

Lab 6

Software Engineering

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

- **Use Case Textual Descriptions**

1. Process Sale

Actors: Cashier, Inventory Management System, Product Catalog System, Payment Gateway

Preconditions: The cashier is logged into the system, and the point-of-sale (POS) is connected to the inventory and product catalog systems.

Postconditions: The transaction is completed, payment is successfully processed, inventory levels are updated, and a receipt is generated.

Main Flow:

1. The cashier initiates a new transaction.
2. The cashier scans the barcode of the item.
3. The system fetches the item's name and price from the product catalog.
4. The system adjusts the inventory count for the scanned item.
5. The cashier concludes the sale and selects a payment method.
6. Payment is processed through cash, credit/debit card, or check.
7. The system issues a receipt for the customer.
8. If the customer presents a coupon, the system calculates and applies the discount before processing the payment.



Extensions:

If the payment is unsuccessful, the system prompts the cashier to either retry the payment or cancel the sale.

If an invalid barcode is scanned, the system alerts the cashier to rescan the item.

2. Handle Return

Actors: Cashier, Inventory Management System

Preconditions: The cashier must be logged into the system, and the item being returned should have a valid receipt or sales record.

Postconditions: The return is successfully completed, inventory levels are adjusted, and a refund is issued.

Main Flow:

1. The cashier begins the return process.
2. The cashier either scans or manually inputs the product information from the receipt.
3. The system checks the product details and price against the sales record.
4. The system updates the inventory to reflect the returned item.
5. The system processes the refund according to the original payment method used.
6. A return receipt is printed for the customer.

Extensions:

If the product cannot be found in the sales record, the system prompts the cashier to verify the receipt.

If the refund amount exceeds a specified threshold, the system escalates the request to the administrator for approval.

Q-2) Identify Entity/Boundary Control Objects.

➤ Entity Objects:

- Product: Provides information on the product, including name, price, and stock.
- Sale: Indicates the completion of a transaction, encompassing the sold goods and the total amount.
- Return: Indicates a product return, complete with reimbursement and restocked merchandise.

➤ Boundary Items:

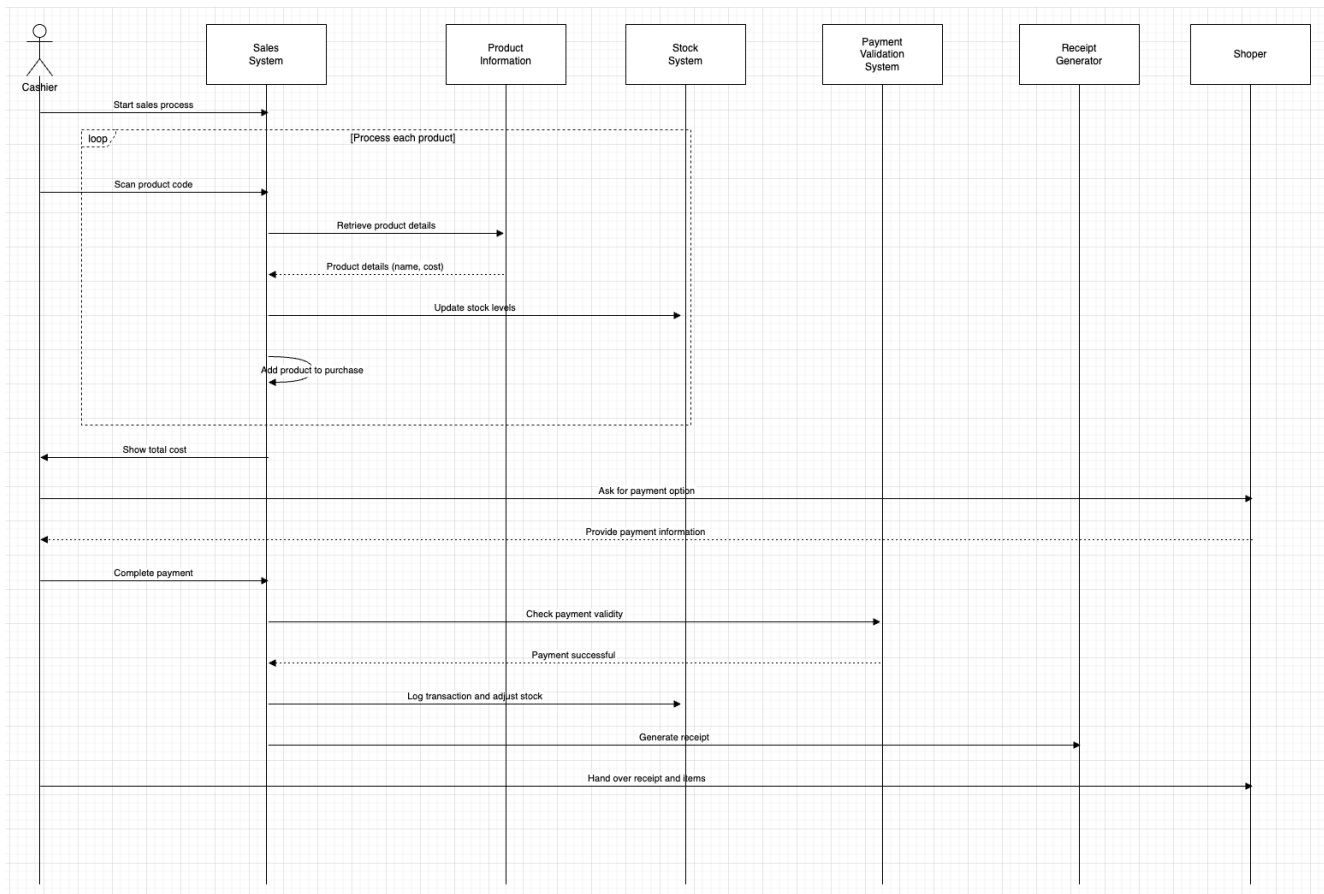
- POS Terminal: The cashier processes sales and returns through this interface.
- Receipt: Printed record following a transaction or exchange.
- Payment Interface: Handles payments from clients (checks, credit cards, and cash).

➤ Control Objects:

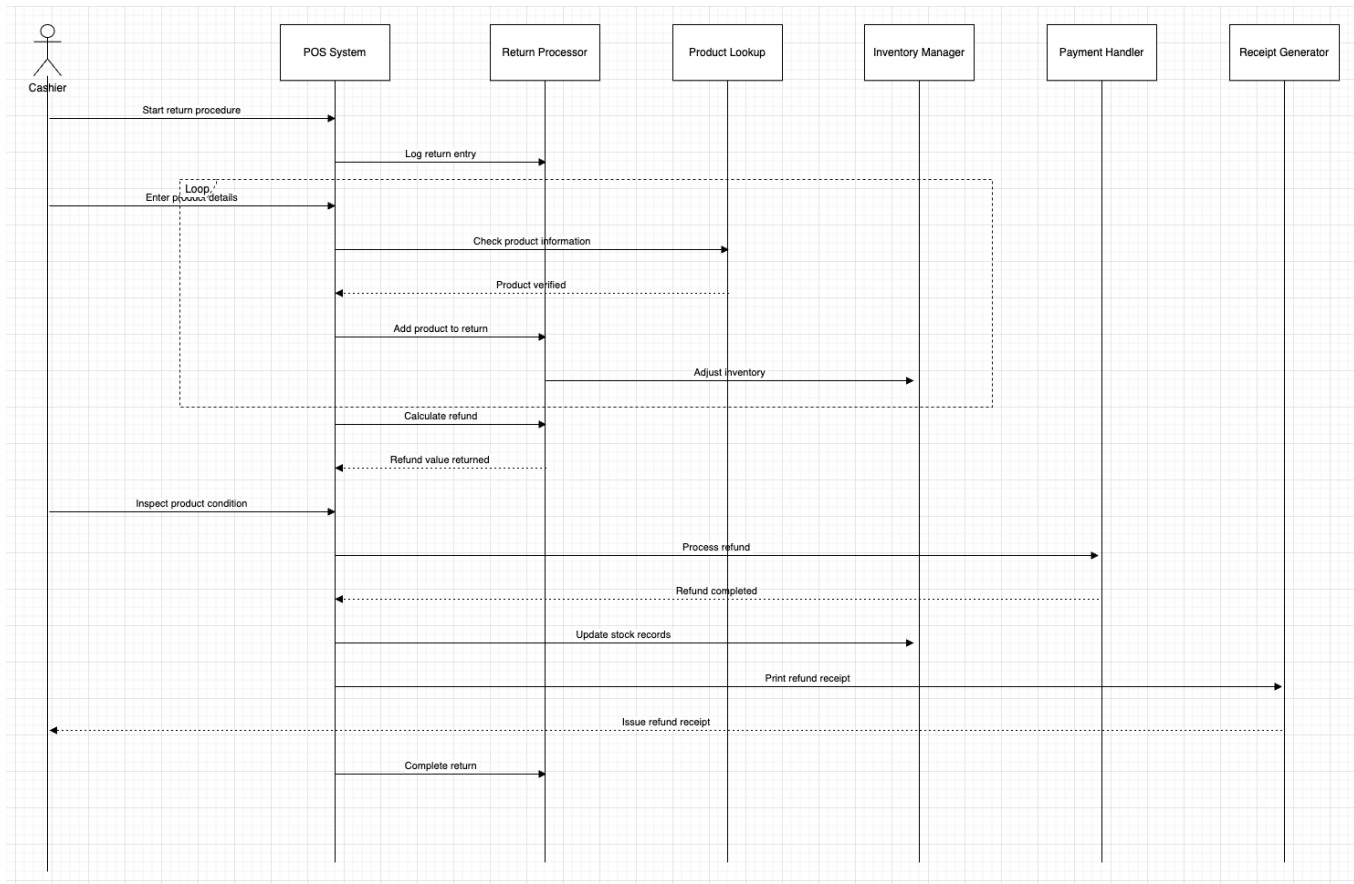
- Sales Controller: Oversees the selling procedure, keeps track of stock, and interfaces with payment processors.
- Return Controller: Oversees refunds, keeps track of inventory, and manages product returns.

Q-3) Develop Sequence Diagram.

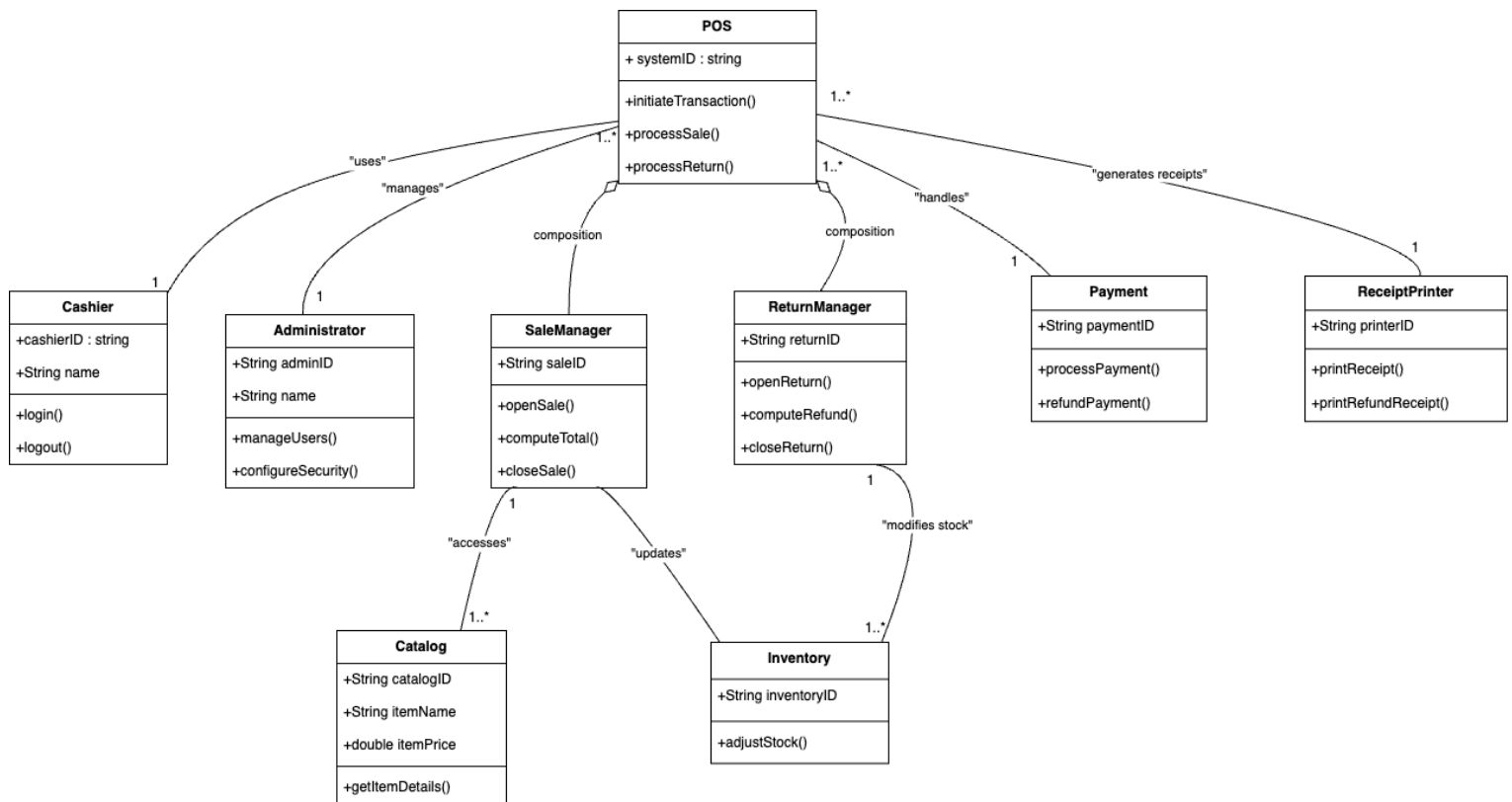
- Below is the sequence diagram for “**Process-Sale**”



- Below is the sequence diagram for “**Handle-Return**”

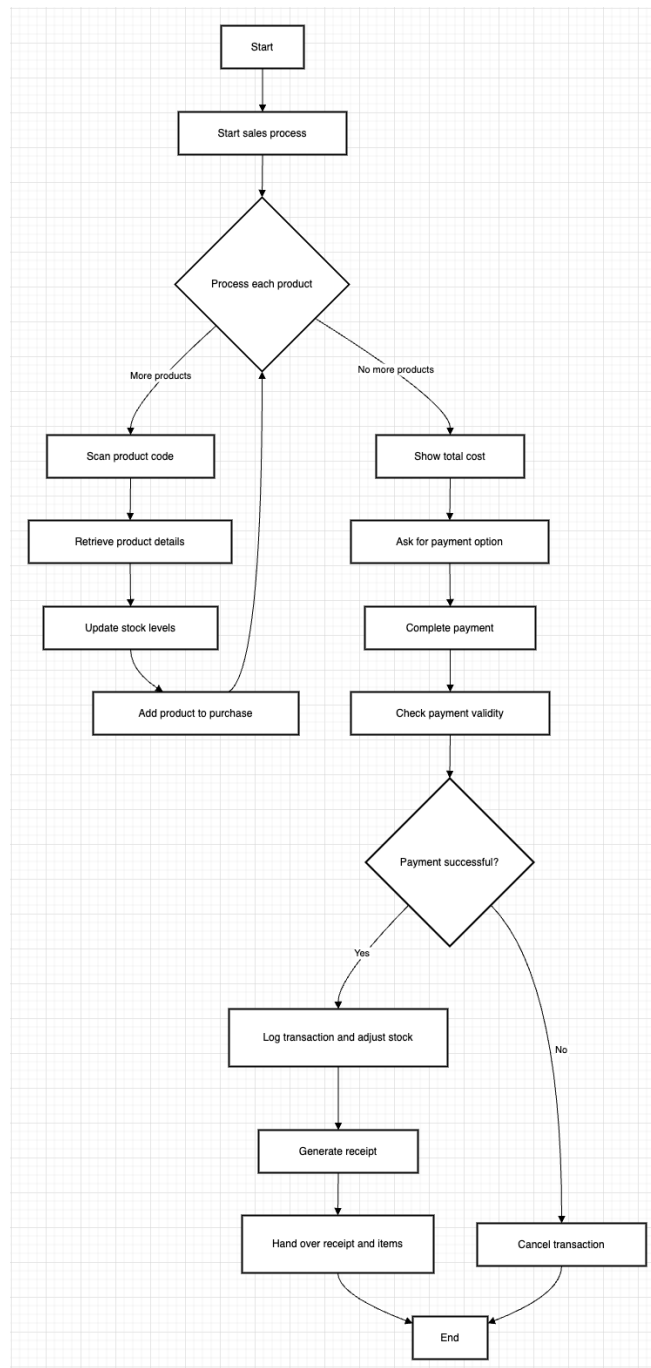


Q-4) Develop analysis domain models.



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

- Activity Diagram for “**Process-Sale**”



- Activity Diagram for “Handle-Return”

