Object Oriented Methods with UML

Introduction to Use Case Diagram

Lecture -2

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Use case Diagram

- A use-case diagram is a set of use cases

- A use case is a model of the interaction between

  - External users of a software product (actors) and
  - The software product itself
  - More precisely, an actor is a user playing a specific role

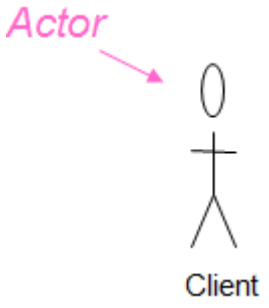
Components of Use case

I) Actors

II)Use Case

III)System Boundary

- **<u>I) Actors:</u>** A role that a user plays with respect to the system, including human users and other systems. e.g., inanimate physical objects (e.g. robot); an external system that needs some information from the current system.



Types of Actors

- Primary Actor
  - Actor who triggers or executes the use case directly

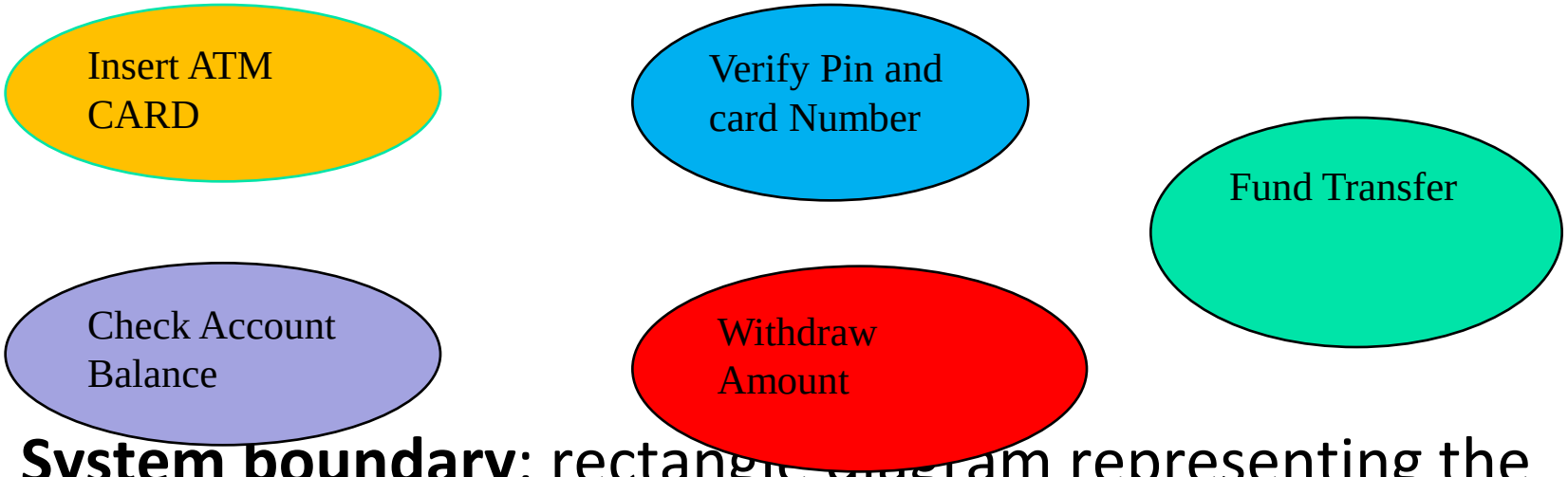
    Eg: Customer/Manager/Executive/Student/Staff/Person/Client
- Secondary Actor
  - Actor that the system needs some assistance to execute the use case.

