IT-314 Lab:

Modelling Class Diagram and Activity Diagram

Submitted by: Dhwani Joshi (202201471)

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

Use Case Textual Description for ‘Process Sale’:

- Primary Actor: Cashier
- Secondary Actor: Customer
- Pre-conditions:
    1. The cashier has logged in the POS system.
    2. The customer has presented the goods to be bought.

- Mainflow:
    1. The cashier starts a transaction.
    2. The cashier scans the barcode on each of the product.
    3. The system software retrieves relevant data about the product.
    4. The POS System updates the inventory.
    5. The customer chooses an appropriate way to pay the bill. (cash/online)
    6. The POS System processes the payment.
    7. The POS System generates a receipt.

- Extensions:

2.1. If the barcode cannot be scanned for some reason, the cashier manually enters the product detail/name.

5.1 For some reason the payment is not approved then the POS system tries again for payment or cancels the purchase.

5.2. If the payment is canceled, the system is reset to its initial state.

- Post-conditions:
    1. The system goes back to its initial state where the cashier can begin a new sales transaction.

Use Case Textual Description for ‘Process Sale’:

- Primary Actor: Cashier
- Secondary Actor: Customer
- Pre-conditions:
    1. The cashier has logged in the POS system.
    2. The customer has presented the receipt of the purchased goods and the goods in a returnable state.

- Mainflow:
    1. The cashier starts a return process.
    2. The cashier scans the barcode on each of the product.
    3. The system software retrieves relevant data about the product.
    4. The POS System updates the inventory.
    5. The customer chooses how he wants to be refunded. (cash/online)
    6. The POS System processes the refund.
    7. The POS System generates a return receipt.

- Extensions:

2.1. If the barcode cannot be scanned for some reason, the cashier manually enters the product detail/name.

5.1 For some reason the payment is not approved then the POS system tries again for payment or the customer is refunded through cash.

- Post-conditions:
    1. The system goes back to its initial state where the cashier can begin a new sales transaction or a return process.

Q.2. Identify Entity/Boundary Control Objects

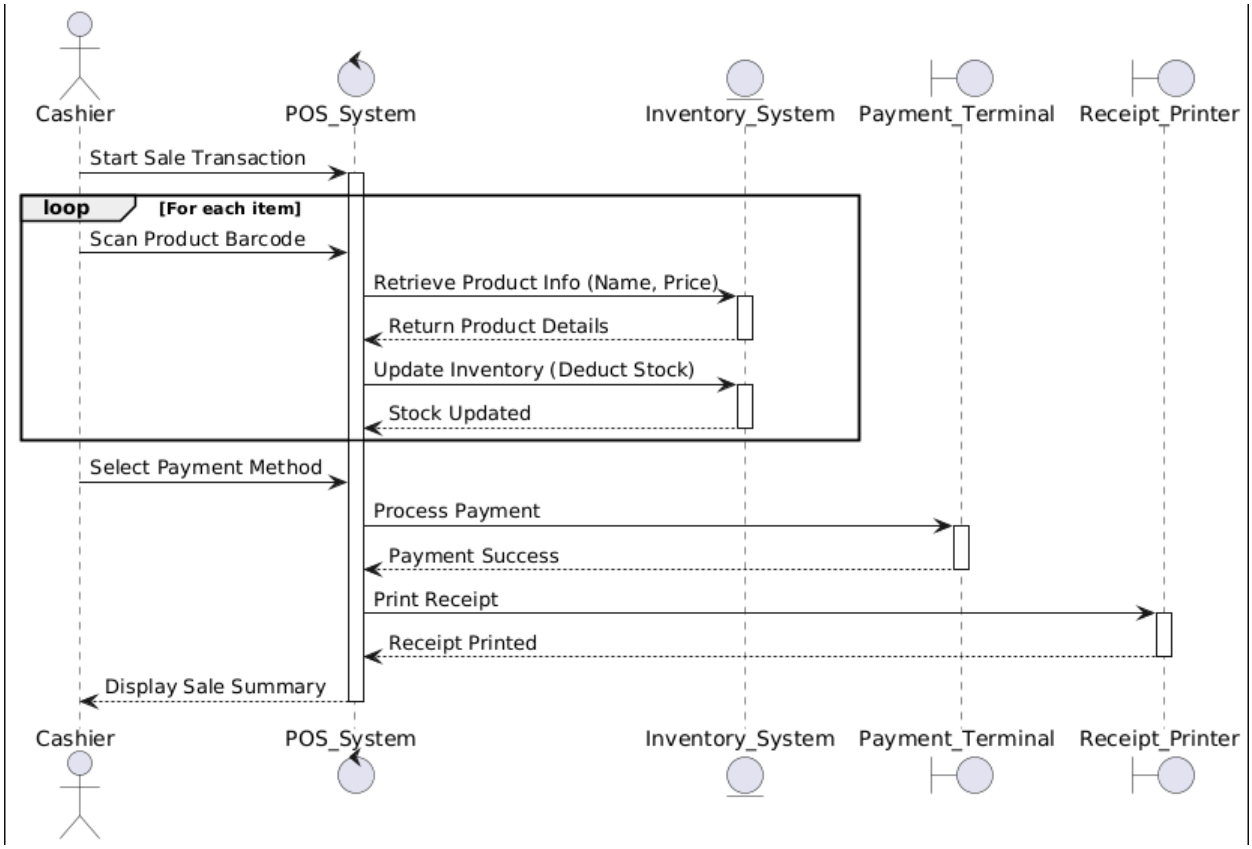
- Entities:
    1. Product: Represents goods being sold/returned (with attributes such as product name, price, and stock).
    2. Transaction: Represents the sale or return event (with details on items, date, payment).
    3. Inventory System: Represents the goods/items available.

- Boundary Objects:
    1. Payment Terminal: Handles cash/credit card processing.
    2. Receipt Printer: Prints receipts after the transaction.

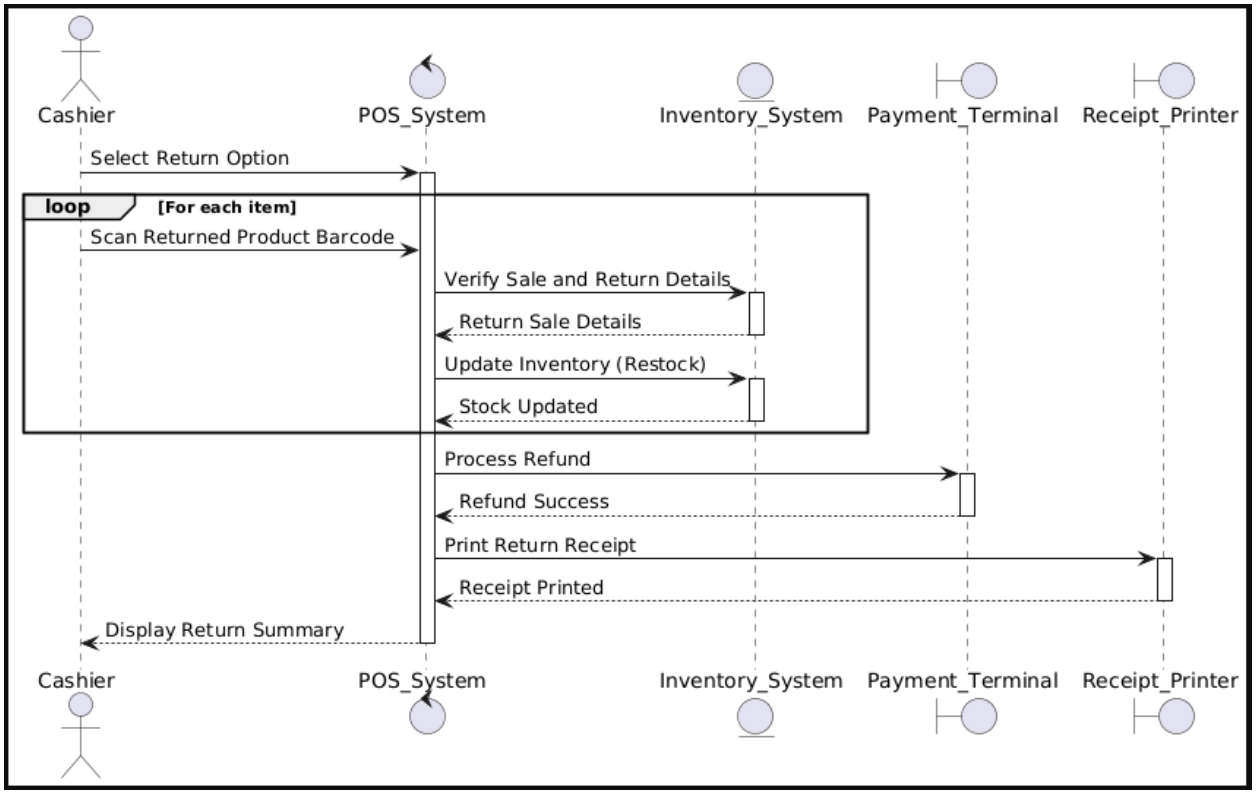
- Control Objects:
    1. POS System: Manages the overall sale, product scanning, inventory updates, payment handling.
    2. Return Controller: Coordinates the return flow (verifying sale, updating inventory, refund).
    3. Payment Processor: Manages payment authorizations and transactions.

Q.3. Develop Sequence Diagrams

Process Sale:



Handle Return:

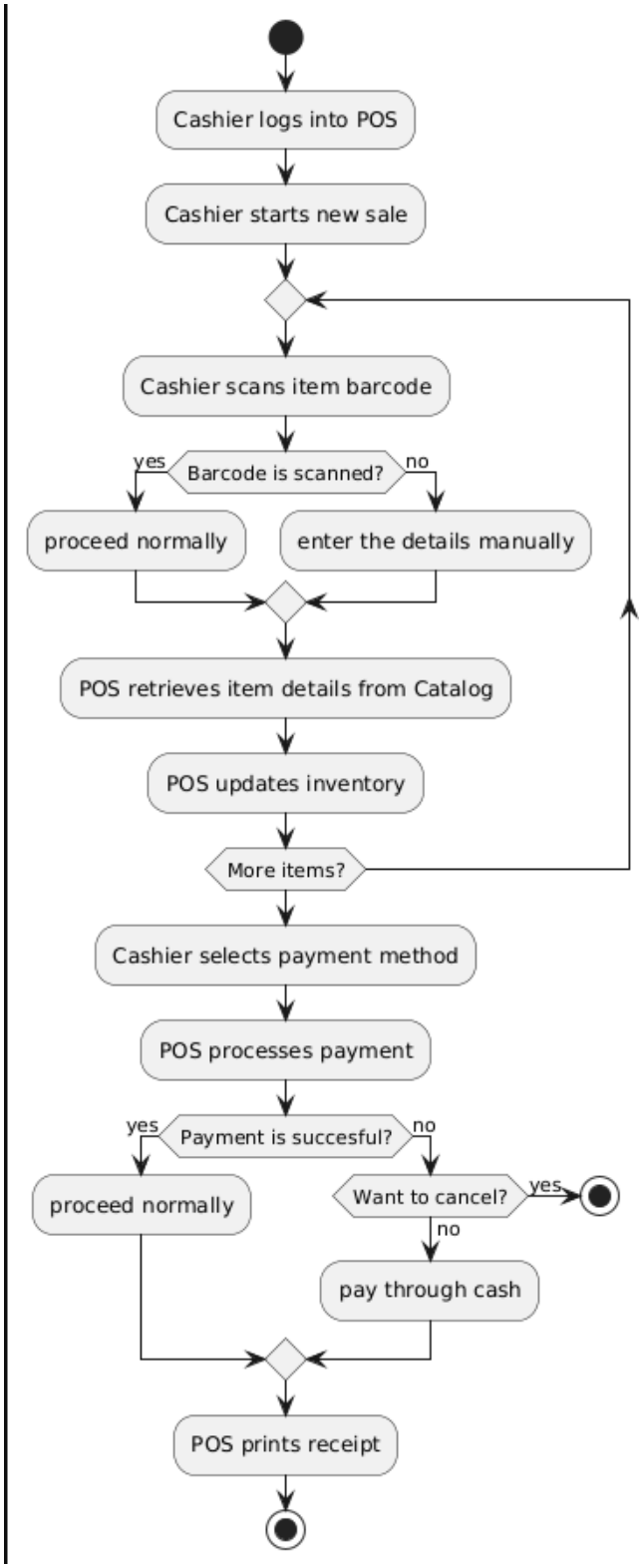


Q.4. Develop Analysis Domain Models

- **Classes:**
  - **Product**: Attributes include `productID`, `name`, `price`, `stockQuantity`.
  - **Transaction**: Attributes include `transactionID`, `date`, `totalAmount`.
  - **Customer**: Attributes include `customerID`, `name`.
  - **CatalogSystem**: Methods include `retrieveProductInfo()`.
  - **InventorySystem**: Methods include `updateStock()`.
  - **PaymentTerminal**: Methods include `processPayment()` and `processRefund()`.
  - **Receipt**: Attributes include `receiptID`, `transactionID`, `date`.

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

For ‘Process Sale’:



For ‘Handle Return’: