SOFTWARE REQUIREMENTS SPECIFICATION

for

Medical Shop Automation Software

Version 4.0

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REVISION HISTORY

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04/02/2025	1.0	SRS 1.0
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11/03/2025	4.0	SRS 4.0

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1 Introduction

1.1. Purpose

The purpose of this document is to outline the Software Requirements Specification (SRS) for the Medical Shop Automation Software, which is designed for a retail medicine shop that maintains various medicines in wall-mounted and numbered racks. The system aims to assist the shop owner in maintaining inventory efficiently, reducing overheads using Just-in-Time (JIT) inventory philosophy, and automating processes related to stock management, vendor interactions, and expiry tracking.

1.2. Scope

The system will allow the shop owner to:

- Maintain an optimal level of medicine inventory.
- Automate the process of ordering medicines when stock falls below a threshold.
- Generate daily reports listing medicines that need to be reordered.
- Record and manage supplier details for different medicines.
- Track new stock arrivals and update inventory with batch details and expiry dates.
- Manage medicines reaching expiration and generate vendor-wise lists for replacement.
- Query medicine details using trade name or generic name.
- Generate automated purchase orders and vendor cheques for supplied items.

This system aims to minimize manual effort, reduce human error, and enhance the efficiency of medicine inventory management.

1.3. Definitions, Acronyms, and Abbreviations

- **JIT (Just-in-Time):** Inventory strategy to reduce storage costs by restocking only when required.
- **SRS (Software Requirements Specification):** A detailed document outlining software requirements.
- **CRM (Customer Relationship Management):** Managing business interactions with suppliers and customers.
- **SKU (Stock Keeping Unit):** Unique identifier for each medicine.
- **MSAS:** Medicine Shop Automation System
- **UI:** User Interface
- **DBMS:** Database Management System
- **API:** Application Programming Interface
- **Admin:** A pharmacy administrator managing the system
- **POS:** Point of Sale

1.4. References

The references for this document are:

- Pharmacy Inventory Management Guidelines. link
- Just-in-Time Inventory Management Principles. link
- Industry Best Practices for Retail Pharmacy Operation. link

1.5. Overview

The remaining sections of this document provide detailed descriptions of the software's general characteristics, functional requirements, and constraints. Section 2 outlines the system's general description, including user characteristics and operational environment. Section 3 delves into specific requirements, encompassing functional, data, and external interface requirements. Section 4 offers supporting information relevant to the system's development and implementation.

2. Overall Description

2.1 Product Perspective

The MSAS will be a web-based and mobile-compatible application that integrates with existing healthcare systems for seamless medicine shop management. It will act as an interface between various modules, ensuring efficient inventory control, customer transactions, and prescription validation.

2.2 Product Functions

Medicine inventory management Sales processing and billing Prescription validation and management Stock level tracking and alerts Expiry date tracking and notifications Supplier management and order processing User authentication and role-based access control Customer transaction history and records management

2.3 User Characteristics

Admin: Can add, update, and delete medicine details, manage stock, and generate reports.
Pharmacist: Can issue medicines, process sales, update stock levels, and validate prescriptions.
Doctor: Can prescribe medicines and validate prescriptions through the system.
Customers: Can purchase medicines, view prescription details, and receive billing information.
Supplier: Can update stock supply records and fulfill medicine orders.

2.4 Constraints

The system must comply with healthcare regulations and industry standards. Secure authentication and data encryption are mandatory for sensitive information. Should support multi-user access with role-based permissions. Should be scalable to accommodate multiple pharmacy branches.

3. Specific Requirements

3.1 Functional Requirements

User Authentication: Secure login for different user roles.
Medicine Management: Add, update, delete medicine details, including price and expiry date.
Stock Monitoring: Track stock levels, generate alerts for low inventory, and notify expiry dates.
Sales Processing: Handle transactions, generate invoices, and maintain sales records.
Prescription Validation: Verify and store prescriptions, ensuring proper medication dispensing.
Reports & Analytics: Generate detailed reports on sales, stock levels, and customer transactions.
Supplier Management: Order medicines from suppliers and update inventory accordingly.

3.2 Non-Functional Requirements

Performance: The system should support concurrent users without latency or delays.
Security: Encrypted storage for sensitive information, including customer and prescription data.
Scalability: Should support multiple branches of a pharmacy chain and adapt to growing demands.
Availability: The system should maintain a high uptime and be accessible 24/7.
User-Friendliness: The UI should be intuitive and easy to navigate for users with minimal training.

3.3 External Interface Requirements

User Interface: A clean, responsive UI for desktops and mobile devices.
Hardware Requirements: Cloud-based or on-premises deployment, compatible with barcode scanners and POS systems.
Software Requirements: Compatible with standard web browsers and mobile platforms (iOS, Android).

4 Data Dictionary

4.1 Medicine Table

Stores information about medicines

Column Name	Data Type	Description	Constraints
medicine_id	INT	Unique identifier for medicine	PRIMARY KEY, AUTO_INCREMENT
name	VARCHAR(255)	Medicine name	NOT NULL
generic_name	VARCHAR(255)	Generic name of the medicine	NOT NULL
batch_number	VARCHAR(50)	Batch number	UNIQUE, NOT NULL
manufacturer	VARCHAR(255)	Manufacturer name	NOT NULL
expiry_date	DATE	Expiry date of medicine	NOT NULL
price	DECIMAL(10,2)	Price per unit	NOT NULL
stock_quantity	INT	Available stock	NOT NULL

4.2 Inventory Table

Stores information about the inventory

Column Name	Data Type	Description	Constraints
inventory_id	INT	Unique identifier for inventory	PRIMARY KEY, AUTO_INCREMENT
medicine_id	INT	Foreign key linking to Medicine	FOREIGN KEY REFERENCES Medicine(medicine_id)
stock_quantity	INT	Quantity in stock	NOT NULL
reorder_level	INT	Minimum stock before reorder	NOT NULL

4.3 Sales Table

Stores information about the sales

Column Name	Data Type	Description	Constraints
sales_id	INT	Unique identifier for sales entry	PRIMARY KEY, AUTO_INCREMENT
customer_id	INT	Foreign key linking to Customer	FOREIGN KEY REFERENCES Customer(customer_id)
medicine_id	INT	Foreign key linking to Medicine	FOREIGN KEY REFERENCES Medicine(medicine_id)
quantity	INT	Quantity sold	NOT NULL
total_price	DECIMAL(10,2)	Total sale price	NOT NULL
sale_date	TIMESTAMP	Date and time of sale	DEFAULT CURRENT_TIMESTAMP

4.4 Supplier Table

Stores information about supplier

Column Name	Data Type	Description	Constraints
supplier_id	INT	Unique identifier for supplier	PRIMARY KEY, AUTO_INCREMENT
name	VARCHAR(255)	Supplier name	NOT NULL
contact	VARCHAR(15)	Contact number	NOT NULL, UNIQUE
email	VARCHAR(255)	Supplier email	NOT NULL, UNIQUE
address	TEXT	Supplier address	NOT NULL

4.5 Purchase Orders Table

Stores information about purchase orders

Column Name	Data Type	Description	Constraints
order_id	INT	Unique identifier for order	PRIMARY KEY, AUTO_INCREMENT
supplier_id	INT	Foreign key linking to Supplier	FOREIGN KEY REFERENCES Supplier(supplier_id)
medicine_id	INT	Foreign key linking to Medicine	FOREIGN KEY REFERENCES Medicine(medicine_id)
order_quantity	INT	Quantity ordered	NOT NULL
order_date	DATE	Date of order	DEFAULT CURRENT_TIMESTAMP
status	ENUM('Pending', 'Completed', 'Cancelled')	Order status	DEFAULT 'Pending'

4.6 Customer Table

Stores information about customers

Column Name	Data Type	Description	Constraints
customer_id	INT	Unique identifier for customer	PRIMARY KEY, AUTO_INCREMENT
name	VARCHAR(255)	Customer name	NOT NULL
contact	VARCHAR(15)	Contact number	NOT NULL, UNIQUE
email	VARCHAR(255)	Customer email	UNIQUE

4.7 Prescription Table

Stores information about prescriptions

Column Name	Data Type	Description	Constraints
prescription_id	INT	Unique prescription identifier	PRIMARY KEY, AUTO_INCREMENT
customer_id	INT	Foreign key linking to Customer	FOREIGN KEY REFERENCES Customer(customer_id)
medicine_id	INT	Foreign key linking to Medicine	FOREIGN KEY REFERENCES Medicine(medicine_id)
prescribed_by	VARCHAR(255)	Doctor's name	NOT NULL
prescription_date	DATE	Date of prescription	DEFAULT CURRENT_TIMESTAMP

4.8 Billing Table

Stores information about bills

Column Name	Data Type	Description	Constraints
bill_id	INT	Unique identifier for bill	PRIMARY KEY, AUTO_INCREMENT
sales_id	INT	Foreign key linking to Sales	FOREIGN KEY REFERENCES Sales(sales_id)
total_amount	DECIMAL(10,2)	Total bill amount	NOT NULL
payment_method	ENUM('Cash', 'Card', 'Online')	Payment method	NOT NULL
billing_date	TIMESTAMP	Date and time of billing	DEFAULT CURRENT_TIMESTAMP

4.9 User Authentication Table

Stores information about users

Column Name	Data Type	Description	Constraints
user_id	INT	Unique identifier for user	PRIMARY KEY, AUTO_INCREMENT
username	VARCHAR(255)	Login username	NOT NULL, UNIQUE
password	VARCHAR(255)	Encrypted password	NOT NULL
role	ENUM('Admin', 'Pharmacist', 'Supplier')	User role	NOT NULL

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5 Data Flow Diagram (DFD)

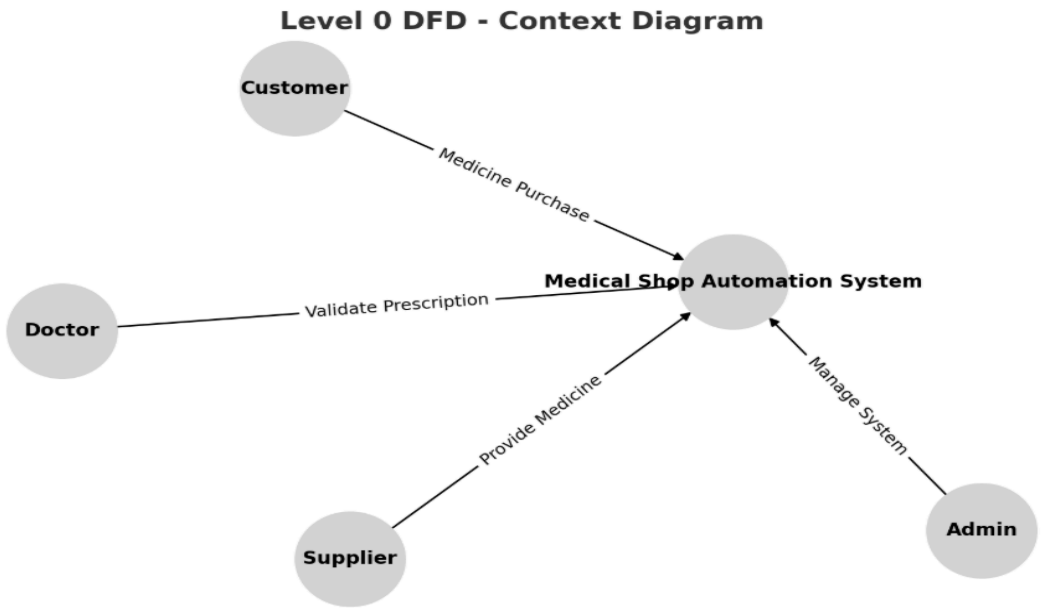
Levels of DFDs:

- ➢ Level 0 (Context Design):
- ➢ Level 1:
- ➢ Level 2:

5.1 Level 0 DFD (Context Diagram)

Level 0, also called the Context Diagram, provides an overview of the entire system as a single process with external entities interacting with it. The main external entities involved are:

- ➢ Admin (manages the system)
- ➢ Pharmacist (handles sales and prescriptions)
- ➢ Supplier (provides medicines)
- ➢ Customer (purchases medicines)
- ➢ Doctor (validates prescriptions)

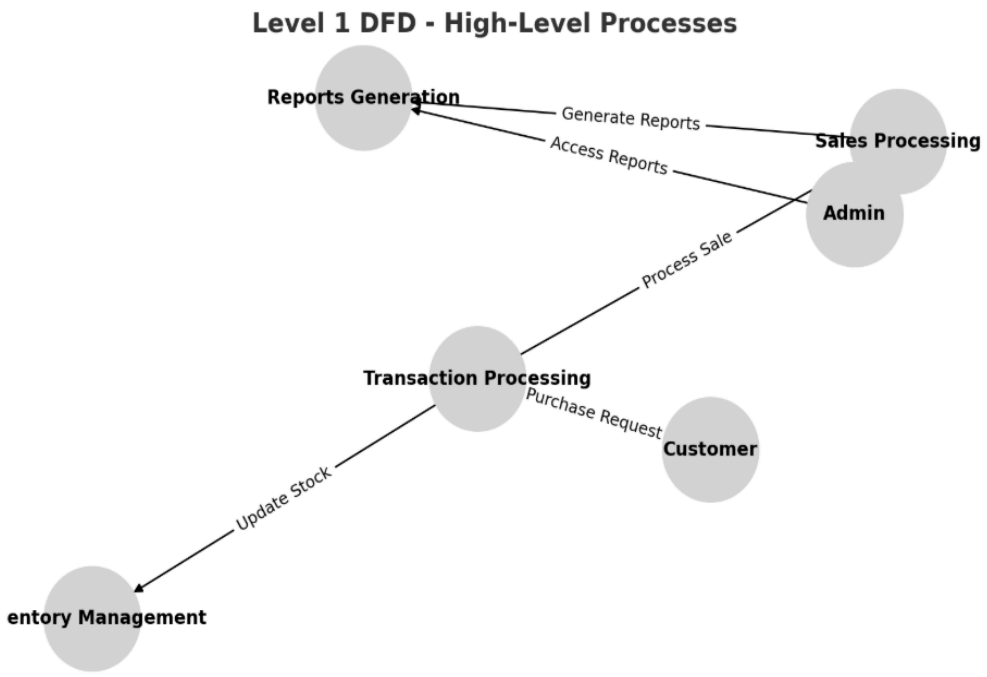


5.2 Level 1 DFD

Level 1 DFD expands the main system process into multiple subprocesses, showing how different parts interact within the system.

Processes in Level 1 DFD:

- ➢ User Authentication – Ensures secure login for Admin, Pharmacist, and Suppliers.
- ➢ Medicine Inventory Management – Updates and tracks stock levels.
- ➢ Sales Processing – Handles customer purchases and billing.
- ➢ Prescription Validation – Doctors verify prescriptions before dispensing medicine.
- ➢ Supplier Management – Manages medicine restocking from suppliers.

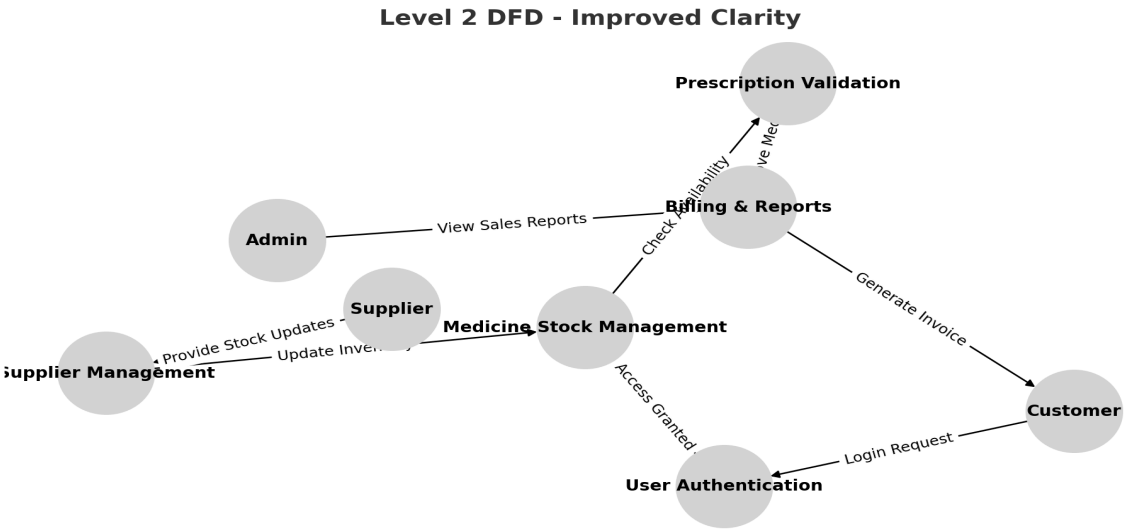


5.3 Level 2 DFD

Level 2 DFD provides a deeper breakdown of each process within the system.

- ➢ Processes in Level 2 DFD:
- ➢ User Authentication
  - ○ Verify Login Credentials
  - ○ Grant Access Based on Role
- ➢ Medicine Inventory Management
  - ○ Update Stock Levels
  - ○ Generate Expiry Notifications
  - ○ Place Restocking Orders
- ➢ Sales Processing
  - ○ Generate Bills
  - ○ Update Sales Records
  - ○ Process Online Payments
- ➢ Prescription Validation
  - ○ Validate Prescription from Doctor
  - ○ Match Prescription to Medicine Stock
- ➢ Supplier Management
  - ○ Send Purchase Orders

- Receive Supplies
- Update Supplier Database



6. Use Case Diagram

6.1 Introduction

The use case diagram for the Medical Shop Automation Software represents the various interactions between the system and its users. It provides a visual representation of how different actors interact with the system's functionalities to streamline operations within the medical shop.

6.2 Actors

- Admin: Oversees the entire system, manages user roles, and controls permissions.
- Manager: Manages the system, inventory, and orders.
- Customer: Searches for medicines, places orders, and makes payments.

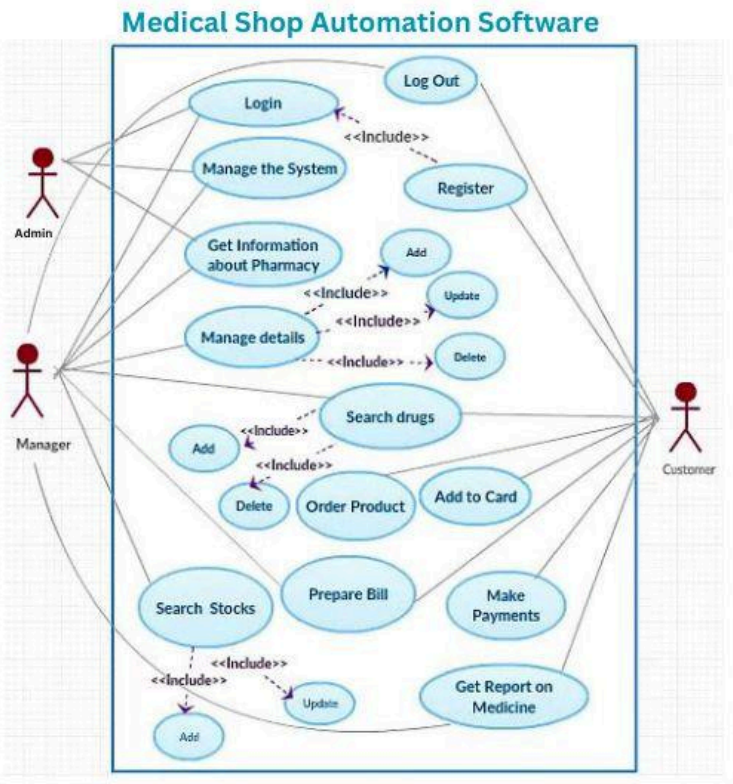
6.3 Use Cases

1. Login & Registration
    - Users must authenticate themselves to access the system.
    - Registration allows new users to create accounts.

2. Manage System
    - The manager can control various system functionalities, including pharmacy details and inventory.
3. Search and Order Medicines
    - Customers can search for available medicines.
    - Customers can add medicines to their cart and place orders.
4. Billing and Payments
    - The system generates bills for purchases.
    - Customers can make payments for their orders.
5. Stock Management
    - The manager can track and update stock levels.
    - The system alerts when stock is low.
6. Reports and Analysis
    - The manager can generate reports on medicines, sales, and inventory.

6.4 Use Case Diagram

Below is the use case diagram representing the interactions within the system:



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This diagram visually explains the relationships between users and the system's key functionalities, ensuring efficient medical shop management.

7 E-R Diagram and Class Diagram

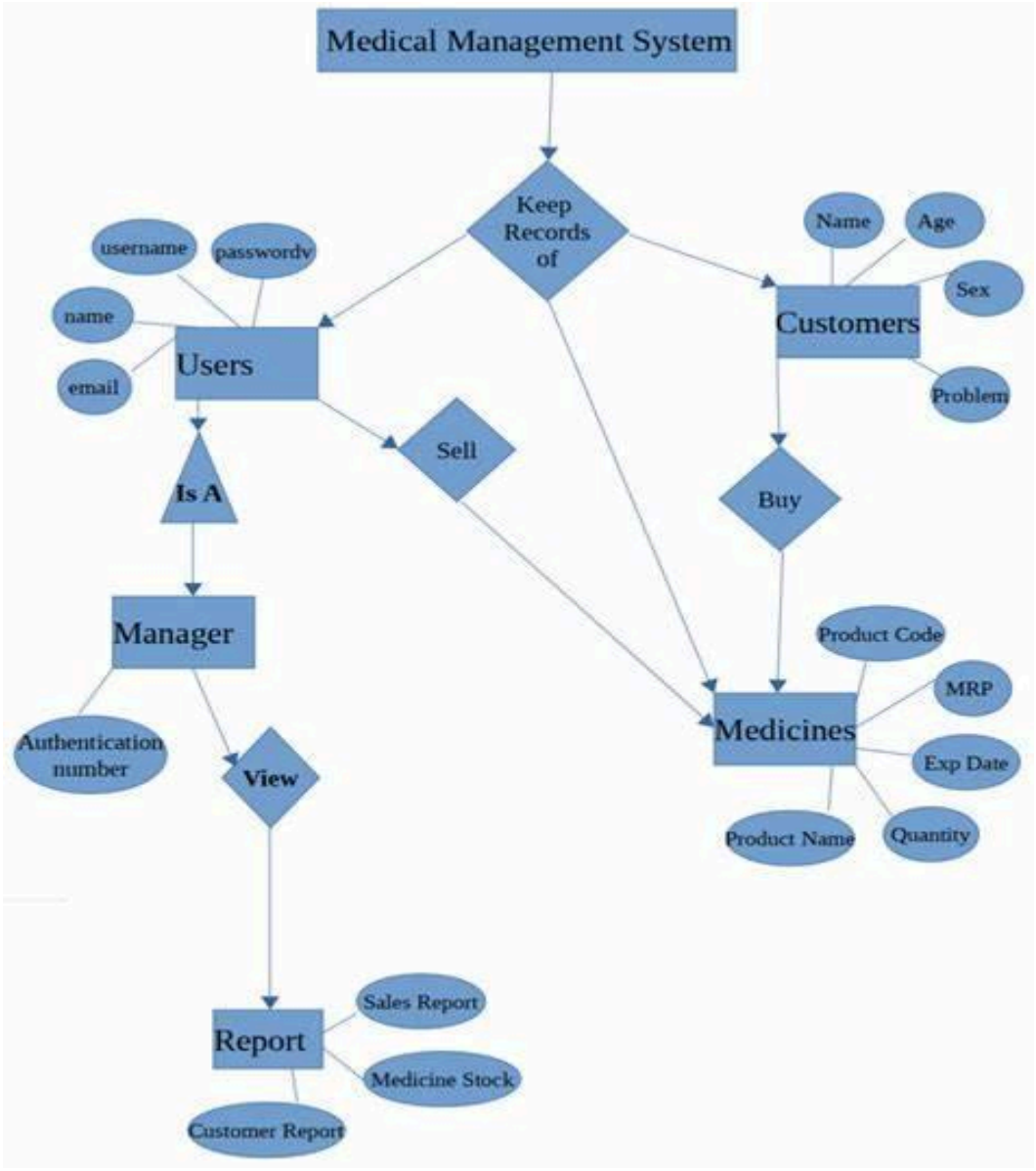

Fig : E-R Diagram

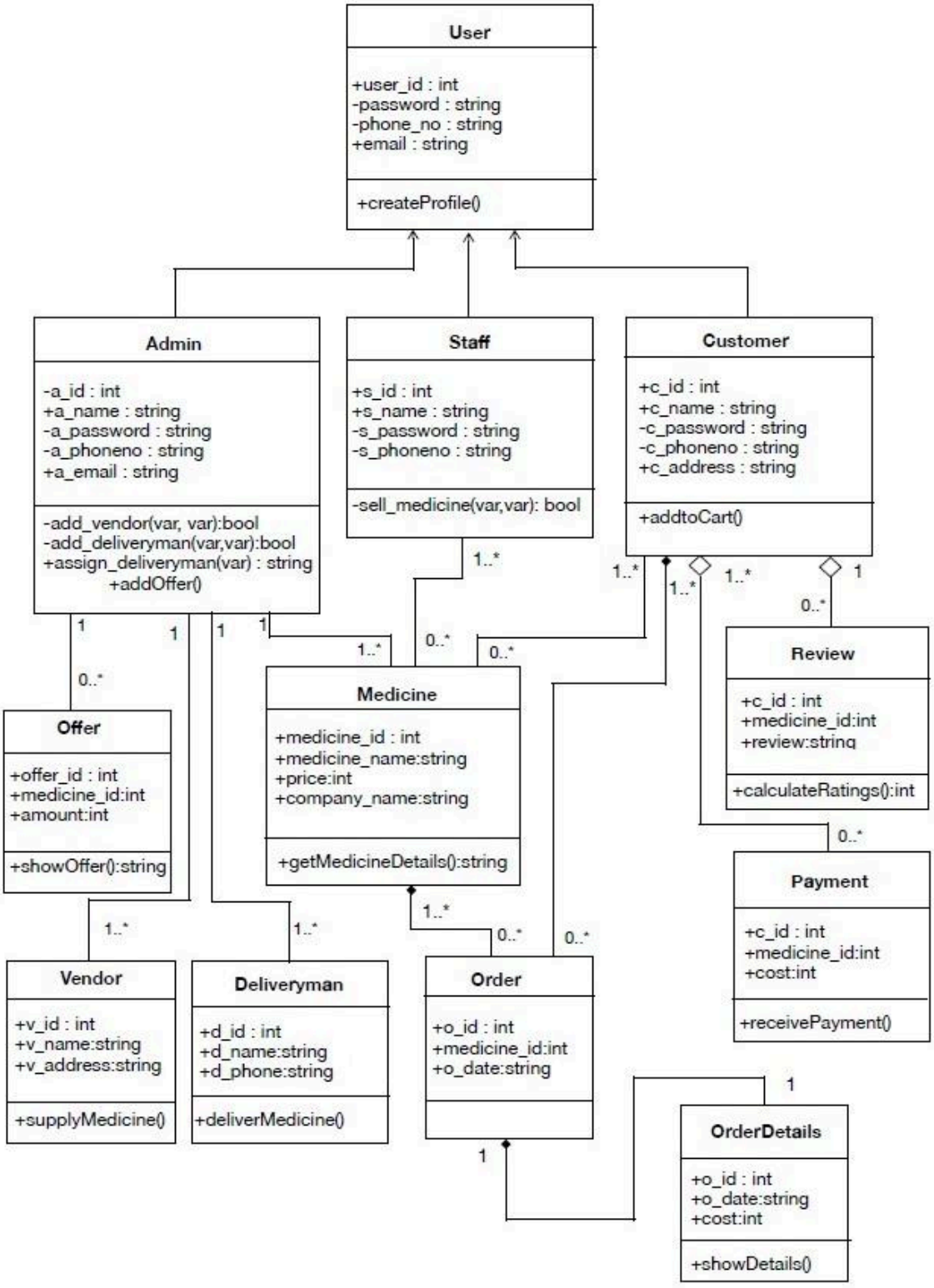

Fig : Class Diagram

8 Activity Diagram

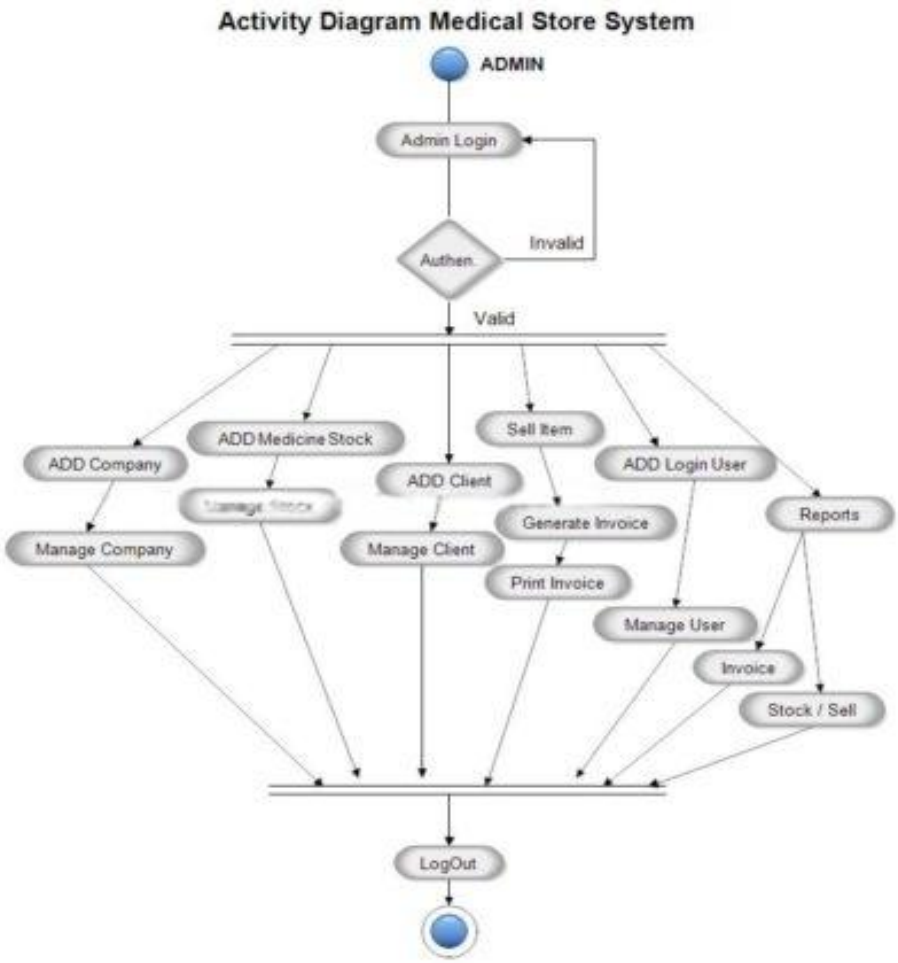

Fig : Activity Diagram