    Eg: Card Reader/ATM /Sensors
- Supporting Actor
  - External Actor that provide service to the use case

    Eg: Database Server/Remote Server/System

Components of Use case

- **II)Use case:** A set of scenarios that describing an interaction between a user and a system, including alternatives.
- ***Use cases in ATM System***

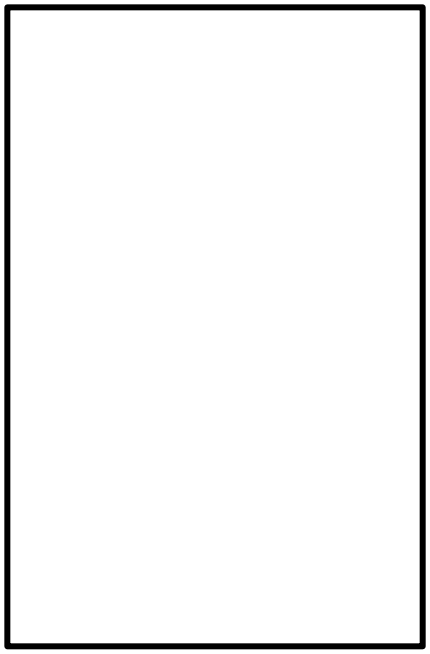


- **System boundary**: rectangle diagram representing the boundary between the actors and the system.

Components of Use case

- **III)System Boundary**

Rectangle diagram representing the boundary between the actors and the system.

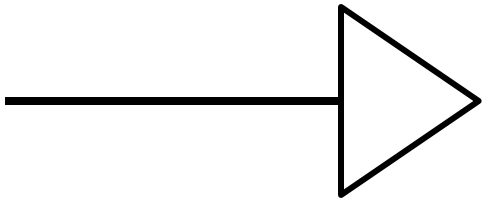


Relationships in Use case Diagram

- Association:

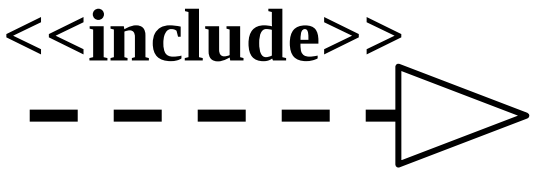
  communication between an actor and a use case; Represented by a solid line.

- Generalization: relationship between one general use case and a special use case (used for defining special alternatives) Represented by a line with a triangular arrow head toward the parent use case.

