Expt No: 3,	USE CASE DIAGRAM – STOCK INVENTORY MANAGEMENT

Aim:

To design a Use Case Diagram for the Stock Inventory Management System.

Definition:

A Use Case Diagram is a visual representation of how a system interacts with external entities (called actors). It shows the system's functionalities (called use cases) and how users (actors) interact with them. It focuses on capturing the functional requirements of a system and describes the main tasks or actions that the system performs in response to an actor's request.

Purpose of a Use Case Diagram:

The primary purpose of a Use Case Diagram is to:

1. Capture system functionalities: It helps identify the high-level actions that the system performs.
2. Identify users and their interactions: It shows which users (actors) interact with which functionalities (use cases).
3. Clarify system boundaries: It helps define the scope of the system and which tasks it should handle.
4. Aid in communication: It serves as a communication tool between stakeholders (clients, developers, etc.) to ensure the system meets the user's needs.
5. Provide a foundation for system design: It lays the groundwork for further design processes, such as creating class diagrams and sequence diagrams.

Components of a Use Case Diagram:

1. Actors:

An actor represents an external entity (user, system, or device) that interacts with the system. Actors can either initiate or receive responses from use cases.

Example in Stock Inventory Management System:

- Admin: Manages users, stock items, and overall system activities.
- Inventory Manager: Adds, updates, and tracks stock levels.
- Cashier: Processes customer purchases and bills.
- Customer: Buys items and provides feedback.

2. Use Cases:

Use cases describe the specific functionality that the system provides. Each use case defines an action that an actor can perform in the system.

Example in Stock Inventory Management System:

- Add Stock
- Remove Stock
- Update Stock Information
- Generate Billing
- Manage Customer Orders

3. System Boundary:

The system boundary defines the scope of the system. It shows what is inside (use cases) and outside (actors) the system.

Example in Stock Inventory Management System:

The system boundary includes all stock management functionalities, such as adding stock, billing, managing stock, and report generation, excluding external systems such as third-party payment processors or external suppliers.

4. Relationships:

- **Association:** Each actor is associated with multiple use cases.

  Example:

  - Inventory Manager → Add Stock, Remove Stock, Update Stock Information
  - Admin → Manage Users, Generate Reports
  - Cashier → Generate Billing, Process Payment
  - Customer → Place Order, View Products
- **Include Relationship:**

  Example:

  - Login includes all major actions like Add Stock, Generate Billing, and Place Order, as users must log into the system to perform these operations.

- **Extend Relationship:**

  Example:

  - Process Payment extends from Generate Billing, since billing must be generated before a payment can be processed.
  - Generate Reports extends from Manage Stock, as reports are based on stock management activities.

Steps to Draw a Use Case Diagram:

1. Identify Actors:

Actors are external entities interacting with the system.

In the Stock Inventory Management System, the primary actors are:

- **Admin**: Oversees the system and manages users and stock.
- **Inventory Manager**: Responsible for updating stock levels and information.
- **Cashier**: Handles billing and customer transactions.
- **Customer**: Places orders and provides feedback on products.

2. **Identify Use Cases:**

Use cases represent the functionalities the system offers to its actors. For the stock inventory system, key use cases include:

- **Add Stock:** Inventory Manager adds new stock to the system.
- **Update Stock Information**: Inventory Manager updates the stock data (price, quantity).
- **Generate Billing**: Cashier creates a bill for purchased items.
- **Place Order**: Customer places an order for stock items.

3**. Draw System Boundary:**

Draw a rectangle representing the stock inventory system, placing all use cases inside the boundary. The actors (Admin, Inventory Manager, Cashier, Customer) interact with the system but remain outside the boundary.

4. **Place Actors:**

Position the actors outside the system boundary and label each actor clearly. These actors will connect to relevant use cases within the system.

- Admin interacts with Manage Users, Generate Reports.
- Inventory Manager interacts with Add Stock, Update Stock, Remove Stock.
- Cashier interacts with Generate Billing, Process Payment.
- Customer interacts with Place Order, View Products.

5. **Connect Actors to Use Cases:**

   Draw lines (associations) from each actor to the corresponding use cases inside the system boundary. For example:

   - Inventory Manager connects to Add Stock, Remove Stock, and Update Stock.
   - Cashier connects to Generate Billing and Process Payment.
   - Customer connects to Place Order.

6. **Add Relationships**:

   Use Include to show that Login is required before other actions like Add Stock, Place Order, and Generate Billing.

Example for Stock Inventory Management System:

1. **Actors in Stock Inventory Management System**:

- Admin: Manages the system, users, and stock.
- Inventory Manager: Manages stock levels, adds, updates, and removes stock.
- Cashier: Handles customer purchases and billing.
- Customer: Places orders and views products.

2. **Use Cases in Stock Inventory Management System**:

- Add Stock: Inventory Manager adds new stock items to the system.
- Update Stock: Inventory Manager updates stock quantity or product information.
- Remove Stock: Inventory Manager removes outdated or sold-out items from the system.
- Generate Billing: Cashier generates the bill after a customer makes a purchase.
- Process Payment: Cashier processes payments for the customer.
- Place Order: Customer orders stock items from the inventory.

3. **Relationships in Stock Inventory Management System:**

- Association:
  - Admin → Manage Users
  - Inventory Manager → Add Stock, Update Stock, Remove Stock
  - Cashier → Generate Billing, Process Payment
  - Customer → Place Order, View Products
- Include Relationships:
  - Login includes Add Stock, Generate Billing, and Place Order, as login is required for these operations.

- Extend Relationships:
    - Process Payment extends Generate Billing, since payment processing happens after billing.
    - Generate Reports extends Manage Stock, as reports are generated based on stock management activities.

USE CASE DIAGRAM

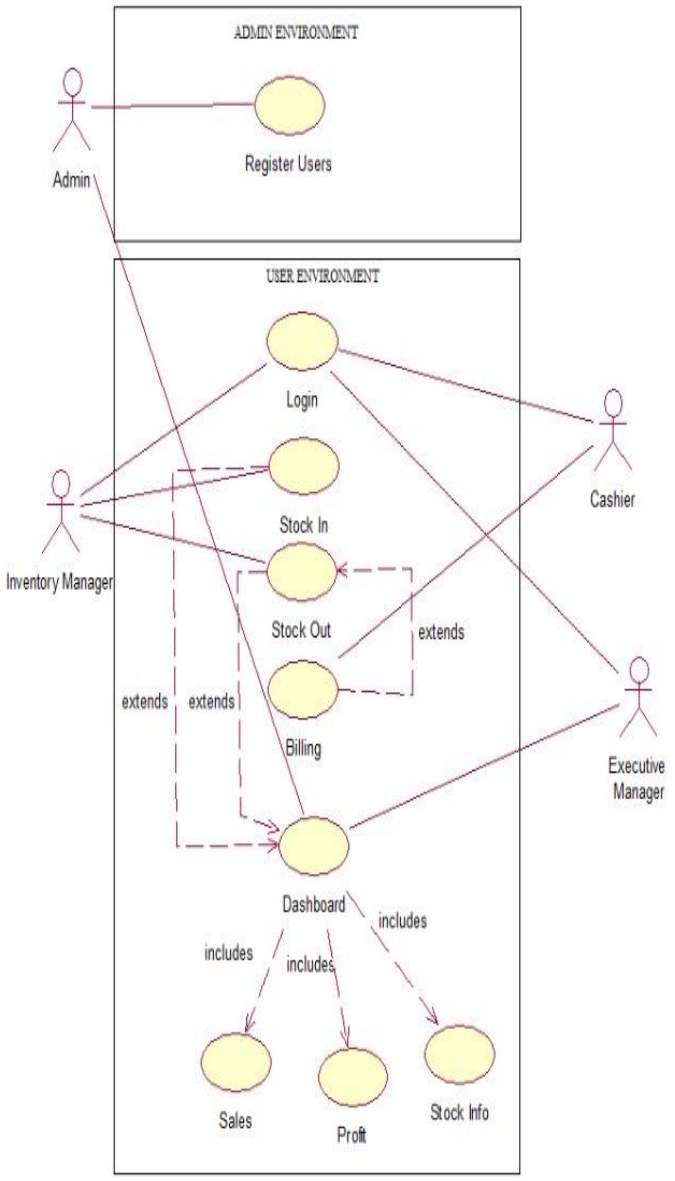

Figure 1: Use Case Diagram for Stock Inventory Management System

RESULT:

Thus, the development of a Use Case Diagram for the Stock Inventory Management System has been done successfully.