



IT-314
SOFTWARE ENGINEERING

LAB-6
SAKSHI SHAH
202201281

Use Case: Process Sale

Actors

Primary Actor: Cashier

Secondary Actor: Customer

Preconditions

1. The POS system is operational.
2. The Cashier is logged into the POS system.

Main Success Scenario

1. The Customer arrives at the POS counter with goods to purchase.
2. The Cashier initiates a new sale transaction in the POS system.
3. For each item: a. The Cashier scans the item's barcode. b. The POS system retrieves the item's name and price from the catalog system. c. The POS system updates the inventory system, reducing the stock amount for the item. d. The POS system adds the item to the current transaction and displays its details.
4. The POS system calculates and displays the total amount due.
5. If the Customer has a gift coupon: a. The Cashier applies the coupon to the transaction. b. The POS system recalculates the total amount due.
6. The Cashier informs the Customer of the final amount due.
7. The Customer chooses a payment method (cash, credit card, or check).
8. The Cashier processes the payment: a. For cash: The Cashier enters the amount received and the POS calculates change. b. For credit card: The Customer swipes the card and the POS processes the payment. c. For check: The Cashier enters check details and the POS verifies the check.
9. The POS system records the sale and updates the inventory.
10. The POS system prints a receipt.
11. The Cashier hands over the receipt and purchased goods to the Customer.

Alternative Flows

- 3a. Invalid barcode:
 1. The POS system displays an error message.
 2. The Cashier manually enters the item details or tries scanning again.
- 5a. Invalid coupon:
 1. The POS system displays an error message.

2. The Cashier informs the Customer and continues without applying the coupon.
- 8a. Insufficient funds:
 1. The POS system displays an error message.
 2. The Cashier informs the Customer.
 3. The Customer chooses another payment method or cancels items.

Postconditions

1. The sale is recorded in the POS system.
2. The inventory is updated.
3. The payment is processed.
4. A receipt is printed.

Special Requirements

- The POS system must be able to handle multiple payment methods.
- Barcode scanning should be fast and accurate.
- The system should be able to apply various types of discounts and coupons.

Use Case: Handle Return

Actor

Primary Actor: Cashier

Secondary Actor: Customer

Preconditions

1. The POS system is operational.
2. The Cashier is logged into the POS system.
3. The Customer has a valid receipt for the item(s) to be returned.

Main Success Scenario

1. The Customer arrives at the POS counter with item(s) to return and the original receipt.
2. The Cashier initiates a new return transaction in the POS system.

3. The Cashier scans or enters the receipt number to retrieve the original sale information.
4. For each item to be returned: a. The Cashier scans the item's barcode or selects it from the original sale list. b. The POS system verifies that the item matches the original purchase. c. The Cashier inspects the item for eligibility (e.g., not damaged, within return period). d. The POS system adds the item to the return transaction.
5. The POS system calculates the total refund amount.
6. The Cashier confirms the return reason with the Customer and enters it into the system.
7. The POS system determines the refund method based on the original payment method: a. For cash purchases: The Cashier provides cash refund. b. For credit card purchases: The POS system processes a refund to the original card. c. For check purchases: The Cashier initiates a refund check process.
8. The POS system updates the inventory, increasing the stock amount for returned items.
9. The POS system prints a return receipt.
10. The Cashier provides the return receipt to the Customer along with the refund.

Alternative Flows

- 3a. Receipt not found:
 1. The Cashier informs the Customer that the receipt is required for returns.
 2. The use case ends.
- 4c. Item not eligible for return:
 1. The Cashier informs the Customer of the reason for ineligibility.
 2. The item is removed from the return transaction.
- 7a. Store credit option:
 1. The Cashier offers store credit as an alternative to cash refund.
 2. If the Customer agrees, the POS system issues store credit instead of cash.

Postconditions

1. The return is recorded in the POS system.
2. The inventory is updated to reflect the returned item(s).
3. The Customer receives a refund or store credit.
4. A return receipt is printed and provided to the Customer.

Special Requirements

- The POS system must be able to retrieve past transactions quickly.
- The system should support multiple refund methods.
- The return process should update inventory in real-time.
- The system should maintain a record of returned items and reasons for returns.

POS System: Simplified Entity, Boundary, and Control Objects

Entity Objects

1. **User**
 - Represents system users (cashiers, administrators)
 - Attributes: user ID, name, role, login credentials
2. **Product**
 - Represents items for sale
 - Attributes: product ID, name, price, barcode, stock quantity
3. **Transaction**
 - Represents a sale or return transaction
 - Attributes: transaction ID, date, type (sale/return), items, total amount, payment method
4. **Coupon**
 - Represents gift coupons for promotions
 - Attributes: coupon ID, value, expiration date

Boundary Objects

1. **POSInterface**
 - Manages the main user interface for sales, returns, and admin functions
2. **HardwareInterface**
 - Interfaces with physical devices (barcode scanner, receipt printer, payment terminal)
3. **ExternalSystemInterface**
 - Interfaces with external systems (catalog, inventory)

Control Objects

1. **AuthenticationManager**
 - Manages user authentication and authorization
2. **TransactionManager**
 - Controls the flow of sale and return transactions
 - Handles price calculations, coupon application, and inventory updates

3. **PaymentProcessor**

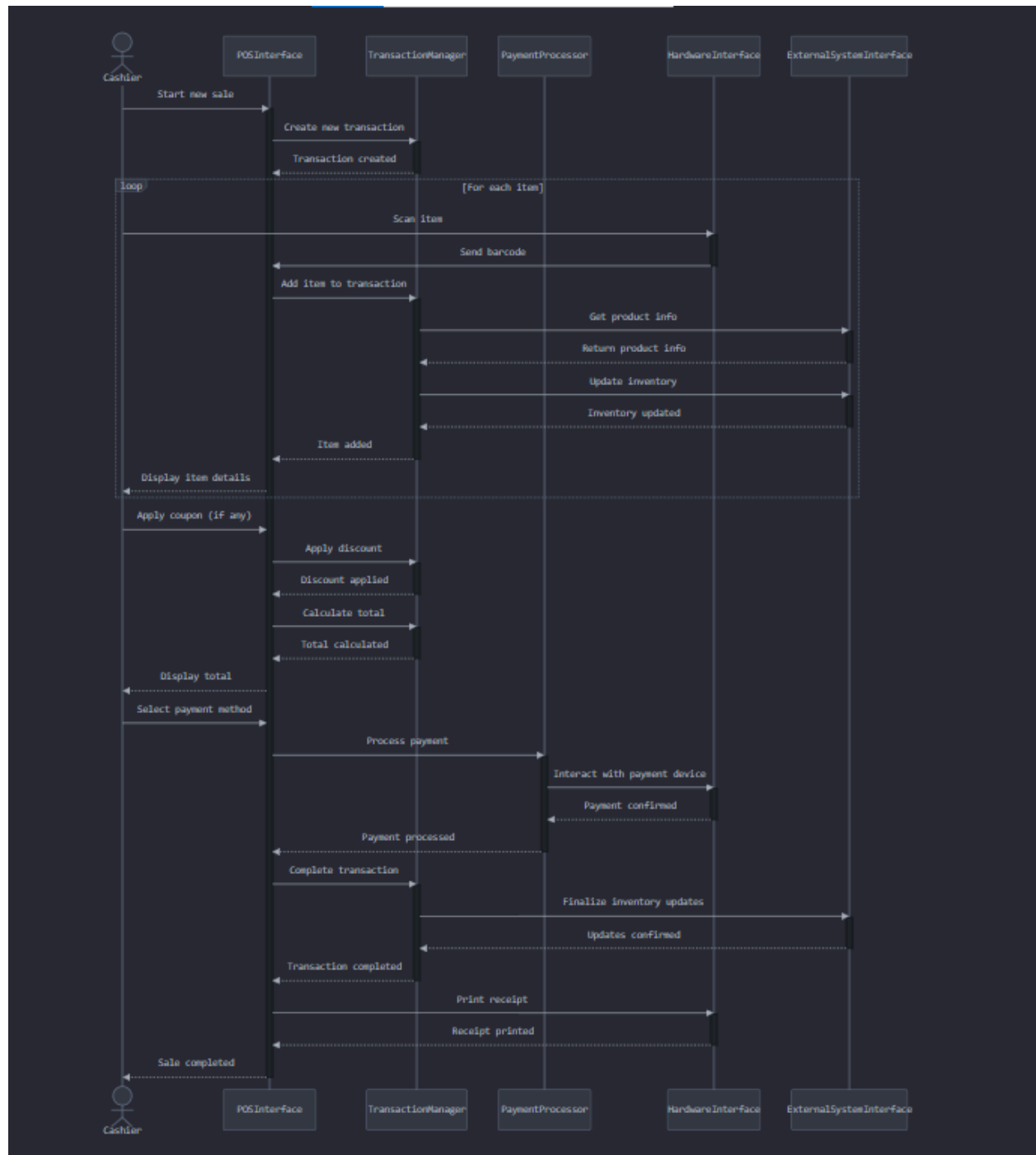
- Manages different payment methods and processes payments

4. **SystemManager**

- Handles system management operations (user management, security configuration, reporting)

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Sequence diagram for Process Sale



Sequence diagram for Handle return



Class Diagram



Activity diagram for Process Sales



Activity diagram for Handle Return

