Expert topic: Unified Modelling Language

Name: Mayank Kapadi

Matriculation Number: 6920518

L.079.07002 Project Group: Adaptive Virtual Chemistry Laboratory for Study Preparation

PADERBORN UNIVERSITY

Outline

- What is UML?
- Classification of UML
- Overview
- Questions

What is UML?

- **UML** stands for **Unified Modeling Language**, is a standardized modeling language consisting of an integrated set of diagrams, developed to help system and software developers for specifying, visualizing, constructing, and documenting the artifacts of software systems, as well as for business modeling and other non-software systems.

- The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

- The UML is a very important part of developing object oriented software and the software development process.

- The UML uses mostly graphical notations to express the design of software projects.

Classification of UML

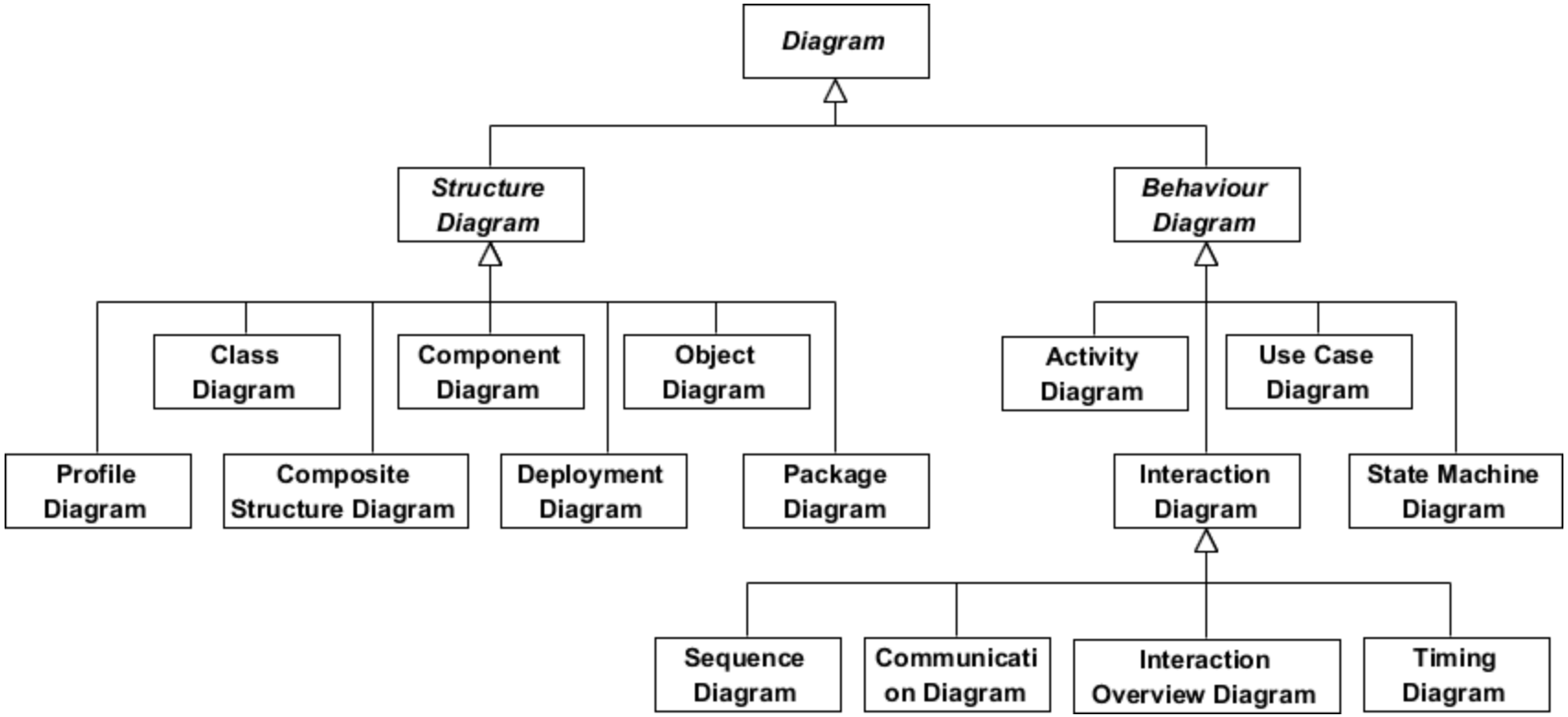

Fig 1: Classification of UML diagrams*

*https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-uml/

Class Diagram

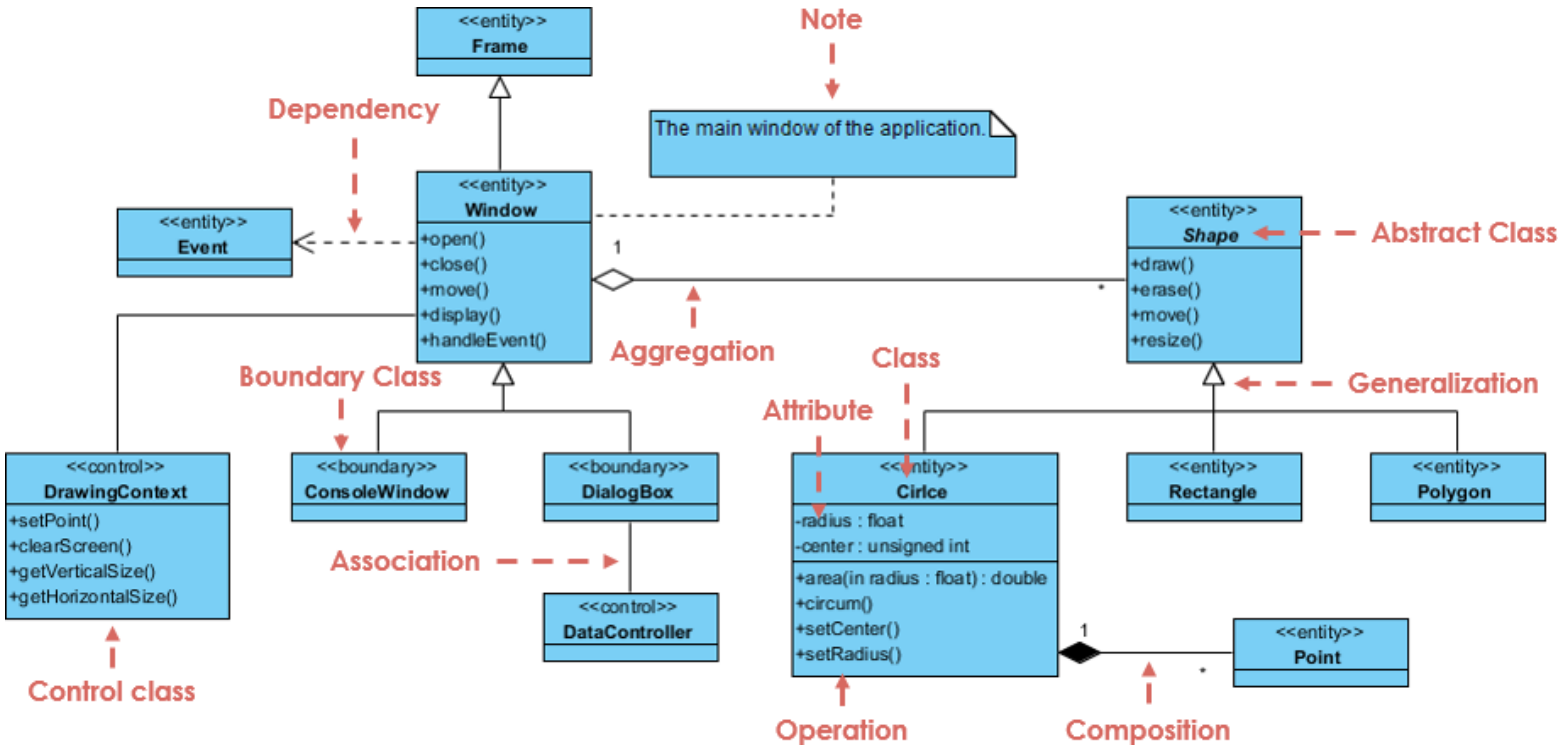

Fig 2: Class Diagram example*

- Class diagram describes the types of objects in the system and various kinds of static relationships which exist between them.
- Types of relationship: Association, Generalization and Aggregation.

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Component Diagram

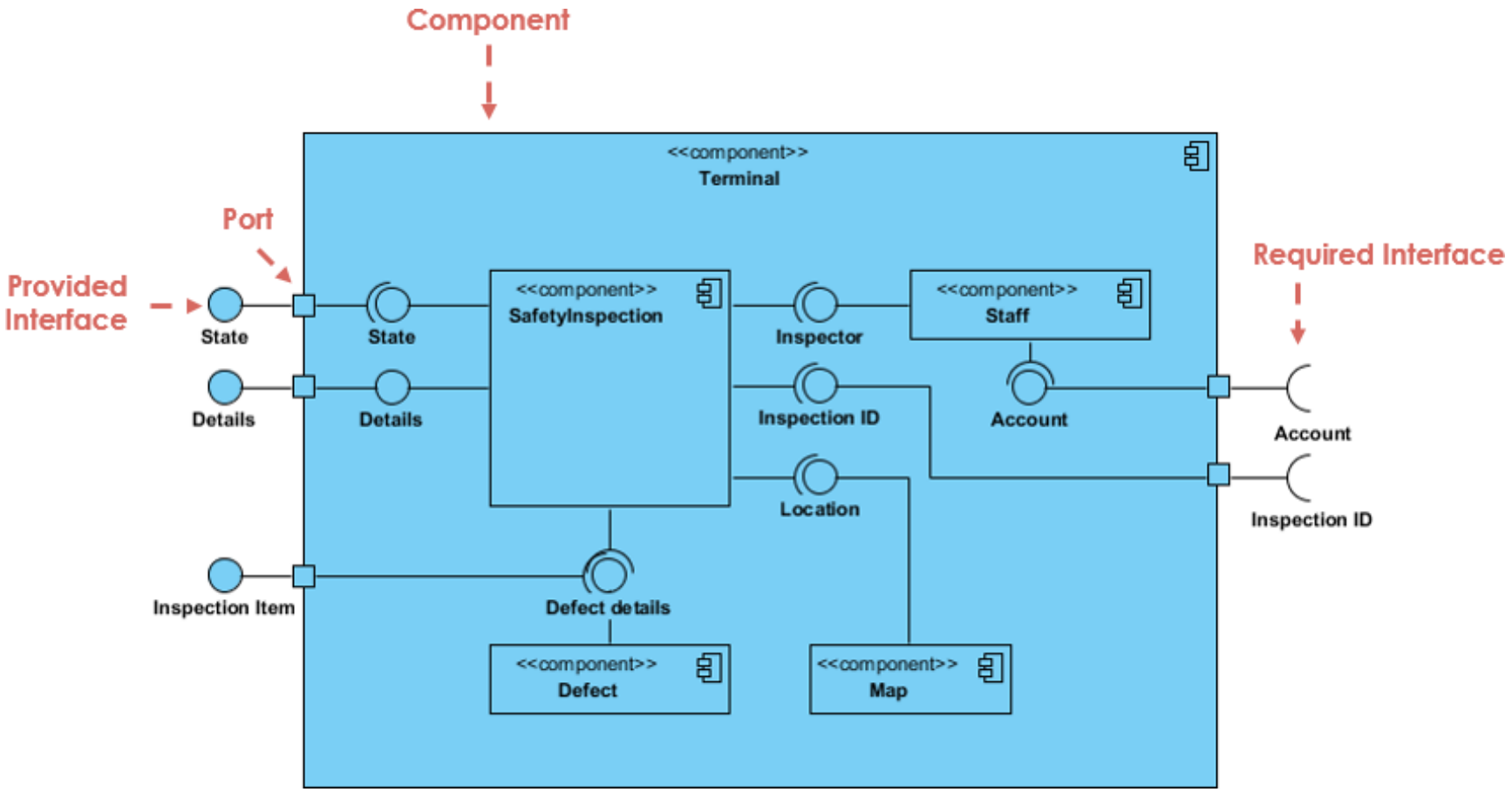

Fig 3: Component Diagram example*

- A component diagram depicts how components are wired together to form larger components or software systems.

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Deployment Diagram

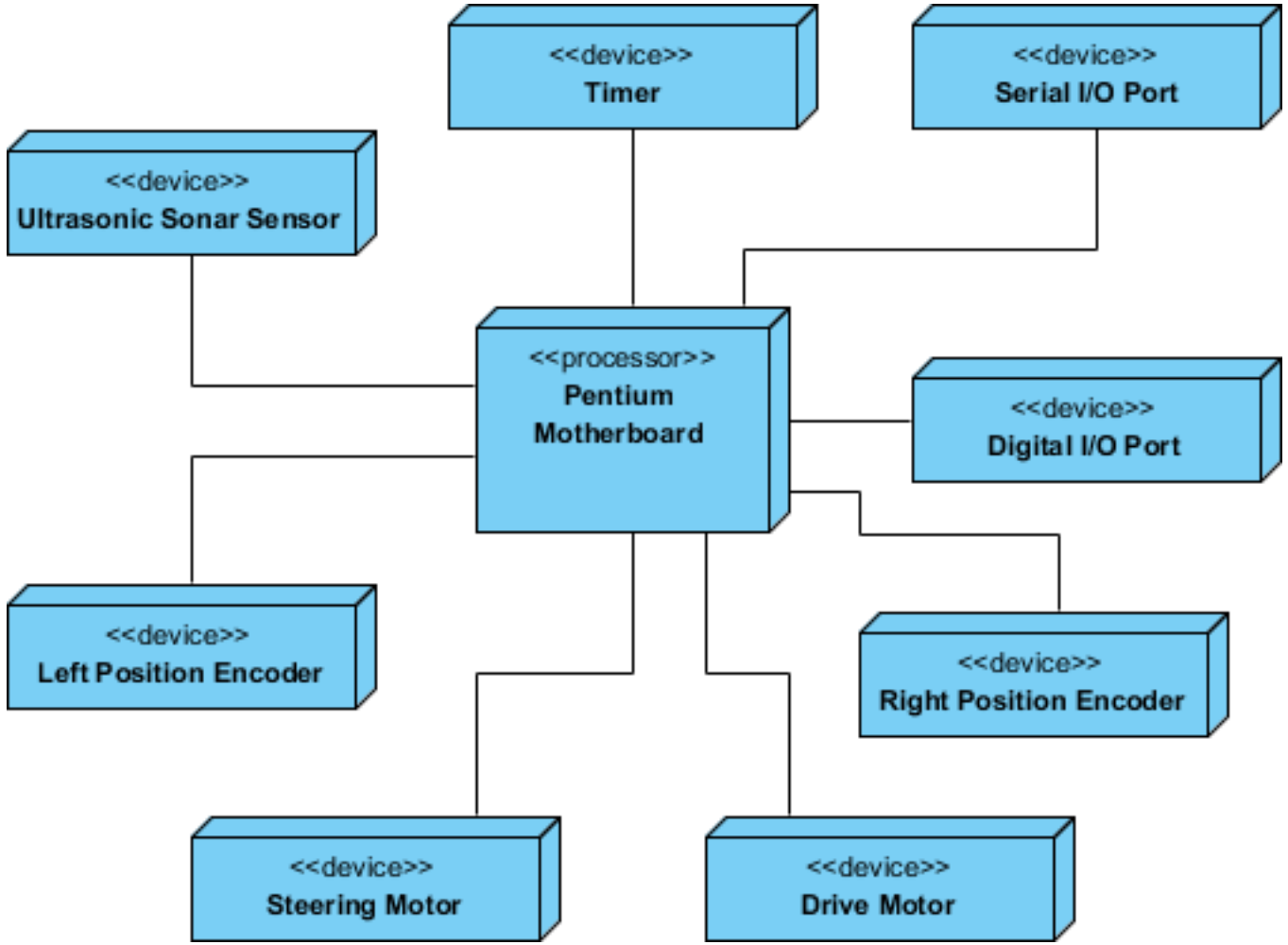

Fig 4: Deployment Diagram example*

- Deployment diagram is a structure diagram which shows architecture of the system as deployment (distribution) of software artifacts to deployment targets.
- 3-D box represents a node, either software or hardware.
- HW node can be signified with <<stereotype>>.

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Package Diagram

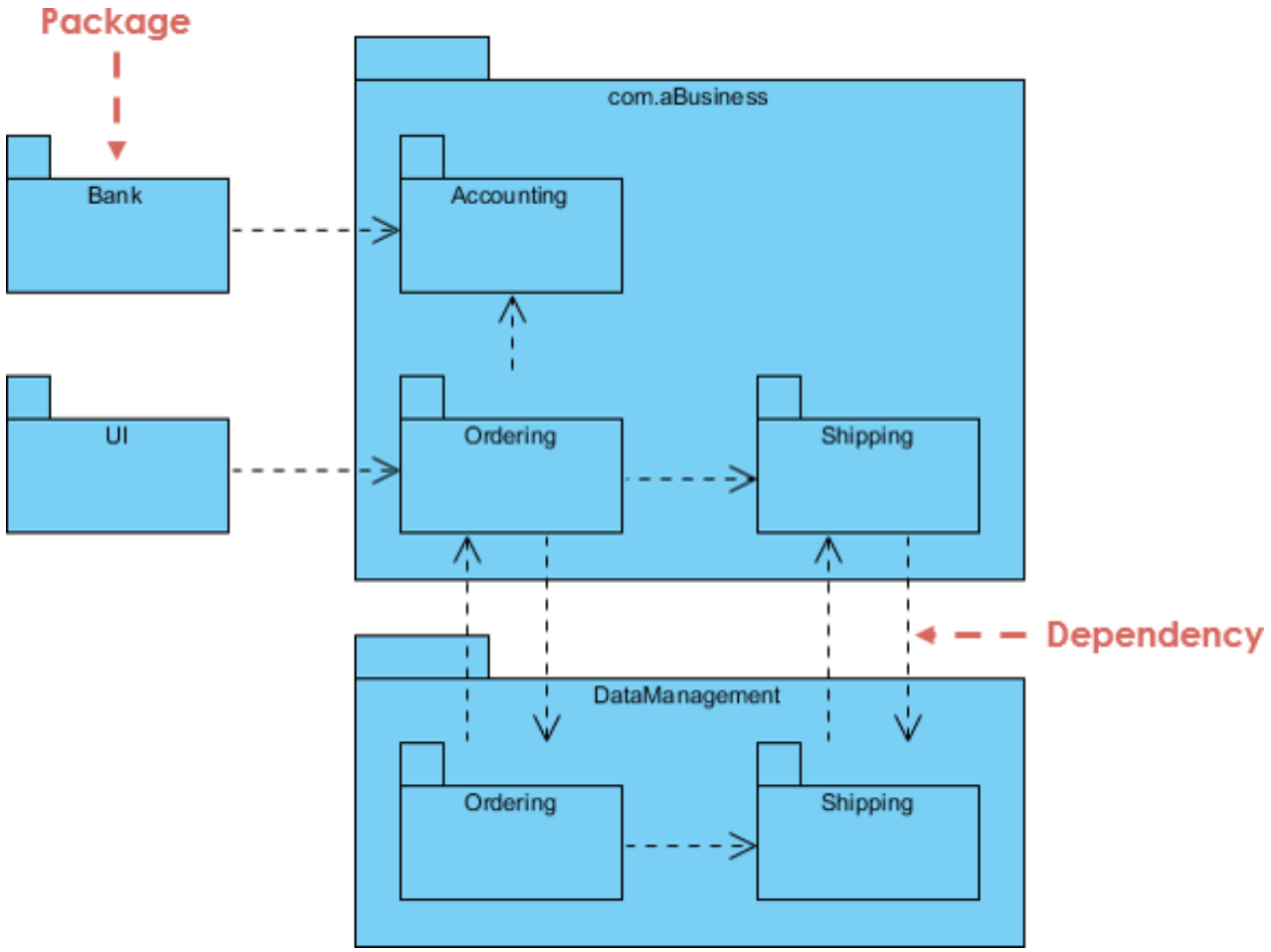

Fig 6: Package Diagram example*

- Package diagram is UML structure diagram which shows packages and dependencies between the packages.
- Packages appear as rectangles with small tabs at the top.
- The package name is on the tab or inside the rectangle. The dotted arrows are dependencies.

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Composite Diagram

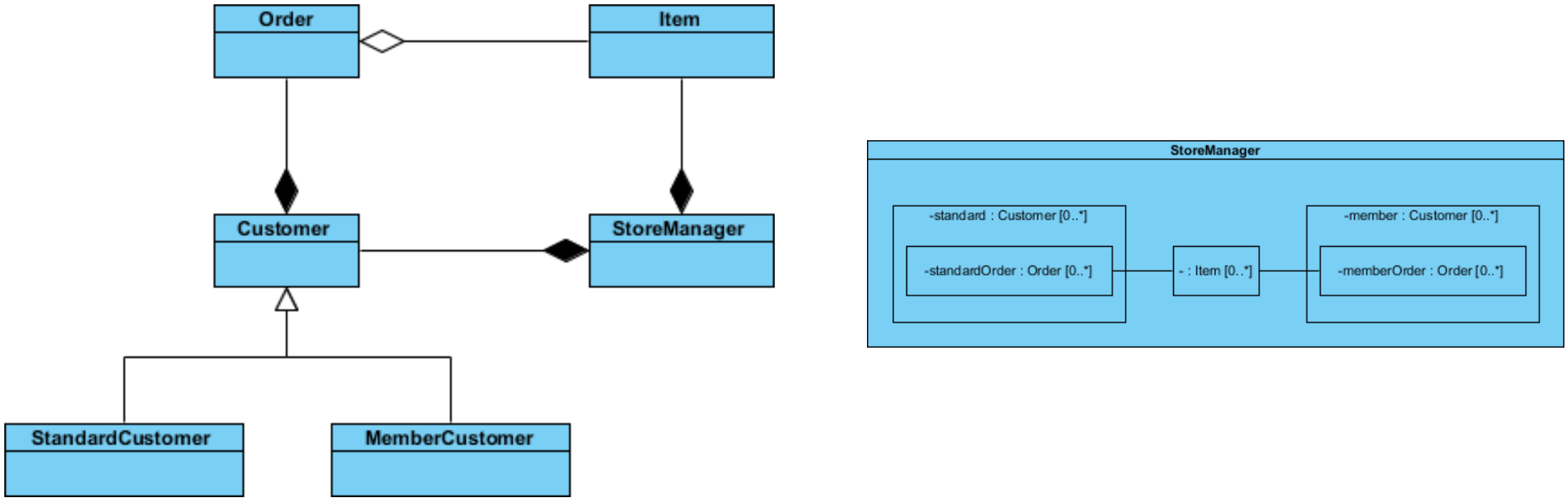

Fig 7: Composite Diagram example*

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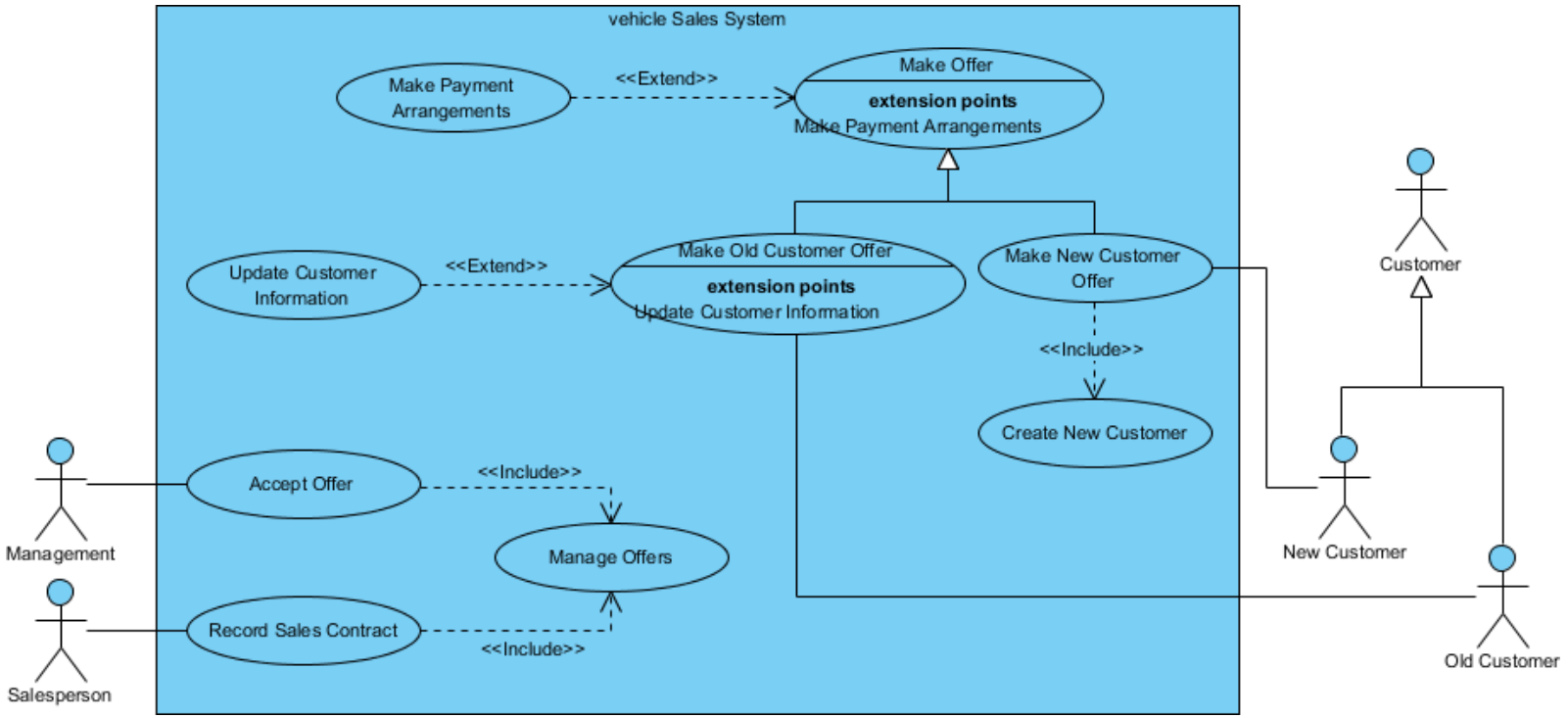
Use case Diagram



- A use-case model describes a system's functional requirements in terms of use cases.
- It is a model of the system's intended functionality (use cases) and its environment (actors).

Fig 8: Use case Diagram example*

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Activity Diagram

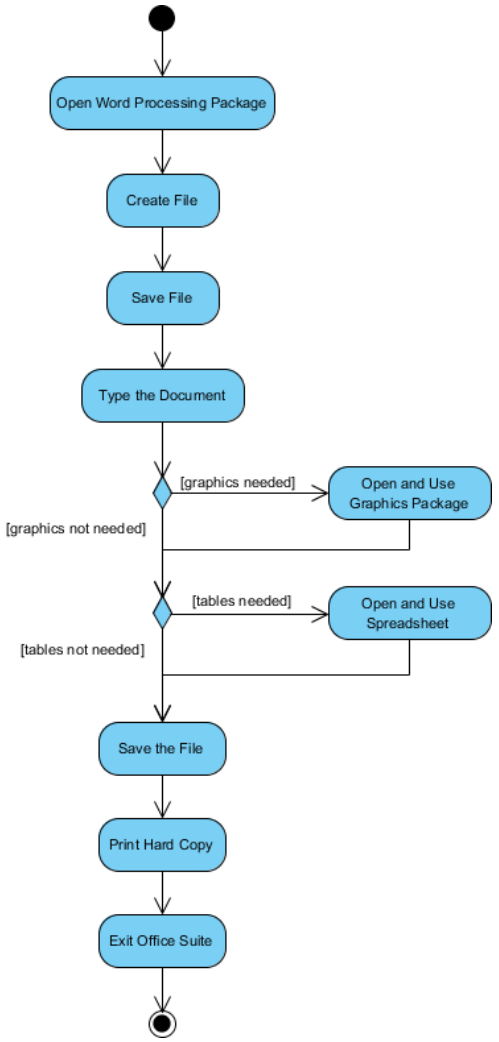

Fig 9: Activity Diagram example*

- Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency.
- It describes the flow of control of the target system, such as the exploring complex business rules and operations

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State machine Diagram

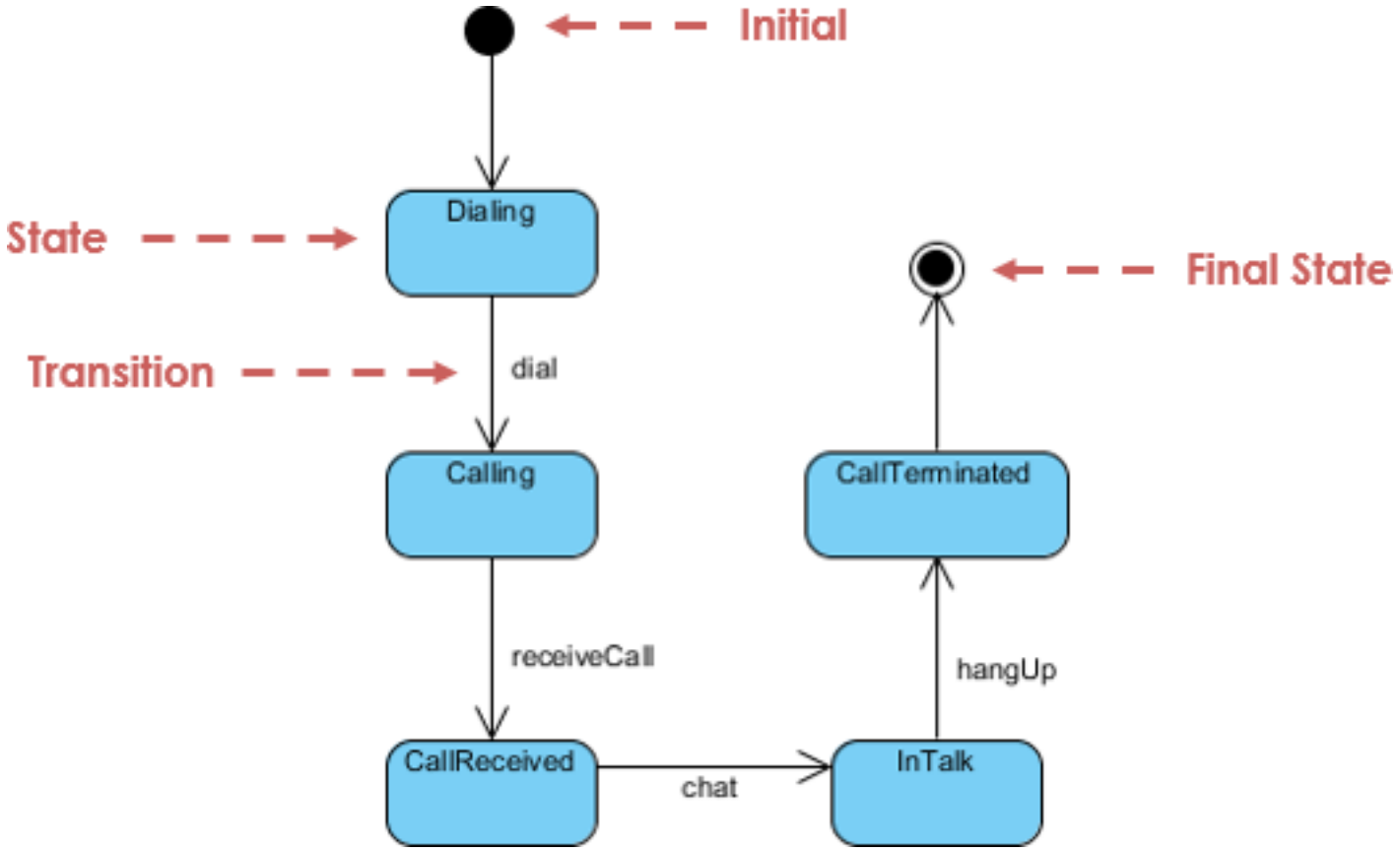

Fig 10: State machine Diagram example*

- State machine diagram typically are used to describe state-dependent behavior for an object.
- An object responds differently to the same event depending on what state it is in

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Sequence vs Communication Diagram

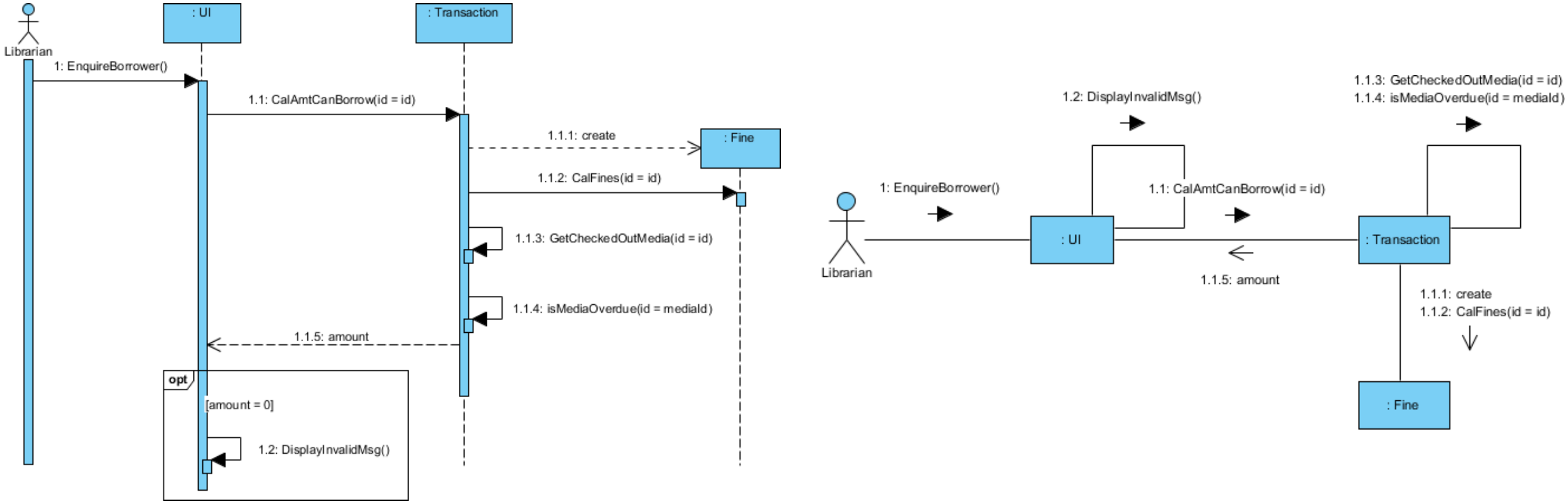

Fig 11: Sequence vs Communication Diagram example*

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Interaction Overview Diagram

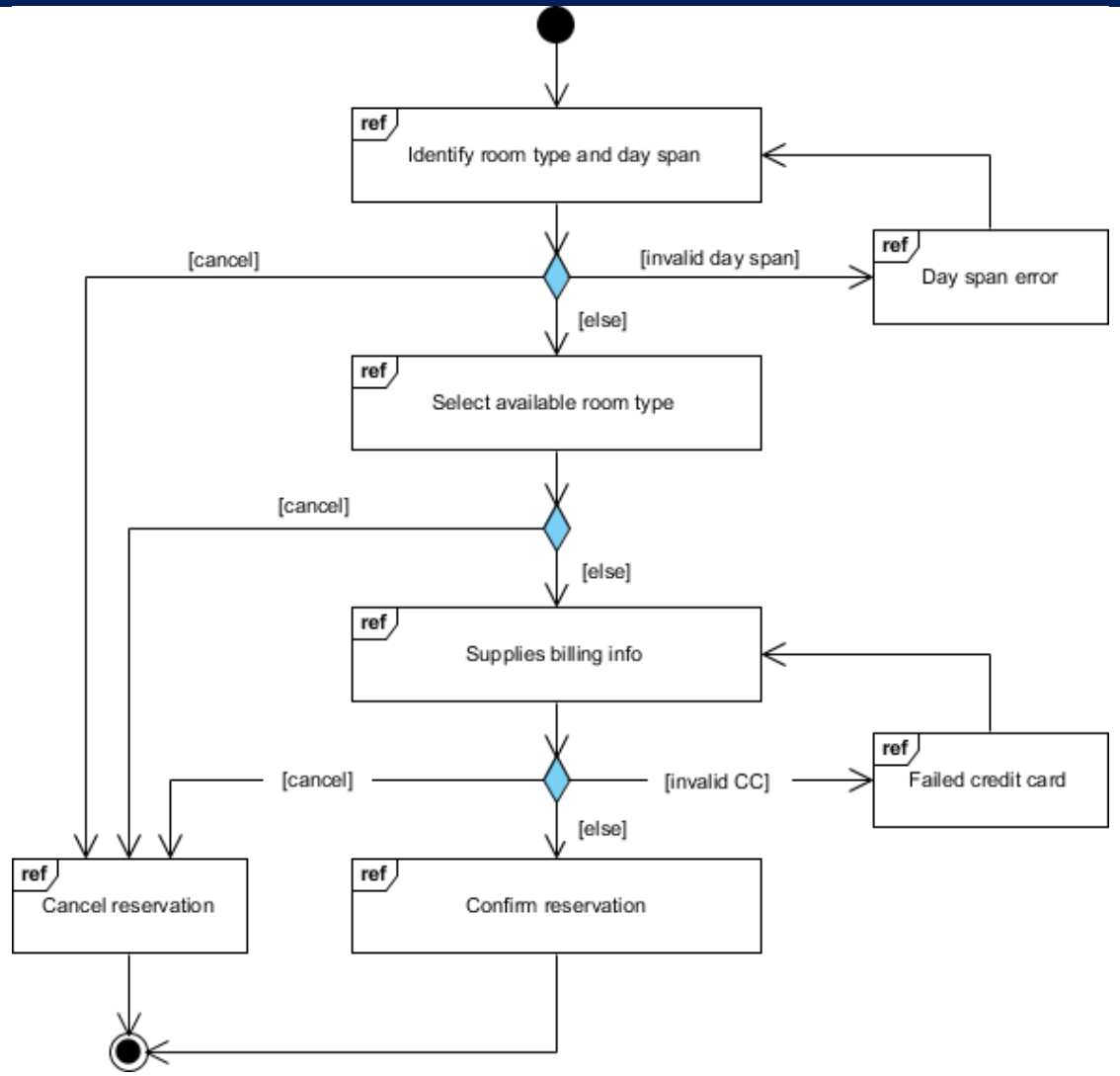

Fig 12: Interaction Overview Diagram example*

- The Interaction Overview Diagram focuses on the overview of the flow of control of the interactions.
- It is a variant of the Activity Diagram where the nodes are the interactions or interaction occurrences.

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Overview

- Using the UML helps project teams communicate, explore potential designs, and validate the architectural design of the software.

- Provide users with a ready-to-use, expressive visual modeling language so they can develop and exchange meaningful models.

- Tools: Visual Paradigm, Lucid Chart.

Thank you!
Any questions?

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