



# **IT-304: Software Engineering**

Group number - 8

Lab Assignment: 6 – Point of sale system

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# USE CASE: Process Sale

**Primary Actor:** Cashier

**Preconditions:** The customer has selected items for purchase, and the POS system is ready to process sales.

**Postcondition:** The sale is completed, and inventory reflects the reduced stock.

## Main Flow:

1. The customer approaches the POS counter with items for purchase.
2. The cashier initiates a new sale transaction in the POS system.
3. For each item:
  - a. The cashier scans the item's barcode.
  - b. The POS system retrieves item details (name, price) from the catalog and displays them.
  - c. If the item is not found, the cashier manually enters the item details or seeks assistance.
  - d. The system updates inventory accordingly and adds the item to the current transaction.
4. The system calculates the total amount due and displays it.
5. The cashier inquires about any promotions, discounts, or gift coupons.
  - a. If applicable, the cashier applies any gift coupons or discounts and the system recalculates the total.
  - b. If an invalid coupon is detected, the cashier informs the customer and proceeds without it.
6. The cashier asks the customer for their preferred payment method (cash, credit card, check).
7. The cashier processes the payment through the POS system.

- a. For card payments, the system communicates with the payment gateway to verify the transaction.
  - b. If payment authorization fails, the cashier requests an alternative payment method.
8. Upon successful payment, the system updates the inventory by deducting the purchased items.
  9. The POS system prints a receipt and hands it to the customer.
  10. The cashier provides the purchased items and any promotional coupons to the customer.
  11. The sale transaction is complete.

### **Extensions:**

- 3a: If the item is not found in the catalog when scanned, the cashier manually enters the details.
- 9a: If a receipt printing failure occurs, the cashier troubleshoots the printer or provides a digital receipt.

## **USE CASE: Handle Return**

**Primary Actor:** Cashier

**Preconditions:** The customer wishes to return an item, and the POS system is operational.

**Postcondition:** The return is completed, and inventory is updated to reflect the returned items.

### **Main Flow:**

1. The customer approaches the cashier with items for return and the original receipt.

2. The cashier initiates a return transaction by scanning the receipt or entering the transaction ID.
3. The system verifies the original sale and checks the item's eligibility for return based on store policy (e.g., return period, item condition).
  - a. If the item is ineligible, the system notifies the cashier, who informs the customer and terminates the return process.
4. If eligible, the system calculates the refund amount.
5. The cashier confirms the reason for the return with the customer and offers an option for refund or exchange.
6. The POS system updates the inventory by adding the returned item back to stock.
7. If a refund is chosen, the system processes the refund using the original payment method.
  - a. If the original payment method is unavailable, the cashier selects an alternative refund method.
8. If an exchange is chosen, the cashier scans the new item, and the system calculates any price difference.
9. The system prints a return receipt and hands it to the customer.
10. The return transaction is completed, and the cashier provides the refund or exchanged item to the customer.

**Extensions:**

- 3b: If an item mismatch is detected during verification, the cashier clarifies the details with the customer.
- 7a: If refund processing fails, the cashier troubleshoots the issue and informs the customer about alternative solutions.

# Identified Objects

## Entity Objects:

- Sale
- Item
- Payment
- Customer
- Cashier
- Inventory
- Coupon
- Return

## Boundary Objects:

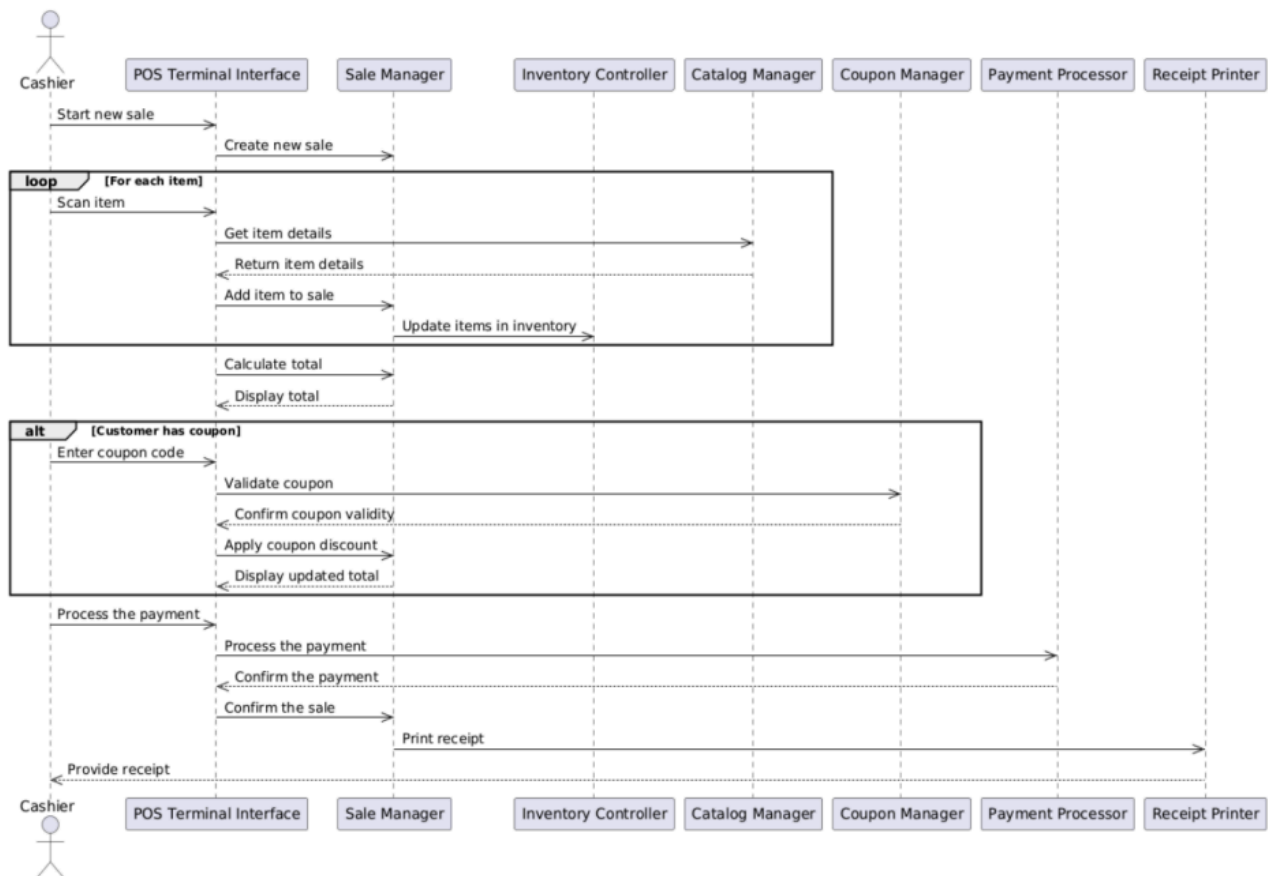
- POS Terminal Interface
- Barcode Scanner
- Receipt Printer
- Payment Terminal

## Control Objects:

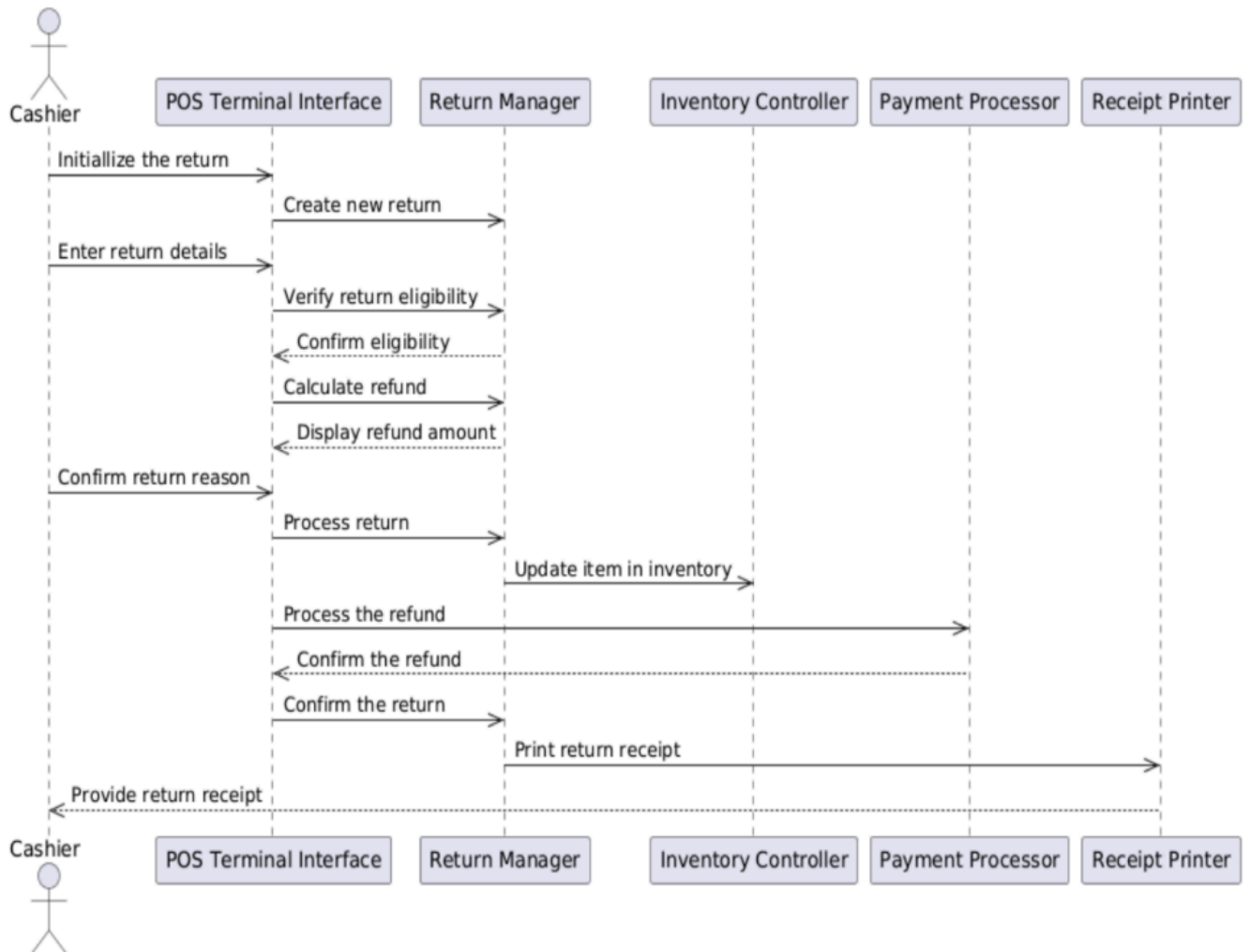
- Sale Manager
- Inventory Controller
- Payment Processor
- Catalog Manager
- Return Manager

# Sequence Diagram:

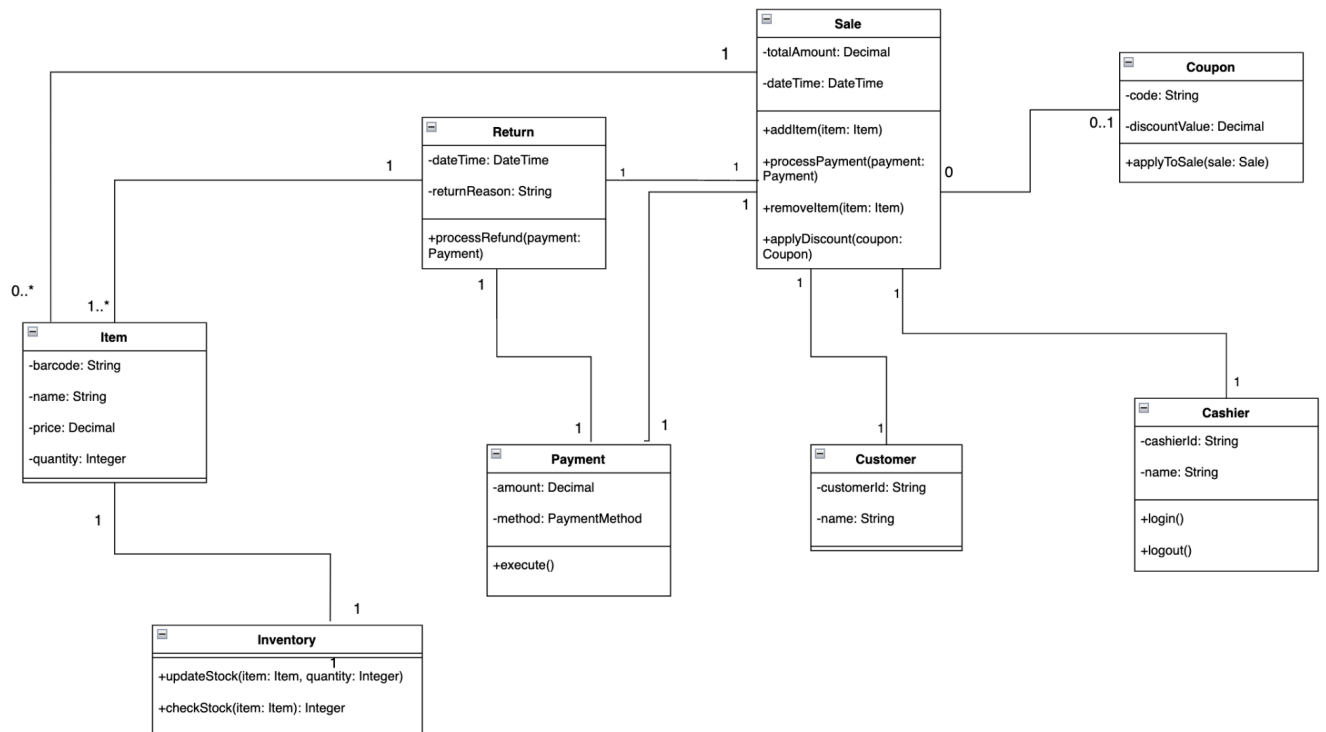
## Process Sale:



## Handle Return:



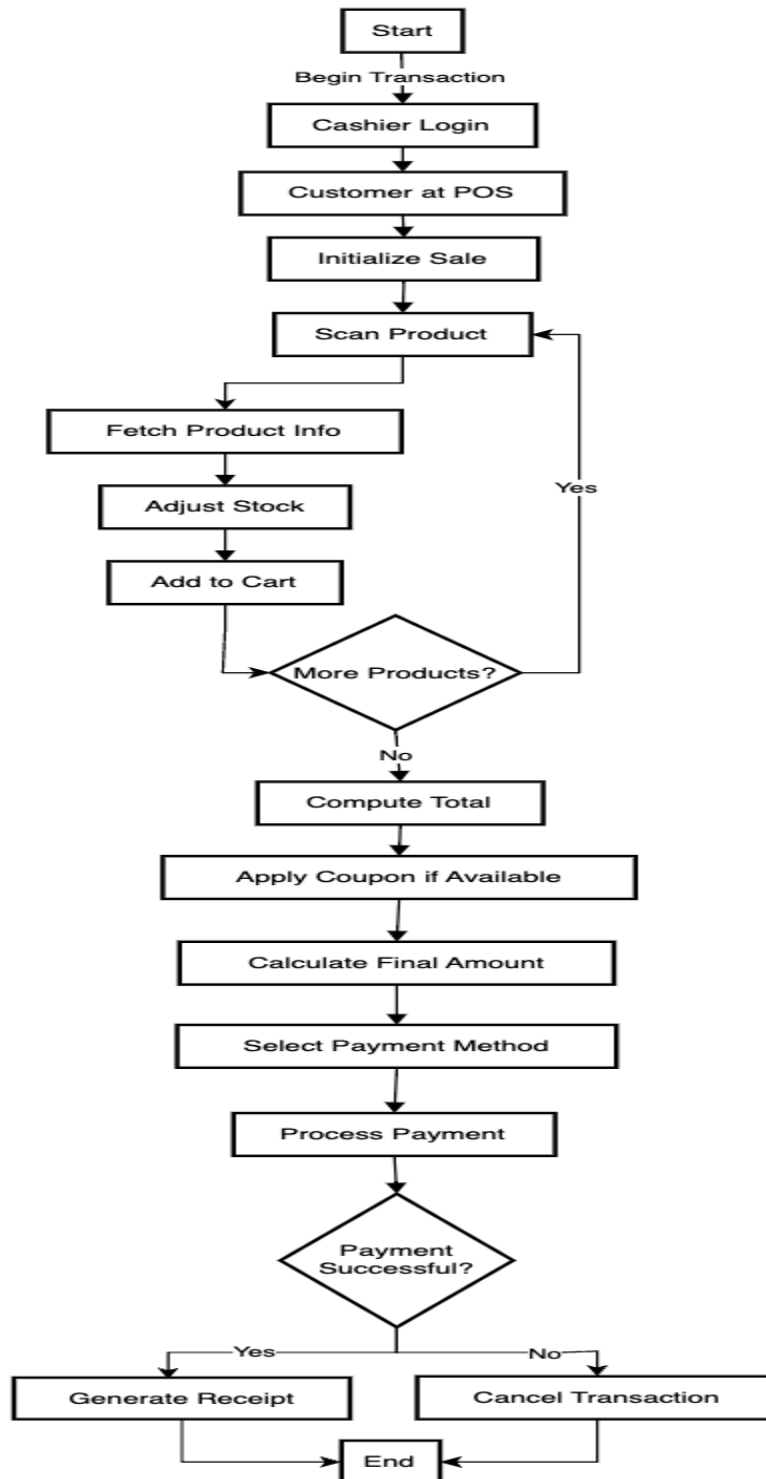
# Analysis Domain Models(Class Diagram):





# Activity Diagrams

## Process Sales



# Handle Return

