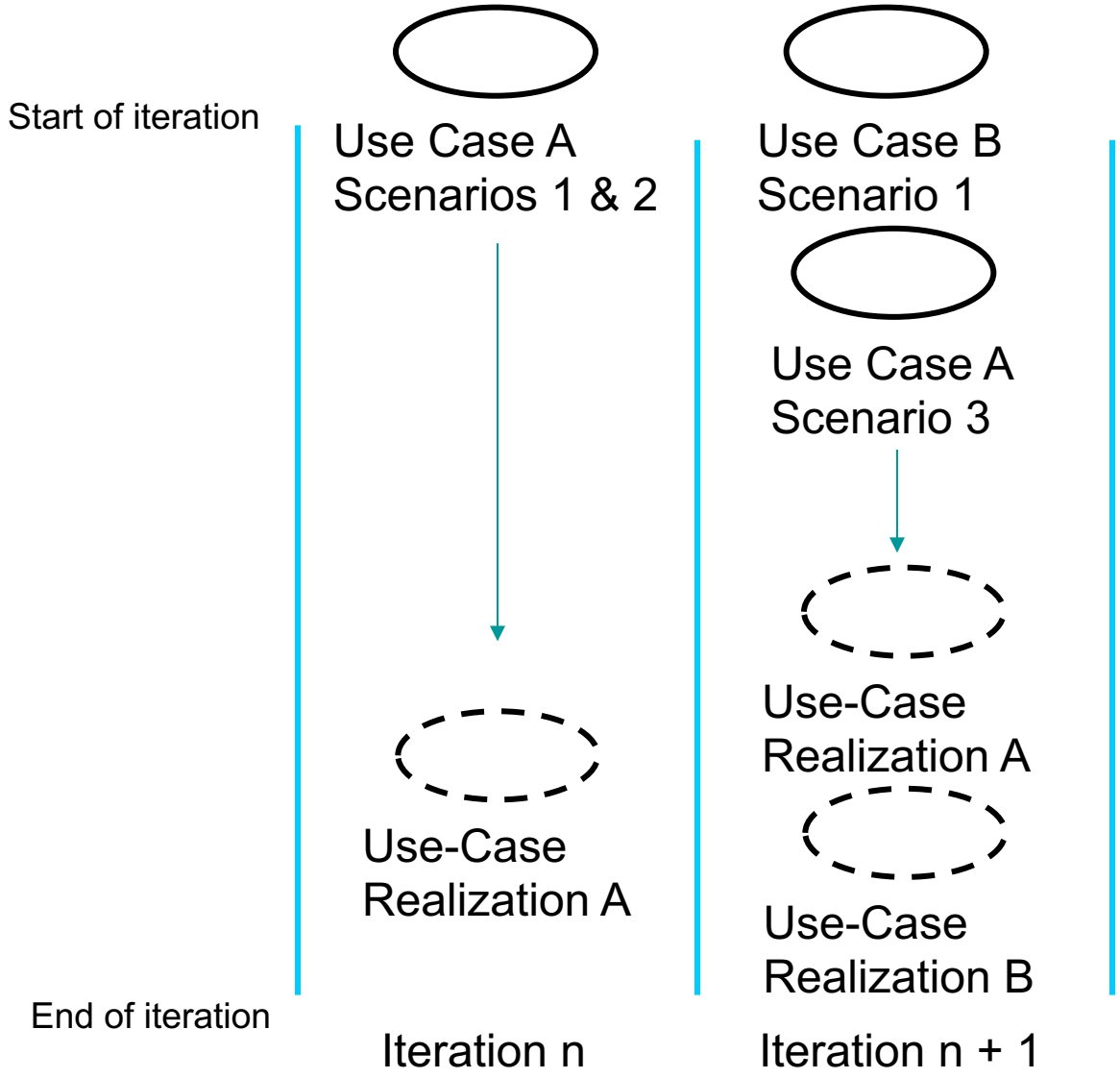
Review: Analysis and Design Is Use-Case Driven

- Use cases defined for a system are the basis for the entire development process.
- Benefits of use cases:
  - Concise, simple, and understandable by a wide range of stakeholders.
  - Help synchronize the content of different models.

What Is a Use-Case Realization?



Analysis and Design in an Iterative Process



Review: Analysis and Design Overview

- What is the purpose of the Analysis and Design Discipline?
- What are the input and output artifacts?
- Name and briefly describe the 4+1 Views of Architecture.
- What is the difference between Analysis and Design?
- What is architecture?