

IT314 - Software Engineering

Zeel Danani (202201507)

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

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

"Process Sale" Use Case

Use Case: Process Sale

Actors: Cashier, Customer, Inventory System, Catalog System, Payment Systems (Cash, Credit Card)

Preconditions:

- The cashier is logged into the POS system.
- The POS system is working, connected to the inventory, catalog, and payment systems.

Basic Flow:

- The cashier initiates a new sale transaction.
- The cashier scans the barcode of each item the customer wishes to purchase.
- The POS system retrieves the name and price of each item from the catalog system.
- The POS system interacts with the inventory system to update stock levels based on the items scanned.
- The cashier confirms the items and the system calculates the total price, including taxes and discounts.
- The customer selects a payment method (cash, credit card, or check).
- The cashier processes the payment through the appropriate payment system.
- Upon successful payment, the POS system prints a receipt.
- The cashier provides the receipt to the customer, completing the transaction.

Postconditions:

- The sale is recorded in the system.
- The inventory is updated to reflect the sold items.
- A receipt is generated and given to the customer.

Alternate Flows:

5a. If the customer presents a gift coupon, the cashier processes it, and the POS system applies the corresponding discount.

6a. If the payment method fails (e.g., card declined), the cashier asks the customer to choose a different payment method.

7a. If the system detects an out-of-stock item after scanning, the cashier notifies the customer and removes the item from the sale.

"Handle Return" Use Case

Use Case: Handle Return

Actors: Cashier, Customer, Inventory System

Preconditions:

The cashier is logged into the POS system.

The customer has the item to be returned and proof of purchase (e.g., a receipt).

Basic Flow:

- The customer presents the item(s) for return along with the receipt.
- The cashier initiates the return process in the POS system.
- The POS system verifies the purchase details using the receipt.
- The cashier confirms the return, and the system updates the inventory to reflect the returned items.
- The POS system calculates the refund amount according to store policy.
- The cashier processes the refund (cash, store credit, or refund to original payment method).
- The POS system prints a return receipt, which the cashier gives to the customer.

Postconditions:

- The return is recorded in the system.
- The inventory is updated to reflect the returned items.
- A return receipt is generated and given to the customer.

Alternate Flows:

3a. If the item is not found in the purchase history, The cashier can manually override the system to process the return if authorized.

5a. If the item is returned outside the allowed return period, the cashier may offer store credit instead of a cash refund, depending on store policy.

6a. If the customer does not have proof of purchase, the cashier may still process the return at a reduced refund value or issue store credit, depending on store policy.

2. Identify Entity/Boundary Control Objects

Entity Objects:

- Product
- SaleTransaction
- Payment
- Coupon
- Inventory

Boundary Objects:

- Sales Screen
- Barcode Scanner Interface
- Payment Screen
- Receipt Printer Interface
- Catalog System API
- Inventory System API

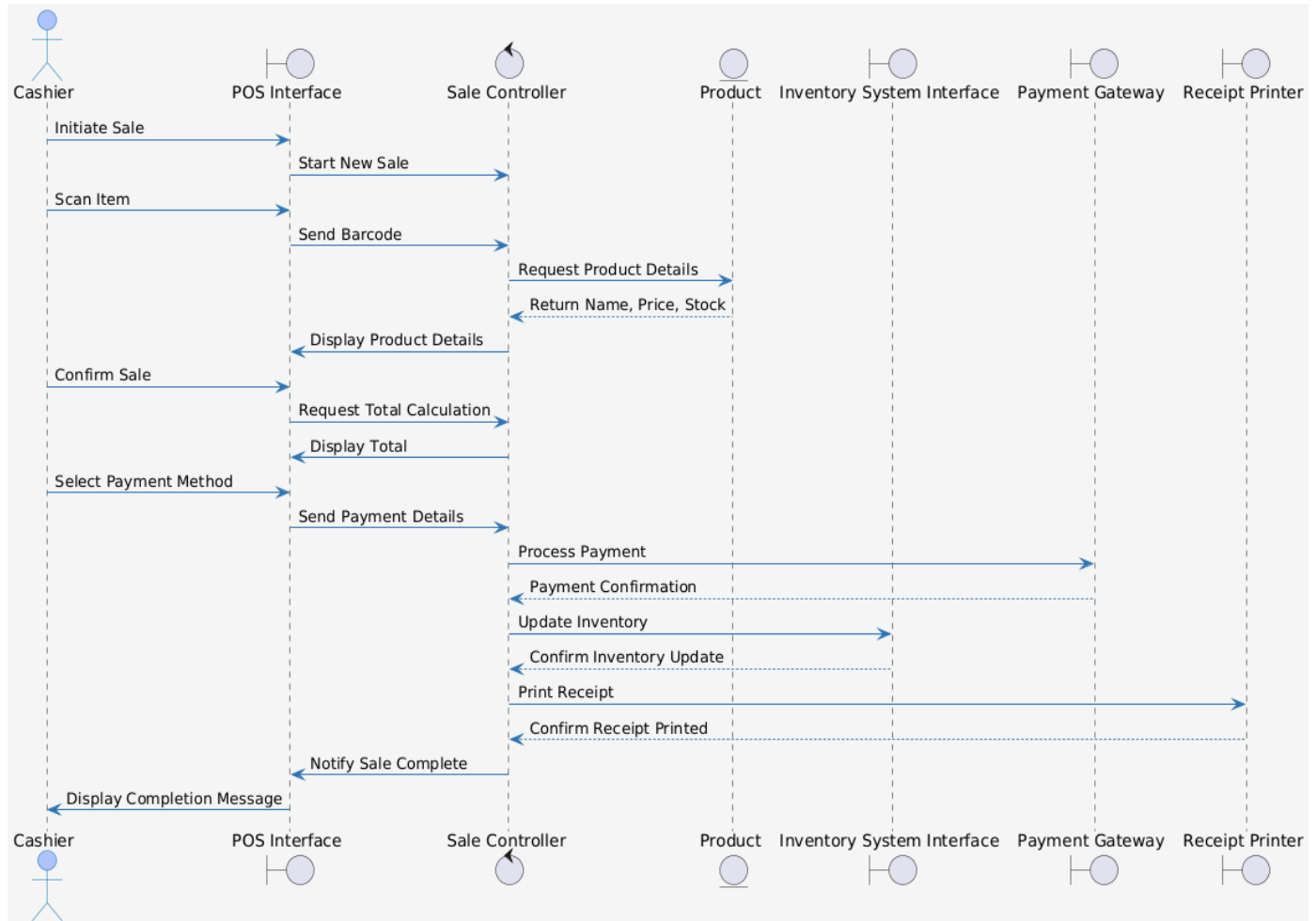
Control Objects:

- SaleController
- PaymentController
- ReceiptController

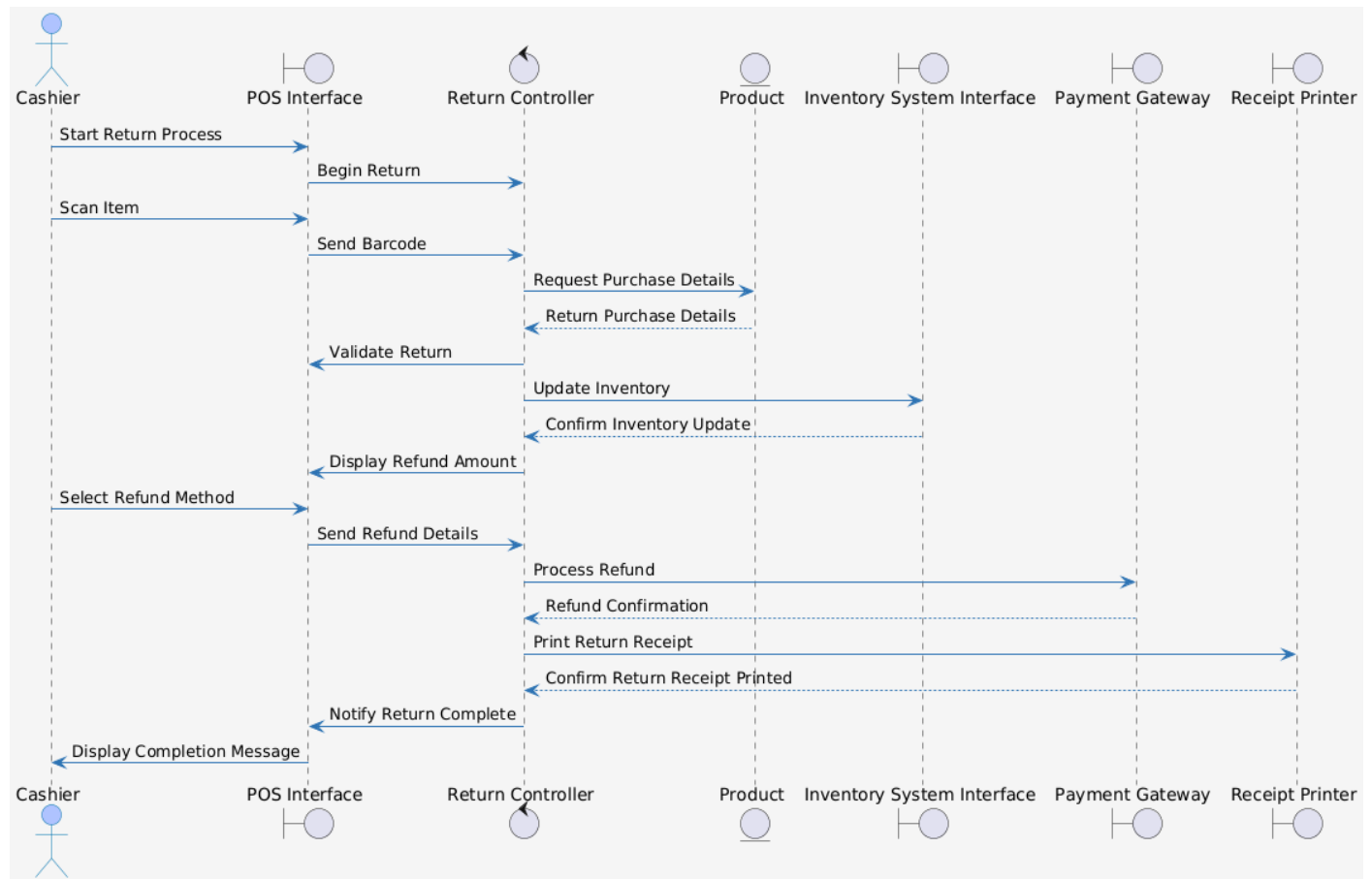
- InventoryController
- CouponController

3. Develop Sequence Diagrams

For Process Sale:

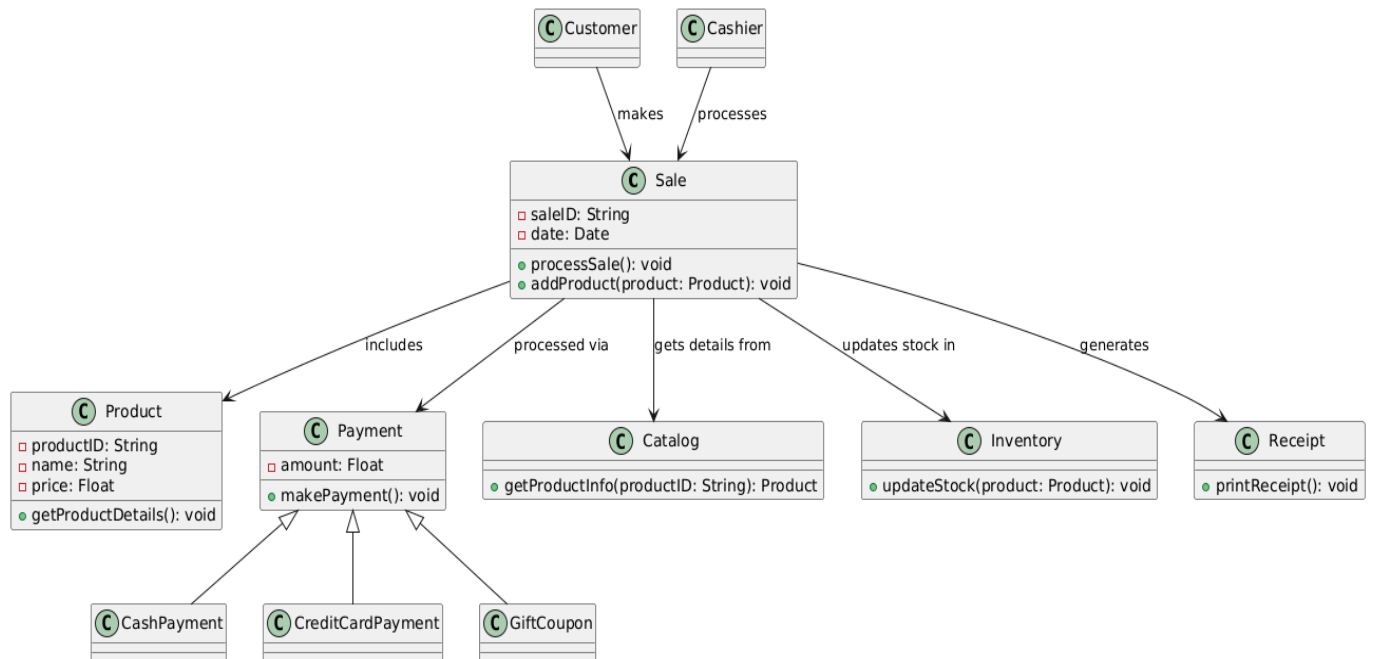


For Handle Return:

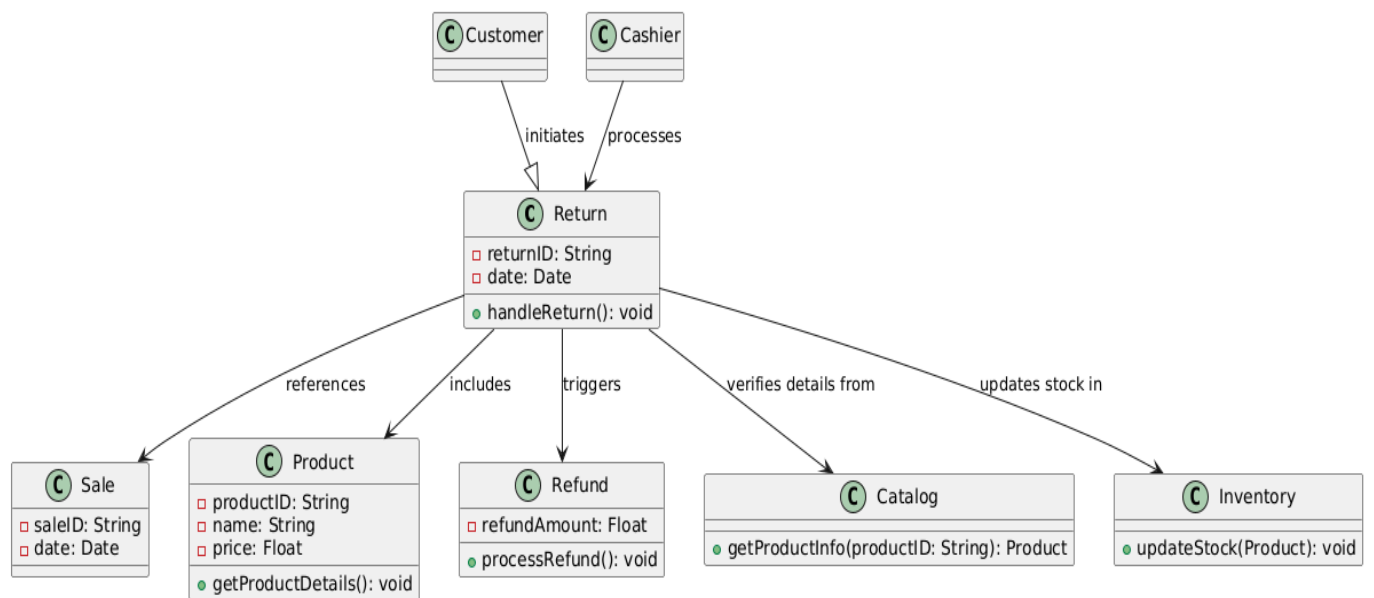


4. Develop Analysis Domain Model

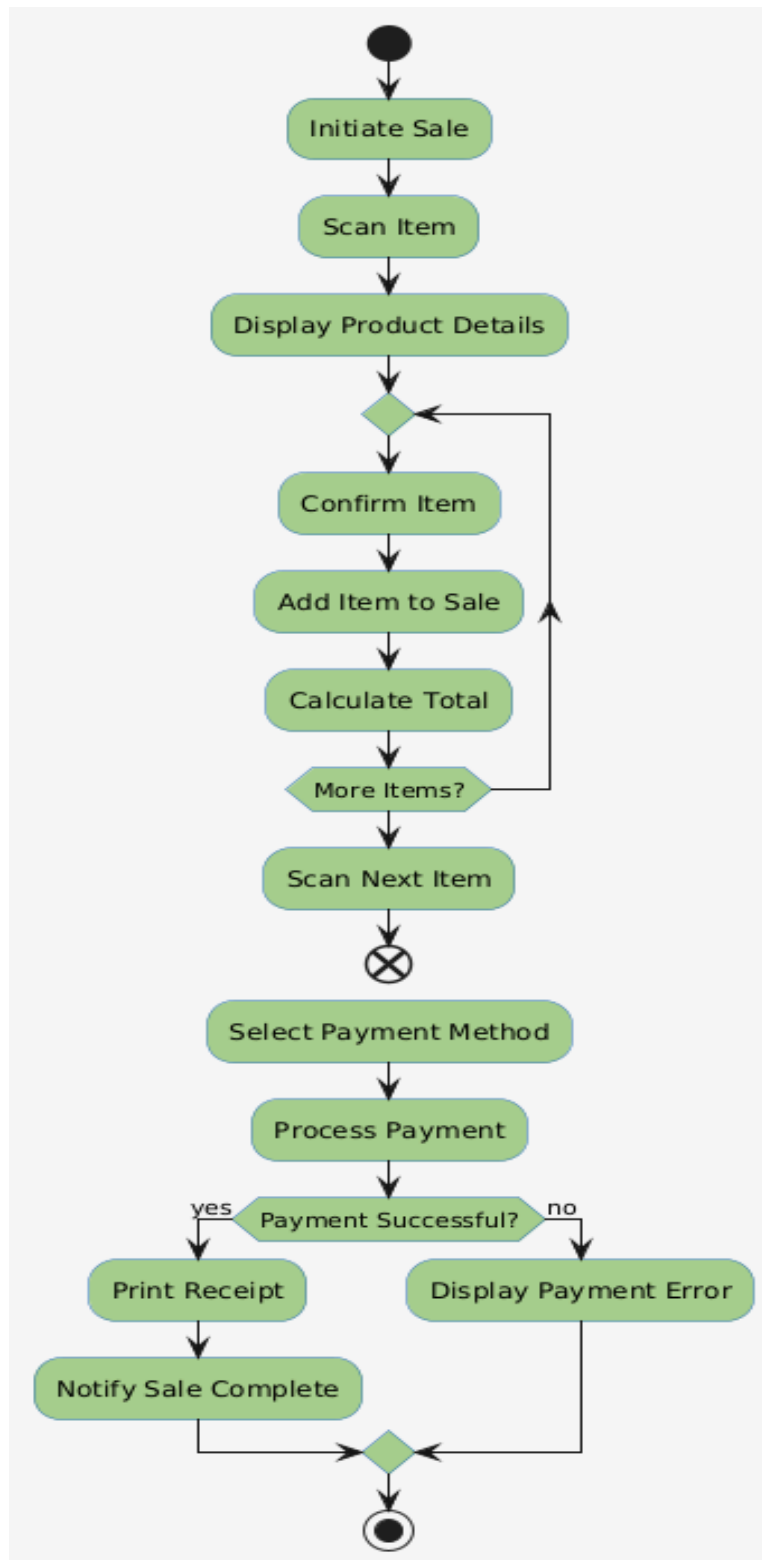
Process Sale:



Handle Return:



5. Develop activity diagram.



Handle Return:

