

# USE CASE DIAGRAM-ELABORATION PHASE



Use case diagrams  
consist of 4 objects.

Actor

Use case

System

Package

Relation

**By**

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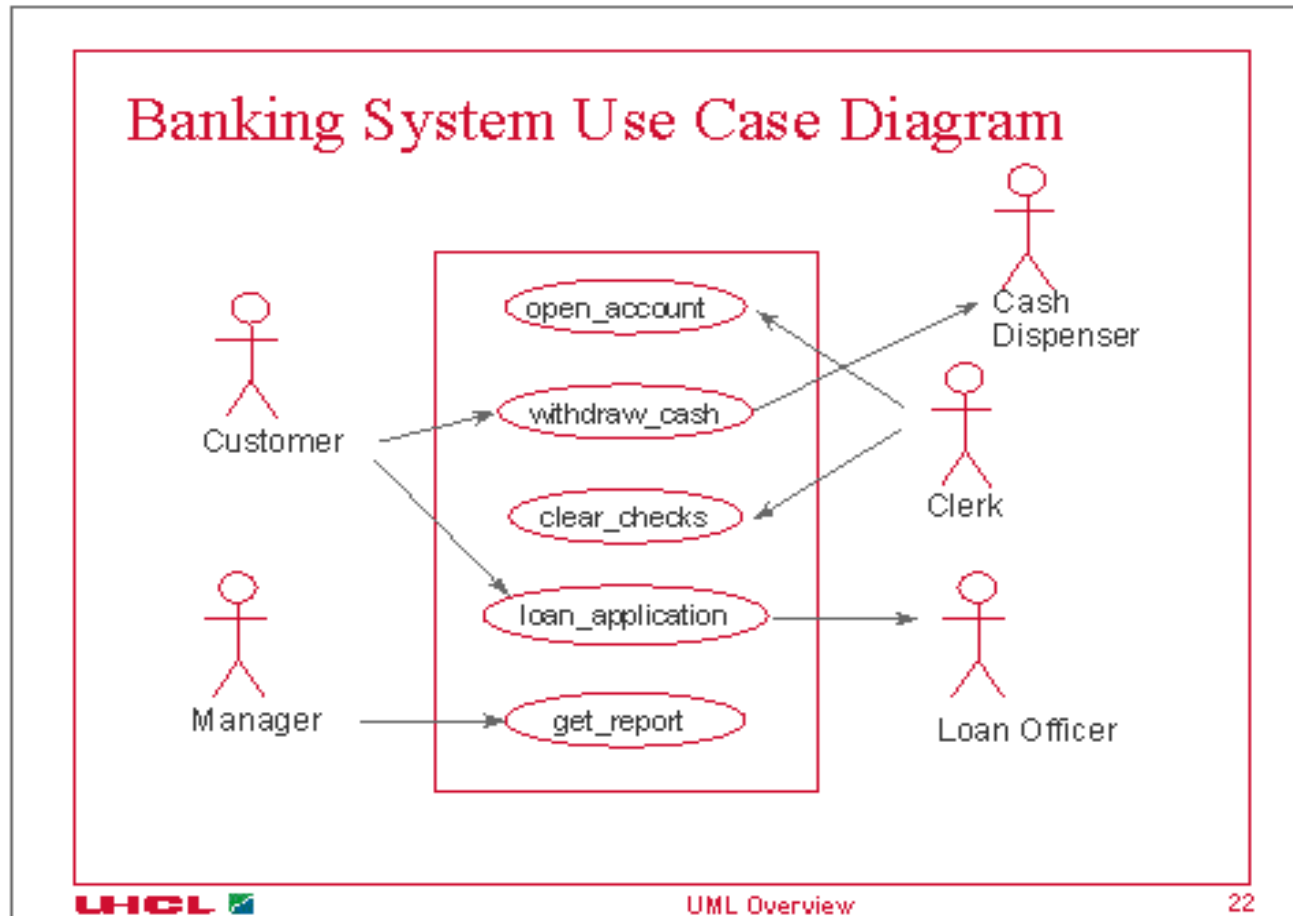
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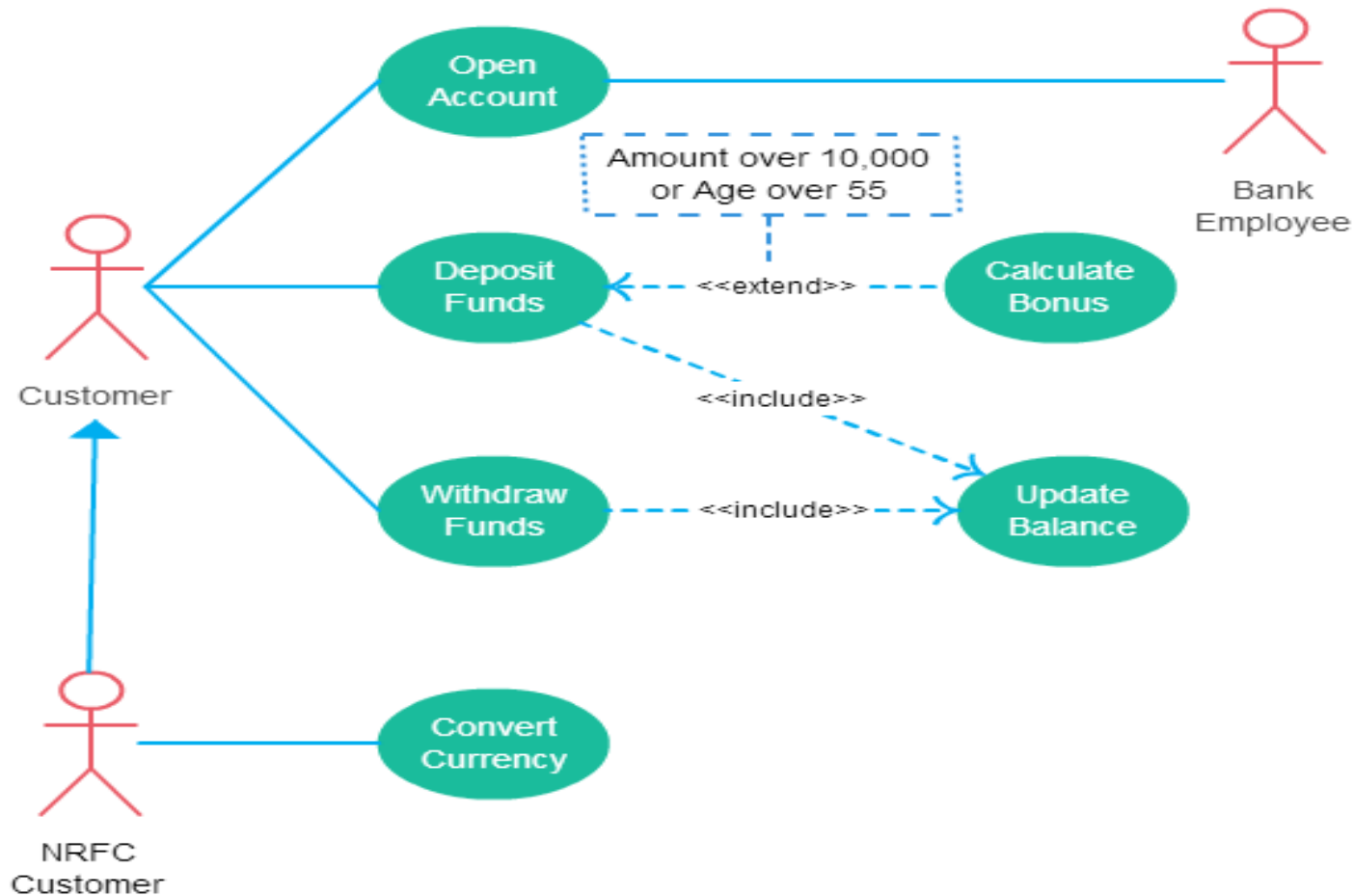
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## Notations :

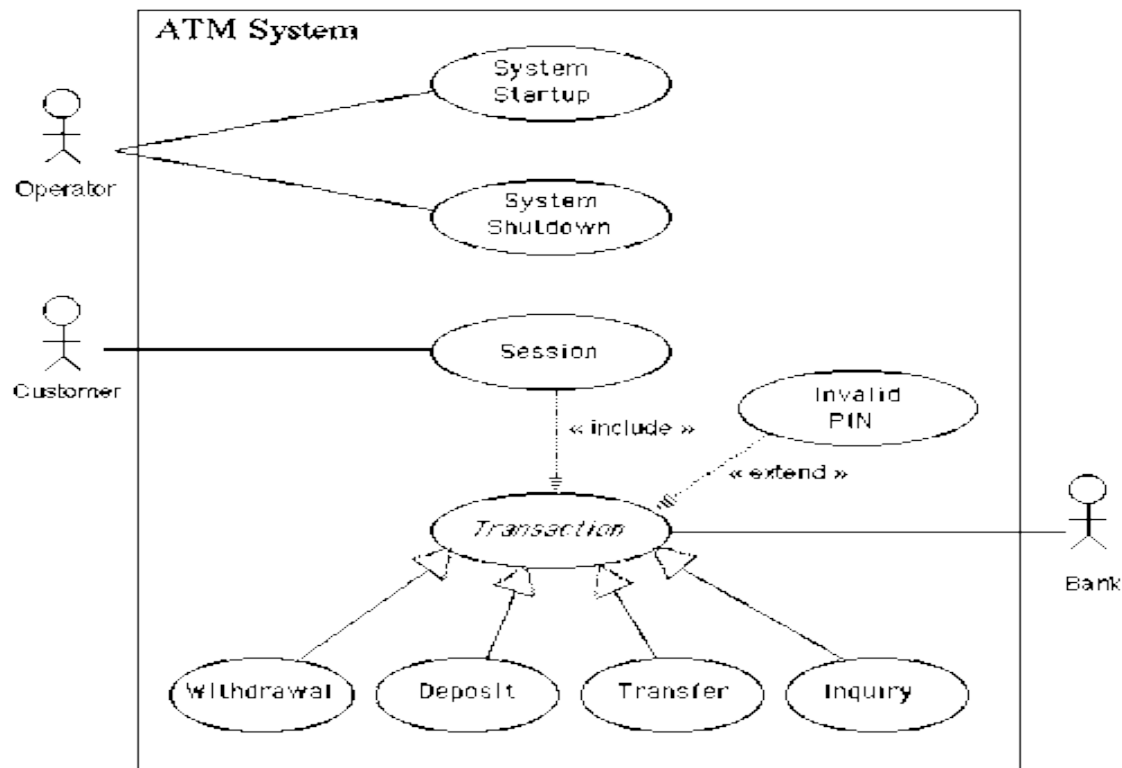
**WHAT IS ACTOR –PRIMARY , SECONDARY,  
SYSTEMS(boundary) USE CASE, ASSOCIATION ?**



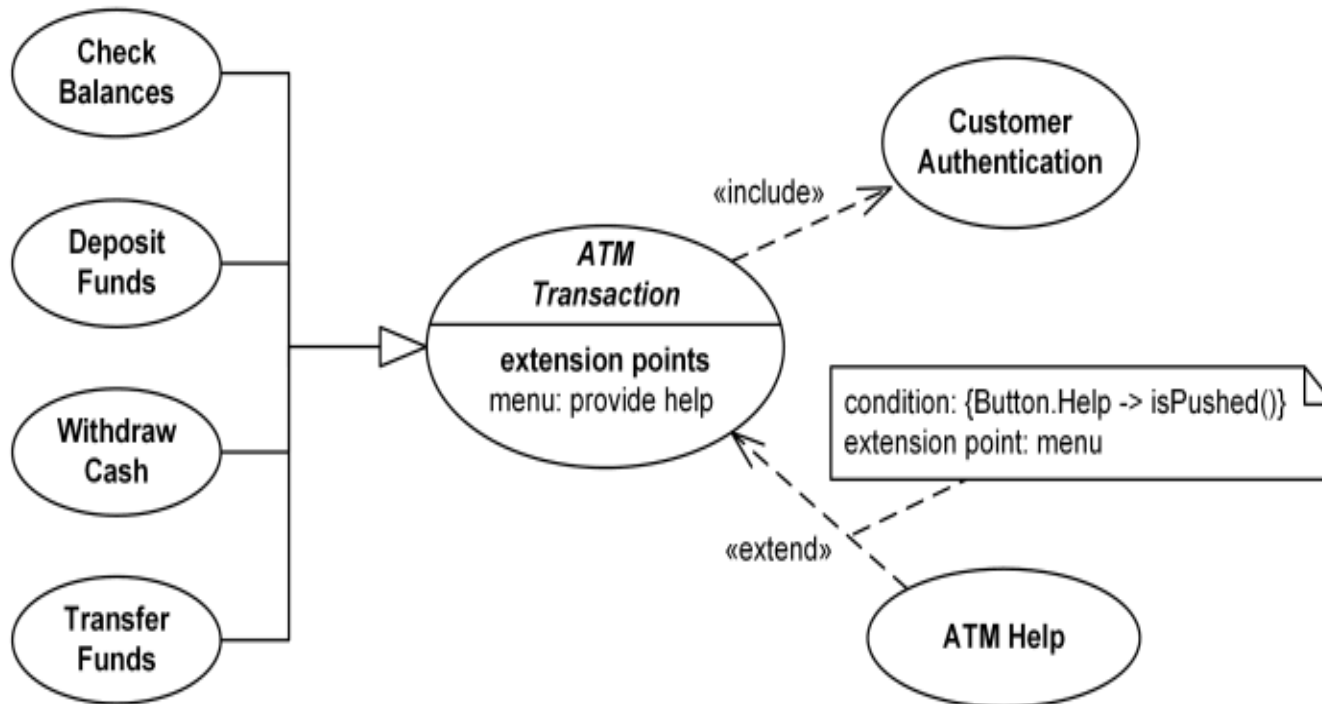
# Generalization of Actor, Association, <<include>>( or <<uses>>) , <<extend>>



**What is RELATIONSHIP –ASSOCIATION, INCLUDE, EXTEND, GENERALIZATION in use case diagram ?**

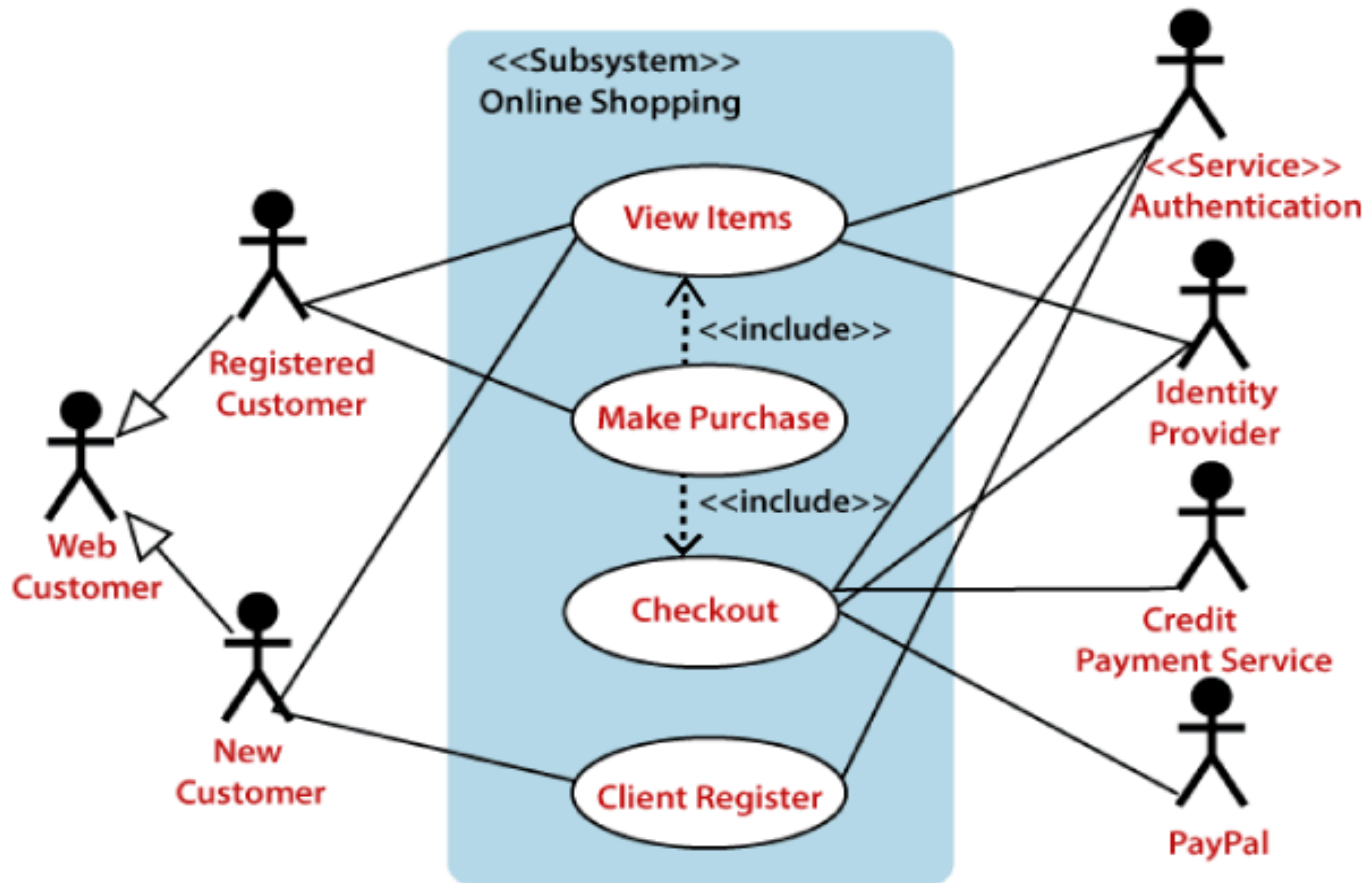


# GENERALIZATION AND EXTENSION POINT

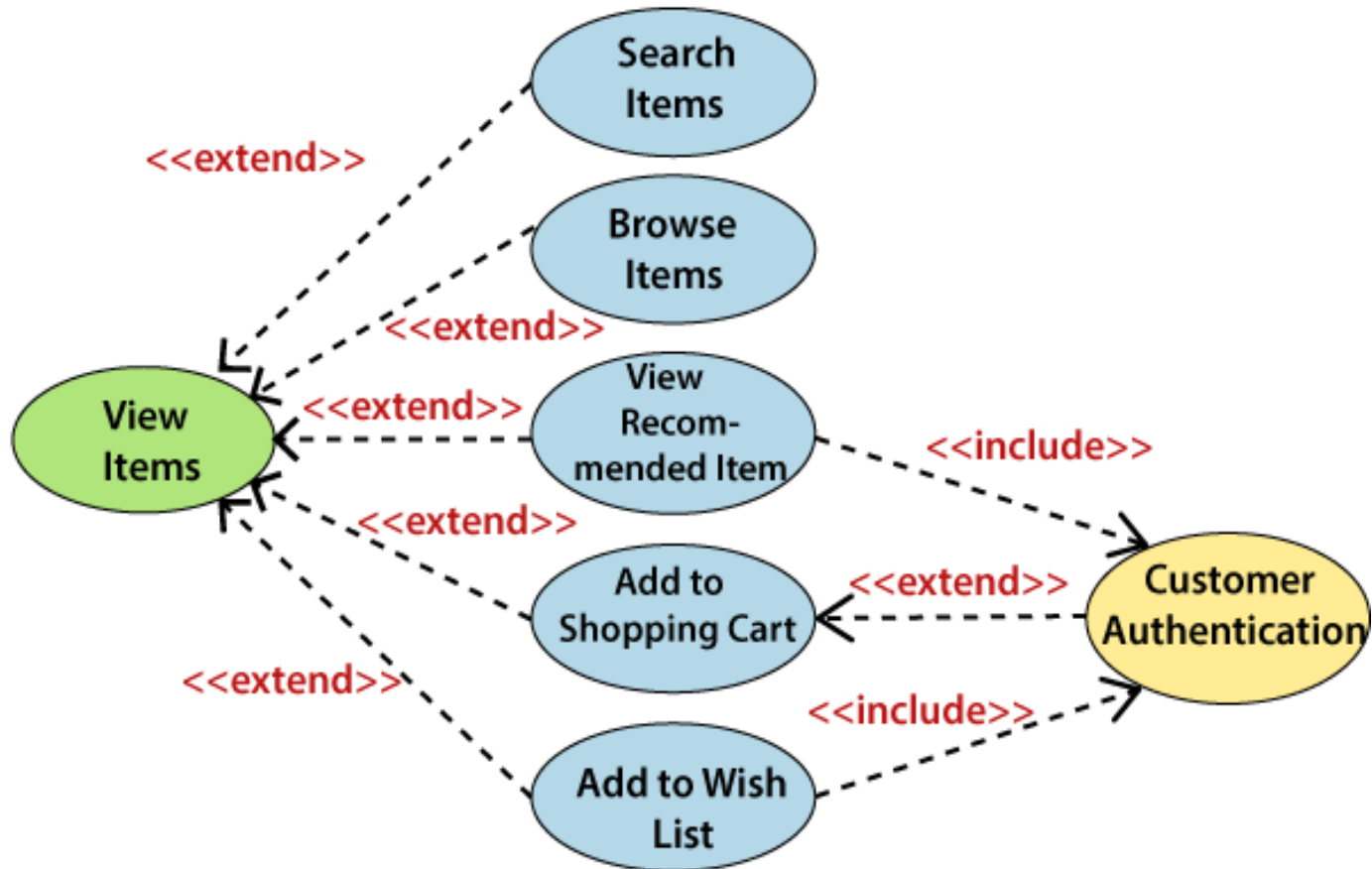


***Bank ATM Transactions and Customer Authentication Use Cases Example***

# <<Subsystem>>

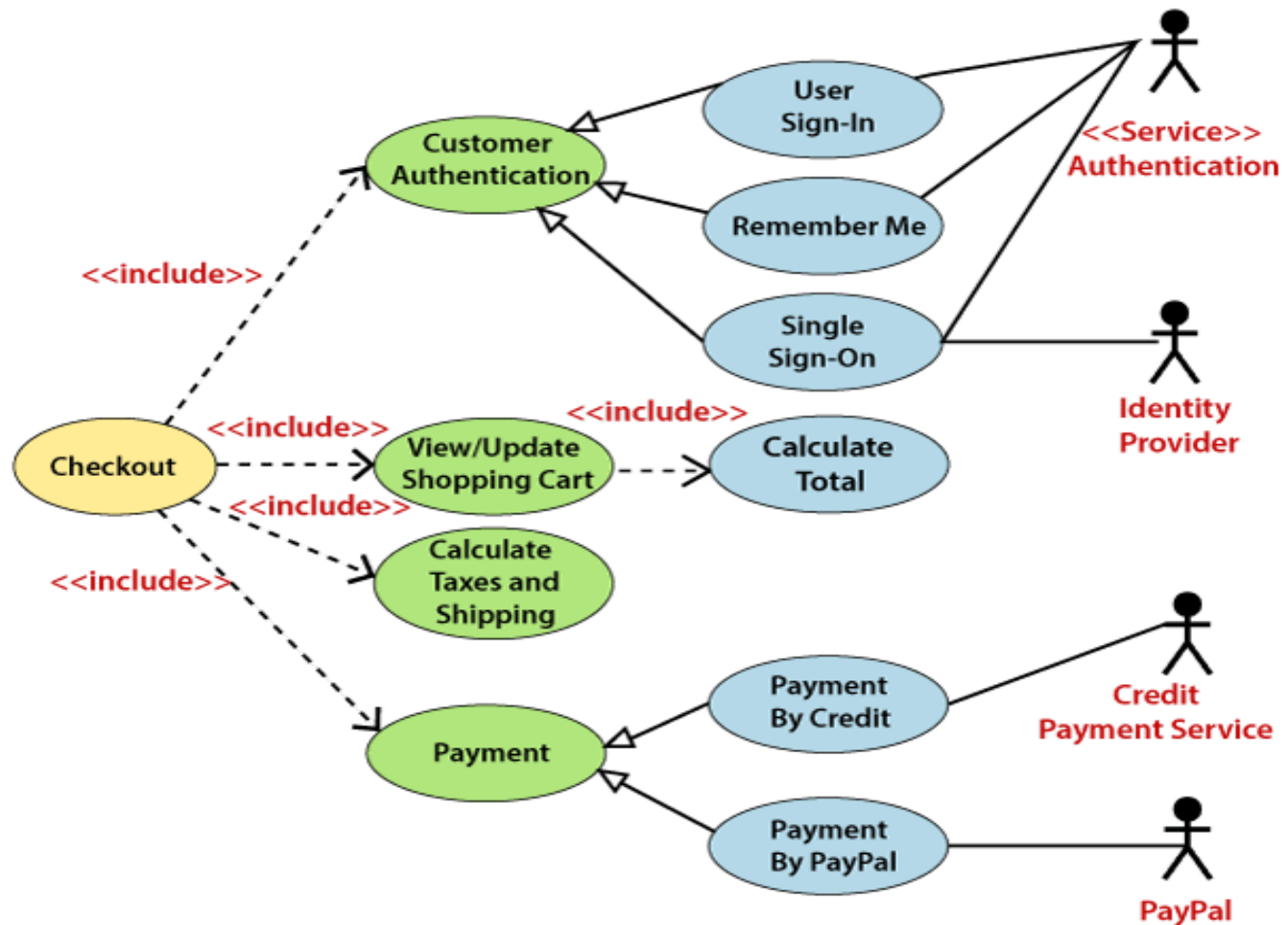


