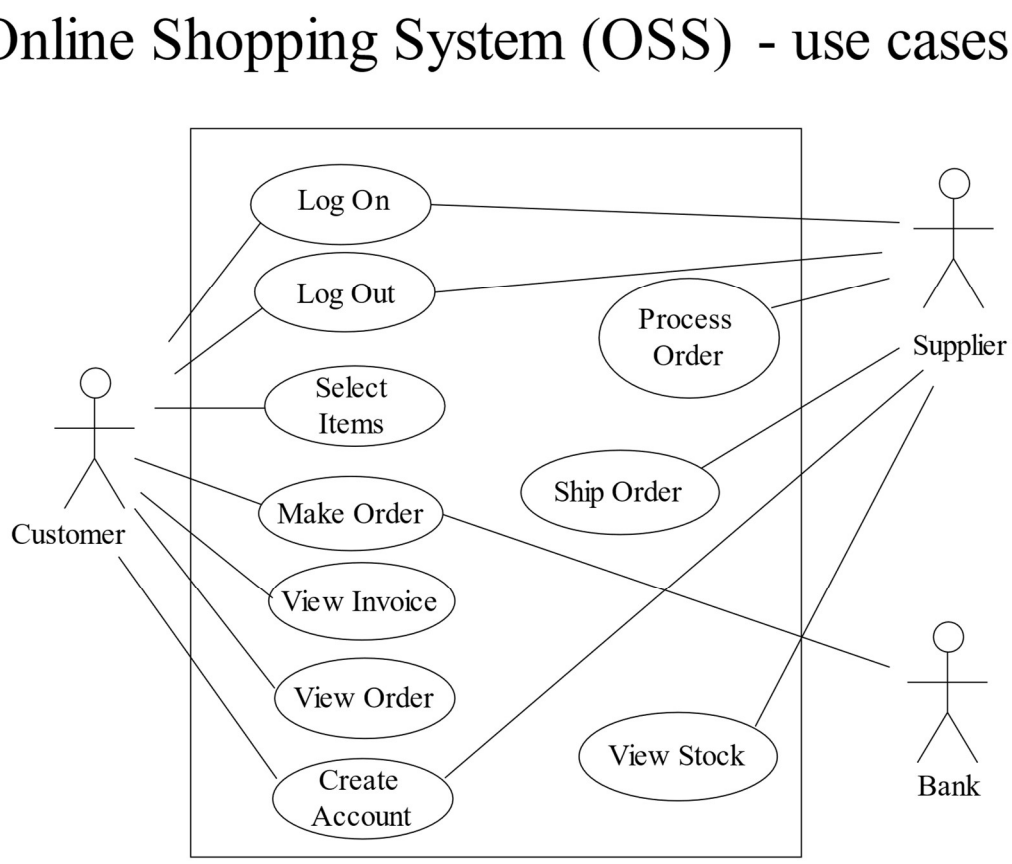
Online Shopping System (OSS)

Problem Description

An online shopping system and banking system's requirements are described in the use case model below:

1. Determine all classes for the use cases in the OSS. (refer to OOAD)
2. Implement each use case in the online shopping system in Java. (refer to Chapters 6-8)
3. Store customer account, order, stock, and catalog in each file (or database) in the OSS, whereas stores customers' credit card accounts in a file (or database) in the banking system. (refer to files)
4. The OSS and banking system shall be implemented using each separate thread, and they shall communicate with each other synchronously via a message buffer and response connector. (refer to Chapter 11)
5. Implement a graphical user interface for the online shopping system. (refer to user interface)

Describe the assumptions you make.



Use case name: Log On
Summary: Customer logs on into the system.
Actor: Customer (or supplier)
Precondition: None.
Main sequence:

1. The customer enters the ID and password.
2. The system checks if the customer ID and password are valid.
3. The system displays a welcome message if the ID and password are valid.

Alternative sequence:

- Step 3: If the customer's ID does not exist in the system, the system displays no account.

Postcondition: Customer has logged on into the system.

Use case name: Log Out
Summary: Customer logs out system.
Actor: Customer (or Supplier)
Precondition: Customer logged on into the system.
Main sequence:

1. The customer selects "log out."
2. The system makes customers log out.

Alternative sequence: None.
Postcondition: Customer has logged out.

Use case name: Create Account
Summary: Customer creates an account.
Actor: Customer (or Supplier)
Precondition: None
Main sequence:

1. The customer enters the id, password, name, address, phone number, and credit card number.
2. The system creates a customer account and stores account information.
3. The system displays account type – regular or premium to the customer.
4. If the customer selects premium, the system updates the account type and charges the membership fee (i.e., $40/year) in the customer account. (The customer must pay the membership fee when he/she purchases the first item in the year.)
5. The system displays an account created.

Alternative sequence:

- Step 1: Supplier inputs only id and password to the system.
- Step 2: If the same id exists in the system, the system displays an error message and requests a different id from the customer (or supplier).
- Step 4: If the customer selects regular, the system does not charge the membership fee.

Postcondition: The customer has created an account.

Use case name: Select Items.
Summary: Customer browses various catalog items from the supplier's catalog and selects items to purchase.
Actor: Customer
Precondition: None.
Main sequence:

1. The customer requests the catalog to browse.
2. The system displays catalog items, short descriptions, regular customer prices, and premium customer prices.

3. The customer selects one or more items from the catalog.
4. The system adds the selected items to a cart.
5. The system displays the selected items, quantities, and the total price. (The total price might be different between regular and premium customers.)

Alternative sequence:

- Step 3: Customer selects no item and exits from the system.

Postcondition: Customer has browsed items and selected them.

Use case name: Make order
Summary: Customer purchases the selected items, and the system charges the items using the customer credit card.
Actor: Customer, Bank
Precondition: Customer added items to a cart and logged on to the customer account.
Main sequence:

1. The customer orders the items selected in a cart.
2. The system displays delivery methods – mail by charging a fee (e.g., $3.00 per purchase order) or in-store pickup for free.
3. The customer selects one of the delivery methods.
4. The system requests a bank to charge the total purchase amount using the customer's credit card in its Account.
5. If the bank approves the charge, the system receives a purchase authorization number from the bank.
6. The system stores the customer order, containing the customer Id, items, purchase authorization number, and order status as "ordered."
7. The system displays order confirmation to the customer.

Alternative sequences:

- Step 4: If the premium customer orders the first time in the year, the system adds the membership fee ($40.00) to the total purchase amount.
- Step 4: If the customer selects mail delivery, the system adds the delivery fee ($3.00) to the total purchase amount.
- Step 5**:** If the bank denies the charge (e.g., invalid credit card or over credit limit), the system prompts the customer to enter another different credit card number. The customer can either enter a different credit card number or cancel the order. If the bank approves the charge using the credit card, the system updates its Account's credit card number.

Postcondition: Customer has ordered items.

Use Case: View Order
Summary: Customer views the order information.
Actor: Customer
Precondition: Customer has logged in.
Main sequence:

1. The customer requests all order information.
2. The system displays the customer's orders.
3. The customer selects an order(s).
4. The system displays the order detail and order status.

Alternative sequence: None
Postcondition: Customer has viewed order status.

Use Case: View Invoice
Summary: Customer views a customer invoice.

Actor: Customer
Precondition: Customer has logged in.
Main sequence:

1. The customer requests his/her all orders.
2. The system displays the customer's orders.
3. The customer selects an order(s).
4. The system displays the order invoice, including the order date, items, total amount, and payment information.

Alternative sequence: None
Postcondition: The customer has viewed an order invoice.

Use Case: Process Order
Summary: Supplier determines that the inventory is available to fulfill the order and processes an order.
Actor: Supplier
Precondition: Supplier has logged in.
Main sequence:

1. The supplier requests orders.
2. The system displays orders to the supplier.
3. The supplier selects an order.
4. The system determines that the items for the order are available in stock.
5. If the items are in stock, the system reserves the items and changes the order status from "ordered" to "ready." After reserving the items, the stock records the numbers of available items and reserved items. The number of total items in stock is the summation of available and reserved items.
6. The system displays a message that the items have been reserved.

Alternative sequence:

- Step 5: If an item(s) is out of stock, the system displays that the item(s) needs to be refilled.

Postcondition: The supplier has processed an order after checking the stock.

Use Case: Ship Order
Summary: The supplier ships an order's items manually and then confirms an order sent to a customer.
Actor: Supplier
Precondition: An order's items were reserved, and the supplier logged in.
Main sequence:

1. The supplier request customer orders that are "ready" status.
2. The system displays the orders ready.
3. The supplier selects an order and ships the order's items manually to the customer.
4. The supplier enters an order shipped into the system.
5. The system updates the number of reserved items in stock.
6. The system changes an order status from "ready" to "shipped."
7. The system displays the order's status to the supplier.

Alternative sequence: None
Postcondition: Supplier shipped an order to the customer.

Use Case: View Stock
Summary: The supplier views stock status.
Actor: Supplier
Precondition: The supplier logged in.
Main sequence:

1. The supplier requests stock status.

2. The system displays stock status regarding the number of total items, available items, and reserved items.

Alternative sequence: None
Postcondition: Supplier shipped an order to the customer.

Use Case for Banking System

Use Case: Charge Amount
Summary: The bank charges the purchase amount from a customer's bank credit card acccount.
Actor: Online Shopping System (External system)
Precondition: None
Main sequence:

1. The OSS requests the bank to charge any amount from a customer bank credit account.
2. The bank system verifies the customer's credit card.
3. If the customer's credit card is valid, the bank charges the customer's Account.
4. The bank system generates an authorization number.
5. The bank system sends the authorization number to the OSS system.

Alternative sequence:

- Step 3: If the customer's credit card is invalid, the bank denies charging its Account.

Postcondition: The bank system charges a customer's Account.