IT314 - SOFTWARE ENGINEERING

LAB 6 :- Modeling Class Diagram and Activity Diagram (Point of Sale System):

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Q1) Develop a textual description for "process sale" and "handle return" use cases.

Use Case: Process Sale

Actors: Cashier

Preconditions:

- The cashier must be logged into the POS system.
- The items to be purchased are available in the inventory.

Postconditions:

- The sale transaction is completed.
- Stock levels of purchased goods are updated in the inventory system.
- A receipt is printed for the customer.

Basic Flow:

1. The cashier initiates a new sale transaction.
2. The cashier scans the barcode of each item to be purchased.
3. For each scanned item, the POS system:
    - Retrieves the item's name and price from the backend catalog system .
    - Updates the stock quantity of the item in the inventory system.

4. The POS system calculates the total price for the transaction, applying any relevant discounts or gift coupons
   .
5. The customer chooses a payment method (cash, credit card, or check).

6. The POS system processes the payment.
   - If the payment is successful, a receipt is printed.

7. The cashier hands over the receipt and the purchased goods to the customer, completing the transaction.

Extensions:

- **Invalid Barcode**: If a barcode is not recognized, the POS system displays an error message and allows the cashier to manually input the item's code.
- **Insufficient Stock**: If an item is out of stock, the system alerts the cashier, who informs the customer.
- **Payment Failure**: If the payment is unsuccessful (e.g., card declined, insufficient funds), the system prompts the cashier to request an alternate payment method.

Entity, boundary, and control objects

Entity Objects:

1. Inventory System
2. Cashier
3. Receipt
4. Catalog System
5. Receipt

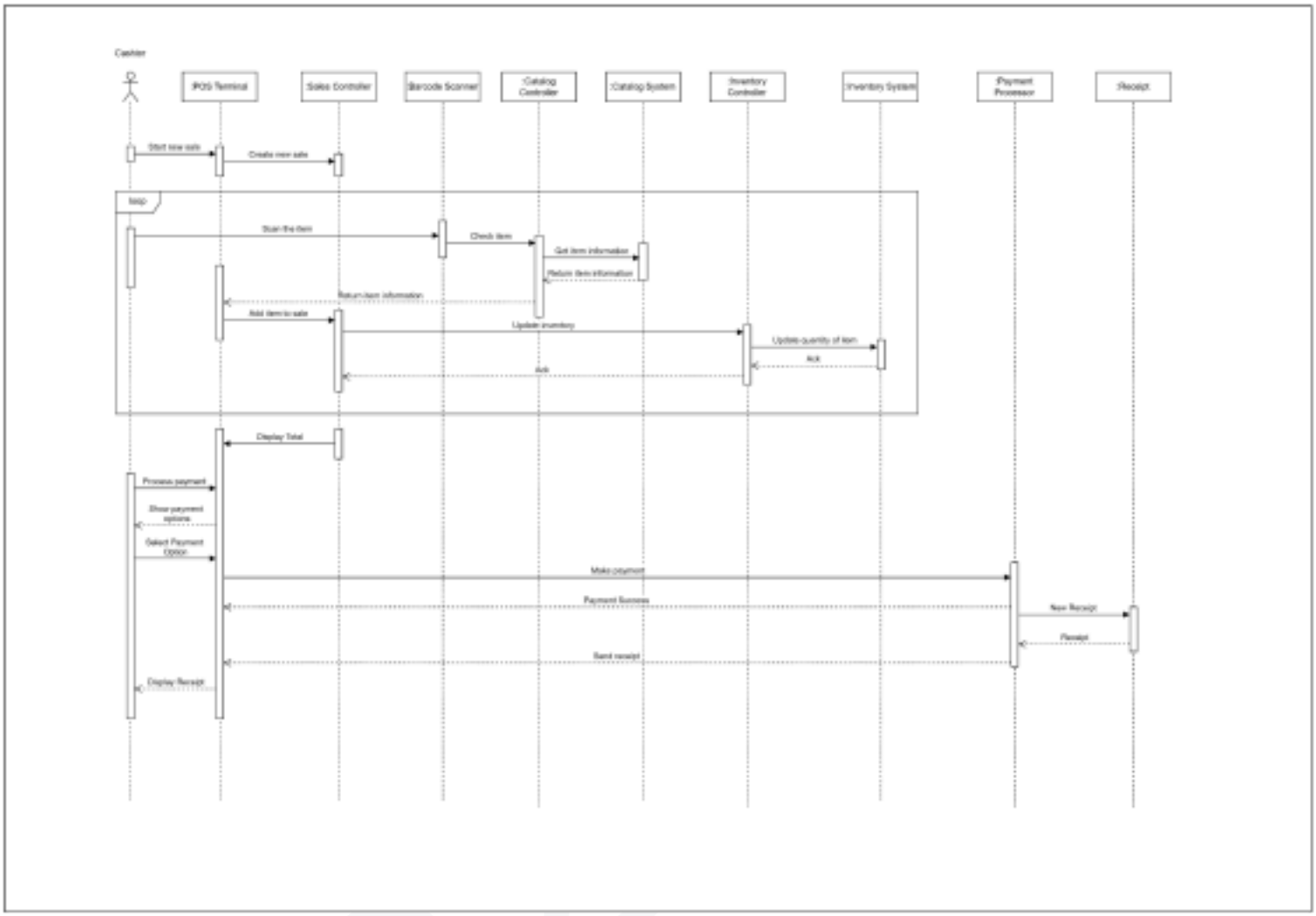
Boundary Objects:

1. POS Interface
2. Barcode Scanner

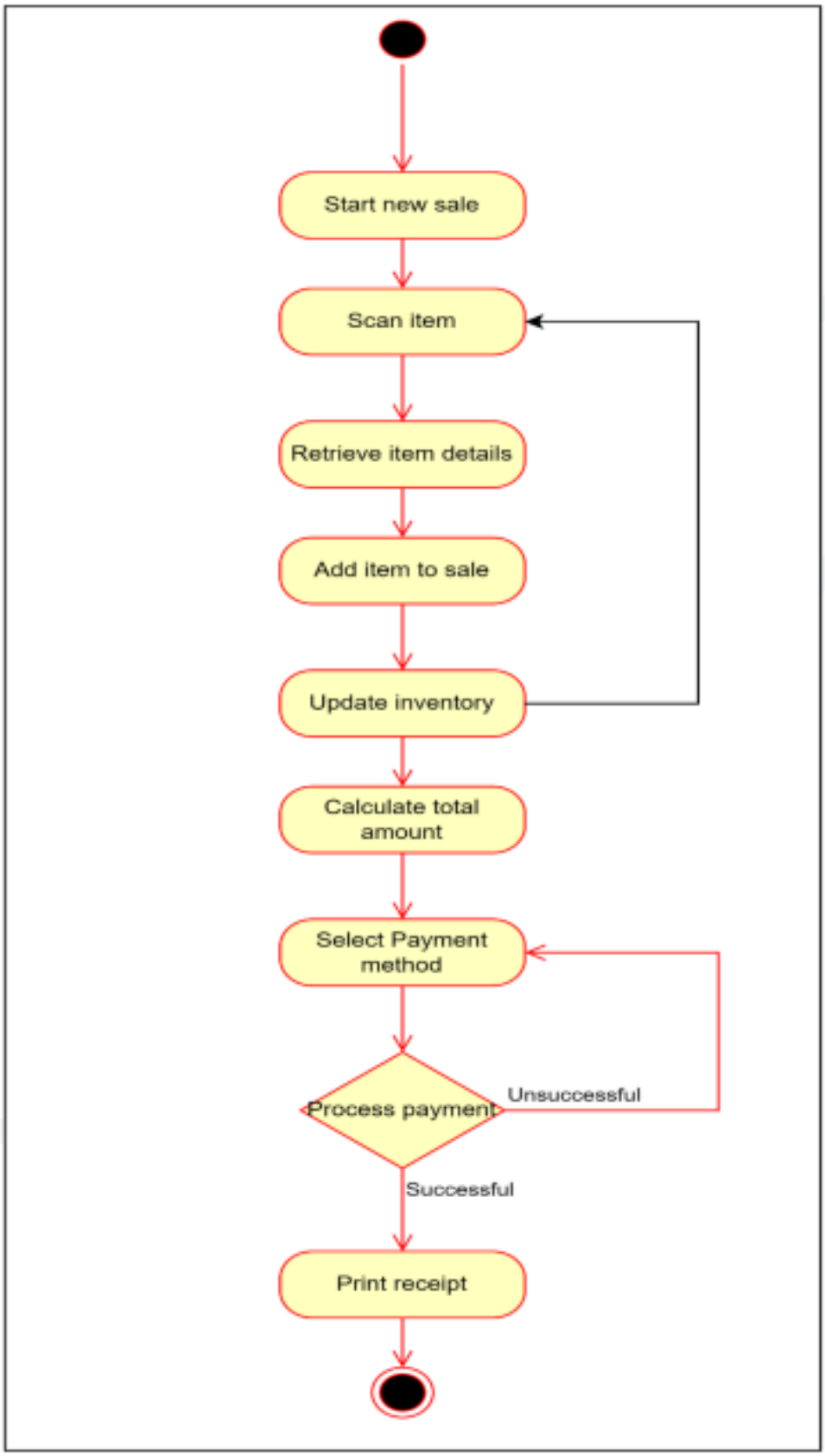
Control Objects:

1. Inventory Manager
2. Catalog Manager
3. Payment Processor
4. Sales Controller

SEQUENCE DIAGRAM:



ACTIVITY DIAGRAM:



HANDLE RETURNS:

Use Case: Handle Returns

Actor: Cashier

Preconditions:

- The customer provides a valid receipt or proof of purchase.
- Sales data is accessible in the system.

Postconditions:

- The return is recorded in the local database.
- The inventory is updated to reflect the returned items. ● The system awaits synchronization with the central server when connectivity is restored.

Flow:

1. The customer requests a return.
2. The cashier retrieves the original transaction from the local database by searching with the receipt or transaction ID.
3. The system verifies whether the items qualify for a return based on store policy.
4. The cashier confirms the return and finalizes the process.
5. The system calculates the refund amount based on the initial purchase details.
6. The system updates the local inventory to reflect the returned items and logs the return transaction in the database.
7. A return receipt is generated and provided to the customer.

Alternate Flow:

Step 2.1: Product Not Found
If the product cannot be located in the database, the system displays an error, prompting the cashier to manually verify the transaction using the receipt.

Step 3.1: Missing Receipt
If the customer does not have a receipt, the cashier requests alternative proof of purchase, such as a loyalty account, credit card transaction details, or other valid forms of purchase verification.

Step 4.1: Unacceptable Item Condition
If the returned item is damaged or does not meet the store's return criteria, the cashier informs the customer of the store's return policy and explains why the item is not eligible for return.

Step 5.1: Partial Refund or Exchange
If the customer prefers an exchange or a partial refund rather than a full refund, the cashier processes the request in line with store policy, ensuring the customer's preference is honored.

Step 6.1: Refund Method Discrepancy
If the customer requests a refund using a different payment method than the original purchase (e.g., cash instead of card), the system enforces a policy of refunding to the original payment method only, and the cashier explains this to the customer.

Step 7.1: System Error During Refund
In the case of a system error while processing the refund, the cashier manually completes the refund process or offers the customer store credit as an alternative.

Entity, boundary, and control objects:

Entity Objects:

1. Return Receipt
2. Inventory System
3. Cashier

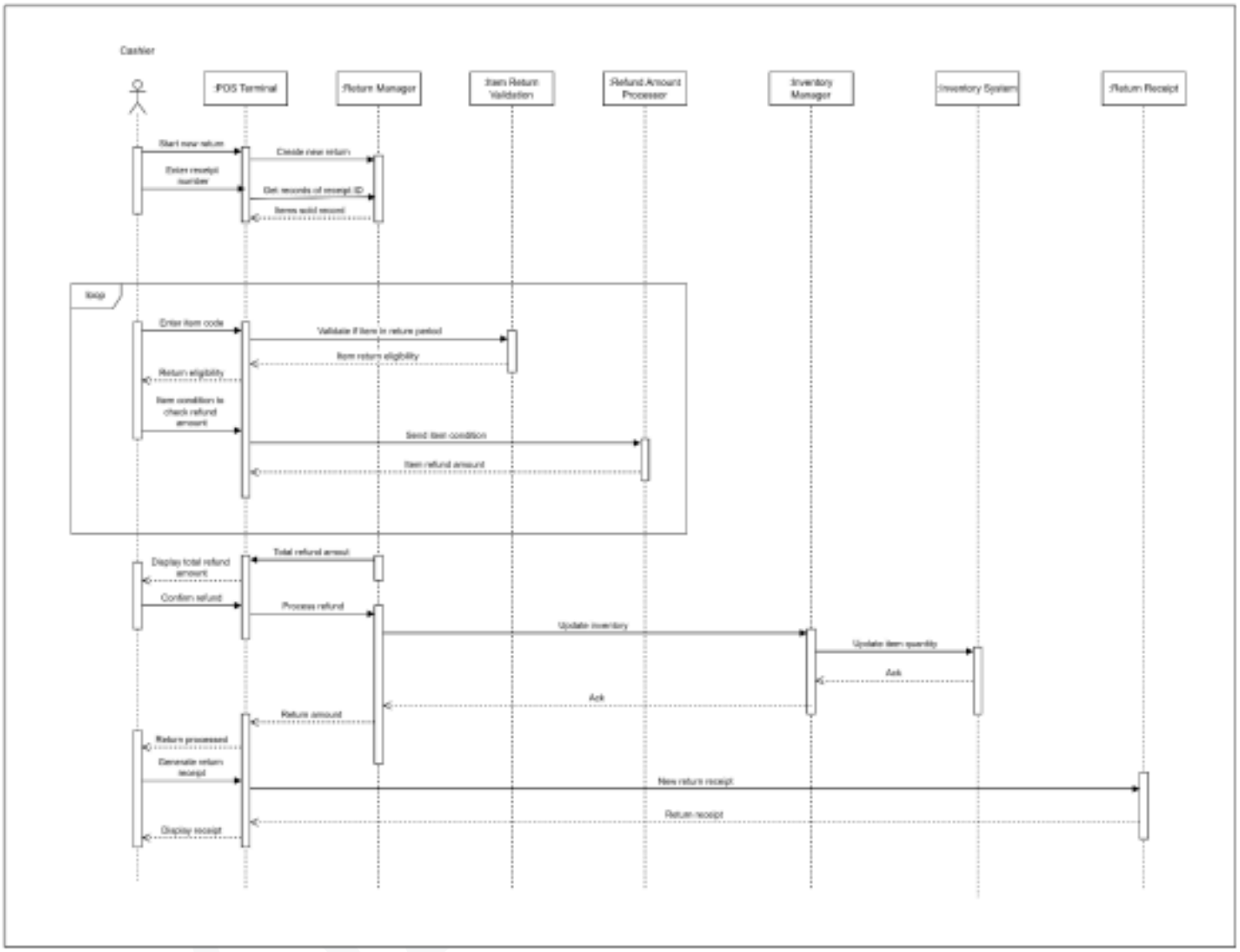
Boundary Objects:

1. POS Interface

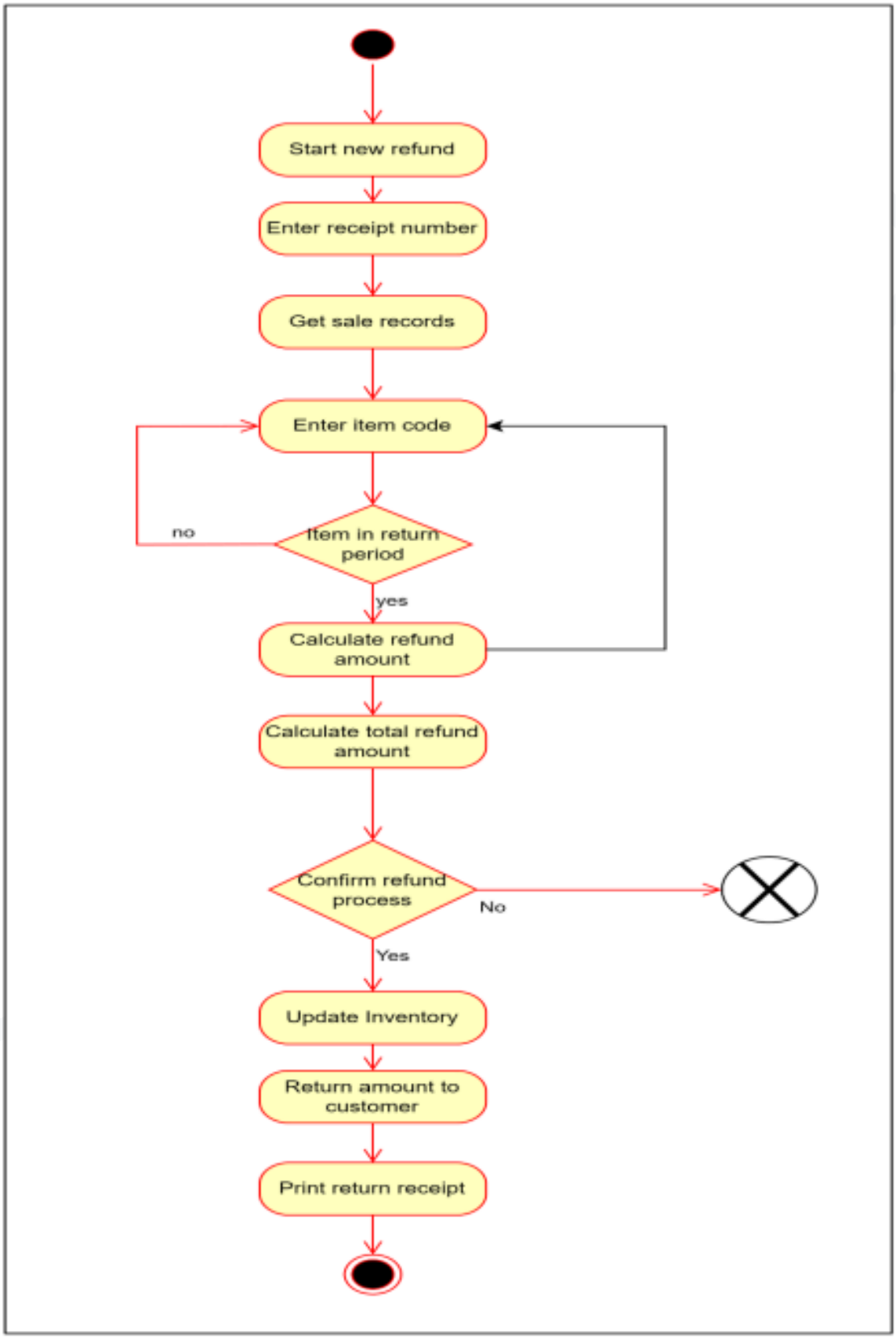
Control Objects:

1. Return Manager
2. Refund Amount Processor
3. Inventory Manager
4. Item Return Validation

SEQUENCE DIAGRAM:



ACTIVITY DIAGRAM:



CLASS DIAGRAM: