PHARMACY INFORMATION SYSTEM : A FRAMEWORK FOR AUTOMATED PRESCRIPTION AND REAL-TIME STOCK MONITORING

23PMC306
MINI PROJECT REPORT

Submitted by

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In partial fulfillment of the requirement

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in

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KOMARAPALAYAM – 637303

NOV-DEC 2024

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BONAFIDE CERTIFICATE

Certified that this project report titled **"PHARMACY INFORMATION SYSTEM: A FRAMEWORK FOR AUTOMATED PRESCRIPTION AND REAL-TIME STOCK MONITORING"** is the bonafide work of **VISHAL KUMAR SINGH (Reg.no: 730923632059),** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported here in does not form part of any other project report dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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Internal Examiner **External Examiner**

DECLARATION

I jointly declare that the project report on **“PHARMACY INFORMATION SYSTEM: A FRAMEWORK FOR AUTOMATED PRESCRIPTION AND REAL-TIME STOCK MONITORING”** is the result of original work done by me and best of my knowledge, similar work has not been submitted to **“ANNA UNIVERSITY, CHENNAI”** for the requirement of Degree of **MASTER OF COMPUTER APPLICATIONS**. This project report is submitted on the partial fulfillment of the requirement of the award of Degree of **MASTER OF COMPUTER APPLICATIONS**.

Signature

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Place: Komarapalayam

Date:

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ABSTRACT

The ***Pharmacy Information System: A Framework for Automated Prescription and Real-Time Stock Monitoring*** is a Java-based solution aimed at revolutionizing pharmacy operations by automating critical processes. Traditional pharmacy systems rely heavily on manual prescription handling and inventory tracking, leading to inefficiencies, errors, and stockouts that affect patient care and business operations.

This project addresses these challenges through a robust, integrated system that automates prescription generation, updates stock levels in real time, and provides timely alerts for low inventory. Key features include dynamic stock monitoring, low-stock notifications, role-based access control, and comprehensive reporting capabilities.

The system is divided into two main modules: stock monitoring, and admin reporting. The stock monitoring module ensures real-time visibility into inventory levels and triggers alerts for timely replenishment. Meanwhile, the admin module provides actionable insights through reports, enabling efficient decision-making.

By reducing manual errors, improving operational efficiency, and ensuring uninterrupted availability of medicines, this system aims to enhance pharmacy management. Furthermore, it lays the groundwork for future enhancements such as AI-driven medication recommendations, mobile app integration for remote access, and third-party system connectivity.

The Pharmacy Information System ultimately serves as a scalable and reliable framework that bridges the gap between technology and efficient healthcare delivery, ensuring better outcomes for pharmacies and patients alike.

CHAPTER 1

INTRODUCTION

Pharmacies play a critical role in the healthcare industry by ensuring patients receive the necessary medications for their treatment. However, traditional pharmacy systems often rely on manual processes for handling prescriptions and inventory, which are prone to errors, inefficiencies, and delays. These limitations can lead to medication shortages, incorrect dosages, and mismanagement of inventory, ultimately impacting patient safety and satisfaction. In this context, integrating technology into pharmacy operations becomes essential to improve efficiency, accuracy, and overall patient care.

1.1 BACKGROUND

Pharmacy operations typically involve a range of activities, including managing prescriptions, monitoring inventory, handling stock replenishment, and generating reports. In manual or semi-automated systems, these processes are often disjointed and time-consuming. Pharmacists may spend considerable time writing prescriptions, updating inventory logs, and manually tracking stock levels. This not only hampers efficiency but also introduces risks such as human errors and delayed decision-making.

Studies have shown that errors in prescription handling and stock mismanagement contribute significantly to pharmacy-related operational challenges. For instance, handwritten prescriptions may result in misinterpretation by pharmacists, leading to incorrect dispensation of medicines. Similarly, a lack of real-time inventory visibility can result in stockouts of critical medicines, negatively affecting patient outcomes.

1.2 PROBLEM STATEMENT

Traditional pharmacy systems face several challenges that hinder their efficiency:

1. **Errors in manual prescriptions:** Handwritten or manually generated prescriptions can be misread or incorrectly prepared, leading to improper medication dispensation.

2. **Inefficient inventory tracking:** Manual or spreadsheet-based stock monitoring systems fail

to provide real-time updates, leading to delays in identifying low-stock situations.

3. **Lack of automation:** Tasks like inventory replenishment alerts and prescription management are largely manual, resulting in time inefficiencies.

4. **Limited reporting capabilities:** Without proper reports, pharmacies struggle to analyze inventory trends or sales patterns effectively.

1.3 OBJECTIVES

This project aims to address these challenges by creating a robust *Pharmacy Information System* with the following objectives:

- Automate the prescription generation process, reducing human errors.
- Implement real-time stock monitoring to ensure medicines are always available.
- Provide automated alerts for low stock levels to avoid stockouts.
- Introduce role-based user access for secure and efficient system operations.
- Enable detailed reporting for better decision-making and inventory control.

1.4 SCOPE

The system is designed to cater to both small and large pharmacies, providing scalable features to meet their needs. It includes:

- **Prescription Automation:** Enables pharmacists to generate prescriptions quickly based on patient and doctor inputs.

- **Real-Time Inventory Management:** Tracks stock dynamically, updating quantities automatically as medicines are dispensed.

- **Low-Stock Alerts:** Sends notifications to the admin when stock levels fall below predefined thresholds.

- **Reporting Module:** Provides detailed insights into inventory trends, sales data, and stock movements.

- **Role-Based Access Control:** Ensures secure operations by restricting access to certain features based on user roles (e.g., Admin vs. Pharmacist).

1.5 SIGNIFICANCE OF THE PROJECT

By automating core pharmacy operations, the proposed system reduces manual effort, increases accuracy, and improves the overall efficiency of pharmacy management. Patients benefit from timely medication availability, while pharmacists and admins gain better control over stock and prescriptions. Additionally, the system provides a foundation for future enhancements, such as

CHAPTER 2

SYSTEM REQUIREMENTS

The Pharmacy Information System requires specific hardware and software configurations to ensure smooth operation and optimal performance. This section outlines the functional, hardware, and software requirements essential for the development and deployment of the system.

2.1 HARDWARE REQUIREMENTS

The hardware specifications ensure the system operates efficiently across in a pharmacy.

Processor Type	: Intel i5
RAM	: 8GB DD4 RAM
Hard disk	: 1TB
Keyboard	: 101/102 Standard Keys
Mouse	: Optical Mouse
Monitor	: LCD/LED Monitor

2.2 SOFTWARE REQUIREMENTS

The software stack includes tools and technologies required for developing, deploying, and operating the system.

Operating System	: Windows 11
Front end	: Net beans IDE / jdk21
Back	: MySQL workbench /MySQL 8.0CE
Coding Language	: Java , MySQL

2.3 FUNCTIONAL REQUIREMENTS

Functional requirements define the specific features and functionalities of the system. They ensure the system fulfills the objectives of automating prescriptions and real-time inventory monitoring.

2.3.1 User Management:

- Admin can add, edit, or remove users (pharmacists and other staff).
- Role-based access ensures only authorized personnel can perform critical tasks (e.g., stock updates by Admin).

2.3.2 Inventory Management:

- Dynamic inventory updates when stock is added or medicines are dispensed.
- Batch tracking and expiry date monitoring.

2.3.3 Low-Stock Alerts:

- Automatic notifications to Admin for medicines nearing threshold levels.
- Alerts displayed in the dashboard and sent via email (if applicable).

CHAPTER 3

EXISTING SYSTEM

The existing systems in most pharmacies, especially small to medium-sized ones, heavily rely on manual processes or semi-automated tools for managing prescriptions and inventory. While these methods have served pharmacies for decades, they come with significant drawbacks that impact efficiency, accuracy, and overall operational effectiveness.

3.1 OVERVIEW OF THE EXISTING SYSTEM

The existing system consists of the following major components:

1. **Manual Prescription Handling:**
   - Prescriptions are handwritten by doctors or pharmacists.
   - Pharmacists manually interpret prescriptions to dispense medicines.
2. **Inventory Management:**
   - Inventory tracking is often performed using spreadsheets or manual logs.
   - Stock counts are updated manually after medicines are dispensed or received.
3. **Reporting and Analytics:**
   - Reports, if generated, are prepared manually or rely on simple spreadsheet tools.
   - Trend analysis and forecasting are rarely performed due to time constraints or lack of tools.
4. **Communication with Suppliers:**
   - Stock replenishment is handled manually by contacting suppliers via phone or email.
   - There is no automated link between stock levels and supplier communication.

3.2 LIMITATIONS OF EXISTING SYSTEM

- High dependency on human effort increases the chances of errors.
- Existing systems are not integrated with other healthcare or supplier systems.
- Difficult to synchronize operations with hospital systems or online pharmacies.
- Data is often stored in unsecured formats, making it vulnerable to breaches.
- No encryption or role-based access to protect sensitive information.
- Manual inventory systems fail to track expiry dates effectively.

- Unsold expired medicines result in financial losses and regulatory non-compliance.

3.3 LITERATURE REVIEW

Research and studies have highlighted the inefficiencies and risks associated with traditional pharmacy systems:

1. According to a study by the *Journal of Pharmacy Practice* (2020), manual processes in pharmacies lead to a **15-20% increase in operational delays** and a **10% higher risk of medication errors** compared to automated systems.
2. A report by *World Health Organization (WHO)* emphasized that outdated inventory systems contribute to frequent stock outs in 35% of pharmacies worldwide, significantly impacting patient satisfaction.
3. Studies in *Healthcare IT Journal* (2021) show that automated pharmacy systems reduce inventory discrepancies by up to **30%** and improve stock replenishment efficiency by **40%**.

CHAPTER 4

PROPOSED SYSTEM

The proposed ***Pharmacy Information System: A Framework for Automated Prescription and Real-Time Stock Monitoring*** is designed to address the limitations of the existing system by introducing a fully automated, efficient, and scalable solution. This system integrates advanced technologies to streamline pharmacy operations, enhance accuracy, and ensure uninterrupted stock availability, ultimately improving patient care and business efficiency.

s

4.1 FEATURES OF THE PROPOSED SYSTEM

□ **Automated Prescription Module:**

- Pharmacists can quickly create and manage digital prescriptions.
- The system ensures prescriptions are error-free and aligned with available stock.

□ **Real-Time Inventory Management:**

- Updates stock levels automatically as medicines are dispensed or restocked.
- Tracks batch numbers, expiry dates, and reorder points dynamically.

□ **Role-Based Access Control:**

- Provides secure access for different user roles (e.g., Admin, Pharmacist).
- Ensures that sensitive operations like stock updates are restricted to authorized users.

□ **Reporting and Analytics:**

- Generates detailed reports on inventory status, sales trends, and prescription history.
- Provides actionable insights for better decision-making and stock planning.

□ **User-Friendly Interface:**

- Simplified, intuitive dashboards for admins and pharmacists.
- Mobile-friendly design for remote access.

□ **Supplier Integration:**

- Automates stock replenishment by linking inventory levels with supplier systems.
- Facilitates efficient communication and order management.

4.2 ADVANTAGES OF THE PROPOSED SYSTEM

- **Increased Efficiency:**
  - Automating routine tasks reduces manual effort and processing time.
  - Real-time updates improve responsiveness to stock and prescription demands.
- **Enhanced Accuracy:**
  - Eliminates human errors in prescription handling and inventory tracking.
  - Ensures accurate stock data for better decision-making.
- **Improved Customer Satisfaction:**
  - Timely availability of medicines enhances patient care.
  - Faster prescription handling reduces customer waiting times.
- **Cost Savings:**
  - Prevents revenue loss due to stock outs and expired medicines.
  - Reduces labour costs by automating repetitive tasks.
- **Scalability and Integration:**
  - Supports growing business needs with a modular design.
  - Allows seamless integration with hospital systems and third-party apps.

CHAPTER 5

MODULE ARCHITECTURE

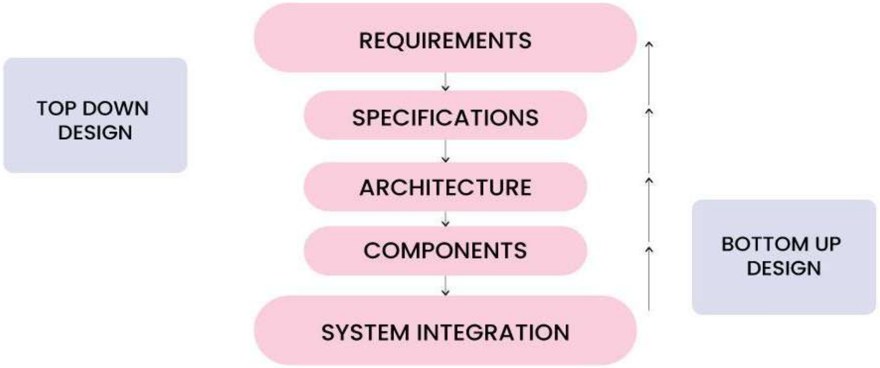
5.1 MODULES OVERVIEW

The module that is used in the PHARMACY INFORMATION SYSTEM : A FRAMEWORK FOR AUTOMATED PRESCRIPTION AND REAL-TIME STOCK MONITORING in computerized by using java.

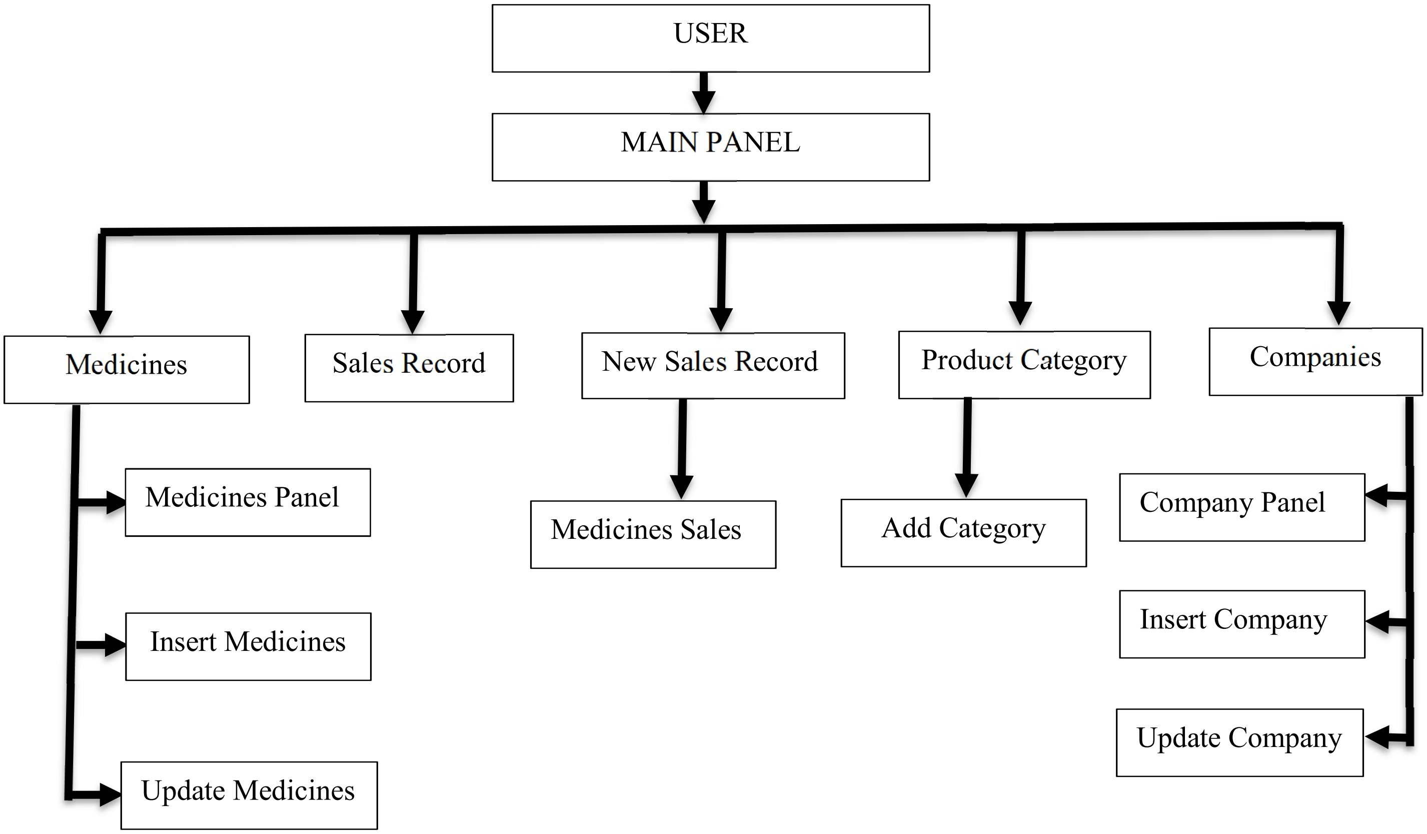
- Main Panel
- Login
- User Registration
- Create User
- Change Password
- Medicines
  - ✓Insert Medicines
  - ✓Medicines Panel
  - ✓Update Medicines
- Sales Record
- New Sales Record
- Product Category
  - ✓Add Category
- Companies
  - ✓Companies Panel
  - ✓Insert Company
  - ✓Update Company
- Connection to Database

5.3 ANALYSIS MODEL

SYSTEMS ANALYSIS DIAGRAM



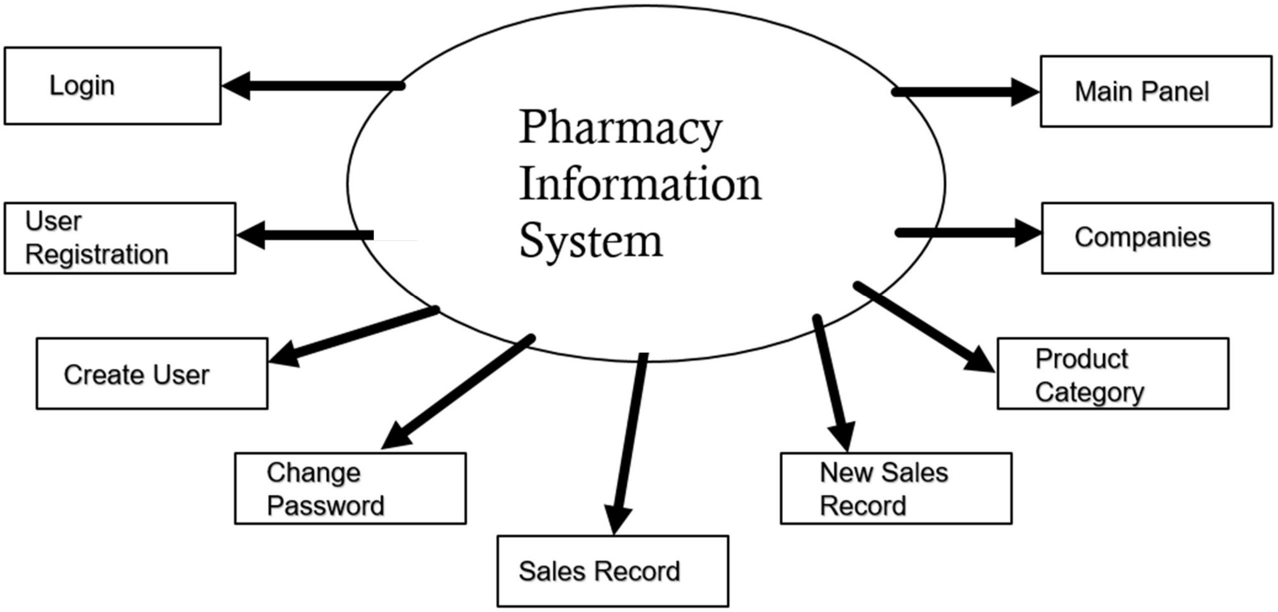
5.3 ARCHITECTURE



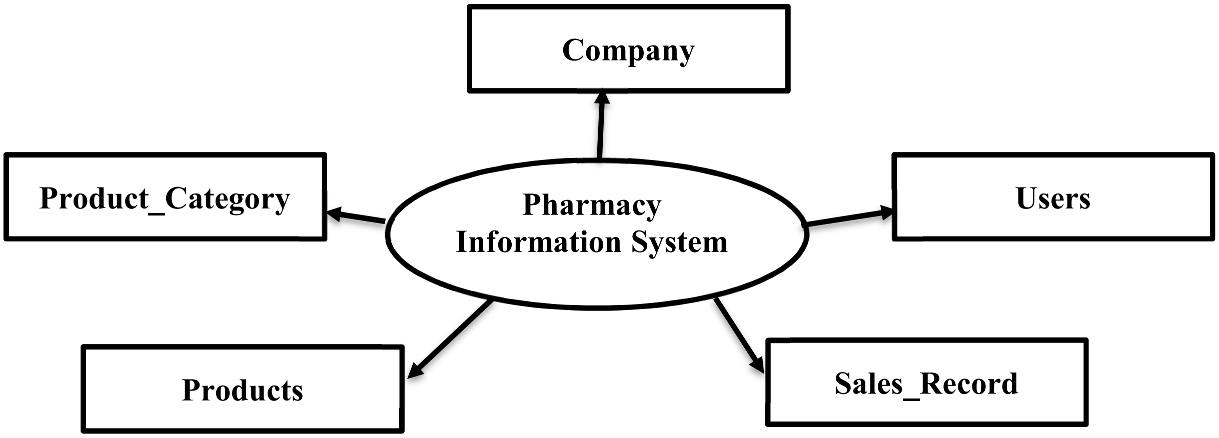
CHAPTER 6

FLOW DIAGRAM

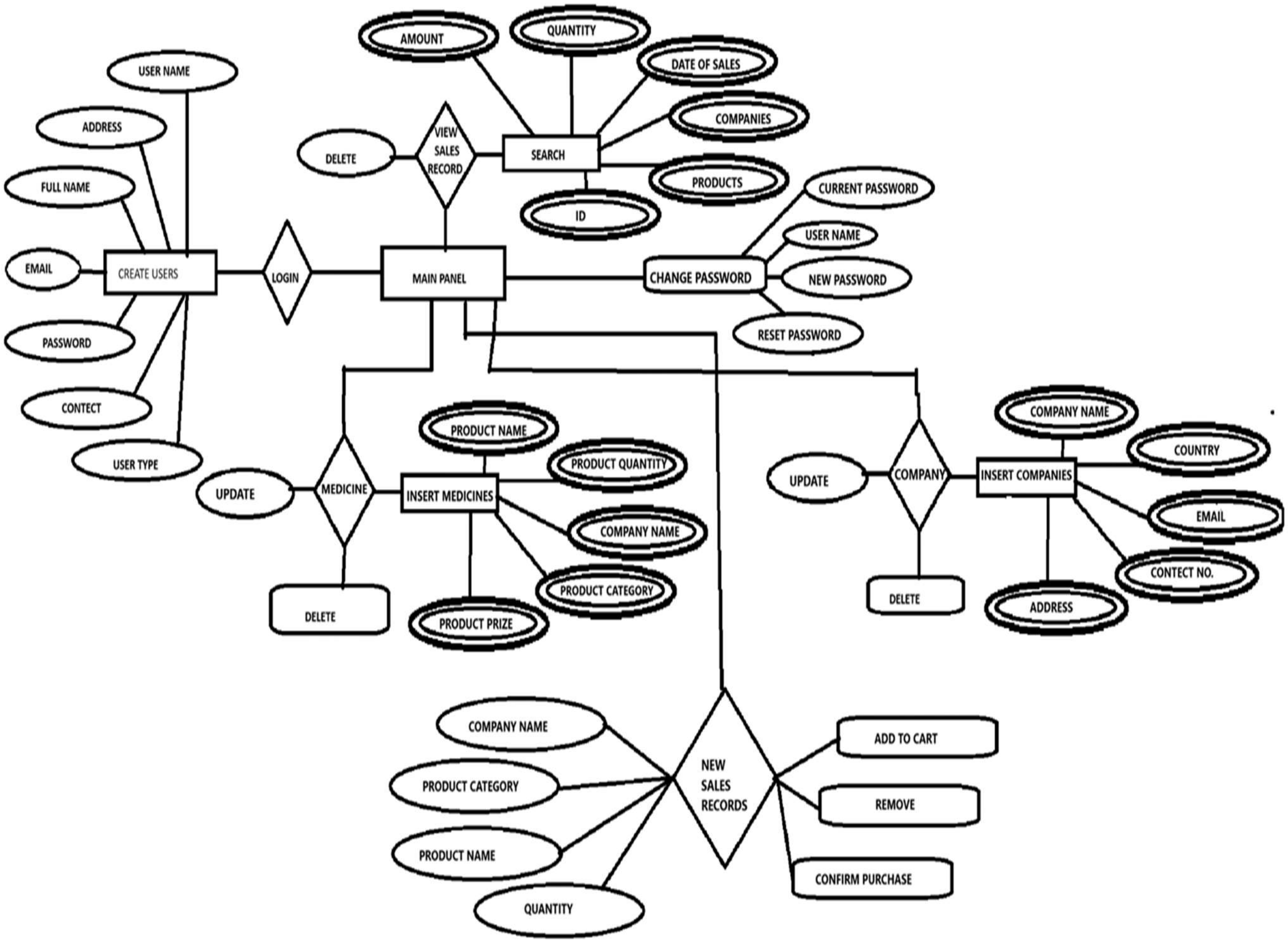
6.1 SYSTEM FLOW DIAGRAM



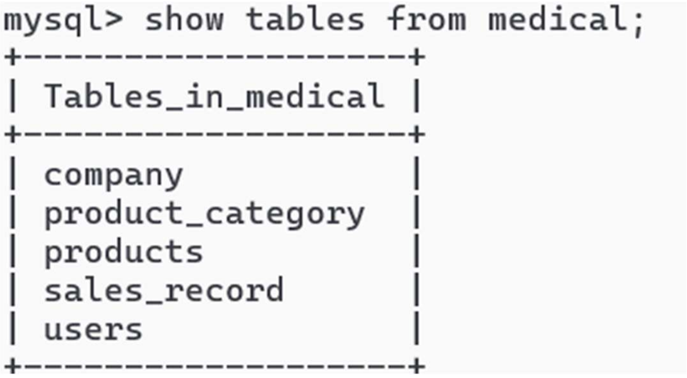
6.3 DATABASE DIAGRAM



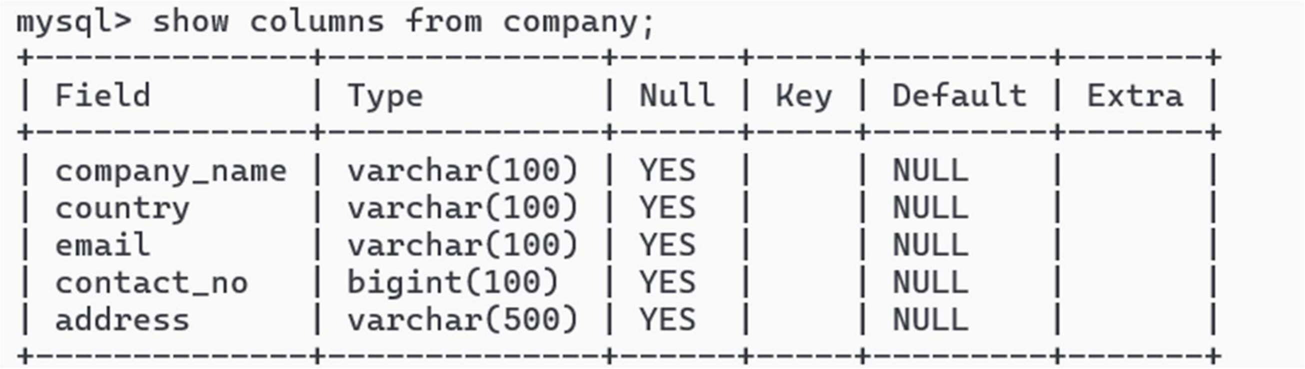
6.3 ER DIAGRAM



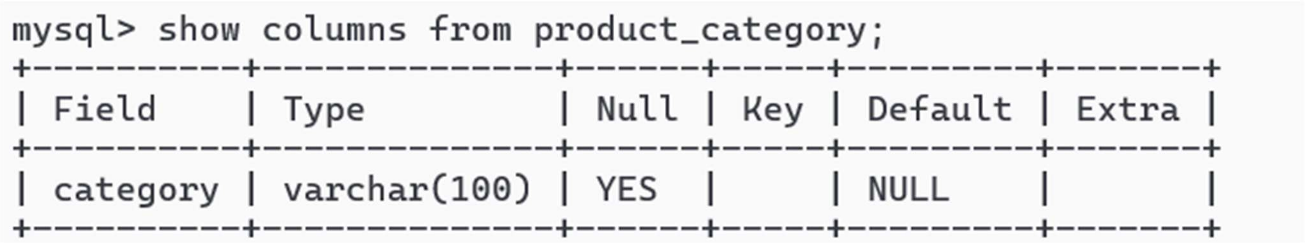
6.4. DATA FLOW DIAGRAM



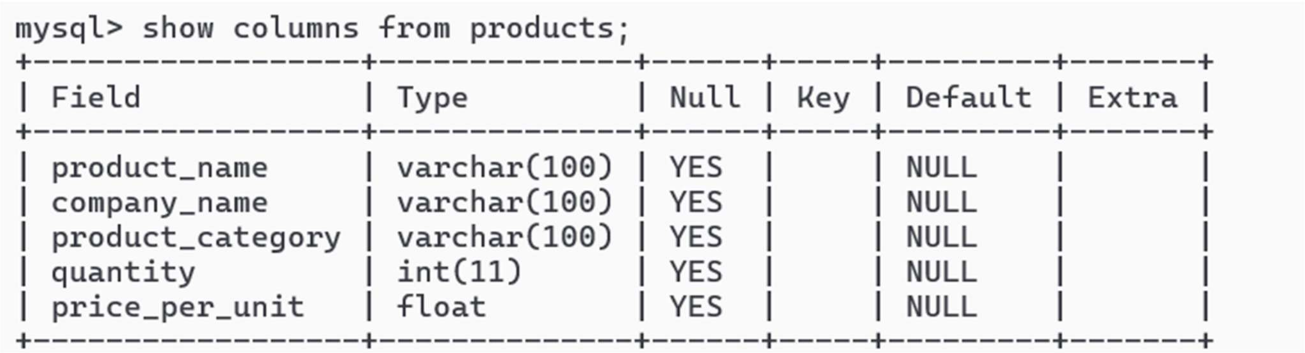
```
mysql> show tables from medical;
+-------------------+
| Tables_in_medical |
+-------------------+
| company           |
| product_category  |
| products          |
| sales_record      |
| users             |
+-------------------+
```



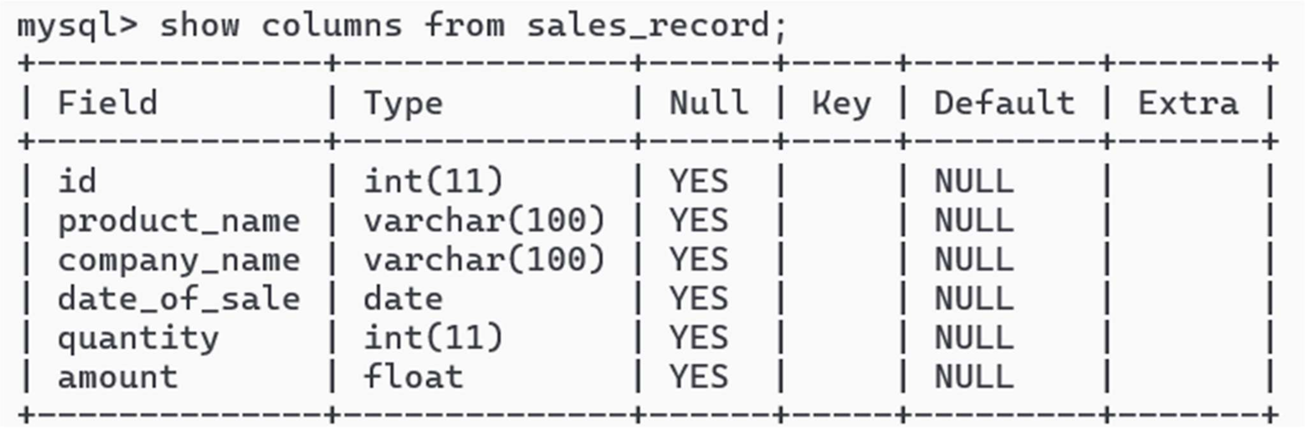
```
mysql> show columns from company;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| company_name | varchar(100) | YES  |     | NULL    |       |
| country      | varchar(100) | YES  |     | NULL    |       |
| email        | varchar(100) | YES  |     | NULL    |       |
| contact_no   | bigint(100)  | YES  |     | NULL    |       |
| address      | varchar(500) | YES  |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
```



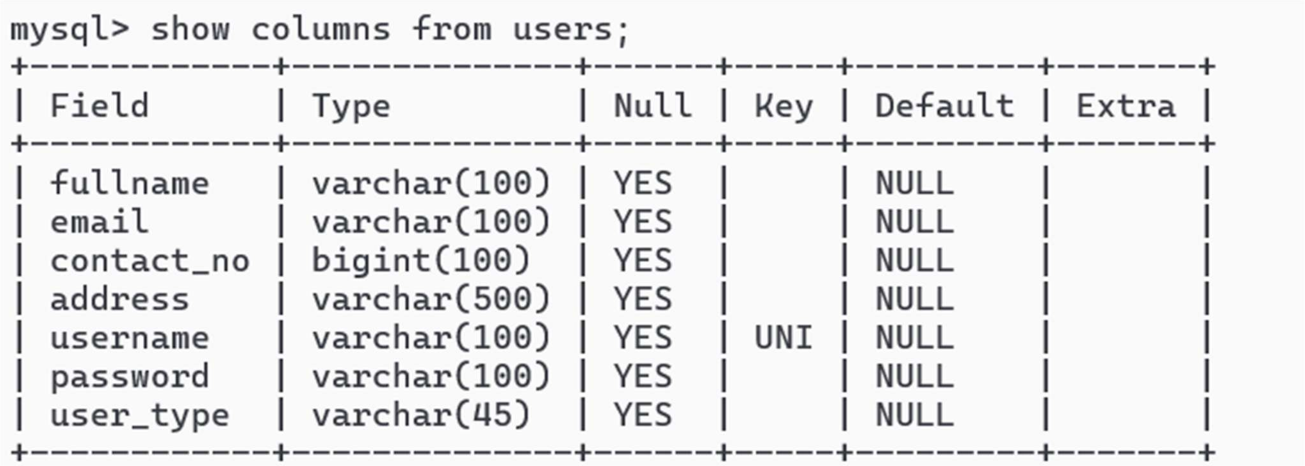
```
mysql> show columns from product_category;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| category | varchar(100) | YES  |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
```



```
mysql> show columns from products;
+------------------+--------------+------+-----+---------+-------+
| Field            | Type         | Null | Key | Default | Extra |
+------------------+--------------+------+-----+---------+-------+
| product_name     | varchar(100) | YES  |     | NULL    |       |
| company_name     | varchar(100) | YES  |     | NULL    |       |
| product_category | varchar(100) | YES  |     | NULL    |       |
| quantity         | int(11)      | YES  |     | NULL    |       |
| price_per_unit   | float        | YES  |     | NULL    |       |
+------------------+--------------+------+-----+---------+-------+
```

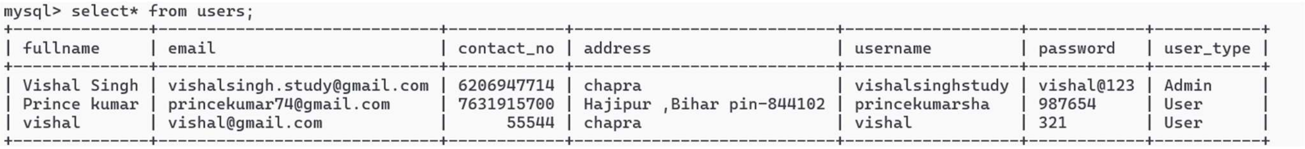


```
mysql> show columns from sales_record;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| id           | int(11)      | YES  |     | NULL    |       |
| product_name | varchar(100) | YES  |     | NULL    |       |
| company_name | varchar(100) | YES  |     | NULL    |       |
| date_of_sale | date         | YES  |     | NULL    |       |
| quantity     | int(11)      | YES  |     | NULL    |       |
| amount       | float        | YES  |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
```

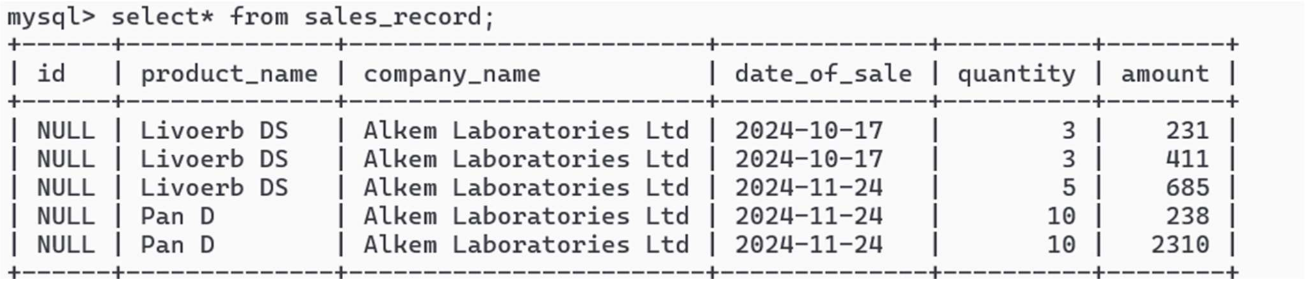


```
mysql> show columns from users;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| fullname   | varchar(100) | YES  |     | NULL    |       |
| email      | varchar(100) | YES  |     | NULL    |       |
| contact_no | bigint(100)  | YES  |     | NULL    |       |
| address    | varchar(500) | YES  |     | NULL    |       |
| username   | varchar(100) | YES  | UNI | NULL    |       |
| password   | varchar(100) | YES  |     | NULL    |       |
| user_type  | varchar(45)  | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
```

