# IT-314 Software Engineering

# <u>Lab Session: Modeling Class Diagram and Activity Diagram (Point of Sale System):</u>

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## <u>Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.</u>

1. Use Case: Process Sale

## Primary Actor: Cashier Stakeholders & Interests:

- Cashier: Wants to process the sale quickly and accurately.
- Customer: Wants to purchase goods with a valid price, using various payment methods.
- Inventory System: Needs to update the stock when items are sold.
- Catalog System: Provides the price and name of goods.

#### **Preconditions:**

- The cashier must be logged into the POS system.
- The Catalog and Inventory systems must be available.

#### Postconditions:

- The sale is recorded.
- The inventory is updated.
- A receipt is printed.
- Payment is confirmed (cash, credit card, or check).

#### Main Success Scenario:

- 1. The cashier initiates a new sale.
- 2. The cashier scans the barcode of the goods.
- 3. The POS system retrieves the item details (price, name) from the Catalog System.
- 4. The POS system interacts with the Inventory System to ensure enough stock is available and to update the stock quantity.

- 5. The customer chooses a payment method (cash, credit card, check).
- 6. The POS system processes the payment.
- 7. The system prints a receipt.
- 8. The sale is completed and recorded in the system.

#### **Extensions (Alternative Flows):**

- 3a. Item not found: If the Catalog System doesn't return the item details, the cashier can manually enter the item code and price or reject the item from the sale.
- 4a. Insufficient stock: The system informs the cashier that the item is out of stock. The cashier can inform the customer and either proceed without that item or cancel the sale.
- 5a. Payment fails: If the credit card or check payment is declined, the cashier asks the customer for an alternate payment method or cancels the transaction.

#### **Special Requirements:**

• The system should handle promotions and discounts (e.g., gift coupons).

#### 2. Use Case: Handle Return

## Primary Actor: Cashier Stakeholders & Interests:

- Cashier: Wants to return goods and refund the customer efficiently.
- Customer: Expects a quick refund for returned goods.
- Inventory System: Needs to restore the returned item to stock.
- Store Administrator: Ensures fraud prevention and accurate accounting for returns.

#### **Preconditions:**

- The cashier must be logged into the POS system.
- The item being returned must have been sold by the store.
- The customer has a valid receipt or proof of purchase.

#### **Postconditions:**

- The return is recorded.
- Inventory is updated to reflect the return.
- A refund is processed.

#### Main Success Scenario:

- 1. The cashier initiates a return process.
- 2. The cashier scans the item to be returned or enters the receipt details.
- 3. The POS system checks if the item was sold previously and is eligible for a return.
- 4. The POS system interacts with the Inventory System to update the stock.
- 5. The customer is refunded either in cash, credit card refund, or store credit.
- 6. A return receipt is printed.
- 7. The return is recorded in the system.

#### **Extensions (Alternative Flows):**

3a. Invalid receipt or no proof of purchase: The system notifies the cashier, who may either reject the return or proceed with store credit (based on store policy).

5a. Refund fails: If a refund cannot be processed (e.g., card declined), the cashier offers an alternative refund method (cash or store credit).

#### **Special Requirements:**

- The system should detect fraudulent or repeated returns and alert the cashier.

### **Identify Entity/Boundary/Control Objects**

#### **Entity Objects:**

- Sale: Represents a completed transaction.
- Item: Product being sold or returned, including details like price, stock, and description.
- Payment: Records details of the transaction, including method and amount paid.
- Receipt: Digital or printed proof of purchase/return.
- User: Represents the cashier or store administrator.

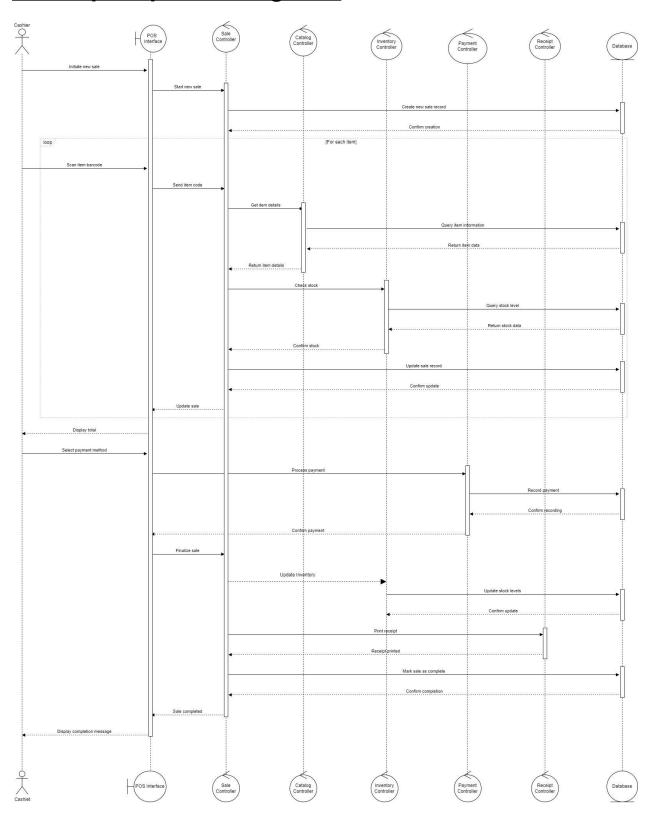
#### **Boundary Objects:**

- POS Interface: The cashier's interface for entering sales and returns.
- Barcode Scanner: A tool for inputting the product details into the POS system.
- Payment Terminal: Device used for credit card transactions.
- Receipt Printer: Hardware used to print receipts for sales or returns.
- Login Screen: Interface used by employees to access the system.

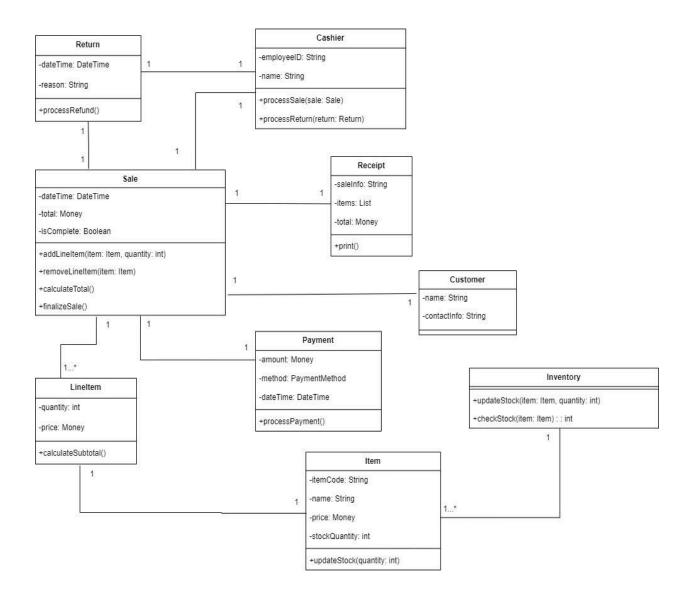
#### **Control Objects:**

- Sale Controller: Handles the process of scanning items, calculating totals, and managing the sale.
- Payment Controller: Manages the payment process, including cash, credit card, or check.
- Return Controller: Manages the return process, verifies eligibility for returns, and updates inventory.
- Inventory Controller: Coordinates with the Inventory System to update stock levels after a sale or return.
- Catalog Controller: Interacts with the Catalog System to retrieve product details like price and name.
- Security Controller: Handles user authentication, permissions, and logging in.

## **Develop Sequence Diagrams**

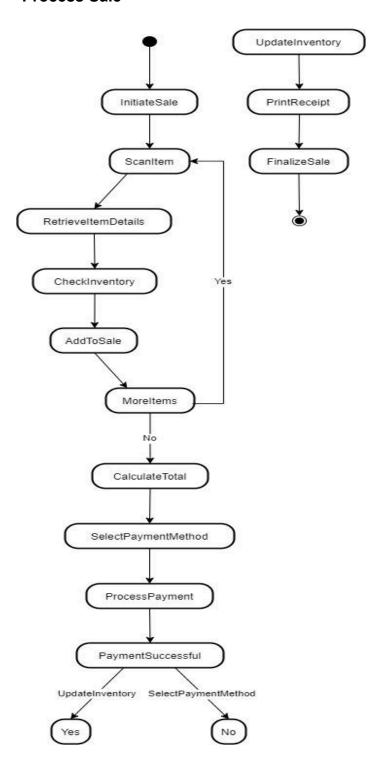


## **Develop Analysis Domain Models**



# <u>Develop activity diagram for "Process Sale" and "Handle Return" use cases.</u>

"Process Sale"



#### "Handle Returns"

