IT4490 - SOFTWARE DESIGN AND CONSTRUCTION

4. OVERVIEW OF ANALYSIS & DESIGN

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Some slides extracted from IBM coursewares

Objectives: Analysis and Design Overview

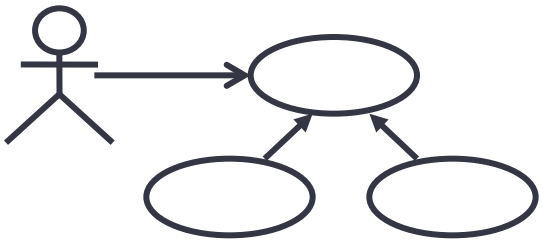
- Review the key Analysis and Design terms and concepts
- Introduce the Analysis and Design process, including roles, artifacts and workflow
- Explain the difference between Analysis and Design

Analysis and Design in Context

The purposes of Analysis and Design are to:

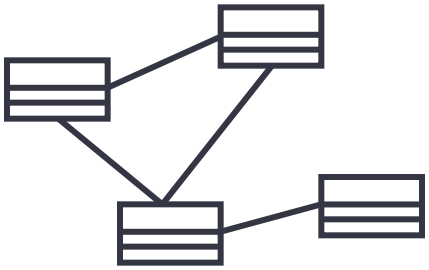
- **Transform the requirements into a design of the system-to-be.**
- **Evolve a robust architecture for the system.**
- **Adapt the design to match the implementation environment, designing it for performance.**

Analysis and Design Overview



Use-Case Model

Analysis and Design

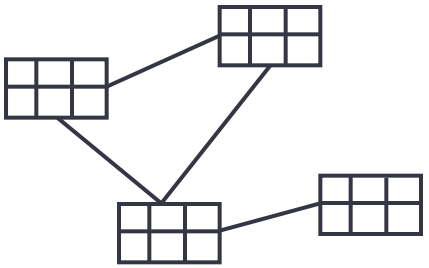


Design Model

Glossary

Supplementary Specification

Architecture Document

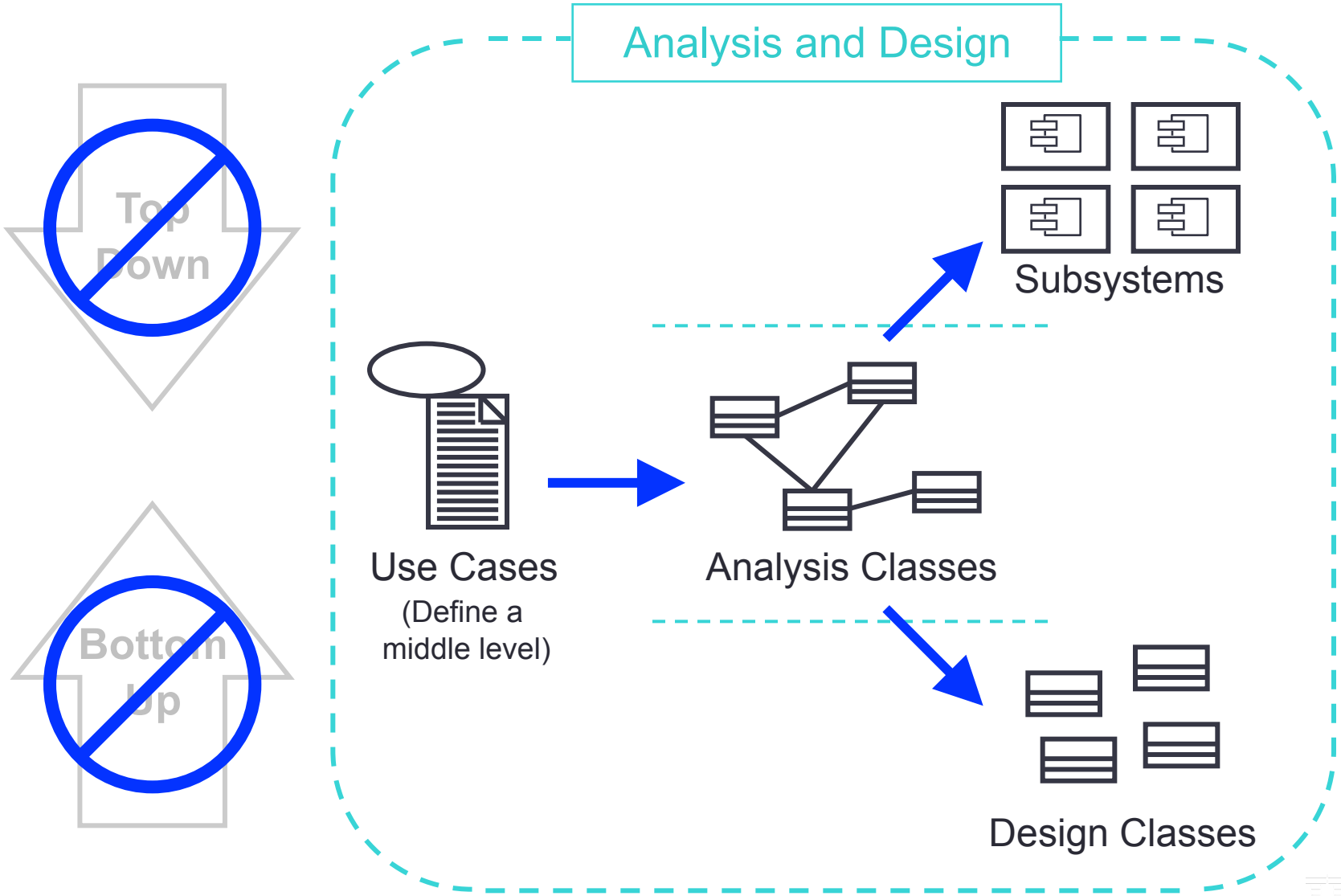


Data Model

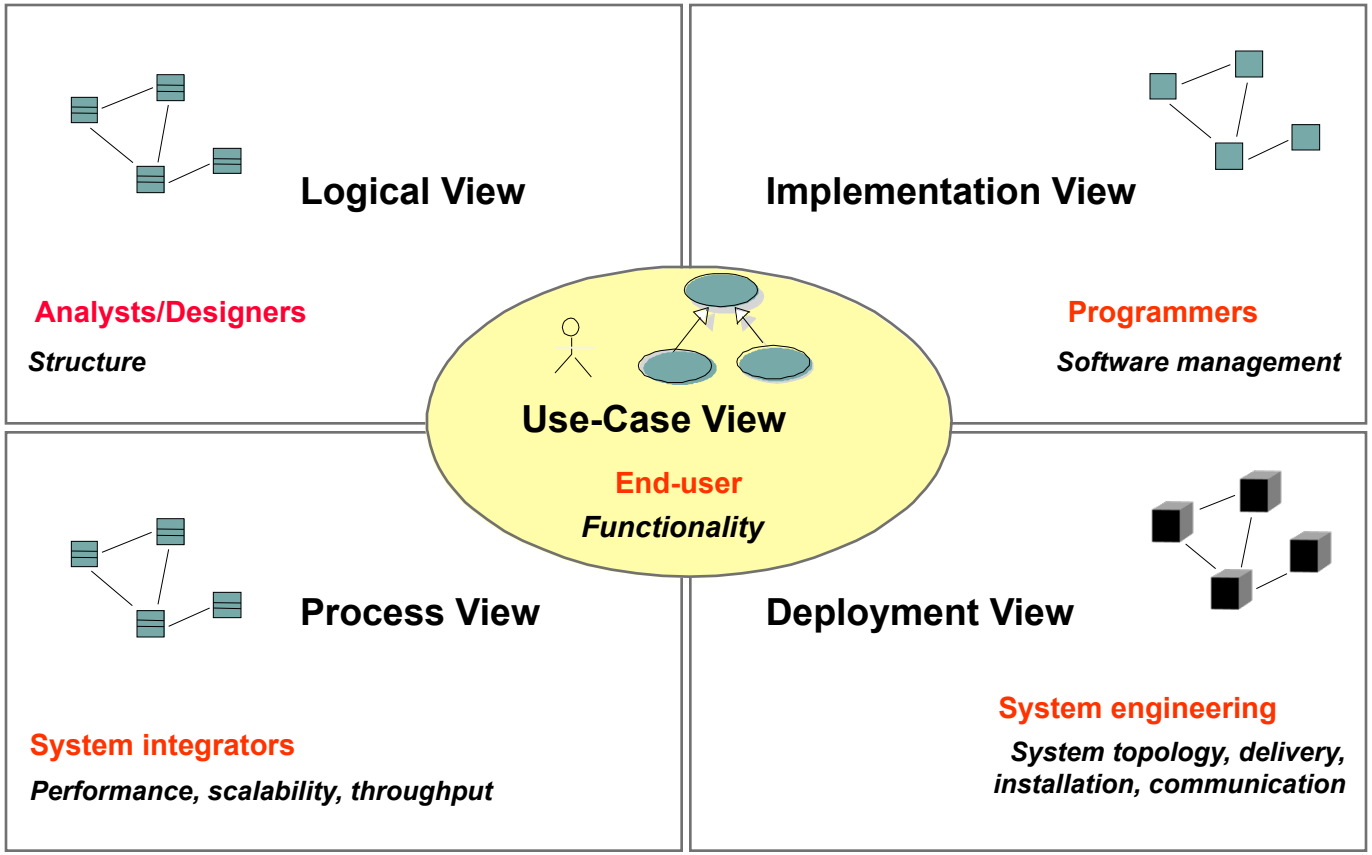
Analysis Versus Design

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



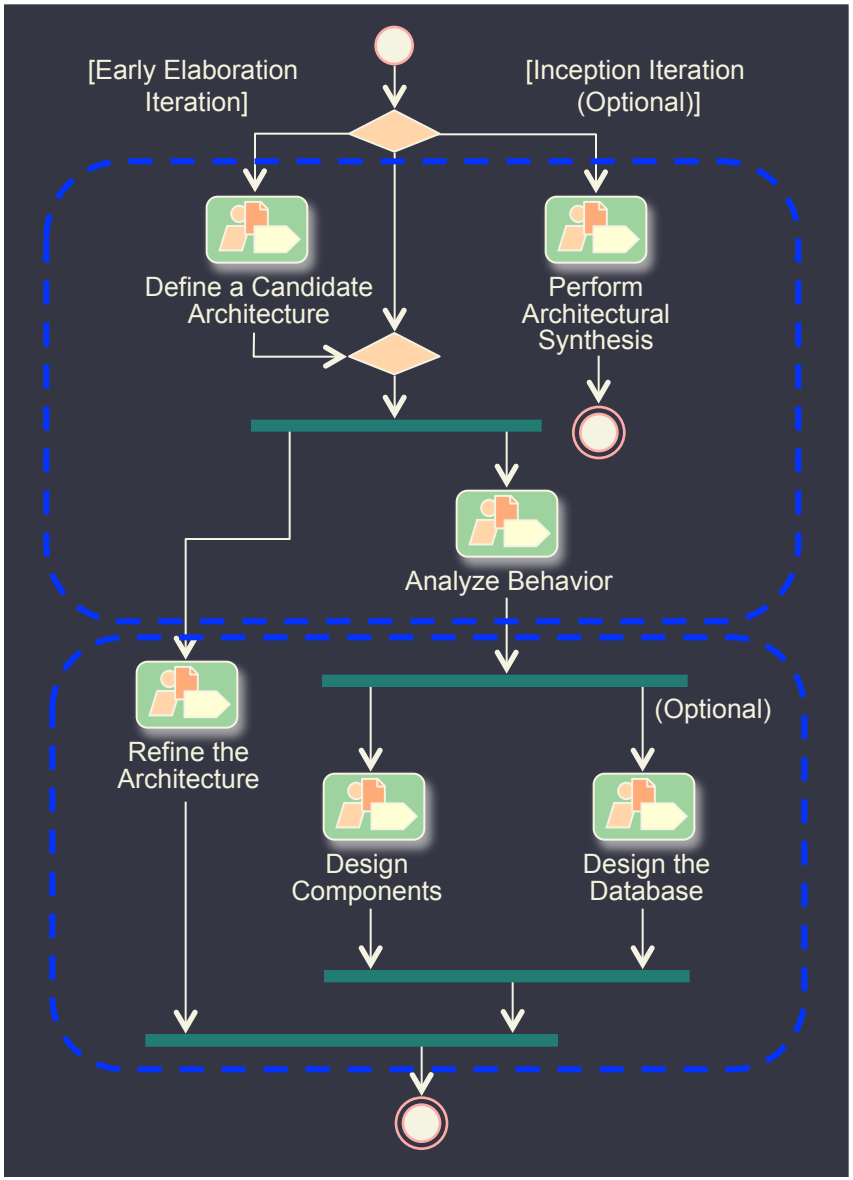
Software Architecture: The “4+1 View” Model



Analysis and Design Workflow

Analysis

Design

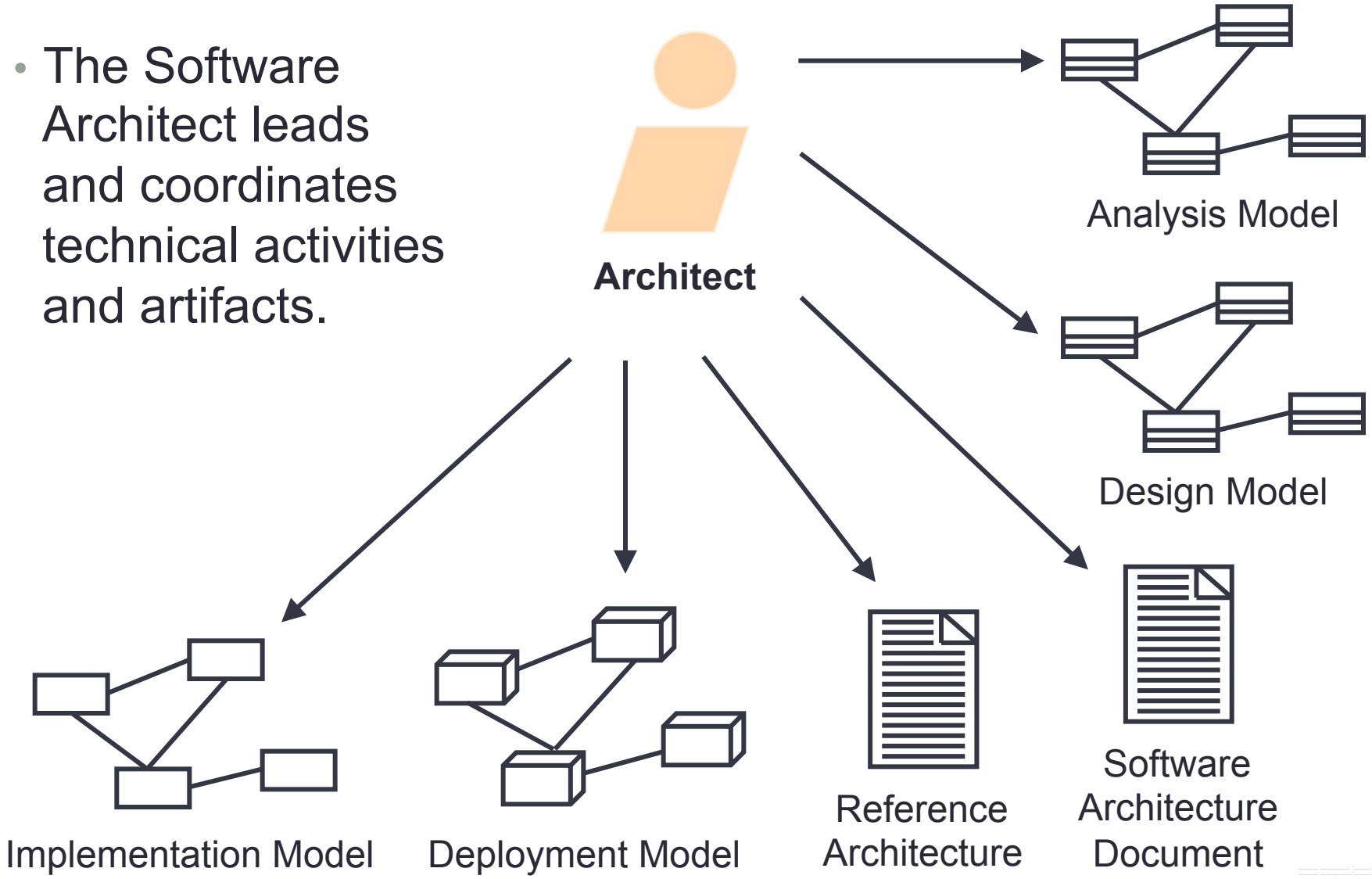


Analysis and Design Steps

Activity	Step	Description	Doer
Define a candidate architecture	1. Architectural Analysis	• Once at early Elaboration • Skip if architectural risk is low	Architect
Analyze behavior	**2. Use case Analysis**	• **Per Use case**	**Designer**
Refine the architecture	**3. Identify Design Elements**	• **Coupling and cohesion** • **Reusability**	**Architect**
	4. Identify Design Mechanisms	• Design patterns	
	5. Describe Run-time Architecture	• Skip if not multi-threading • Process View	
	6. Describe Distribution	• Physical Architecture	
Design components	**7. Use case Design**	• **Per Use case**	**Designer**
	8. Subsystem Design		
	9. Class Design		
Design DB	**10. Database Design**		

