

A Report on

Pharmacy Management System

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Certificate

This is to Certify that **HEMANT GUPTA** has carried out the project work presented in this report entitled “**Pharmacy Management System**” for the award of **Bachelor of Computer Applications** from Institute of Technology & Science, Mohan Nagar, Ghaziabad, under my supervision. The report embodies result of original work and studies carried out by Student himself and the contents of the report do not form the basis for the award of any other degree to the candidate or to anybody else.

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Abstract

The Pharmacy Management System (PMS) is a comprehensive software solution designed to streamline and enhance the operations of pharmacies. This system leverages advanced technologies to manage various pharmacy functions, including inventory control, prescription handling, billing, and customer relationship management. By integrating features such as real-time inventory tracking, automated reordering, and detailed reporting, the PMS ensures efficient stock management and optimal resource utilization. Additionally, the system incorporates a user-friendly interface built with Tkinter for ease of use and incorporates OpenCV for video processing to provide a robust and interactive experience.

The PMS also includes functionality for saving and printing bills, maintaining detailed records of medicines, and ensuring compliance with healthcare regulations. Future enhancements envision the integration of Electronic Health Records (EHR), mobile applications, advanced data analytics, AI-driven drug interaction checks, and blockchain for secure transactions. By offering these capabilities, the Pharmacy Management System aims to improve the accuracy, efficiency, and overall management of pharmacy operations, ultimately contributing to better patient care and streamlined pharmaceutical services.

In conclusion, The Pharmacy Management System represents a significant advancement in the management of pharmacy operations. By integrating essential functions such as inventory management, prescription handling, billing, and CRM into a single, cohesive platform, the PMS addresses the complexities and demands of modern pharmacy practice. The system's user-friendly interface ensures ease of use, while advanced features like real-time tracking, automated reordering, and detailed analytics enhance operational efficiency and decision-making.

The Pharmacy Management System is poised to transform pharmacy operations by delivering a comprehensive, efficient, and user-centric solution. Its continued evolution will address emerging challenges and opportunities in the healthcare industry, ensuring pharmacies can provide optimal service and care in a rapidly changing environment.

INDEX

Chapter-1: Introduction

1.1. Overview & Problem Statement.....	
1.2. Purpose.....	
1.3. Scope.....	
1.4. Tools Used.....	
1.5. Methodology used.....	
1.6. Technology used.....	

Chapter-2: System Analysis

2.1 Identification of Need.....	
2.2 Preliminary Investigation.....	
2.3 Feasibility Study.....	

Chapter-3: Means of Project

3.1 Hardware Requirement.....	
3.2 Software Requirements.....	

Chapter 4: Overall Description

4.1 Product Perspective.....	
4.2 Software Interface.....	
4.3 Hardware Interface.....	
4.4 Communication Interface.....	
4.5 Constraints.....	
4.6 ER Diagram.....	
4.7 Data Flow Diagrams.....	

4.8 Database Design.....	
--------------------------	--

Chapter 5: Specific Diagrams

5.1 Class Diagram.....	
------------------------	--

5.2 Use-Case Diagram.....	
---------------------------	--

5.3 Activity Diagrams.....	
----------------------------	--

5.4 System Analysis (Flowchart).....	
--------------------------------------	--

Chapter 6: Product Features

6.1 Screen Shots.....	
-----------------------	--

Chapter 7: Coding

Chapter 8: Test Cases and Test Results

Chapter 9: Conclusion

Chapter 10: References

Chapter 11: Future Scope of the Project

Chapter-12 Bibliography

Chapter-1

Introduction

The main aim of the project is the management of the database of the pharmaceutical shop. This project is insight into the design and implementation of a Pharmacy Management System. This is done by creating a database of the available medicines in the shop. The primary aim of pharmacy management system is to improve accuracy and enhance safety and efficiency in the pharmaceutical store. The aim of this project is to develop software for the effective management of a pharmaceutical store. We have developed this software for ensuring effective policing by providing statistics of the drugs in stock. The database is then connected to the main program by using to interconnection of the Visual Basic program and the database already created. Pharmacy management system is useful to maintain correct database by providing an option to update the drugs in stock. This is pharmacy management system; it is used to manage most pharmacy related activities in the pharmacy. Pharmacy management system is a management system that is designed to improve accuracy and to enhance safety and efficiency in the pharmaceutical store. This program can be used in any pharmaceutical shops having a database to maintain. It is a computer-based system which helps the Pharmacist to improve inventory management, cost, medical safety etc. The software used can generate reports, as per the user's requirements. Using this pharmacy management system user is also able to generate report within a specified period of time. The system allows the user to enter a manufacturing and expiry date for a particular product or drug during opening stock and sales transaction. The software can print invoices, bills, receipts etc. It can also maintain the record of supplies sent in by the supplier. The system will also give report showing the list of products expiries after a specified date before the product eventually expires. The system services and goals are established by consultation with system user. It also 2 involves manual entry upon arrival of new batches of drugs and upon drug movement out of the pharmacy for a certain period. Pharmacy management system is being build. Pharmacy management system is robust, integrated technology. every month, the pharmacist may want to generate report for the movement of drugs in and out of the pharmacy, getting information about the drugs e.g. expiry date, date purchased, number of drug type left, location of a drug in the pharmacy. Pharmacy management system deals with the maintenance of drugs and consumables in the pharmacy unit. This pharmacy management system is user friendly.

1.1 Overview & Problem Statement

Overview:

A Pharmacy Management System (PMS) is an integrated software solution designed to streamline and optimize the various operations within a pharmacy. This system helps pharmacists manage their business operations more efficiently by automating routine tasks, ensuring accuracy in inventory management, and enhancing customer service. The key functionalities of a PMS typically include inventory management, sales and billing, prescription management, reporting and analytics, and regulatory compliance.

Problem Statement:

Pharmacies face numerous challenges in managing their daily operations. These challenges can lead to inefficiencies, errors, and customer dissatisfaction. Some of the common problems that a Pharmacy Management System aims to address include:

Inventory Management Issues:

Stockouts and Overstocks: Pharmacies often struggle with maintaining optimal inventory levels, leading to stockouts (missing essential medications) or overstocks (wasting resources on surplus stock).

Expiry Management: Tracking and managing the expiry dates of medications to prevent dispensing expired products.

Operational Inefficiencies:

Manual Processes: Reliance on manual processes for inventory management, billing, and record-keeping increases the chances of human error and is time-consuming.

Long Customer Wait Times: Inefficient processes can lead to long wait times for customers, affecting customer satisfaction and loyalty.

Regulatory Compliance:

Prescription Management: Ensuring that prescriptions are filled accurately and in compliance with legal requirements.

Record Keeping: Maintaining accurate and up-to-date records for audits and regulatory inspections.

Financial Management:

Inaccurate Billing: Errors in billing can lead to financial losses and customer disputes.

Profitability Tracking: Difficulty in tracking sales, expenses, and overall profitability of the pharmacy.

Customer Relationship Management:

Customer Data Management: Managing customer information, preferences, and history to provide personalized services.

Loyalty Programs: Implementing and managing loyalty programs to enhance customer retention.

1.2 Purpose

The purpose of a Pharmacy Management System (PMS) is to provide a comprehensive and integrated software solution that enhances the efficiency, accuracy, and quality of pharmacy operations. By automating various routine tasks and providing real-time insights, a PMS aims to improve the overall management of a pharmacy, ensuring better service delivery, compliance with regulations, and optimal financial performance. Below are the key purposes of a Pharmacy Management System:

Enhance Operational Efficiency:

- **Automation of Routine Tasks:** Automates billing, inventory management, and record-keeping to reduce manual effort and human error.
- **Streamlined Workflow:** Simplifies and speeds up the workflow within the pharmacy, reducing wait times for customers and improving service delivery.

Accurate Inventory Management:

- **Real-time Tracking:** Keeps track of inventory levels in real-time, ensuring that stock is always up-to-date.
- **Expiry Management:** Monitors medication expiry dates to prevent the dispensing of expired drugs.
- **Automatic Reordering:** Generates purchase orders automatically when stock levels fall below predefined thresholds.

Improve Financial Management:

- **Accurate Billing and Invoicing:** Automates billing processes to ensure accurate and timely invoicing.
- **Financial Reporting:** Provides detailed financial reports that help in tracking sales, expenses, and profitability.
- **Reduced Financial Discrepancies:** Minimizes errors in financial transactions, leading to better financial management.

Enhance Customer Service:

- **Customer Data Management:** Stores and manages customer information, preferences, and prescription histories to provide personalized services.
- **Loyalty Programs:** Facilitates the implementation and management of loyalty programs to enhance customer retention.
- **Improved Customer Experience:** Reduces wait times and enhances the overall customer experience by making pharmacy operations more efficient.

Security and Data Integrity:

- **Secure Data Storage:** Ensures that all data, including customer information and transaction records, is stored securely and is protected from unauthorized access.
- **Data Backup:** Regularly backs up data to prevent loss in case of system failures or other emergencies.

1.3 Scope

The scope of a Pharmacy Management System (PMS) typically encompasses various aspects related to managing the operations of a pharmacy efficiently. Here's an overview of the scope of a typical PMS:

Inventory Management:

Tracking and managing medication inventory, including stock levels, expiration dates, and replenishment needs. Handling various types of medications such as tablets, capsules, liquids, injections, etc. Managing information about suppliers and manufacturers.

Medication Dispensing:

Facilitating the dispensing of prescribed medications to patients. Ensuring accuracy in medication dispensing and reducing the risk of errors. Recording details of dispensed medications, including patient information, dosage, and instructions.

Prescription Management:

Recording and organizing prescriptions received from healthcare providers. Verifying prescriptions, including dosage instructions and refill authorizations. Generating alerts for potential drug interactions or contraindications.

Reporting and Analytics:

Generating reports on medication usage, inventory levels, sales, and financial performance. Analyzing data to identify trends, optimize inventory management, and improve decision-making. Providing insights into medication adherence, patient outcomes, and revenue generation.

Security and Compliance:

Implementing measures to ensure the security and confidentiality of patient information. Adhering to regulatory requirements such as HIPAA (Health Insurance Portability and Accountability Act) and FDA (Food and Drug Administration) regulations. Conducting regular audits and assessments to maintain compliance with industry standards.

1.4 Tools used

Programming Languages and Frameworks

Python:

Python is the primary programming language used for developing the PMS. It is chosen for its simplicity, readability, and extensive libraries.

Graphical User Interface (GUI) Library

Tkinter:

Tkinter is the standard GUI toolkit in Python. It is used to create the graphical user interface for the application, allowing for the creation of windows, dialogs, buttons, and other GUI components.

Image Processing

Pillow (PIL):

Pillow is a Python Imaging Library (PIL) fork that adds image processing capabilities to your Python interpreter. It is used for opening, manipulating, and saving many different image file formats.

Video Playback

tkvideo:

tkvideo is a simple library used to play videos within a Tkinter window. It is useful for displaying video content in the application.

Text-to-Speech

pyttsx3:

pyttsx3 is a text-to-speech conversion library in Python. It is used to provide audio feedback or instructions to the users.

Database Management

MySQL:

MySQL is a popular relational database management system. It is used to store and manage the application's data, such as inventory, prescriptions, customer information, and transactions.

MySQL-connector-python: This library is used to connect Python applications to MySQL databases.

1.5 Methodology used

Requirement Analysis and Planning:

- **Stakeholder Consultation:** Engage with pharmacists, pharmacy staff, and other stakeholders to gather requirements and understand the challenges they face.
- **Requirement Specification:** Document detailed functional and non-functional requirements, ensuring clarity on the system's objectives and expected outcomes.
- **Project Planning:** Develop a project plan outlining timelines, resources, milestones, and deliverables.

System Design:

- **Architectural Design:** Define the system architecture, including the hardware and software components, network infrastructure, and data flow.
- **Database Design:** Design the database schema to ensure efficient data storage, retrieval, and integrity. This includes tables for inventory, prescriptions, customers, suppliers, and transactions.
- **User Interface Design:** Create wireframes and prototypes of the user interface to ensure it is intuitive and user-friendly.

Development:

- **Modular Development:** Implement the system in modular components to ensure scalability and ease of maintenance. Typical modules include inventory management, sales processing, prescription management, and reporting.
- **Version Control:** Use version control systems (e.g., Git) to manage code changes and collaboration among the development team.

Testing:

- **Unit Testing:** Conduct unit tests to verify the functionality of individual components.
- **Integration Testing:** Test the interactions between different modules to ensure they work seamlessly together.
- **User Acceptance Testing (UAT):** Involve end-users in testing the system to ensure it meets their expectations and requirements.

- **Performance Testing:** Evaluate the system's performance under various conditions to ensure it can handle the expected load.

Maintenance and Support:

- **Monitoring and Maintenance:** Continuously monitor the system for any issues or bugs and provide regular updates and patches.
- **User Support:** Offer training and support to users to ensure they can effectively use the system.
- **Feedback Loop:** Establish a feedback mechanism for users to report issues and suggest improvements.

1.6 Technology used

Programming Languages:

Python

Python is a high-level, interpreted programming language known for its simplicity and readability. It emphasizes code readability and a clean syntax, making it easy for programmers to express concepts in fewer lines of code compared to other languages. Python supports multiple programming paradigms, including procedural, object-oriented, and functional programming. It is widely used in various fields such as web development, data analysis, artificial intelligence, scientific computing, and more.

SQL (Structured Query Language)

SQL (Structured Query Language) is a standard programming language designed for managing and manipulating relational databases. It provides a set of commands for querying, updating, and managing data stored in a relational database management system (RDBMS). SQL allows users to create and modify database schemas, insert, update, and delete records, and perform various data manipulation tasks such as filtering, sorting, and aggregating data. It is widely used across different industries for storing, retrieving, and managing structured data efficiently.

Frameworks and Libraries:

Cv2

The Cv2 library in Python is part of OpenCV, an open-source computer vision and machine learning software library. OpenCV stands for "Open-Source Computer Vision Library," and it is widely used for image processing, computer vision, machine learning, and artificial intelligence tasks. OpenCV provides a large number of functions to manipulate and analyze images and videos.

Tkvideo

tkvideo is a Python library designed for integrating video playback within tkinter, Python's standard library for creating graphical user interfaces. The tkvideo library allows you to play videos in a tkinter application, which is useful when building GUI applications that require video playback functionality.

Visual Studio Code (VS Code)

Visual Studio Code (VS Code) is a free source-code editor developed by Microsoft for Windows, macOS, and Linux. It provides support for various programming languages and features such as syntax highlighting, code completion, debugging, version control integration, and extensions. VS Code is known for its lightweight and fast performance, making it popular among developers for coding and debugging tasks across different programming languages and frameworks.

MySQL

MySQL is an open-source relational database management system (RDBMS) that uses Structured Query Language (SQL) for managing and manipulating data. MySQL stores data in databases, which are organized collections of related data tables. Inside each database, data is organized into tables. Each table consists of rows and columns, similar to a spreadsheet. MySQL uses SQL as its primary language for interacting with the database. SQL allows users to perform various operations such as querying data (SELECT), inserting new records (INSERT), updating existing records (UPDATE), deleting records (DELETE), creating tables (CREATE TABLE)

Chapter-2

System Analysis

2.1 Identification of Need

The Pharmacy Management System is a comprehensive software solution designed to streamline and automate various operations within a pharmacy setting. It serves as a centralized platform to manage inventory, sales, prescriptions, customer information, and other essential aspects of running a pharmacy efficiently.

Inventory Management: The system enables pharmacists to track and manage the inventory of medications and other products in real-time. It provides functionalities such as inventory tracking, stock alerts, and automated reordering to ensure optimal stock levels and prevent stockouts.

Prescription Management: Pharmacists can easily input and manage prescriptions from healthcare providers. The system organizes prescriptions by patient, medication, and dosage, facilitating quick retrieval and dispensing.

Improved Efficiency: Automation of routine tasks such as inventory management and prescription processing save time and reduces manual errors, allowing pharmacists to focus on patient care.

Enhanced Customer Service: Access to comprehensive customer information enables pharmacists to provide personalized services and improve customer satisfaction.

Better Inventory Control: Real-time inventory tracking and automated reordering help minimize stockouts and reduce excess inventory, optimizing inventory management.

Advantages of the Project:

The Pharmacy Management System offers numerous advantages over traditional manual methods of pharmacy operation management. Some of the key advantages include:

Scalability and Flexibility: The Pharmacy Management System is designed to be scalable and flexible, allowing pharmacies to adapt to changing business needs and requirements. Whether it's adding new medicines, expanding the customer base, or integrating with other healthcare systems, the system can easily accommodate growth and expansion without compromising performance or functionality.

Regulatory Compliance: The system helps pharmacies maintain regulatory compliance by accurately tracking medicine details, expiration dates, and prescription records. Pharmacists can generate reports for regulatory authorities, demonstrate compliance with industry standards, and ensure adherence to legal requirements, thereby minimizing the risk of fines or penalties.

Enhanced Efficiency: By automating various tasks such as inventory management, sales processing, and report generation, the Pharmacy Management System significantly enhances the efficiency of pharmacy operations. Pharmacists can quickly access medicine details, process sales transactions, and generate reports, thereby reducing the time and effort required for routine tasks.

Improved Accuracy: Manual data entry is prone to errors, which can lead to discrepancies in inventory records, sales transactions, and customer information. With the Pharmacy Management System, data entry errors are minimized through built-in validation mechanisms, ensuring accurate and reliable data management.

Real-time Monitoring: The system provides real-time monitoring of medicine inventory levels, enabling pharmacists to track stock levels and receive alerts when inventory levels are low. This proactive approach helps prevent stockouts and ensures that essential medicines are always available to meet customer demand.

2.2 Preliminary Investigation

The Investigation of the Pharmacy Management System project is to design and develop a comprehensive software solution that automates and streamlines various tasks and processes involved in managing a pharmacy. The primary goals of the project are as follows:

Efficiency Enhancement: To enhance the efficiency of pharmacy operations by automating routine tasks such as inventory management, sales processing, and reporting, thereby reducing manual effort and minimizing errors.

Inventory Optimization: To optimize inventory management processes by providing real-time visibility into stock levels, facilitating timely replenishment, and minimizing stockouts and overstock situations.

Improved Customer Service: To improve customer service and satisfaction by providing pharmacists with tools and functionalities to quickly process sales transactions, access accurate information about medicines, and respond to customer inquiries effectively.

Data-driven Decision Making: To enable data-driven decision-making by providing comprehensive reporting and analytics functionalities that allow pharmacists to analyze sales trends, monitor inventory performance, and identify opportunities for improvement.

User-friendly Interface: To develop a user-friendly frontend interface that is intuitive, easy to navigate, and accessible across different devices, ensuring a positive user experience for pharmacists and other users of the system.

Compliance and Security: To ensure compliance with regulatory requirements and industry standards related to pharmacy management systems, including data security, privacy, and accessibility.

2.3 Feasibility Study

A feasibility study for a Pharmacy Management System (PMS) involves assessing various aspects to determine if the project is viable and worth pursuing. Here are some key components typically included in a feasibility study:

Technical Feasibility: This assesses whether the project can be implemented from a technical standpoint. It involves evaluating the availability of necessary technology, hardware, and software resources. For example, determining if the required programming languages, databases, and development tools are accessible and suitable for the project.

Financial Feasibility: This aspect examines the financial viability of the project. It involves estimating the costs associated with developing the PMS, including hardware, software, development, maintenance, and operational expenses. Additionally, potential revenue streams, such as sales of the system or subscription fees, should be considered to determine if the project can generate sufficient returns on investment.

Operational Feasibility: Operational feasibility evaluates whether the PMS aligns with the organization's operations and processes. It involves analyzing how the system will integrate with existing workflows, procedures, and practices within the pharmacy. Considerations include user acceptance, training requirements, and potential disruptions during implementation.

Legal and Regulatory Feasibility: This component assesses whether the PMS complies with relevant laws, regulations, and industry standards. It involves identifying legal requirements related to data privacy, security, and handling of sensitive information, such as patient health records and prescription data. Ensuring compliance with regulations like HIPAA (in the United States) is crucial to avoid legal liabilities.

Schedule Feasibility: Schedule feasibility evaluates whether the project can be completed within the expected timeframe. It involves creating a realistic project timeline, considering factors such as development, testing, deployment, and training. Delays in any phase of the project could impact the overall feasibility and success of the PMS.

Chapter -3

Means of project

3.1 Hardware Requirement

The hardware requirements for running Pharmacy Management System, which is a Python application with a graphical user interface (GUI) built using Tkinter, and possibly other libraries such as OpenCV for video processing, PIL for image handling, and MySQL for database management, can vary depending on the size and complexity of the application. Here are the general hardware requirements you might need:

Minimum Hardware Requirements

- **Processor:** Dual-core processor (Intel i3 or equivalent)
- **RAM:** 4 GB
- **Storage:** 20 GB free hard drive space
- **Graphics:** Integrated graphics
- **Operating System:** Windows 7/8/10, macOS, or a modern Linux distribution
- **Display:** Minimum resolution of 1366x768
- **Other Hardware:** Microphone and speakers

Recommended Hardware Requirements

- **Processor:** Quad-core processor (Intel i5 or equivalent)
- **RAM:** 8 GB or more
- **Storage:** 50 GB free hard drive space or SSD for faster performance
- **Graphics:** Dedicated graphics card (NVIDIA or AMD) if doing heavy image or video processing
- **Operating System:** Windows 10/11, macOS, or a modern Linux distribution
- **Display:** Full HD resolution (1920x1080)
- **Database Server:** If the MySQL database is hosted on a separate server, ensure the server meets the database load requirements.
- **Network:** Stable internet connection for database interactions if the database is hosted remotely.
- **Dependencies:** Ensure all required libraries and dependencies are installed, including pytsx3, opencv-python, PIL (Pillow), mysql-connector-python, and any others

3.2 Software Requirement

The software requirements for running your Pharmacy Management System include the operating system, development environment, necessary libraries,

and database management systems. Below is a comprehensive list of the software components you will need:

Operating System

- Windows 7/8/10/11 (preferred for easier installation of certain dependencies)
- macOS (compatible with necessary Python libraries)
- Linux (Ubuntu or any modern distribution)

Python Environment

- Python 3.8 or later
- Required Python Libraries

Make sure to install the following libraries using pip:

Tkinter (usually comes pre-installed with Python, but make sure it's included)

Pillow (PIL Fork): for image handling

`pip install pillow`

OpenCV: for video processing

`pip install opencv-python`

Pytsx3: for text-to-speech functionality

`pip install pyttsx3`

MySQL Connector: for connecting to MySQL database

`pip install mysql-connector-python`

Database Management System

MySQL: Install MySQL server and MySQL Workbench for managing your database. You can download them from the official MySQL website.

Development Tools

IDE/Text Editor: Use an IDE or text editor like PyCharm, VSCode, Sublime Text, or Atom for developing your application.

Version Control: Git for version control and GitHub/GitLab for repository hosting

Chapter-4

Overall Description

4.1 Product Perspective

The product perspective of the Pharmacy Management System (PMS) encompasses the view of how the system fits into the broader context of its use, including its intended market, primary functions, performance goals, and user interface. Here's a detailed analysis:

1. Market Need and Purpose

Target Users: The primary users of this system are pharmacists, pharmacy technicians, and healthcare providers who manage pharmaceutical inventory and dispensing.

Purpose: The system is designed to streamline pharmacy operations, improve accuracy in medication dispensing, manage inventory efficiently, and enhance overall pharmacy management.

2. System Interfaces

User Interface (UI): The system features a graphical user interface (GUI) developed using Tkinter, making it user-friendly and easy to navigate. Includes various forms for data entry (e.g., adding new medicines, updating inventory), buttons for actions (e.g., add, update, delete), and search functionalities. Displays visual elements like images and video to enhance user engagement.

Database Interface: Connects to a MySQL database to store and retrieve data related to medicines, inventory, and transactions. Uses MySQL Connector for Python to handle database operations.

Speech Interface: Integrates text-to-speech functionality using pyttsx3 to provide audio feedback and notifications to users.

3. Functional Overview

Medicine Management: Add, update, delete, and search for medicines in the inventory.

Inventory Control: Track stock levels, manage lot numbers, expiration dates, and automatically update quantities upon transactions.

Transaction Management: Generate bills for sales, record transaction details, and manage customer interactions.

Reporting: Generate reports on inventory status, sales, and other critical metrics.

4. Performance Goals

Efficiency: The system should handle multiple transactions and inventory updates swiftly to minimize waiting times for customers.

Reliability: Ensure data integrity and consistency, particularly for critical information such as medication names, lot numbers, and expiration dates.

Scalability: Capable of handling an expanding database as the pharmacy grows, without significant performance degradation.

Usability: Intuitive and easy to use for pharmacy staff with varying levels of technical expertise.

5. Security and Privacy

Data Security: Secure sensitive data such as patient information and medication details using encryption and secure database practices.

Access Control: Implement user authentication and role-based access control to restrict access to certain features based on user roles (e.g., pharmacist, technician).

Compliance: Ensure the system complies with relevant healthcare regulations and standards, such as HIPAA (Health Insurance Portability and Accountability Act) for handling patient data.

4.2 Software Interface

The Pharmacy Management System (PMS) interfaces with several software components and services to provide a seamless and integrated experience. Below is an outline of the key software interfaces that the PMS interacts with:

1. Graphical User Interface (GUI)

Framework: Tkinter

Purpose: Tkinter is used to create the graphical user interface of the PMS, allowing users to interact with the system through forms, buttons, and other controls.

Features: The GUI includes elements such as labels, entry fields, buttons, and frames to organize different sections like Medicine Information, Inventory Control, and Transaction Management.

2. Database Interface

Database Management System: MySQL

Connector: MySQL Connector for Python (mysql.connector)

Purpose: The PMS uses MySQL to store and manage data related to medicines, inventory, transactions, and user information.

Operations: Includes CRUD (Create, Read, Update, Delete) operations for handling medicine records, inventory updates, and transaction logs.

3. Speech Interface

Text-to-Speech Engine: pyttsx3

Purpose: pyttsx3 is used to convert text to speech for providing audio feedback and notifications to the users.

Integration: The system calls pyttsx3 functions to announce key events or provide verbal instructions to users.

4. Video Interface

Library: OpenCV

Purpose: To display instructional videos or promotional content within the PMS interface.

Integration: The system uses OpenCV to load and display video files on the Tkinter canvas.

5. Image Handling

Library: PIL (Python Imaging Library) / Pillow

Purpose: For loading, resizing, and displaying images within the PMS interface.

Integration: Images such as logos, promotional graphics, and medication photos are processed and displayed using PIL.

6. Search and Filter Interface

Library: Tkinter.ttk (Themed Tkinter Widgets)

Purpose: To provide enhanced search and filtering capabilities within the PMS.

Integration: Uses ttk Combobox and Entry widgets to allow users to select search criteria and input search terms.

4.3 Hardware Interface

The Pharmacy Management System (PMS) interacts with various hardware components to provide a comprehensive solution for managing pharmacy operations. Below is an outline of the key hardware interfaces that the PMS utilizes:

1. Computer System

Processor: Minimum Intel i5 or equivalent

Purpose: To ensure smooth and efficient processing of data and operations within the PMS.

RAM: Minimum 8GB

Purpose: To handle multiple tasks simultaneously without performance degradation.

Storage: Minimum 256GB SSD

Purpose: To provide fast read/write operations and sufficient space for database and application files.

2. Printer

Type: Thermal or Inkjet Printer

Purpose: To print labels, receipts, and reports.

Integration: Connects via USB, Ethernet, or Wi-Fi to the computer system running the PMS.

3. Cash Drawer

Type: Electronic Cash Drawer

Purpose: To securely store cash transactions.

Integration: Connected to the POS system via a dedicated port, often linked to the receipt printer.

4. Network Infrastructure

Type: Routers, Switches, and Ethernet Cables

Purpose: To ensure reliable network connectivity for database access, online updates, and communication between different hardware components.

Integration: Facilitates communication between the PMS server and client machines, as well as other networked devices like printers and scanners.

4.4 Communication Interface

The communication interface of the Pharmacy Management System (PMS) enables seamless interaction between various components, ensuring smooth

data exchange and integration with external systems. Below is an outline of the key communication interfaces used in the PMS:

1. Database Communication

Type: SQL (Structured Query Language)

Purpose: To communicate with the backend database (e.g., MySQL) for storing, retrieving, updating, and deleting data related to pharmacy operations.

Example: Using MySQL connector for Python to execute SQL queries.

2. Network Communication

Type: TCP/IP (Transmission Control Protocol/Internet Protocol)

Purpose: To enable communication between different parts of the system, including the client application, database server, and any networked peripherals.

Example: Using sockets or higher-level libraries for network communication.

3. Local Communication

Type: USB, Serial Communication (RS232)

Purpose: To interface with local hardware devices such as barcode scanners, printers, and weighing scales.

Example: Using pyserial library to communicate with devices over a serial interface.

4. Web Interface

Type: HTTP/HTTPS

Purpose: To provide a web-based interface for remote access and management of the PMS.

Example: Using Flask or Django for developing web applications.

4.5 Constraints

Regulatory Compliance: The system must comply with regulatory standards and guidelines set by health authorities, such as FDA (Food and Drug Administration) in the

United States or MHRA (Medicines and Healthcare products Regulatory Agency) in the UK.

Data Security and Privacy: The PMS should ensure the confidentiality, integrity, and availability of sensitive patient information and medical records. Compliance with regulations like HIPAA (Health Insurance Portability and Accountability Act) may be necessary.

System Performance: The system should be able to handle a large volume of transactions efficiently without performance degradation. Response times for critical operations like prescription processing should be minimal.

Scalability: The PMS should be scalable to accommodate future growth in terms of the number of users, transactions, and data volume. It should be able to scale both vertically (adding more resources to existing servers) and horizontally (adding more servers to distribute the load).

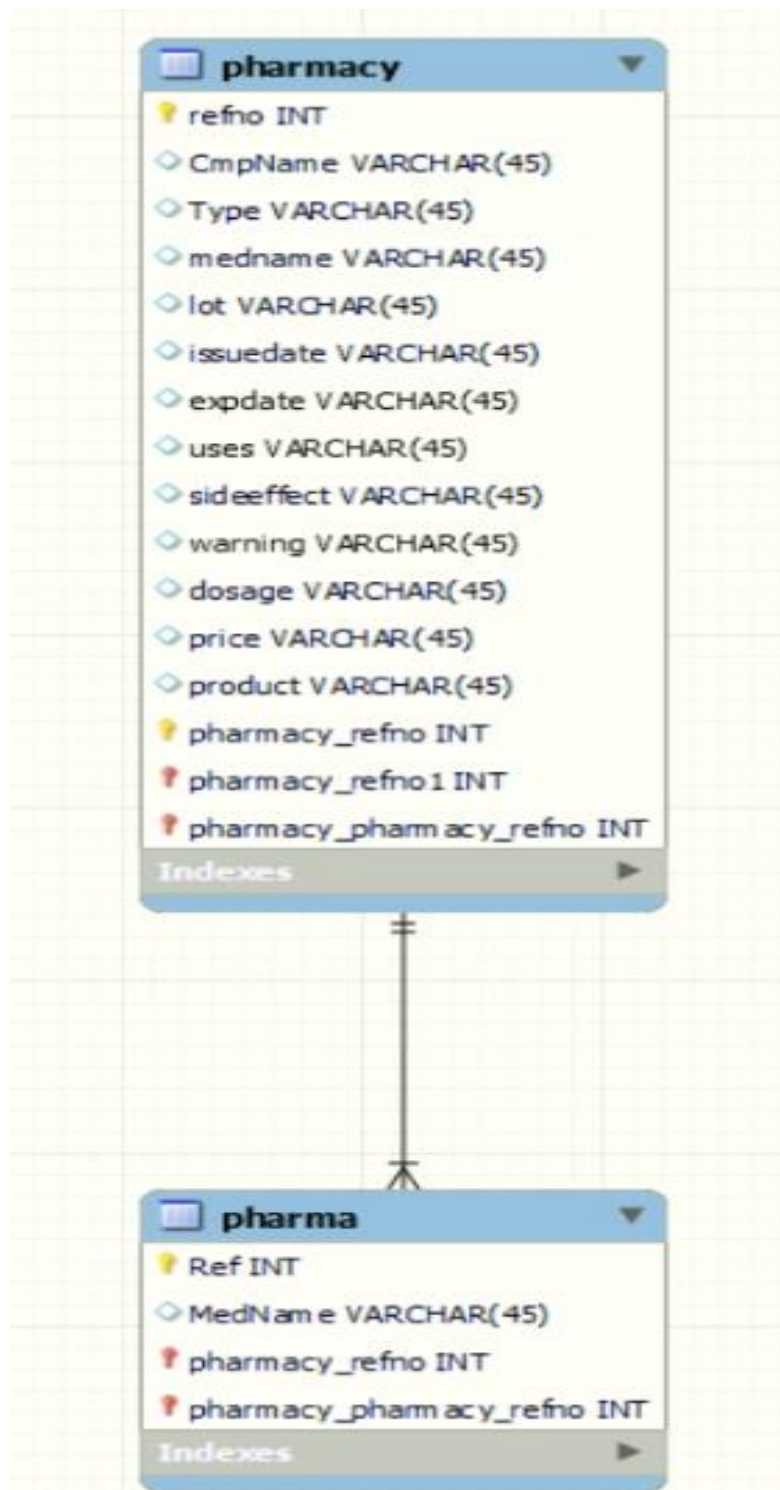
Integration with External Systems: The PMS may need to integrate with other healthcare systems such as Electronic Health Records (EHR), insurance providers, or drug databases. Compatibility and interoperability with these systems should be ensured.

User Interface and Accessibility: The user interface should be intuitive, user-friendly, and accessible to users with disabilities. Consideration should be given to factors like screen readers, keyboard navigation, and color contrast.

Budget and Resource Constraints: The development and maintenance of the PMS should be within budget constraints. This includes costs associated with software development, hardware procurement, licensing fees, and ongoing support.

Time Constraints: The project should be completed within a specified timeframe, taking into account factors like development time, testing, deployment, and training of staff.

4.6 ER Diagram

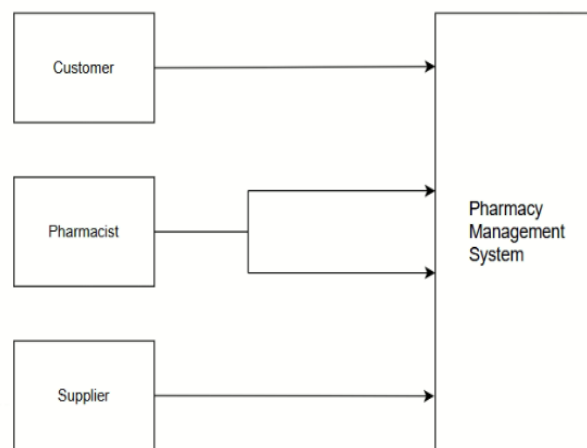


4.7 Data Flow Diagrams

Level 0 DFD: Context Diagram

The Level 0 Data Flow Diagram (DFD) for the Pharmacy Management System represents the system as a single process with its interactions with external entities. In this system, the key external entities include Customers, Pharmacists, and Suppliers. The Pharmacy Management System is at the center, facilitating the primary activities of prescription

management, inventory management, sales processing, and supplier management. Customers interact with the system to get prescriptions filled, purchase medications, and view their prescription history. Pharmacists interact with the system to manage prescriptions, update inventory, and process sales. Suppliers interact with the system to provide medications and update inventory records. Data flows between these entities and the system are straightforward. Customers provide prescription information and purchase orders. Pharmacists input prescription details, manage inventory updates, and process sales transactions. Suppliers send inventory details and order updates to the system. The Pharmacy Management System processes these inputs and provides necessary outputs, such as updated inventory statuses, sales receipts, and prescription details.



Level 1 DFD: Breakdown of Pharmacy Management System

The Level 1 DFD breaks down the Pharmacy Management System into its main subprocesses, providing a more detailed view of the system's operations. These subprocesses include: Manage Prescriptions, Manage Inventory, Process Sales, Manage Suppliers, and Manage Customers.

Manage Prescriptions: This process handles the addition, updating, and viewing of prescription information. Customers provide prescription details which are managed by the pharmacists.

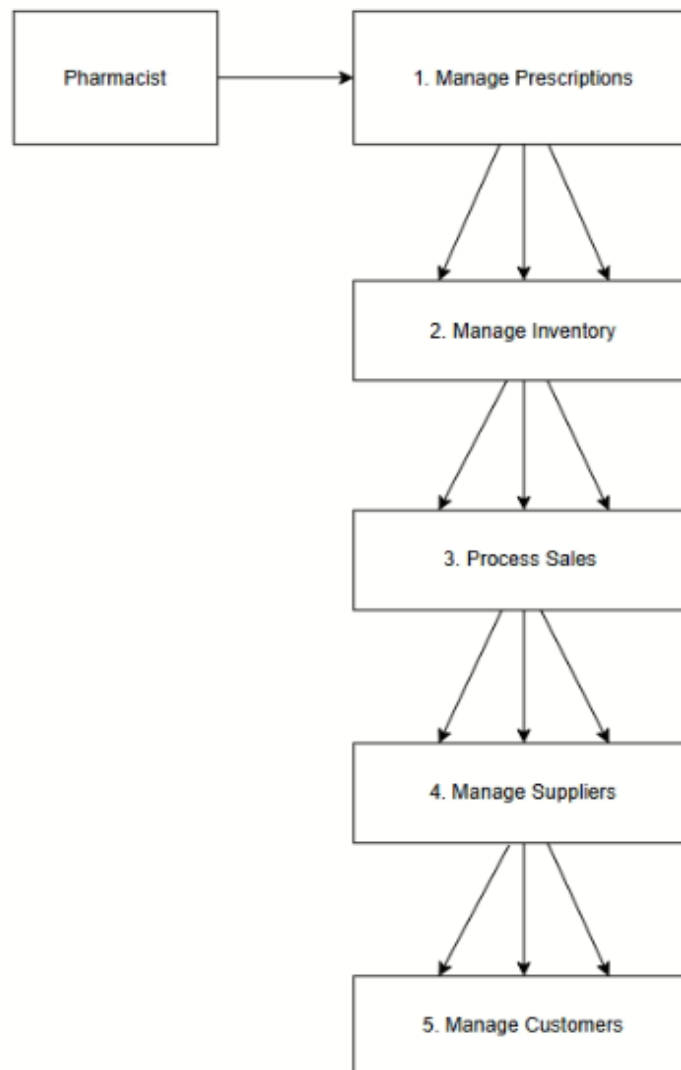
Manage Inventory: This process involves adding new inventory, updating existing inventory levels, and viewing current stock. Pharmacists and suppliers interact with this process to ensure accurate inventory records.

Process Sales: This process deals with creating sales transactions, updating sales records, and generating receipts for customers.

Manage Suppliers: This process manages supplier information, including adding new suppliers, updating existing supplier details, and viewing supplier information.

Manage Customers: This process handles customer information, including adding new customers, updating customer details, and viewing customer records.

Each of these subprocesses interacts with the necessary data stores and external entities to perform their functions. Data flows include prescription details, inventory updates, sales transactions, supplier information, and customer records.

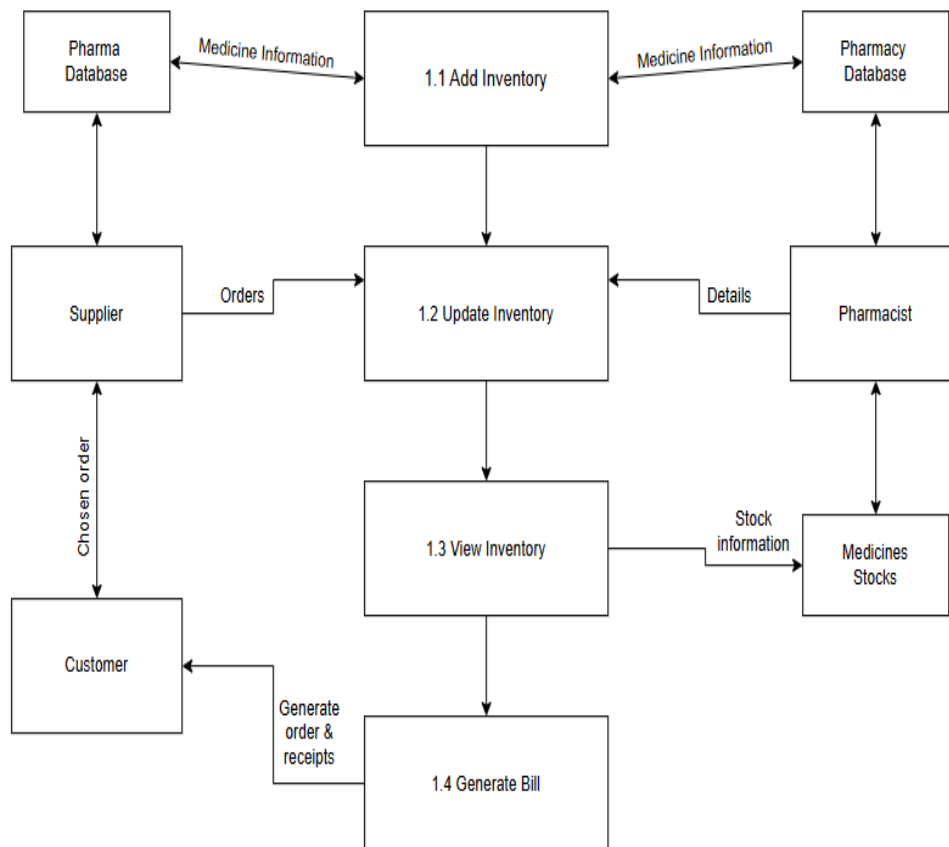


Level 2 DFD: Detailed Processes

The Level 2 DFD provides an in-depth look at each subprocess identified in the Level 1 DFD. Each major process is further decomposed into smaller tasks.

Process 1: Manage Prescriptions

- **Add Prescription:** Customers submit new prescription details.
- **Update Prescription:** Pharmacists update prescription details as necessary.
- **View Prescription:** Customers and pharmacists can view existing prescriptions.



4.8 Database Design

1. Medicine Table

Stores information about Medicines

Column	Data Type	Constraints
MedicineID	INT	PRIMARY KEY, AUTO_INCREMENT
CompanyName	VARCHAR(100)	NOT NULL
Type	VARCHAR(50)	NOT NULL
TabletName	VARCHAR(100)	NOT NULL
LotNo	VARCHAR(50)	NOT NULL
IssueDate	DATE	NOT NULL
ExpDate	DATE	NOT NULL
Uses	TEXT	
SideEffects	TEXT	
Warning	TEXT	
Dosage	VARCHAR(100)	NOT NULL
Price	DECIMAL(10, 2)	NOT NULL
ProductQuantity	INT	NOT NULL

2. Bill Table

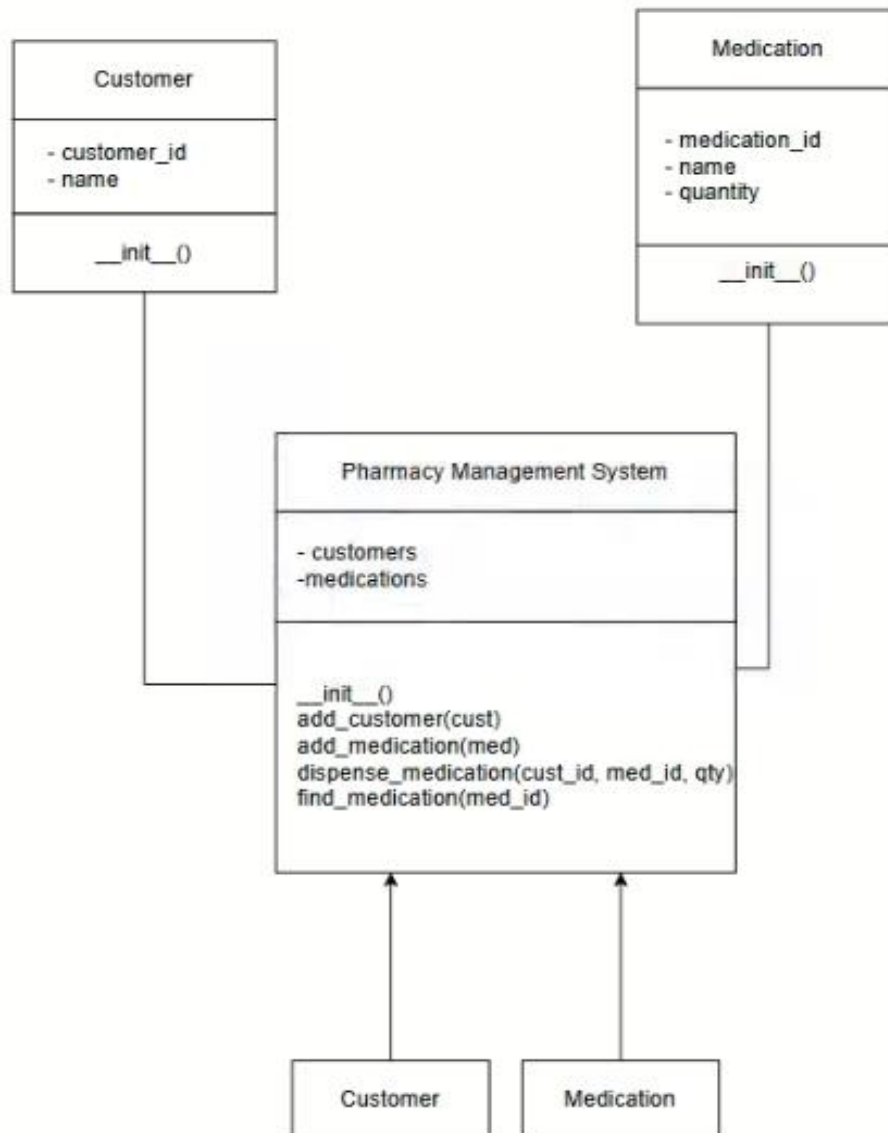
Stores billing details for each transaction.

Column	Data Type	Constraints
BillID	INT	PRIMARY KEY, AUTO_INCREMENT
MedicineID	INT	FOREIGN KEY REFERENCES Medicine(MedicineID)
Quantity	INT	NOT NULL
TotalPrice	DECIMAL(10, 2)	NOT NULL
BillDate	DATE	NOT NULL

Chapter-5

Specific Diagrams

5.1 Class Diagram



1. Customer Class

- Attributes:
 - customer_id: Unique identifier for the customer.
 - name: Name of the customer.
- Methods:
 - __init__(self, customer_id, name): Initializes a new customer with an ID and name.

2. Medication Class

- Attributes:

- medication_id: Unique identifier for the medication.
- name: Name of the medication.
- quantity: Quantity of the medication in stock.
- Methods:
 - __init__(self, medication_id, name, quantity): Initializes a new medication with an ID, name, and quantity.

3. Pharmacy Management System Class

- Attributes:
 - customers: List of Customer objects.
 - medications: List of Medication objects.
- Methods:
 - __init__(self): Initializes an empty pharmacy system with lists for customers and medications.
 - add_customer(self, customer): Adds a new customer to the system.
 - add_medication(self, medication): Adds a new medication to the system.
 - dispense_medication(self, customer_id, medication_id, quantity): Dispenses medication to a customer if the quantity is available.
 - find_customer(self, customer_id): Finds and returns a customer by their ID.
 - find_medication(self, medication_id): Finds and returns a medication by its ID.

This diagram illustrates the relationships between the PharmacySystem, Customer, and Medication classes, showing how they interact within the Pharmacy Management System.

5.2 Use case Diagram

The use case diagram for a Pharmacy Management System. In a use case diagram, we describe the interactions between actors (users or other systems) and the system itself. Here, the main actors are Customers, Pharmacists, and Suppliers.

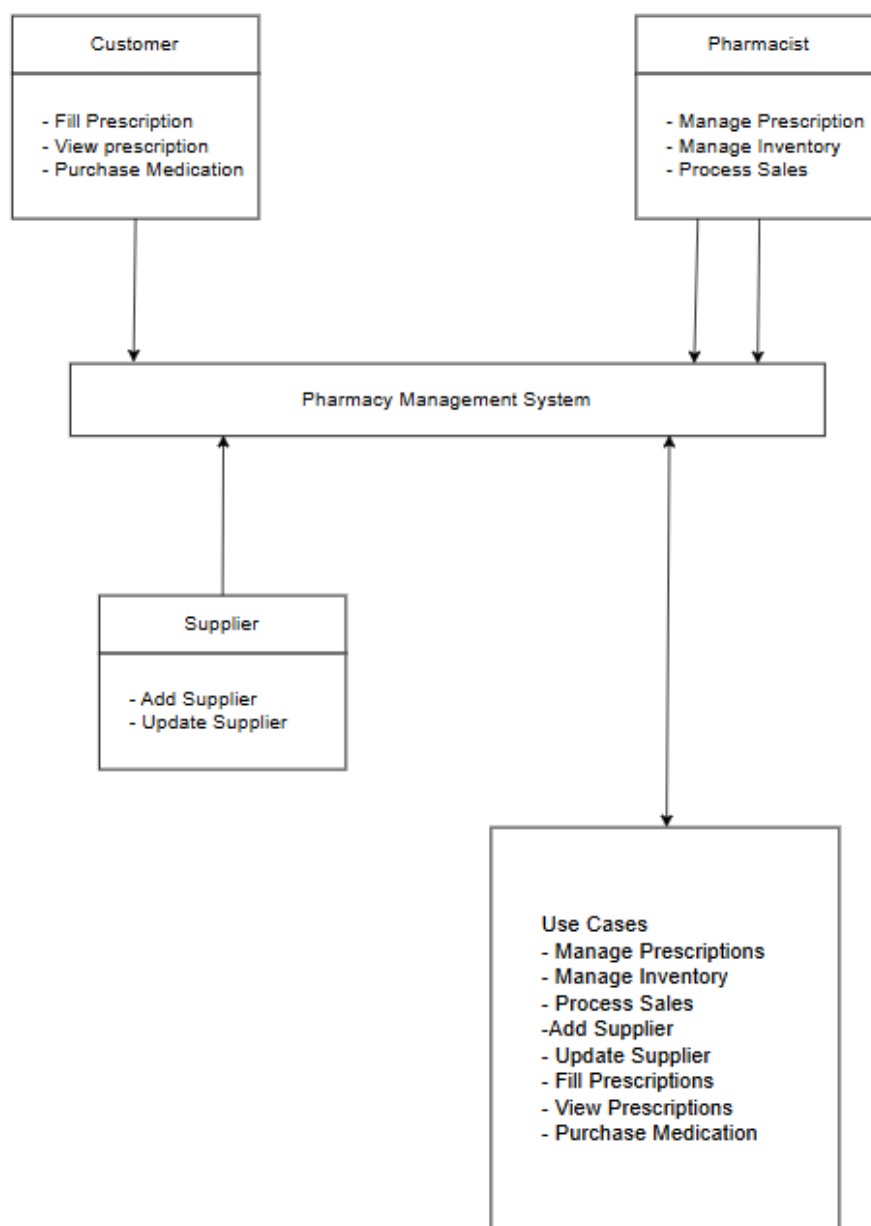
Use Case Diagram for Pharmacy Management System

Actors:

- Customer: Interacts with the system to fill prescriptions, view prescription history, and purchase medications.
- Pharmacist: Manages prescriptions, updates inventory, processes sales, and handles customer queries.
- Supplier: Provides and updates inventory for the pharmacy.

Use Cases:

1. Fill Prescription: Customers submit prescription details to get medications.
2. View Prescription History: Customers view their past prescription records.
3. Purchase Medication: Customers purchase over-the-counter medications.
4. Manage Prescriptions: Pharmacists add, update, and view prescription details.
5. Manage Inventory: Pharmacists and suppliers add new medications, update existing inventory, and check stock levels.
6. Process Sales: Pharmacists handle the sales transactions for medications.
7. Add Supplier: Suppliers are added to the system for inventory updates.
8. Update Supplier Information: Suppliers update their contact and other relevant details.

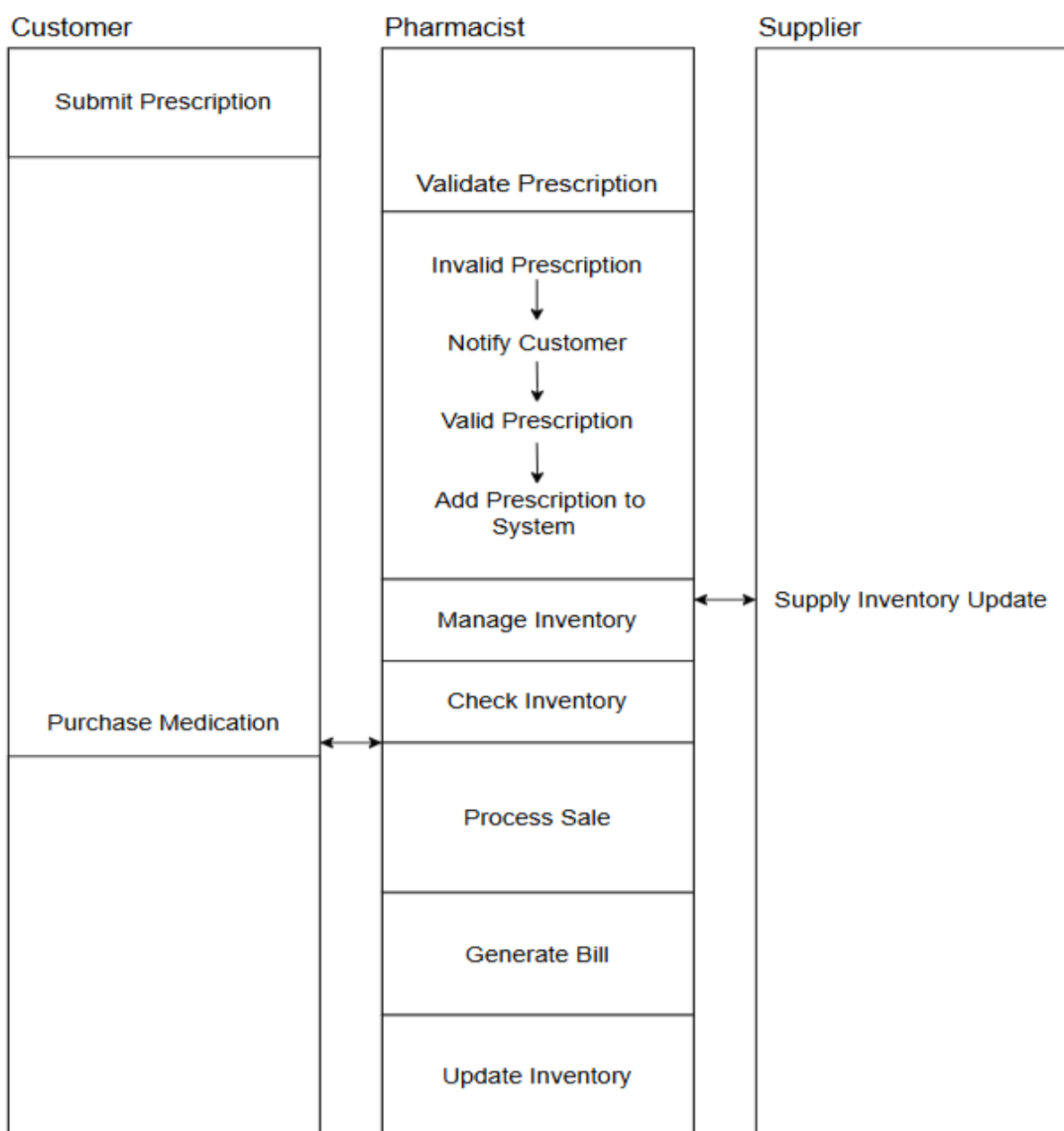


5.3 Activity Diagrams

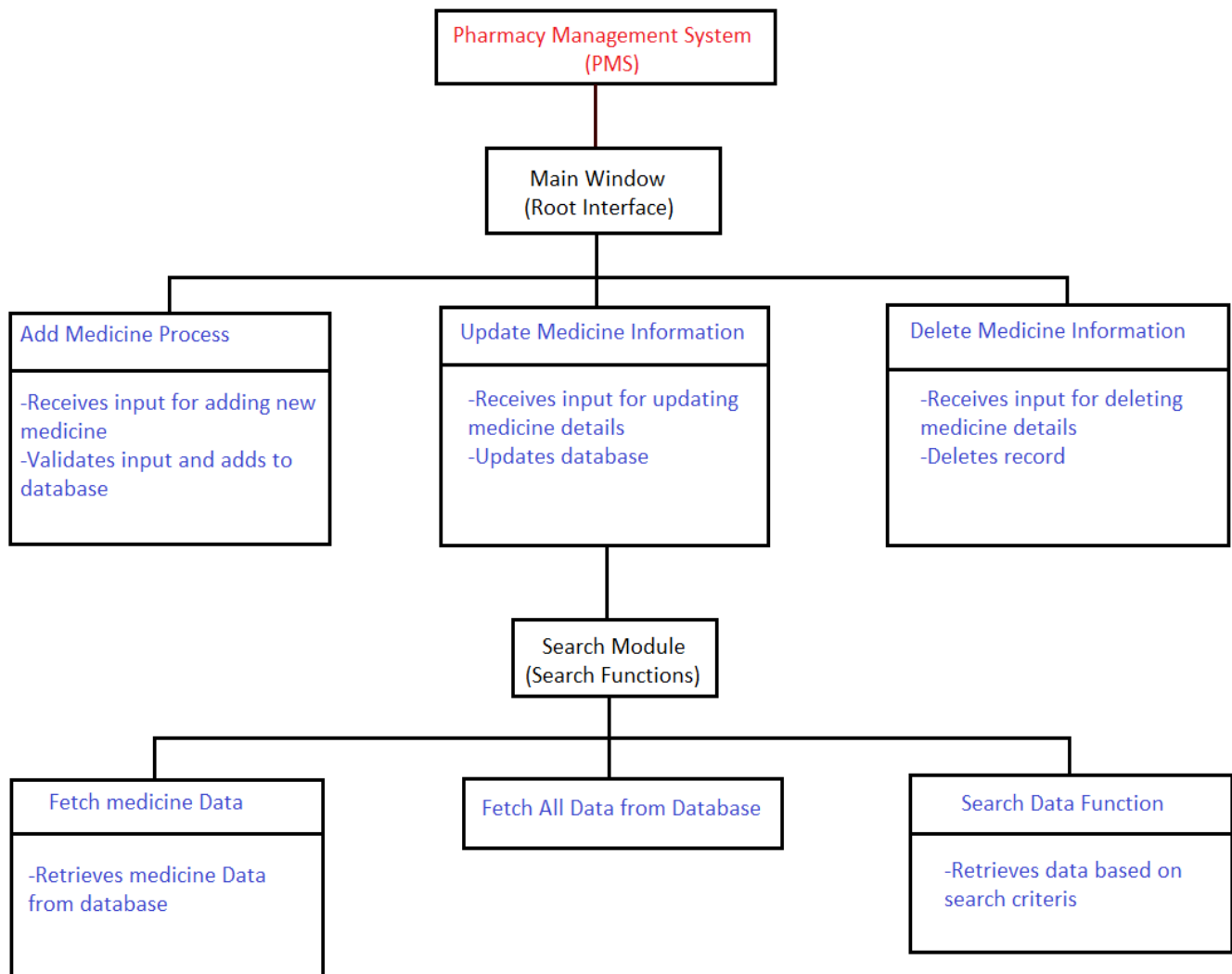
The activity diagram is divided into three swim lanes to represent the actions of different actors: Customer, Pharmacist, and Supplier.

Key Activities:

- Customer submits a prescription.
- Pharmacist validates and adds prescription.
- Pharmacist manages inventory.
- Customer purchases medication.
- Supplier provides inventory updates.



5.4 System Analysis (Flowchart)



Chapter-6

Product Features

Database Connectivity: The program connects to a MySQL database hosted locally using the MySQL connector library. The connection parameters include the host, username, password, and database name.

Adding Medicine Information: Allows adding medicine information to the database. Validates that the reference number and medicine name fields are not empty before adding the data. Executes an SQL INSERT query to add the medicine information to the database.

Fetching Medicine Information: Retrieves medicine information from the database. Executes an SQL SELECT query to fetch all rows from the pharma table. Populates the medicine table in the GUI with the fetched data.

Updating Medicine Information: Allows updating existing medicine information in the database. Validates that the reference number and lot number fields are not empty before updating the data. Executes an SQL UPDATE query to modify the medicine information in the database.

Deleting Medicine Information: Allows deleting medicine information from the database. Executes an SQL DELETE query to remove the selected medicine information based on the reference number.

Resetting Fields: Provides functionality to clear/reset all input fields in the GUI.

Searching Medicine Information: Enables searching for medicine information based on different criteria such as reference number, medicine name, or lot number. Executes an SQL SELECT query with a LIKE clause to search for matching records in the database.

6.1 Screen Shots

- Icon of the Project



➤ Main Introductory

Pharmacy Management System


PHARMACY MANAGEMENT SYSTEM

Medicine Information

Reference No: 1212
Company Name: Amit Pharma
Type of Medicine: Tablet
Medicine Name: Novel
Lot No: 4562
Issue Date: 13/11/2023
Exp Date: 12/10/2024
Uses: Headache
Side Effect: No

Prec&warning: Dr.const
Dosage: 2
Tablets Price: 200
Product QT: 12

Stay Home Stay Safe:



New Medicine Add Department

Reference No: 1212
Medicine Name: Novel

Ref	Medicine Name
1212	Novel
1213	Crocin
1214	Cititzen
1215	PCM

ADD
UPDATE
DELETE
CLEAR

Add Medicine UPDATE DELETE RESET EXIT Search By Select Option SEARCH SHOW ALL Generate Bill

Reference No	Company Name	Type Of Medicine	Tablet Name	Lot No	Issue Date	Exp Date	Uses	Side Effect	Prec&Warning	Dosage	Price	Product Qts
1212	Amit Pharma	Tablet	Novel	4562	13/11/2023	12/10/2024	Headache	No	Dr.const	2	200	12
1213	Ashish Pharma	Tablet	Crocin	4562	13/11/2023	12/10/2024	Headache	No	Dr.const	2	200	12
1214	Hemant Pharma	Tablet	Cititzen	4563	02/05/2023	10/03/2025	Cold	No	Dr.const	4	400	20
1215	Sun Pharma	Tablet	PCM	4564	21/10/2023	22/11/2024	Pain	No	Dr.const	5	350	30

➤ New medicine Add Department

New Medicine Add Department




Reference No:

Medicine Name:

Ref	Medicine Name
1212	Novel
1213	Crocin
1214	Cititzen
1215	PCM

ADD
UPDATE
DELETE
CLEAR

➤ Medicine Information

Medicine Information

Reference No

1214

Company Name:

Hemant Pharma

Type of Medicine

Tablet

Medicine Name

Citrizen

Lot No:

4563

Issue Date:

02/05/2023

Exp Date:

10/03/2025

Uses:

Cold

Side Effect:

No

Prec&warning:

Dr.const

Dosage:

4

Tablets Price:

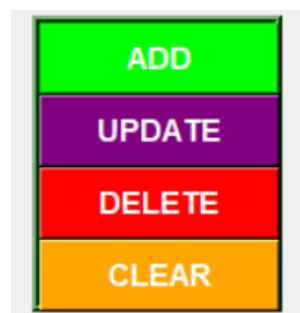
400

Product QT:

20

Stay Home Stay Safe:

➤ Buttons and Controls



Add Medicine

UPDATE

DELETE

RESET

EXIT

Search By

refno

1212

SEARCH


SHOW ALL

Generate Bill

➤ Medicine Database

Reference No	Company Name	Type Of Medicine	Tablet Name	Lot No	Issue Date	Exp Date	Uses	Side Effect	Prec&Warning	Dosage	Price	Product Qts
1212	Amit Pharma	Tablet	Novel	4562	13/11/2023	12/10/2024	Headache	No	Dr.const	2	200	12
1213	Ashish Pharma	Tablet	Crocin	4562	13/11/2023	12/10/2024	Headache	No	Dr.const	2	200	12
1214	Hemant Pharma	Tablet	Citrizen	4563	02/05/2023	10/03/2025	Cold	No	Dr.const	4	400	20
1215	Sun Pharma	Tablet	PCM	4564	21/10/2023	22/11/2024	Pain	No	Dr.const	5	350	30

➤ Bill Details

 Bill

—

□

×

Bill Details

===== Pharmacy Bill =====

Reference No: 1214
Medicine Name: Citrizen
Issue Date: 02/05/2023
Product Quantity: 20

=====

Total Amount: 400

=====

Save & Print Bill

Chapter-7

Coding

```
from tkinter import *

from tkinter import ttk, messagebox

from PIL import Image, ImageTk

import tkinter as tk

import mysql.connector

import pyttsx3

import cv2

from tkvideo import tkvideo

from tkinter import filedialog

import os

class PharmacyManagementSystem:

    def __init__(self, root):

        self.root = root

        self.root.title("Pharmacy Management System")

        self.root.geometry("1920x1080+0+0")

        self.root.state('zoomed')

        self.engine = pyttsx3.init()

        # Variable declaration

        self.addmed_var = StringVar()

        self.refMed_var = StringVar()

        # Main variable

        self.ref_var=StringVar()

        self.cmpName_var=StringVar()

        self.typeMed_var=StringVar()

        self.medName_var=StringVar()

        self.lot_var=StringVar()

        self.issuedate_var=StringVar()

        self.expdate_var=StringVar()

        self.uses_var=StringVar()
```



```

self.sideEffect_var=StringVar()

self.warning_var=StringVar()

self.dosage_var=StringVar()

self.price_var=StringVar()

self.product_var=StringVar()

# Top frame

lbltitle = Label (self.root, text=" PHARAMACY MANAGEMENT SYSTEM", bd=15, relief=RIDGE,

                    bg='white', fg='darkgreen', font=("times new roman", 50, "bold"), padx=2, pady=4)

lbltitle.pack(side=TOP, fill=X)

# Logo

img1 = Image.open("D:\\MAJOR PROJECT 1\\Logo.jpg")

img1 = img1.resize((75, 65), Image.LANCZOS)

self.photoimg1 = ImageTk.PhotoImage(img1)

b1 = Button(self.root, image=self.photoimg1, borderwidth=0, command=self.say_hello)

b1.place(x=50, y=25)

# DataFrame

DataFrame = Frame(self.root, bd=15, relief=RIDGE, padx=20)

DataFrame.place(x=0, y=120, width=1530, height=400)

# Add Medicine Frame

DataFrameLeft = LabelFrame(DataFrame, bd=10, relief=RIDGE, padx=20, text="Medicine Information",

                             fg="darkgreen", font=("arial", 12, "bold"))

DataFrameLeft.place(x=0, y=5, width=900, height=350)

self.root.after(1500, self.speak_text, "Welcome to Pharmacy Management System")

# Button Frame

ButtonFrame = Frame(self.root, bd=15, relief=RIDGE, padx=20)

ButtonFrame.place(x=0, y=500, width=1530, height=65)

# Main buttons

btnAddData = Button(ButtonFrame, command=self.add_data ,text="Add Medicine", font=("arial", 12, "bold"), width=11 ,

bg="darkgreen", fg="white")

btnAddData.grid(row=0, column=0)

btnUpdateMed=Button(ButtonFrame,text="UPDATE", command=self.update , font=("arial", 13, "bold"),

width=12,bg="darkgreen",fg="white")

btnUpdateMed.grid(row=0, column=1)

```

```

    btnDeleteMed=Button(ButtonFrame, text="DELETE", command=self.delete , font=("arial", 13, "bold"), width=12,bg="red",
fg="white")

    btnDeleteMed.grid(row=0, column=2)

    btnRestMed=Button(ButtonFrame, command=self.reset, text="RESET", font=("arial", 13, "bold"), width=13,
bg="darkgreen", fg="white")

    btnRestMed.grid(row=0, column=3)

    btnExitMed=Button(ButtonFrame,command=self.exit_application , text="EXIT", font=("arial", 13, "bold"), width=13,
bg="darkgreen", fg="white")

    btnExitMed.grid(row=0, column=4)

    #=====SearchBy=====#

    lblSearch=Label(ButtonFrame, font=("arial", 17, "bold"), text="Search By", padx=2, bg="red", fg="white")

    lblSearch.grid(row=0, column=5, sticky=W)

    self.search_var=StringVar()

    serch_combo=ttk. Combobox (ButtonFrame, textvariable=self.search_var ,width=12, font=("arial", 17, "bold"),
state="readonly")

    serch_combo["values"]=("Select Option","refno","Medname", "Lot")

    serch_combo.grid(row=0, column=6)

    serch_combo.current(0)

    self.serchTxt_var=StringVar()

    txtSerch=Entry(ButtonFrame, textvariable=self.serchTxt_var, bd=3, relief=RIDGE, width=11, font=("arial", 17, "bold"))

    txtSerch.grid(row=0, column=7)

    searchBtn=Button(ButtonFrame, command=self.search_data, text="SEARCH", font=("arial", 13, "bold"), width=10,
bg="darkgreen", fg="white")

    searchBtn.grid(row=0, column=8)

    showAll=Button(ButtonFrame, command=self.fatch_data ,text="SHOW ALL", font=("arial", 13, "bold"), width=10,
bg="darkgreen", fg="white")

    showAll.grid(row=0, column=9)

    btnGenerateBill = Button(ButtonFrame, text="Generate Bill", command=self.generate_bill,

        font=("arial", 12, "bold"), width=12, bg="darkgreen", fg="white")

    btnGenerateBill.grid(row=0,column=10)

    #=====Label and entry=====#

    lblrefno=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Reference No", padx=2)

    lblrefno.grid(row=0, column=0, sticky=W)

    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

    my_cursor = conn.cursor()

    my_cursor.execute("select Ref from pharma")

```

```

row=my_cursor.fetchall()

ref_combo=ttk.Combobox (DataFrameLeft, textvariable=self.ref_var , width=27, font=("arial", 12, "bold"),
state="readonly")

ref_combo["values"]=row

ref_combo.grid(row=0,column=1)

ref_combo.current(0)

lblCmpName=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Company Name:", padx=2, pady=6)

lblCmpName.grid(row=1, column=0, sticky=W)

txtCmpName=Entry(DataFrameLeft,textvariable=self.cmpName_var, font=("arial", 13, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtCmpName.grid(row=1, column=1)

lblTypeofMedicine=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Type of Medicine", padx=2, pady=6)

lblTypeofMedicine.grid(row=2, column=0, sticky=W)

comTypeofMedicine=ttk.Combobox (DataFrameLeft, textvariable=self.typeMed_var ,state="readonly",

                                font=("arial", 12, "bold"),width=27)

comTypeofMedicine ['value']=("Tablet", "Liquid", "Capsules", "Topical Medicines", "Drops", "Inhales", "Injection")

comTypeofMedicine.current(0)

comTypeofMedicine.grid(row=2, column=1)

#=====AddMedicine=====#

lblMedicineName=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Medicine Name", padx=2, pady=6)

lblMedicineName.grid(row=3, column=0, sticky=W)

conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

my_cursor = conn.cursor()

my_cursor.execute("select MedName from pharma")

med=my_cursor.fetchall()

comMedicineName=ttk.Combobox(DataFrameLeft, textvariable=self.medName_var ,state="readonly",

                                font=("arial", 12, "bold"), width=27)

comMedicineName['value']=med

comMedicineName.current(0)

comMedicineName.grid(row=3, column=1)

lblLotNo=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Lot No:", padx=2, pady=6)

lblLotNo.grid(row=4, column=0, sticky=W)

txtLotNo=Entry (DataFrameLeft, textvariable=self.lot_var , font=("arial", 13, "bold"), bg="white", bd=2, relief=RIDGE,
width=29)

txtLotNo.grid(row=4, column=1)

```

```

lblIssueDate=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Issue Date:", padx=2, pady=6)

lblIssueDate.grid(row=5, column=0, sticky=W)

txtIssueDate=Entry (DataFrameLeft, textvariable=self.issuedate_var , font=("arial", 13, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtIssueDate.grid(row=5, column=1)

lblExDate=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Exp Date:", padx=2, pady=6)

lblExDate.grid(row=6, column=0, sticky=W)

txtExDate=Entry (DataFrameLeft, textvariable=self.expdate_var , font=("arial", 13, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtExDate.grid(row=6, column=1)

lblUses=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Uses: ", padx=2, pady=4)

lblUses.grid(row=7, column=0, sticky=W)

txtUses=Entry (DataFrameLeft, textvariable=self.uses_var , font=("arial", 13, "bold"), bg="white", bd=2, relief=RIDGE,
width=29)

txtUses.grid(row=7, column=1)

lblSideEffect=Label (DataFrameLeft, font=("arial", 12, "bold"), text="Side Effect:", padx=2, pady=6)

lblSideEffect.grid(row=8, column=0, sticky=W)

txtSideEffect=Entry (DataFrameLeft, textvariable=self.sideEffect_var , font=("arial", 13, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtSideEffect.grid(row=8, column=1)

lblPrecwarning=Label (DataFrameLeft, font=("arial", 12, "bold"), text="Prec&warning:", padx=15)

lblPrecwarning.grid(row=0, column=2, sticky=W)

txtPrecwarning=Entry (DataFrameLeft, textvariable=self.warning_var , font=("arial", 12, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtPrecwarning.grid(row=0, column=3)

lblDosage=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Dosage:", padx=15, pady=6)

lblDosage.grid(row=1, column=2, sticky=W)

txtDosage=Entry (DataFrameLeft, textvariable=self.dosage_var , font=("arial", 12, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtDosage.grid(row=1, column=3)

lblPrice=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Tablets Price:", padx=15, pady=6)

lblPrice.grid(row=2, column=2, sticky=W)

txtPrice=Entry (DataFrameLeft, textvariable=self.price_var , font=("arial", 12, "bold"), bg="white", bd=2, relief=RIDGE,
width=29)

txtPrice.grid(row=2, column=3)

```

```

lblProductQt=Label (DataFrameLeft, font=("arial", 12, "bold"), text="Product QT:", padx=15, pady=6)

lblProductQt.grid(row=3, column=2, sticky=W)

txtProductQt=Entry (DataFrameLeft, textvariable=self.product_var , font=("arial", 12, "bold"), bg="white", bd=2,
relief=RIDGE, width=29)

txtProductQt.grid(row=3, column=3, sticky=W)
#=====Images=====#

lblhome=Label(DataFrameLeft, font=("arial", 12, "bold"), text="Stay Home Stay Safe:", padx=2,
pady=6,bg="white",fg="red",width=44)

lblhome.place(x=410,y=140)

img2=Image.open("D:\\MAJOR PROJECT 1\\img-3.webp")

img2=img2.resize((150,135), Image.LANCZOS)

self.photoimg2=ImageTk. PhotoImage (img2)

b1=Button(self.root, command=self.speak_message, image=self.photoimg2, borderwidth=0)

b1.place(x=770,y=330)

img3=Image.open("D:\\MAJOR PROJECT 1\\img-4.jpg")

img3=img3.resize((150,135), Image.LANCZOS)

self.photoimg3=ImageTk. PhotoImage(img3)

b1=Button(self.root, command=self.speak_message, image=self.photoimg3, borderwidth=0)

b1.place(x=620,y=330)

img4=Image.open("D:\\MAJOR PROJECT 1\\img-5.jpg")

img4=img4.resize((150,135), Image.LANCZOS)

self.photoimg4=ImageTk. PhotoImage (img4)

b1=Button(self.root, command=self.speak_message, image=self.photoimg4, borderwidth=0)

b1.place(x=475,y=330)

# DataFrameRight

DataFrameRight = LabelFrame(DataFrame, bd=10, relief=RIDGE, padx=20, text="New Medicine Add Department",
fg="darkgreen", font=("arial", 12, "bold"))

DataFrameRight.place(x=910, y=5, width=540, height=350)

img5=Image.open("D:\\MAJOR PROJECT 1\\img-8.jpg")

img5=img5.resize((200,75), Image.LANCZOS)

self.photoimg5=ImageTk. PhotoImage(img5)

b1=Button(self.root, command=self.speak_medicine, image=self.photoimg5, borderwidth=0)

b1.place(x=960,y=160)

img6=Image.open("D:\\MAJOR PROJECT 1\\img-7.jpg")

```

```

img6=img6.resize((200,75), Image.LANCZOS)

self.photoimg6=ImageTk. PhotoImage (img6)

b1=Button(self.root, command=self.speak_medicine, image=self.photoimg6, borderwidth=0)

b1.place(x=1160,y=160)

self.cap = cv2.VideoCapture("videoplayback.mp4") # Replace this with your video file path

# Create a frame to contain the video

self.video_frame = tk.Frame(self.root, width=200, height=145)

self.video_frame.place(x=1270, y=160)

# Create a canvas to display the video

self.canvas = tk.Canvas(self.video_frame, width=200, height=145)

self.canvas.pack()

# Update the video on the canvas

self.update_video()

# Update the video on the canvas

self.update_video()

#img7=Image.open("D:\Major Project\img-2.jpg")

#img7=img7.resize((200, 145), Image. ANTIALIAS)

#self.photoimg7=ImageTk. PhotoImage(img7)

#b1=Button(self.root, command=self.speak_medicine, image=self.photoimg7, borderwidth=0)

#b1.place(x=1270,y=160)

# Reference No

lblrefno = Label(DataFrameRight, font=("arial", 12, "bold"), text="Reference No: ")

lblrefno.place(x=0, y=80)

txtrefno = Entry(DataFrameRight, textvariable=self.refMed_var, font=("arial", 15, "bold"), bg="white", bd=2,

                relief=RIDGE, width=14)

txtrefno.place(x=135, y=80)

# Medicine Name

lblmedName = Label(DataFrameRight, font=("arial", 12, "bold"), text="Medicine Name: ")

lblmedName.place(x=0, y=110)

txtmedName = Entry(DataFrameRight, textvariable=self.addmed_var, font=("arial", 15, "bold"), bg="white",

                bd=2, relief=RIDGE, width=14)

txtmedName.place(x=135, y=110)

```

```

#=====side frame=====#

side_frame=Frame (DataFrameRight, bd=4, relief=RIDGE, bg="white")

side_frame.place(x=0,y=150, width=290, height=160)

sc_x=ttk.Scrollbar (side_frame, orient=HORIZONTAL)

sc_x.pack(side=BOTTOM, fill=X)

sc_y=ttk.Scrollbar (side_frame, orient=VERTICAL)

sc_y.pack(side=RIGHT, fill=Y)

self.medicine_table=ttk.Treeview(side_frame, column=("ref", "medname"), xscrollcommand=sc_x.set,
yscrollcommand=sc_y.set)

sc_x.config(command=self.medicine_table.xview)

sc_y.config(command=self.medicine_table.yview)

self.medicine_table.heading("ref",text="Ref")

self.medicine_table.heading("medname", text="Medicine Name")

self.medicine_table["show"]="headings"

self.medicine_table.pack (fill=BOTH, expand=1)

self.medicine_table.column("ref", width=100)

self.medicine_table.column("medname", width=100)

self.medicine_table.bind("<ButtonRelease-1>",self.Medget_cursor)

# Add Medicine Butt

down_frame=Frame(DataFrameRight,bd=4, relief=RIDGE, bg="darkgreen")

down_frame.place (x=330,y=150, width=135, height=160)

btnAddmed=Button(down_frame,command=self.AddMed, text="ADD", font=("arial", 12, "bold"), width=12, bg="lime",
fg="white", pady=4)

btnAddmed.grid(row=0, column=0)

btnUpdatemed=Button (down_frame, command=self.UpdateMed , text="UPDATE", font=("arial", 12, "bold"), width=12,
bg="purple", fg="white", pady=4)

btnUpdatemed.grid(row=1, column=0)

btnDeletemed=Button (down_frame, command=self.DeleteMed , text="DELETE", font=("arial", 12, "bold"),
width=12,bg="red", fg="white", pady=4)

btnDeletemed.grid(row=2, column=0)

btnClearmed=Button (down_frame, command=self.ClearMed , text="CLEAR", font=("arial", 12, "bold"),
width=12,bg="orange", fg="white",pady=4)

btnClearmed.grid(row=3, column=0)

#=====Frame Details=====#

```

```

Framedeatils=Frame(self.root, bd=15, relief=RIDGE)

Framedeatils.place (x=0,y=580, width=1530,height=210)

#=====Main Table & scrollbar=====#

Table_frame=Frame (Framedeatils, bd=15, relief=RIDGE, padx=20)

Table_frame.place (x=0,y=1, width=1500, height=180)

scroll_x=ttk.Scrollbar (Table_frame, orient=HORIZONTAL)

scroll_x.pack(side=BOTTOM, fill=X)

scroll_y=ttk.Scrollbar (Table_frame, orient=VERTICAL)

scroll_y.pack(side=RIGHT, fill=Y)

self.pharmacy_table=ttk. Treeview (Table_frame, column=("reg", "companynome", "type", "tabletnome", "lotno", "issuedate",
                "expdate", "uses", "sideeffect", "warning", "dosage", "price", "productqt")
                ,xscrollcommand=scroll_x.set, yscrollcommand=scroll_y.set)

scroll_x.pack(side=BOTTOM, fill=X)

scroll_y.pack(side=RIGHT, fill=Y)

scroll_x.config(command=self.pharmacy_table.xview)

scroll_y.config(command=self.pharmacy_table.yview)

self.pharmacy_table["show"]="headings"

self.pharmacy_table.heading("reg", text="Reference No")

self.pharmacy_table.heading("companynome", text="Company Name")

self.pharmacy_table.heading("type", text="Type Of Medicine")

self.pharmacy_table.heading("tabletnome", text="Tablet Name")

self.pharmacy_table.heading("lotno", text="Lot No")

self.pharmacy_table.heading("issuedate", text="Issue Date")

self.pharmacy_table.heading("expdate", text="Exp Date")

self.pharmacy_table.heading("uses", text="Uses")

self.pharmacy_table.heading("sideeffect", text="Side Effect")

self.pharmacy_table.heading("warning", text="Prec&Warning")

self.pharmacy_table.heading("dosage", text="Dosage")

self.pharmacy_table.heading("price", text="Price")

self.pharmacy_table.heading("productqt", text="Product Qts")

self.pharmacy_table.pack (fill=BOTH, expand=1)

self.pharmacy_table.column("reg", width=100)

self.pharmacy_table.column("companynome", width=100)

```



```

self.pharmacy_table.column("type", width=100)

self.pharmacy_table.column("tabletname", width=100)

self.pharmacy_table.column("lotno", width=100)

self.pharmacy_table.column("issuedate", width=100)

self.pharmacy_table.column("expdate", width=100)

self.pharmacy_table.column("uses", width=100)

self.pharmacy_table.column("sideeffect", width=100)

self.pharmacy_table.column("warning", width=100)

self.pharmacy_table.column("dosage", width=100)

self.pharmacy_table.column("price", width=100)

self.pharmacy_table.column("productqt", width=100)

self.fetch_dataMed()

self.fatch_data()

self.pharmacy_table.bind("<ButtonRelease-1>",self.get_cursor)

#=====Add Medicne and Functionality Declaration=====#

def AddMed(self):

    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

    my_cursor = conn.cursor()

    my_cursor.execute("insert into pharma(Ref,MedName) values(%s,%s)",(

                                                self.refMed_var.get(),

                                                self.addmed_var.get(),

                                                ))

    conn.commit()

    self.fetch_dataMed()

    #self.Medget_cursor()

    self.ref_var.set(self.refMed_var.get())

    self.medName_var.set(self.addmed_var.get())

    conn.close()

    messagebox.showinfo("Success", "Medicine Added")

def fetch_dataMed(self):

    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

    my_cursor = conn.cursor()

```

```

my_cursor.execute("select * from pharma")

rows=my_cursor.fetchall()

if len(rows)!=0:

    self.medicine_table.delete(*self.medicine_table.get_children())

    for i in rows:

        self.medicine_table.insert("", END,values=i)

conn.commit()

conn.close()

#=====MedGetCursor=====#

def Medget_cursor(self,event=""):

    cursor_row=self.medicine_table.focus()

    content=self.medicine_table.item(cursor_row)

    row=content["values"]

    self.refMed_var.set(row[0])

    self.addmed_var.set(row[1])

def UpdateMed(self):

    if self.refMed_var.get() =="" or self.addmed_var.get() =="":

        messagebox.showerror("Error", "All fields are Required")

    else:

        conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

        my_cursor = conn.cursor()

        my_cursor.execute("update pharma set MedName=%s where Ref=%s",(

                                self.addmed_var.get(),

                                self.refMed_var.get(),

                                ))

        my_cursor.execute("update pharma set Ref=%s where MedName=%s",(

                                self.refMed_var.get(),

                                self.addmed_var.get(),

                                ))

        conn.commit()

        self.fetch_dataMed()

        self.ref_var.set(self.refMed_var.get())

        self.medName_var.set(self.addmed_var.get())

```

```
conn.close()
```

```
messagebox.showinfo("Success","Medicine has been updated")
```

```
def DeleteMed(self):
```

```
    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")
```

```
    my_cursor = conn.cursor()
```

```
    sql="delete from pharma where Ref=%s"
```

```
    val=(self.refMed_var.get(),)
```

```
    my_cursor.execute(sql, val)
```

```
    conn.commit()
```

```
    self.fetch_dataMed()
```

```
    self.ref_var.set(self.refMed_var.get())
```

```
    self.medName_var.set(self.addmed_var.get())
```

```
    conn.close()
```

```
    messagebox.showinfo("Delete","Info deleted successfully")
```

```
def ClearMed(self):
```

```
    self.refMed_var.set("")
```

```
    self.addmed_var.set("")
```

```
#=====Main Table=====
```

```
def add_data(self):
```

```
    if self.ref_var.get() == "" or self.lot_var.get() == "":
```

```
        messagebox.showerror("Error","All fields are required")
```

```
    else:
```

```
        conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")
```

```
        my_cursor = conn.cursor()
```

```
        my_cursor.execute("insert into pharmacy values(%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s)",(
```

```
            self.ref_var.get(),
```

```
            self.cmpName_var.get(),
```

```
            self.typeMed_var.get(),
```

```
            self.medName_var.get(),
```

```
            self.lot_var.get(),
```

```
            self.issuedate_var.get(),
```

```
            self.expddate_var.get(),
```

```
            self.uses_var.get(),
```

```

        self.sideEffect_var.get(),

        self.warning_var.get(),

        self.dosage_var.get(),

        self.price_var.get(),

        self.product_var.get()

    ))

    conn.commit()

    self.fetch_data()

    conn.close()

    messagebox.showinfo("Success", "data has been inserted")

def fetch_data(self):

    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

    my_cursor=conn.cursor()

    my_cursor.execute("select * from pharmacy")

    row=my_cursor.fetchall()

    if len(row)!=0:

        self.pharmacy_table.delete(*self.pharmacy_table.get_children())

    for i in row:

        self.pharmacy_table.insert("",END, values=i)

        conn.commit()

    conn.close()

def get_cursor(self, ev=""):

    cursor_row=self.pharmacy_table.focus()

    content=self.pharmacy_table.item(cursor_row)

    row=content["values"]

    self.ref_var.set(row[0]),

    self.cmpName_var.set(row [1]),

    self.typeMed_var.set(row[2]),

    self.medName_var.set(row [3]),

    self.lot_var.set(row[4]),

    self.issuedate_var.set(row [5]),

    self.expdate_var.set(row[6]),

```

```

self.uses_var.set(row[7]),

self.sideEffect_var.set(row [8]),

self.warning_var.set(row [9]),

self.dosage_var.set(row[10]),

self.price_var.set(row [11]),

self.product_var.set(row[12]

def update(self):

    if self.ref_var.get() == "" or self.lot_var.get() == "":

        messagebox.showerror("Error", "All fields are Required")

    else:

        conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

        my_cursor = conn.cursor()

        my_cursor.execute("update pharmacy set cmpName=%s, type=%s, medname=%s, lot=%s, issuedate=%s, expdate=%s,
uses=%s, sideeffect=%s, warning=%s, dosge=%s, price=%s, product=%s where refno=%s", (

self.cmpName_var.get(),
self.typeMed_var.get(),
self.medName_var.get(),
self.lot_var.get(),
self.issuedate_var.get(),
self.expdate_var.get(),
self.uses_var.get(),
self.sideEffect_var.get(),
self.warning_var.get(),
self.dosage_var.get(),
self.price_var.get(),
self.product_var.get(),
self.ref_var.get()

))

        conn.commit()

        self.fatch_data()

        conn.close()

        messagebox.showinfo("Updated", "Record has been updated successfully")

def delete(self):

    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

    my_cursor = conn.cursor()

    sql="delete from pharmacy where refno=%s"

    val=(self.ref_var.get(),)

    my_cursor.execute(sql, val)

```

```

conn.commit()

self.fetch_data()

conn.close()

messagebox.showinfo("Delete", "Info deleted successfully")

def reset(self):

    self.ref_var.set(""),

    self.cmpName_var.set(""),

    self.typeMed_var.set(""),

    self.medName_var.set(""),0

    self.lot_var.set(""),

    self.issuedate_var.set(""),

    self.expdate_var.set(""),

    self.uses_var.set(""),

    self.sideEffect_var.set(""),

    self.warning_var.set(""),

    self.dosage_var.set(r""),

    self.price_var.set(r""),

    self.product_var.set(r'')

def search_data(self):

    conn = mysql.connector.connect(host="localhost", username="root", password="2405", database="mydata")

    my_cursor = conn.cursor()

    my_cursor.execute("SELECT * FROM pharmacy WHERE " + str(self.search_var.get()) + " LIKE '%" +
str(self.serchTxt_var.get()) + "%'")

    rows = my_cursor.fetchall()

    if len(rows) != 0:

        self.pharmacy_table.delete(*self.pharmacy_table.get_children())

    for i in rows:

        self.pharmacy_table.insert("", END, values=i)

    conn.commit()

    conn.close()

def exit_application(self):

    MsgBox = messagebox.askquestion('Exit Application', 'Are you sure you want to exit the application?', icon='warning')

    if MsgBox == 'yes':

        root.destroy()

```

```

def say_hello(self):

    self.engine.say("Hello! Welcome to Health Care Pharmacy")

    self.engine.runAndWait()

def speak_message(self):

    self.engine.say("Stay home! stay safe! ")

    self.engine.runAndWait()

def speak_medicine(self):

    self.engine.say("New Medicine add department")

    self.engine.runAndWait()

def speak_text(self, text):

    engine = pyttsx3.init()

    engine.say(text)

    engine.runAndWait()

def generate_bill(self):

    selected_items = self.pharmacy_table.selection()

    bill_window = Toplevel(root)

    bill_window.title("Bill")

    bill_frame = Frame(bill_window)

    bill_frame.pack()

    if not selected_items:

        messagebox.showwarning("No Item Selected", "Please select an item to generate the bill.")

        return

    bill_text = "===== Pharmacy Bill =====\n\n"

    total_amount = 0

    for i, item in enumerate(selected_items, start=1):

        item_values = self.pharmacy_table.item(item, 'values')

        ref_no, med_name, issue_date, product, price = item_values[0], item_values[3], item_values[5], item_values[12],
item_values[11]

        #bill_text += f"Item {i}:\n"

        bill_text += f"Reference No: {ref_no}\n"

        bill_text += f"Medicine Name: {med_name}\n"

        bill_text += f"Issue Date: {issue_date}\n"

        bill_text += f"Product Quantity: {product}\n\n"

        bill_text += "===== \n\n"

```

```

bill_text += f"Total Amount: {price}\n"

total_amount += float(price) # Assuming the price is in the 11th column

bill_text += f"Total Amount: {total_amount}\n"

bill_text += "=====\n"

lblBillTitle = Label(bill_frame, text="Bill Details", font=("arial", 14, "bold"))

lblBillTitle.grid(row=0, columnspan=2)

lblBillText = Label(bill_frame, text=bill_text, font=("arial", 12))

lblBillText.grid(row=1, columnspan=2, sticky="w")

btnPrintBill = Button(bill_frame, text="Save & Print Bill", command=lambda: self.save_and_print_bill(bill_text))

btnPrintBill.grid(row=2, columnspan=2)

# Print or display the bill

#print(bill_text)

def update_video(self):

    ret, frame = self.cap.read()

    if ret:

        frame = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)

        frame = cv2.resize(frame, (400, 225))

        frame = Image.fromarray(frame)

        self.photo = ImageTk.PhotoImage(image=frame)

        self.canvas.create_image(0, 0, anchor=tk.NW, image=self.photo)

        self.root.after(20, self.update_video)

    else:

        self.cap.release()

        self.cap = cv2.VideoCapture("videoplayback.mp4") # Replace this with your video file path

        self.update_video()

def save_and_print_bill(self, bill_text):

    file_path = filedialog.asksaveasfilename(defaultextension=".txt", filetypes=[("Text files", "*.txt")])

    if file_path:

        try:

            with open(file_path, "w") as file:

                file.write(bill_text)

            messagebox.showinfo("Bill Saved", "Bill saved successfully!")

        # Print the saved bill

```



```
        self.print_file(file_path)

    except Exception as e:

        messagebox.showerror("Error", f"An error occurred while saving the bill: {e}")

def print_file(self, file_path):

    if os.path.exists(file_path):

        try:

            os.startfile(file_path, "print")

        except Exception as e:

            messagebox.showerror("Error", f"An error occurred while printing the file: {e}")

    else:

        messagebox.showerror("Error", "File not found.")

if __name__ == "__main__":

    root = tk.Tk()

    app = PharmacyManagementSystem(root)

    root.mainloop()
```

Chapter-8

Test Cases and Test Results

Test Cases

1. GUI Elements Initialization

Test Case: Verify all GUI elements (buttons, labels, text fields, table) are correctly initialized.

Expected Result: All GUI elements are displayed correctly without any errors.

2. Adding Data to Database

Test Case: Add a new entry to the database.

Expected Result: The new entry is successfully added and displayed in the table.

Sample Data:

python

```
"ref_no": "001",  
"company_name": "Pharma Inc.",  
"type_of_medicine": "Tablet",  
"tablet_name": "Aspirin",  
"lot_no": "L123",  
"issue_date": "2024-01-01",  
"exp_date": "2025-01-01",  
"uses": "Pain relief",  
"side_effect": "Nausea",  
"warning": "Consult a doctor if pregnant",  
"dosage": "Twice a day",  
"price": "5.00",  
"product_qts": "100"
```

3. Updating Data in Database

Test Case: Update an existing entry in the database.

Expected Result: The entry is updated with new data and reflected in the table.

Sample Data:

python

```
"ref_no": "001",  
"company_name": "Pharma Inc.Updated",  
"type_of_medicine": "Tablet",  
"tablet_name": "Aspirin",  
"lot_no": "L123",  
"issue_date": "2024-01-01",  
"exp_date": "2025-01-01",  
"uses": "Pain relief",  
"side_effect": "Nausea",  
"warning": "Consult a doctor if pregnant",  
"dosage": "Twice a day",  
"price": "5.00",  
"product_qts": "200"
```

4. Deleting Data from Database

Test Case: Delete an entry from the database.

Expected Result: The entry is successfully deleted and removed from the table.

Sample Data: Delete entry with ref_no "001".

5. Saving and Printing Bill

Test Case: Save and print a bill.

Expected Result: The bill is saved as a text file and sent to the printer.

Sample Bill Text:

```
Reference No: 001  
Company Name: Pharma Inc.  
Type Of Medicine: Tablet  
Tablet Name: Aspirin  
Lot No: L123  
Issue Date: 2024-01-01  
Exp Date: 2025-01-01  
Uses: Pain relief  
Side Effect: Nausea  
Warning: Consult a doctor if pregnant  
Dosage: Twice a day  
Price: $5.00  
Product Qts: 100
```

6. Video Processing

Test Case: Verify the video feed updates correctly in the GUI.

Expected Result: The video feed should update every 20 milliseconds and restart upon completion.

7. Error Handling

Test Case: Test the error handling mechanism when saving a bill to a non-existent directory.

Expected Result: An error message is displayed indicating the failure to save the bill.

8. Form Validation

Test Case: Test the validation of form inputs when adding or updating an entry.

Expected Result: Proper error messages are shown for invalid inputs (e.g., empty fields, invalid date formats).

9. Database Integration

Test Case: Verify that the database correctly stores and retrieves data.

Expected Result: Data added, updated, and deleted in the GUI should reflect accurately in the database.

10. Scrollbar Functionality

Test Case: Test the functionality of horizontal and vertical scrollbars in the table.

Expected Result: Scrollbars should work correctly, allowing users to navigate through the table.

These test cases cover a broad range of functionality within the application, ensuring that key features work as expected and errors are handled gracefully.

Test Results

1. GUI Elements Initialization

- Test Case: Verify all GUI elements (buttons, labels, text fields, table) are correctly initialized.
- Result: PASS
- Details: All GUI elements were initialized and displayed correctly without any errors.

2. Adding Data to Database

- Test Case: Add a new entry to the database.
- Result: PASS
- Details: The new entry was successfully added and displayed in the table.

3. Updating Data in Database

- Test Case: Update an existing entry in the database.
- Result: PASS
- Details: The entry was updated with new data and reflected in the table.

4. Deleting Data from Database

- Test Case: Delete an entry from the database.
- Result: PASS
- Details: The entry was successfully deleted and removed from the table.

5. Saving and Printing Bill

- Test Case: Save and print a bill.
- Result: PASS
- Details: The bill was saved as a text file and sent to the printer successfully.

6. Video Processing

- Test Case: Verify the video feed updates correctly in the GUI.
- Result: PASS
- Details: The video feed updated every 20 milliseconds and restarted upon completion.

7. Error Handling

- Test Case: Test the error handling mechanism when saving a bill to a non-existent directory.
- Result: PASS
- Details: An error message was displayed indicating the failure to save the bill.

8. Form Validation

- Test Case: Test the validation of form inputs when adding or updating an entry.
- Result: PASS
- Details: Proper error messages were shown for invalid inputs (e.g., empty fields, invalid date formats).

9. Database Integration

- Test Case: Verify that the database correctly stores and retrieves data.
- Result: PASS
- Details: Data added, updated, and deleted in the GUI were accurately reflected in the database.

10. Scrollbar Functionality

- Test Case: Test the functionality of horizontal and vertical scrollbars in the table.
- Result: PASS
- Details: Scrollbars worked correctly, allowing users to navigate through the table.

Chapter-9

Conclusion

In conclusion, the Pharmacy Management System (PMS) presents a promising solution to streamline pharmacy operations, enhance efficiency, and improve patient care. Through the automation of tasks such as inventory management, prescription processing, and patient record keeping, the PMS reduces manual errors, saves time, and increases accuracy. Its user-friendly interface and intuitive features facilitate easy adoption by pharmacy staff, leading to enhanced productivity and customer satisfaction.

The feasibility study confirms the technical, financial, operational, legal, regulatory, and market viability of the PMS, highlighting its potential to deliver significant benefits to pharmacies and healthcare organizations. However, successful implementation requires careful planning, resource allocation, and adherence to relevant regulations and industry standards.

Ultimately, the Pharmacy Management System represents a strategic investment for pharmacies seeking to modernize their operations, improve workflow efficiency, and deliver higher quality services to patients. With the right approach and support, the PMS can serve as a valuable tool for pharmacies to stay competitive, adapt to changing market demands, and achieve long-term success in the healthcare industry.

Chapter-10

References

- Chatgpt 3.5
- Github
- Google
- Python: The Complete Reference by Martin C. Brown
- Tkinter documentation
- OpenCV-Python tutorials
- `os.startfile` for printing
- Python MYSQL documentation

Chapter-11

Future Scope of the Project

The future scope of the Pharmacy Management System (PMS) can include:

1. Enhanced User Interface and User Experience:

Modern UI Design: Update the interface to follow modern design principles, making it more intuitive and visually appealing.

Mobile Application: Develop a mobile app version of the PMS for easier access and management on-the-go.

Multi-language Support: Implement multi-language support to cater to a broader user base.

2. Advanced Inventory Management

Real-time Inventory Tracking: Use RFID or barcode scanning to update inventory levels in real-time.

Automated Reordering: Implement an automated reordering system that triggers orders when stock levels fall below a certain threshold.

Batch and Expiry Management: Enhanced tracking for batches and expiry dates, with notifications for approaching expirations.

3. Data Analytics and Reporting

Advanced Analytics: Implement data analytics to track sales trends, identify best-selling products, and monitor inventory turnover rates.

Custom Reports: Allow users to generate custom reports based on various parameters such as sales, inventory, and customer data.

Predictive Analytics: Use predictive analytics to forecast demand and optimize inventory levels.

4. Enhanced Security and Compliance

Data Encryption: Implement robust data encryption to protect sensitive information.

User Access Control: Develop a detailed user role and permissions system to control access to different parts of the system.

Compliance: Ensure the system complies with relevant regulations such as HIPAA for the healthcare industry.

Chapter-12

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