Table of Contents

Super Shop Management System

1. Introduction

In today's rapidly evolving retail market, an efficient and well-structured management system is crucial for success. The Super Shop Management System is a console-based application written in C that simulates everyday operations in a retail store. The system integrates key functionalities such as product management, user (employee and customer) registration and login, sales processing, and administrative controls. Designed with role-based access, the system ensures that each user—whether an administrator, employee, or customer—has access to the functionalities relevant to their responsibilities. This report outlines the design, objectives, functionality, and feasibility of the system, ensuring that it meets operational demands and enhances overall efficiency.

2. Objective

The primary objectives of the Super Shop Management System are to:

- **Streamline Retail Operations:**
  Integrate product inventory management, sales processing, and user management into a single cohesive system.
- **Enhance User Experience:**
  Provide an intuitive and role-specific interface that minimizes user errors and maximizes efficiency.
- **Improve Data Accuracy:**
  Automate billing, inventory updates, and sales tracking to reduce manual errors.
- **Implement Robust Security:**
  Ensure that sensitive operations—such as admin functions and sales processing—are accessible only to authenticated and authorized users.
- **Facilitate Easy Maintenance and Scalability:**
  Use modular programming practices to allow for future enhancements and integrations.

3. Key Features

- **User Registration and Login:**
    - Separate registration processes for Employees (including Admin) and Customers.
    - Secure login functionality with input validation to prevent duplicate entries and ensure data integrity.
- **Product Management:**
    - Adding new products with details such as name, price, quantity, and discount.
    - Displaying current inventory status and detailed product information.
    - Deleting products by name and updating cumulative sales data.
- **Sales and Purchase Processing:**
    - **Employee Sales:**
      Process product sales using a global store discount (e.g., Eid discount), update stock levels, and generate detailed bills.
    - **Customer Purchases:**
      Allow customers to purchase products with product-specific discounts, update inventory accordingly, and provide purchase receipts.
- **Administrative Controls:**
    - Set a global discount applicable to employee sales.
    - Assign bonuses to employees (e.g., during special events or holidays).
    - Manage user records (employees and customers) and maintain system configurations.
- **User Feedback and Reporting:**
    - Provide detailed bills and receipts after every transaction.
    - Display current product stock and sales summaries.

---

4. Scenario Writing

4.1 Scenario-1: Employee Sells a Product

- **Description:**
  An employee logs into the system, selects a product from the inventory, enters the quantity to sell, and processes the sale. The system applies a global discount, updates the product stock, and generates a detailed bill.
- **Flow:**
  1. Employee logs in and selects “Sell a Product.”
  2. Enters the product name and quantity.
  3. System checks if sufficient quantity is available.
  4. Applies the store discount, updates total sales, and decreases available stock.
  5. Displays a bill with product details, quantity sold, discount applied, and final amount.

4.2 Scenario-2: Customer Buys a Product

- **Description:**
  A customer logs in, browses available products, selects a product, and enters the quantity for purchase. The system applies a product-specific discount, updates the inventory, and displays the bill.
- **Flow:**
  1. Customer logs in and selects “Buy a Product.”
  2. Enters the product name and desired quantity.
  3. System validates available stock and applies the product discount.
  4. Updates the inventory and records the sale.
  5. Generates and displays a receipt detailing the purchase.

4.3 Scenario-3: Registration and Login

- **Description:**
  A new user (employee or customer) registers by entering required details. Once registered, the user logs into the system using the provided credentials.

- **Flow:**
    1. User selects the registration option from the main menu.
    2. Enters personal information (name, username, password, etc.).
    3. The system verifies the uniqueness of the username and saves the details.
    4. User then selects login, enters credentials, and gains access to their respective dashboard.

4.4 Scenario-4: Admin Sets Discounts and Bonuses

- **Description:**
  An administrator logs into the system and sets a global discount applicable to sales. Additionally, the admin assigns a bonus to a specific employee.
- **Flow:**
    1. Admin logs in and accesses the administrative dashboard.
    2. Selects the “Set Eid Discount” option and enters a discount percentage.
    3. Chooses the “Set Employee Bonus” option, selects an employee by index, and inputs the bonus amount.
    4. The system confirms the updates and displays the new discount and bonus details.

---

5. Scope

The SuperShop Management System covers the following functionalities:

1. **User Registration and Login:**
    - Secure registration for Employees (and Admin) and Customers.
    - Robust authentication mechanisms to ensure secure login and logout.
2. **Product Management:**
    - Adding new products with complete details.
    - Displaying inventory with detailed product information.

- Deleting products based on user input.
- Tracking sales and updating inventory accordingly.

3. **Sales and Purchase Processing:**
    - Employee-driven sales processing with a global discount.
    - Customer purchase processing with product-specific discounts.
    - Automatic bill generation and detailed receipt printing.
4. **Administrative Controls:**
    - Setting global store discounts.
    - Assigning bonuses to employees.
    - Managing user (employee and customer) accounts and system configurations.
5. **Security and Validation:**
    - Input validation for product details, user registrations, and transactions.
    - Role-based access control to ensure secure operations.
    - Clear error and success notifications for every operation.

---

6. Stakeholders

1. **Admin (System Administrator / Manager)**
    - **Role:**
      The Admin oversees overall system management and configuration. They are responsible for critical tasks such as setting global discounts, assigning bonuses, managing user accounts, and monitoring inventory and sales.
    - **Responsibilities:**
        - Configure system settings (e.g., global store discount).
        - Manage employee and customer registrations.
        - Oversee product inventory and sales performance.
        - Resolve system errors and support end users.

- **Impact:**
  Admin decisions affect pricing, employee incentives, and overall operational efficiency. Their role is vital for maintaining system integrity and ensuring a smooth workflow.
- **Decision Authority:**
  Admins have the highest level of access and decision-making authority within the system.

2. **Employee (Store Operator / Salesperson)**
   - **Role:**
     Employees are responsible for daily operations such as processing sales, managing inventory, and interacting with customers. They execute the core transactional processes.
   - **Responsibilities:**
     - Process sales transactions and generate bills.
     - Update product inventory after each sale.
     - Assist customers with queries and support product-related operations.
   - **Impact:**
     The efficiency and accuracy of employees directly influence customer satisfaction and revenue generation. Their actions ensure that inventory data remains current.
   - **Operational Significance:**
     Employees operate at the frontline, and their performance affects the store's day-to-day functioning and overall service quality.
3. **Customer (Shopper)**
   - **Role:**
     Customers are the end-users who interact with the system to browse products and make purchases. Their experience drives sales and overall store performance.
   - **Responsibilities:**
     - Register and log in to the system.
     - Browse and select products for purchase.

- Complete transactions securely and review purchase receipts.

- **Impact:**
  Customer satisfaction is key to the store's success. A positive user experience leads to repeat business and increased sales.

- **User Experience Focus:**
  The system must be intuitive, reliable, and secure to meet the diverse needs of its customer base.

---

6. User Profiles

User Profile-01: Admin

User Class	Notes on Characteristics	Requirement Implied
Type of User	Administrator / Manager	Verification
Age Range	25-50	Verification
Frequency of Use	Daily during business hours	Performance,Operation, Acceptance
Mandatory	Yes	
Computer Experience	Advanced	Documentation
Education	Bachelor's degree or higher in Business Administration, Information Systems, or related-	
Goals	Ensure system security and smooth operations; manage staff, inventory, sales, and discounts	Resource, Performance, Security, Acceptance, Operation
Language Skills	Bangla, English, Computer Terminology	
Number of Users	5–10	Performance, Operation, Acceptance, Portability

Training	**May accept training, prefers not to repeat**	**Documentation**
Other System Used	**Yes (Backend Management Systems)**	
Ways of Working	**Collaborates with IT; expects full support from the system**	**Acceptance, Safety, Security, Operation, Maintenance, Portability**

User Profile-02: Employee

User Class	**Notes on Characteristics**	**Requirement Implied**
Type of User	**Salesperson / Operational Staff**	**Verification**
Age Range	**20-45**	**Verification**
Frequency of Use	**Daily during shifts (higher during peak hours)**	**Performance,Operation, Acceptance**
Mandatory	**Yes**	
Computer Experience	**Basic to Intermediate**	**Documentation**
Education	**High School or equivalent**	
Goals	**Process sales efficiently, update inventory, ensure customer satisfaction**	**Resource, Performance, Acceptance, Operation**
Language Skills	**Bangla, English**	
Number of Users	**10-15**	**Performance, Operation, Acceptance, Portability**
Training	**Accepts on-the-job training**	**Documentation**
Other System Used	**Yes (POS or Inventory Tools)**	
Ways of Working	**Frontline, interaction ; stable, fast system**	**Acceptance, Safety, Security, Operation, Maintenance**

User Profile-03: Customer

User Class	Notes on Characteristics	Requirement Implied
Type of User	Shopper / End-User	Verification
Age Range	15-65+	Verification
Frequency of Use	Occasional to frequent (depends on habits/promos)	Performance,Operation, Acceptance
Mandatory	No	
Computer Experience	Basic	Documentation
Education	Varied (minimum literacy)	
Goals	Shop safely and easily, complete payment smoothly, see bill clearly	Resource, Performance, Acceptance, Operation
Language Skills	Bangla, English	
Number of Users	Unlimited / General Public	Performance, Operation, Acceptance, Portability
Training	Not expected	Documentation
Other System Used	No	
Ways of Working	Uses from home, mobile, or store kiosk; expects clean and intuitive UI	Acceptance, Safety, Security, Portability

8. Software Requirement Specification (SRS)

FR ID	Description	Stakeholder
FR01	**User Registration:** Employees and customers must register using a unique username and password before accessing the system.	Admin, Employee, Customer
FR02	**User Login/Logout:** Registered users must log in to access the system's functionalities. Role-specific login functions ensure that only authorized users can access sensitive functions. Logout functionality terminates sessions securely.	Admin, Employee, Customer
FR03	**Product Management:** The system must support adding new products (with details such as name, price, quantity, and discount), displaying the product inventory, and deleting products by name.	Admin, Employee
FR04	**Sales Processing (Employee Sales):** Employees can process sales transactions by selecting products, entering quantities, applying a global discount, and updating inventory. The system generates a detailed bill after each sale.	Employee
FR05	**Purchase Processing (Customer Purchases):** Customers can purchase products by selecting items, entering the desired quantity, and receiving a bill that reflects any product-specific discounts.	Customer
FR06	**Administrative Controls:** Admin users can set a global discount, assign bonuses to employees, and manage user accounts (adding new admins, deleting employees, etc.).	Admin

FR07	**Data Validation and Security:** The system must validate inputs (non-negative values for prices, quantities, and discounts) and ensure that duplicate usernames or products are not allowed.	All
FR08	**Reporting and Notifications:** After every transaction, the system displays detailed bills/receipts and updates cumulative sales data.	Employee, Customer, Admin

○

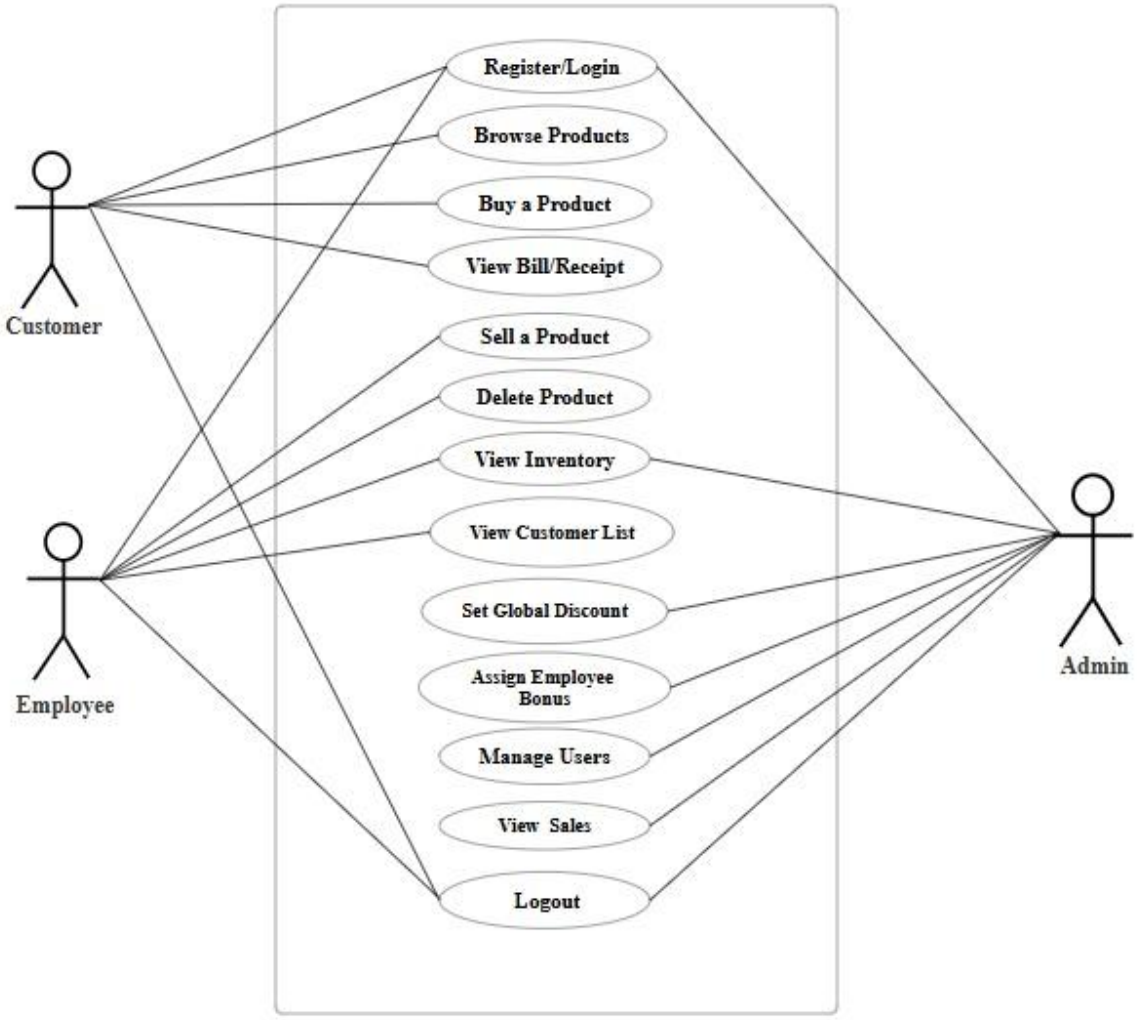
Non-Functional Requirements

- **Usability:**
  The system is designed with a clear, text-based menu interface that is intuitive and self-explanatory.
- **Reliability:**
  The application performs input validations and error handling to minimize transaction errors.
- **Performance:**
  As a console-based application, the system is lightweight and responds quickly to user inputs.
- **Security:**
  Role-based authentication ensures that only authorized users perform sensitive operations.

9. Use Case Diagram

- **Actors:**
    - **Admin:**
        - Use Cases: Register/Login, Set Global Discount, Assign Employee Bonus, Manage Users, View Inventory & Sales, Logout.
    - **Employee:**
        - Use Cases: Register/Login, Sell a Product, Delete Product, View Inventory, View Customer List, Logout.
    - **Customer:**
        - Use Cases: Register/Login, Browse Products, Buy a Product, View Bill/Receipt, Logout.

- **System Interactions:**
    - All users interact with the registration and login functions.
    - Product management functions are accessible to Admin and Employee roles.
    - Sales/Purchase processing functions are role-specific (Employee for sales; Customer for purchases).



Use Case Diagram for Super Shop Management System

10. Feasibility Study

10.1 Technical Feasibility

- **Hardware:**
  The system runs on standard desktop or laptop computers using any C compiler (e.g., GCC). It does not require high-end hardware.
- **Software:**
  Developed in C, the system is compatible with major operating systems (Windows, Linux, etc.). No third-party libraries are needed.
- **Expertise:**
  Requires developers and maintainers with moderate C programming skills. The modular structure allows ease of updates and debugging.

10.2 Operational Feasibility

- **User Acceptance:**
  The menu-driven interface is simple and intuitive, ensuring ease of use for employees and customers alike.
- **Impact on Operations:**
  Automation of sales and inventory processes reduces manual workload and minimizes errors.
- **Training:**
  Minimal training is needed due to the system's straightforward design. Basic instructions can be provided to end users.

10.3 Economic Feasibility

- **Development Cost:**
  Being a console-based application developed in C, the initial development and maintenance costs are relatively low.
- **Benefits:**
  Enhanced efficiency in sales processing and inventory management can lead to cost savings and improved revenue generation.

- **ROI:**
  Faster and error-free transactions are expected to deliver a positive return on investment within a short period.

10.4 Scheduling Feasibility

- **Timeline:**
  The system's moderate complexity allows it to be developed, tested, and deployed within a few months.
- **Dependencies:**
  Minimal external dependencies exist. The system primarily relies on a standard C compiler and console environment.

10.5 Security and Privacy Considerations

- **Data Validation:**
  Robust checks ensure that inputs (such as prices, quantities, and discount values) are non-negative and valid.
- **Access Control:**
  Role-based login prevents unauthorized access to administrative functions.
- **Future Enhancements:**
  While data is currently stored in memory, future versions may incorporate file-based or database storage with encryption for enhanced security.

Use Case Description

Case Description-01: Registration

<table>
<tr><td>Use Case</td><td>Registration</td></tr>
<tr><td>Goal</td><td>Users can register to sign in to the system.</td></tr>
<tr><td>Precondition</td><td>The user must not have an existing account.</td></tr>
<tr><td>Success End Condition</td><td>Notification: !!!Successfully Registered!!!</td></tr>
<tr><td>Failed End Condition</td><td>Notification: “Submission Not Submitted”</td></tr>
<tr><td>Actors:</td><td>Customer, Employee, Admin</td></tr>
<tr><td>Trigger</td><td>The user selects the registration option.</td></tr>
<tr><td>Description / Main
Success
Scenario</td><td>
<table>
<tr><td>1.</td><td>Press “Registration” Button</td></tr>
<tr><td>2.</td><td>Provide registration form</td></tr>
<tr><td>3.</td><td>Enter Information</td></tr>
<tr><td>4.</td><td>Press “Submit” Button.</td></tr>
<tr><td>5.</td><td>Information saved</td></tr>
<tr><td>6.</td><td>The system saves the details and shows them !!!Successfully Registered!!! Notify</td></tr>
</table>
</td></tr>
</table>

Alternative Flows	

1.1	System Error
	1.1.a. Try Again!!
2.1	System Doesn't work.
	2.1.a. Try Again Later!
4.1	The user Did not fill up the details!
	4.1.a. Checked By the system & Notify by “Please! Fill Up the Box”.
5.1	The system did not respond
	5.1.a. Show Error Message.
6.1	The system Doesn’t save the details.
	6.1.a. Notification: “Details did not Save”

Case Description-02: Login

Use Case	Login
Goal	Users can enter the system by the login.
Precondition	Users must have to be registered First.
Success End Condition	Notification: “Login Successful”
Failed End Condition	Notification: “Login Failed!!”
Primary Actors:	Customer, Employee, Admin

<table>
<tr><td>Trigger</td><td>The user will request a login to enter the system</td></tr>
<tr><td>Description / Main Success Scenario</td><td>
<table>
<tr><td>1.</td><td>Press “Login” Button</td></tr>
<tr><td>2.</td><td>Provide login interface</td></tr>
<tr><td>3.</td><td>Enter user id and password.</td></tr>
<tr><td>4.</td><td>User provide the “Login” button</td></tr>
<tr><td>5.</td><td>Verified and login</td></tr>
<tr><td>6.</td><td>Notification: “Login Successful”</td></tr>
</table>
</td></tr>
<tr><td>Alternative Flows</td><td>
<table>
<tr><td>1.1</td><td>System Error</td></tr>
<tr><td></td><td>1.1.a. Try again</td></tr>
<tr><td>2.1</td><td>Server Not Found</td></tr>
<tr><td></td><td>2.1.a. Try Again Later!</td></tr>
<tr><td>4.1</td><td>The system Did not respond.</td></tr>
<tr><td></td><td>4.1.a. Show error message.</td></tr>
<tr><td>5.1</td><td>Information Error!!</td></tr>
<tr><td></td><td>5.1.a. Notification: “Enter the right User ID and Password.”</td></tr>
</table>
</td></tr>
<tr><td>Quality Requirements</td><td>Users fill up the login info within 10 minutes.</td></tr>
</table>

Case Description-03: Product Management

Use Case	Product Management
Goal	Ensure efficient handling of product inventory, including adding, updating, and deleting products.
Precondition	The user must be logged in.
Primary Actors:	Admin, Employee
Trigger	The user selects "Manage Products."
Description / Main Success Scenario	1. The user selects "Add Product," "Update Product," or "Delete Product." 2. The system prompts for product details (name, category, price, stock quantity, discount). 3. If adding or updating, the system saves the product information in the inventory. 4. If deleting, the system removes the specified product from inventory. 5. The user receives confirmation of the action.
Alternative Flows	• If insufficient stock is available, the system prompts an error. • If the payment method fails, the system allows retrying or choosing an alternative method.

