

# **IT314 - Software Engineering**

Lab Session: Modeling Class Diagram and Activity Diagram  
(Point of Sale System)

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

### **Process Sale :**

#### **Actor**

- Cashier

#### **Preconditions**

- Cashier logged into the POS system.
- Customers have items to purchase.

#### **Main Flow**

1. Cashier starts a new sale transaction.
2. For each item:
  - a. Cashier scans the barcode of the item.
  - b. System retrieves item details (name, price) from the backend catalog system.
  - c. System updates the stock amount in the inventory system.
  - d. System adds items to the current transaction.
3. System displays the total amount of the items.

4. Cashier informs the customer about the total amount to be paid.
5. Customer chooses a payment method (cash, credit card, etc).
6. If a customer has a coupon:
  - a. Cashier applies a coupon to the total amount.
  - b. System recalculates the total amount.
7. Cashier processes payment.
8. System confirms payment.
9. System generates the receipt.
10. Cashier prints the receipt.
11. System finalizes the transaction.

### **Alternate Flows**

2b. If item not found in catalog system, cashier manually enters item details

7a. If payment fails by any payment method, customer chooses another payment method

### **Postconditions**

- Sale is recorded in the POS system
- Inventory system is updated
- Receipt is printed

### **Handle Return :**

#### **Actor**

- Cashier

#### **Preconditions**

- Cashier logged into the POS system
- Customer has item(s) to return

#### **Main Flow**

1. Cashier starts return process

2. Customer provides receipt
3. Cashier verifies the return criteria
4. For each item being returned:
  - a. Cashier scans barcode of the item
  - b. System retrieves item details (name, price) from the backend catalog system
  - c. System updates the stock amount in the inventory system
  - d. System adds item to current return transaction
5. System calculates total refund amount
6. Cashier confirms return items and amount with customer
7. Cashier processes refund using original payment method
8. System generates return receipt
9. Cashier prints return receipt
10. System finalizes return transaction

### **Alternate Flows**

- 2a. If customer doesn't have receipt, cashier searches for transaction in POS system
- 3a. If item is not eligible for return, cashier informs customer and ends process
- 7a. If original payment was by credit card and card is not present, alternative refund method is used

### **Postconditions**

- Return is recorded in the POS system
- Inventory system is updated
- Refund is processed
- Return receipt is printed

## 2) Identify Entity/Boundary Control Objects

### Entity Objects:

- Sale
- Item
- Payment
- Coupon
- User (Cashier/Administrator)
- Inventory
- Catalog

### Boundary Objects:

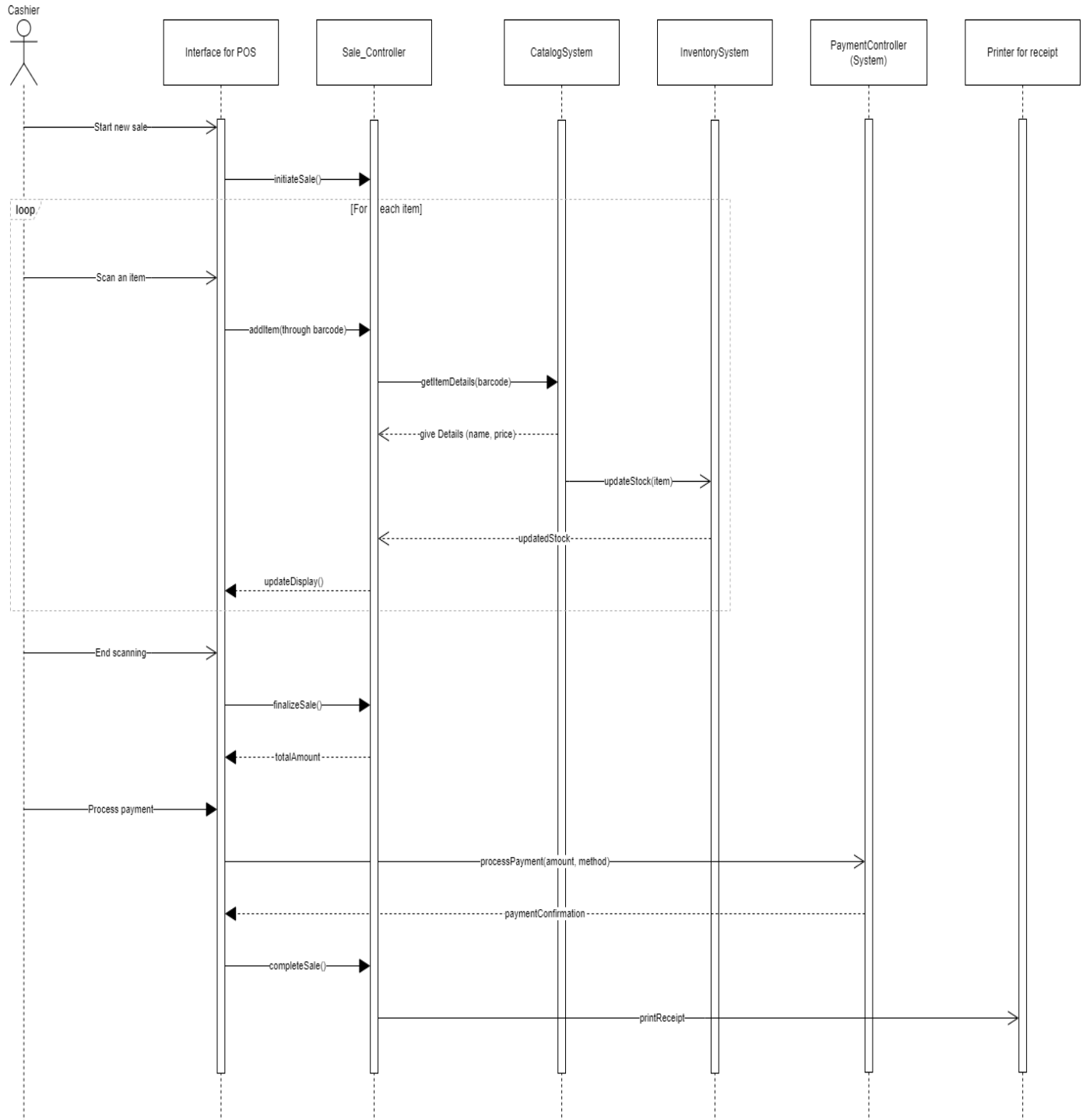
- LoginScreen
- POSInterface
- PaymentInterface
- ReceiptPrinter
- BarcodeScanner

