



PHARMACY PRESCRIPTION TRANSACTION MANAGER

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Course / Instructor: CCE 105L / Althea Owe

Date Submitted: 10/09/25

Abstract

The project is a pharmacy management system database designed to address the problem of organizing and managing pharmacy operations efficiently. The objective is to create a structured database that handles medicines inventory, patient records, prescriptions, payments, and transactions. The method involves designing relational tables such as medicines, patients, prescriptions, prescription items, payments, transactions, and users, with appropriate relationships and data constraints. The system tracks medicine stock status, patient prescription history, payment details, and transactional records. The outcome is a comprehensive, normalized database schema supporting data integrity and facilitating smooth pharmacy workflow management, including inventory control, prescription processing, and payment tracking. This enables pharmacists and administrators to manage resources and services effectively in a digital environment.

INTRODUCTION

Background

In today's fast-paced world, applying technology to everyday tasks is very essential for efficiency and accuracy. This proposal presents the application development of Pharmacy Prescription Transaction Manager featuring a graphical user interface (GUI) to operate simple pharmacy operations. By utilizing this modern technology, this system will reduce manual paperwork and it speeds up the service. It also emphasizes future growth by designing a friendly and easy to use and secure interface system that is adaptable. It is vital for ensuring timely, reliable and safe services, while also supporting pharmacy staff in managing workload effectively.

The project was developed to modernize and digitize manual pharmacy operations, which are often prone to errors, inefficiencies, and difficulty managing large volumes of data related to medicines, patients, prescriptions, and payments. The goal was to create a centralized, computerized system that streamlines pharmacy workflows, improves inventory and prescription management, and enhances overall service quality to meet growing demands in healthcare delivery.

1.1 Problem Statement

The primary issue addressed is the challenge faced by pharmacies in efficiently managing their operations manually or using fragmented systems. Problems include inventory mismanagement, difficulty tracking prescriptions and patient records, delayed payment processing, and lack of real-time data for decision-making. These operational inefficiencies can lead to medicine shortages, errors, and poor patient service.

1.2 Objectives

To develop a reliable pharmacy management system that automates inventory, prescription, payment, and patient record management.

1.2 Scope and Limitations

The system covers managing medicine stock, patient information, prescriptions, payments, and sales within the pharmacy to help improve daily operations. Hence, it excludes connecting to outside health or insurance systems, checking for drug interactions and depends on having good computer equipment and internet to work well.

Methodology

In developing our program, we used the Waterfall methodology. Waterfall methodology is a way to build software (or do a project) by following a set of steps, one after another, in a fixed order. You finish one step completely before moving to the next. Imagine water flowing down steps in a waterfall once it goes down, it doesn't go back up. This means that in our project, each phase (such as planning, design, coding, testing, and deployment) was done one at a time. Only after we finished and reviewed one step did we move on to the next, which helped us stay organized and focused during development. This approach also made it easier for us to track our progress and ensure that every part of the project met our requirements before moving forward.

- **Requirements**

We defined clear features and modules up-front: login, patient management, admin, transactions, prescription, payments.

- **System and Software Design**

We designed database schemas first, and worked on class diagrams (UML) and GUI layouts before coding the logic.

- **Implementation (Coding)**

We developed each module (Login, Admin Panel, Payment, Prescription etc.) sequentially, testing one panel/class at a time. Coding focused on one clear function before moving to the next module.

- **Integration and Testing**

We connected Java Swing GUIs to MySQL with JDBC after building and testing GUI elements. Testing is performed as each panel or feature is implemented.

- **Deployment**

The program is used on a local machine, with transfer to new devices via file copy or Google Drive/Github.

- **Maintenance**

We debug, refactor, and modify code as you discover issues during usage or integration.

Other factors that we used

- **Prototyping**

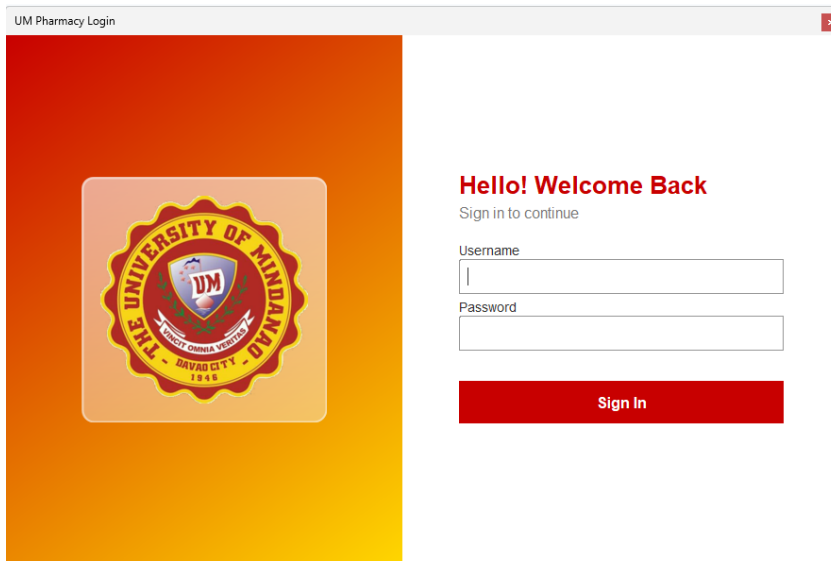
Each GUI panel/class was prototyped and repeatedly improved

- **Iterative refinement**


We made several changes and corrections to individual classes and workflows over time.

System Design

1.1 Login Frame



UM Pharmacy Login



Hello! Welcome Back

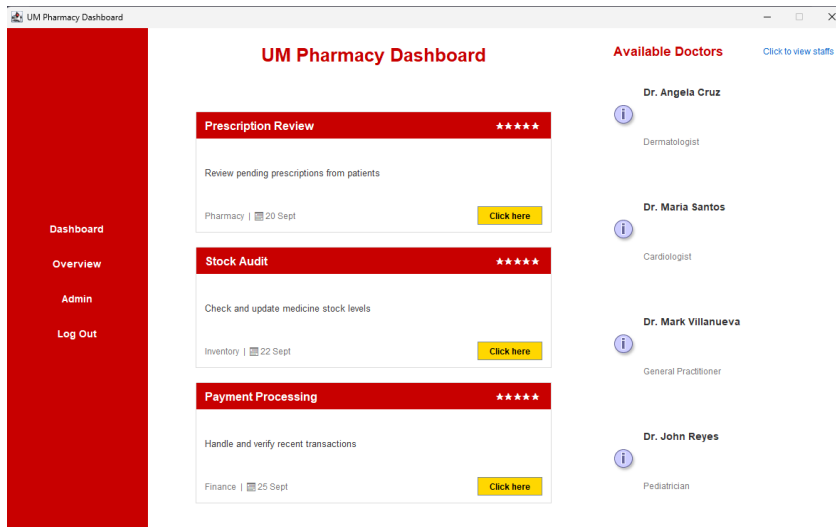
Sign in to continue

Username

Password

Sign In

1.2 Dashboard Frame



UM Pharmacy Dashboard

Dashboard

Overview

Admin

Log Out

UM Pharmacy Dashboard

Prescription Review ★★★★★

Review pending prescriptions from patients

Pharmacy | 20 Sept [Click here](#)

Stock Audit ★★★★★

Check and update medicine stock levels

Inventory | 22 Sept [Click here](#)

Payment Processing ★★★★★

Handle and verify recent transactions

Finance | 25 Sept [Click here](#)

Available Doctors [Click to view staffs](#)

Dr. Angela Cruz

Dermatologist

Dr. Maria Santos

Cardiologist

Dr. Mark Villanueva

General Practitioner

Dr. John Reyes

Pediatrician

1.3 Prescription Review Frame

UM Pharmacy Dashboard

UM Pharmacy Dashboard

Available Doctors

[Click to view staffs](#)

Dashboard

Overview

Admin

Log Out

Good day, Pharmacist!

[Create a new profile](#)

Name	Age	Address
Juan Dela Cruz	45	Davao City
Maria Santos	38	Quezon City
Pedro Reyes	50	Cebu City
Khang	29	Manila

Execution Time: 0.12 ms

Finance | 25 Sept

[Click here](#)

Pediatrician

1.4 Create Patient Information Frame

New Patient Profile

Create New Patient Profile

Patient Name:

Address:

Age:

Gender:

Male

Registration Date:

Save

Cancel

1.5 Prescription View Tab

Patient: Juan Dela Cruz

Patient: Juan Dela Cruz | Age: 45 | Address: Davao City

Prescription View

Stock View

Medicine	Brand	Price	Quantity	Amount per 1 pad	Total
Hydrocodone	Generic	30	3	30	90

Proceed to Payment

1.6 Stock View Tab

Patient: Juan Dela Cruz

Patient: Juan Dela Cruz | Age: 45 | Address: Davao City

Prescription View

Stock View

Execution Time: 320.82 ms

Medicine	Brand	Price	Stock Left	Status
Hydrocodone	Generic	30	50	Available
Metformin	Generic	20	0	Not Available
Losartan	Generic	25	0	Not Available
Antibiotics	Pfizer	40	80	Available
Albuterol	Ventolin	35	75	Available
Antihistamines	Zyrtec	15	60	Available

Filter: All

Proceed to Payment

1.7 Payment Frame

Payment Panel

Execution Time: 14.07 ms

How would you like to pay?

PayPal

Cards

Cash

Payments are processed securely
Your data is protected

Order summary

Patient: Juan Dela Cruz

Address: Davao City

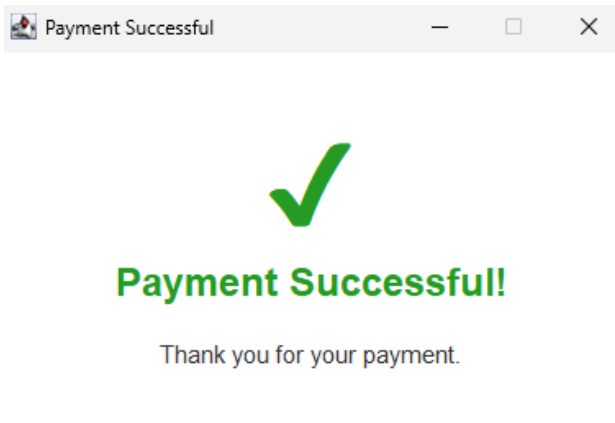
Age: 45

Hydrocodone (x3) P90

Total P90.00

Pay securely

1.8 Payment Success Frame



1.9 Overview Frame

UM Pharmacy Dashboard

Dashboard

Overview

Admin

Log Out

UM Pharmacy Dashboard

Welcome to the Overview!

Here you can display summary stats, charts, or quick links.

Available Doctors

[Click to view staffs](#)

Dr. Angela Cruz

Dermatologist

Dr. Maria Santos

Cardiologist

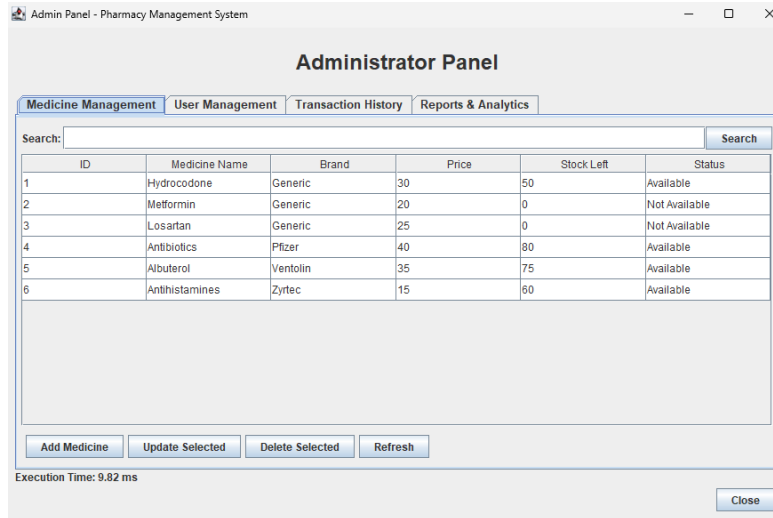
Dr. Mark Villanueva

General Practitioner

Dr. John Reyes

Pediatrician

2.0 Admin Frame



Results and Discussion

After following the Waterfall methodology for our software project, we were able to build a pharmacy management system with key features such as user authentication, medicine and patient management, prescription handling, transaction recording, and payment processing. Using Java Swing for the user interface and MySQL for the database allowed us to create a system that is easy to use and helps organize pharmacy operations more efficiently.

Results:

- The program successfully allowed users to log in (with hardcoded sample credentials), add, search, and update medicine information, manage patient and prescription details, process payments, and maintain a record of transactions.
- The database integration using JDBC worked as intended, enabling persistent storage and retrieval of pharmacy records.

- Various GUIs (Admin Panel, Payment Frame, Patient Details, etc.) were created for different modules, each interfacing with the database as required.
- Features like a search bar, filters, and prescription quantity controls enhanced usability.

Discussion:

- The system improves traditional pharmacy work by reducing errors (e.g., by tracking available stock and patient histories), speeding up transaction recording, and simplifying report generation.
- One limitation we observed is that user authentication is currently based on hardcoded usernames and passwords, not live database records. This means new users need to be programmed in, and security is basic.
- The system depends on the local setup of MySQL and proper configuration of JDBC; if these are incorrect, the program will not run.
- While most core features are covered, some advanced needs (like user role permissions, real-time concurrent access, or online backup) are not included.
- User interface adjustments (panel resizing, error dialogs) and method timing feedback were incorporated in later stages, demonstrating iterative improvement even within a mostly Waterfall approach.

Conclusion and Recommendations

Our Pharmacy Prescription Transaction Manager successfully integrates a Java Swing user interface with a MySQL backend, providing pharmacy users with streamlined management of medicines, patients, transactions, and payments. By following the Waterfall methodology, we methodically planned, designed, implemented, and tested each feature, resulting in a functional and organized system. The program helps reduce errors, speeds up recording and searching of pharmacy

data, and offers a user-friendly experience. While core goals were achieved, our project also revealed some limitations, such as the lack of database-driven user authentication, limited security, minimal input validation, and no role-based permissions.

To further improve the system, we recommend:

- Implementing secure user authentication that checks login credentials directly against the database, rather than using hardcoded sample users.
- Adding user roles and permissions (e.g., admin, pharmacist, cashier) to control access to sensitive features.
- Improving input validation and error handling to prevent invalid entries and provide helpful feedback.
- Strengthening data security and privacy, including password hashing and secure database connections.
- Enabling scalable features such as backup and restore, report export, and support for remote/cloud deployment.
- Enhancing the user interface for better responsiveness and accessibility on different screen sizes.

Study of Algorithm Origin Used

Rule-Based Algorithm

A rule-based algorithm uses a clear set of "if this happens, then do that" rules created by experts to automate decisions. It processes input by checking conditions and performing actions based on fixed, human-coded logic. Originating from AI expert systems, it is widely used in pharmacy for

automating tasks like medicine distribution and inventory management because it is transparent, flexible, and reliable.

Mufadhol M., Mustafid M., Jie F., Hidayah Y. N. (2023). The new model for medicine distribution by combining supply chain and expert system using rule-based reasoning method. *International Journal of Artificial Intelligence*, 12(1), 295-304. <https://doi.org/10.11591/ijai.v12.i1.pp295-304>

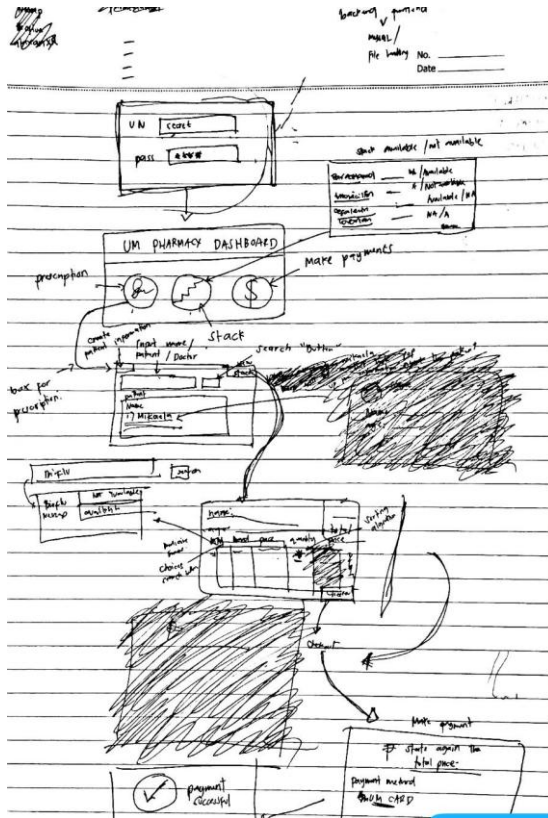
1.2 Algorithm Selection

In developing our Pharmacy Prescription Transaction Manager, finding an algorithm fit for our code will help the system manage prescriptions and transactions efficiently. As for this project, the Searching Algorithm was chosen.

The searching algorithm was chosen because it will help our pharmacy system find the prescriptions, medicines, the patient's name and background, and even the past transactions quickly. This searching algorithm allows the pharmacist to serve customers faster, more accurate, and easier to use.

To improve the searching algorithm, It is by making it work even with a large number of records as the pharmacy grows. The researcher's plan is to have another improvement. It is to add features that suggest the correct name of the medicine when spelling is wrong, In order not to give a wrong medicine and to avoid such accidents. These improvements will make our system more accurate, reliable, and even user-friendly.

Wireframe System



Appendices

<https://github.com/yurachi-prog/Pharmacy-Prescription-Transaction-Manager.git>



College of Computing Education
ITS Final Laboratory ENRED

Enhancement Recommendation Discussion

Project: Pharmacy Prescription Transaction Manager

Proponents: Trisha Mabigad
Shana Guisado
Hannah Shane Dohles

Date: 10-9-23

Document:

V

System:

UI (font size explore, also the layout and sidebar dili i center. Also the logout is sa baba. Pure white ang execution time area, need spacing sa date.)

Approve Minor Revision
Defense

S. SARANA
Panel

Re-Checking Major Revision

John Dohles
Panel

Re-

Panel

SYSTEM TITLE: Pharmacy Prescription Transaction Manager
MEMBER NAMES: Mabigad, Guisado, Dohles
SUBJECT AND CODE: CCE100 3603

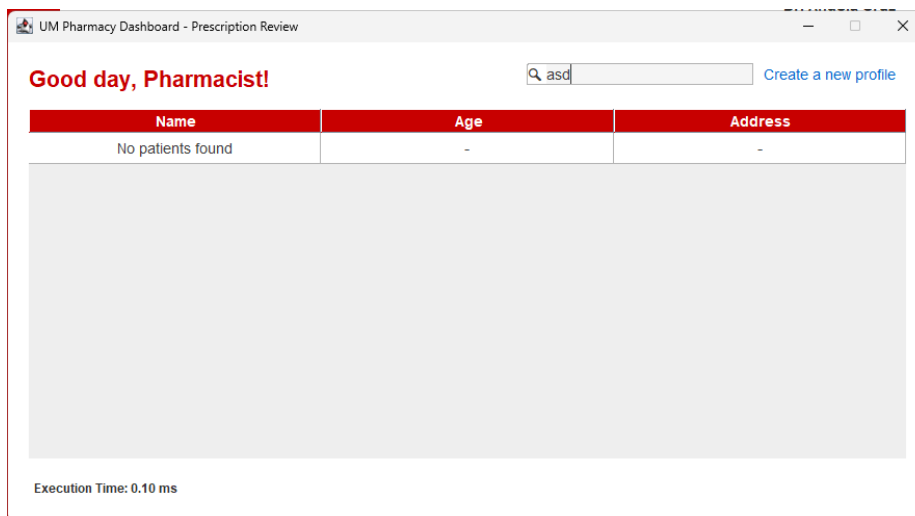
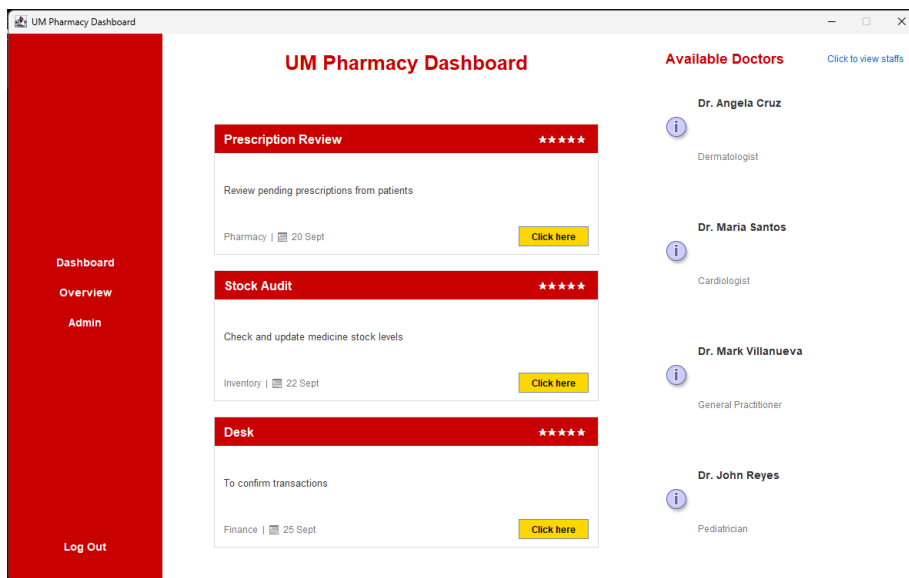
DATA STRUCTURES AND ALGORITHMS PROJECT RUBRIC

Criteria	Excellent (90-100)	Good (80-89)	Satisfactory (70-79)	Needs Improvement (60-69)	Poor (50-59)
1. Data Structures <small>Proper and efficient use of suitable data structures.</small>	Uses multiple relevant data structures effectively.	Uses at least one suitable structure with minor issues.	Basic or partially correct use.	Limited or inefficient use.	No or incorrect data structure.
2. Algorithm Design <small>Correctness, efficiency, and problem-solving logic.</small>	Well-designed, efficient, and correct algorithm.	Mostly efficient; minor flaws.	Works but lacks optimization.	Inefficient or partially incorrect.	No valid algorithm implemented.
3. Functionality <small>Program performance, output accuracy, and completeness.</small>	Fully functional; meets all requirements.	Works with small bugs or missing features.	Partially functional; some errors.	Major bugs; limited functionality.	Program does not run.
4. Algorithm Improvement <small>Optimization or enhancement of existing algorithm.</small>	Clear, measurable improvement; justified optimization.	Some improvement shown; partly justified.	Attempted improvement with minimal effect.	Weak or unclear improvement.	No optimization attempted.
5. Documentation & Code Quality <small>Code readability, organization, and documentation.</small>	Clean, well-structured, and thoroughly documented.	Well-organized with some missing comments.	Readable but lacks structure.	Disorganized or poorly commented.	No documentation or unreadable code.
6. Presentation / Explanation <small>Clarity in explaining logic, design, and improvements.</small>	Clear, confident, and comprehensive explanation.	Understandable but missing some details.	Basic explanation; limited depth.	Unclear or incomplete explanation.	No explanation or presentation.
7. UI/UX Design <small>Layout, usability, and user experience (minor weight).</small>	Clean, intuitive, and user-friendly interface.	Functional but needs minor improvements.	Basic or inconsistent design.	Poor usability or confusing layout.	No interface or user interaction.

RECHECKER: SARANA
PANEL NAME/SIGNATURE

Revisions made based on the panel's advice or recommendations

- UI (Font sizes, explore other fonts and the layout and sidebar do not center. Also, the logout put it in the bottom) and need spacing for the dates.
- Pure white for the execution time area



References

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