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

Process Sale

1) Use case diagram textual description

- Use Case ID: UC-01
- Use Case Name: Process Sale
- Actor(s): Cashier, Customer

Preconditions:

- Cashier is logged into the POS system.
- Inventory is available and up-to-date.

Postconditions:

- Sale transactions are recorded in the system.
- Inventory is updated to reflect the sale.
- Receipts are generated and printed.

Main Flow:

- (i) The cashier initiates a new sale transaction in the POS system.
- (ii) The cashier scans the barcode of the first item.
- (iii) The system retrieves the item's name and price from the backend catalog.
- (iv) The system checks the inventory for stock availability.

- If the item is out of stock, the system notifies the cashier and prompts to continue or cancel the sale.
- (v) The cashier scans additional items as needed.
- (vi) Once all items are scanned, the system calculates the total cost.
- (vii) The cashier applies any gift coupons or promotions as requested by the customer.
- (viii) The system updates the total amount.
- (ix) The customer chooses a payment method (cash, credit card, or check).
- (x) The system processes the payment.
- If payment is successful, the system updates the inventory accordingly.
 - If payment fails, the system notifies the cashier and prompts for a different payment method.
- (xi) The system generates a receipt.
- (xii) The cashier hands the receipt to the customer and confirms the transaction is complete.

Extension:

- If the customer wishes to cancel the transaction at any point before payment, the cashier can void the transaction, and the system will discard all scanned items without processing any sale.

2) Identify Entity/Boundary Control Objects

Entity Objects:

- Product
- Inventory System
- Cashier
- Customer
- Receipt
- Payment

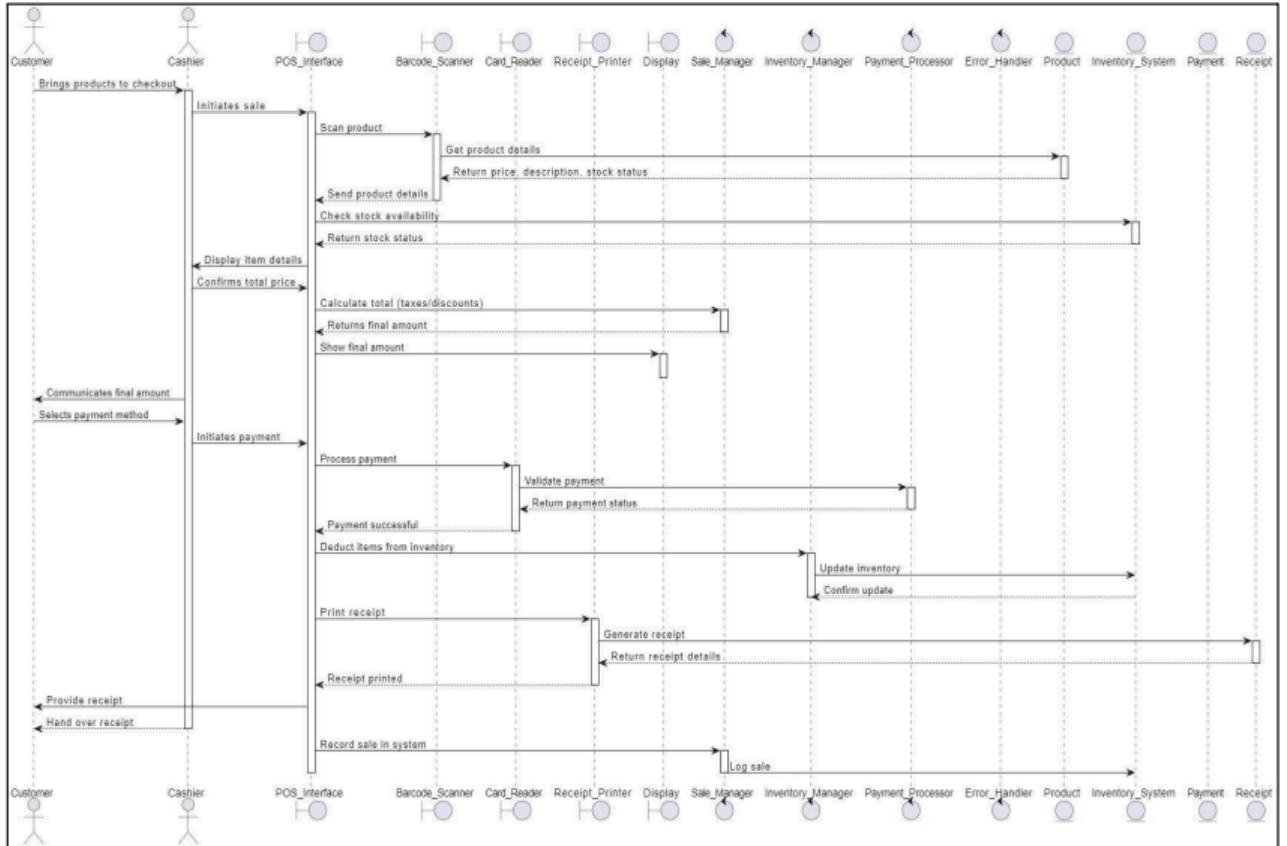
Boundary Objects:

- POS Interface
- Barcode Scanner
- Card Reader
- Receipt Printer
- Display

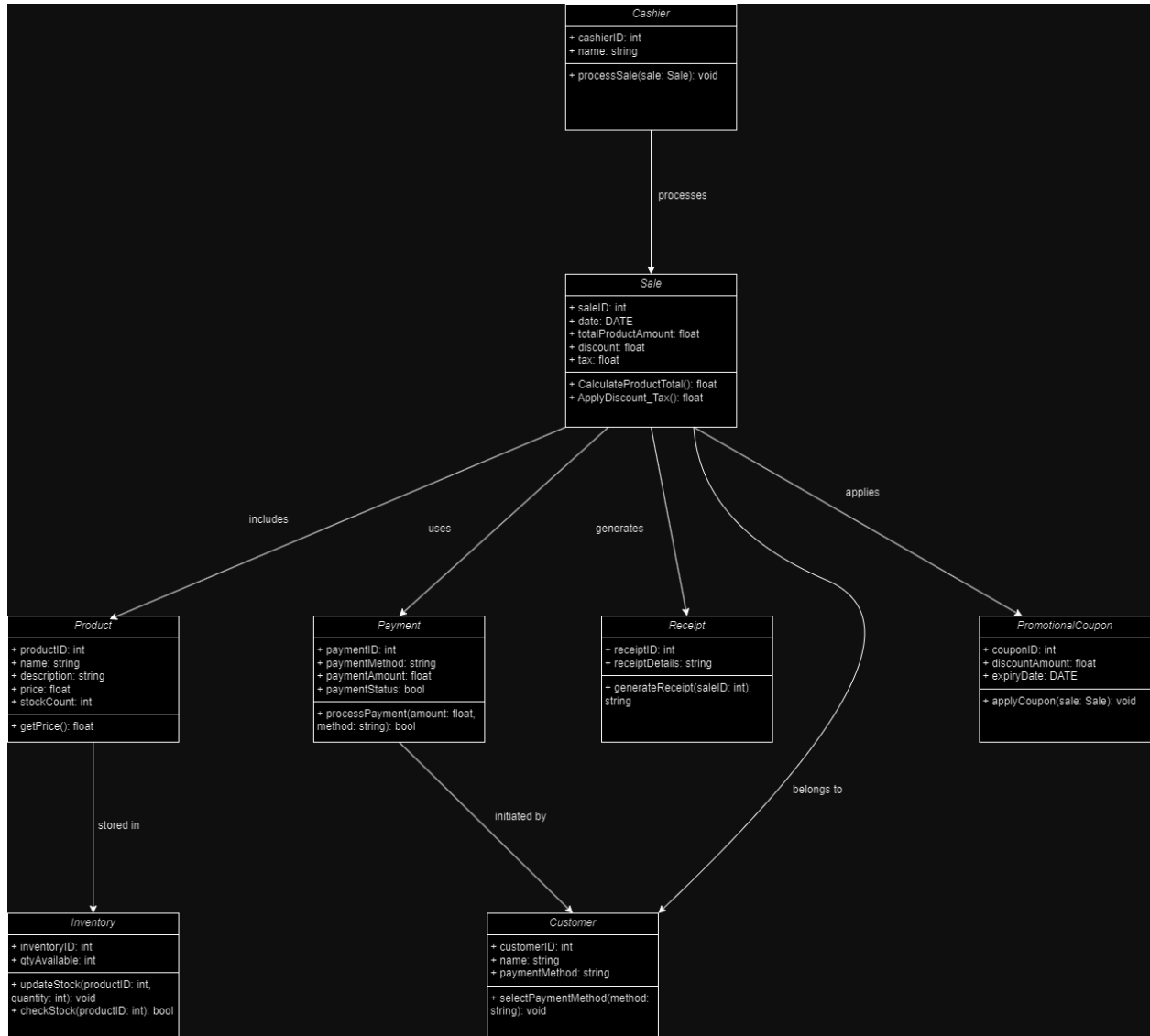
Control Objects:

- Inventory Manager
- Payment Processor
- Error Handler
- Sale manager

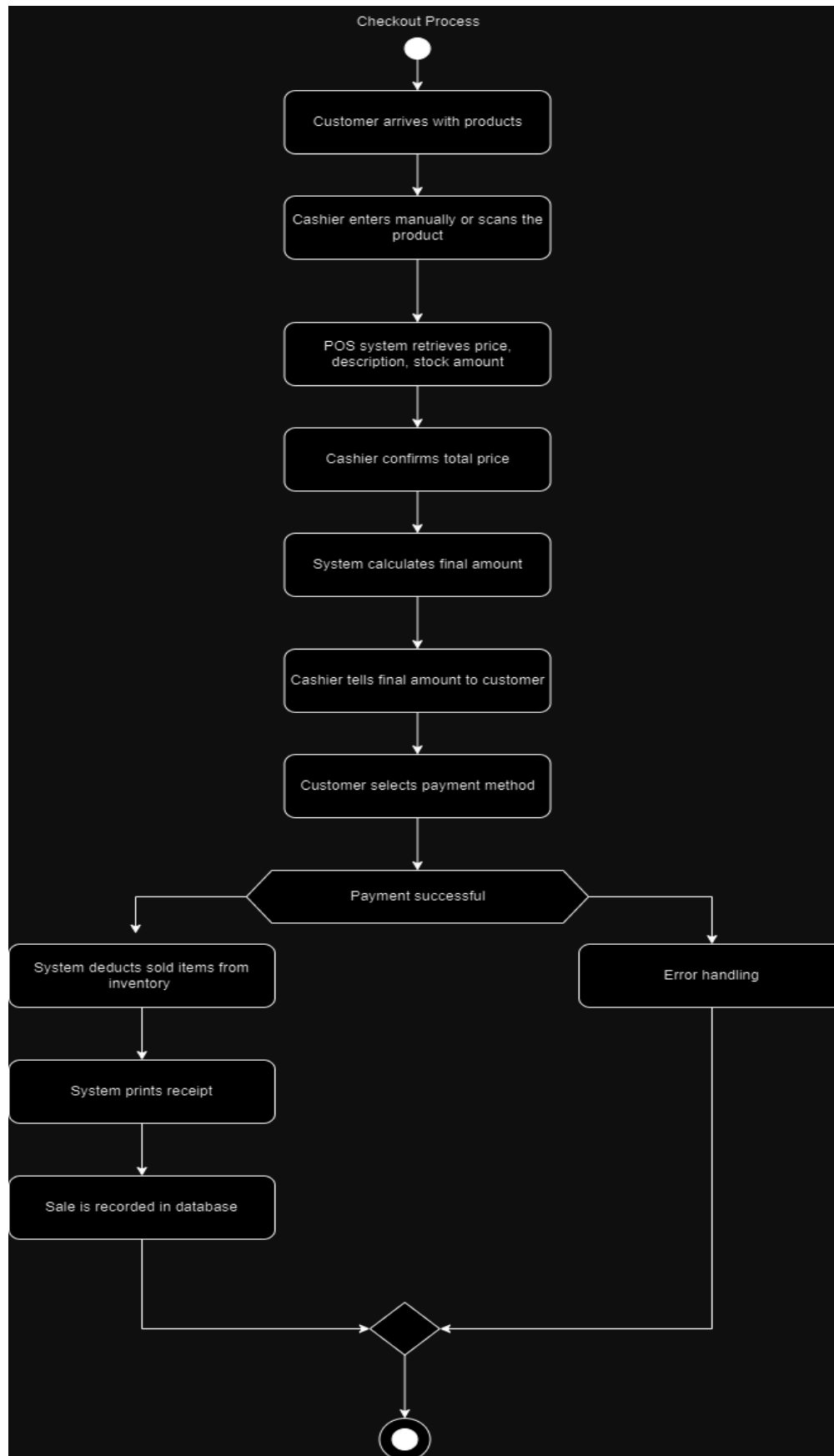
3) Develop Sequence Diagrams



4) Develop Analysis Domain Models



5) Develop activity diagram



Handle Return

1) Use case diagram

- **Use Case ID:** UC-02
- **Use Case Name:** Handle Return
- **Actor(s):** Cashier, Customer

Preconditions:

- Cashier is logged into the POS system.
- The item to be returned is eligible for return based on store policy.

Postconditions:

- Return transactions are recorded in the system.
- Inventory is updated to reflect the return.
- Customers are issued a refund or store credit.

Main Flow:

- (i) The cashier initiates a return transaction in the POS system.
- (ii) The customer provides the item and any relevant receipt or proof of purchase.
- (iii) The cashier scans the barcode of the returned item.
- (iv) The system verifies the item's eligibility for return and checks the original purchase details.
- (v) If the item is not eligible for return, the system notifies the cashier and the return process is aborted.
- (vi) If eligible, the system retrieves the original sale price.
- (vii) The cashier processes the refund based on the customer's preference (cash, credit card, or store credit).
- (viii) The system updates the inventory to add the returned item back into stock.
- (ix) A return receipt is generated and printed for the customer.

(x) The cashier hands the return receipt to the customer, confirming the return is complete.

Extensions:

- If the customer cannot provide a receipt but insists on returning the item, the cashier can follow store policy procedures for exceptions, which may include manual verification of the purchase or issuing store credit based on the item's condition.

2) Identify Entity/Boundary Control Objects

Entity Objects:

1. Product
2. Receipt
3. Return
4. Refund
5. Inventory System
6. Customer
7. Cashier

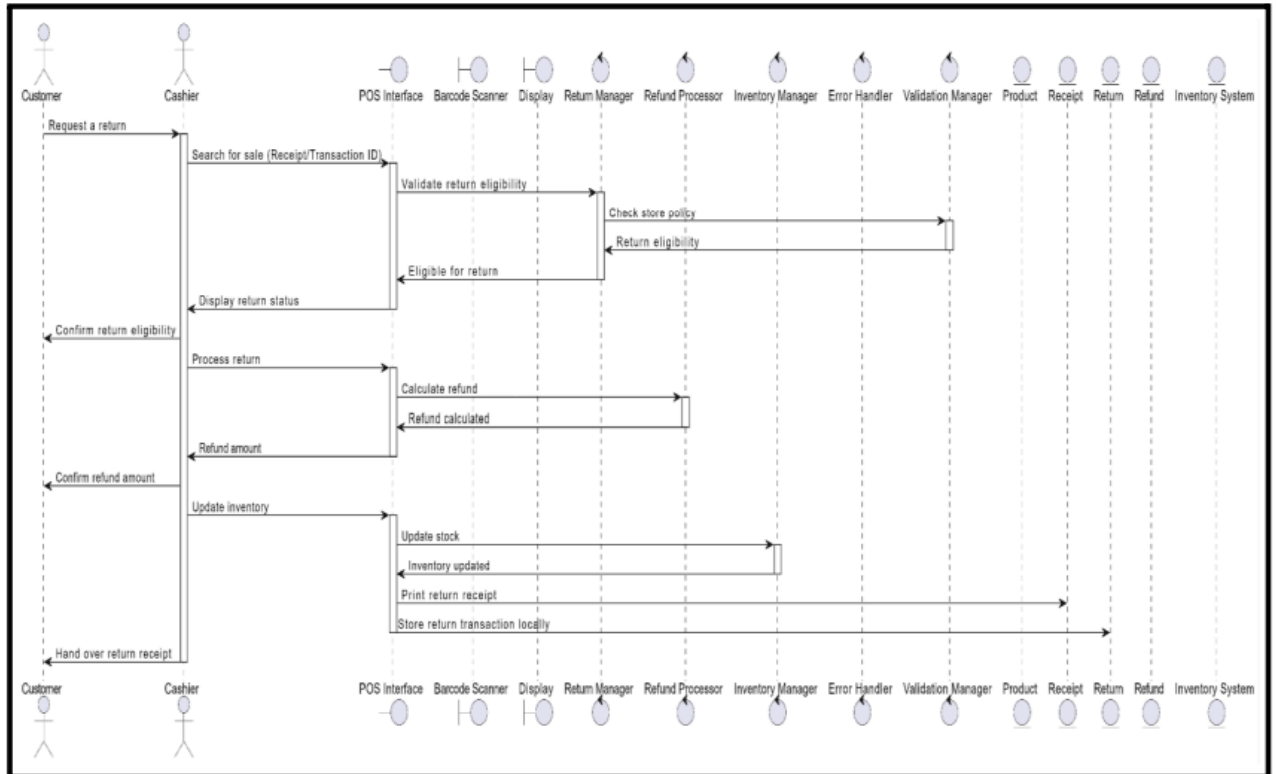
Boundary Objects:

1. POS Interface
2. Barcode Scanner
3. Display

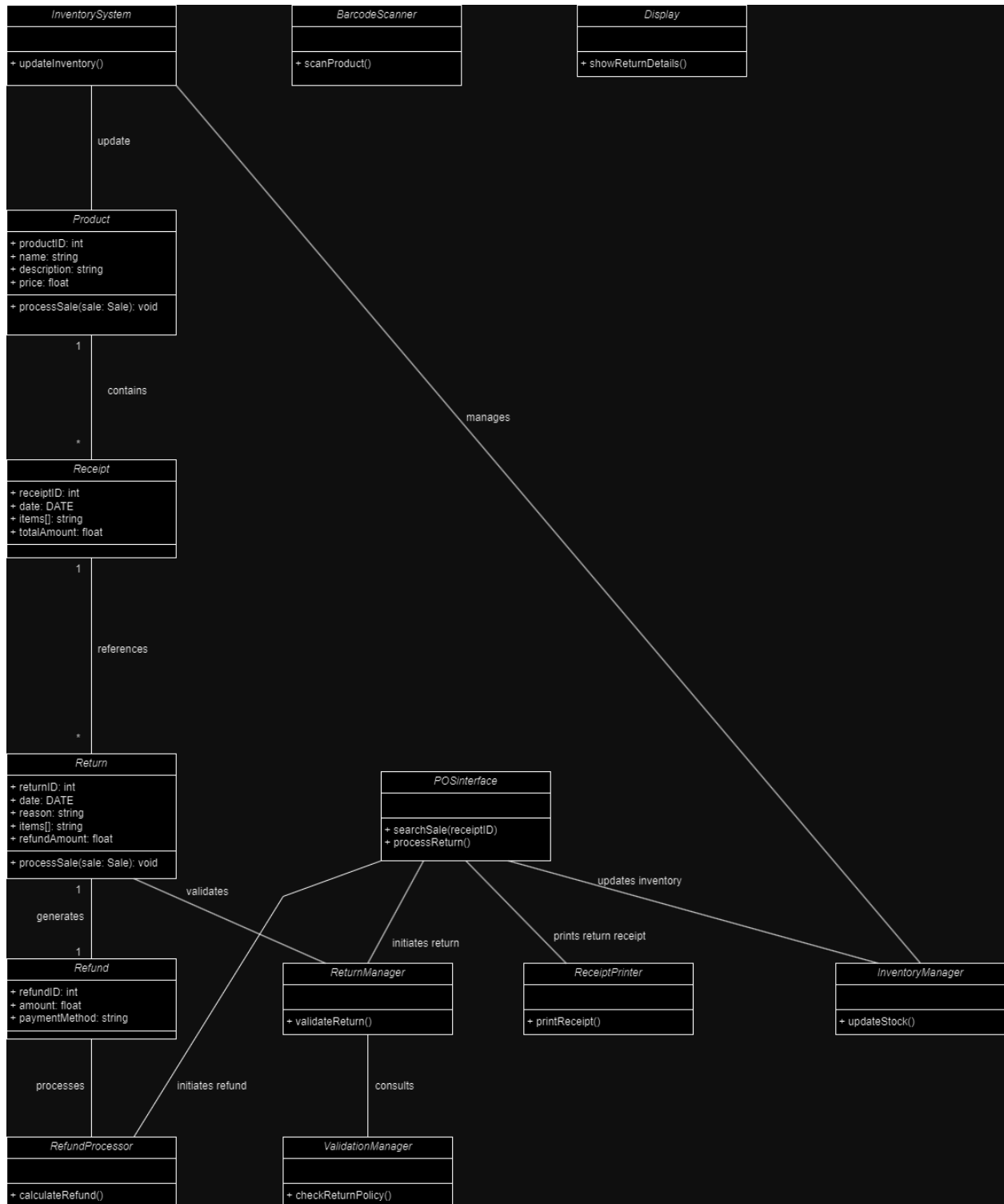
Control Objects:

1. Return Manager
2. Refund Processor
3. Inventory Manager
4. Error Handler
5. Validation Manager

3) Develop Sequence Diagrams



4) Develop Analysis Domain Models



5) Develop activity diagram

