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FACULTY OF ENGINEERING & TECHNOLOGY

BCS-503: Object Oriented Techniques

Lecture-07

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OBJECTIVES

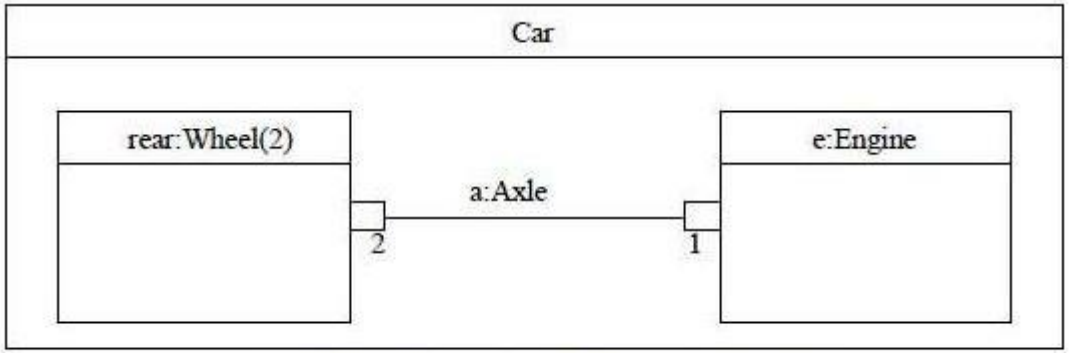
In this PPT, you will learn to:

- ❖Composite Structure Diagrams
- ❖Interaction Overview Diagrams
- ❖Associating UML Diagrams with UML Modeling Techniques
- ❖Software System Architecture

COMPOSITE STRUCTURE DIAGRAMS

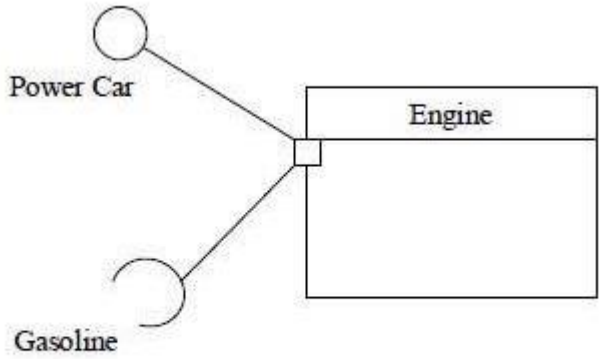
- A composite structure diagram represents the internal structure and interaction points of a classifier.
- Classifier refers to classes, objects, or interfaces.
- Interaction points refer to the points within a classifier using which the classifier interacts with other parts of the system.
- Composite structure diagrams are used to explore run-time instances of interconnected classifiers collaborating over communications links.
- A composite structure diagram is made up of several elements, such as parts, ports, and interfaces.
- A part is an element that represents a set of one or more instances owned by the containing classifier instance.

COMPOSITE STRUCTURE DIAGRAMS (Contd.)



Parts in a Composite Structure Diagram

- **A port can interact in both directions.**



Port and Interfaces in a Composite Structure Diagram

INTERACTION OVERVIEW DIAGRAMS

- Interaction overview diagrams give an overview of interaction diagrams. Interaction diagrams include the following types of diagrams:

    1) Sequence diagram

    2) Communication diagram

    3) Timing diagram

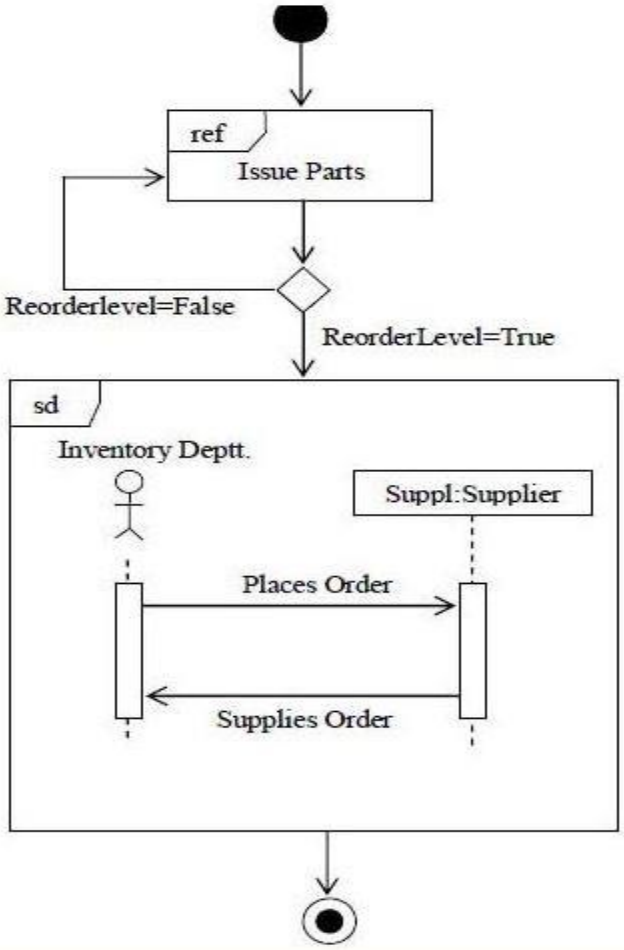
    4) Interaction overview diagram

- Interaction overview diagrams represent the logical interaction between the interaction diagrams and the process flows in between the set of interaction diagrams.

- Interaction overview diagrams are a variant of activity diagrams.

INTERACTION OVERVIEW DIAGRAMS (Contd.)

Example of Interaction Overview Diagram



Interaction Overview Diagram for Inventory Management System

ASSOCIATING UML DIAGRAMS WITH UML MODELING TECHNIQUES

You can divide all the UML diagrams into four modeling techniques :

Requirements modeling: Involves depicting the requirements using use case diagrams.

Static modeling: Involves depicting the static constituents of the software system using the class, object, and composite structure diagrams.

Dynamic modeling: Involves depicting the behavior of static constituents using the following diagrams:

- Activity diagrams
- State machine diagrams
- Communication diagrams
- Sequence diagrams
- Interaction overview diagrams
- Timing diagrams

Architectural modeling: Involves depicting the architecture of the software system into multiple tiers, such as presentation, business, and resource by using the following diagrams:

- Package diagram
- Component diagram
- Deployment diagram

SOFTWARE SYSTEM ARCHITECTURE

The architecture of a software system is defined as an arrangement of the static and dynamic constituents in a model. You can view the architecture of a software system from different perspectives.

The various views of a software system are:

- **Use case view:** Indicates the functionalities that the system offers to each stakeholder.
- **Design view:** Focuses on the static and dynamic representation of the system.
- **Process view:** Represents various processes executing in a system at a given instance of time.
- **Implementation view:** Represents the physical system including files and components required to assemble the system.
- **Deployment view:** Represents the hardware components on which the software system will execute.

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Multiple Choice Question:

Q1. What is the Interaction diagram?

a) Interaction diagrams are the UML notations for dynamic modeling of collaborations

b) Interaction diagrams are a central focus of engineering design

c) All of the mentioned

d) None of the mentioned

Multiple Choice Question:

Q2. What are the different interaction diagram notations does UML have?

a) A sequence diagram

b) A communication diagram

c) An interaction overview diagram

d) All of the mentioned

Multiple Choice Question:

Q3. Which of the following diagram is time oriented?

a) Collaboration

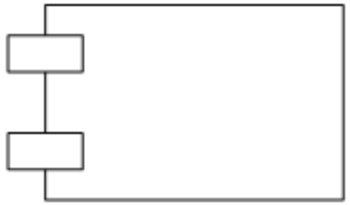
b) Sequence

c) Activity

d) None of the mentioned

Multiple Choice Question:

Q4. Which core element of UML is being shown in the figure?



a) Node

b) Interface

c) Class

d) Component

Multiple Choice Question:

Q5. How many diagrams are here in Unified Modelling Language?

a) six

b) seven

c) eight

d) nine

Summary

In this PPT, you learned that:

- The thirteen UML diagrams are use case, class, object, communication, sequence, state machine, activity, component, deployment, timing, composite structure, Interaction overview, and package.
- The architecture of a software system can be viewed from the different perspectives of the stakeholders.