### Control Objects:

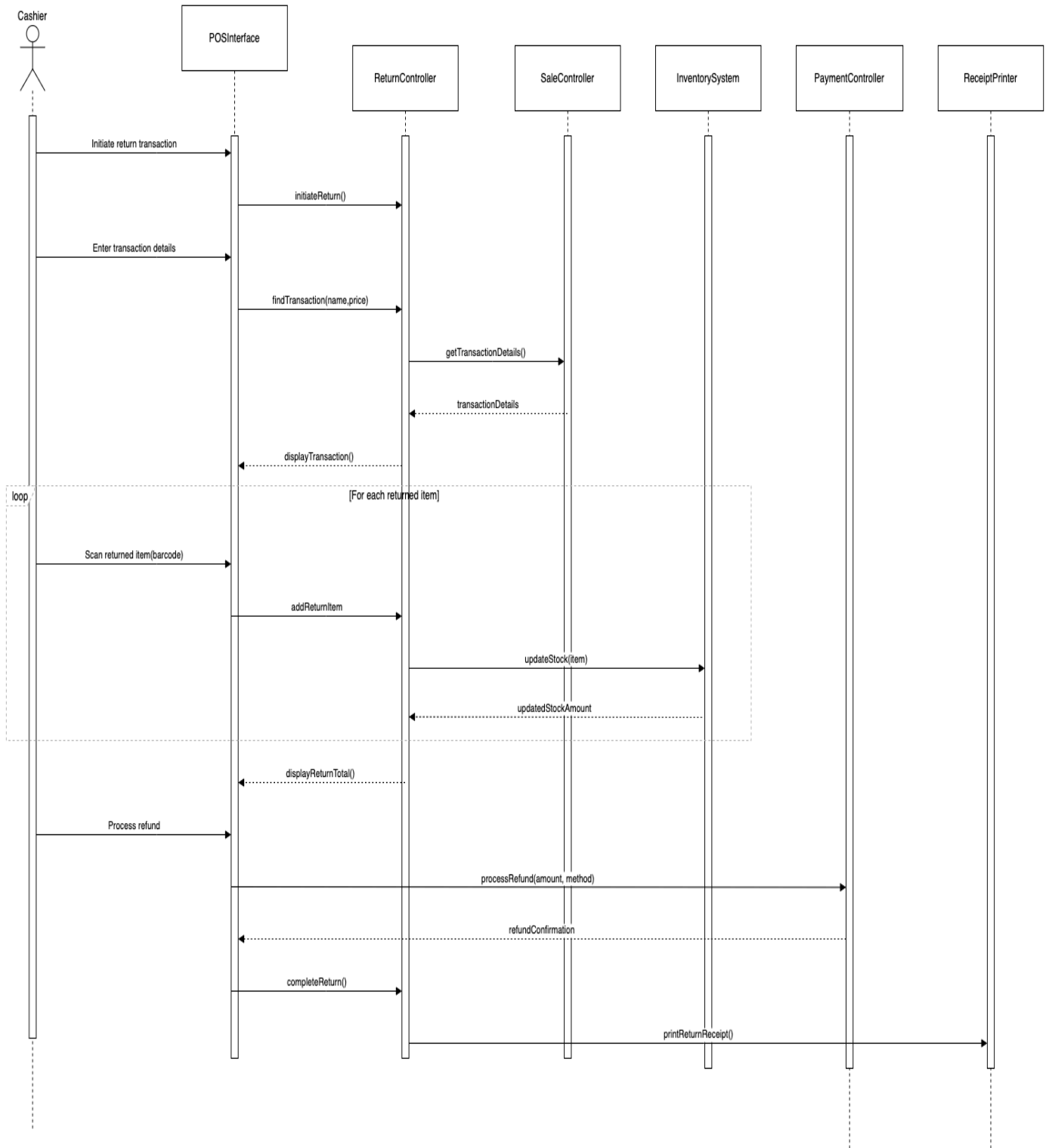
- SaleController
- PaymentController
- InventorySystem
- CatalogSystem
- ReturnController

