



## **IT-314**

### **Lab Assignment : 6**

**Title:** Modeling Class Diagram and Activity Diagram (Point of Sale System)

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**Lab Group:** 3

# **Point of Sale (POS) System Analysis**

## **Introduction**

A Point of Sale (POS) system is an essential tool in retail and service sectors, enabling seamless transactions between businesses and customers. This document explores the key functionalities of a modern POS system, with a focus on two main use cases: processing sales and managing returns.

## **Task - 1:**

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

### **Use Case: Process Sale**

#### **Actor**

- Cashier

#### **Preconditions**

- The POS system must be functioning properly.
- The cashier is logged into the system with valid credentials.

#### **Postconditions**

- The sale is successfully recorded in the system.
- The inventory reflects the items sold.
- The customer is given a receipt for the transaction.

#### **Basic Flow**

1. The customer brings the selected items to the checkout.
2. The cashier starts a new sales transaction in the POS system.
3. For each item:
  - The cashier scans the item's barcode.
  - The system retrieves the item's details (e.g., name, price) from the database.
  - The system adds the item to the current transaction.
4. The system calculates and displays the total cost.
5. The cashier informs the customer of the total amount due.

6. The customer chooses a payment option (cash, credit card, or mobile payment).
7. The cashier processes the payment using the chosen method.
8. The system records the sale and adjusts the inventory.
9. A receipt is generated by the system.
10. The cashier hands the receipt and the purchased items to the customer.

## **Alternative Flows**

- 3b. Manual Entry:
  - If an item's barcode cannot be scanned, the cashier enters the SKU manually or looks it up in the system.
- 5a. Applying a Discount:
  - The customer presents a coupon or discount code.
  - The cashier applies the discount.
  - The system recalculates the new total.
- 6a. Payment Failure:
  - If the payment method is declined, the cashier informs the customer.
  - The customer may choose a different payment option or remove items from the transaction.
- 7a. Transaction Cancellation:
  - The customer may decide to cancel the transaction at any point before it's completed.
  - The cashier cancels the transaction in the system.
  - The system voids the transaction and restores any inventory changes.

## **Use Case 2: Handle Return**

### **Actor**

- Cashier

### **Preconditions**

- The POS system must be up and running.
- The cashier must be logged in with valid credentials.
- The customer has the items to return along with the original purchase receipt.

### **Postconditions**

- The return is successfully recorded in the system.
- The inventory is updated to reflect the returned items.
- The customer is issued a refund and provided with a return receipt.

### **Basic Flow**

1. The customer arrives at the counter with the items to return and the original receipt.
2. The cashier starts a new return transaction in the POS system.
3. The cashier scans the items the customer is returning.
4. The system checks if the items are eligible for return (e.g., return period, item condition).
5. The system calculates the refund amount.
6. The cashier asks the customer to confirm the reason for the return.
7. The system updates the inventory to account for the returned items.
8. The cashier refunds the amount to the customer via the original payment method.

9. The system logs the return transaction.
10. The system generates a receipt for the return.
11. The cashier hands the return receipt to the customer.

## **Alternative Flows**

- 3a. Scanner Unavailable:
  - If the scanner isn't working, the cashier manually inputs the item details into the system.
- 4a. Item Not Eligible for Return:
  - The system notifies the cashier that the item is ineligible for return.
  - The cashier informs the customer about the issue.
  - The customer can either continue with the return of eligible items or cancel the entire process.
- 7a. Damaged or Used Items:
  - The cashier inspects the item for any damage or signs of use.
  - The system adjusts the refund or applies a restocking fee.
  - The cashier informs the customer about the revised refund.
  - The customer decides whether to proceed with the return.
- 8a. Original Payment Method Not Available:
  - If the original payment method is unavailable, the cashier chooses an alternative refund option (e.g., store credit).
  - The system processes the refund using the chosen alternative method.

## **Task - 2: Object Identification**

### **Entity Objects:**

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

### **Boundary Objects:**

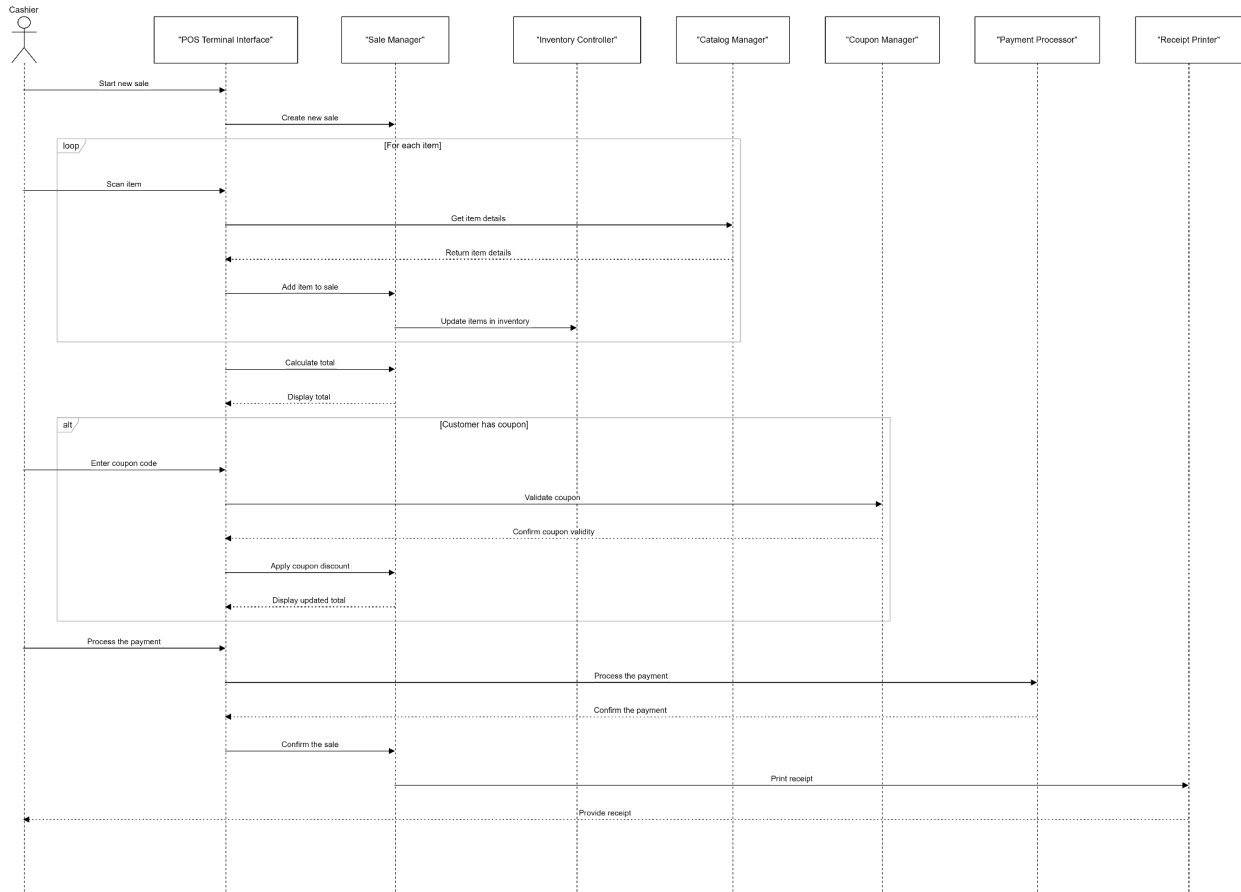
- POS Terminal Interface
- Barcode Scanner
- Receipt Printer
- Payment Terminal

### **Control Objects:**

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

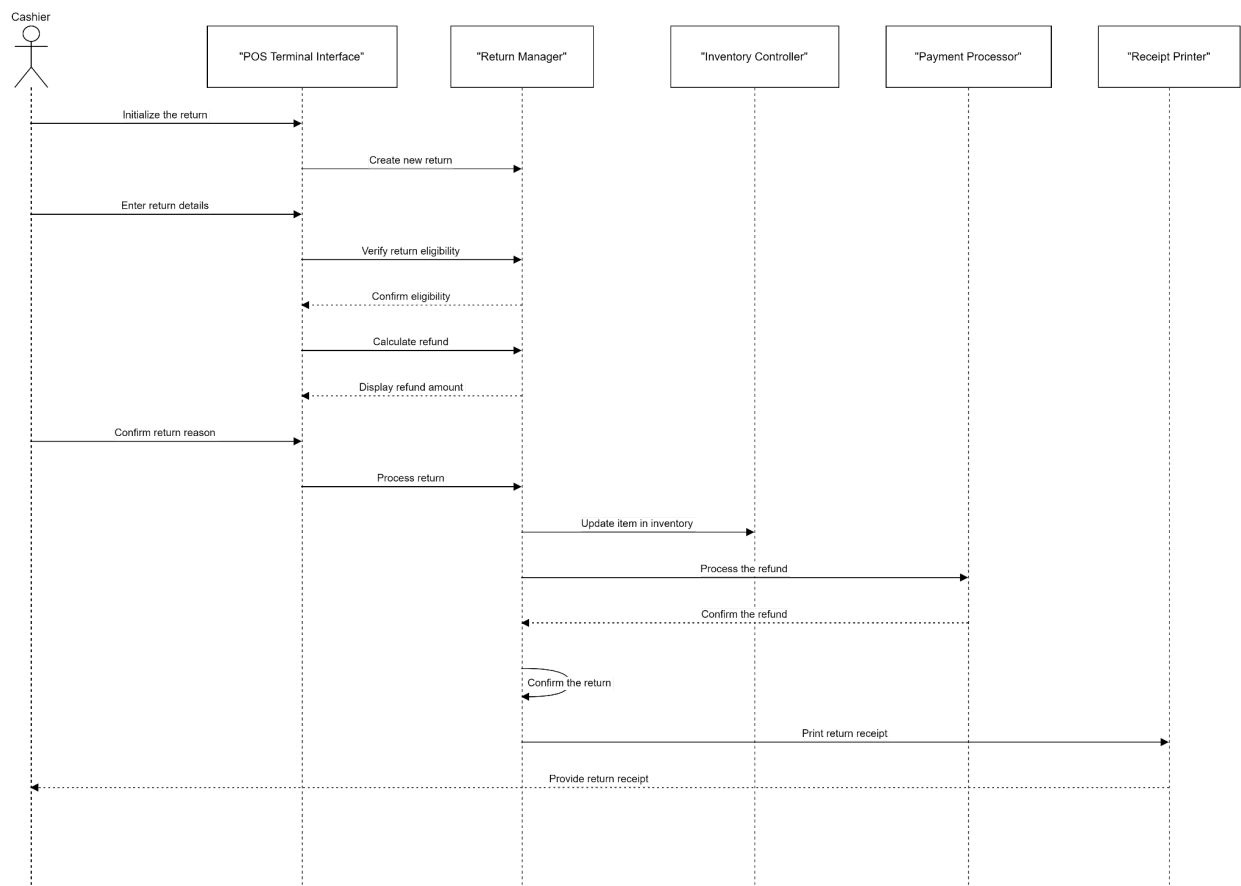
## Task - 3: Develop Sequence Diagrams

### Process Sale:

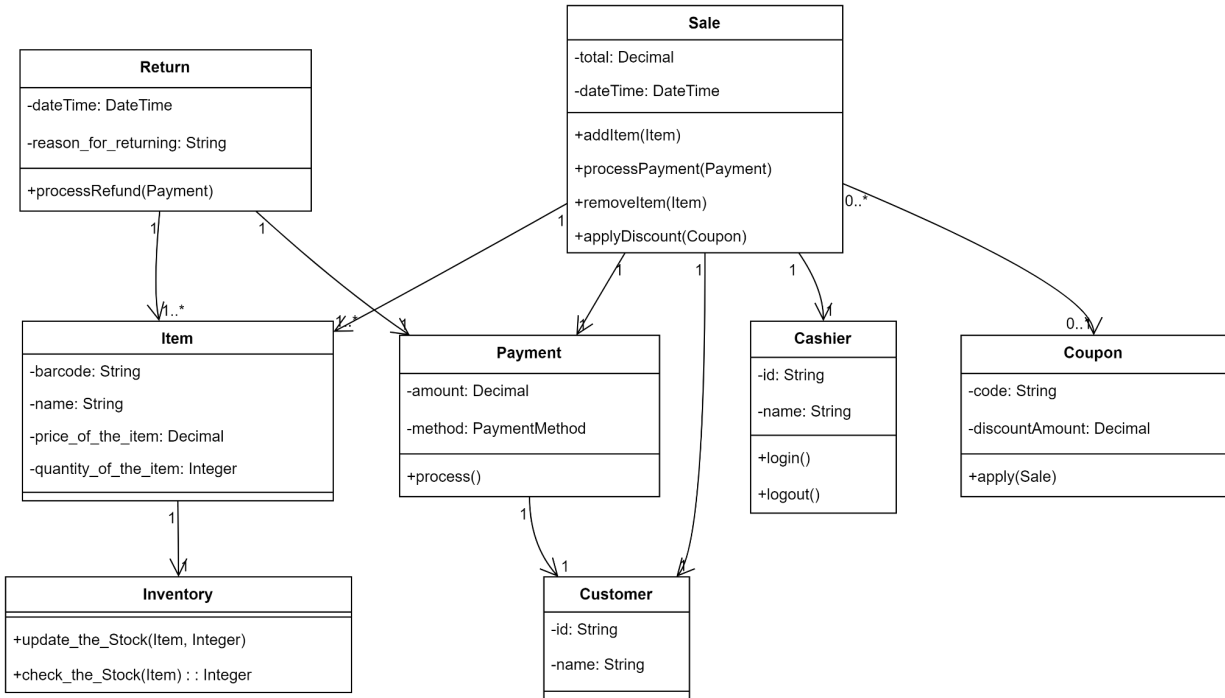




# Handle Returns:

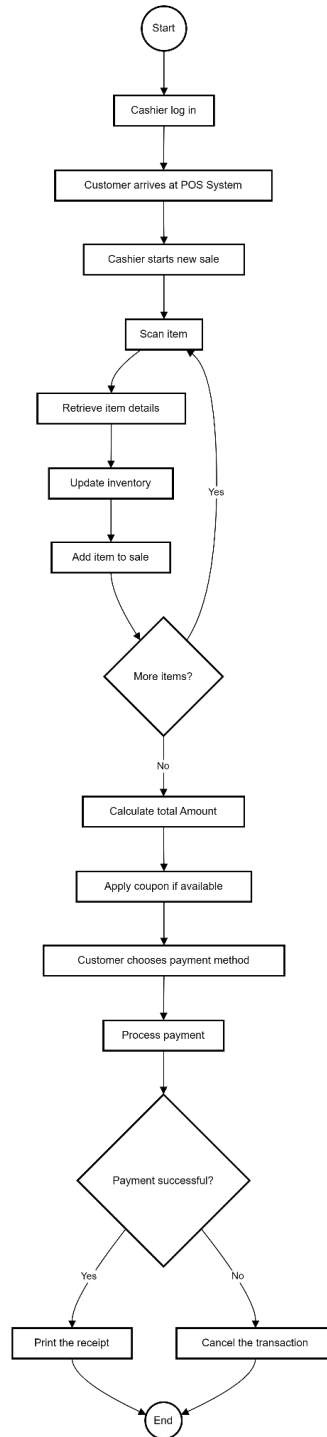


## Task - 4: Develop Analysis Domain Models



## Task - 5: Develop activity diagram for "Process Sale" and "Handle Return" use cases.

### Process Sale



# Handle Return

