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Que-1: Develop Use Case Textual Description for "Process Sale" and"Handle Return" use cases.

(1) Use case : Process Sale
Actors : Cashier, Customer
Conditions :
-> The cashier is logged into the POS system.
-> The customer has selected goods to purchase.
-> A sale transaction is recorded in the system.
-> Inventory levels are updated accordingly.
-> A receipt is printed for the customer.

Main Flow :
-> The cashier starts a new sale transaction in the POS system.
-> The cashier scans the barcode of each item presented by the customer.
-> The POS system retrieves the item details (name, price) from the backend catalog.
-> The system updates the inventory to reflect the deduction of the sold items.
-> The system calculates the total amount due, applying any promotions or gift coupons if applicable.
-> The cashier informs the customer of the total amount due.
-> The customer provides payment (cash, credit card, or check).
-> If cash, the system verifies the amount and gives change if necessary.
-> If credit card, the system processes the transaction via the payment gateway.
-> Upon successful payment, the system generates a receipt, which is printed and handed to the customer.

Alternative Flow :
-> Invalid Payment: If payment fails, the system prompts the cashier to retry or choose another payment method.
-> Coupon Invalidity: If a coupon is invalid, the system alerts the cashier, allowing the customer to pay the full amount.

(2) Use case : Handle Return
Actors : Cashier, Customer
Conditions :
-> The cashier is logged into the POS system.

-> The customer presents an item for return..
-> The return transaction is completed.
-> Inventory levels are updated.
-> A receipt for the return is generated and printed.

Main Flow :

-> The cashier initiates a return transaction in the POS system.
-> The cashier scans the barcode of the item being returned.
-> The system retrieves the item details (original sale price) from the backend catalog.
-> The cashier verifies the return conditions (e.g., within return period, item condition).
-> If eligible, the system calculates any refund amount.
-> The cashier informs the customer of the refund amount.
-> The customer provides their original purchase receipt for verification.
-> The system processes the refund: If it was a credit card, the refund is processed back to the card, If the original payment was by cash, the amount is refunded in cash.
-> The system updates the inventory to reflect the return of the item.
-> A return receipt is generated and printed for the customer, and the return transaction is recorded in the system.

Alternative Flow :

-> Return Denied: If the return conditions are not met, the system alerts the cashier and the return is canceled.
-> Missing Receipt: If the customer does not have the original receipt, the cashier may need to verify the purchase through the system based on other identifying information.
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Que-2: Identify Entity/Boundary Control Objects.

(1) Entity Objects :

Product
Customer
Payment
Coupon
User
Inventory

(2) Bounty Objects

LoginInterface
AdminInterface
InventorySystemInterface
ReceiptPrinter
SaleTransactionScreen

BarcodeScanner

(3) Control Objects

TransactionController
PaymentController
CouponController
InventoryController
UserController
ReturnController