### 3) Develop Sequence Diagrams

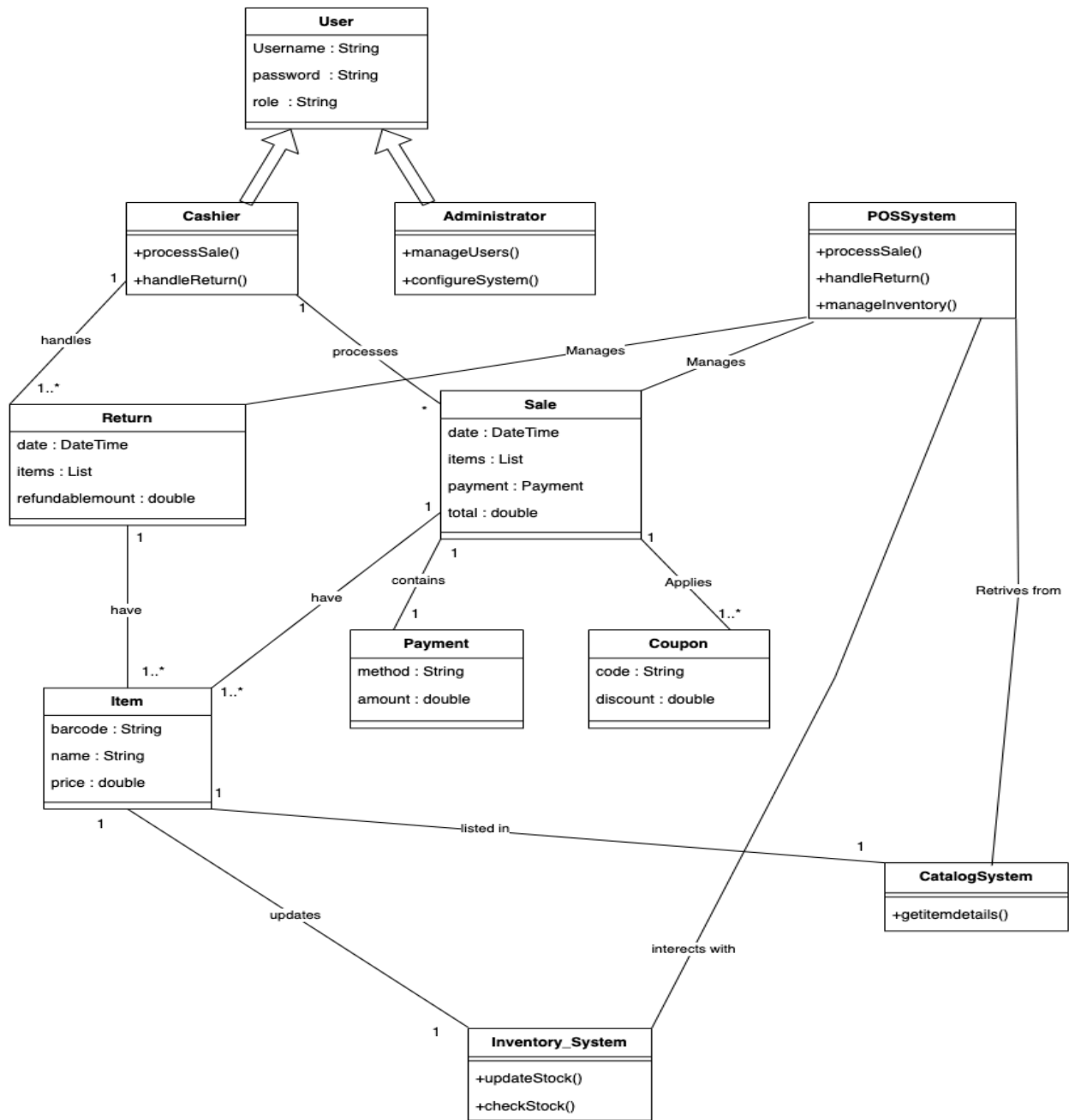
#### Process Sale:



## Handle Return:

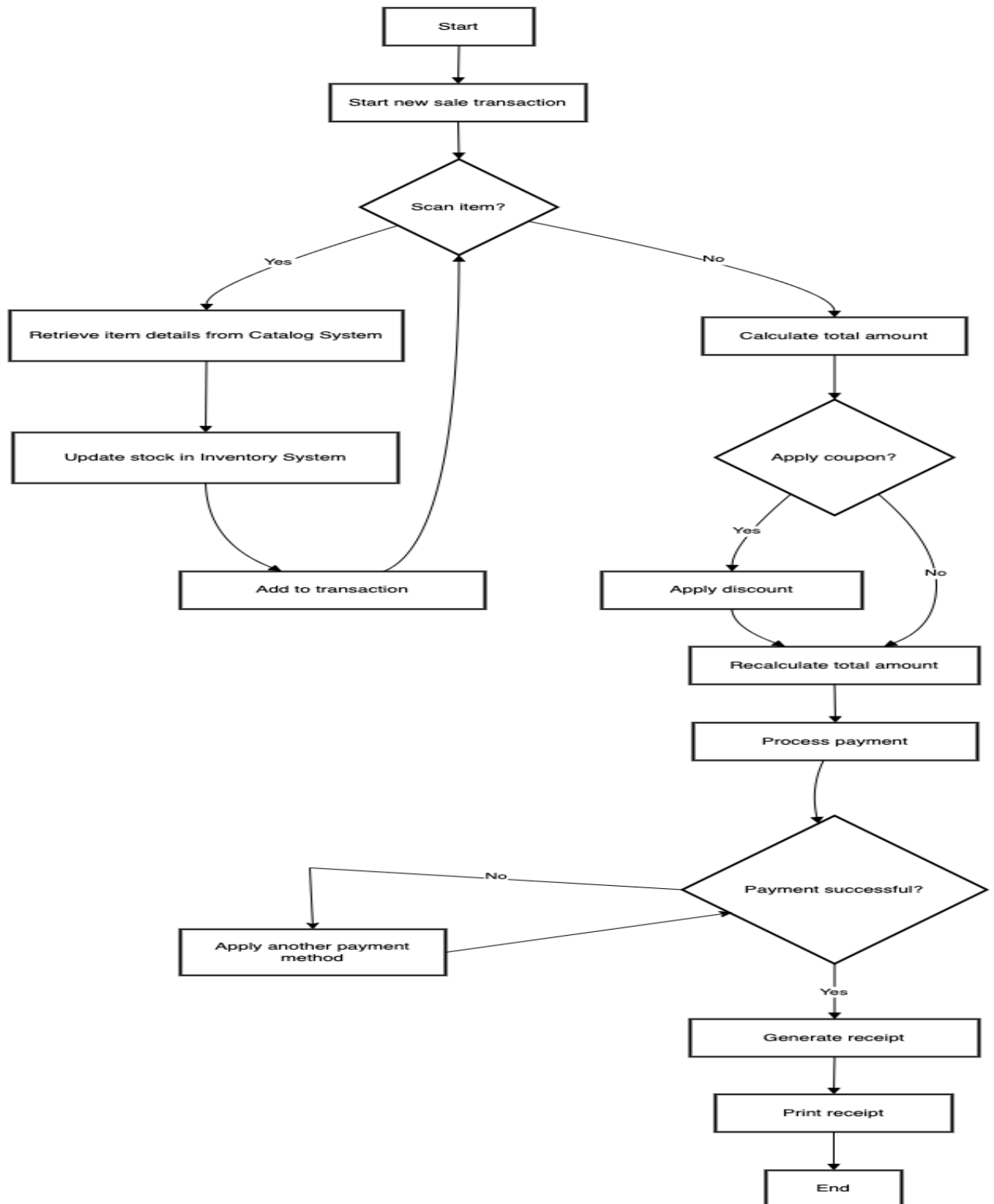


## 4) Develop Analysis Domain Models



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

## Process Sale:





## Handle Return:

