IT314 SOFTWARE ENGINEERING

202201325
KEYUR PADIA
LAB-6

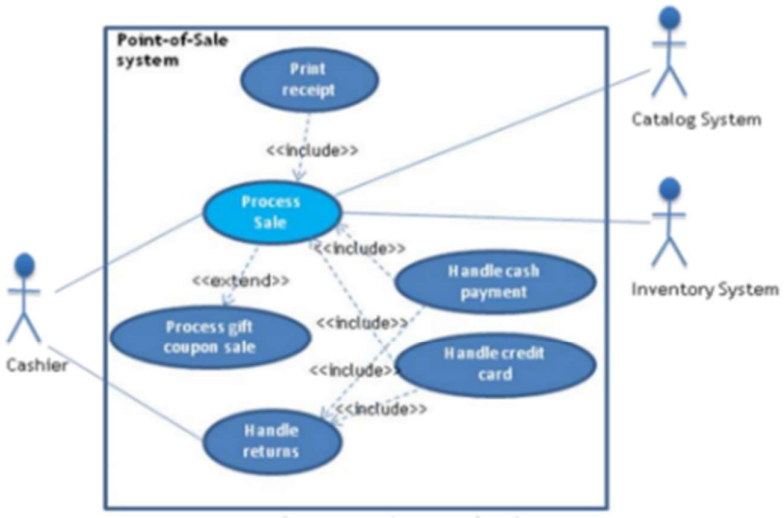
A Problem Description

A POS (Point-Of-Sale) system is a computer system typically used to manage the sales in retail stores. It includes hardware components such as a computer, a bar code scanner, a printer and also software to manage the operation of the store.

The most basic function of a POS system is to **handle sales**. When a customer arrives at a POS counter with goods to purchase, the cashier will start a new sale transaction. When the barcode of a good is read by the POS system, it will retrieve the name and price of this good from the backend catalog system and interact with inventory system to deduce the stock amount of this good. When the sale transaction is over, the customer can pay in cash, credit card or even check. After the payment is successful, a receipt will be printed. Note that for promotion, the store frequently issue gift coupons. The customer can use the coupons for a better price when purchasing goods.

Another function of a POS system is to handle returns…. [The details of which are not given here]

A user must log in to use the POS. The users of a POS system are the employees of the store including cashiers and the administrator. The administrator can access the system management functions of the POS system including user management and security configuration that cashiers can't do.



Use Case: Process Sale

Actor

- Cashier

Preconditions

- Cashier is logged into the POS system
- POS system is connected to the backend catalog and inventory systems

Main Flow

1. Cashier initiates a new sale transaction
2. For each item: a. Cashier scans item barcode b. System retrieves item details (name, price) from catalog c. System updates inventory count d. System adds item to current transaction
3. System calculates total amount
4. If customer has gift coupons: a. Cashier applies coupons b. System recalculates total amount
5. Cashier selects payment method (cash, credit card, or check)
6. Customer provides payment
7. Cashier processes payment
8. System validates payment
9. System finalizes transaction
10. System prints receipt

Alternate Flows

- 2b. If item not found in catalog, cashier manually enters item details
- 8a. If payment is invalid, return to step 6
- At any point, cashier can cancel the transaction

Postconditions

- Sale is recorded in the system
- Inventory is updated
- Payment is processed
- Receipt is printed

Use Case: Handle Return

Actor

- Cashier

Preconditions

- Cashier is logged into the POS system
- Customer has items to return and original receipt

Main Flow

1. Cashier initiates a new return transaction
2. Cashier scans or enters receipt number
3. System retrieves original sale transaction
4. For each item to be returned: a. Cashier scans item barcode b. System verifies item was in original transaction c. System updates inventory count 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 finalizes return transaction
9. System prints return receipt

Alternate Flows

- 2a. If receipt is not available, cashier searches for transaction using other criteria
- 4b. If item not found in original transaction, cashier consults manager for approval
- 7a. If original payment method is not available, cashier issues store credit

Postconditions

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

Entity Object/Boundary Objects/Control Object

For the POS system, we can identify the following objects:

Entity Objects:

- Sale
- Item
- User (Cashier/Administrator)
- Inventory
- Coupon
- Return
- Reciept

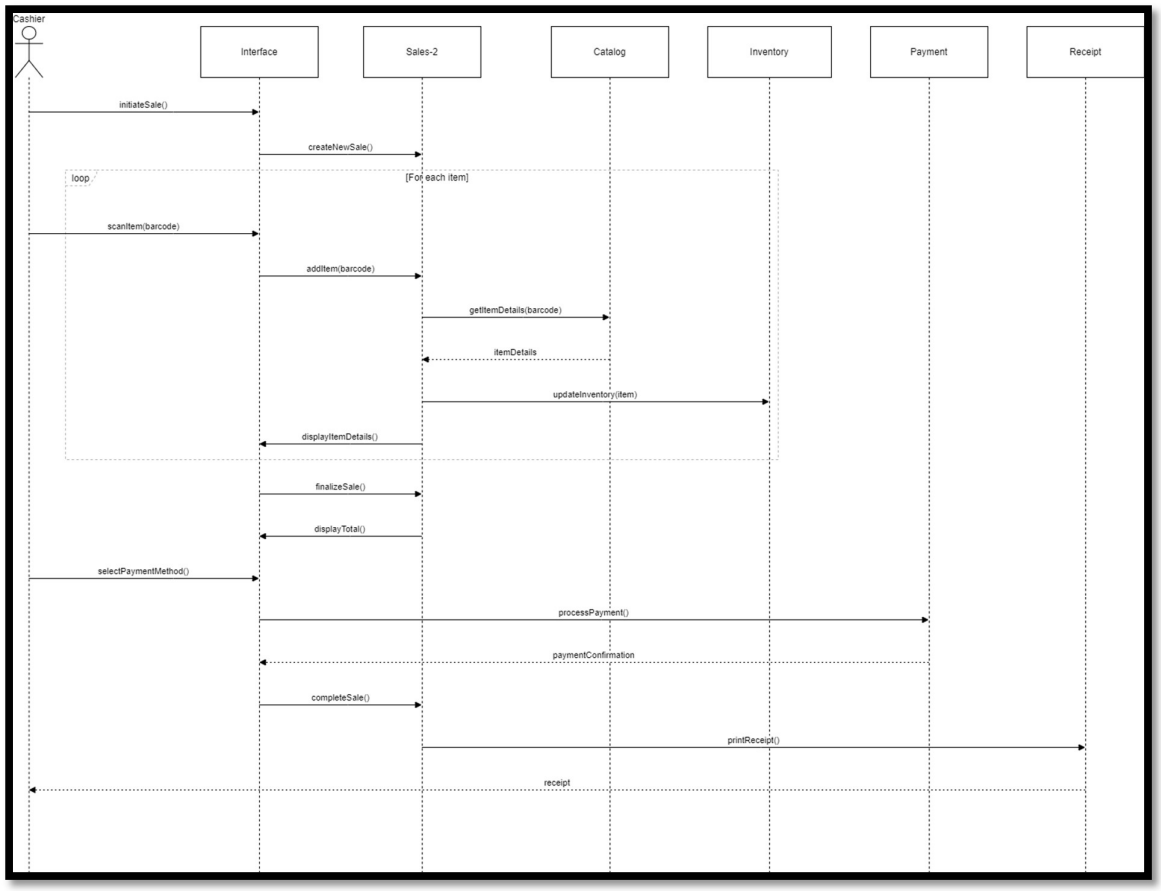
Boundary Objects:

- LoginInterface
- SaleInterface
- ReturnInterface
- PaymentInterface
- ReceiptPrinter
- BarCodeScanner

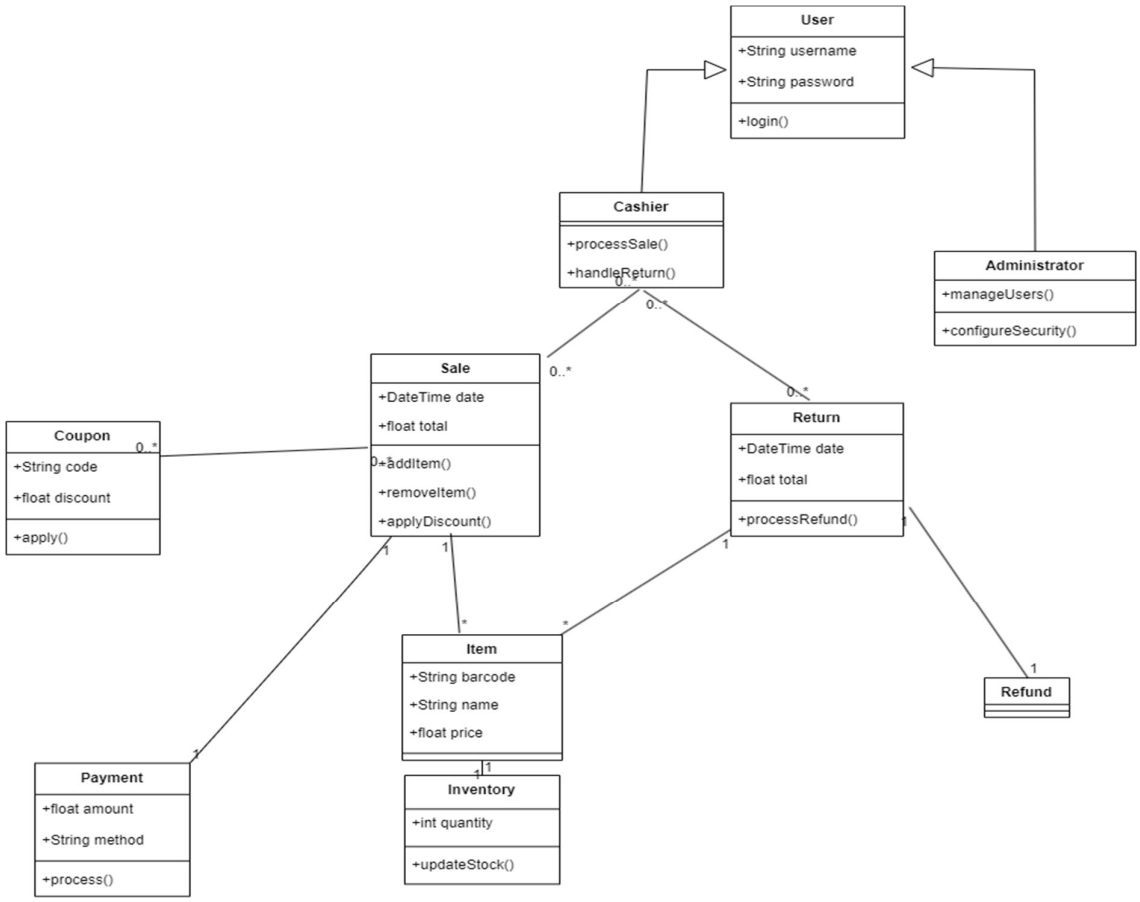
Control Objects:

- SaleController
- ReturnController
- InventoryController
- UserAuthenticationController
- PaymentProcessor
- CatalogController

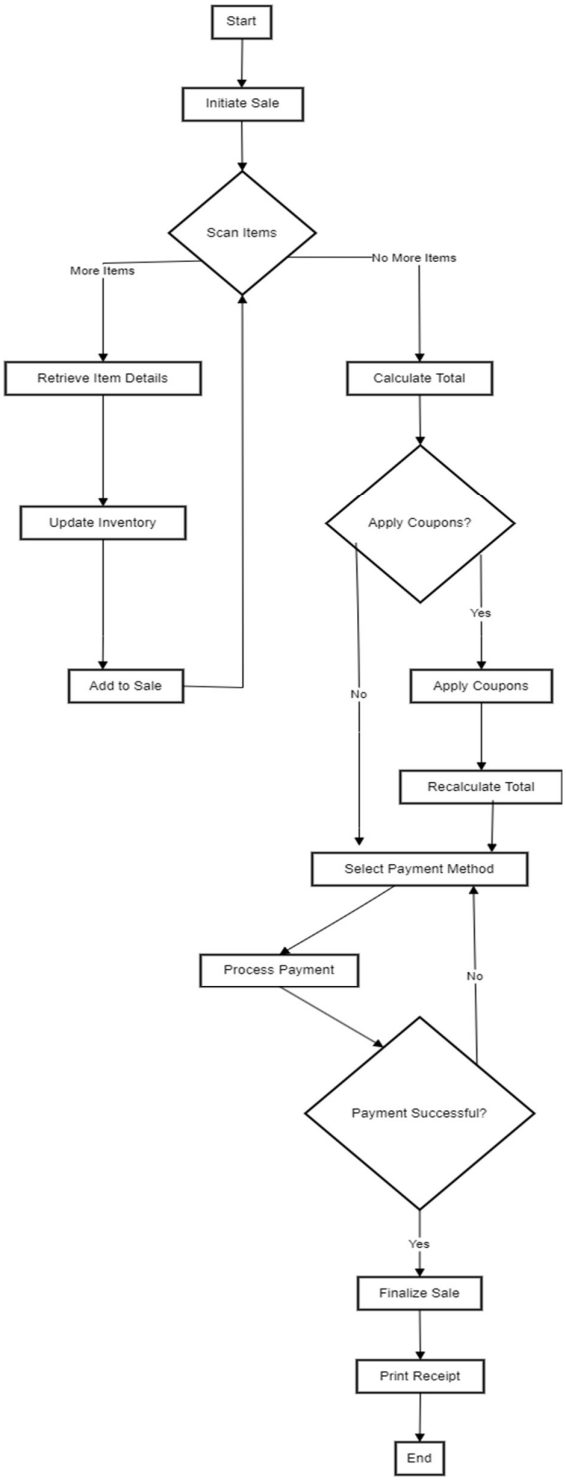
Sequence Diagram



Analysis Domain Model



Activity Diagram for “Process sale” and “Handle Return”




Start
Initiate Return
Scan/Enter Receipt
Retrieve Original Sale
Scan Return Items
More Items
No More Items
Verify Item in Original Sale
Update Inventory
Add to Return
Calculate Refund Amount
Confirm with Customer
Process Refund
Finalize Return
Print Return Receipt
End