

# Object Oriented Analysis Design (OOAD)

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# Overview

- The Fundamental of OOAD
- Analysis in OO
- Design in OO
- The Implementation of OOAD

# Fundamental of OOAD



# Four Pillar of Object Oriented

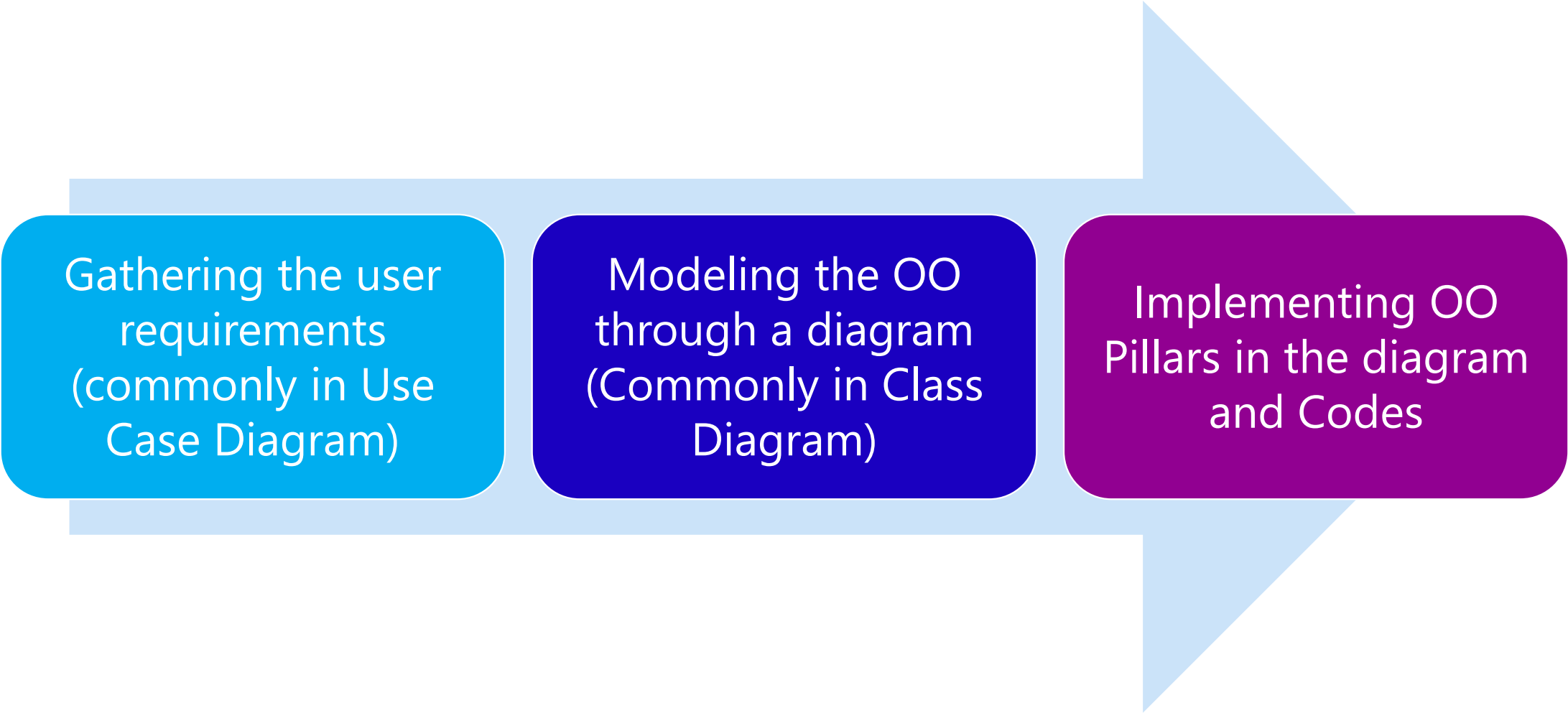
**Abstraction**

**Polymorphism**

**Inheritance**

**Encapsulation**

# Modeling Object Oriented



Gathering the user requirements  
(commonly in Use Case Diagram)

Modeling the OO through a diagram  
(Commonly in Class Diagram)

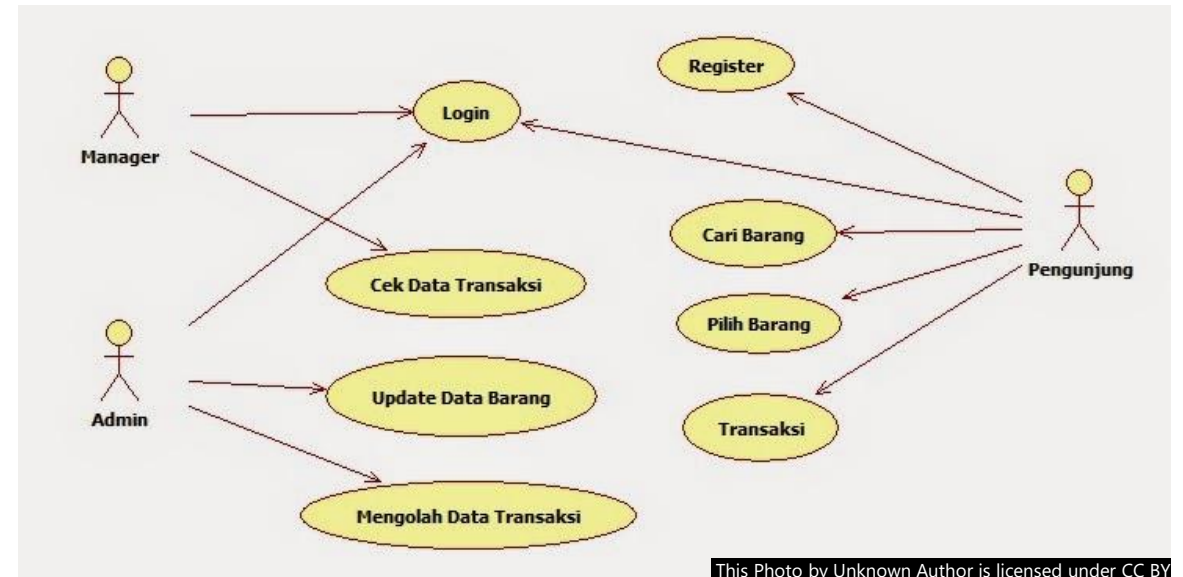
Implementing OO Pillars in the diagram and Codes

# Forward Engineering

- Creating a skeleton codes using class diagram model
- Provided by CASE (Computer Aided Software Engineering) Tools
  - Enterprise Architect
  - Rational Rose
  - Visual Paradigm
  - Power Designer
- Other ways: reverse engineering or round trip

