Software Engineering
IT-314
Lab6 - Modeling Class Diagram and Activity Diagram (Point of Sale System)

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

Use Case Name: Process Sale

Actors: Cashier

Description: This use case covers the process of handling a customer purchase transaction at a POS system. The cashier scans the items, processes the payment, and provides the customer with a receipt. The inventory is updated accordingly after the transaction is completed.

Preconditions:

- The cashier must be logged into the POS system.
- The POS system must be connected to the inventory and payment systems.

Postconditions:

- The inventory is updated with reduced stock levels for the purchased items.
- The sale transaction is recorded in the POS system.
- Receipts is generated and given to the customer.

Main Flow:.

1. The cashier initiates a new sale in the POS system.
2. The cashier scans each item's barcode.
3. The POS system retrieves item details and prices and also interacts with the inventory system to update stock levels.
4. The total amount is displayed, and the cashier requests the payment method.
5. The cashier asks the customer to select a payment method (cash, credit card, or check).
6. The payment gateway processes the payment.
7. The transaction is completed successfully.
8. The cashier gives the customer his/her goods along with the receipt generated by the POS system.

Alternate Flow:

- **Gift Coupons Applied:**
  4a. If the customer has a gift coupon, the cashier scans the coupon before payment.
  4b. The system applies the coupon to reduce the total price.
  Continue with step 5.

Exception:

- **Payment Declined:**
  6a. If the payment is declined, the system alerts the cashier.
  6b. The cashier asks the customer for an alternative payment method.
  Return to step 5.

2. Handle Return

Use Case Name: Handle Return

Actors: Cashier

Description:
This use case tells us how a cashier handles the return of items previously purchased by a customer. The cashier retrieves the original sale, verifies the items, and processes the return. The inventory is updated, and a refund is issued to the customer.

Preconditions:

- The cashier must be logged into the POS system.
- The customer must have a valid receipt of the product he purchased.

Postconditions:

- The inventory is updated with the returned items.
- The return transaction is recorded in the POS system.
- The refund is processed and returned to the customer via the chosen method.

Main Flow:

1. The customer asks the cashier for a return presenting the item and a receipt.
2. The cashier locates the original sale in the POS system.
3. The cashier verifies that the items are eligible for return.
4. The cashier checks the price of items returned by the system.
5. The cashier confirms the return, and the POS system updates the inventory.
6. The customer selects the refund method (cash or store credit).
7. The payment gateway processes the refund.
8. The system generates a return receipt, and the cashier provides it to the customer.

Alternate Flow:

1a. If the customer doesn't have a receipt, the cashier can look up the original sale by other means (e.g., customer account or transaction date).
Continue with step 2.

2a. If the record is not found the cashier tells the customer that the item cannot be returned because the item has not been sold from the store.

Exception:

- **Item Ineligible for Return:**
  3a. If the items do not meet the return criteria (e.g., past return window or damaged goods), the system alerts the cashier.
  3b. The cashier informs the customer that the return cannot be processed.
  3c. The return process is aborted.

Extend:

- Exchange item for an another item

Task-2: Identify Entity/Boundary Control Objects

Entity Objects:

1. Inventory
2. Customer
3. Cashier
4. Receipt
5. GiftCoupon

Boundary Objects:

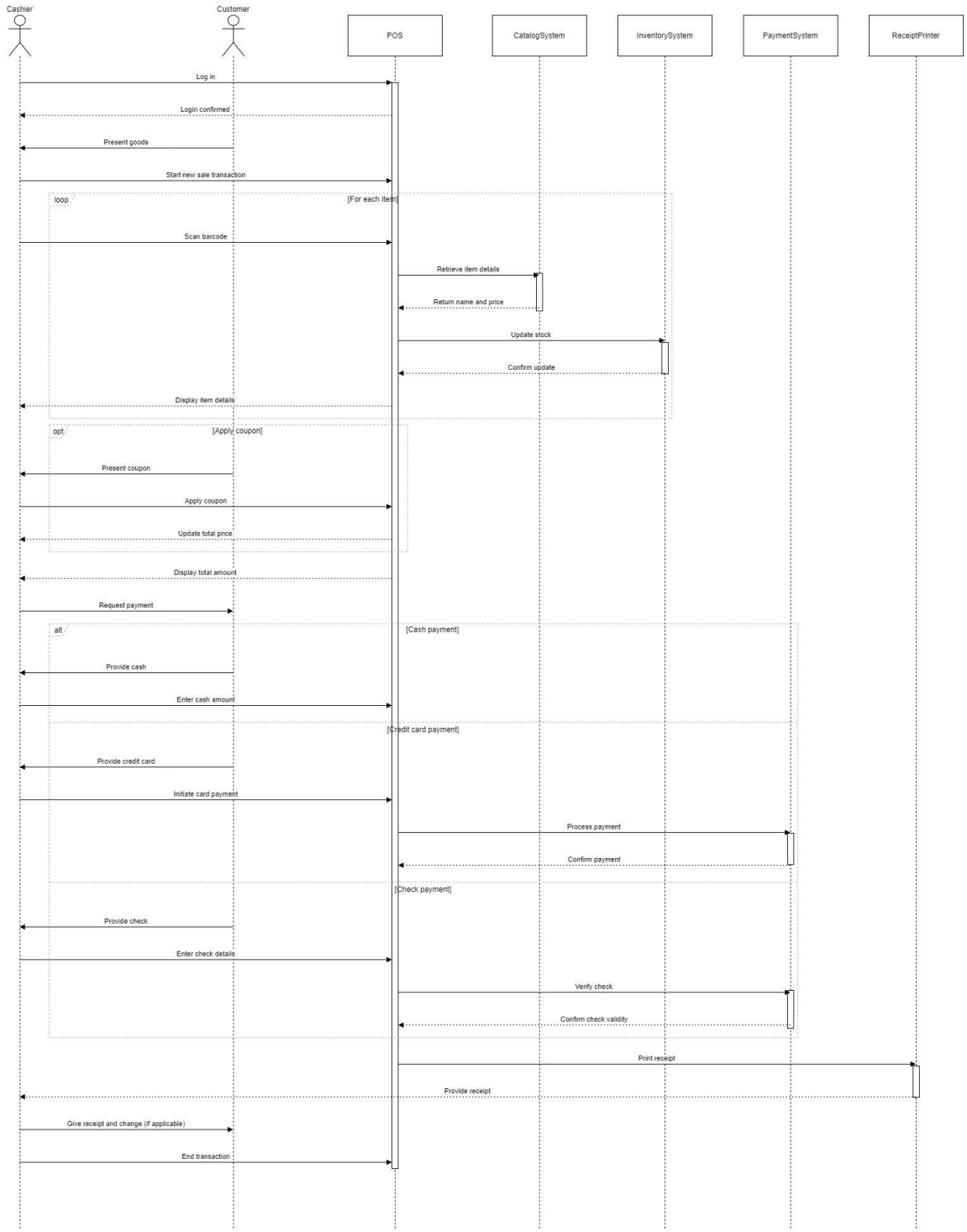
1. POS Interface
2. BarcodeScanner
3. PaymentTerminal
4. ReceiptPrinter
5. Admin Interface

Control Objects:

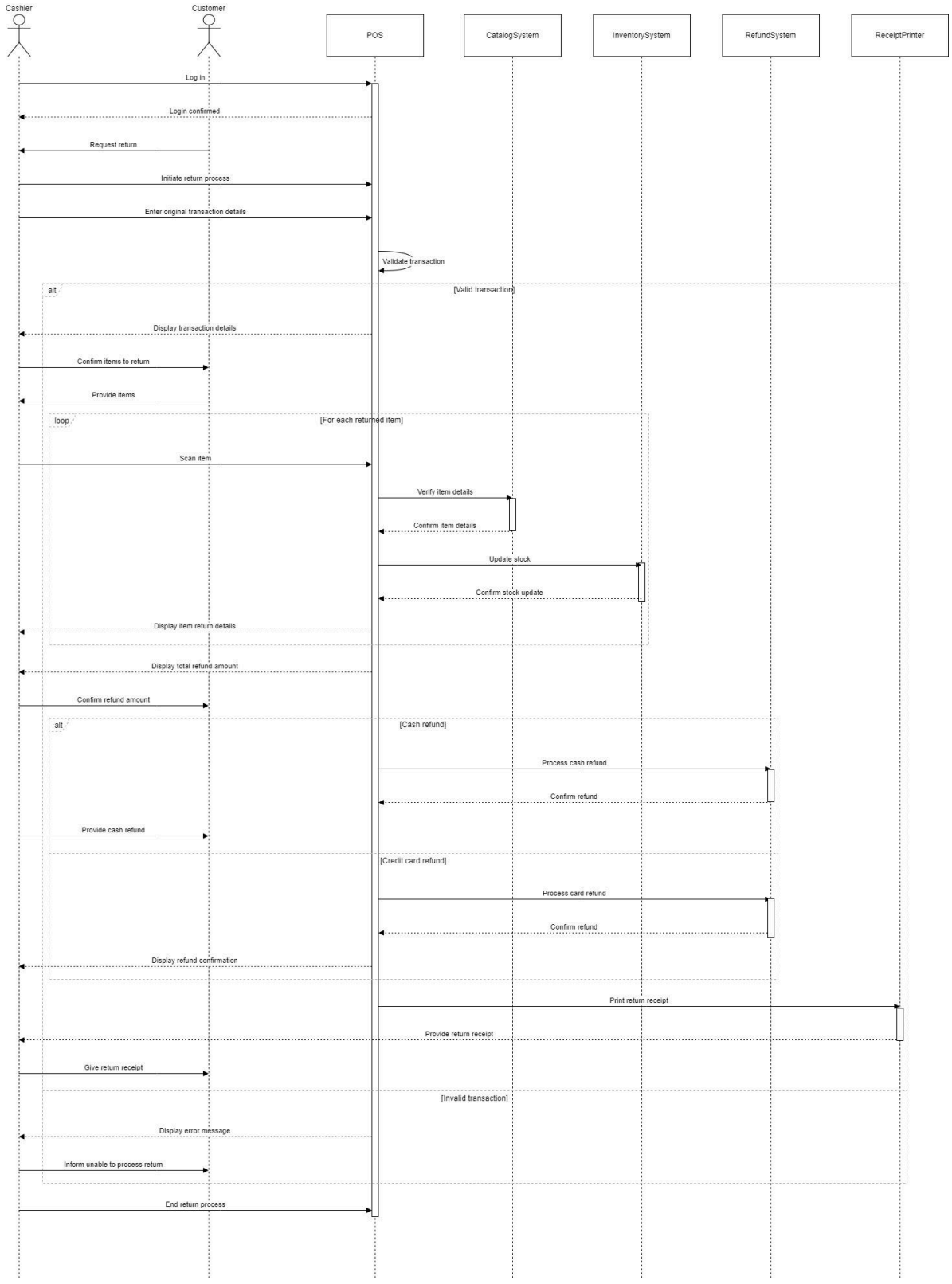
- SaleController
- ReturnController
- InventoryController
- PaymentController

Task-3 : Develop Sequence Diagrams

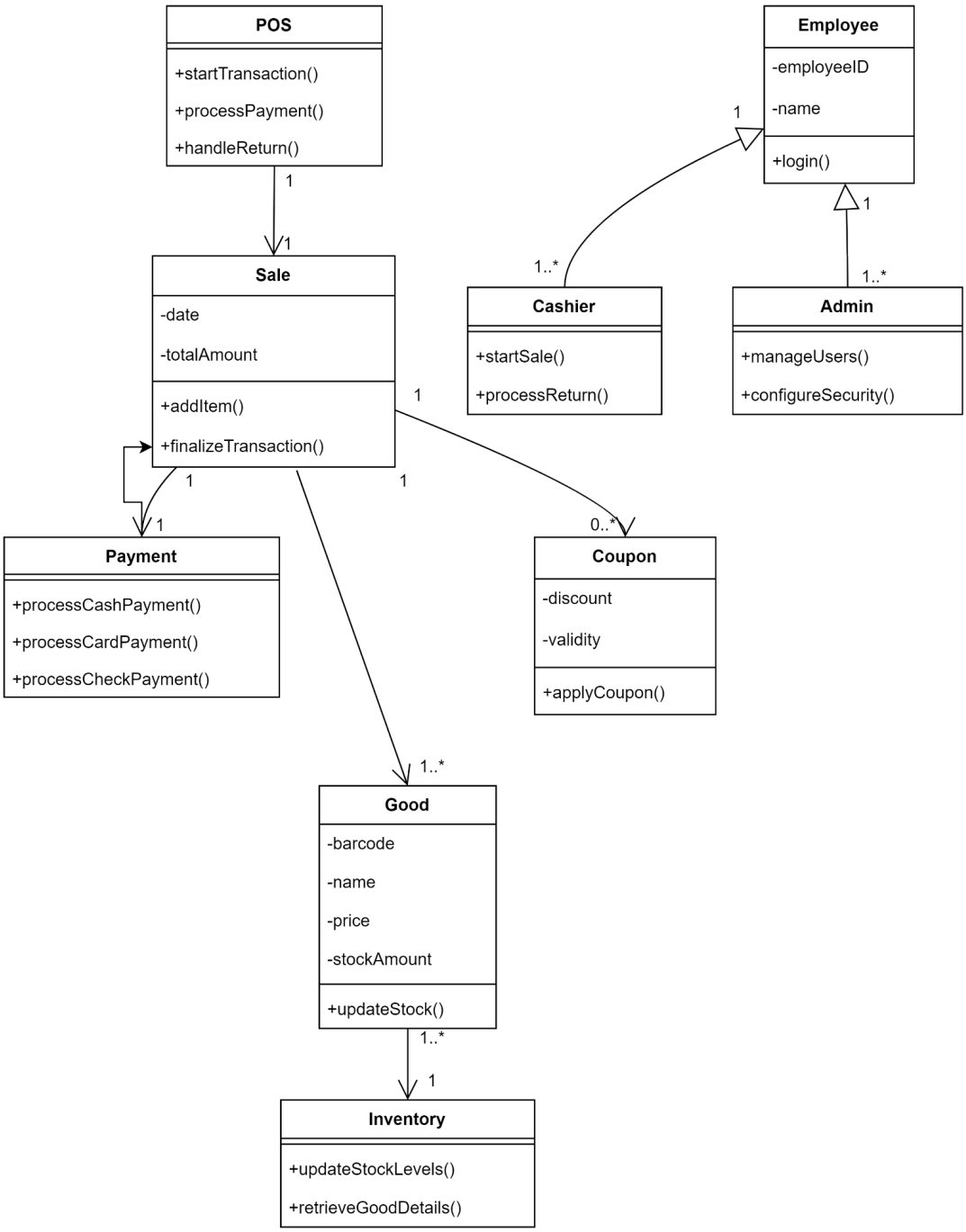
Process Sale:



Handle Return:

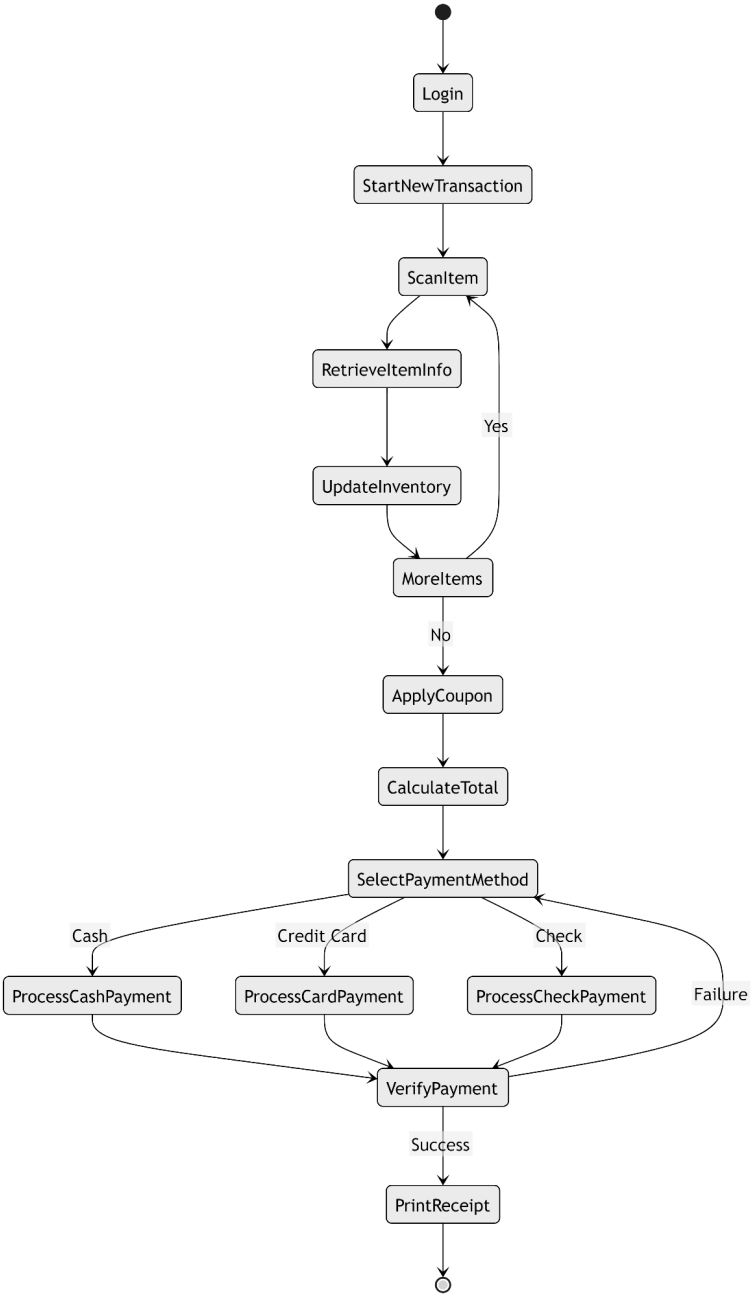


Task-4: Develop Analysis Domain Models(Class Diagram)



Task-5 : Develop activity diagram for "Process Sale" and "Handle Return" use cases.

Process Sale:



Handle Return: