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IT314 : Lab - 6

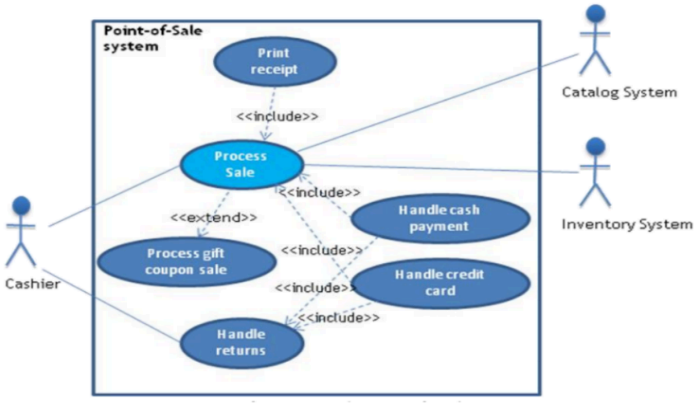
Problem Description

A POS (Point-Of-Sale) system is a computer system typically used to manage the sales in retail stores. It includes hardware components such as a computer, a bar code scanner, a printer and also software to manage the operation of the store.

The most basic function of a POS system is to handle sales. When a customer arrives at a POS counter with goods to purchase, the cashier will start a new sale transaction. When the barcode of a good is read by the POS system, it will retrieve the name and price of this good from the backend catalog system and interact with the inventory system to deduce the stock amount of this good. When the sale transaction is over, the customer can pay in cash, credit card or even check. After the payment is successful, a receipt will be printed. Note that for promotion, the store frequently issues gift coupons. The customer can use the coupons for a better price when purchasing goods.

Another function of a POS system is to handle returns.... [The details of which are not given here]

A user must log in to use the POS. The users of a POS system are the employees of the store including cashiers and the administrator. The administrator can access the system management functions of the POS system including user management and security configuration that cashiers can’t do.



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

1. Process Sale Use Case

- **Primary Actor:** Cashier

- **Precondition:**

  The cashier is logged into the POS system.

- **Main Flow:**
  - The cashier initiates a new sale.
  - The cashier scans the item(s), and the system retrieves the product information (name and price) from the Catalog System.
  - The system interacts with the Inventory System to update the stock quantity.
  - The cashier confirms the total price and initiates payment.
  - The customer chooses a payment method (cash, credit card, or coupon).
  - The system processes the payment via the appropriate method.
  - Once payment is confirmed, the system prints a receipt.

- **Postcondition:**

  The sale is successfully recorded, stock is updated, and the receipt is printed.

- **Alternate Flow:**
  - The system may process gift coupons for discounts (extends the basic flow).
  - The payment can be split across multiple methods (cash + credit).

- If payment fails, the transaction is canceled, and items are not removed from inventory.

Handle Return Use Case

- **Primary Actor:** Cashier

- **Precondition:** The cashier is logged into the system and the customer presents an item to be returned.

- **Main Flow:**
  - The cashier starts the return process.
  - The cashier scans the product, and the system retrieves sale information.
  - The system verifies the purchase record.
  - The system updates the inventory, adding the returned item back to stock.
  - The system processes the return payment (either refund or store credit).
  - The system prints a return receipt.

- **Postcondition:** The return is successfully recorded, inventory is updated, and the customer receives a refund/store credit.

- **Alternate Flow:**
  - If no purchase record is found, the return cannot be processed.
  - In case of a partial return, the system calculates the refund accordingly.

Identify Entity/Boundary Control Objects

Entity Objects:

- **Product:** Represents the items for sale.
- **SaleTransaction:** Represents an ongoing or completed sale.
- **Payment:** Represents payment details (method, amount).

- **Customer:** Represents the person purchasing goods.
- **Receipt:** Document of the completed transaction.

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SaleTransaction	Represents an ongoing or completed sale.
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Boundary Objects:

- **Catalog System:** External system for retrieving product information.
- **Inventory System:** External system that manages stock levels.
- **POS Interface:** The screen used by the cashier to interact with the POS system.

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Inventory System	External system that manages stock levels.
POS Interface	The screen used by the cashier to interact with the POS system.

Control Objects:

- **SaleController:** Manages the overall process of a sale transaction.
- **ReturnController:** Manages the process of handling returns.
- **PaymentController:** Manages the different payment methods and their validation.

SaleController	Manages the overall process of a sale transaction.
ReturnController	Manages the process of handling returns.
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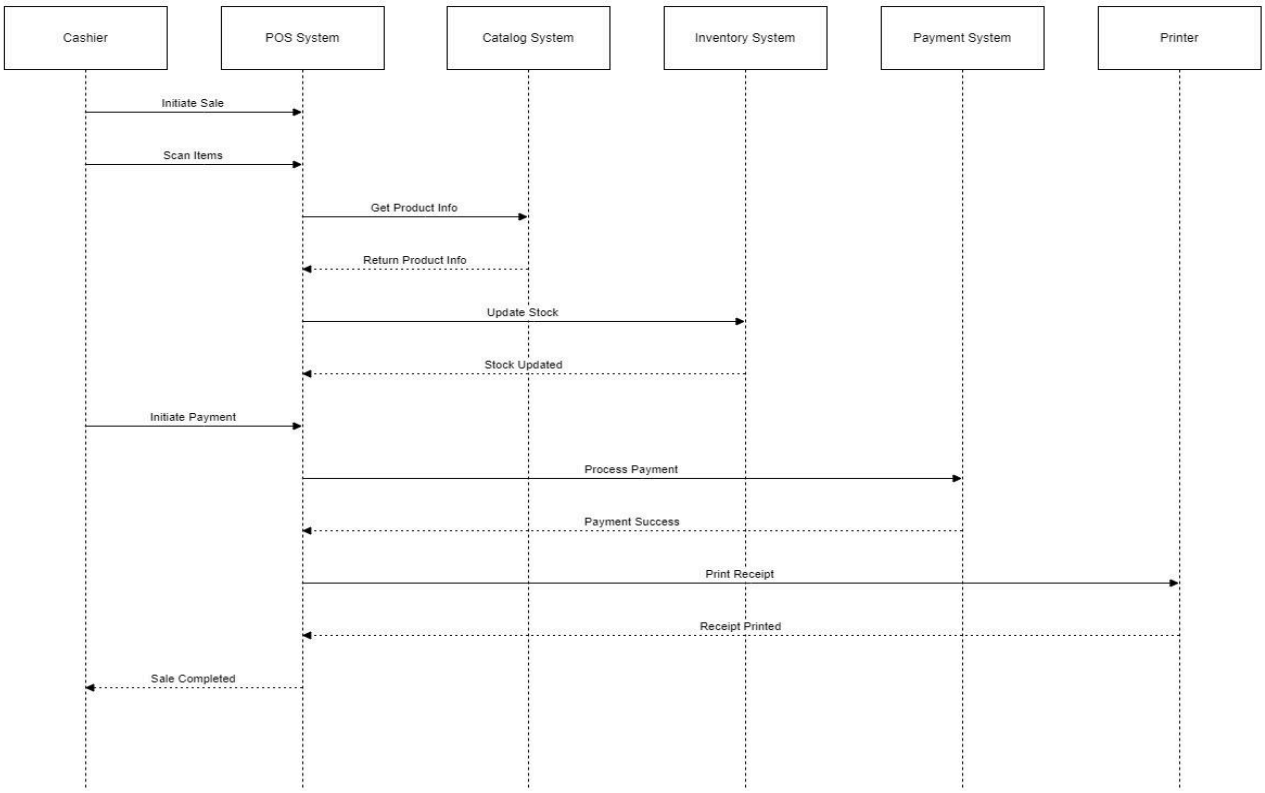
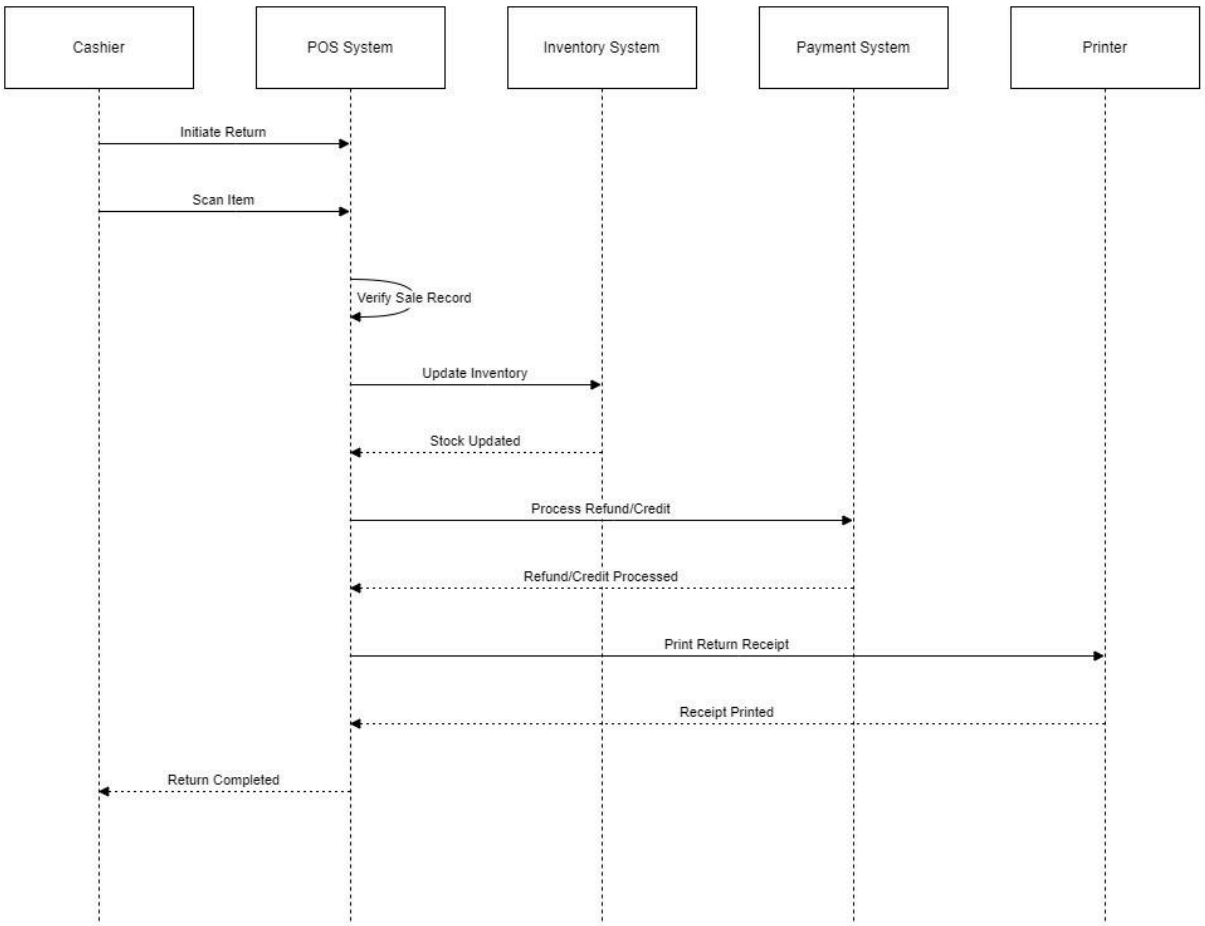
- **Develop Sequence Diagrams**

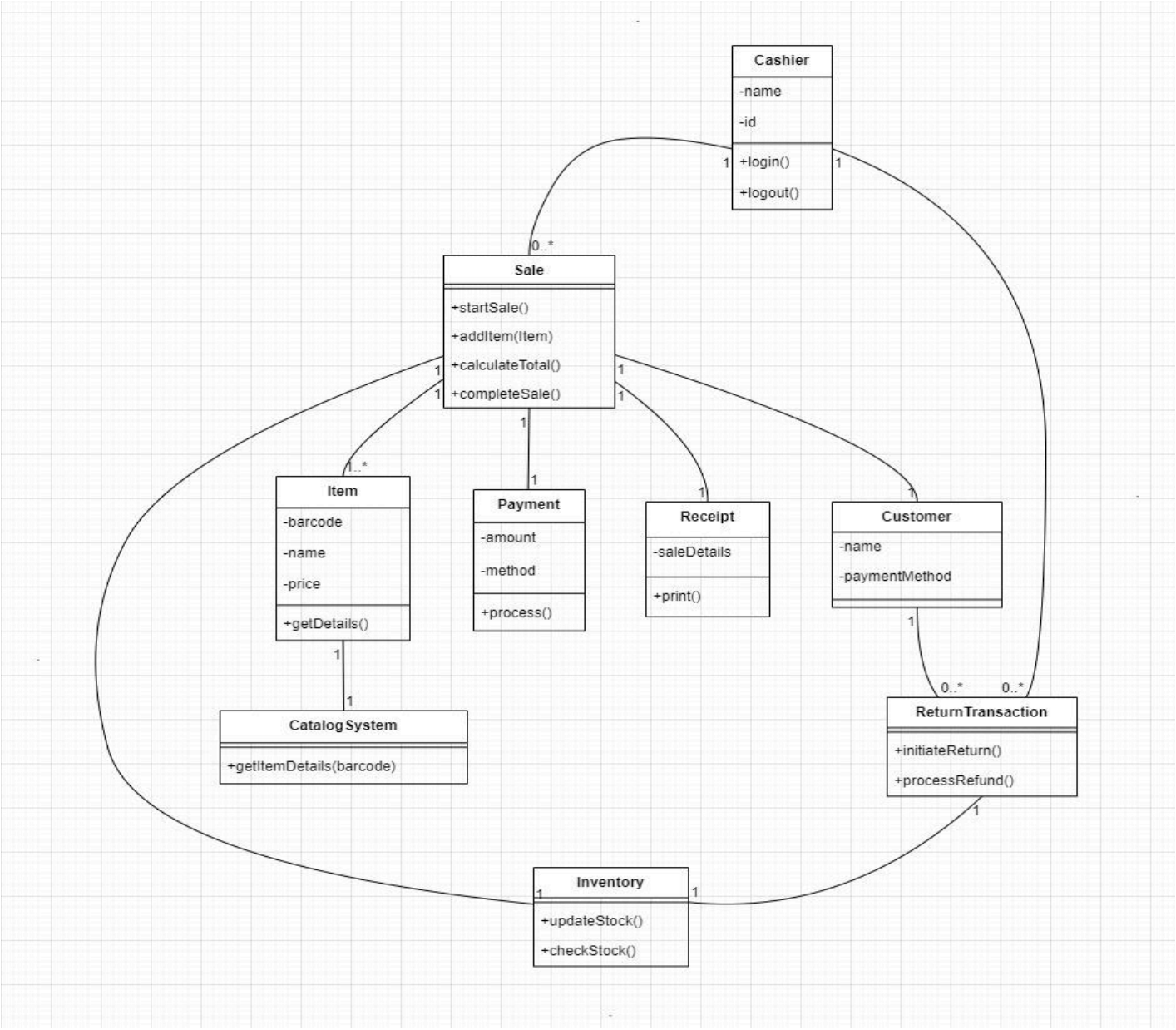
Use Case : - Process Sale



Use Case : - Handle Returns

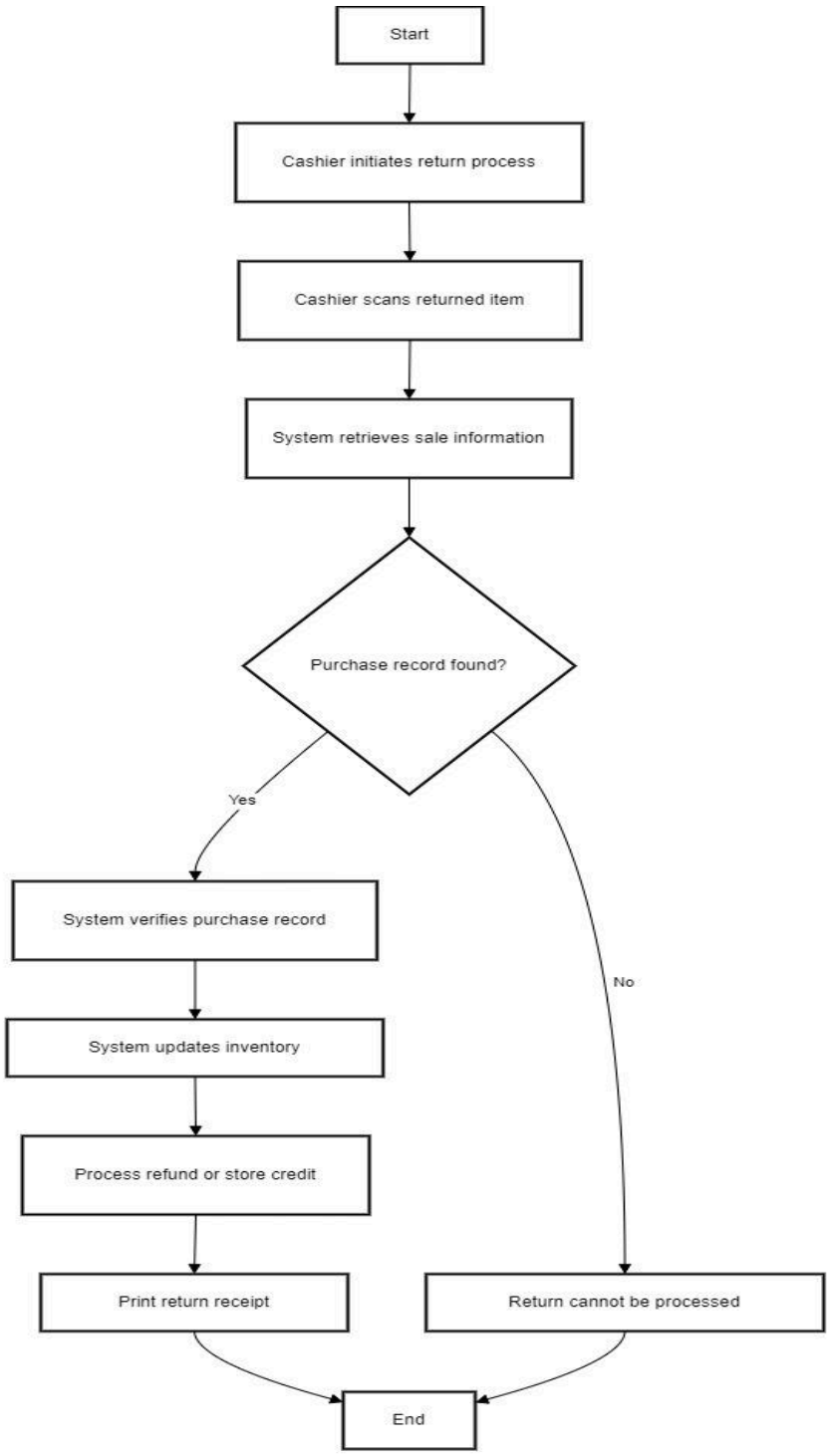


- **Develop Analysis Domain Models**



- **Develop activity diagrams for "Process Sale" and "Handle Return" use cases.**

Use Case : - Handle Return



Use Case : - Process Sale