

## IT-314 Software Engineering

### Lab Session: Modelling Class Diagram & Activity Diagram (POS System)

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#### ★ Use Cases

##### 1. Process Sale

**Use Case Name:** Process Sale

**Actor(s):** Cashier

**Preconditions:**

- The cashier is logged into the POS system.
- The customer has goods ready for purchase.

**Postconditions:**

- The sale transaction is recorded in the system.
- The inventory is updated to reflect the sale.
- A receipt is printed for the customer.

**Main Flow:**

1. The cashier starts a new sale transaction.
2. The cashier scans the barcode of each item presented by the customer.
3. The POS system retrieves the item details (name, price) from the backend catalog.
4. The system checks the inventory for the availability of each item.
5. If an item is unavailable, the system notifies the cashier and prompts for action (e.g., remove item, substitute item).
6. The system calculates the total cost of the items.
7. The cashier applies any applicable promotions or gift coupons.
8. The customer selects the payment method (cash, credit card, check).
9. The system processes the payment.
  - If the payment is successful, the transaction is completed.
  - If the payment fails, the system notifies the cashier and prompts for another payment method.
10. A receipt is generated and printed for the customer.
11. The inventory is updated to deduct the sold items.

**Alternate Flows:**

- **Item Unavailable:** If an item is not in stock, the system prompts the cashier to decide whether to continue with the sale without that item.
- **Payment Failure:** If payment fails, the system prompts the cashier to retry the payment with a different method.

## 2. Handle Return

**Use Case Name:** Handle Return

**Actor(s):** Cashier

**Preconditions:**

- The cashier is logged into the POS system.
- The customer has items to return.
- The original sale transaction details are available (e.g., receipt).

**Postconditions:**

- The return transaction is recorded in the system.
- The inventory is updated to reflect the returned items.
- A refund is processed, if applicable.

**Main Flow:**

1. The cashier initiates a return transaction.
2. The cashier asks the customer for the original receipt or transaction details.
3. The system retrieves the original sale details using the receipt or transaction ID.
4. The cashier scans the barcodes of the returned items.
5. The system verifies that the items are eligible for return (within return policy).
6. If items are not eligible, the system informs the cashier and provides the reason (e.g., outside return window, used items).
7. If eligible, the system calculates the total refund amount.
8. The cashier processes the refund based on the original payment method.
  - For cash, the system instructs the cashier to give the appropriate amount.
  - For credit card or check, the system initiates the refund process electronically.
9. A return receipt is generated and printed for the customer.
10. The inventory is updated to add the returned items back to stock.

**Alternate Flows:**

- **Item Not Eligible for Return:** If an item is not eligible, the system provides options for the cashier to communicate to the customer.
- **Refund Process Failure:** If there is an issue processing the refund, the system notifies the cashier and provides alternatives for resolution.

## ★ Entity/Boundary/Control Objects

- **Entity Objects**

1. Product
2. Transaction
3. Customer
4. Return
5. Coupon

- **Boundary Objects**

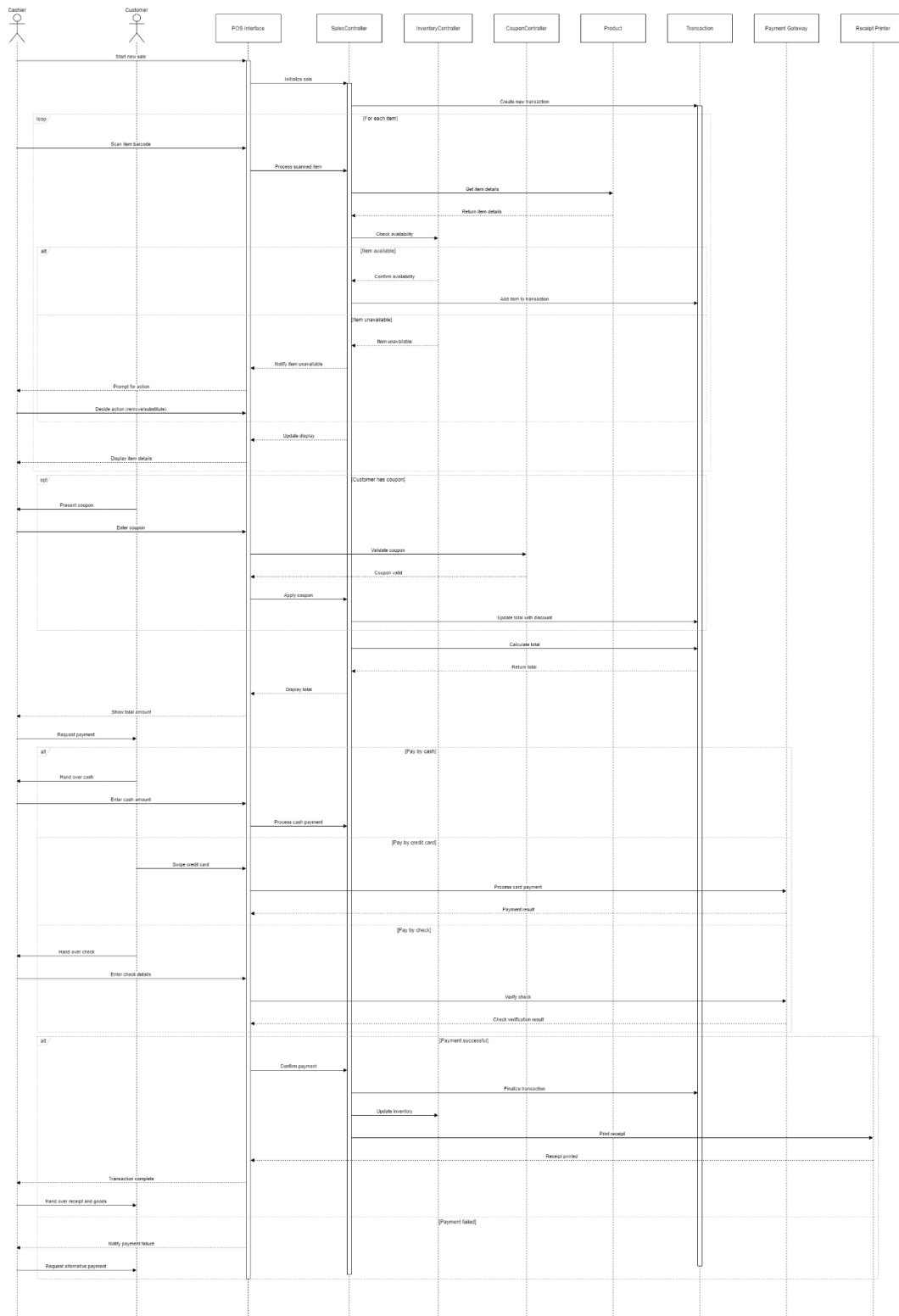
1. POS Interface
2. Receipt Printer
3. Payment Gateway
4. User Login Interface

- **Control Objects**

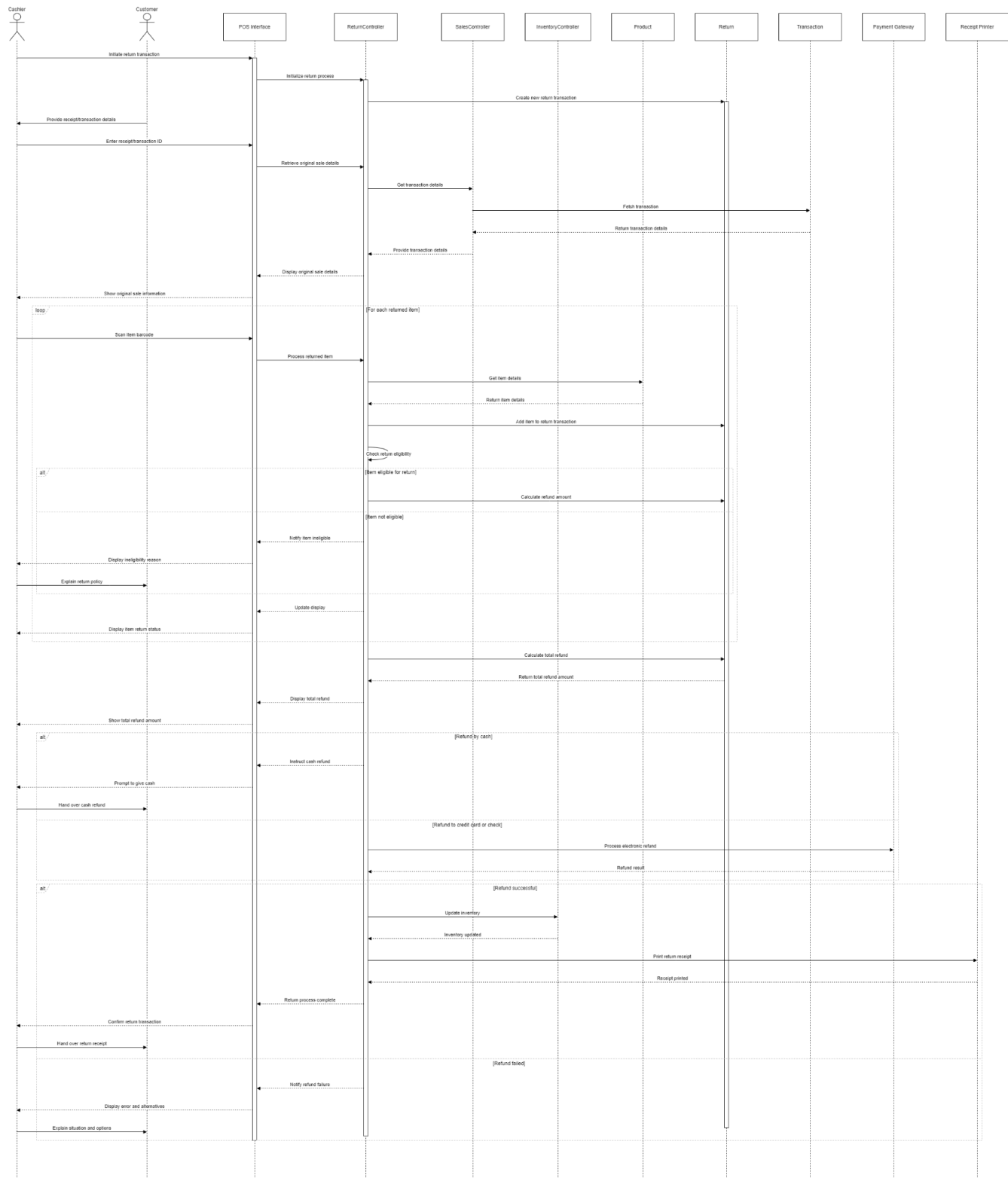
1. SalesController
2. ReturnController
3. InventoryController
4. UserController
5. CouponController