# Use case-View items(base use case)



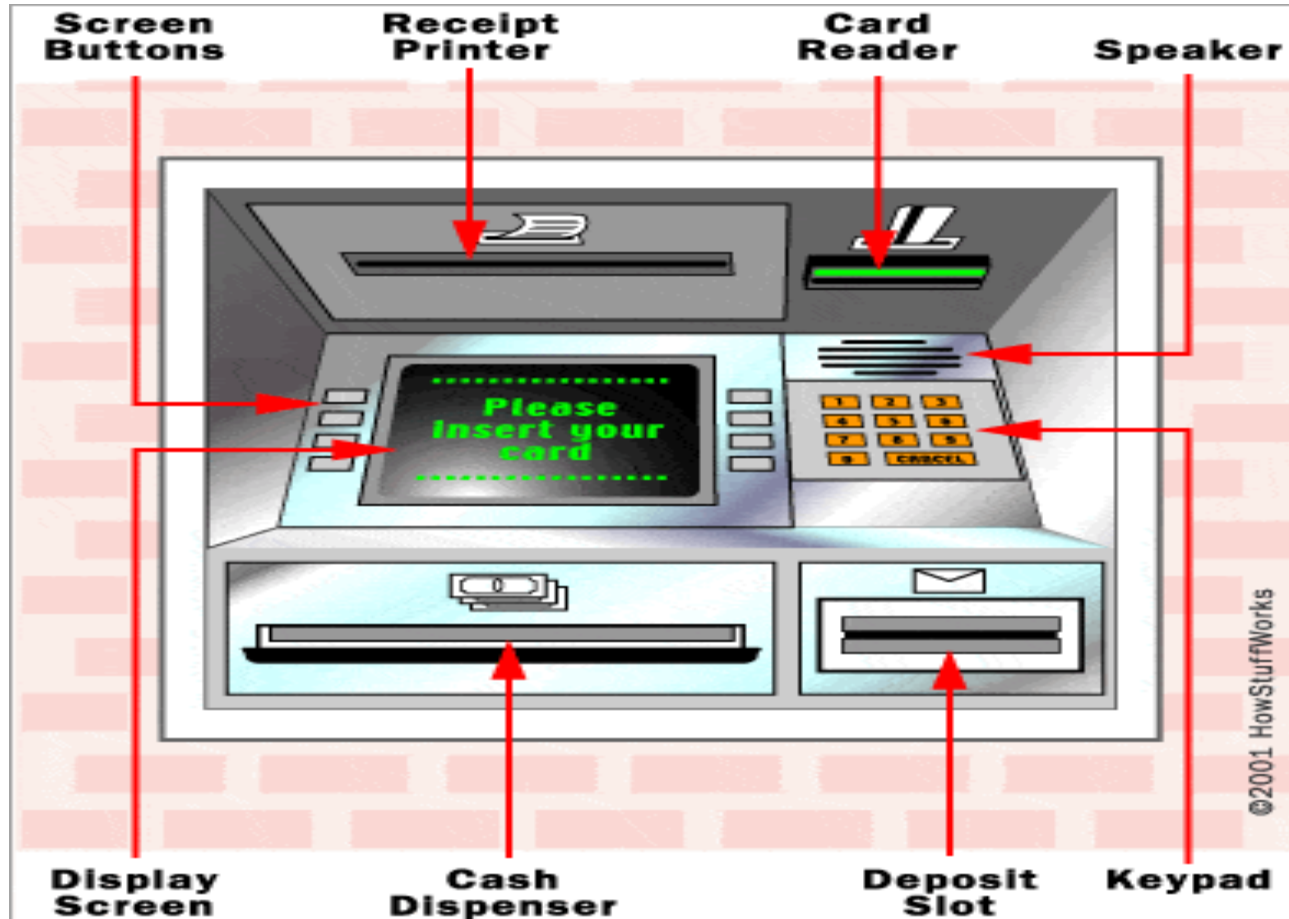
## CHECK OUT USE CASE

The Checkout use case involves Payment use case that can be done either by the credit card and external credit payment services or with PayPal.

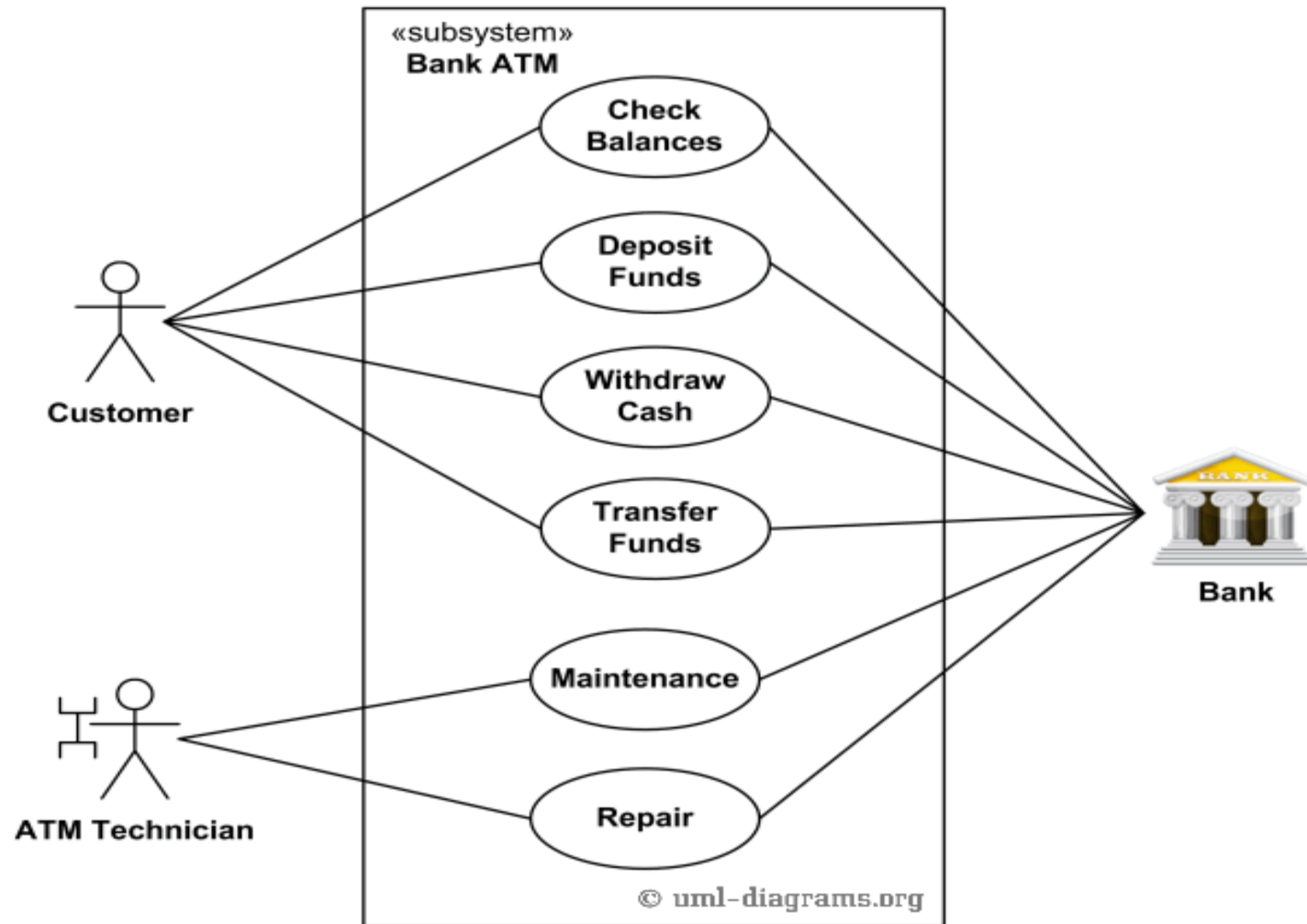




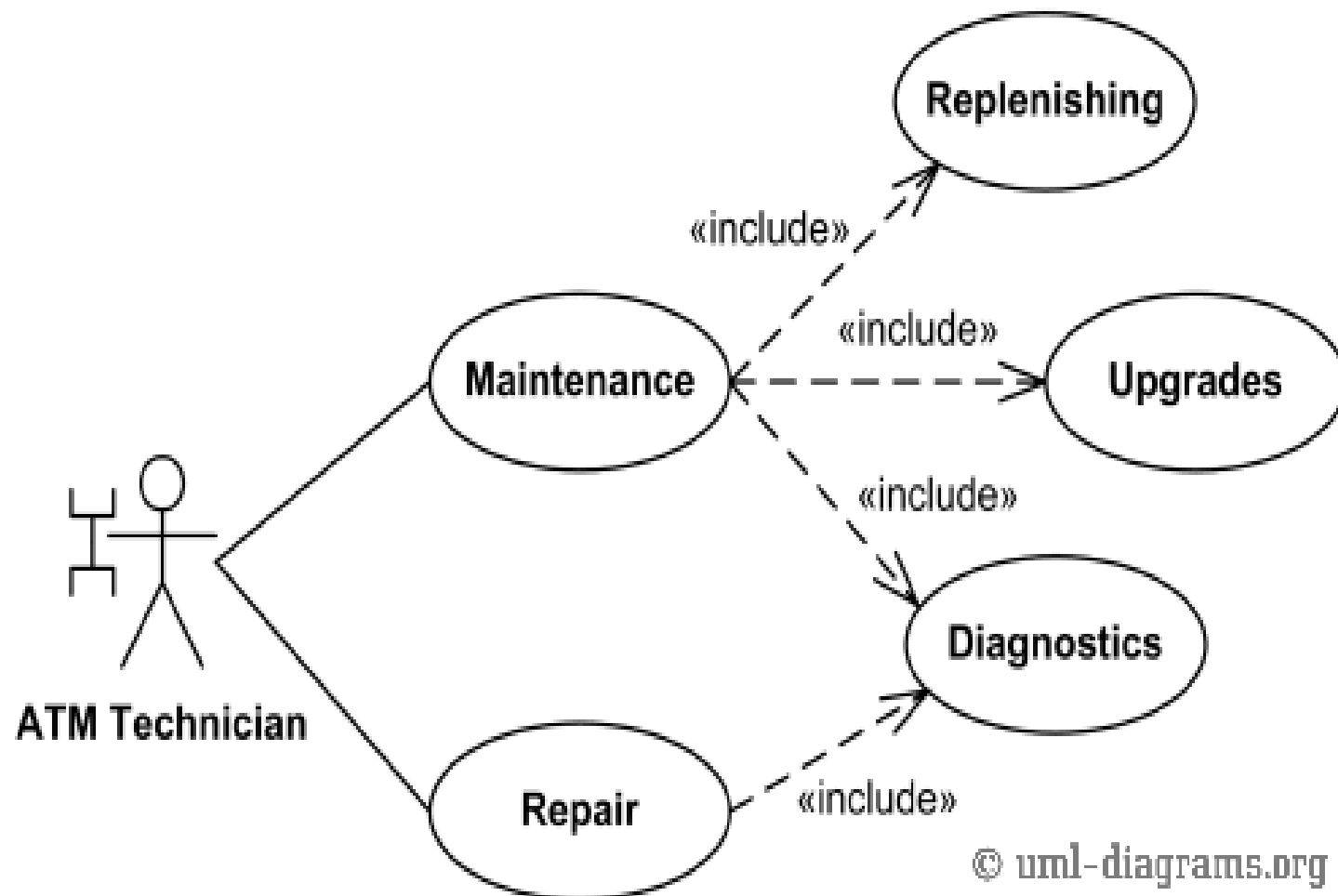
## How ATM SYSTEMS work- GUI ?



# Elaboration Phase

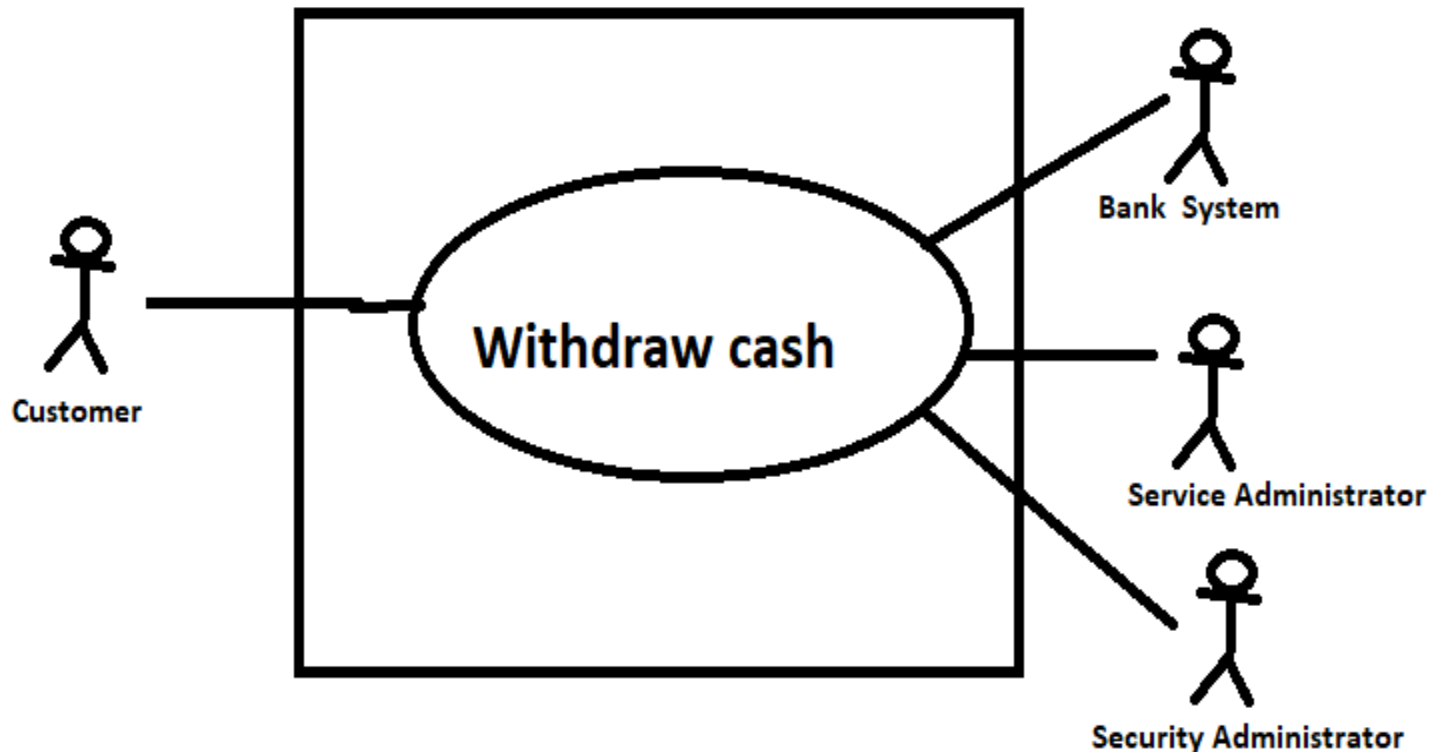


## ***Bank ATM Maintenance, Repair, Diagnostics Use Cases Example***



1. **Description** use case describes how a Bank Customer uses an ATM to withdraw money from a bank account. •

## 2. Use case diagram



### 3. Preconditions

1. The bank Customer must possess a bank card.
2. The network connection to the Bank System must be active.
3. The system must have at least some cash that can be dispensed.
4. The cash withdrawal service option must be available.

## 5.8 Postconditions :

- 1.The ATM has returned the card and dispensed the cash to the Customer and the withdrawal is registered on the Customer's account.
- 2 The ATM has returned the card to the Customer and no withdrawal is registered on the Customer's account.
3. The ATM has returned the card but has not supplied the amount of cash registered as withdrawn from the Customer's account. The discrepancy is registered in the ATM's log.
4. The ATM has kept the card, no withdrawal has registered on the Customer's account and the Customer has been notified where to contact for more information.

## 4. Basic Flow of Events

**4.1 Insert Card** The use case begins when the actor Customer inserts their bank card into the card reader on the ATM. The system allocates an ATM session identifier to enable errors to be tracked and synchronized between the ATM and the Bank System.

**4.2 Read Card** The system reads the bank card information from the card.

**4.3 Authenticate Customer Perform Subflow Authenticate Customer** to authenticate the use of the bank card by the individual using the machine.

**4.4 Select Withdrawal** The system displays the service options that are currently available on the machine. The Customer selects to withdraw cash.

**4.5 Select Amount** The system prompts for the amount to be withdrawn by displaying the list of standard withdrawal amounts. The Customer selects an amount to be withdrawn.

**4.6 Confirm Withdrawal Perform Subflow Assess Funds on Hand Perform Subflow Conduct Withdrawal**

**4.7 Eject Card** The system ejects the Customer's bank card. The Customer takes the bank card from the machine. **4.8 Dispense Cash** The system dispenses the requested amount of cash to the Customer. The system records a transaction log entry for the withdrawal. **4.9 Use Case Ends** The use case ends.

## 5. Alternative Flows

### 5.1 Customer Authentication -PIN

5.1.1 Handle No Communications with the Bank System.-Validate Card Information-Service Administrator

5.1.2 Handle No Communications with the Customer's Bank

5.1.3 Handle Inactive Card or Account

5.1.4 Handle Stolen Bank Card

5.1.5 Handle Invalid Bank Card Information

5.1.6 Handle Correct PIN Not Entered

### 5.2 Specialist Withdrawal Facilities

5.2.1 Handle the Withdrawal of a Non-Standard Amount At the Select Amount -multiple of the smallest denomination note held and must be below the amount of ATM's withdrawal limit

### 5.3 Card Handling

5.3.1 Handle Card Jam

5.3.2 Handle Unreadable Bank Card

5.3.3 Handle Invalid Card-Eject Card.

5.3.4 Handle Card Left Behind By Customer



## 5.4 Receipt Handling

5.4.1 Offer Receipt Handling to the Customer

5.4.2 Withdraw the Receipt Facility

5.4.3 Handle the Printing of Receipts

5.5 Error Handling

5.5.1 Handle Authentication Failures

5.5.2 Handle the Bank Not Approving the Withdrawal

5.5.3 Handle Cash Dispensing Errors

5.5.4 Handle Money Left Behind By Customer

5.5.5 Handle Running Out Of Critical Resources

5.5.6 Handle Running Out of Cash

5.5.7 Handle Security Breaches

5.5.8 Handle the Customer Quitting the Session

5.5.9 Handle the Customer Stopping Responding

5.5.10 Handle Video Recording Failure

5.5.11 Handle Transaction Log Failure

5.5.12 Handle Event Log Failure

## 5.6 Handle the Bank System Stopping Responding

5.6.1 Handle Loss of Connection to the Security Admin

## 6. Subflows

6.1 Authenticate Customer

6.2 Assess Funds on Hand

6.3 Conduct Withdrawal

6.4 Service Shutdown

6.5 Handle Transaction Adjustments

## 5.7 Special Requirements

5.7.1 Reliable Cash Dispensing

## Key Scenarios

### 7.1 Success Scenarios

**Withdraw cash** – Basic Flow

**Withdraw cash of a non-standard amount** – Basic Flow, Alternative Flow: Handle the Withdraw of a Non-Standard Amount

**Withdraw cash with withdrawal receipt printed** – Basic Flow, Alternative Flow: Handle the Printing of Receipts

### 7.2 Failure Scenarios

**Fail due to authentication failure** – Basic Flow, **Alternative Flow**: Handle Authentication Failures

**Fail due to invalid card** – Basic Flow, **Alternative Flow**: Handle Invalid Card

**Fail due to insufficient funds in the account** – Basic Flow, **Alternative Flow**: Handle the Bank Not Approving the Withdrawal

**Fail due to cash dispensing errors** – Basic Flow, **Alternative Flow**: Handle Cash Dispensing Errors

**Fail due to card jam** – Basic Flow, Alternative Flow: Handle Card Jam

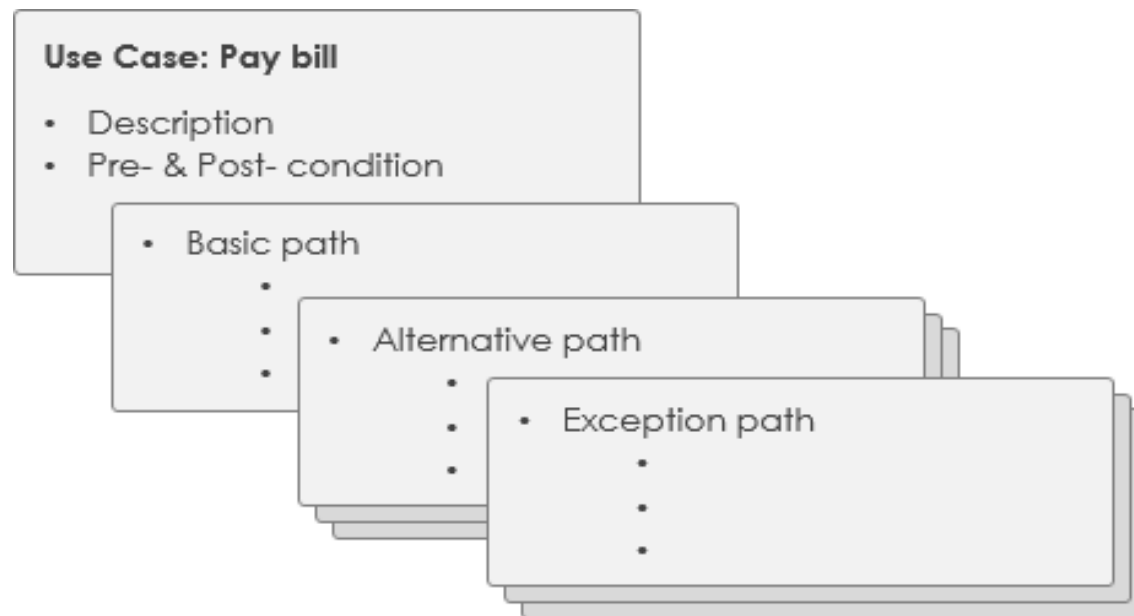
**Fail due to inadequate critical resources** – Basic Flow, Alternative Flow: Handle Running Out of Critical Resources

**Fail due to non-responding bank system** – Basic Flow, Alternative Flow: Handle the Bank System Stops Responding Quit – Basic Flow, Alternative Flow: Handle the Customer Quitting the Session

## 5.8 Postconditions :

- 1.The ATM has returned the card and dispensed the cash to the Customer and the withdrawal is registered on the Customer's account.
- 2 The ATM has returned the card to the Customer and no withdrawal is registered on the Customer's account.
3. The ATM has returned the card but has not supplied the amount of cash registered as withdrawn from the Customer's account. The discrepancy is registered in the ATM's log.
4. The ATM has kept the card, no withdrawal has registered on the Customer's account and the Customer has been notified where to contact for more information.

# How to detail use case -Use case template



# USE CASE TEMPLATE-text detailing of use case

USE CASE	DESCRIPTIONM
NAME OF USE CASE	
DESCRIPTION	
ACTOR	
VIEWPOINT	
PRECONDITION	
POST CONDITIN	
1.PRIMARY SCENARIO	
INCLUDE	
EXTEND	
GENERALIZATION	
1.1ALTERNATIVE PATH	
1.2 EXCEPTIONS	
NONFUNCTIONAL REQUIREMENTS	

Use case	Description
Name	Payment of salary.
Description	It calculates the salaries for all the employees of the institution.
Actors	Head of accounting dept., accounting assistant.
Viewpoints	Accounting department.
Primary scenario	<ol style="list-style-type: none"> <li>1. Get info about employees;</li> <li>2. Calculate salaries;</li> <li>3. Print cheque.</li> </ol>
Includes	Cheque printing.
NFRs	Security, performance.

<b>Name</b>	Save item for purchase.
<b>ID</b>	UC_001
<b>Description</b>	While browsing items in the eStore, a user finds an item he is not ready to purchase yet, but he wants to save it to a list so that he can later find the item that he was previously interested in.
<b>Actors</b>	eStore customer.
<b>Organizational Benefits</b>	Increase sales by helping the customer remember products he was previously interested in.
<b>Frequency of Use</b>	20% of users save an item to be bought later each time they visit the site. 50% of saved items are purchased within one year of the saved date.
<b>Triggers</b>	The user selects an option to save an item.
<b>Preconditions</b>	User is viewing an item in the catalog.
<b>Postconditions</b>	The item selected to be saved is visible to the user when he views his saved items. The item selected to be saved is reflected as a saved item when the user views his eStore search and browse results.
<b>Main Course</b>	<ol style="list-style-type: none"> <li>1. System prompts user to confirm saving selected item instead of purchasing it right away.</li> <li>2. User confirms to save now (see EX1).</li> <li>3. System determines user is not logged in and redirects user to log on (see AC1).</li> <li>4. User logs on (see AC2, AC3).</li> <li>5. System stores the saved item (see EX2).</li> <li>6. System redirects the user to their saved items list to view the full list.</li> </ol>
<b>Alternate Courses</b>	<p>AC1 System determines user is already logged on.</p> <ol style="list-style-type: none"> <li>1. Return to Main Course step 5.</li> </ol> <p>AC2 User logs off again.</p> <ol style="list-style-type: none"> <li>1. Return user to Main Course step 3.</li> </ol> <p>AC3 User does not have an account already.</p> <ol style="list-style-type: none"> <li>1. User creates an account.</li> <li>2. System confirms account creation.</li> <li>3. Return user to Main Course step 4.</li> </ol>
<b>Exceptions</b>	<p>EX1 User decides to purchase the item now.</p> <ol style="list-style-type: none"> <li>1. See "Purchase item" Use Case.</li> </ol> <p>EX2 System fails on saving item to list.</p> <ol style="list-style-type: none"> <li>1. System notifies user that an error has occurred.</li> <li>2. Return user to Main Course step 1.</li> </ol>



Here are two sample use cases, written at different levels, for different needs.

Use Case MO1. Register arrival of a box

RA means "Receiving Agent".

RO means "Registration Operator"

DS means "Department Supervisor"

**Primary Actor:** RA System: Nighttime Receiving Registry Software

1. RA receives and opens box (box id, bags with bag ids) from TransportCompany TC
2. RA validates box id with TC registered ids.
3. RA maybe signs paper form for delivery person
4. RA registers arrival into system, which stores: RA id date, time box id TransportCompany # bags (?with bag ids)
5. RA removes bags from box, puts onto cart, takes to RO.

**Extensions:**

- 2a. box id does not match transport company
- 4a. fire alarm goes off and interrupts registration
- 4b. computer goes down leave the money on the desk and wait for computer to come back up.

**variations:**

- 4'. with and without Person id
- 4''. with and without estimated value
- 5'. RA leaves bags in box.

## Use case example 2. A business use case, strategic goal.

**Use Case:** Get paid for car accident Design

**Scope:** The insurance company ("Tata Insurance")

**Goal Level:** Strategic **Primary Actor:** The claimant

### Main success scenario

1. Claimant submits claim with substantiating data.
2. Insurance company verifies claimant owns a valid policy
3. Insurance company assigns agent to examine case
4. Agent verifies all details are within policy guidelines
5. Insurance company pays claimant

### Extensions:

1a. Submitted data is incomplete:

1a1. Insurance company requests missing information

1a2. Claimant supplies missing information

2a. Claimant does not own a valid policy:

2a1. Insurance company declines claim, notifies claimant, records all this, terminates proceedings.