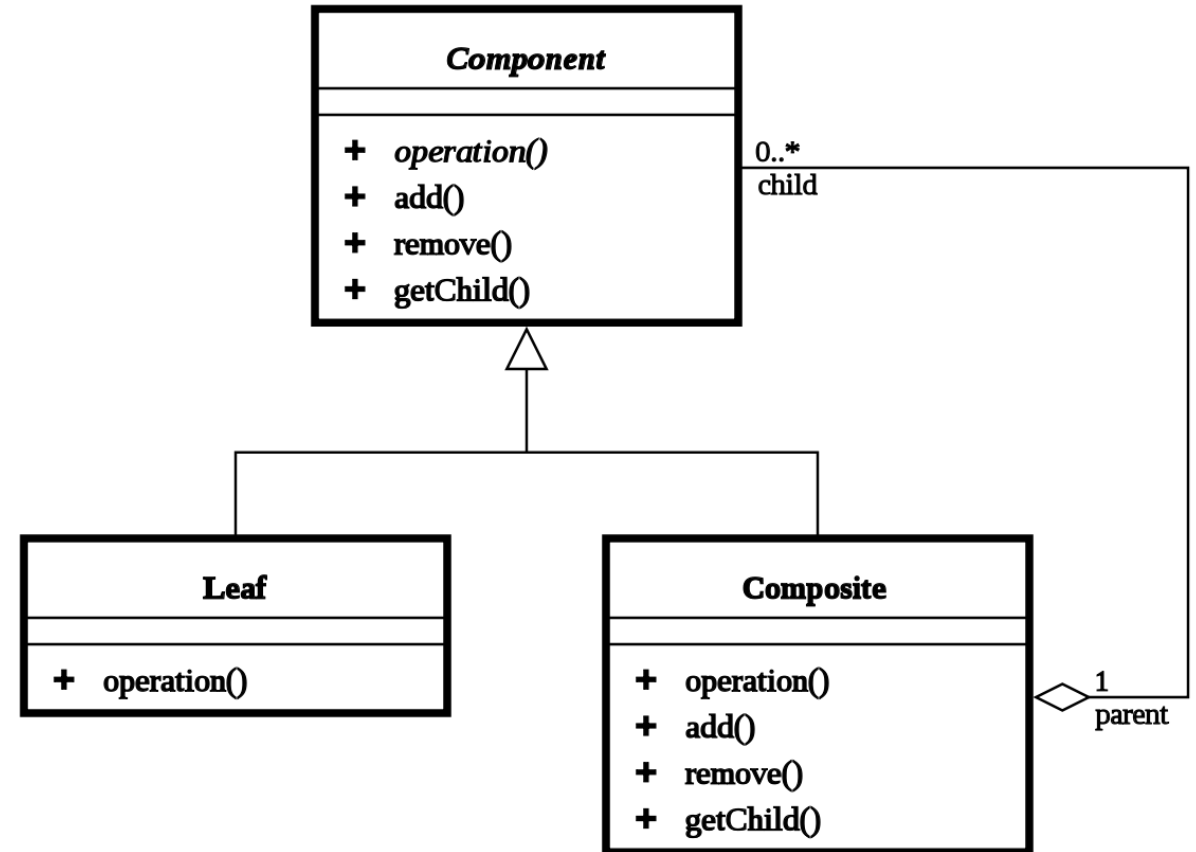
# Review the Use Case Diagram

- Kite Level
- Sea Level



# Review the Class Diagram

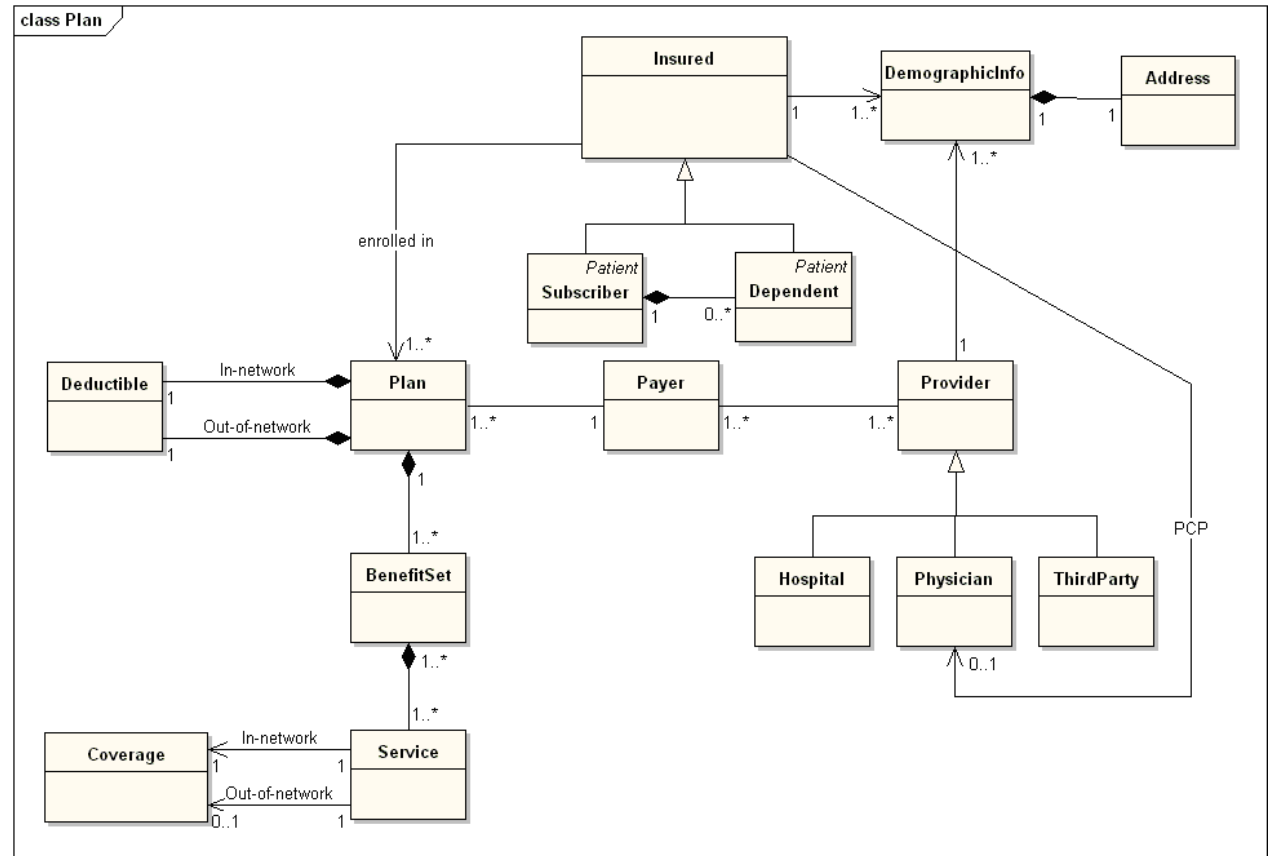
- Domain Model Level
- Object Model Level





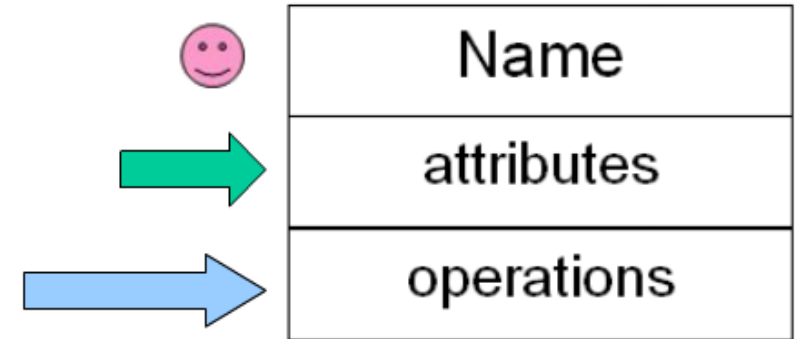
# Domain Model

- As a conceptual model of a domain of interest
- It contains
  - Entity Name
  - Relation between entity

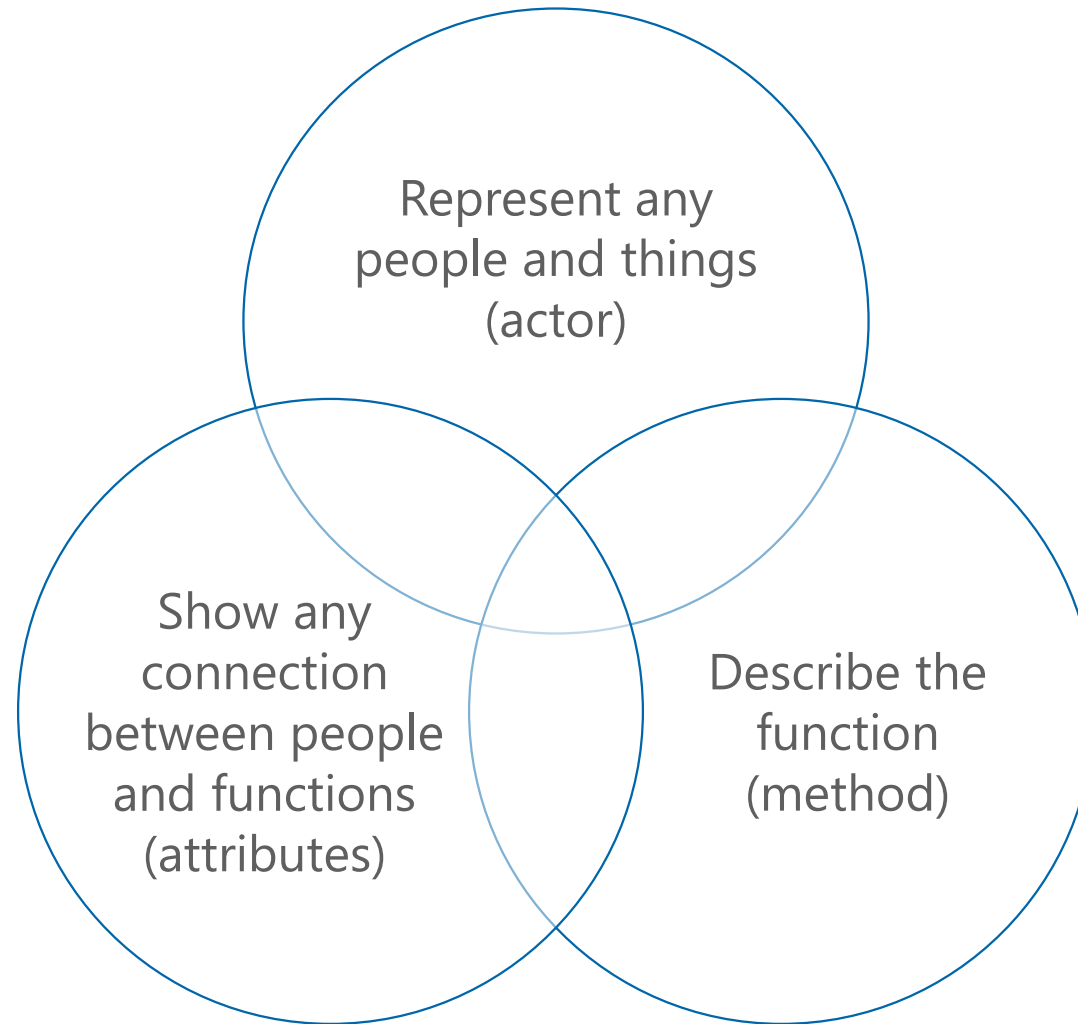


# Objects model

- Entity Name
  - Things, abstractions or concept
  - may be defined as a thing which is recognized as being capable of an independent existence
- Attribute
  - Entity characteristics
- Operations
  - Capability and functions



# Object Oriented Model Should



# Others Diagram

Entity  
Relationship  
Diagram

Activity  
Diagram

Component  
Diagram

Software  
Deployment  
Diagram

Business Process  
Modelling  
Notation

# Demo

Implementing OO Model in UML Diagram

# Why OOAD

**Software Complexity is increasing**

**Algorithm is multifaceted**

**Distributed but Connected**

# Object Oriented Analysis



# What is OO Analysis

Method of analysis that examines the requirements from the perspectives the classes & objects found in the vocabulary of the problem domain

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# Examples of Verbatim Requirements

Member request book in the library. Member can ask the librarian or look for himself. Member ask the book to the librarian. Librarian will tell the location and the availability of the book. Member will confirm to rent the book. Librarian will note the rent date return. Member should return the book based on the rent date return. Memberi will have maximum ten books.

# Analysis Characteristics

- Highest level of abstraction
- Obtain the objects until uniquely identified
- The Objects should be abstracted
- More investigation than solution

# Exercise

Try writing your requirement and do noun-verb analysis

# Object Oriented Design



# What is OO Design

Method of design encompassing the process of OO Decomposition for depicting both logical dan physical as well as static and dynamic model

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# Logical vs Physical

## LOGICAL DATA MODEL VERSUS PHYSICAL DATA MODEL

### LOGICAL DATA MODEL

Model that describes the data as much as possible, without regard to how they will be physical implemented in the database

Defines the data elements and their relationships

Data Architects and business analysts create logical data model

The objective of logical data model is to develop a technical map of rules and data structures

Simpler than the physical data model

### PHYSICAL DATA MODEL

Model that represents how the actual database is built

Allows developing the actual database

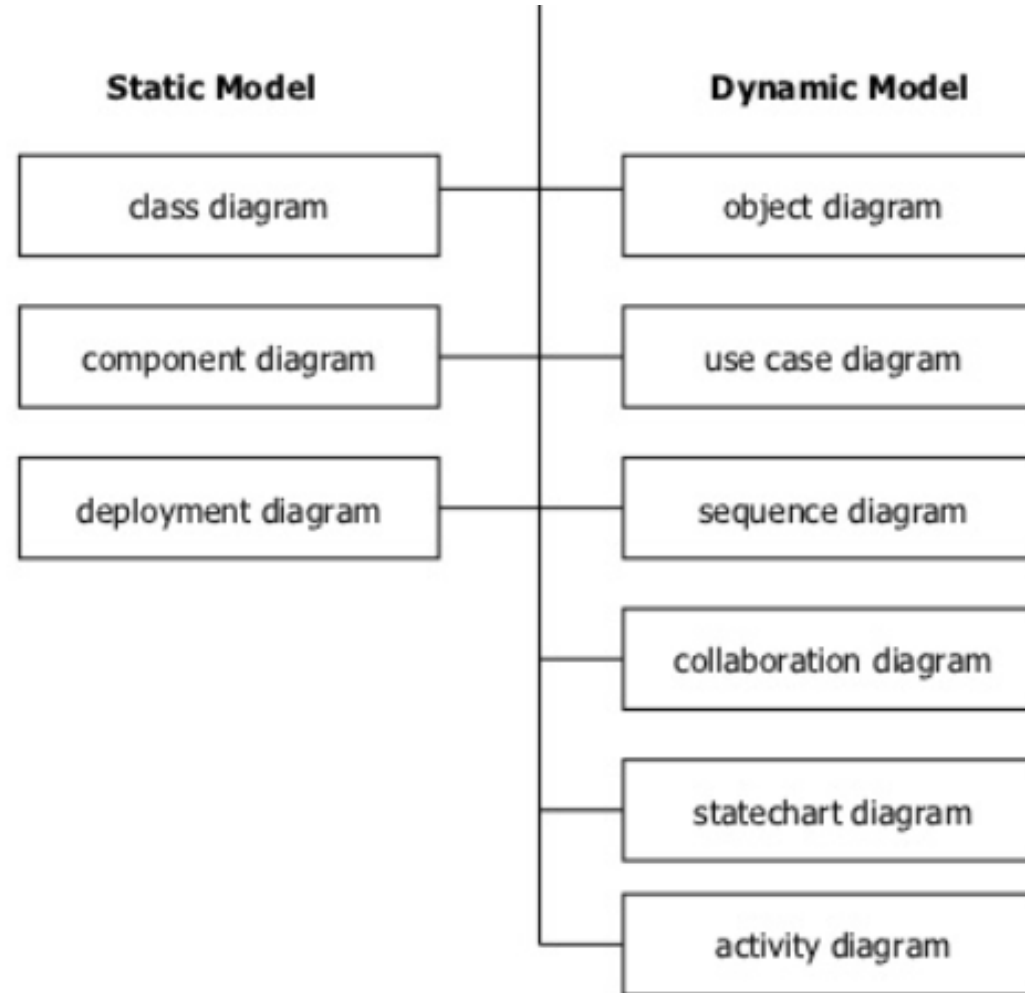
Database Administrators and developers create physical data model

The objective of physical model is to implement the actual database

Complex than the logical data model

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# Static and Dynamic



Source: Arlow and Neustadt, *UML and the Unified Process* (Addison-Wesley, 2002), p. 11.

# Exercise

Try writing your design in UML



# Keypoints