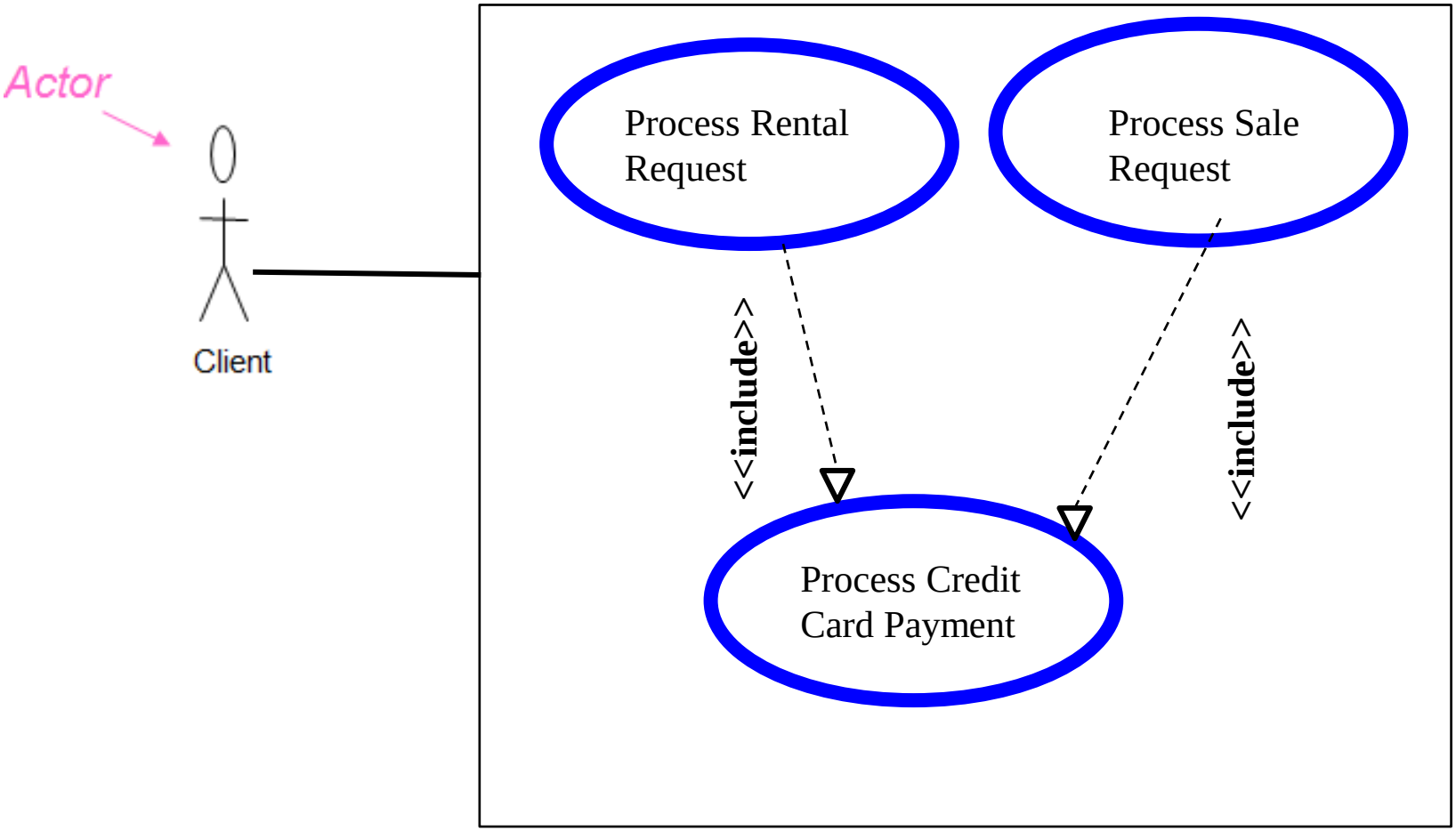


Relationships in Use case Diagram

- **Include**: a dotted line labeled <<include>> beginning at base use case and ending with an arrows pointing to the include use case. The include relationship occurs when a chunk of behavior is similar across more than one use case. Use “include” in stead of copying the description of that behavior.



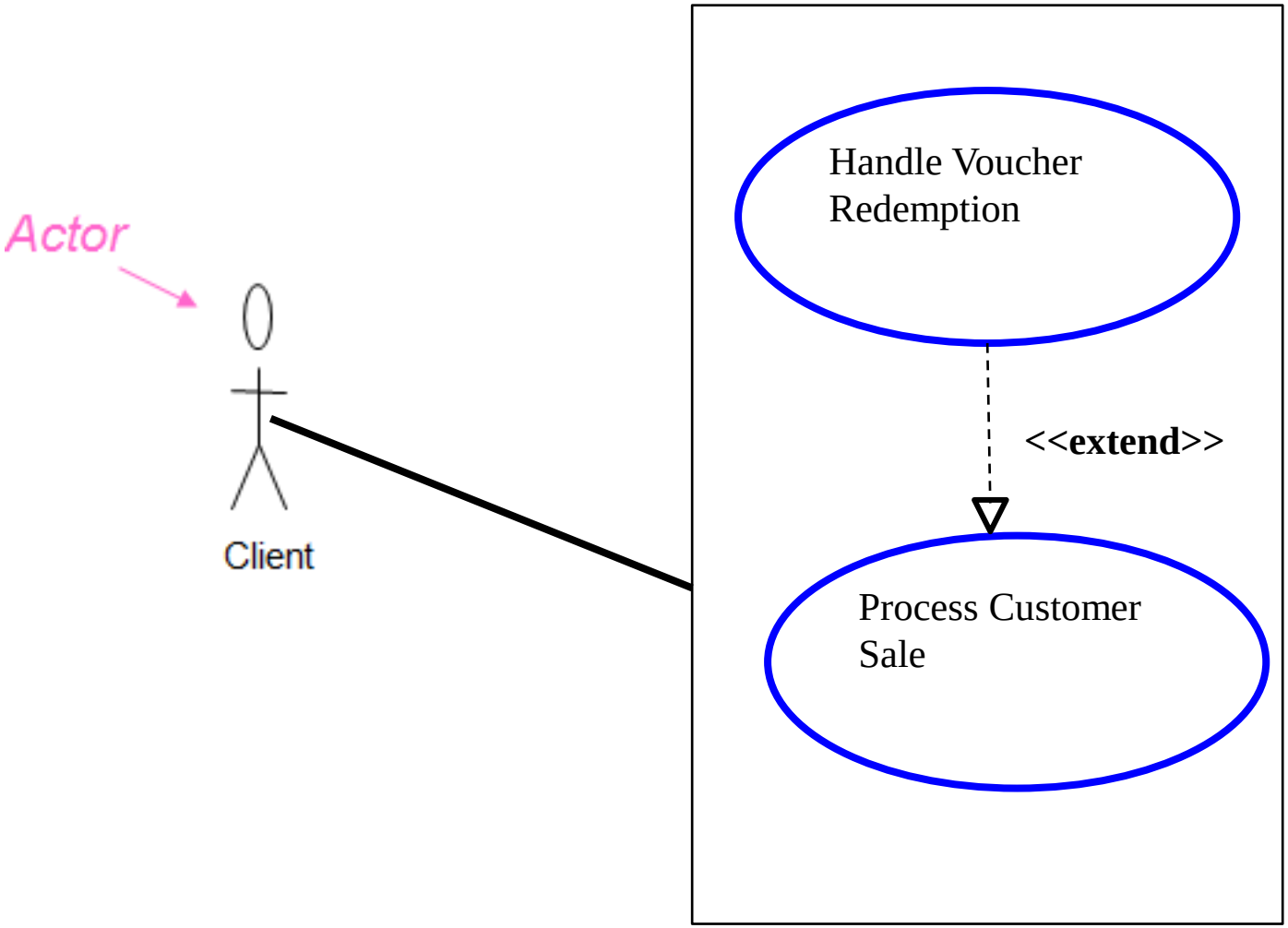
Depiction of <<Include>> Relationship



Relationships in Use case Diagram

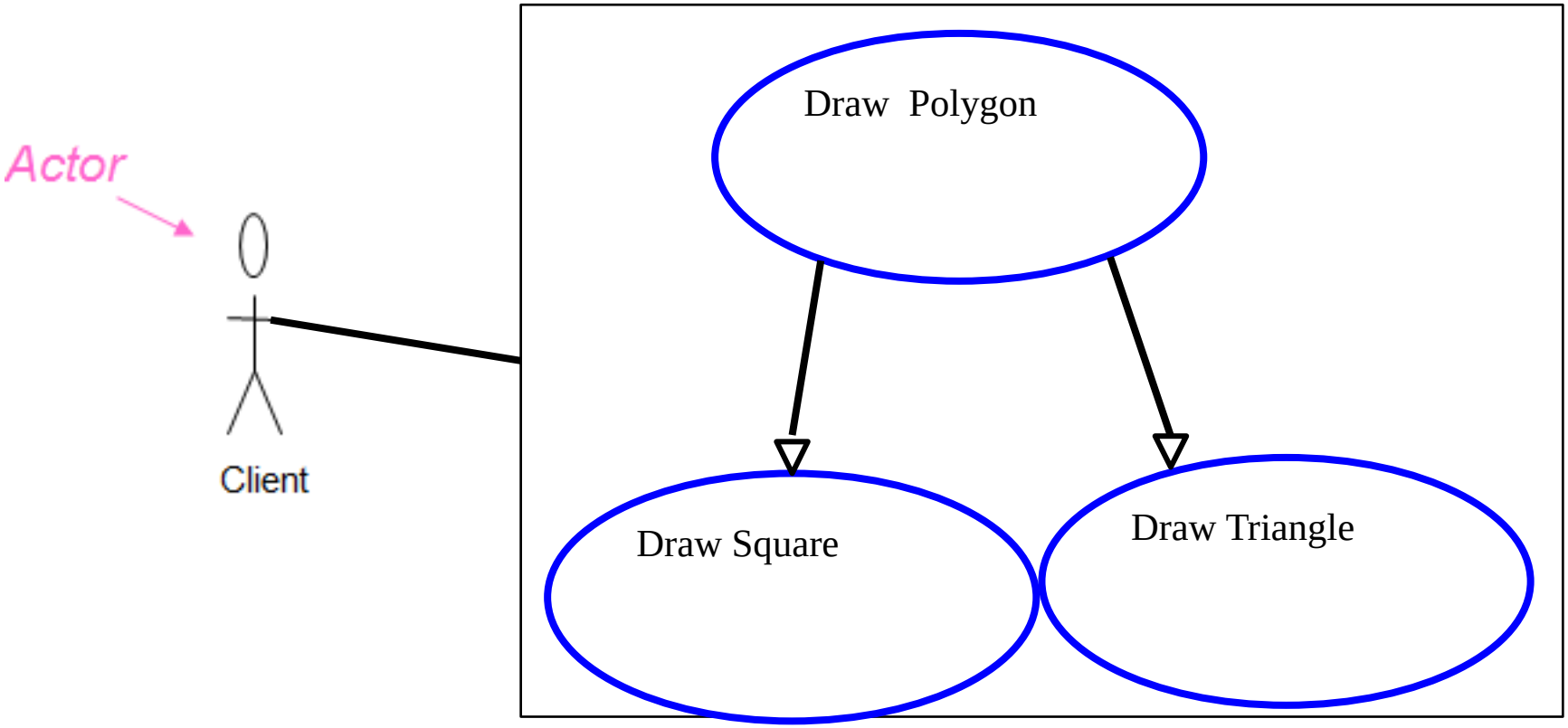
- Extend: a dotted line labeled <<extend>> with an arrow toward the base case. The extending use case may add behavior to the base use case. The base class declares “extension points”.

Depiction of <<Extend>>Relationship



Use Case Generalization

- Relationship between base Use case and derived Use case.



Use case diagram for on-line banking

- Actors
  - Primary Actor : User
  - Secondary Actor:ATM
  - Supporting Actor:Bank Database
- Use case:
  1. Insert card
  2. Login
  3. Validate Card
  4. Verify pin
  5. Withdrawal of Amount
  6. Verify Balance in user's account
  7. Deposit
  8. Fund Transfer
  9. Change Pin
  10. Send Notification to user

Writing Use Cases Formally

- Identify the Actors
- List the pre condition and post condition
- Identify the main success scenario
- Identify the alternate flow
- List the special requirements
- Identify the technology and data variation list

Use case 1:Login

Primary Actor : User

Pre Condition: User should have account in any Bank

Post Condition: System should display a message.

Main Scenario

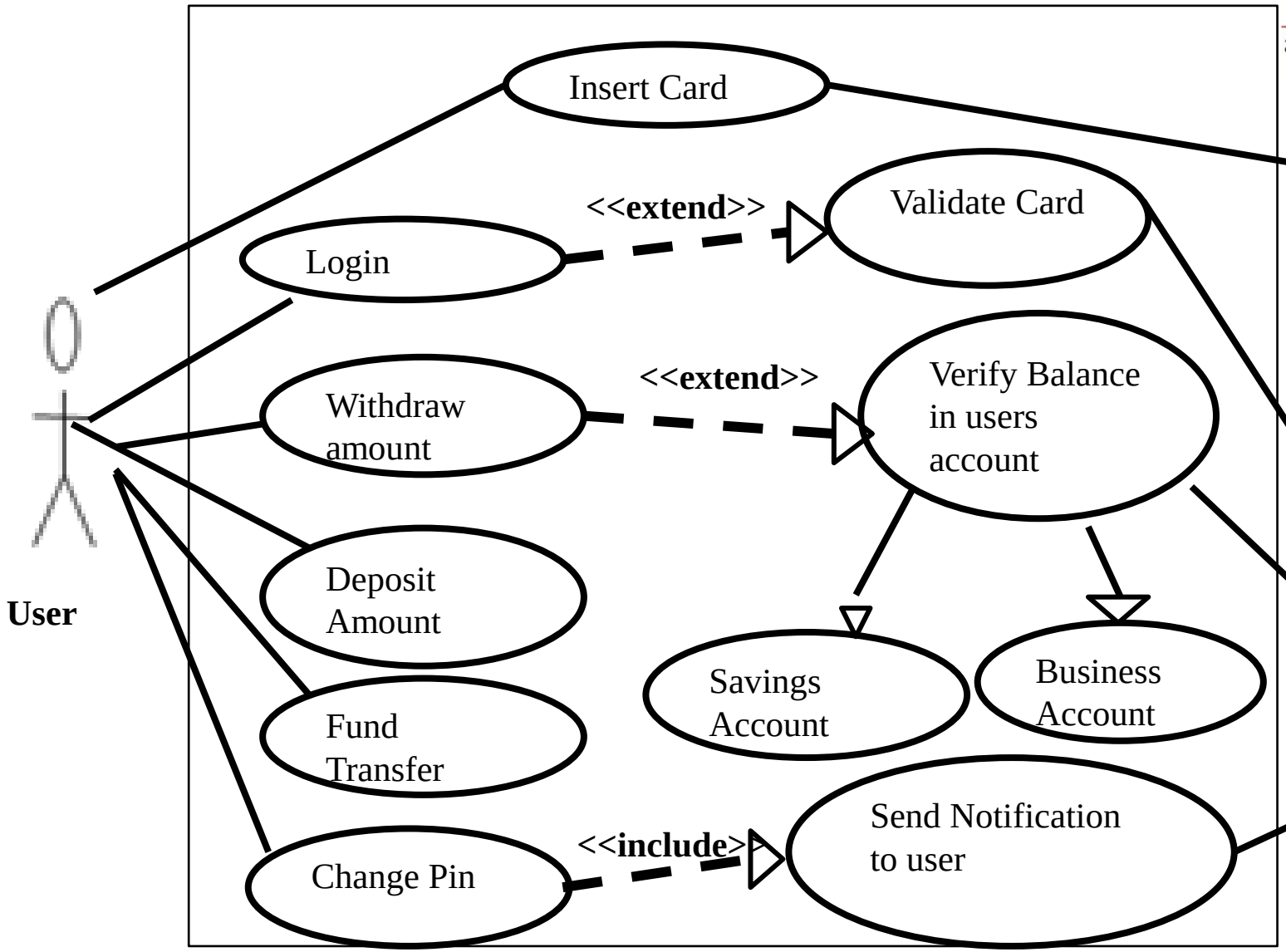
I. User Inserts the card
II. Bank Database validate the card
III. System displays "Login Success"

Alternate Flow

System Displays "Invalid card "

Special Requirement :Touch screen based ATM

Use Case Diagram –On line Banking



ATM

Bank Database

References

- E-Books:

1)Author:Mahesh.P.Matha, EEE Publication

http://www.adslwi-fi.com/aa.php?isbn=ISBN:8120333225&name=Object-Oriented_Analysis_and_Design_Using_UML

2) Author:Grady Booch,wesley publication

http://www.cvauni.edu.vn/imgupload_dinhkem/file/pttkht/object-oriented-analysis-and-design-with-applications-2nd-edition.pdf