3a. No agents are available at this time

3a1. (What does the insurance company do here?)

4a. Accident violates basic policy guidelines:

4a1. Insurance company declines claim, notifies claimant, records all this, terminates proceedings.

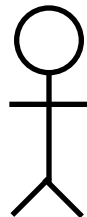
4b. Accident violates some minor policy guidelines:

4b1. Insurance company begins negotiation with claimant as to degree of payment to be made.

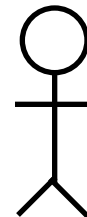
## *Dr. Babasaheb Ambedkar Library, VJTI*

*The Dr. Babasaheb Ambedkar Library, VJTI* is a library that lends books for a specified period of time to the students, faculties and nonteaching staff. Books are lent to members only. If available, the book is issued forthwith to the requesting member. If the book is not currently available, the member can reserve the same. If the member fails to return the book after the specified period and/or loses or damages the book, he is required to make good the loss/damage.

Actors:

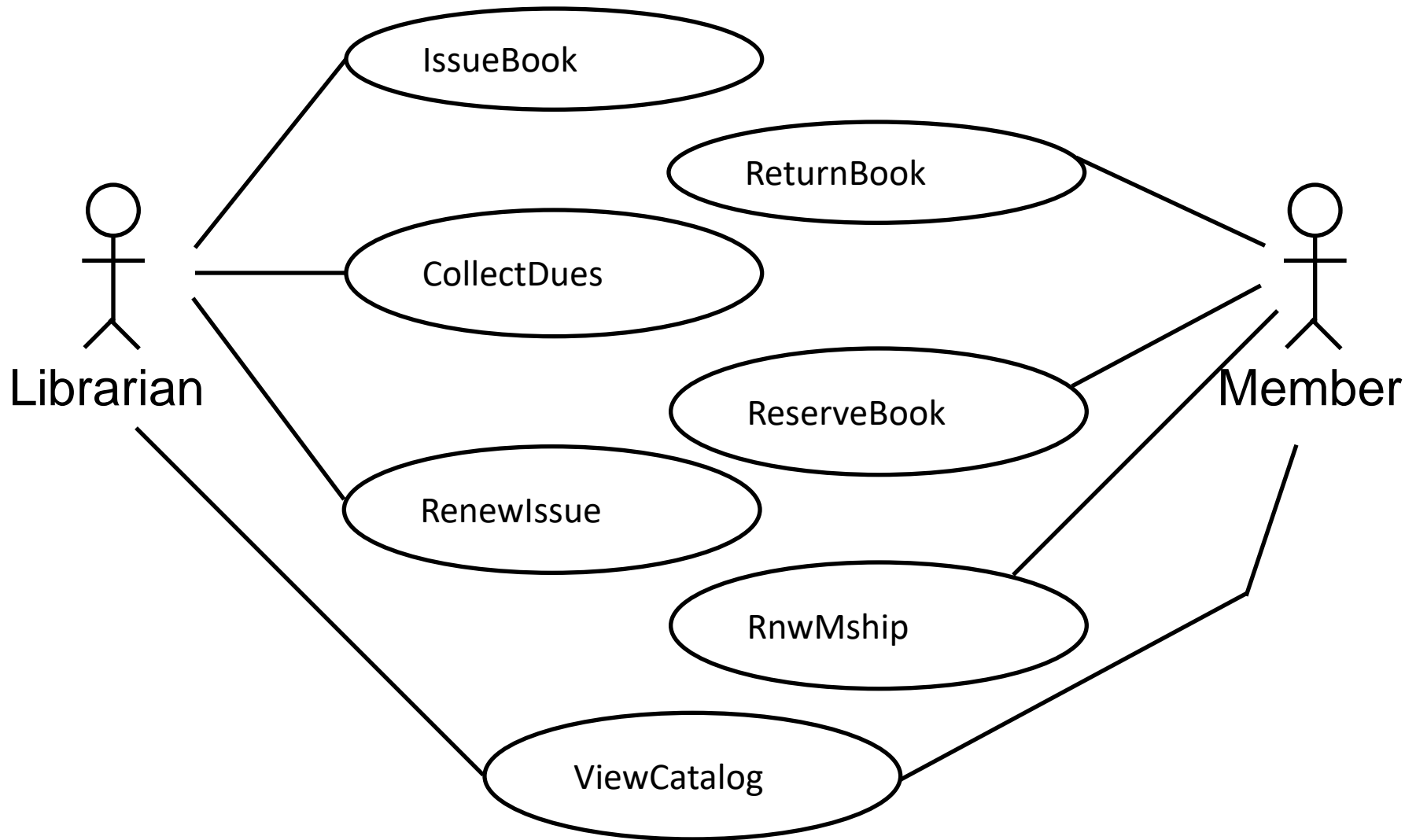


Librarian

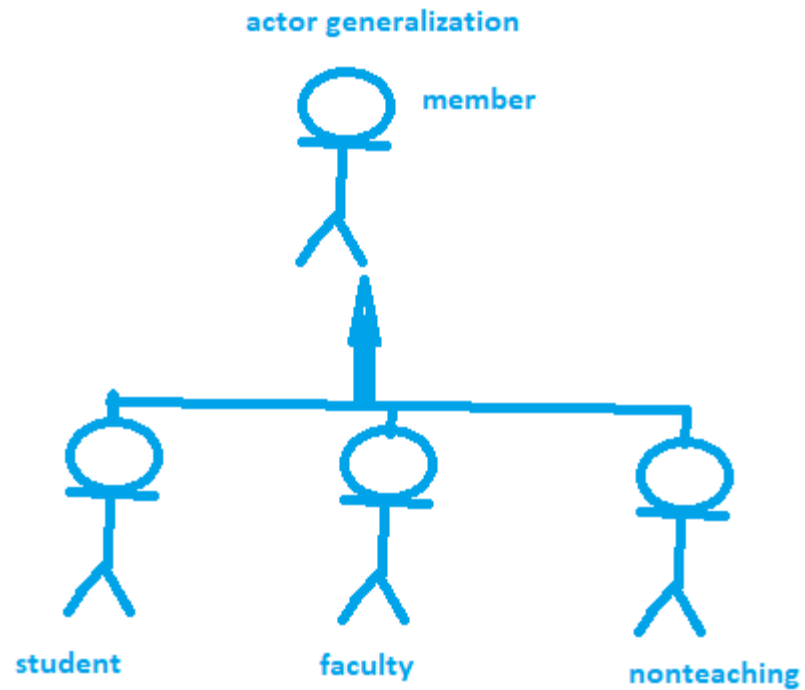


Member

# Use Case Diagram: Example



**Who is primary actor and who is secondary actor? Give your opinion and justify your stand ?**



# Use Case Description - Example

**Use Case:** ViewCatalog

**Actors:** Librarian, Member

**Purpose:** Browse the Catalog of books and journals

**Overview:** Allows the librarian or a member to browse through the catalog of books. The catalog contains details such as .....

Preconditions:

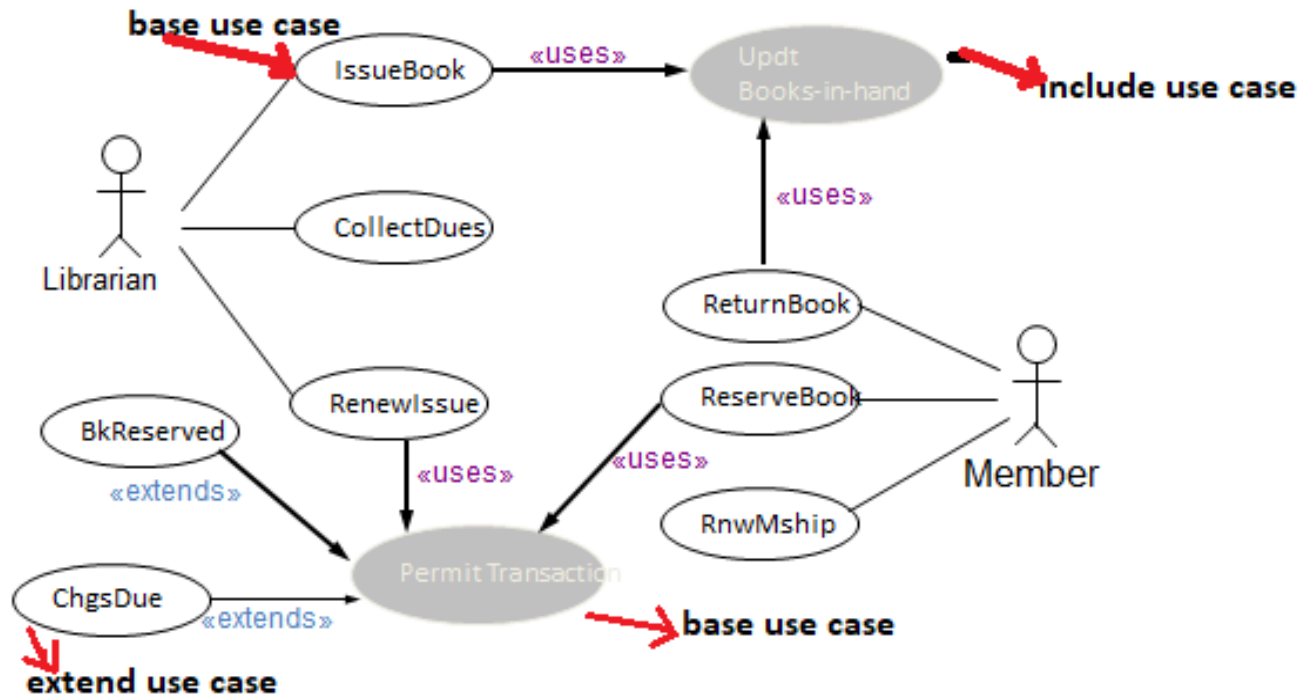
Post conditions:

Psuedocode :

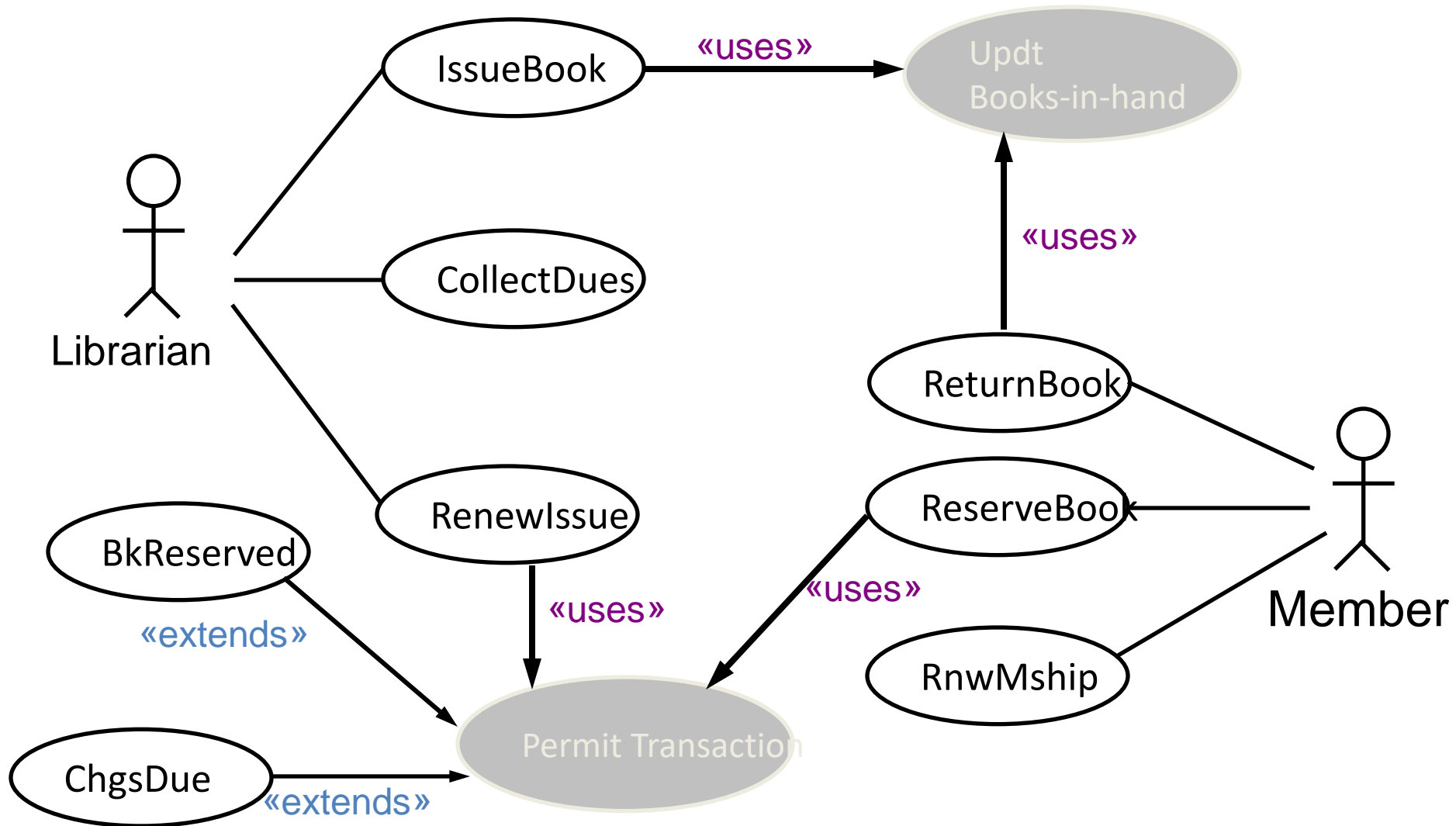
*Main flow of events:*

The use case begins when either actor starts browsing for a book. They can specify a specific book by Title, Author or Publisher. All books satisfying the specified criteria are displayed to the user (Librarian or Member).

## «extends» and «uses» : Example



# «extends» and «uses» : Example





ISSUE BOOK USE CASE OR  
REGISTER BOOK LOAN- ASK FOR  
BOOK TO THE SYSTEMS.

<b>UC-0015</b>	<b>Register Book Loan</b>	
<b>Dependencies</b>	<ul style="list-style-type: none"> <li>• OBJ-0001 <i>To manage book loans</i> (objective)</li> <li>• OBJ-0005 <i>To know library users' preferences</i> (objective)</li> <li>• CRQ-0003 <i>Maximum number of simultaneous loans</i> (business rule)</li> <li>• CRQ-0014 <i>Return date for a loan</i> (business rule)</li> </ul>	
<b>Description</b>	The system shall behave as described in the following use case when <i>a library user requests a loan of one or more books.</i>	
<b>Precondition</b>	<i>The library user has been identified by means of his or her identity card, has picked up the books to loan from the shelves, has not reached the maximum number of simultaneous loans and has no penalty.</i>	
<b>Ordinary Sequence</b>	<b>Step</b>	<b>Action</b>
	1	<i>Actor librarian requests the system for starting the book loan registering process.</i>
	2	<i>The system requests for the identification of the library user requesting a loan.</i>
	3	<i>Actor librarian provides identification data of the library user to the system.</i>
	4	<i>The system requests for the identification of the books to be loaned.</i>
	5	<i>Actor librarian provides identification data of the books to be loan to the system.</i>
	6	<i>The system displays the return date for each of the books to be loan and requests loan confirmation for each of them.</i>
	7	<i>Actor library user confirms the librarian which books he or she wants to loan after knowing return dates.</i>
	8	<i>Actor librarian re-confirms the book loans confirmed by the library user to the system.</i>
	9	<i>The system informs that the book loans have been successfully registered.</i>
<b>Postcondition</b>	<i>The library user can take the loaned books away and the system has registered the book loans.</i>	
<b>Exceptions</b>	<b>Step</b>	<b>Action</b>
	3	<i>If the library user has already reached the maximum number of simultaneous loans or has a penalty, the system informs of the situation, then this use case is cancelled.</i>
<b>Comments</b>	<i>The maximum number of simultaneous book loans and the loan period depend on the library policy and can change in the future. See business rules CRQ-0003 y CRQ- 0014.</i>	

# Use Case to Issue Book<sub>(1)</sub>

**Use case:** Login

**Description:** The User logs in to the Library Management System by providing userID and password .

**Precondition:** The user has accessed the Main page of the System.

**Pseudo code:**

1. Display Home Page of Library Management System.
2. Enter user ID and password.
3. If user ID and password are validated  
Then User successfully logged in
4. Else  
Displays “User is not a member of Library”  
User has to register to the System.

**Post condition:** User logged in or registered to the System.

# Use Case to Issue Book<sub>(2)</sub>

**Use case:** Search Book

**Description:** User requests for the book. Book can be searched on the basis of Book ID, Author and Name.

**Precondition:** User successfully logged in to the System .

**Pseudo Code:**

1. Enter Book ID, Author or Book Name to be searched.
2. If book ID, Author or Name of Book matches with that in the Repository  
Then Get the Status of the book  
Get Details of the User
3. Else  
Displays message “Book not found”

**Postcondition:** The Book searched or book not searched.

# Use Case to Issue Book<sub>(3)</sub>

**Use case:** Issue Book

**Description:** Book is issued to the User.

**Precondition:** Book is found in the Repository.

**Pseudo code:**

1. If book found

Then Get Book Status and No. of books issued to the User

If No. of book issued to the User > max limit then

“SORRY, Book cannot issued”

2. Else

Book Issued to the User

Update the Repository.

User DB, Book status are updated in the Repository.

**Post condition:** Book is issued and necessary updates to the Repository are made.

# Identify the roles played by following and its impact on society.



Identify Use Cases, Preconditions, Post Conditions, Triggers And Use Cases Performed By Savitribai Phule and Mahatma Jyotirao Phule? Clearly Identify The Primary Actor And Secondary Actors. Construct use case diagram and write the use case template for one important use case.