# ★ Sequence Diagrams:

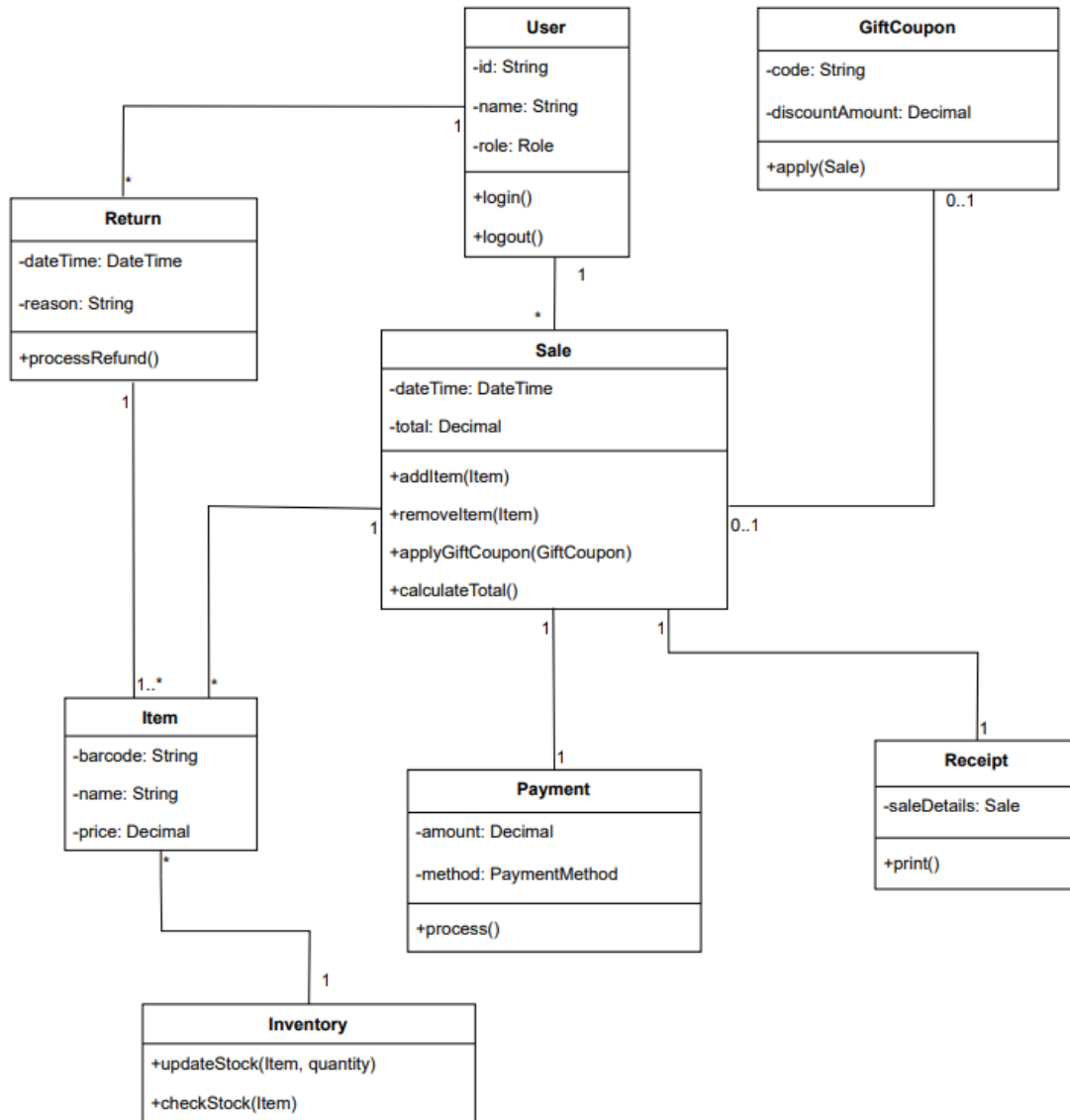
## 1. For Process Sale



## 2. For Handle Return

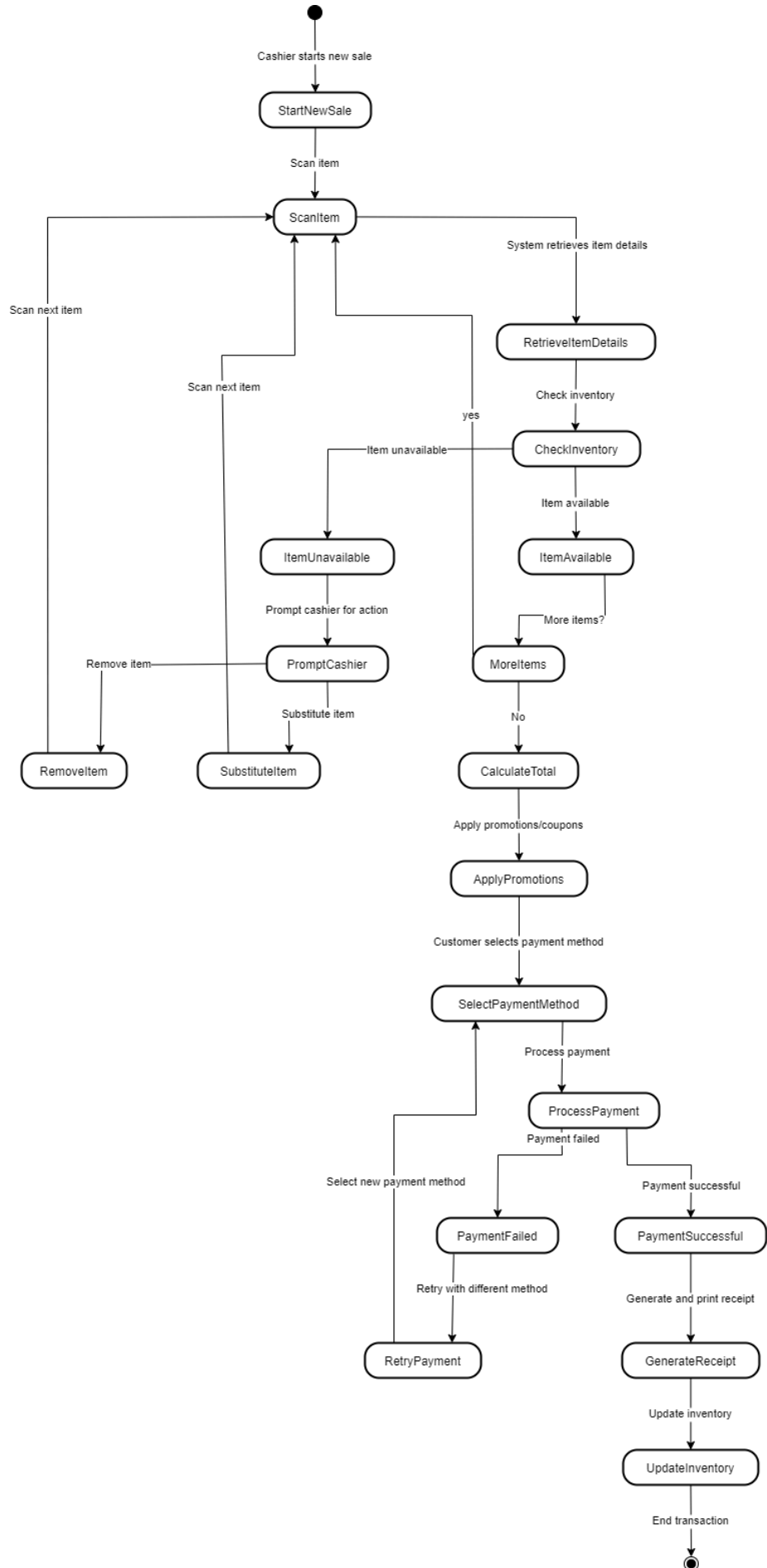


## ★ Class Diagram (Analysis Domain Model)



## ★ Activity Diagram

### 1. For Process Sale



## 2. For Handle Return