Case Description-04: Sales Process*ing*

Use Case	Sales Process*ing*
Goal	Facilitate an accurate and efficient sales transaction, ensuring inventory updates and proper billing.
Precondition	The employee must be logged in; the customer must have selected products.
Primary Actors:	Employee, Customer
Trigger	The employee initiates a sale.
Description / Main Success Scenario	1. The employee selects "Process Sale." 2. The system displays the selected products and applies relevant discounts. 3. The employee confirms the sale and generates a bill. 4. The system updates the inventory and sales records. 5. The customer receives a receipt.
Alternative Flows	• If insufficient stock is available, the system prompts an error. • If the payment method fails, the system allows retrying or choosing an alternative method.

Case Description-05: Purchase Processing

Use Case	Purchase Processing
Goal	Enable customers to browse, select, and securely purchase products.
Precondition	The customer must be logged in.
Primary Actors:	Customer
Trigger	The customer selects "Buy Product."
Description / Main Success Scenario	1. The customer browses and selects products. 2. The system verifies stock availability. 3. The customer selects a payment method and completes the purchase. 4. The system updates inventory and generates a receipt.
Alternative Flows	• If stock is unavailable, an error message is displayed. • If the payment fails, the system prompts for retry or alternative payment options.

Case Description-06: Administrative Controls

Use Case	Administrative Controls
Goal	Allow administrators to manage users and configure system settings.
Precondition	The admin must be logged in.
Primary Actors:	Customer
Trigger	The admin accesses the management dashboard.
Description / Main Success Scenario	1. The admin selects "Manage Users and System Settings." 2. The system provides options to add, update, or remove employees and customers. 3. The admin can configure store policies and operational settings. 4. The system saves and applies changes.
Alternative Flows	• If invalid data is entered, the system displays an error message. • If an unauthorized user attempts access, the system denies entry.

Case Description-07: Data Validation and Security

Use Case	Administrative Controls
Goal	Provide detailed analytics and reports for sales, inventory, and customer activities.
Precondition	The user must be logged in.
Primary Actors:	Data Validation and Security
Trigger	The The user selects "Generate Reports."
Description / Main Success Scenario	1. The system validates user inputs for correctness and completeness. 2. If discrepancies or security threats are detected, the system flags or blocks the action. 3. The admin receives notifications about security concerns. 4. The system applies encryption for sensitive data and ensures role-based access control.
Alternative Flows	• If data validation fails, the system prompts an error message. • If unauthorized access attempts are detected, the system triggers a security alert.

Case Description-08: Generating Reports

Use Case	Administrative Controls
Goal	Provide detailed analytics and reports for sales, inventory, and customer activities.
Precondition	The admin must be logged in.
Primary Actors:	Admin, Employee
Trigger	The user selects "Generate Report."
Description / Main Success Scenario	1. The system provides options for generating reports, including sales summaries, inventory status, and customer purchase history. 2. The user selects report criteria such as date range, product category, or employee performance. 3. The system retrieves and compiles relevant data. 4. The system generates a structured report, which can be viewed, downloaded, or printed.
Alternative Flows	• If no data matches the selected criteria, an error message is displayed. • If the system is down, the user is notified to try later.

These use cases ensure that all major functionalities of the Super Shop Management System are documented effectively.

Activity Diagram

Activity Diagram-1: User Registration

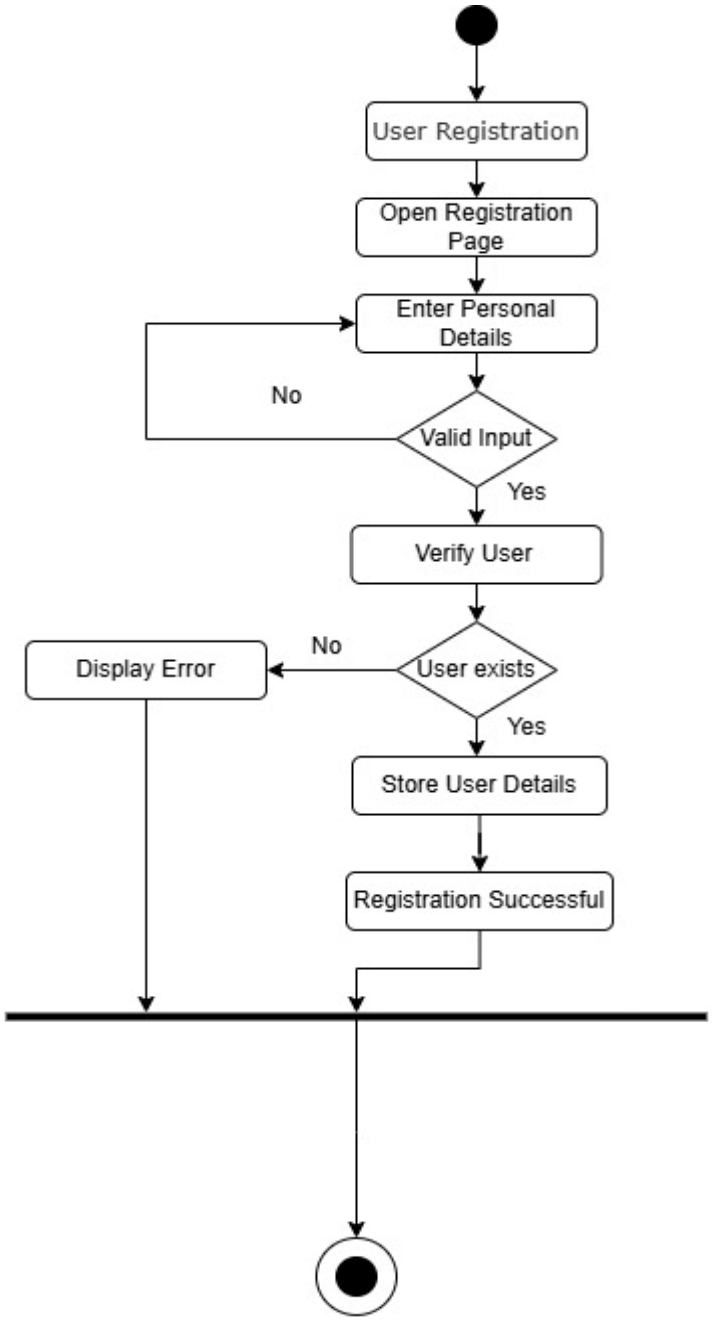


Figure-01: Activity Diagram for User Registration

Activity Diagram-2: Product Management

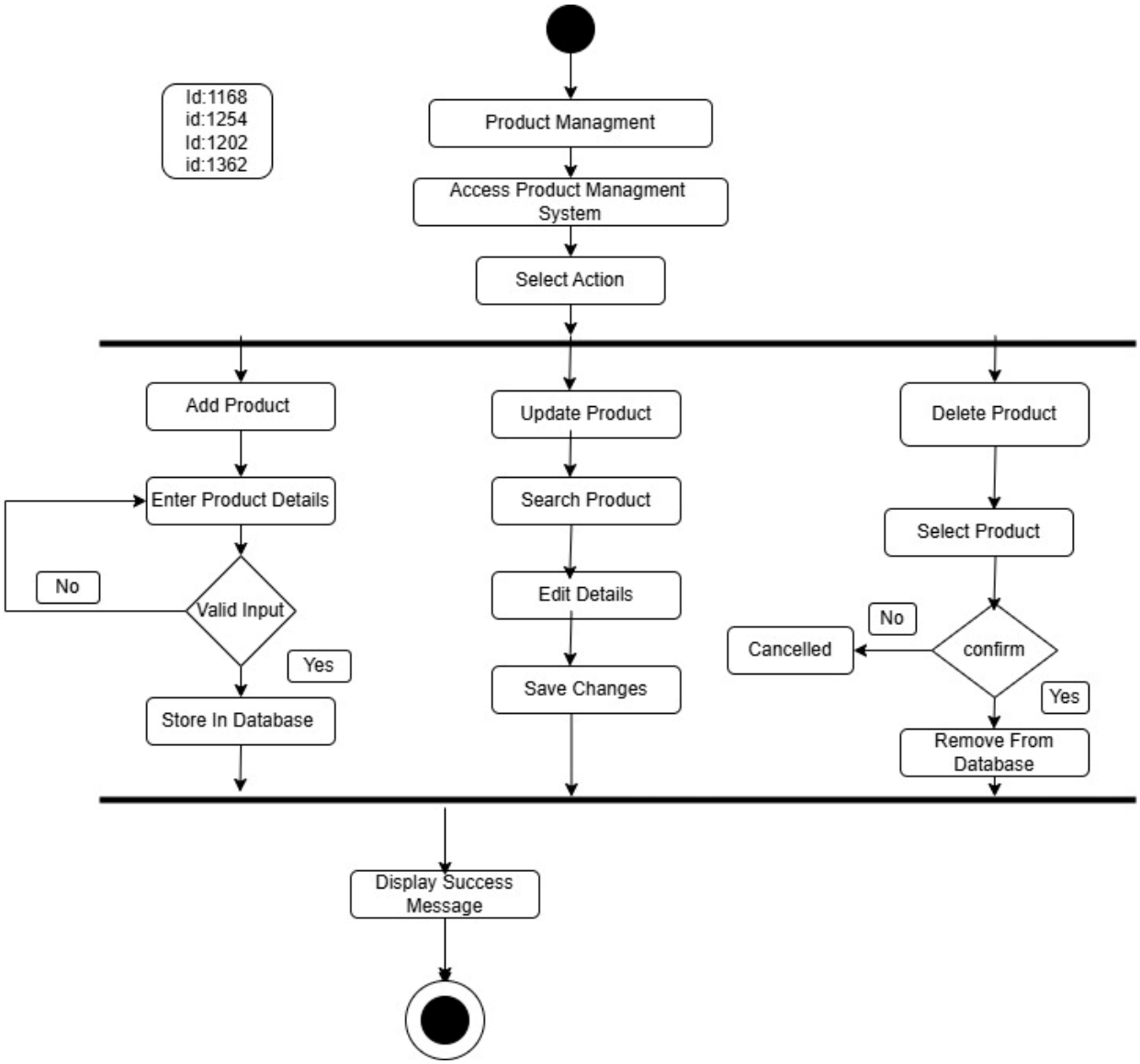


Figure-02: Activity Diagram for Product Management.

Activity Diagram-3: Sales Processing

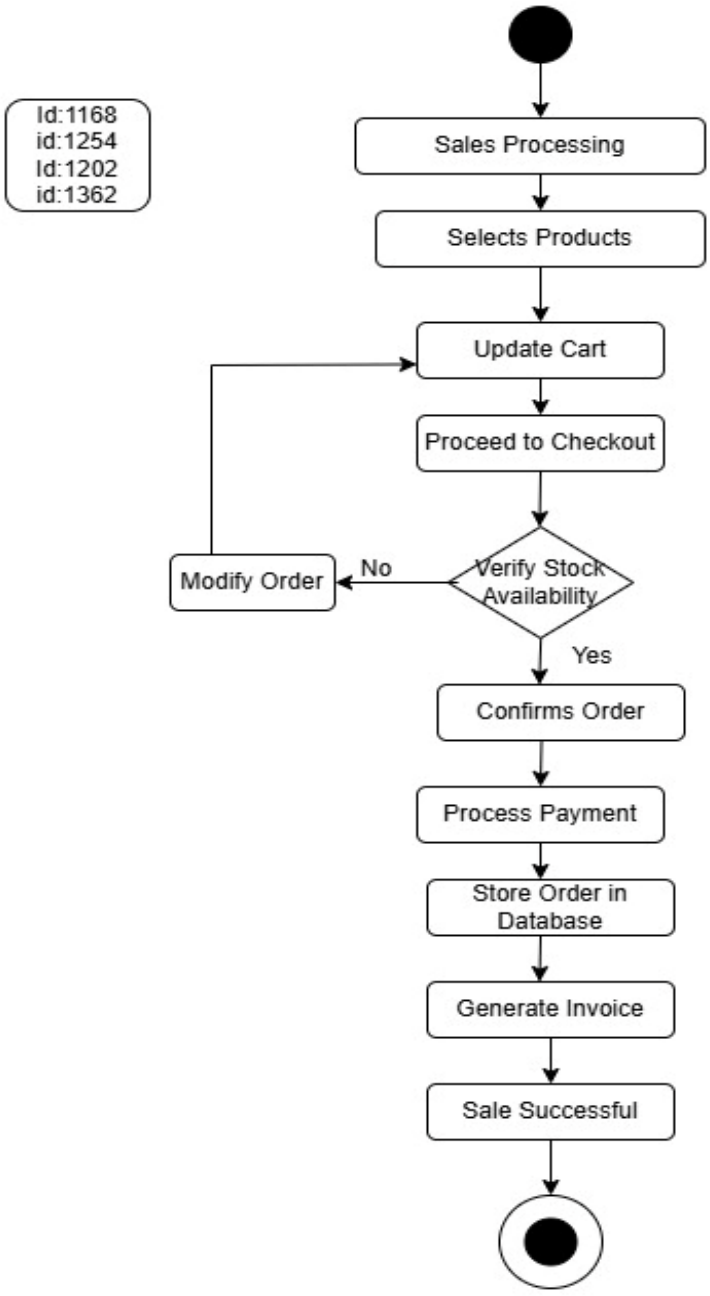


Figure-03: Activity Diagram for Sales Processing.

Activity Diagram-4: Billing Process

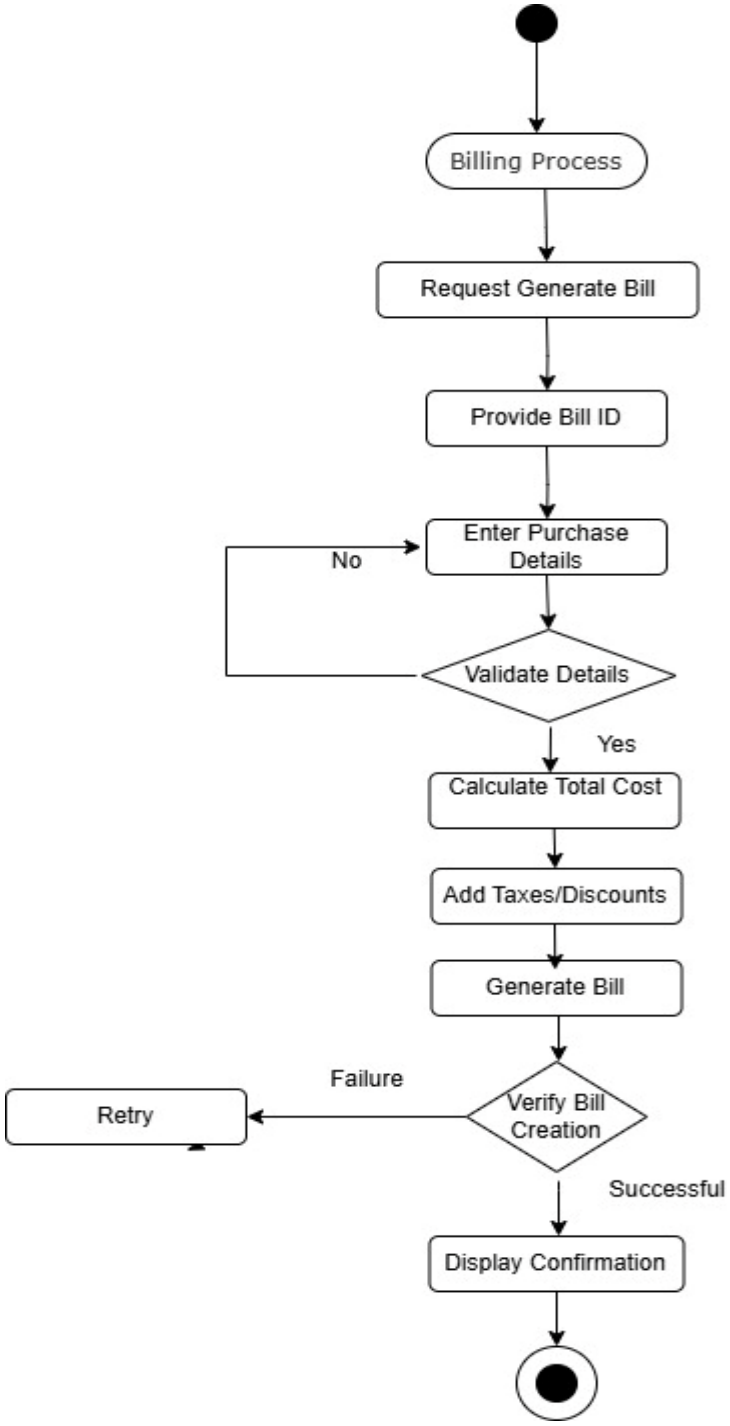


Figure-04: Activity Diagram for Billing Process.

State Diagram

State Diagram-1: User Registration.

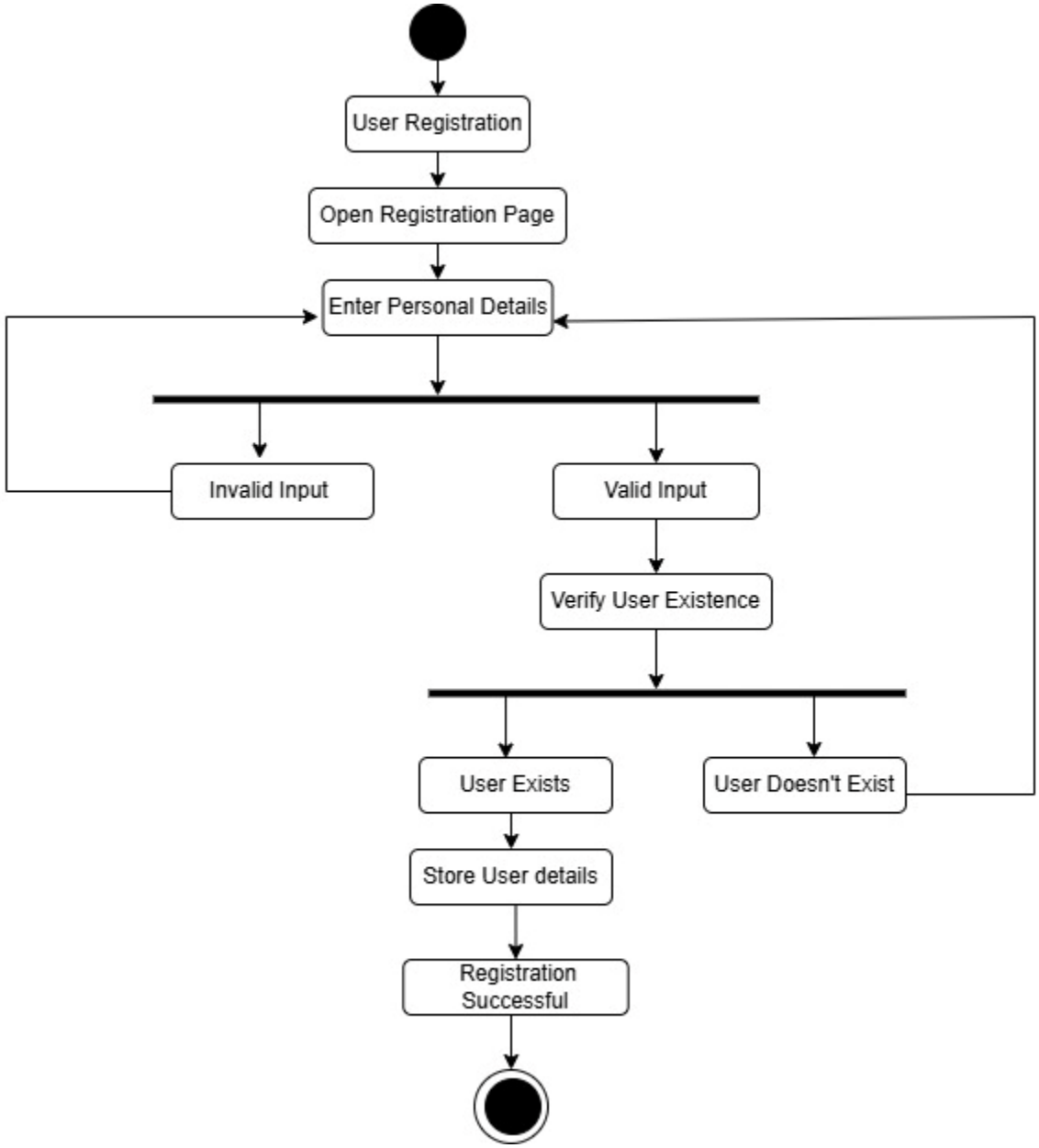


Figure-05: State Diagram for User Registration.

