

SOFTWARE ENGINEERING

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USE CASE DIAGRAM :-



WHAT IS USE CASE DIAGRAM?

In the Unified Modeling Language (UML), a use case diagram can summarize the details of our system's users (also known as actors) and their interactions with the system. use case diagram is used to represent the dynamic behavior of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application. It depicts the high-level functionality of a system and also tells how the user handles a system.

PURPOSE OF USE CASE DIAGRAM

The main purposes of a use case diagram are given below:

- It gathers the system's needs.
- It depicts the external view of the system.
- It recognizes the internal as well as external factors that influence the system.
- It represents the interaction between the actors.

WE NEED TO IDENTIFY FOLLOWING ITEM

- **Functionality to be represent as use case**
- **Actor**
- **Relationship among user case and actor**

ELEMENT OF USE CASE DIAGRAM

- **Actor** :-An actor in a use case diagram interacts with a use case. For example, for modeling a banking application, a customer entity represents an actor in the application.
- **Use case**:-A use case in a use case diagram is a visual representation of a distinct business functionality in a system.
- **System boundary**: A system boundary defines the scope of what a system will be. A system have a limit.
- **Relationships**:-A relationship between two use cases is basically a dependency between the two use case. This reuse of an existing use case using different types of relationships reduces the overall effort .

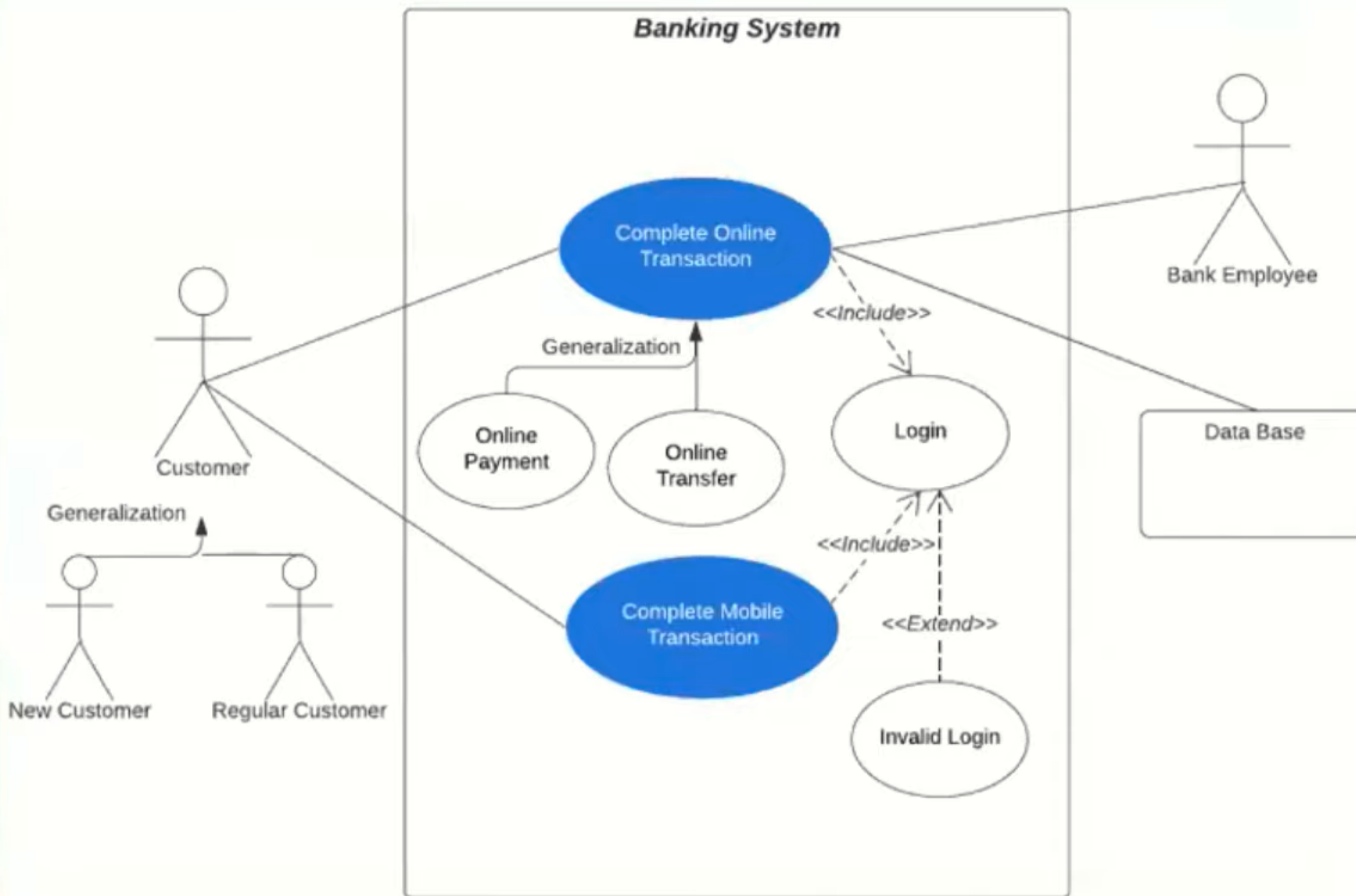
TYPES OF RELATIONSHIPS:-

- **Include:** When a use case is depicted as using the functionality of another use case in a diagram, this relationship between the use cases is named as an include relationship.
- **Extend:** In an extend relationship between two use cases, the child use case adds to the existing functionality and characteristics of the parent use case.
- **Generalizations:** A generalization relationship is also a parent-child relationship between use cases. The child use case in the generalization relationship has the underlying business process meaning, but is an enhancement of the parent use case.

GUIDELINES TO DRAW AN USE CASE DIAGRAM

- The name of a use case is very important. The name should be chosen in such a way so that it can identify the functionalities performed.
- Give a suitable name for actors.
- Show relationships and dependencies clearly in the diagram.
- Do not try to include all types of relationships, as the main purpose of the diagram is to identify the requirements.
- Use notes whenever required to clarify some important points.

Use Case Diagram - Banking System Example



Use of use case diagram

- Requirement analysis and high level design.
- Model the context of a system.
- Reverse engineering:-to prepare the requirement details from the existing application.
- Forward engineering:- used to make test cases

USE CASE DESCRIPTION

WHAT IS USE CASE DESCRIPTION?

A use case is a written description of how a user performs a task on system. It outlines the behavior of the system from the user's perspective when responding to a request. Each use case is represented as a sequence of simple steps, starting with the user's goal and ending when the goal is achieved.

Use case descriptions are important because they help stakeholders to understand how the system will work and how it will interact with its environment.

USE CASE DESCRIPTION

The use case description typically includes the following information:

Use case name: A unique identifier for the use case.

Actors: The people or systems that interact with the system.

Preconditions: The conditions that must be met before the use case can be executed.

Basic flow of events: A step-by-step description of the actions that the user and system take to accomplish the goal.

Alternative flows: Descriptions of any deviations from the basic flow, such as exceptions or errors.

Postconditions: The conditions that must be true after the use case is executed.

Extensions: Any additional functionalities that may be added in the future.

USE CASE DESCRIPTION EXAMPLE

Example of a use case description for an online transaction:

Use Case Name: Online Transaction

Actors: Customer, Bank

Preconditions: The customer must be logged into a system .

Use case description Example

BASIC FLOW OF EVENTS:

ACTOR ACTION

1) customer select account type

3) customer select payment

5) customer complete payee field

8) customer enter amount

11) customer submit transaction

SYSTEM RESPONSE

2) System display a transaction option

4) system display payee fields

6) system validates fields

7) Display amount list

9) system validates account balance

10) system prompts customer to confirm

12) system display confirmation message

USE CASE DESCRIPTION EXAMPLE

Alternative Flows:

1a)

If the customer does not have a valid account type then, the system prompts them to add valid account

3a.)

If the payment information is invalid, the system displays a prompts them to correct the information.

8a)

If the payment is declined due to insufficient funds, the system displays an error message to the customer and prompts them to select a different payment method.

USE CASE DESCRIPTION EXAMPLE

Post condition:- The customer's payment information is securely transmitted to the payment gateway and the order status is updated to "Paid" if the transaction is successful.

Extensions: In the future, the system may add support for additional payment methods or integrate with new payment gateways.

ANY QUESTIONS?

Thank you all