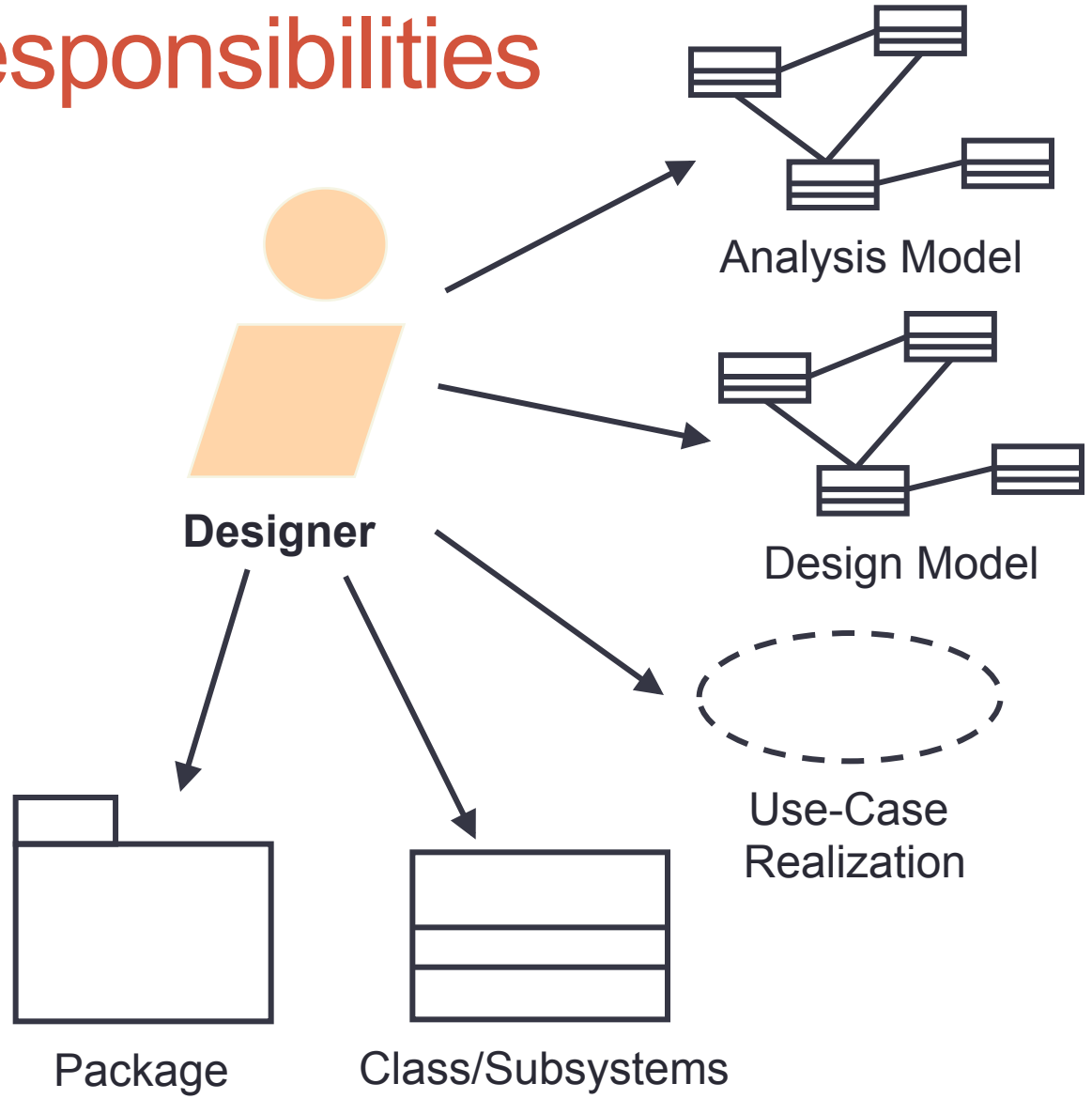
Software Architect's Responsibilities

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



Designer's Responsibilities

- Must know use-case modeling techniques, system requirements, and software design techniques
- Use case realization



What Is a Use-Case Realization?