IT – 314

Software Engineering

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

Dhruvin Akhaja – 202201172

Lab Group : 2

Team ID : 12

Point of Sale (POS) System Analysis

Introduction :

A Point of Sale (POS) system is a crucial component in retail and service industries, facilitating transactions between businesses and customers. This document analyzes the key functionalities of a modern POS system, focusing on two primary use cases: **Processing a Sale** and **Handling Returns**.

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

Use Case 1: “Process Sale”

Actor

- Cashier

Preconditions

- POS system is operational and ready for use
- Cashier is authenticated and logged into the system

Postconditions

- Sale is recorded in the system
- Inventory is updated to reflect the sale
- Customer receives a receipt for the transaction

Basic Flow

1. Customer brings items to the checkout counter
2. Cashier initiates a new sale in the POS system

3. For each item: a. Cashier scans the item's barcode b. System retrieves item details (name, price) from the database c. System adds the item to the current transaction
4. System calculates and displays the total amount due
5. Cashier informs the customer of the total
6. Customer selects a payment method (cash, credit card, or mobile payment)
7. Cashier processes the payment through the system
8. System records the sale and updates inventory
9. System generates a receipt
10. Cashier provides the receipt and purchased items to the customer

Alternative Flows

3b. Manual Entry: If an item's barcode is unreadable, the cashier manually enters the item's SKU or looks it up in the system.

5a. Apply Discount:

->Customer presents a coupon or discount code
->Cashier applies the discount to the transaction
->System recalculates the total amount due

6a. Payment Declined:

->If the chosen payment method is declined
->Cashier informs the customer
->Customer chooses an alternative payment method or cancels items

7a. Transaction Cancellation:

->At any point before finalizing, the customer may choose to cancel the transaction
->Cashier initiates cancellation in the POS system
->System voids the transaction and reverts any inventory changes

Use Case 2: “Handle Return”

Actor

- Cashier

Preconditions

- POS system is operational and ready for use
- Cashier is authenticated and logged into the system
- Customer has items to return and the original purchase receipt

Postconditions

- Return is processed and recorded in the system
- Inventory is updated to reflect the returned items
- Customer receives a refund and a return receipt

Basic Flow

1. Customer approaches the counter with items to return and the original receipt
2. Cashier initiates a new return transaction in the POS system
3. Cashier scans the items being returned
4. System verifies the return eligibility (e.g., within return period, item condition)
5. System calculates the refund amount
6. Cashier confirms the reason for the return with the customer
7. System updates the inventory to reflect the returned items
8. Cashier processes the refund using the original payment method
9. System records the return transaction
10. System generates a return receipt
11. Cashier provides the return receipt to the customer

Alternative Flows

3a. If the scanner is not available then manually enters the details of the items into the system.

4a. Item Ineligible for Return:

->System notifies the cashier that an item is not eligible for return
->Cashier informs the customer of the issue
->Customer decides whether to proceed with eligible items or cancel the return

7a. Damaged or Used Item:

->Cashier inspects the item and notes any damage or signs of use
->System applies a restocking fee or adjusted refund amount
->Cashier informs the customer of the adjusted refund
->Customer decides whether to proceed with the return

8a. Original Payment Method Unavailable:

->If the original payment method is not available for refund
->Cashier selects an alternative refund method (e.g., store credit)
->System processes the refund using the alternative method

-> Identify Entity/Boundary Control Objects :

Object Identification

Entity Objects

1. Cashier: Represents the employee operating the POS
2. Invoice: receipt that ensures payment successfulness
3. Discount: Represents various types of discounts or coupons

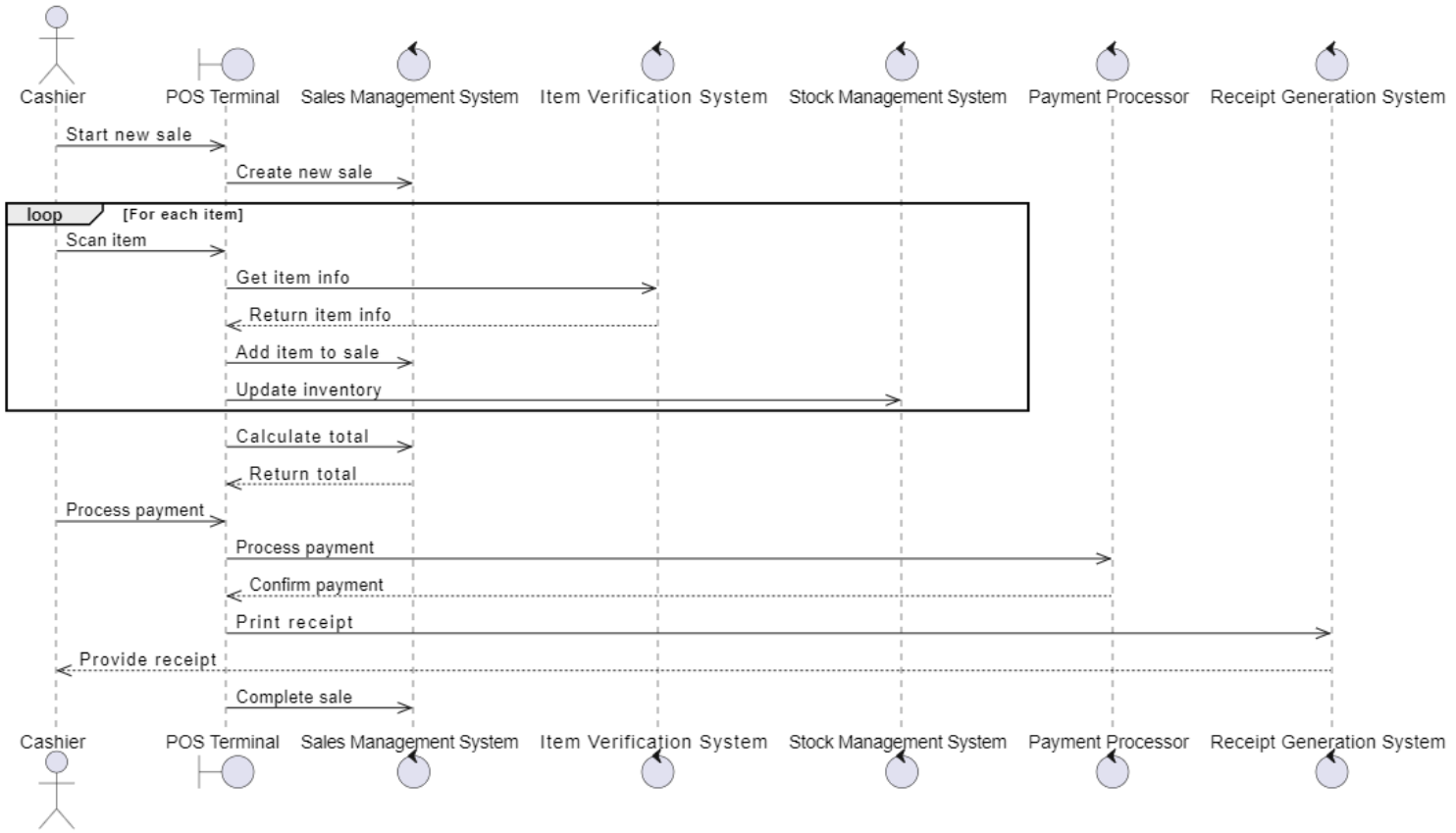
Boundary Objects

1. POSTerminal: The main interface for the cashier
2. BarcodeScanner: Device for reading product barcodes
3. PaymentTerminal: Processes various payment methods

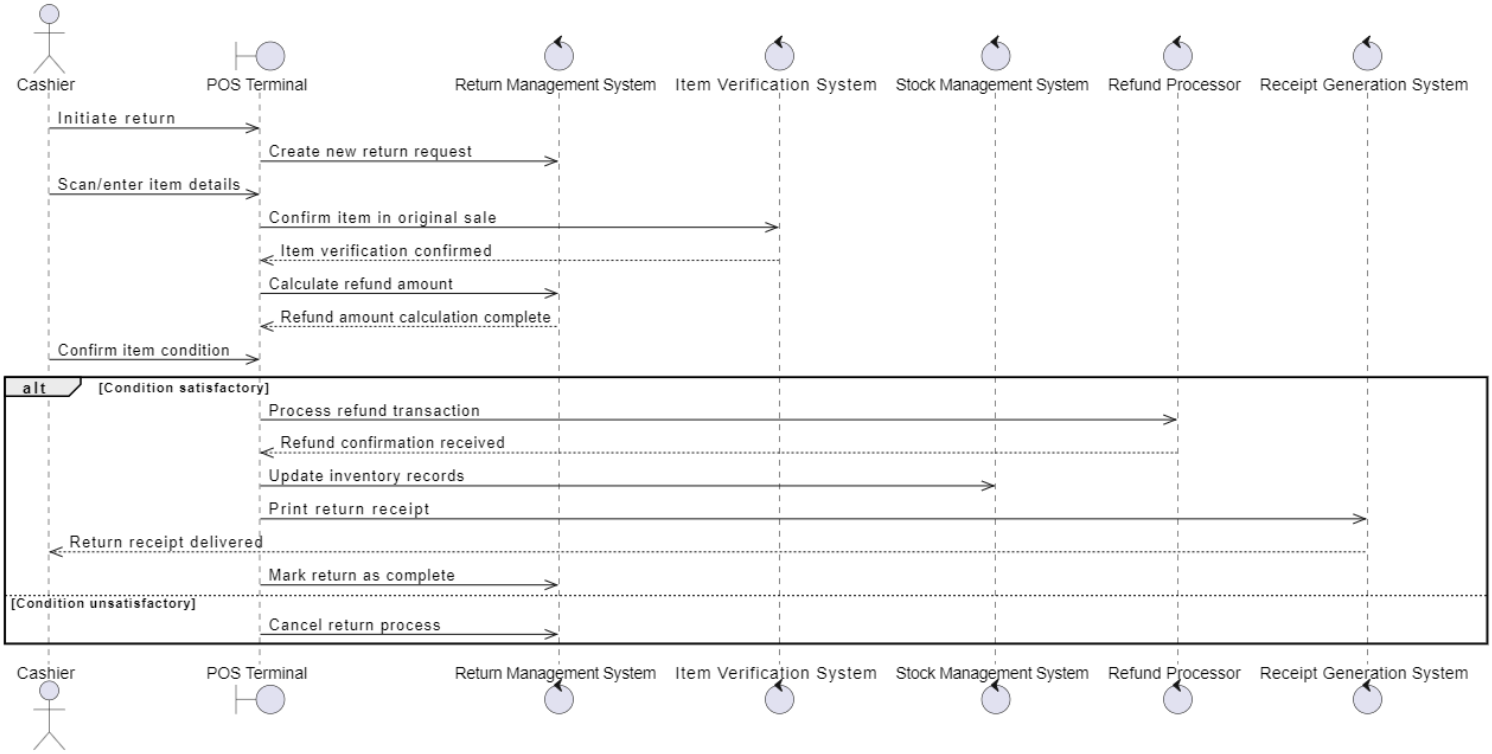
Control Objects

1. Sales Management System : Coordinates the sale process
2. Return Management System : Coordinates the Return process
3. Stock Management System: Manages inventory updates
4. Payment Processor: Handles payment transactions
5. Item Verification System : Manages product information
6. Receipt Generator System : Generates sales and inventory reports

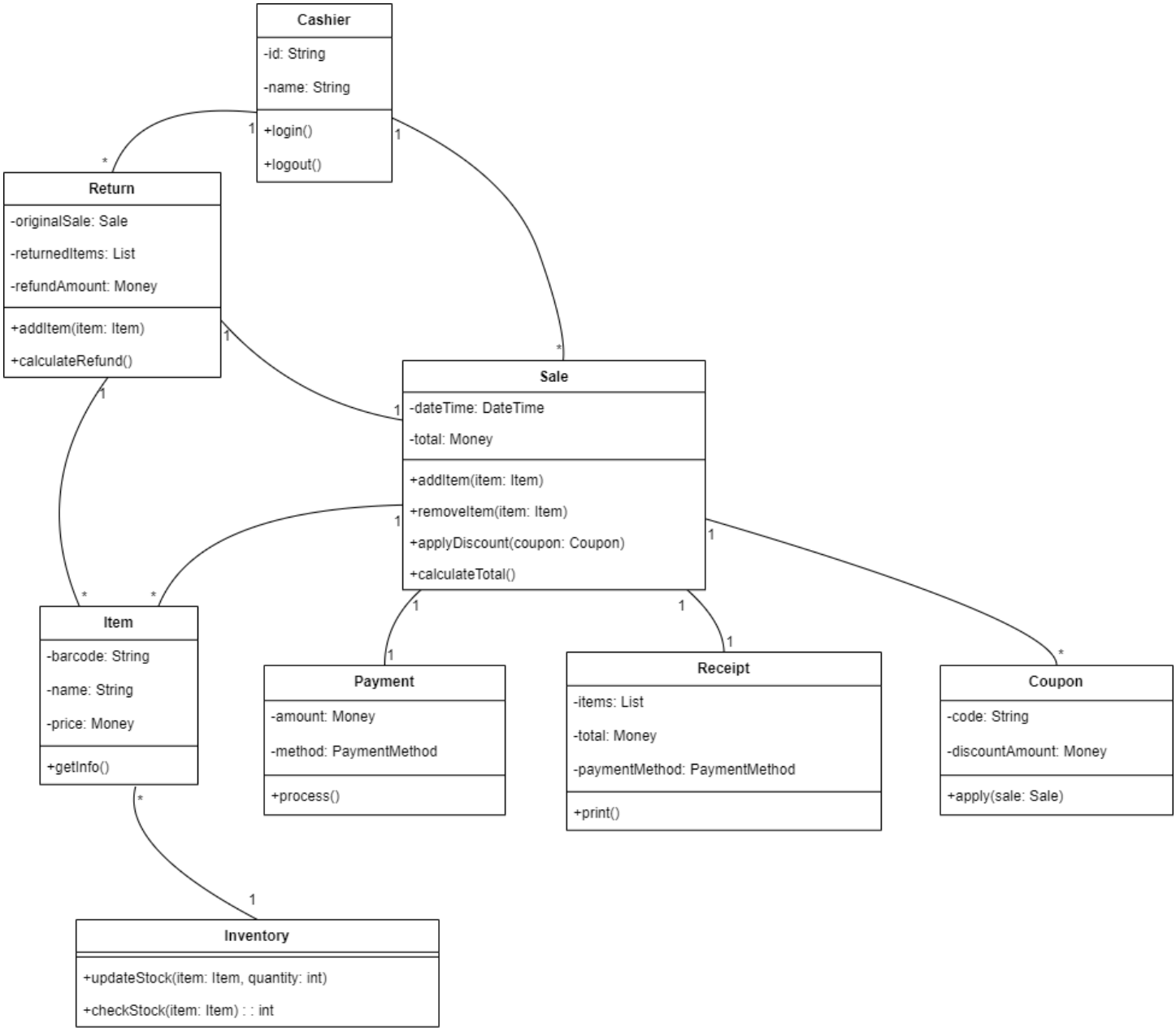
-> Develop Sequence Diagram : (For “Process Sale”)



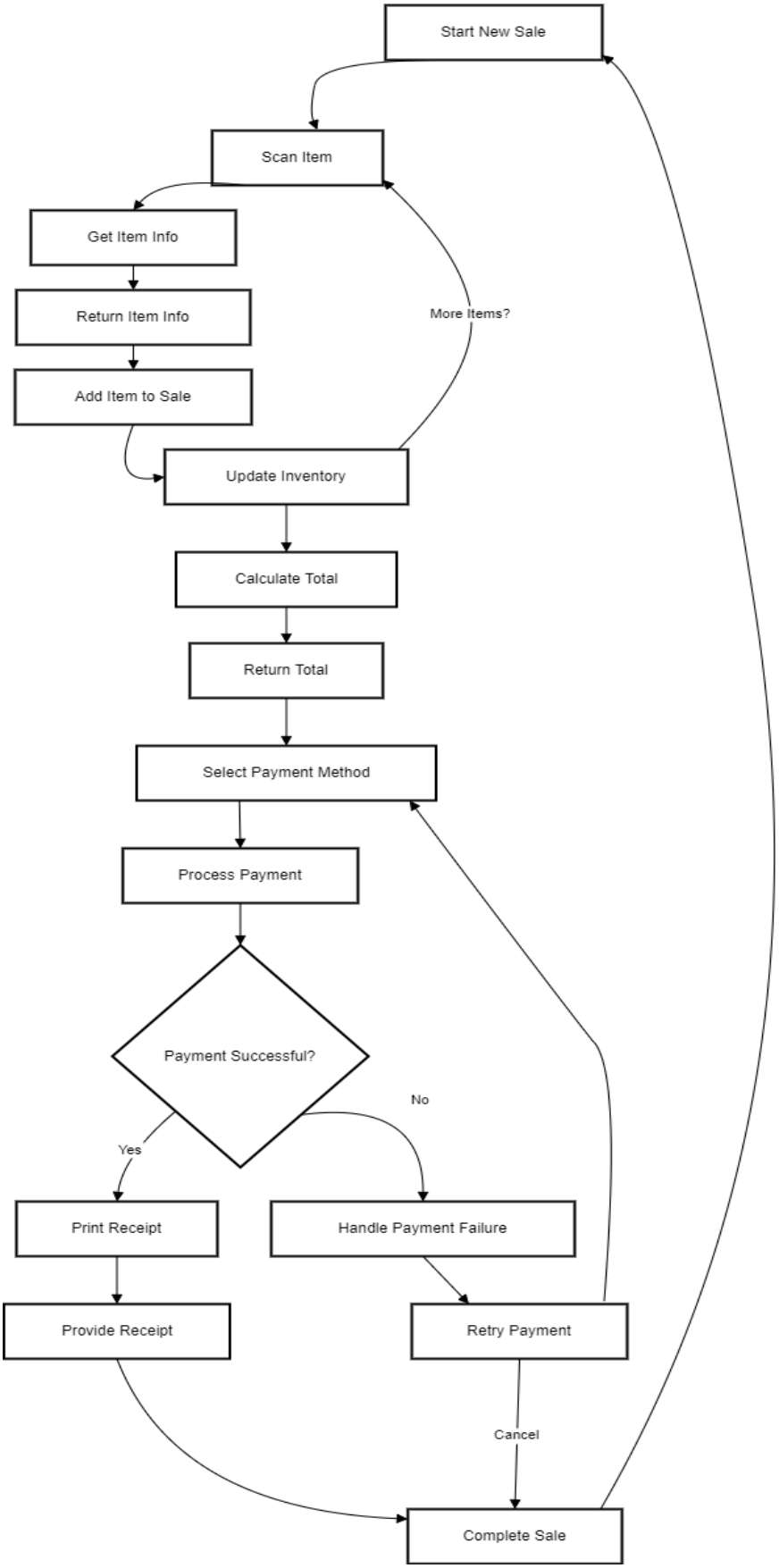
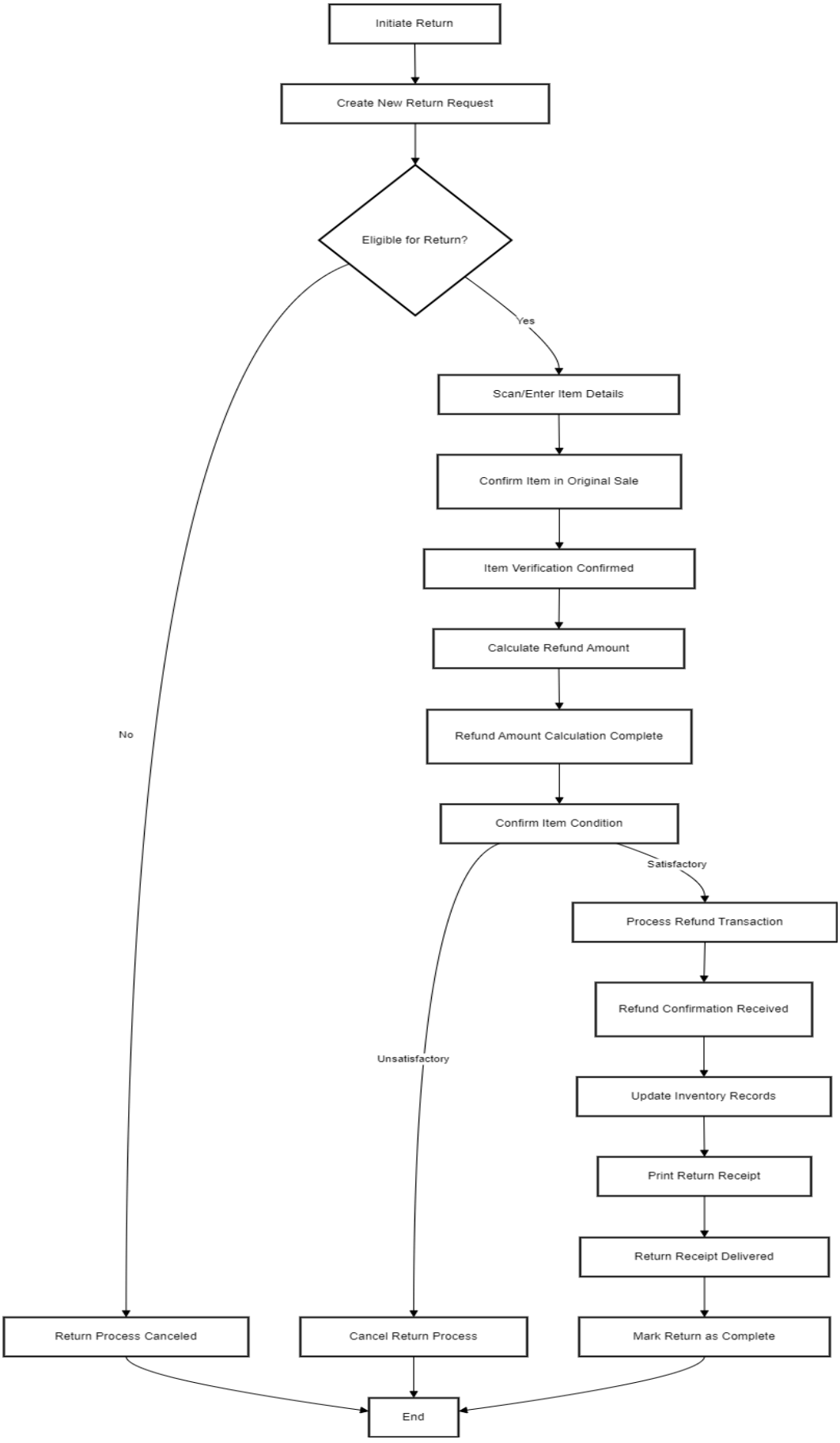
-> Develop Sequence Diagram : (For "Handle Return")



-> Develop Analysis Domain Models :



-> Develop activity diagram : (for "Process Sale")



-> Develop activity diagram : (for "Handle Return")