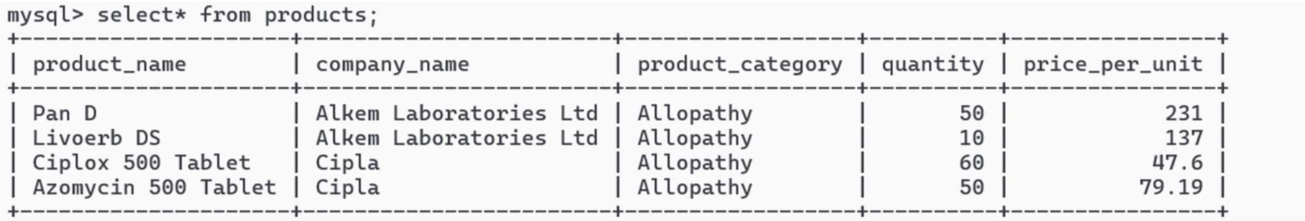
6.5.DATA TABLE



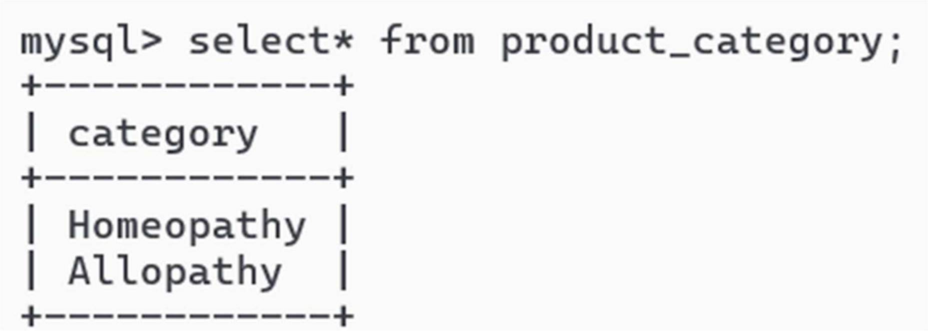
```
mysql> select* from users;
+--------------+-----------------------------+------------+---------------------------+------------------+------------+-----------+
| fullname     | email                       | contact_no | address                   | username         | password   | user_type |
+--------------+-----------------------------+------------+---------------------------+------------------+------------+-----------+
| Vishal Singh | vishalsingh.study@gmail.com | 6206947714 | chapra                    | vishalsinghstudy | vishal@123 | Admin     |
| Prince kumar | princekumar74@gmail.com     | 7631915700 | Hajipur ,Bihar pin-844102 | princekumarsha   | 987654     | User      |
| vishal       | vishal@gmail.com            |      55544 | chapra                    | vishal           | 321        | User      |
+--------------+-----------------------------+------------+---------------------------+------------------+------------+-----------+
```



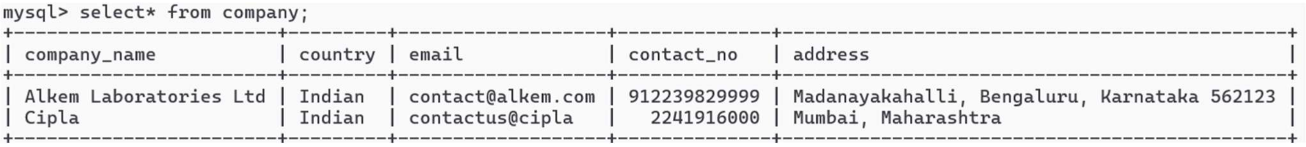
```
mysql> select* from sales_record;
+------+--------------+------------------------+--------------+----------+--------+
| id   | product_name | company_name           | date_of_sale | quantity | amount |
+------+--------------+------------------------+--------------+----------+--------+
| NULL | Livoerb DS   | Alkem Laboratories Ltd | 2024-10-17   |        3 |    231 |
| NULL | Livoerb DS   | Alkem Laboratories Ltd | 2024-10-17   |        3 |    411 |
| NULL | Livoerb DS   | Alkem Laboratories Ltd | 2024-11-24   |        5 |    685 |
| NULL | Pan D        | Alkem Laboratories Ltd | 2024-11-24   |       10 |    238 |
| NULL | Pan D        | Alkem Laboratories Ltd | 2024-11-24   |       10 |   2310 |
+------+--------------+------------------------+--------------+----------+--------+
```



```
mysql> select* from products;
+---------------------+------------------------+------------------+----------+----------------+
| product_name        | company_name           | product_category | quantity | price_per_unit |
+---------------------+------------------------+------------------+----------+----------------+
| Pan D               | Alkem Laboratories Ltd | Allopathy        |       50 |            231 |
| Livoerb DS          | Alkem Laboratories Ltd | Allopathy        |       10 |            137 |
| Ciplox 500 Tablet   | Cipla                  | Allopathy        |       60 |           47.6 |
| Azomycin 500 Tablet | Cipla                  | Allopathy        |       50 |          79.19 |
+---------------------+------------------------+------------------+----------+----------------+
```



```
mysql> select* from product_category;
+------------+
| category   |
+------------+
| Homeopathy |
| Allopathy  |
+------------+
```



```
mysql> select* from company;
+------------------------+---------+-------------------+--------------+----------------------------------------------+
| company_name           | country | email             | contact_no   | address                                      |
+------------------------+---------+-------------------+--------------+----------------------------------------------+
| Alkem Laboratories Ltd | Indian  | contact@alkem.com | 912239829999 | Madanayakahalli, Bengaluru, Karnataka 562123 |
| Cipla                  | Indian  | contactus@cipla   |   2241916000 | Mumbai, Maharashtra                          |
+------------------------+---------+-------------------+--------------+----------------------------------------------+
```

CHAPTER 7

TESTING

Testing is a crucial phase in the development of the Pharmacy Information System, ensuring that the system meets all functional, non-functional, and user requirements. This phase involves systematically identifying and resolving bugs, verifying system functionality, and validating performance. It ensures the system is reliable, secure, and operates as intended.

7.1 TYPES OF TESTING

1. **Unit Testing**
   - **Objective**: Test individual modules or components in isolation.
   - **Scope**: Focus on specific functionalities such as prescription generation, inventory updates, and low-stock alerts.
2. **Integration Testing**
   - **Objective**: Test interactions between different modules of the system.
   - **Scope**: Ensure seamless data flow between modules like the prescription module, inventory management, and reporting tools.

3. **System Testing**

- **Objective**: Validate the entire system as a whole to ensure it meets the specified requirements.
- **Scope**: Includes functional, non-functional, and performance testing.

4. Performance Testing

- **Objective:** Evaluate system performance under varying workloads.
- **Scope:** Assess system speed, responsiveness, and scalability.

7.1.1 OBJECTIVES OF TESTING

- **Identify and Fix Defects:**

  - Ensure the system is free of errors in functionality, logic, and design.

- **Validate System Performance:**
  - Test the system under various conditions to ensure efficiency and scalability.

- **Enhance User Experience:**
  - Verify the system is user-friendly, with intuitive interfaces and seamless workflows.

- **Ensure Data Security:**
  - Confirm that sensitive information (e.g., prescriptions, inventory data) is protected.

- **Test Integration:**
  - Verify the system integrates properly with third-party tools, such as supplier systems or hospital management systems.

7.2. SAMPLE TEST CASES

Test ID	**Test Scenario**	**Expected Outcome**	**Status**
TC01	Add stock to inventory	Inventory reflects updated stock levels	Pass
TC02	Trigger low-stock alert	Alert is displayed when stock falls below the threshold	Pass
TC03	Generate reports	Reports are generated with accurate data	Pass
TC04	Unauthorized user attempts access	Access is denied, and the attempt is logged	Pass
TC05	Simulate 100 concurrent users	System remains responsive and updates data in real-time	Pass
TC06	Test data encryption during transmission	Sensitive data is securely encrypted	Pass

7.2.1 TESTING ENVIRONMENT

1. **Hardware Configuration:**

- **Server:** Intel i5 Processor, 8GB RAM, 500GB Storage.
- **Clients:** Intel i3 Processor, 4GB RAM

3. **Software Configuration:**

- **Database:** MySQL or PostgreSQL.
- **Testing Tools:** Selenium (for UI testing), JMeter (for performance testing).

7.3 TEST RESULTS SUMMARY

- **Number of Test Cases Executed:** 50
- **Passed:** 48
- **Failed:** 2 (Minor UI adjustments required)
- **Critical Defects Resolved:** All

CHAPTER 8

APPENDICES

8.1 SOURCE CODE

MainPanel.java

```
package Forms;


import ChangePassword.ChangePassword;
import Companies.CompaniesPanel;
import Createuser.CreateUser;
import Forms.Medicines.MedicinesPanel;
import NewSalesRecord.NewSalesRecord;
import ProductCategory.AddCategory;
import SalesRecord.SalesRecord;
import java.awt.Toolkit;
import java.awt.event.WindowEvent;
import java.sql.*;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
import javax.swing.UIManager;
import javax.swing.table.TableColumn;
import net.proteanit.sql.DbUtils;
public class MainPanel extends javax.swing.JFrame  {
Connection conn = null;
PreparedStatement pst = null;
ResultSet rs = null;
```

```
    /**
     * Creates new form MainPanel
     */
    public MainPanel() {
        initComponents();
        conn = ConnectionToDatabase.connectToDb();
        this.setExtendedState(this.getExtendedState() |
JFrame.MAXIMIZED_BOTH);
        updateTable();


    }
     public void close(){
        WindowEvent we = new
WindowEvent(this,WindowEvent.WINDOW_CLOSING);
        Toolkit.getDefaultToolkit().getSystemEventQueue().postEvent(we);
    }

    private void updateTable(){

        try{
          String sql = "SELECT  product_name as 'Product Name',company_name as
'Company Name',product_category as 'Product Category',quantity as
'Quantity',price_per_unit as 'Price Per Unit' FROM products";
            pst = conn.prepareStatement(sql);
            rs = pst.executeQuery();

        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton addNewProductCategoryBtn;
    private javax.swing.JButton changePasswordBtn;
    private javax.swing.JButton companiesBtn;
    private javax.swing.JButton createUserBtn;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JLabel jLabel6;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JButton logOutBtn;
    public javax.swing.JLabel loggedInAsLbl;
    private javax.swing.JButton medicineBtn;
    private javax.swing.JTable medicineTable;
    private javax.swing.JButton newSalesBtn;
    private javax.swing.JTextField searchTxt;
    private javax.swing.JButton viewSalesRecordsBtn;
    // End of variables declaration
}
```

MedicinesPanel.java

```
package Forms.Medicines;

import Forms.ConnectionToDatabase;
import Forms.MainPanel;
import java.awt.Toolkit;
import java.awt.event.WindowEvent;
import javax.swing.JOptionPane;
import net.proteanit.sql.DbUtils;

/**
 *
 * @author Black Code
 */
import java.sql.*;
import javax.swing.JFrame;
public class MedicinesPanel extends javax.swing.JFrame {
Connection conn = null;
PreparedStatement pst = null;
ResultSet rs = null;
String productName,companyName,productCategory,quantity,price_per_unit;
 String tableClicked = "";
   /**
    * Creates new form MedicinesPanel
    */
   public MedicinesPanel() {
      initComponents();
      conn = ConnectionToDatabase.connectToDb();
      this.setExtendedState(this.getExtendedState() | JFrame.MAXIMIZED_BOTH);
      updateTable();
   }
      public void close(){
      WindowEvent we = new WindowEvent(this,WindowEvent.WINDOW_CLOSING);
      Toolkit.getDefaultToolkit().getSystemEventQueue().postEvent(we);
   }

   private void updateTable(){

      try{
        String sql = "SELECT  product_name as 'Product Name',company_name as 'Company 
Name',product_category as 'Product Category',quantity as 'Quantity',price_per_unit as 'Price Per 
Unit' FROM products";
         pst = conn.prepareStatement(sql);
         rs = pst.executeQuery();
```

```
            medicineTable.setModel(DbUtils.resultSetToTableModel(rs));
        }catch(Exception e){
            JOptionPane.showMessageDialog(null, e.getMessage());
        }
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        insertMedBtn = new javax.swing.JButton();
        updateMedBtn = new javax.swing.JButton();
        delMedBtn = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        medicineTable = new javax.swing.JTable();
        searchTxt = new javax.swing.JTextField();
        searchBtn = new javax.swing.JButton();
        loggedInAsLbl = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        backBtn = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        setResizable(false);
        addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                formMouseClicked(evt);
            }
        });
        getContentPane().setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

        insertMedBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
        insertMedBtn.setText("Insert Medicines");
        insertMedBtn.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                insertMedBtnActionPerformed(evt);
            }
        });
        getContentPane().add(insertMedBtn, new org.netbeans.lib.awtextra.AbsoluteConstraints(32,
164, 241, 33));

        updateMedBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
        updateMedBtn.setText("Update Medicines");
        updateMedBtn.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                updateMedBtnActionPerformed(evt);
            }
        });

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new MedicinesPanel().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton backBtn;
    private javax.swing.JButton delMedBtn;
    private javax.swing.JButton insertMedBtn;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JScrollPane jScrollPane1;
    public javax.swing.JLabel loggedInAsLbl;
    private javax.swing.JTable medicineTable;
    private javax.swing.JButton searchBtn;
    private javax.swing.JTextField searchTxt;
    private javax.swing.JButton updateMedBtn;
    // End of variables declaration
}
```

CompaniesPanel.java

```
package Companies;

    import Forms.Medicines.*;
    import Forms.ConnectionToDatabase;
    import Forms.MainPanel;
    import java.awt.Toolkit;
    import java.awt.event.WindowEvent;
    import javax.swing.JOptionPane;
    import net.proteanit.sql.DbUtils;

    /**
     *
     * @author Black Code
     */
    import java.sql.*;
    import javax.swing.JFrame;
```

```
public class CompaniesPanel extends javax.swing.JFrame {
Connection conn = null;
PreparedStatement pst = null;
ResultSet rs = null;
String companyName,country,email,contactNo,address;
 String tableClicked = "";
    /**
     * Creates new form MedicinesPanel
     */
    public CompaniesPanel() {
        initComponents();
        conn = ConnectionToDatabase.connectToDb();
        this.setExtendedState(this.getExtendedState() | JFrame.MAXIMIZED_BOTH);
        updateTable();
    }
        public void close(){
        WindowEvent we = new WindowEvent(this,WindowEvent.WINDOW_CLOSING);
        Toolkit.getDefaultToolkit().getSystemEventQueue().postEvent(we);
    }

    private void updateTable(){

        try{
          String sql = "SELECT  company_name as 'Company Name',country as 'Country',email as
'Email',contact_no as 'Contact No.',address as 'Address' FROM company";
            pst = conn.prepareStatement(sql);
            rs = pst.executeQuery();

            medicineTable.setModel(DbUtils.resultSetToTableModel(rs));
        }catch(Exception e){
            JOptionPane.showMessageDialog(null, e.getMessage());
        }
    }


    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        insertComBtn = new javax.swing.JButton();
        updateComBtn = new javax.swing.JButton();
        delComBtn = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        medicineTable = new javax.swing.JTable();
        searchTxt = new javax.swing.JTextField();
        searchBtn = new javax.swing.JButton();
        loggedInAsLbl = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        backBtn = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
    setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
    setResizable(false);
    addMouseListener(new java.awt.event.MouseAdapter() {
      public void mouseClicked(java.awt.event.MouseEvent evt) {
        formMouseClicked(evt);
      }
    });
    getContentPane().setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

    insertComBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    insertComBtn.setText("Insert Company");
    insertComBtn.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        insertComBtnActionPerformed(evt);
      }
    });
    getContentPane().add(insertComBtn, new org.netbeans.lib.awtextra.AbsoluteConstraints(32,
164, 241, 33));

    updateComBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    updateComBtn.setText("Update Company");
    updateComBtn.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        updateComBtnActionPerformed(evt);
      }
    });
    getContentPane().add(updateComBtn, new org.netbeans.lib.awtextra.AbsoluteConstraints(32,
215, 241, 33));

    delComBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    delComBtn.setText("Delete Company");
    delComBtn.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        delComBtnActionPerformed(evt);
      }
    });
    getContentPane().add(delComBtn, new org.netbeans.lib.awtextra.AbsoluteConstraints(32, 266,
241, 33));

    medicineTable.setModel(new javax.swing.table.DefaultTableModel(
      new Object [][] {
        {},
        {},
        {},
        {}
      },
      new String [] {

      }
    ));
    medicineTable.getTableHeader().setReorderingAllowed(false);
```

```
        medicineTable.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                medicineTableMouseClicked(evt);
            }
        });
        jScrollPane1.setViewportView(medicineTable);
        });
        getContentPane().add(backBtn, new org.netbeans.lib.awtextra.AbsoluteConstraints(32, 533,
241, 33));

        jLabel1.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/Companies/company.jpg"))); // NOI18N
        jLabel1.setText("jLabel1");
        getContentPane().add(jLabel1, new org.netbeans.lib.awtextra.AbsoluteConstraints(0, 0, -1, -1));

        pack();
        setLocationRelativeTo(null);
    }// </editor-fold>

    private void insertComBtnActionPerformed(java.awt.event.ActionEvent evt) {
      InsertCompany im = new InsertCompany();
      close();
      im.setVisible(true);

    }

    private void updateComBtnActionPerformed(java.awt.event.ActionEvent evt) {
            if ("".equals(tableClicked)){
                JOptionPane.showMessageDialog(null, "Please select a company to update!");
            }else{

                UpdateCompany up = new UpdateCompany();
                up.companyName = this.companyName;
                up.companyNameTxt.setText(companyName);
                up.countryTxt.setText(country);
                up.emailTxt.setText(email);
                up.contactNoTxt.setText(contactNo);
                up.addressTxt.setText(address);
                close();
                up.setVisible(true);
            }
    }

    private void delComBtnActionPerformed(java.awt.event.ActionEvent evt) {
         if ("".equals(tableClicked)){
                JOptionPane.showMessageDialog(null, "Please select a company to delete!");
         }else{

    }

    private void searchBtnActionPerformed(java.awt.event.ActionEvent evt) {
    }

    private void backBtnActionPerformed(java.awt.event.ActionEvent evt) {
      MainPanel mp = new MainPanel();
        close();
        mp.setVisible(true);

    }

    private void formMouseClicked(java.awt.event.MouseEvent evt) {

    }

    private void medicineTableMouseClicked(java.awt.event.MouseEvent evt) {


    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info :

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new CompaniesPanel().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton backBtn;
    private javax.swing.JButton delComBtn;
    private javax.swing.JButton insertComBtn;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JScrollPane jScrollPane1;
    public javax.swing.JLabel loggedInAsLbl;
    private javax.swing.JTable medicineTable;
    private javax.swing.JButton searchBtn;
    private javax.swing.JTextField searchTxt;
    private javax.swing.JButton updateComBtn;
```

```
    // End of variables declaration
}
```

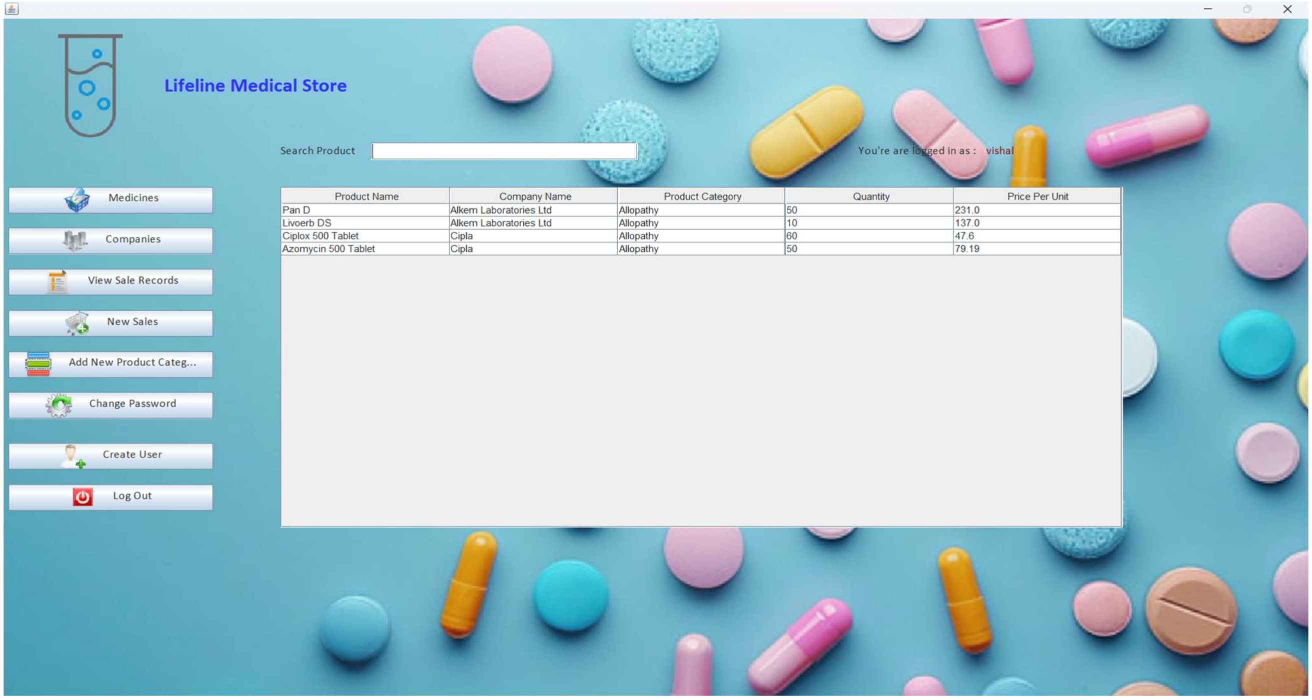
NewSalesRecord.java

```
package NewSalesRecord;
import Forms.ConnectionToDatabase;
import Forms.MainPanel;
import java.awt.Toolkit;
import java.awt.event.WindowEvent;
import java.sql.*;
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import java.util.Arrays;
import java.util.Calendar;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
import javax.swing.table.DefaultTableModel;
public class NewSalesRecord extends javax.swing.JFrame {
Connection conn = null;
PreparedStatement pst = null;
ResultSet rs = null;
String[] productName;
String[] quantity;
double[] amountPerRows;
    /**
     * Creates new form NewSalesRecord
     */
    public NewSalesRecord() {
        initComponents();
        conn = ConnectionToDatabase.connectToDb();
        populateCompany();
        this.setExtendedState(this.getExtendedState() | JFrame.MAXIMIZED_BOTH);
    }

    public void close(){
        WindowEvent we = new WindowEvent(this,WindowEvent.WINDOW_CLOSING);
        Toolkit.getDefaultToolkit().getSystemEventQueue().postEvent(we);
    }
    public void populateCompany(){
        try{
            String sql = "SELECT company_name FROM company";
            pst = conn.prepareStatement(sql);
            rs = pst.executeQuery();
             while(rs.next()){
               companyCombo.addItem(rs.getString("company_name"));
            }
        }catch(Exception e){
            JOptionPane.showMessageDialog(null, e);
        }
    }
    public void populateCategory(){
          productCategoryCombo.removeAllItems();
        try{
            String sql = "SELECT category FROM product_category";
            pst = conn.prepareStatement(sql);
            rs = pst.executeQuery();
            while(rs.next()){
                productCategoryCombo.addItem(rs.getString("category"));
            }
        }catch(Exception e){
            JOptionPane.showMessageDialog(null, e);
        }
    }
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        quantityTxt = new javax.swing.JTextField();
        productCombo = new javax.swing.JComboBox();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jScrollPane1 = new javax.swing.JScrollPane();
        cartTable = new javax.swing.JTable();
        jLabel5 = new javax.swing.JLabel();
        companyCombo = new javax.swing.JComboBox();
        productCategoryCombo = new javax.swing.JComboBox();
        jLabel6 = new javax.swing.JLabel();
        backBtn = new javax.swing.JButton();
        doneBtn = new javax.swing.JButton();
        removeBtn = new javax.swing.JButton();
        addToCartBtn = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        jLabel4 = new javax.swing.JLabel();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        getContentPane().setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

        jPanel1.setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

        quantityTxt.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
        quantityTxt.setEnabled(false);
        jPanel1.add(quantityTxt, new org.netbeans.lib.awtextra.AbsoluteConstraints(142, 134,
258, -1));
```

```
    productCombo.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    productCombo.setModel(new javax.swing.DefaultComboBoxModel(new String[] { " "
}));
    productCombo.setEnabled(false);
    productCombo.addItemListener(new java.awt.event.ItemListener() {
      public void itemStateChanged(java.awt.event.ItemEvent evt) {
        productComboItemStateChanged(evt);
      }
    });
    productCombo.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        productComboActionPerformed(evt);
      }
    })

    jPanel1.add(productCategoryCombo, new
org.netbeans.lib.awtextra.AbsoluteConstraints(142, 50, 258, -1));

    jLabel6.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    jLabel6.setText("Product Category");
    jPanel1.add(jLabel6, new org.netbeans.lib.awtextra.AbsoluteConstraints(6, 53, 118, -
1));

    getContentPane().add(jPanel1, new org.netbeans.lib.awtextra.AbsoluteConstraints(6,
86, -1, -1));

    backBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    backBtn.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/NewSalesRecord/Go-back-icon.png"))); //
NOI18N
    backBtn.setText("Back");
    backBtn.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        backBtnActionPerformed(evt);
      }
    });
    getContentPane().add(backBtn, new
org.netbeans.lib.awtextra.AbsoluteConstraints(778, 501, 241, 33));

    doneBtn.setBackground(new java.awt.Color(0, 204, 102));
    doneBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
    doneBtn.setForeground(new java.awt.Color(255, 255, 255));
    doneBtn.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/NewSalesRecord/Accept-icon.png"))); //
NOI18N
    doneBtn.setText("Confirm Purchases");
    doneBtn.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                doneBtnActionPerformed(evt);
            }
        })
        getContentPane().add(removeBtn, new
org.netbeans.lib.awtextra.AbsoluteConstraints(272, 500, 212, 36));

        addToCartBtn.setBackground(new java.awt.Color(0, 153, 51));
        addToCartBtn.setFont(new java.awt.Font("Calibri", 0, 14)); // NOI18N
        addToCartBtn.setForeground(new java.awt.Color(255, 255, 255));
        addToCartBtn.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/NewSalesRecord/shop-cart-add-
icon.png"))); // NOI18N
        addToCartBtn.setText("Add to cart");
        addToCartBtn.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                addToCartBtnActionPerformed(evt);
            }
        });
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new NewSalesRecord().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton addToCartBtn;
    private javax.swing.JButton backBtn;
    private javax.swing.JTable cartTable;
    private javax.swing.JComboBox companyCombo;
    private javax.swing.JButton doneBtn;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JLabel jLabel6;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JComboBox productCategoryCombo;
    private javax.swing.JComboBox productCombo;
    public javax.swing.JTextField quantityTxt;
    private javax.swing.JButton removeBtn;
}
```

8.2 SCREEN SHOTS

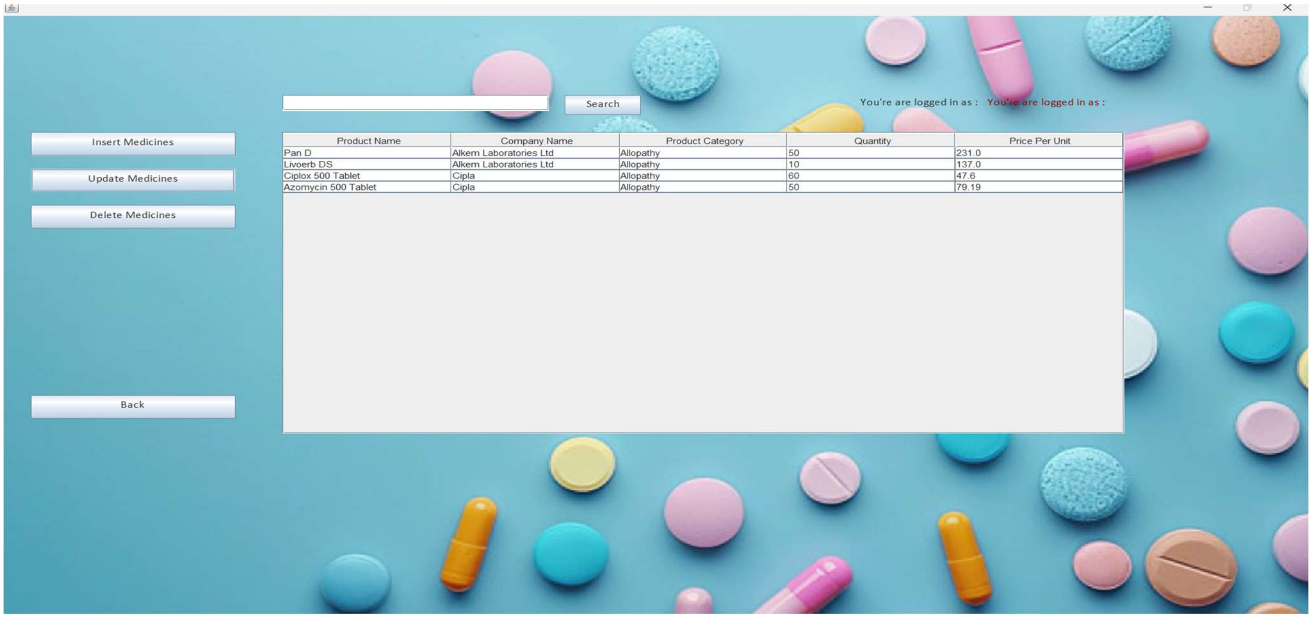
MAIN PANEL



You're are logged in as : vishal

Product Name	Company Name	Product Category	Quantity	Price Per Unit
Pan D	Alkem Laboratories Ltd	Allopathy	50	231.0
Livoerb DS	Alkem Laboratories Ltd	Allopathy	10	137.0
Ciplox 500 Tablet	Cipla	Allopathy	60	47.6
Azomycin 500 Tablet	Cipla	Allopathy	50	79.19

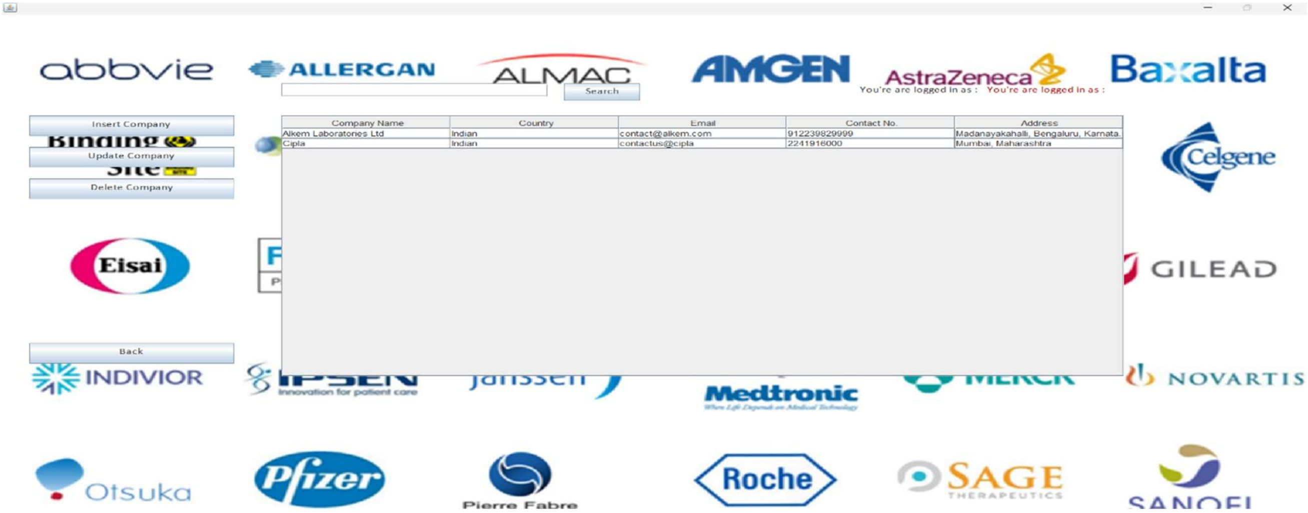
MEDICINES



You're are logged in as : You're are logged in as :

Product Name	Company Name	Product Category	Quantity	Price Per Unit
Pan D	Alkem Laboratories Ltd	Allopathy	50	231.0
Livoerb DS	Alkem Laboratories Ltd	Allopathy	10	137.0
Ciplox 500 Tablet	Cipla	Allopathy	60	47.6
Azomycin 500 Tablet	Cipla	Allopathy	50	79.19

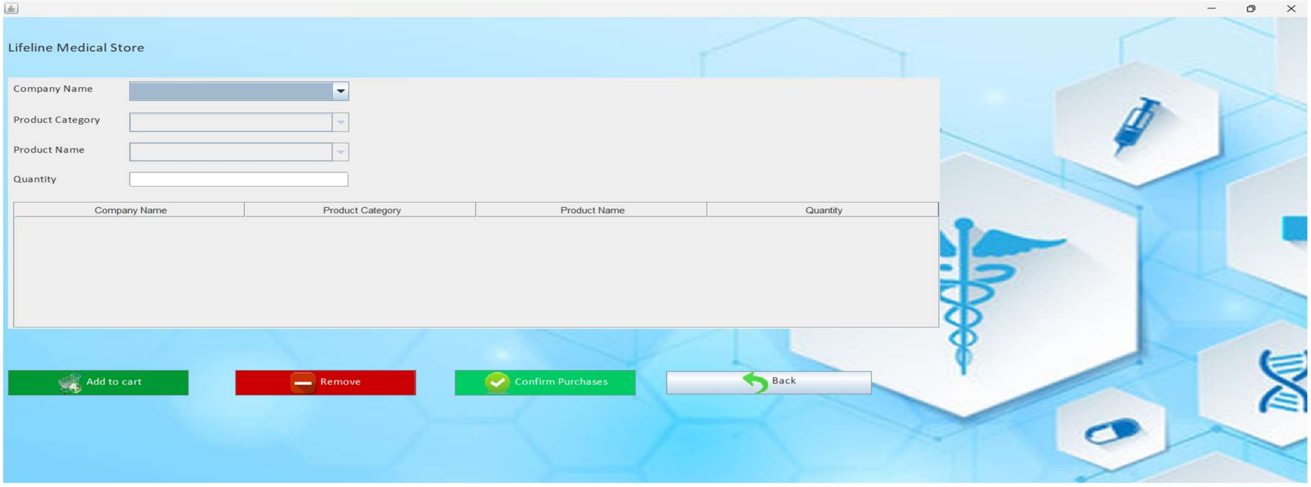
COMPANIES



You're are logged in as : You're are logged in as :

Company Name	Country	Email	Contact No.	Address
Alkem Laboratories Ltd	Indian	contact@alkem.com	912239829999	Madanayakahalli, Bengaluru, Karnata.
Cipla	Indian	contactus@cipla	2241916000	Mumbai, Maharashtra

SALES



Lifeline Medical Store

Company Name

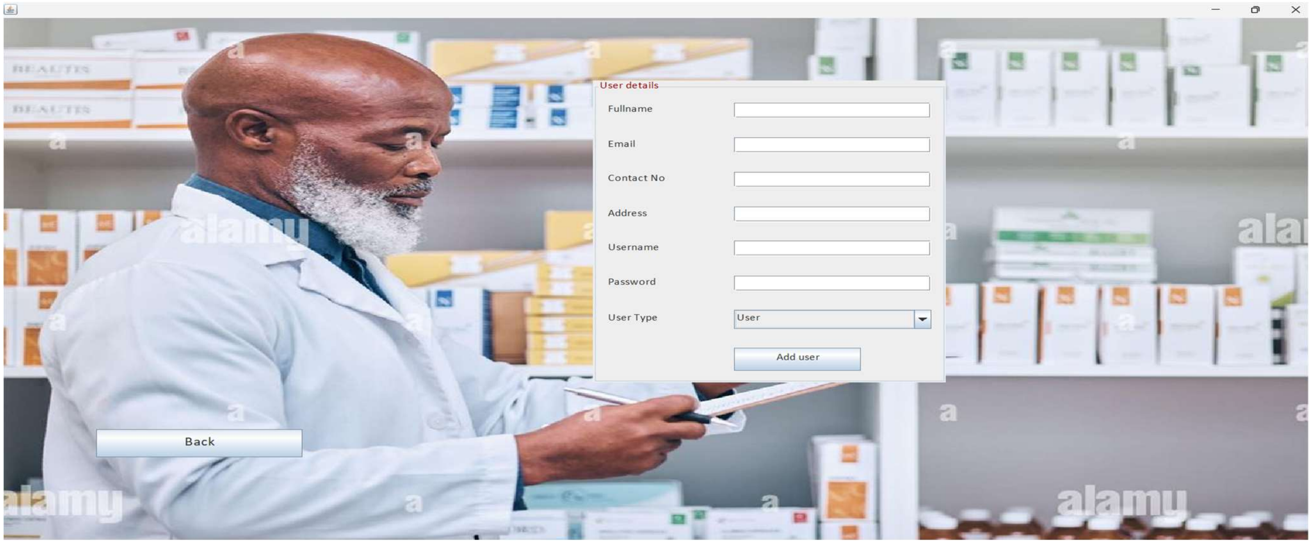
Product Category

Product Name

Quantity

Company Name	Product Category	Product Name	Quantity

CREATE USER



User details

Fullname

Email

Contact No

Address

Username

Password

User Type: User

CHAPTER 9

CONCLUSION & FUTURE ENHANCEMENT

9.1 CONCLUSION

The Pharmacy Information System: A Framework for Automated Prescription and Real-Time Stock Monitoring successfully addresses the limitations of traditional pharmacy systems. By leveraging automation, real-time data updates, and robust analytics, it ensures efficient operations, reduced human errors, and improved customer satisfaction.

Key achievements of the system include:

1. **Streamlined Operations:** Automated processes such as prescription management and stock monitoring save time and enhance accuracy.
2. **Improved Inventory Management:** Real-time tracking of inventory levels prevents stock outs and reduces wastage due to expired medicines.
3. **Enhanced Decision-Making:** Comprehensive reporting tools and analytics provide actionable insights into inventory trends and sales performance.
4. **Data Security:** Secure access controls and encryption safeguard sensitive information.

This system lays a solid foundation for modernizing pharmacy management and improving overall healthcare service delivery.

9.2 FUTURE ENHANCEMENT

To remain scalable and meet future demands, several enhancements can be incorporated into the system:

1. **Mobile Application Development**

Feature: Develop a mobile app for pharmacists and customers.

Benefit: Allow customers to place online orders and check prescription history, while pharmacists can access inventory remotely.

2. AI-Powered Recommendations
Feature: Integrate AI to suggest alternative medicines for out-of-stock items and predict stock demands.
Benefit: Enhance operational efficiency and improve customer service.

3. Integration with E-Prescription Systems
Feature: Enable direct integration with hospital or clinic e-prescription systems.
Benefit: Simplify prescription handling and eliminate manual data entry.

4. Enhanced Supplier Collaboration
Feature: Implement a fully automated ordering system with suppliers based on real-time inventory data.
Benefit: Reduce delays in stock replenishment and maintain optimal stock levels.

5. Multilingual and Accessibility Features
Feature: Add support for multiple languages and accessibility options for differently-abled users.
Benefit: Increase system usability across diverse user bases.

6. Blockchain for Secure Data Management
Feature: Use blockchain technology to store prescription and transaction data securely.
Benefit: Enhance transparency and security, especially for audit and compliance purposes.

7. Enhanced Analytics and Forecasting
Feature: Use advanced analytics tools to forecast sales and inventory trends.
Benefit: Optimize stock management and improve business planning.

CHAPTER 9

REFERENCE

9.1 BOOK REFERENCE

1. "Head First Java" by Kathy Sierra and Bert Bates

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3. "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan

4. "Java: The Complete Reference" by Herbert Schildt

10.1WEB REFERENCES

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2. http:\\ https://www.geeksforgeeks.org/java/

3. http:\\ www.codeacademy.com

4. http:\\ www.1000projects.com