IT314 - Software Engineering

Lab6 Report

Modeling Class Diagram and Activity Diagram (Point of Sale System)

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➔ A Problem Description:

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A POS (Point-Of-Sale) system is a computer system typically used to manage the sales in retail stores. It includes hardware components such as a computer, a bar code scanner, a printer and also software to manage the operation of the store.

The most basic function of a POS system is to **handle sales**. When a customer arrives at a POS counter with goods to purchase, the cashier will start a new sale transaction. When the barcode of a good is read by the POS system, it will retrieve the name and price of this good from the backend catalog system and interact with inventory system to deduce the stock amount of this good. When the sale transaction is over, the customer can pay in cash, credit card or even check. After the payment is successful, a receipt will be printed. Note that for promotion, the store frequently issue gift coupons. The customer can use the coupons for a better price when purchasing goods.

Another function of a POS system is to handle returns.... [The details of which are not given here]

A user must log in to use the POS. The users of a POS system are the employees of the store including cashiers and the administrator. The administrator can access the system management functions of the POS system including user management and security configuration that cashiers can't do.

Q. 1) Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.

➔ Process sales:

Primary Actor: Cashier

Goal: To process a customer's purchase and complete the sale**.**

Precondition: The customer has selected items for purchase and the cashier is logged in.

Postcondition : Sale is saved. Receipt is printed. Stock data updated. Payment authorization approvals are recorded.

Main Flow:

1. The cashier starts a new sale by scanning the item barcode.

2. The POS system communicates with the catalog system to get the item details (price, description, etc.).

3. The POS system adds the item to the sale.

4. This process is repeated for all items the customer wishes to buy.

5. The cashier selects the payment method (cash, credit, etc.).

6. The POS system calculates the total and updates the inventory system.

7. The payment is processed.

8. A receipt is printed and handed to the customer. Postcondition: The sale is completed, and the inventory is updated. Alternative Flow: If the payment fails, the system prompts for another payment method or cancels the transaction.

➔ Handel Return:

Primary Actor: Cashier

Goal: To process the return of purchased items**.**

Precondition: The customer has a valid receipt and the cashier is logged in.

Postconditions : The item is returned to the inventory. The customer receives a refund (or store credit). The system logs the return transaction.

Main Flow:

1. The cashier selects the return option in the POS system.

2. The POS system asks for the receipt details or the original transaction number.

3. The cashier scans the items to be returned.

4. The POS system communicates with the inventory system to restock the items.

5. The POS system calculates the amount to be refunded.

6. The cashier completes the return by either refunding cash or processing a card refund.

7. The system updates the inventory and generates a receipt for the return. Postcondition: The return is completed, and the inventory is updated. Alternative Flow: If the receipt is invalid or the item is ineligible for return, the system displays an error message and cancels the return.

Q. 2) Identify Entity/Boundary Control Objects

➔ Entity Object:

- Sale

- Item
- Customer
- Payment
- Receipt
- Return Transaction

➔ **Boundary Object:**

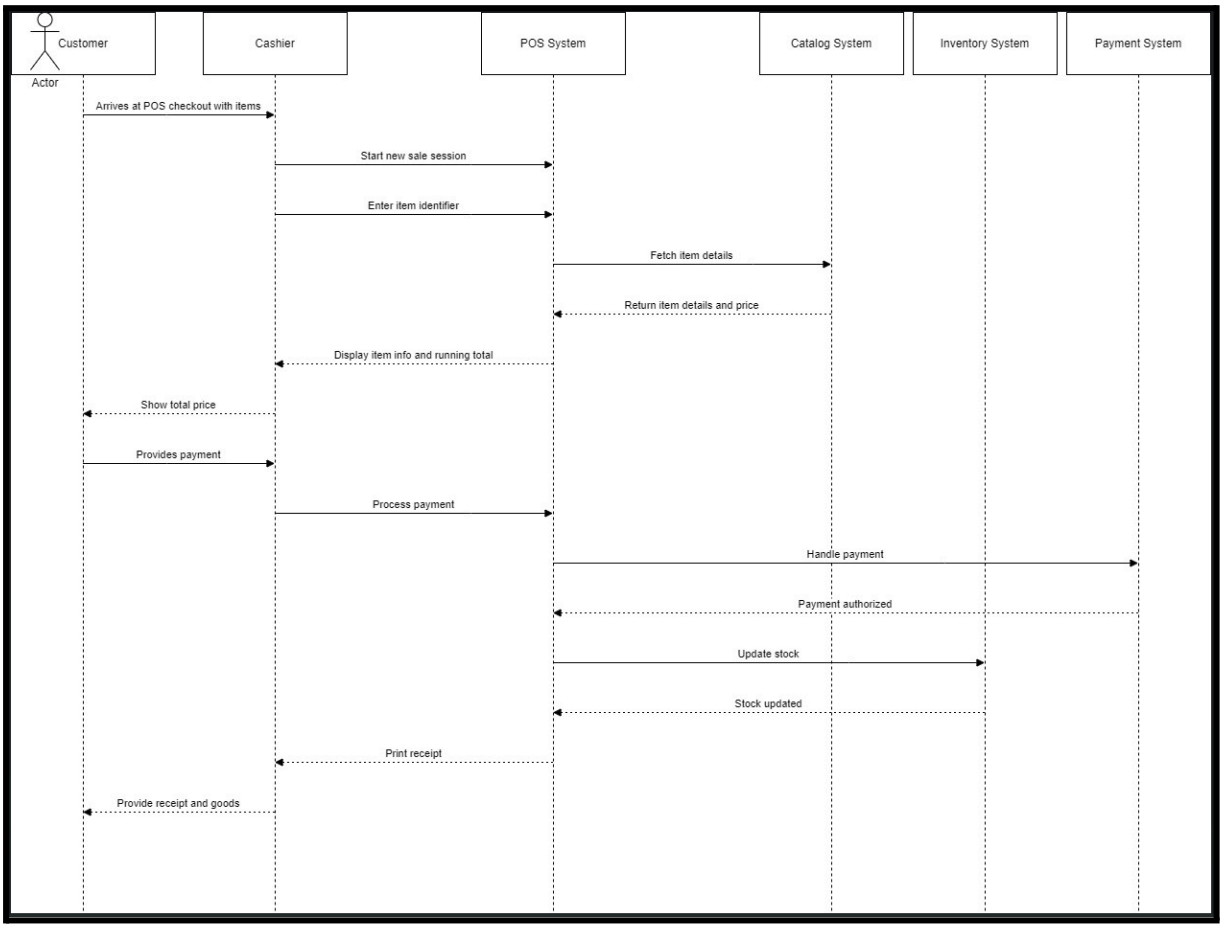
- Cashier Interface
- Catalog System
- Inventory System
- Payment System

➔ **Control Object:**

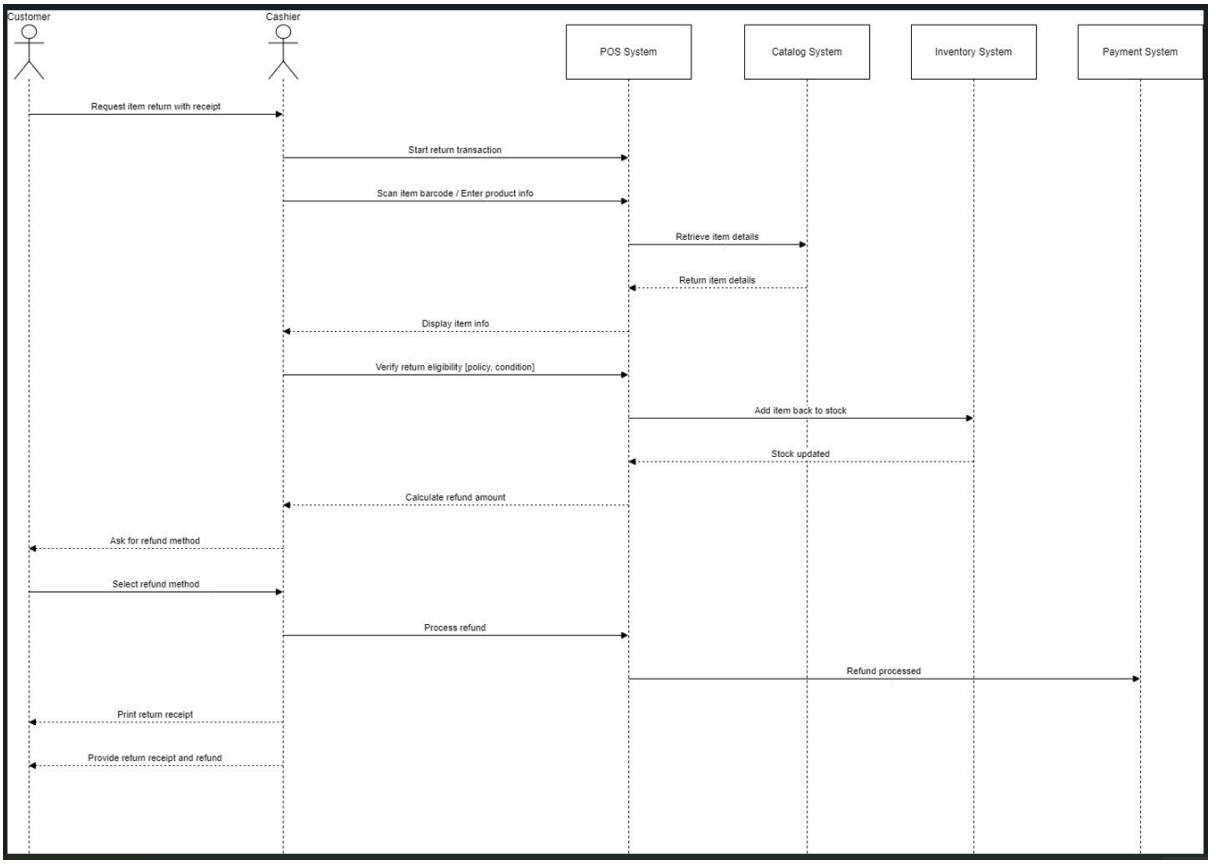
- ReturnController
- InventoryController
- UserController
- PaymentController

Q. 3) Develop Sequence Diagrams:

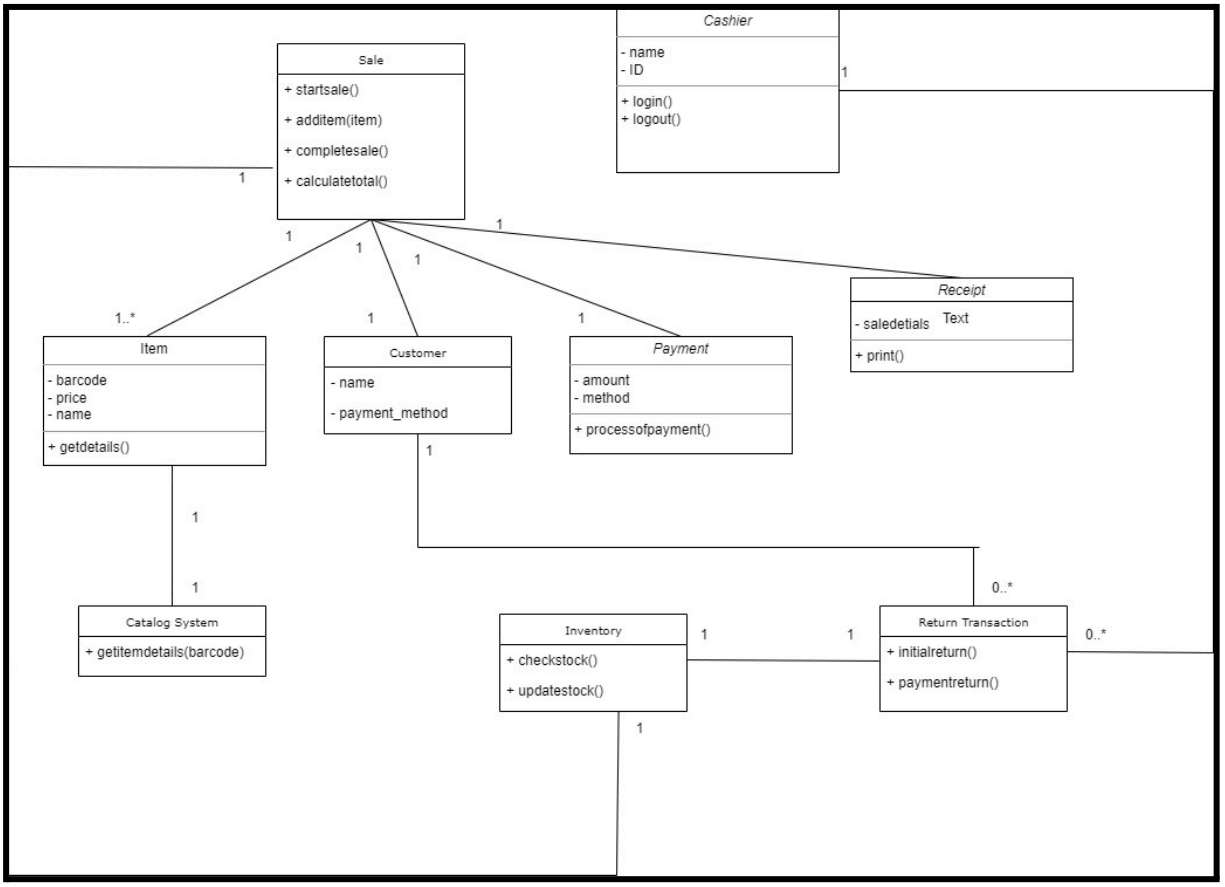
➔ For Process Sale



➔ For Handle Return :

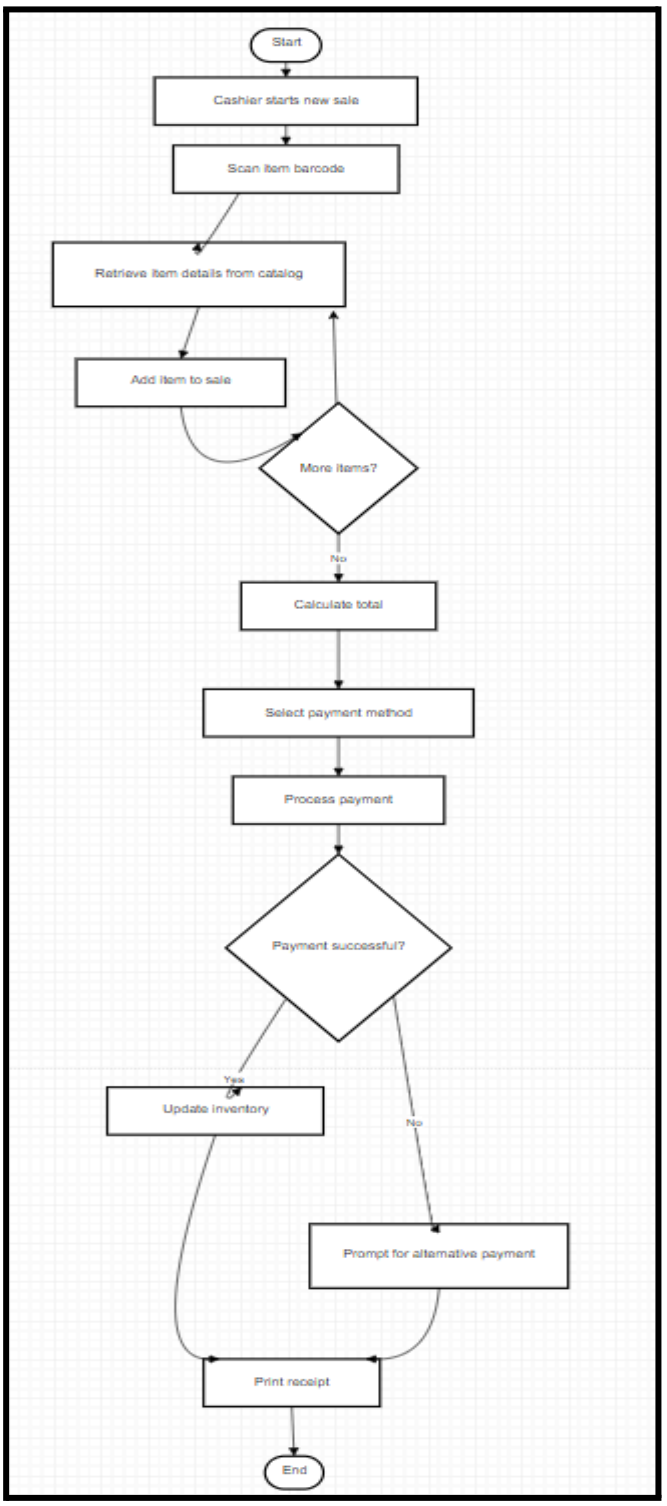


Q 4). Develop Analysis Domain Model



Q 5). Develop activity diagram for "Process Sale" and "Handle Return" use cases.

➔ **Process Sale:**



➔ **Handle Return:**