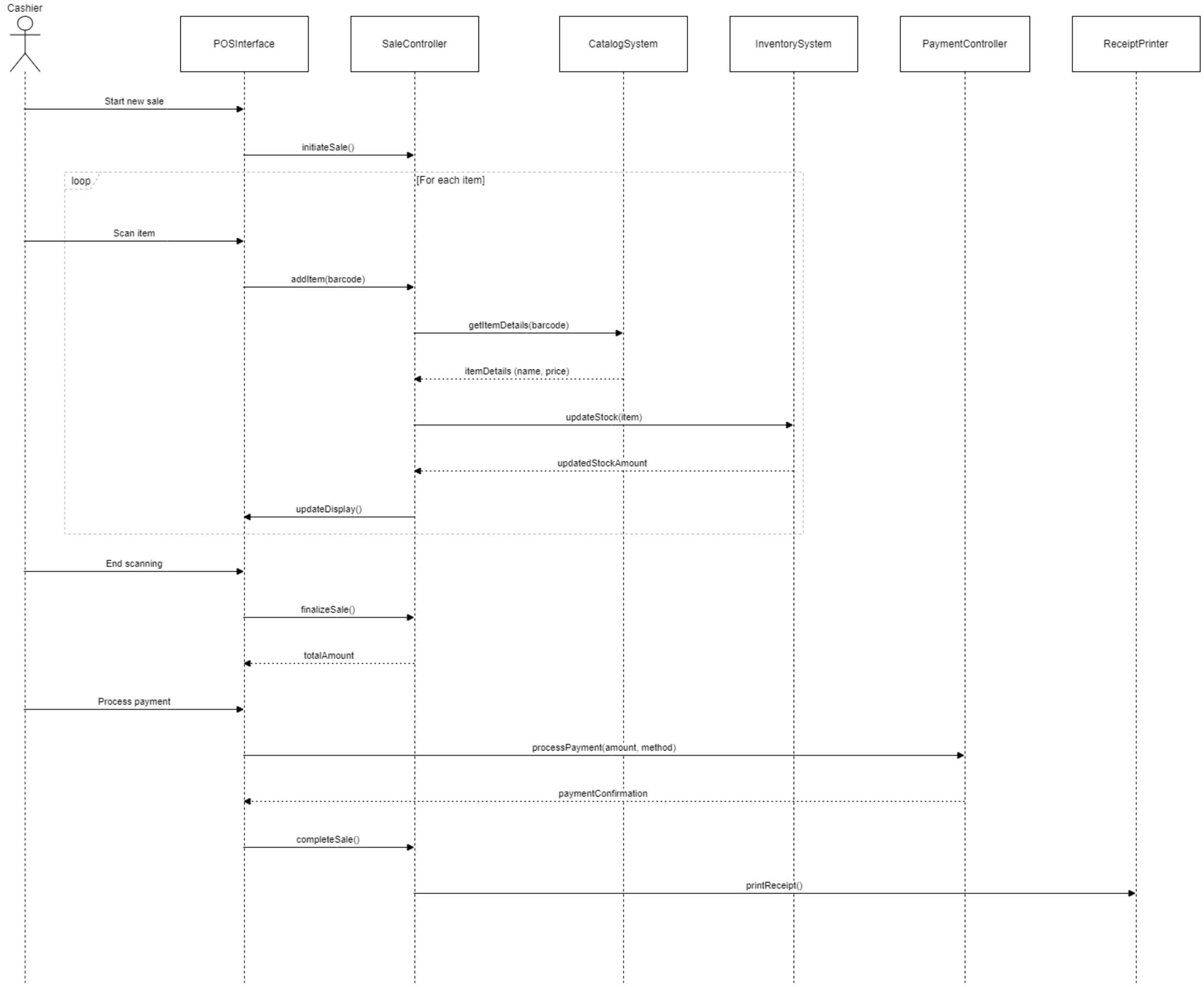
3. Sequence Diagrams

a. Process Sale

Objects:

- Cashier
- POS interface
- Catalog controller
- Sale controller
- Inventory System
- Payment controller
- ReceiptPrinter

Flow:

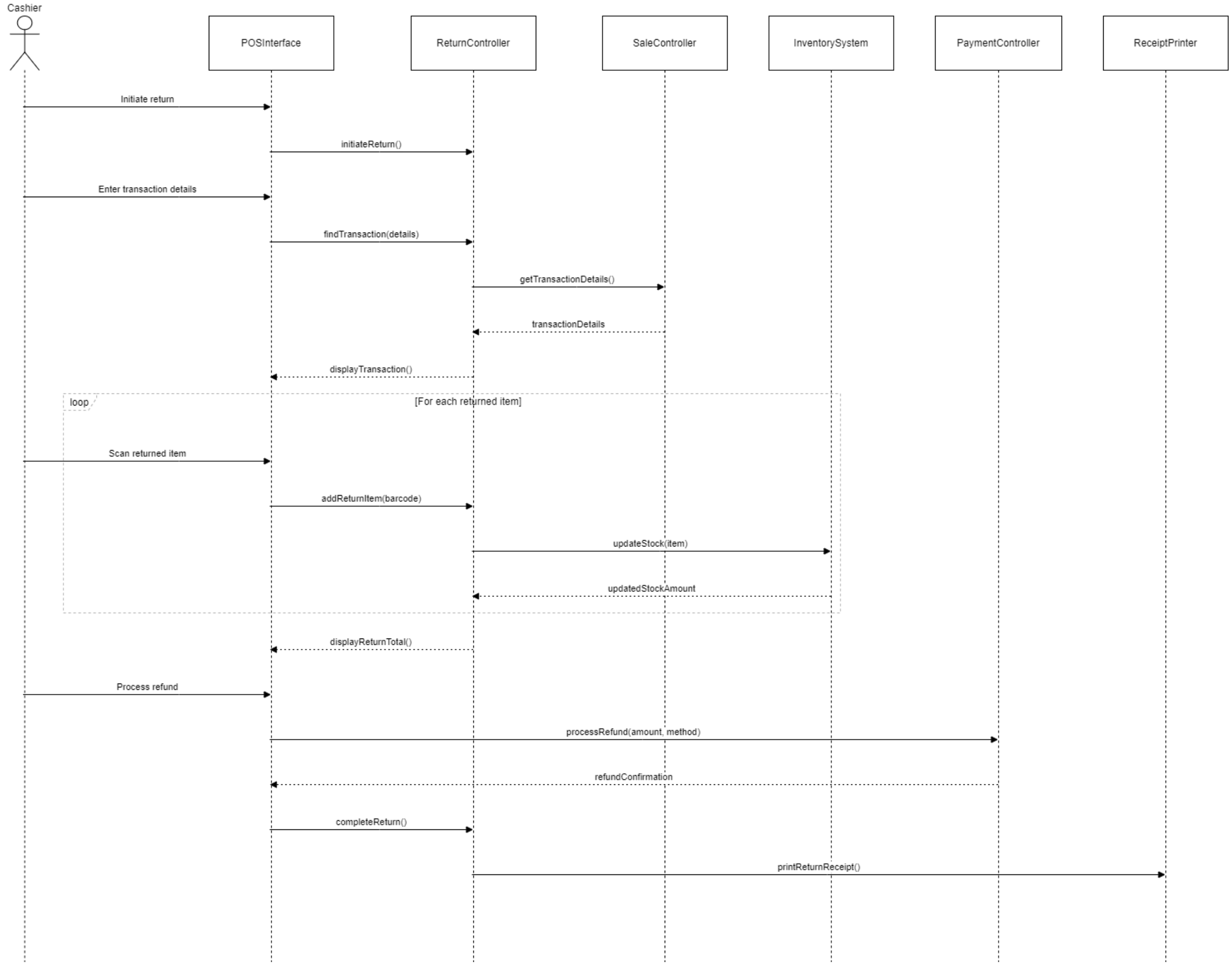


b. Handle Return

Objects:

- Cashier
- POS interface
- Return controller
- Sale controller
- Inventory System
- Payment controller
- ReceiptPrinter

Flow:

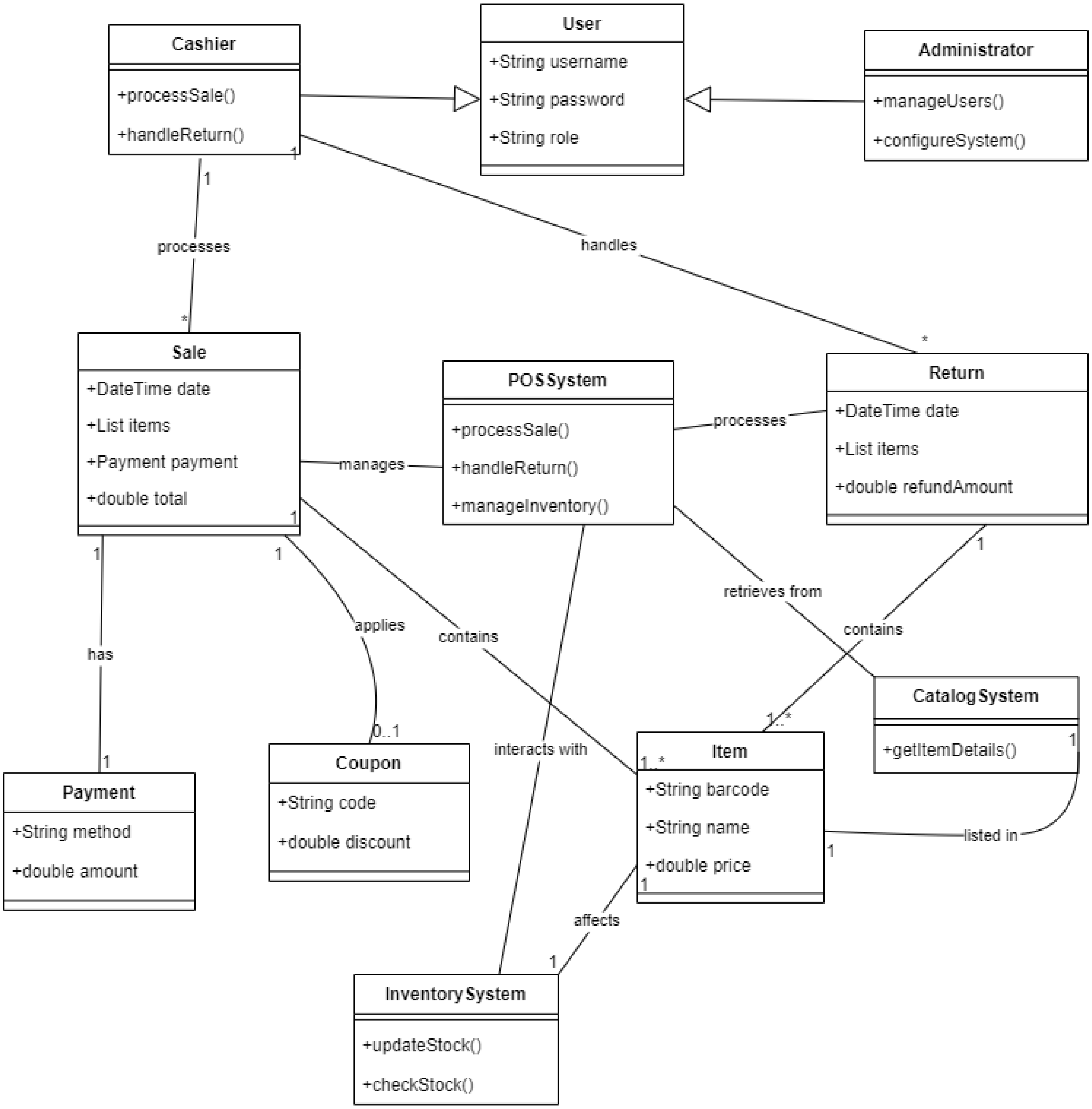


4. Analysis Domain Models

Entities:

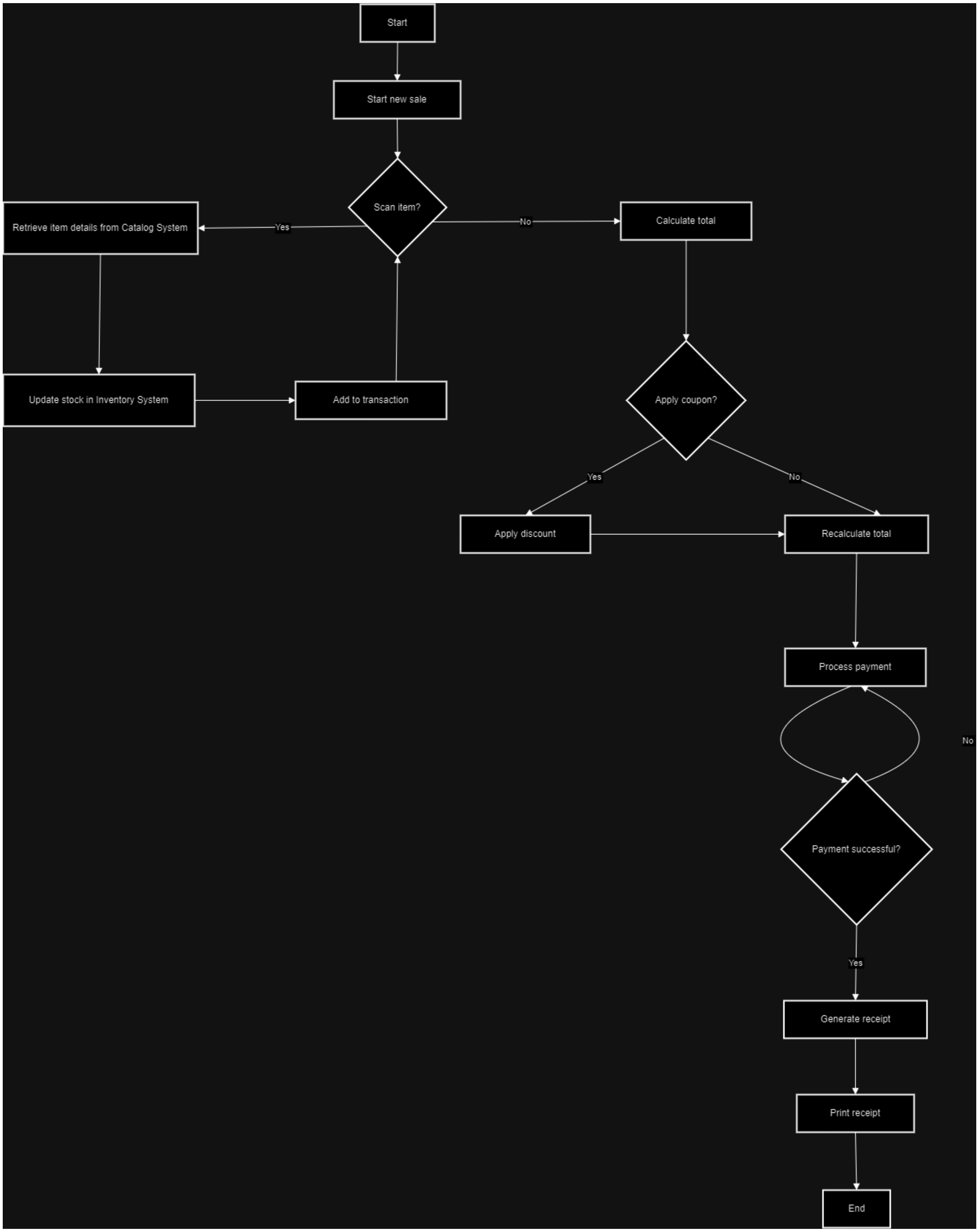
1. **Item**:
   - Attributes: barcode, name, price
2. **Sale**:
   - Attributes: Date, Items, payment, total
3. **User**:
   - Attributes: username, password, role
4. **Cashier**:
   - Attributes: processSale, handleReturn
5. **Payment**:
   - Attributes: Payment Method, Amount
6. **Return**:
   - Attributes: Date Time
7. **Administrator**:
   - Attributes: manageUser, configureSystem

8. **PosSystem**:
    - Attributes: Sale, return, inventory
9. **Coupon**:
    - Attributes: code, discount
10. **Catalong System**:
    - Attributes: itemDetails
11. **Inventory System**:
    - Attributes: updateStock, checkStock

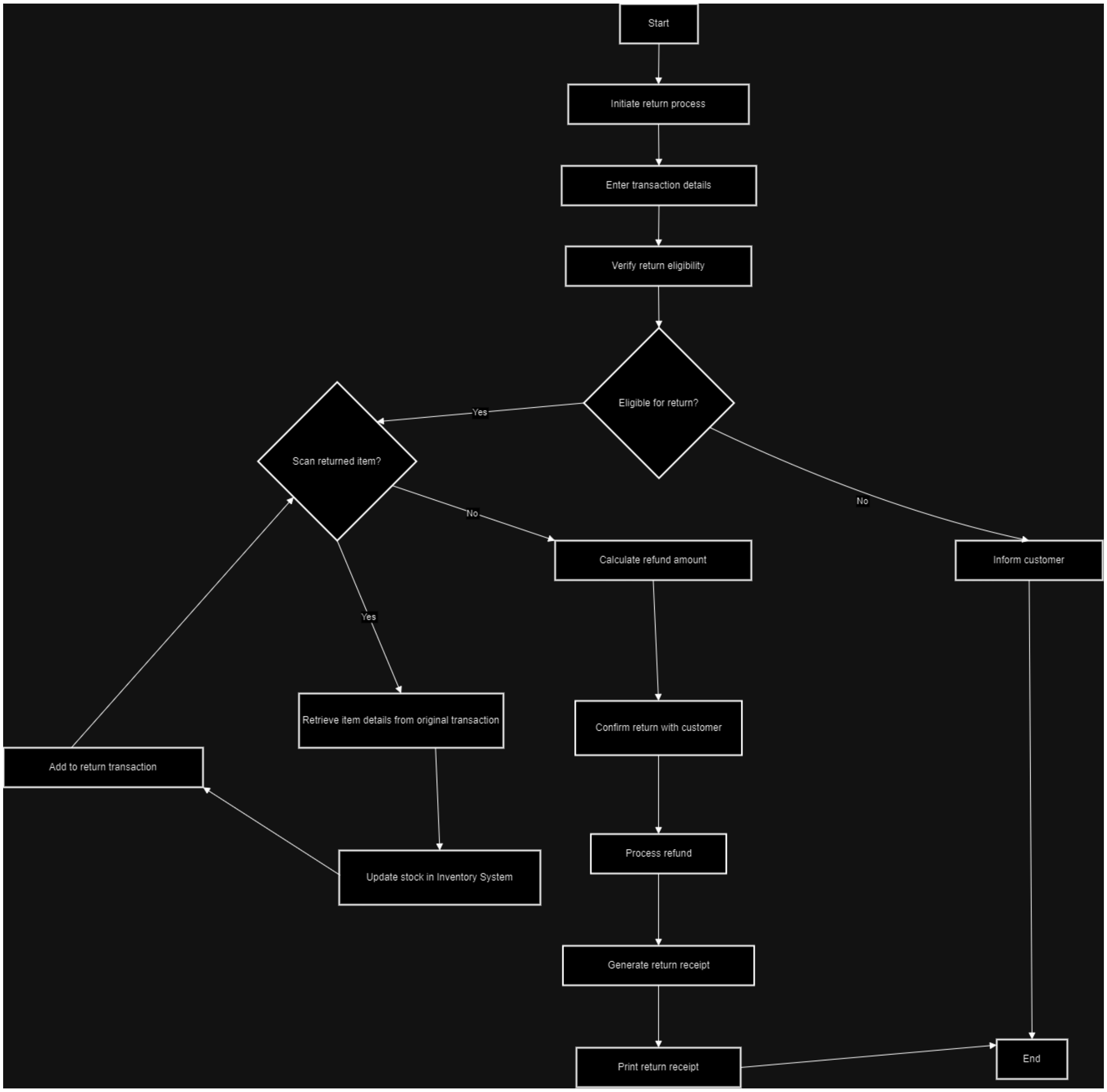


5. Activity Diagrams

a. Process Sale Activity Diagram



b. Handle Return Activity Diagram


Start
Initiate return process
Enter transcation details
Verify return eligibility
Eligible for return?
Yes
No
Scan returned item?
No
Yes
Calculate refund amount
Inform customer
Retrieve item details from original transaction
Confirm return with customer
Add to return transaction
Process refund
Update stock in Inventory System
Generate return receipt
Print return receipt
End