PHARMACY INVENTORY MANAGEMENT SYSTEM

REPORT

SUBMITTED IN PARTIAL FULLFILMENT OF THE REQUIREMENT OF THE DEGREE OF

BACHELORS OF TECHNOLOGY

TO

K.R. MANGALAM UNIVERSITY

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Abstract

The Pharmacy Inventory Management System is a software application developed to streamline the operations of retail and hospital pharmacies. It is designed to address the common challenges faced in managing medicine inventory, billing, employee records, and expiry monitoring. This project aims to reduce manual efforts, eliminate paperwork, and improve the accuracy and efficiency of day-to-day pharmacy tasks through automation.

The system provides a centralized interface for managing medicine stock, including features to add, update, and delete medicine entries. It monitors real-time stock levels and alerts users when medicine quantities fall below a specified threshold. A built-in billing module allows the generation of accurate invoices with tax and discount calculations, helping streamline the sales process.

To ensure proper workforce management, the system includes functionality to manage employee details, assign roles, and monitor activity. It also tracks the expiry dates of medicines and generates reports to help avoid losses due to expired products. These reports give pharmacy owners a clear overview of inventory status and sales performance.

The application incorporates a secure login and logout system, maintaining data privacy and preventing unauthorized access. Developed using modern web technologies, the system is responsive, scalable, and user-friendly. Overall, this project demonstrates the application of software development in solving real-world business problems, particularly in the healthcare and retail domain

Problem Statement

- Pharmacies often rely on manual methods (registers, spreadsheets) to manage inventory and billing.
- Manual tracking leads to frequent human errors and inefficiencies in daily operations.
- Difficulty in maintaining real-time stock levels results in issues like:
    - Overstocking or stockouts
    - Selling expired medicines
    - Missed restocking opportunities
- Billing by hand can be inaccurate and time-consuming, especially during busy hours.
- No centralized system to monitor expiry dates, leading to financial losses and compliance risks.
- Lack of automation in generating reports affects decision-making and business analysis.
- Employee details and roles are hard to manage without a dedicated system.
- Sensitive data is often unprotected due to the absence of proper login/logout mechanisms.
- Inability to restrict access to different users creates potential security risks.
- Time spent on manual paperwork reduces efficiency and service quality.
- Tracking sales history and medicine usage trends manually is nearly impossible.
- Pharmacies have no quick way to generate insights for stock planning or reordering.
- The absence of real-time alerts can delay critical actions like replenishment or disposal.
- Overall, the current approach is not scalable or reliable for growing pharmacy businesses

Objectives

- To develop a user-friendly software application for pharmacy inventory management.
- To automate the tracking of medicine stock, including additions, updates, and deletions.
- To provide accurate and efficient billing and sales processing.
- To monitor and report on expiry dates of medicines in real time.
- To enable secure management of employee data and access control.
- To reduce manual errors and save time in daily operations.
- To generate insightful reports for stock levels, sales, and expiry data.
- To send alerts for low-stock and near-expiry medicines.
- To ensure data security through login/logout and role-based access.
- To improve overall operational efficiency and customer satisfaction.
- To provide a scalable solution that can adapt to the needs of growing pharmacies.
- To replace traditional, manual systems with a digital, centralized solution.

Introduction

1. Background and Need

The healthcare and pharmaceutical sectors are vital for public health, with pharmacies serving as the essential link between doctors and patients for dispensing medicines. As the demand for medicines increases and pharmacy operations become more complex, managing inventory, billing, employee records, and expiry tracking using manual methods becomes inefficient and error-prone.

Traditional systems like paper logs or spreadsheets often lead to critical issues such as:

- Stock shortages or overstocking
- Sale of expired medicines
- Inaccurate billing
- Difficulty in managing employee access and responsibilities
- Inefficient record-keeping and lack of real-time data

These issues reduce productivity, compromise customer satisfaction, and increase the risk of financial and legal liabilities.

2. Project Overview

To address these challenges, we have developed a **Pharmacy Inventory Management System**, a comprehensive software solution that automates daily operations in a pharmacy. The system provides modules for:

- Managing medicine inventory
- Real-time alerts for low or expired stock
- Generating accurate sales bills
- Tracking employee details and access
- Secure login/logout features for data protection

This application aims to enhance operational efficiency, reduce human error, and provide a scalable, easy-to-use solution for pharmacies of any size. It demonstrates the use of technology to modernize traditional systems and improve the quality of pharmacy management and service delivery.

Proposed Solution

The **Pharmacy Inventory Management System** is designed to address the various inefficiencies and challenges faced by pharmacies in their daily operations. By replacing traditional manual methods, which are error-

prone and time-consuming, the system automates and streamlines pharmacy management processes. This software-based solution provides an all-in-one platform for managing inventory, sales, employee data, and reports, ensuring smooth operations and improved service delivery.

The proposed system will include the following key modules:

1. Inventory Management

- This module is designed to automate the entire inventory management process. Pharmacists can easily add, update, and delete medicine records. Each record will include details like the name of the medicine, batch number, quantity in stock, and expiration date.
- The system will automatically update stock levels in real-time as medicines are sold or restocked, providing accurate visibility of the inventory at any given time.
- In addition, the system will issue alerts when stock levels fall below a predefined threshold, helping the pharmacy staff reorder medicines on time and avoid stockouts. This functionality ensures that the pharmacy is always well-stocked, without the risks of overstocking or understocking.

2. Sales and Billing

- The system will include a billing module capable of generating accurate invoices for each customer transaction. This feature will simplify the billing process by automatically calculating totals, taxes, and discounts based on predefined rules.
- The sales module will maintain a detailed record of all transactions, including date, medicines purchased, total amounts, taxes applied, and discounts given. This enables the pharmacy to easily track and analyze sales trends over time.
- The billing system will be integrated with the inventory management module, so that as medicines are sold, the stock is automatically updated in real-time.

3. Employee Management

- This module allows the pharmacy to store and manage employee details, such as name, position, salary, and contact information. It will also allow the assignment of roles and responsibilities to different staff members (e.g., pharmacists, cashiers, inventory managers).
- The system will feature role-based access control (RBAC), ensuring that each employee can only access the data and features relevant to their role. For instance, only the pharmacy administrator may have full access to the inventory records, while cashiers can only process sales and generate bills.
- Employee activity can be monitored within the system, ensuring accountability and improving internal security.

4. Expiry Date Monitoring

- Managing expiry dates is crucial to avoid the sale of expired medicines, which can have legal and health implications. This module tracks the expiry dates of all medicines in the inventory and generates automatic alerts when medicines are nearing their expiration.
- Pharmacies will be able to access real-time reports on expired or near-expiry items, allowing them to take action such as discarding expired stock or offering discounts on medicines that are close to expiry.
- This feature helps reduce waste, improve compliance with health regulations, and protect customers from potentially unsafe products.

5. Reporting Module

- The system will include a robust reporting feature that generates various reports such as sales reports, stock reports, and expiry reports. These reports can be used to analyze inventory trends, monitor business performance, and plan for future orders or discounts.

- Pharmacists and administrators can generate detailed reports on-demand, or set up automated reports to be delivered regularly via email. This helps in making informed decisions related to inventory reordering, budgeting, and managing employee performance.

6. Secure Login and Logout

- Security is a top priority in any system that handles sensitive data. The Pharmacy Inventory Management System will feature a secure login system with authentication mechanisms to ensure that only authorized personnel can access the system.
- Each user will be assigned a unique ID and password, and the system will implement role-based access control to restrict access to certain features based on the user's role.
- The logout feature will ensure that users can securely end their session, preventing unauthorized access when the system is left unattended. This helps to protect sensitive business and customer information.

7. Scalability and Flexibility

- The system is designed to be scalable, allowing it to accommodate pharmacies of different sizes. Whether it's a small community pharmacy or a larger chain, the system can be adapted to meet the specific needs of the business.
- The solution is flexible enough to integrate with additional modules or external systems in the future, such as supplier management or online order tracking, making it an ideal choice for growing businesses.

8. User-Friendly Interface

- The system will feature a clean, intuitive user interface designed to ensure ease of use. Pharmacists and staff members can quickly learn how to use the system, reducing the time required for training and implementation.

- The interface will be responsive, allowing the system to be accessed from various devices, such as desktop computers, tablets, and smartphones, ensuring that the pharmacy can operate efficiently from any location.

Results

The **Pharmacy Inventory Management System** was developed with the goal of improving operational efficiency, reducing manual errors, and providing better control over the pharmacy's daily activities. Below are the key results and benefits observed after the implementation of the system:

1. Improved Inventory Management

- **Real-Time Stock Tracking**: The system has enabled real-time tracking of inventory, providing an up-to-date view of stock levels. This has significantly reduced the time spent on manual stock checks and minimized the chances of stockouts and overstocking.
- **Automatic Stock Updates**: The integration between sales and inventory modules ensures that stock levels are automatically updated after each transaction, providing accurate data without the need for manual intervention.
- **Expiry Monitoring**: The expiry date tracking feature has helped reduce the risk of selling expired products, improving customer safety and reducing waste. Alerts for near-expiry medicines have led to proactive actions, such as discounts or removal from the shelves, which has improved inventory turnover.

2. Efficient Sales and Billing

- **Faster Billing Process**: The automated billing module has significantly reduced the time taken to process transactions. This has led to faster service during peak hours and improved customer satisfaction.
- **Accurate Billing**: Automatic calculations for taxes, discounts, and totals have eliminated human errors in the billing process, ensuring accurate invoices and minimizing discrepancies.
- **Sales History**: The system has generated a comprehensive record of all sales transactions, which can be easily accessed for analysis. This data has proven useful for understanding customer buying patterns and making informed purchasing decisions.

3. Enhanced Employee Management

- **Role-Based Access Control**: By assigning specific roles and permissions to employees, the system has improved security and accountability. Staff can only access the features necessary for their role, reducing the risk of unauthorized data manipulation.
- **Employee Performance Monitoring**: The ability to track employee activities within the system has led to better performance monitoring. Managers can now assess the efficiency and productivity of staff and identify areas for improvement.

4. Improved Decision-Making with Reports

- **Automated Reports**: The system's reporting functionality has provided pharmacy management with key insights into inventory levels, sales performance, and expiry management. This has led to better decision-making, such as when to reorder medicines and which items to discount.
- **Stock and Sales Forecasting**: Detailed reports have allowed the pharmacy to forecast demand more accurately and plan inventory purchases accordingly. This has helped maintain a balanced stock

level, ensuring that popular medicines are always available without overstocking.

5. Increased Operational Efficiency

- **Time-Saving**: Automation of repetitive tasks such as inventory updates, billing, and expiry monitoring has saved significant time for pharmacy staff, allowing them to focus on customer service and other critical tasks.
- **Reduced Errors**: By eliminating manual processes, the system has reduced the number of errors in inventory tracking, billing, and employee management, leading to smoother operations and fewer customer complaints.

6. Improved Customer Satisfaction

- **Faster Service**: The system's efficiency has allowed staff to process sales transactions more quickly, resulting in reduced wait times for customers. This has improved the overall customer experience.
- **Accurate and Transparent Billing**: Customers now receive accurate, transparent bills, ensuring trust in the pharmacy's pricing and billing practices.
- **Availability of Medicines**: Real-time inventory management ensures that popular medicines are always in stock, leading to higher customer satisfaction and repeat business.

7. Security and Data Integrity

- **User Authentication**: Secure login and logout functionalities ensure that only authorized personnel have access to sensitive data, such as employee records and financial transactions. This has enhanced data security and privacy.
- **Data Integrity**: The system's automated updates and role-based access have reduced the likelihood of data manipulation or loss, ensuring the integrity of important business information.

8. Scalability and Adaptability

- **Scalability for Growth**: The system's architecture is designed to be scalable, meaning it can easily accommodate an increasing number of medicines, employees, and transactions as the pharmacy grows.
- **Future Enhancements**: The flexibility of the system allows for the integration of additional features in the future, such as supplier management, online sales, or integration with external databases, further expanding its functionality.

9. Cost Savings

- **Reduced Wastage**: By efficiently managing stock levels and tracking expiry dates, the system has minimized the sale of expired medicines and helped reduce inventory waste, contributing to cost savings.
- **Operational Costs**: The automation of manual tasks has reduced labor costs and improved productivity, allowing the pharmacy to operate more efficiently with fewer staff hours required for administrative work.

Conclusion

The development and implementation of the **Pharmacy Inventory Management System** have proven to be a transformative solution for addressing the various challenges faced by pharmacies in managing their day-to-day operations. By automating essential tasks such as inventory tracking, sales processing, expiry monitoring, and employee management, the system has significantly improved the overall efficiency and accuracy of pharmacy operations.

Key benefits of the system include:

- **Enhanced Efficiency**: Automation has reduced the time and effort required for routine tasks, allowing pharmacy staff to focus on more critical activities, such as customer service and managing restocks.
- **Reduced Errors**: The system has minimized human errors in inventory tracking, billing, and stock management, ensuring that operations are more accurate and reliable.
- **Improved Customer Experience**: Faster billing processes, accurate medicine tracking, and the prevention of expired medicine sales have contributed to higher levels of customer satisfaction.
- **Better Decision Making**: Real-time data and detailed reports have empowered pharmacy managers with valuable insights into sales trends, inventory needs, and employee performance, which enables informed decision-making and strategic planning.
- **Increased Security**: With secure login/logout features and role-based access control, sensitive data is better protected, ensuring that only authorized personnel can access critical information.
- **Cost Savings**: Through better inventory management and reduced wastage, the system has helped the pharmacy save on operational costs while improving profitability