State Diagram-2: Product Management

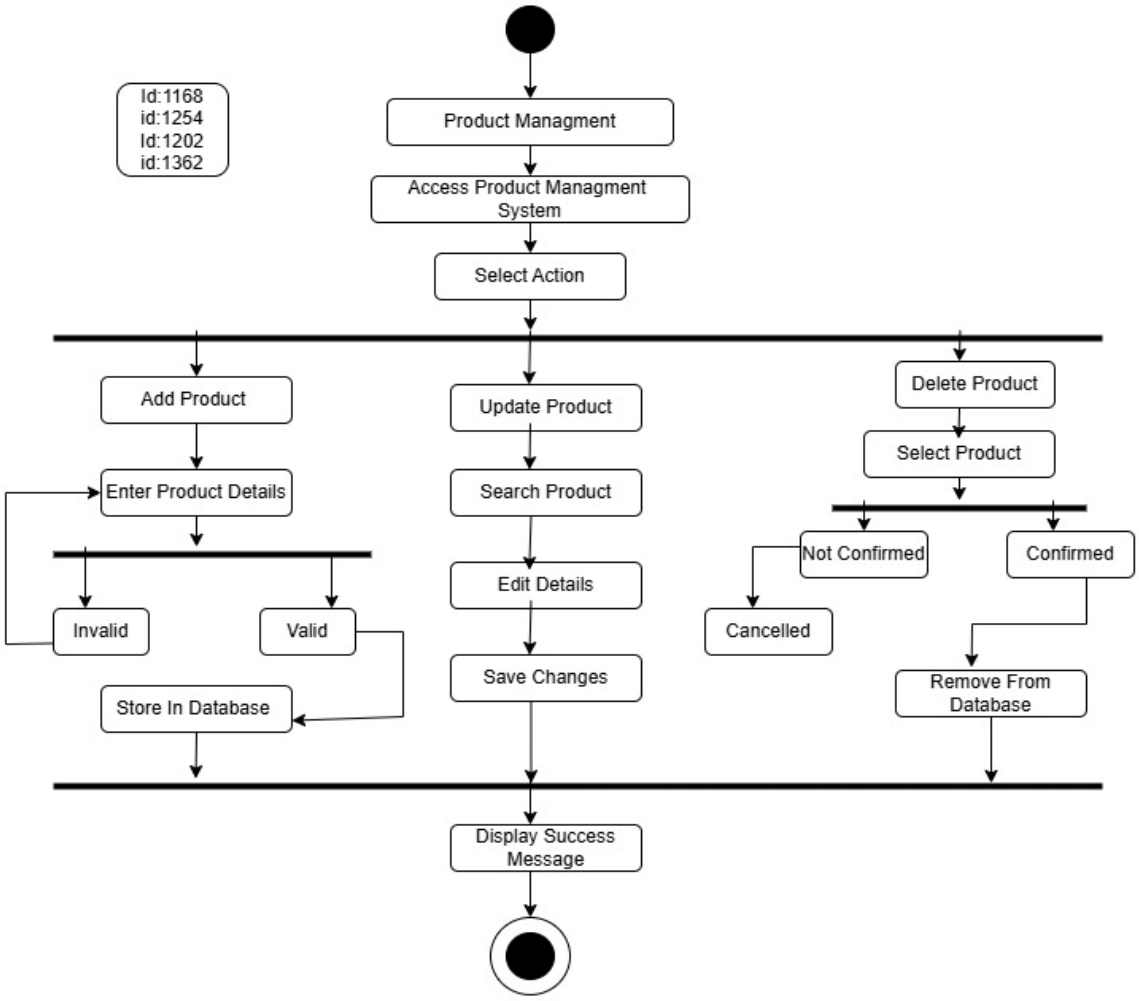


Figure-06: State Diagram for Product Management.

State Diagram-3: Sales Processing

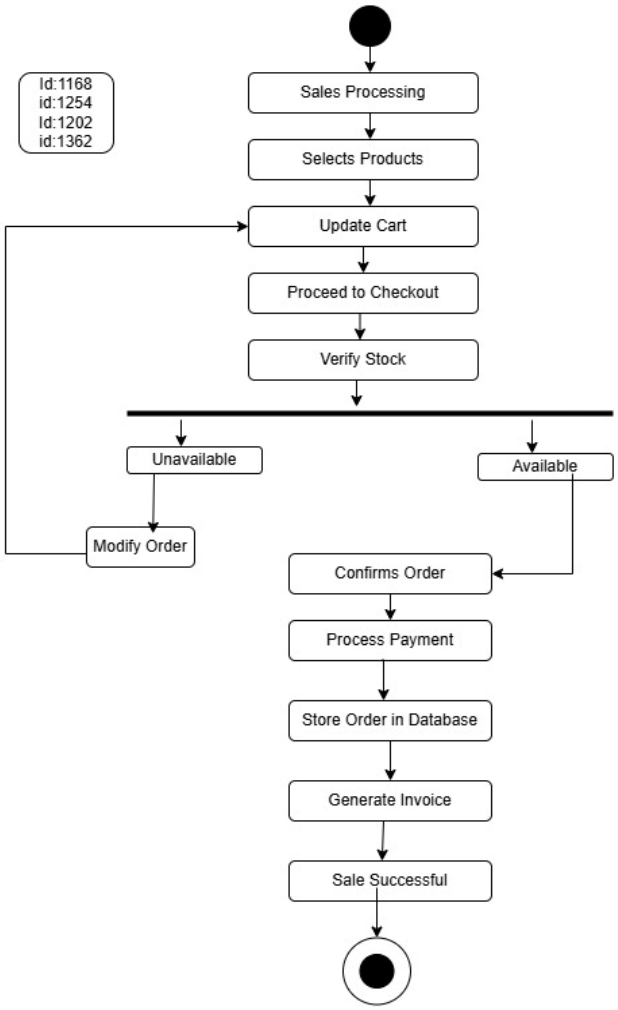


Figure-07: State Diagram for Sales Processing.

State Diagram-4: Billing Process

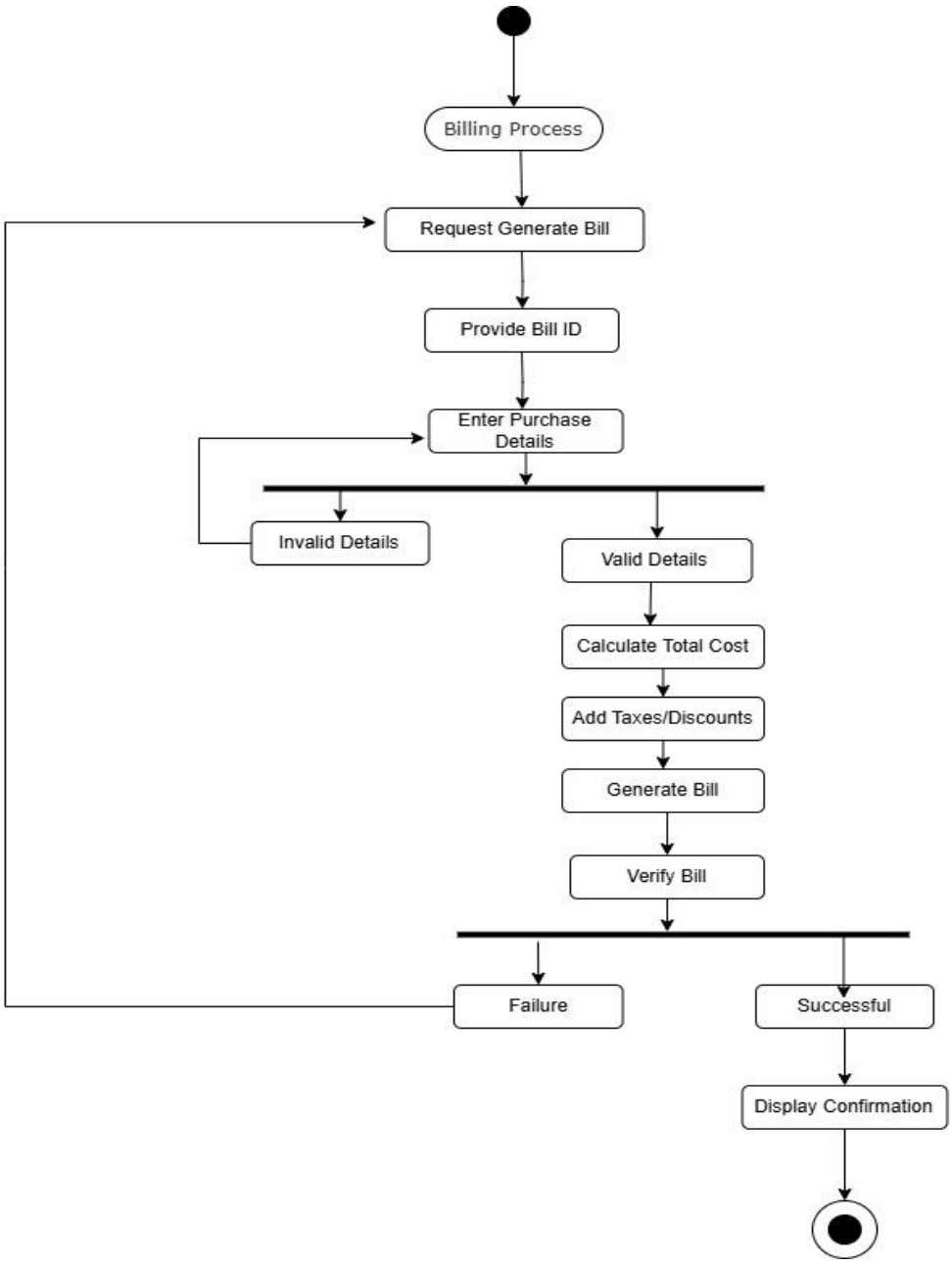


Figure-08: State Diagram for Billing Process.

Sequence Diagram

Sequence Diagram-1: User Registration.

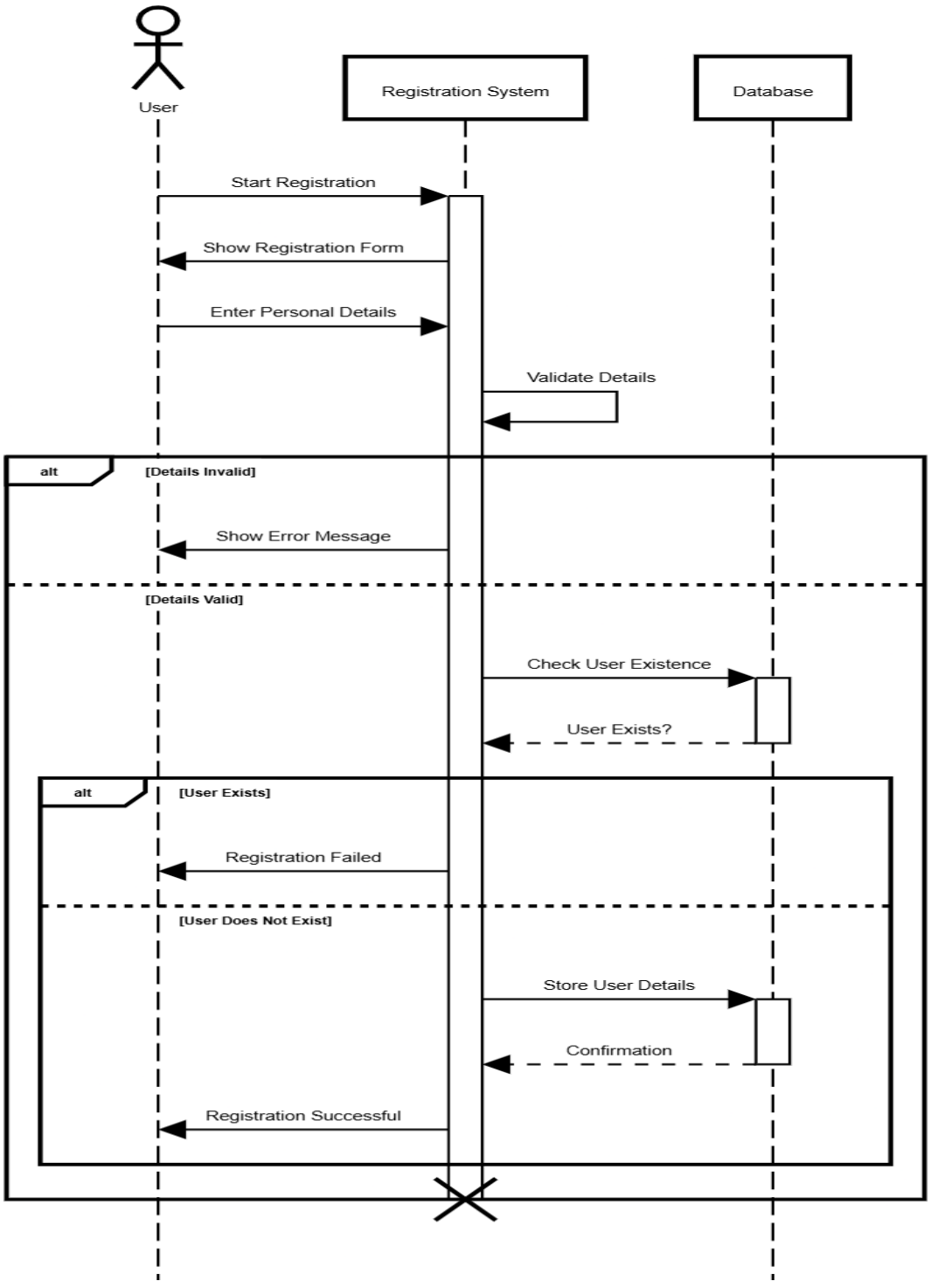


Figure-09: Sequence Diagram for User Registration.

Sequence Diagram-2: Product Management.

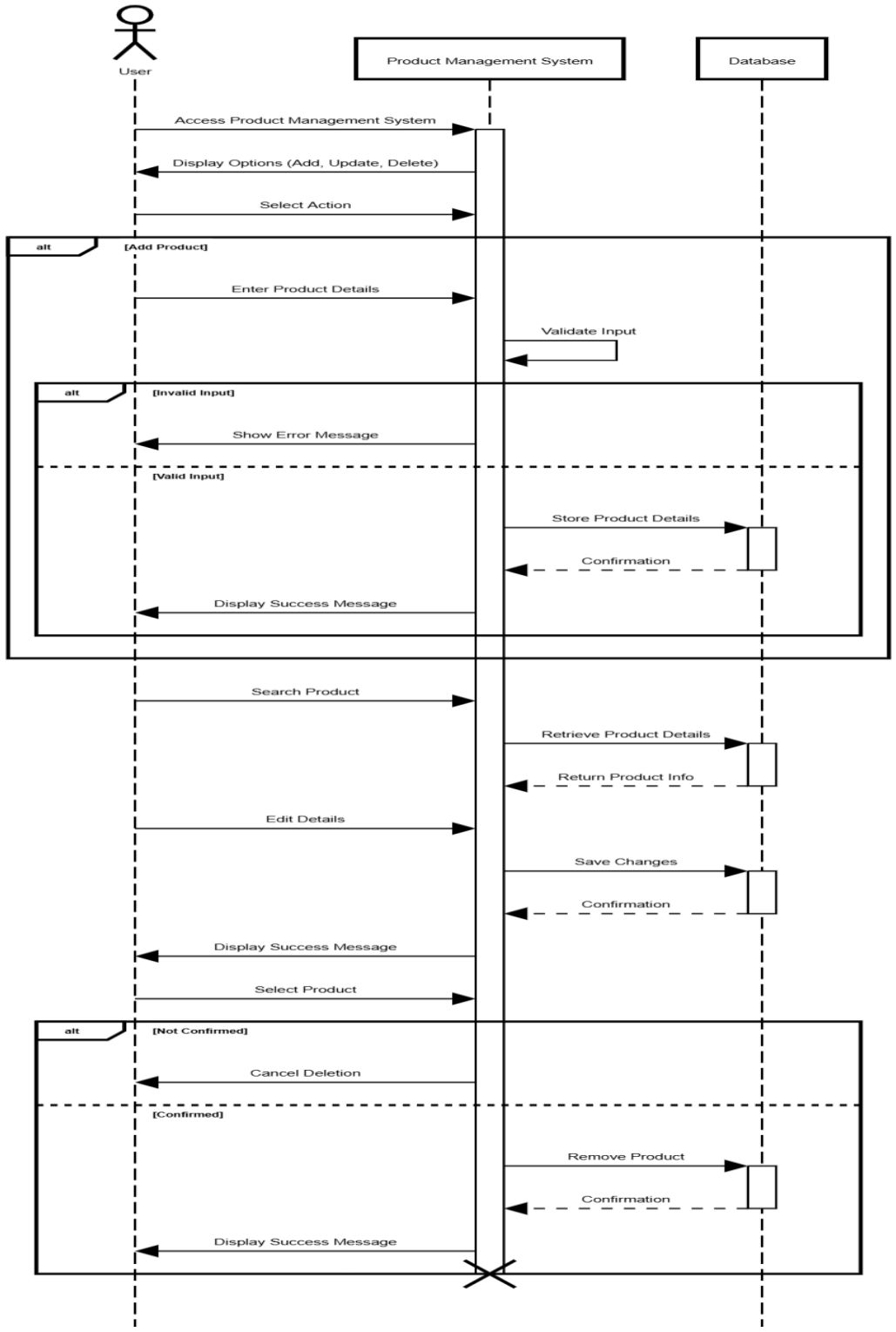


Figure-10: Sequence Diagram for Product Management.

Sequence Diagram-3: Sales Processing.

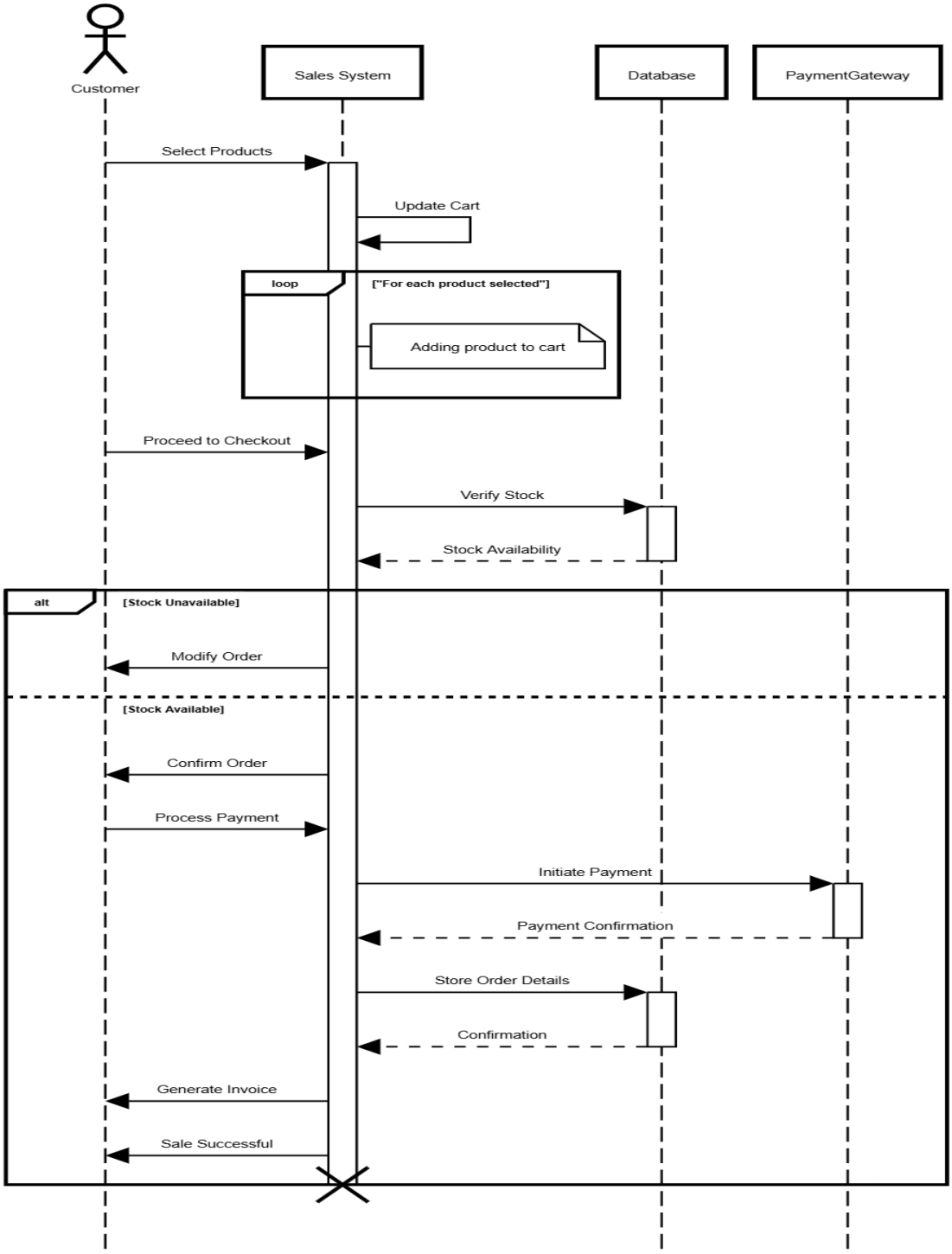


Figure-11: Sequence Diagram for Sales Processing.

Sequence Diagram-4: Billing Process.

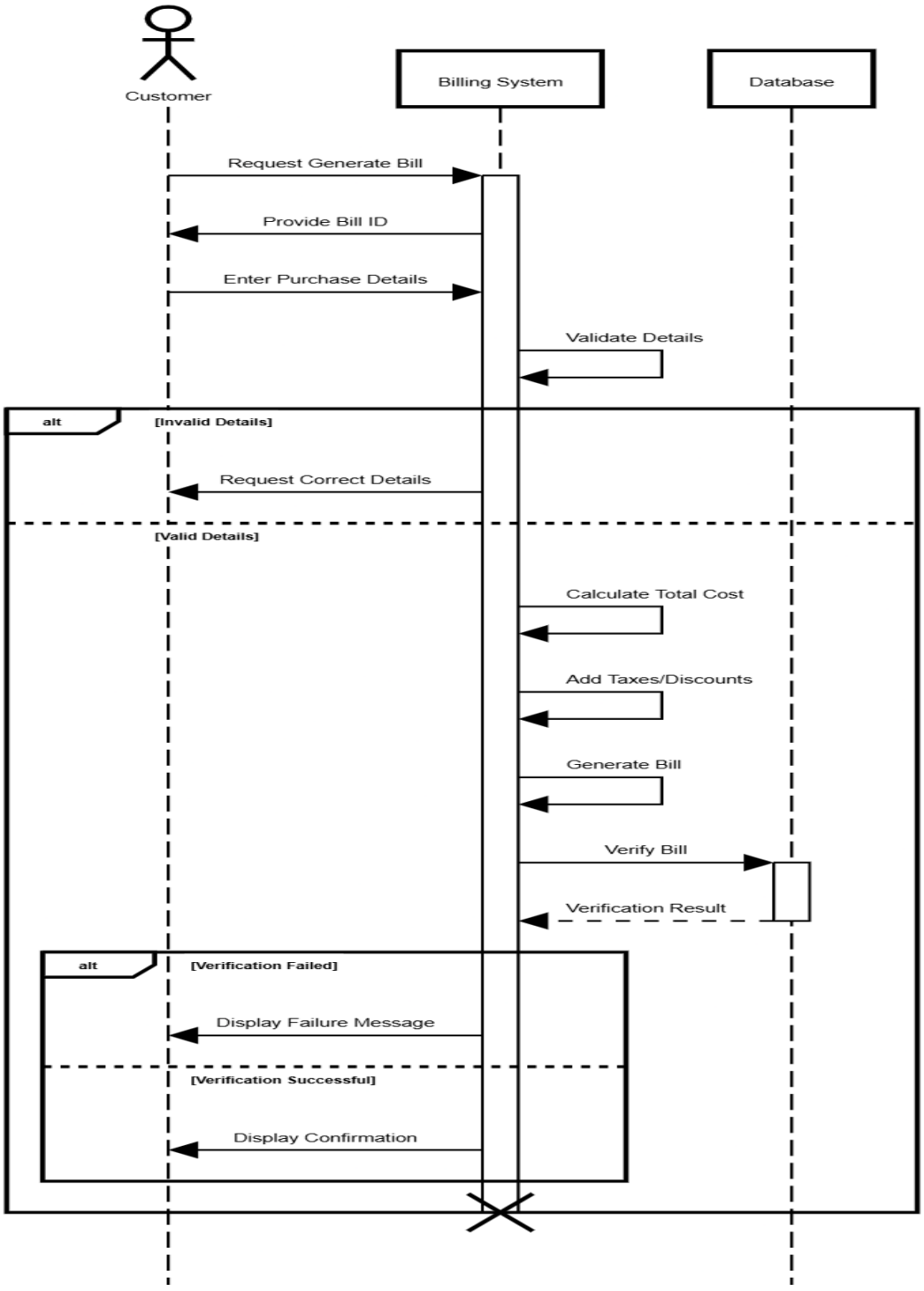


Figure-12: Sequence Diagram for Billing Process.

Class Diagram

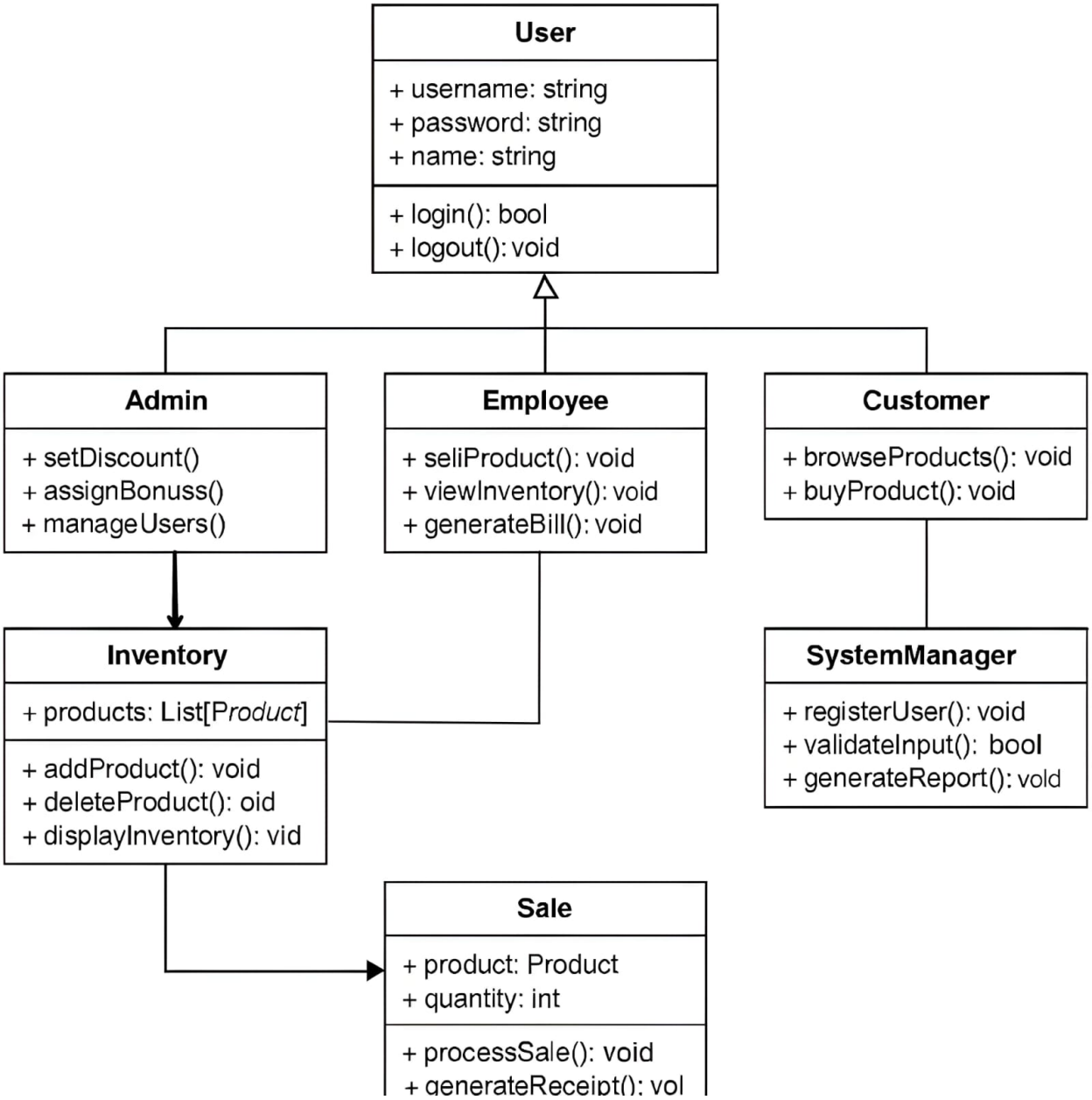


Figure 13: Class Diagram for Super Shop Management System.

Project Block Diagram

Block Diagram-1: Admin

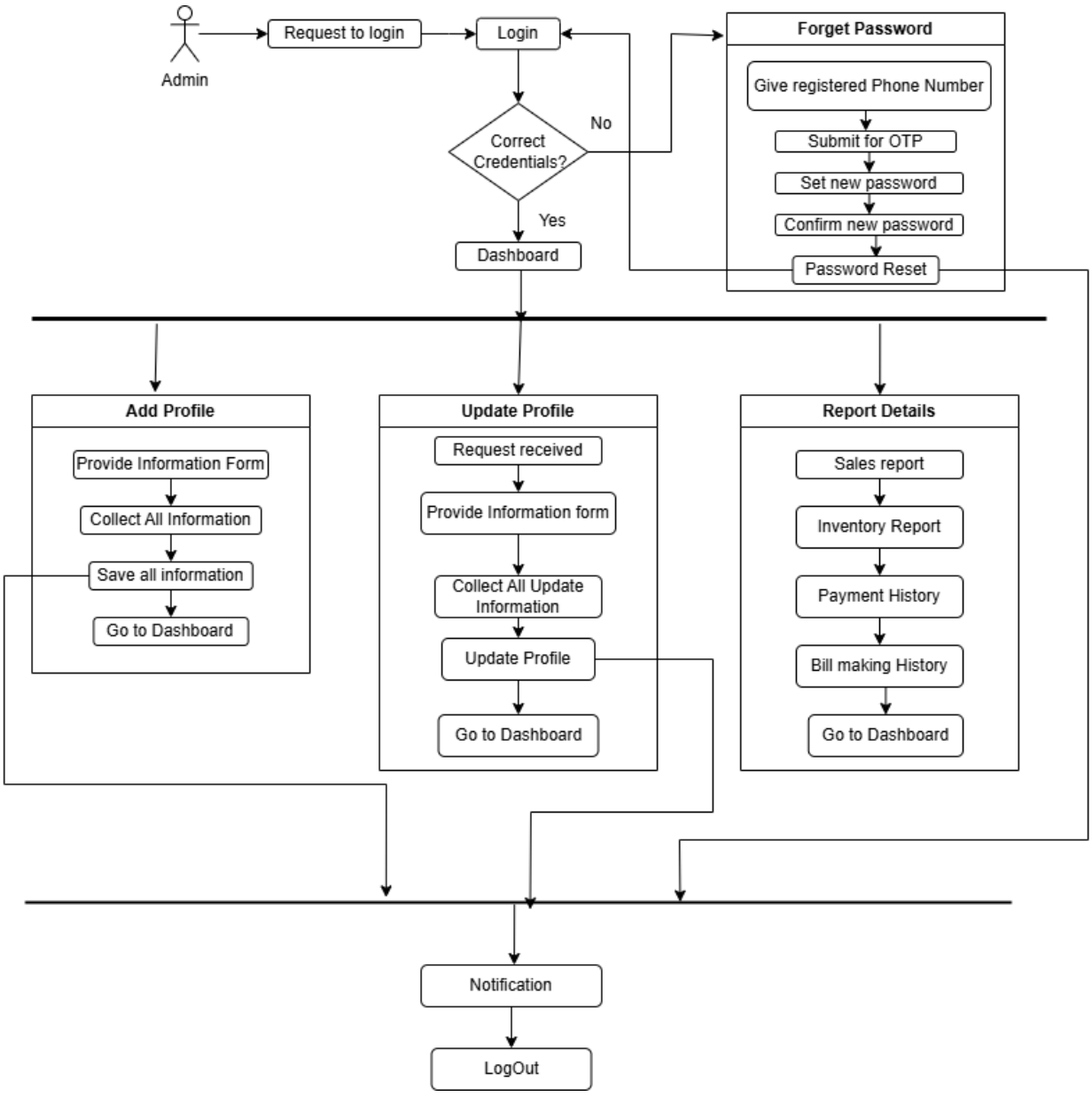


Figure-14: Block Diagram for Admin.

Block Diagram-2: Employee

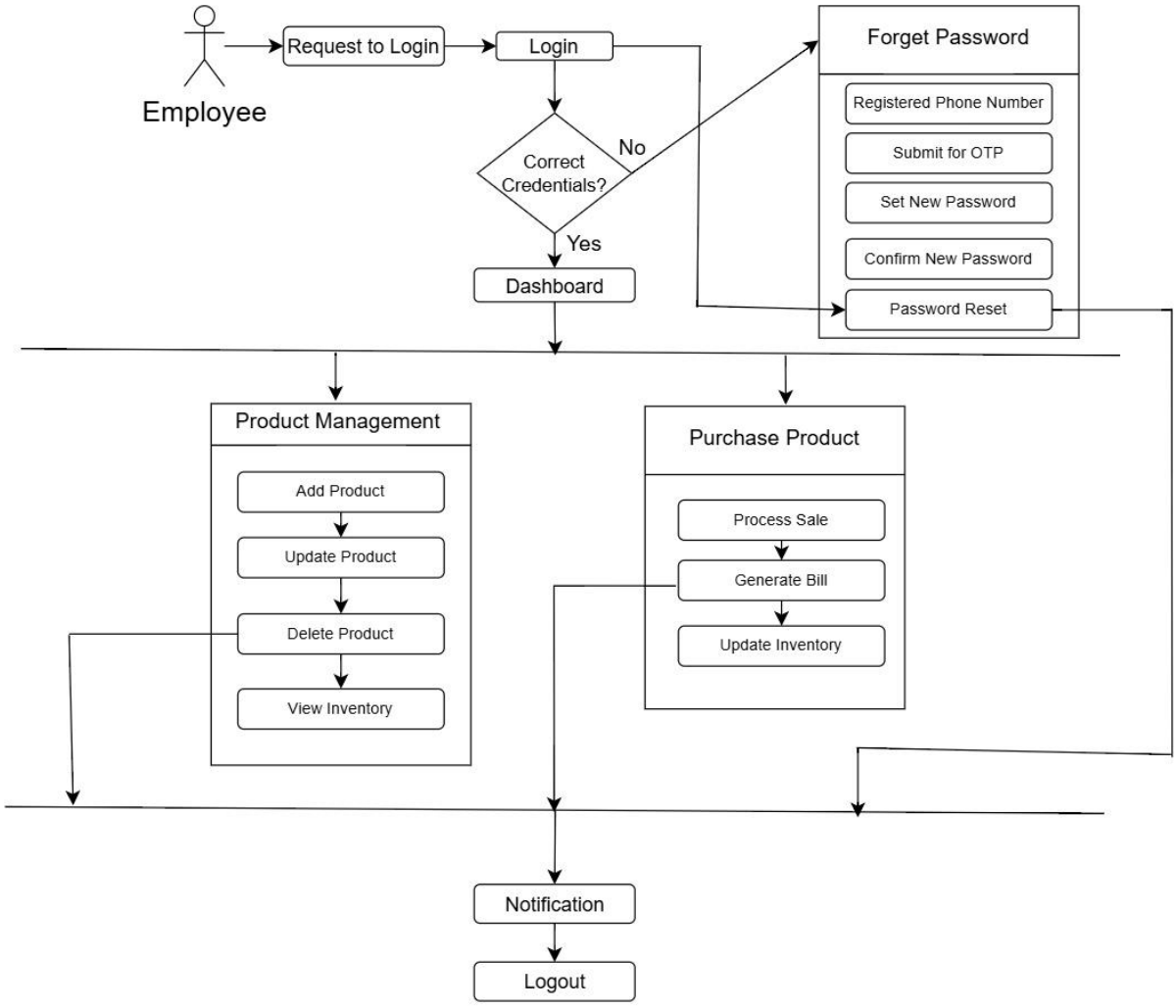


Figure-15: Block Diagram for Employee.

Block Diagram-3: Customer

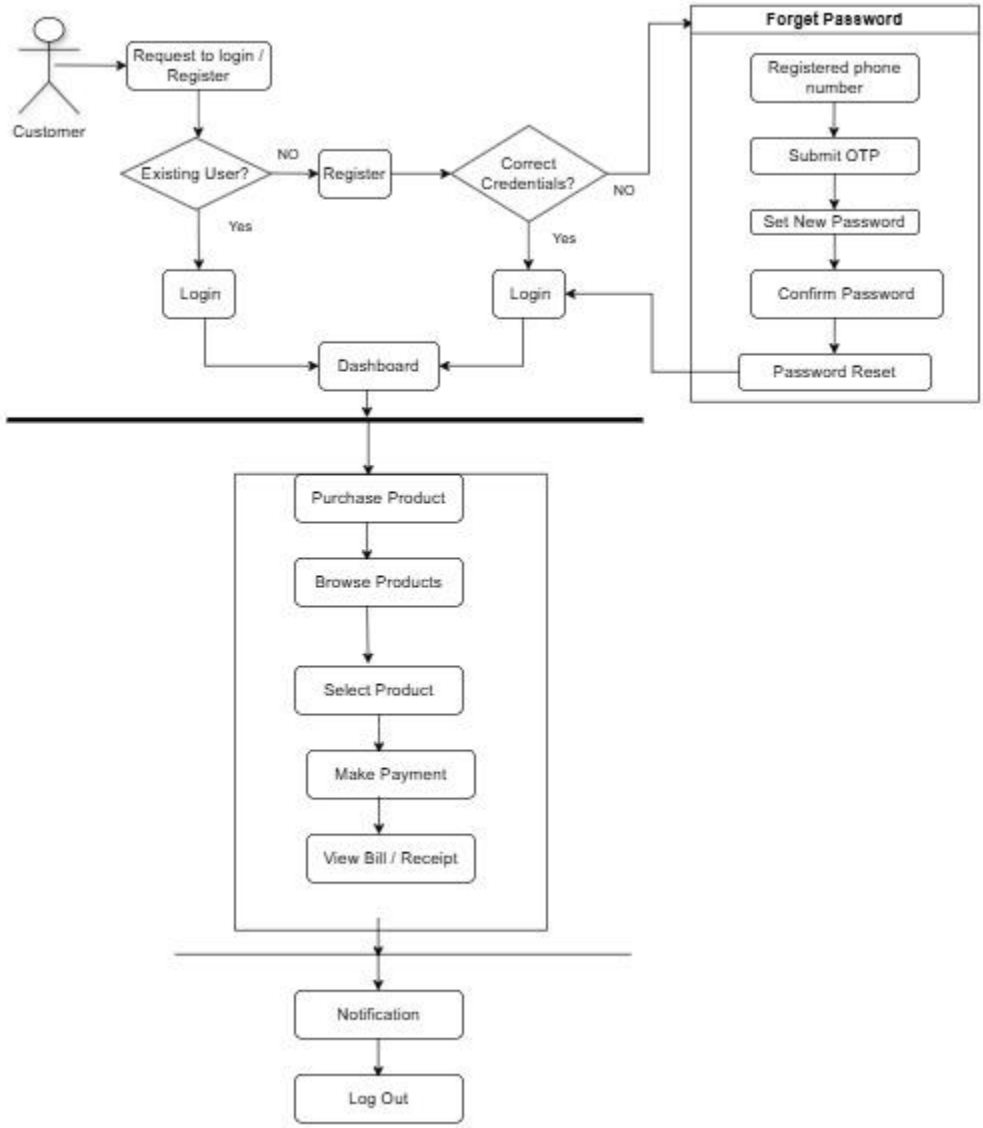


Figure-16: Block Diagram for Customer.

11. Conclusion

The Super Shop Management System is a robust, console-based application designed to address the daily operational needs of a retail environment. By integrating product management, sales processing, and role-based user management into a single system, it streamlines operations and enhances efficiency. Detailed user interfaces for Admin, Employee, and Customer roles ensure that each stakeholder can perform their tasks effectively. The system's modular design, input validations, and role-specific functions make both reliable and scalable. The feasibility study confirms that the project is technically, operationally, and economically viable. Overall, the Super Shop Management System is poised to significantly improve retail operations and provide a solid foundation for future enhancements.
