



Sri Lanka Institute of Information Technology
B.Sc. Honors Degree in Information Technology

“EasyMed”
Pharmacy Management System

ITP
Project Proposal

Group No: ITP_WD_B06_T74

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Declaration

This project report is our original work, and the content is not plagiarized from any other resource. References for all the content taken from external resources are correctly cited. To the best of our knowledge, this report does not contain any material published or written by third parties, except as acknowledged in the text.

| Name | ID No |
|----------------------|------------|
| Kumara M.G.S.D. | IT21184208 |
| Sepala S.N. | IT21232572 |
| Kusumsiri W.A.N.P.M. | IT21168840 |
| Herath. D.C. | IT21377662 |
| Pathirana V.P.E.P.V. | IT21175084 |
| Prasad P.A.J. | IT21214370 |
| Seneviratne D.M.O.C. | IT21286650 |
| Jayakody J.A.D.H.S. | IT21242236 |

2 BACKGROUND

'EasyMed' is a pharmacy. Medicine is issued to patients/customers who come to the pharmacy through that pharmacy. Patients with a prescription are issued the relevant medicine accordingly, and medicine and other products that can be obtained without a prescription are given to the customers accordingly. When providing this medicine to the customers, the item code of the relevant medicine or non-medicine items is mentioned through their existing system and the prices of those items are entered into the system and the total is generated and an e-bill is generated. Doctors who come to get medicine will issue medicine in bulk and generate an e-bill. Customers who come to the pharmacy and doctors can do the transaction with Visa card, master card or cash. The e-bill given to a customer in the pharmacy. A printed copy is kept. There is no way to buy medicine online through the pharmacy and you have to come to the pharmacy and get the medicine. The employees work in the pharmacy. The daily arrival to the service is collected and managed manually by a book. The time of arrival at the pharmacy, the time of departure and the days of the customer's arrival are managed manually. When managing the inventory of the pharmacy, the decrease in stock should be updated manually. A stock level report can be generated through the system. Expiry date management of products/items is done manually, and the employees of the pharmacy manually mention the item code and name of the products that are about to expire every month in a book and the items that are about to expire When they are removed from the stock of the pharmacy. The removed medicine is returned to the relevant supplier and the amount available to be returned can be checked through their existing system. The orders received from the supplier and supplier details are mentioned in a separate book and those details are managed separately. If a new product is obtained from the supplier, they are inserted under an existing category. is advertised among the customers. Also, a box called customer feedback has been placed in the pharmacy to evaluate and give feedback to the customers about their service and any customer can add comments to it. Through their existing system, they can look at the monthly loss and profit and report It is also possible to generate one.

3 PROBLEM AND MOTIVATION

3.1 PROBLEM

After analyzing the current business processes and client requirements, we were able to identify the problems mentioned below in the existing structure.

- Managing attendance data manually.

As the employee are being paid the correct attendance of the employee should be obtained

- Item expiration tracking do manually.

Expiry date checking of the items (drug and non-drug items) in the pharmacy should be done manually. Therefore, it is difficult to track the expiration date of the items properly.

- Lack of ways for customers to order medicine online.

Customers have to come to the pharmacy to get medicine. With the current situation in Sri Lanka, it causes the sales of the pharmacy to decrease.

- Doctors do not have a way to order medicine in bulk.

The doctors who come to the pharmacy and get medicine in bulk have to visit the pharmacy often to get the medicine. With the busy lifestyle of the doctors, it is difficult to come like that and it also affects the sales of the pharmacy.

- Manage supplier order details manually

The information about the order received from the suppliers and the money paid to them is maintained manually through a book therefore a computerized system is needed.

- No way to create subcategories.

Since there is no way to create a subcategory under the sub main category in the inventory, the added product must be added under the existing category. It is sometimes difficult to manage the product.

1.1 MOTIVATION

- The HR manager marks the attendances and adds them to the system. After that, an attendance report can be generated through the system monthly and annually.
- When a new stock is added to the system, the system asks for the expiration date and the manufacture date of that item. Through this, an alert is given through the system for items that are about to expire.
- Customers can order medicine online through our online pharmacy management system. Doctors can order medicine in bulk. Therefore, customers can get medicine without visiting the pharmacy.
- It is easy to manage the product because it is possible to create subcategories through our system. Due to the facility of creating categories as needed, it makes the work of the pharmacy easier.
- Get supplier order details The supplier manager can manually enter the system and generate a supplier order details report when needed.

3.2 BENEFIT THROUGH SOLUTION

- Flexible access – Students able to access the course materials and lectures can upload it into the system online.

- Higher efficiency – Time wastage is lower when compared with the manual method.
- Generate reports – Easy to generate relevant reports by using the data taken from the databases which simplify the management works.
- Higher Security – Providing access privileges to users can secure the data from the unauthorized persons accessing the system.
- Organized – All the records of the system are up to date and structured well.
- User friendliness – System is well designed and easy to use with better GUI.
- Fewer human errors – Converting functions done by the manually into automation can reduce the human mistakes.
- Low redundancy – Storing all the records in the databases effectively minimizes the redundancy.

4 AIM AND OBJECTIVES

4.1 AIM

- develop a user-friendly application for the effective management of The Pharmacy management system which helps to manage all sections of pharmacy like medicine, store, and billing etc.

4.2 OBJECTIVES

- Improving the efficiency of the system by ensuring effective monitoring of services and activities.
- Ensuring effective policy by providing statistics of the products in stock.

- To ensure that the system is user-friendly.
- Maintaining correct database by providing an option to update the products in stock.
- To display Relevant messages of stock which are ending soon, expiry dates.
- Customer can search the availability of a particular product by viewing the website.
- The automating tasks of maintaining bills.
- To be able to generate various reports according to the requirements.
- To provide optimal drug inventory management by monitoring the drug movement in the pharmacy.
- To ensure that there exists a level of restricted access based on functionality and role.
- To manage employee records.
- To provide easily accessibility of Employees records.
- To minimize human errors.

- Fast searching for medicine.

5 SYSTEM OVERVIEW

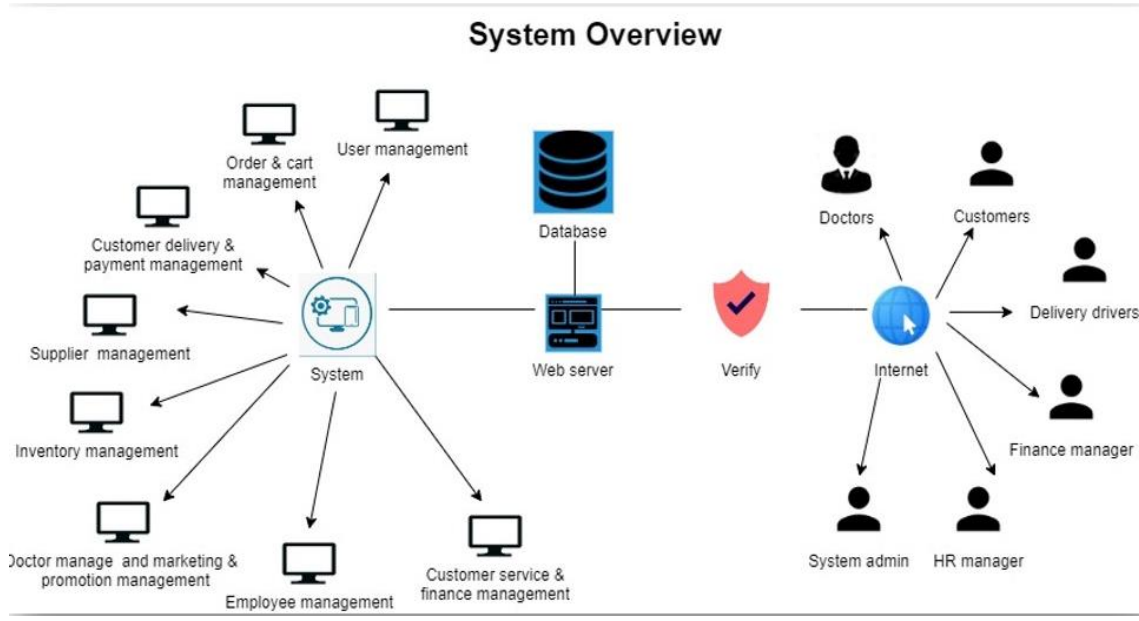
5.1 SYSTEM FUNCTIONS

Company to manage all the system's functions and features. The system's primary functions are as follows.

- User Management
- Order Management and cart management
- Inventory management

- Delivery management and payment management
- Supplier management
- Employee management
- Doctor management and promotion management
- Financial management and

5-1USE CASE DIAGRAM



5-2SYSSYTEM OVERVIEW

5.1.1 USER MANAGEMENT

According to the user management functions, the customer is the primary user. The customer behaves as a buyer through the system. In these user management functions, there are the following functional requirements related to the customer.

Create customer profile,

Delete customer profile,

Customer profile view,

Customer profile update,

Customer password reset,

Customer notification management,

Customer register,

Customer login,

When a customer registers in the system, the customer's first name, last name, username, phone number, email and a password that matches the privacy policy can be registered in the system. If the information provided by the customer is valid, the customer's profile One will be created and the details related to that user will be saved in the system database. When the customer logs in to the system again, the user can login to the system by giving the username and password provided by the user. To update the details, he can change the details that need to be updated through the edit account functions and update the user profile details. Through the user profile deletion function, a user profile can be completely removed from the system database. It is done through the account deletion option. It is possible. To confirm the account deletion request, click on the account deletion option and type the delete key word in the confirmation box that appears. It is used to protect the user account. This is a new security step. If a customer needs to enter and view profile details, it can be done through the view profile option. If a customer forgets the password he entered, he can use the password reset option and enter a new password. Through the notification management functions, the customer can get all the updated notifications and can view them and delete received notifications.

Regarding the user management functions, the moderator acts as a second user. The moderator has the following functional requirements.

Role base access control.

User account termination management.

User permission management.

User profile creation.

Delete user profile.

User profile edit.

User profile view.

Search user.

View user activity log.

Generate user detail report.

User profile creation functions allow a new user to create a profile (for a new manager or administrator or a customer). Thus, after creating a user profile, the moderator can delete, view, and edit that user profile. Also, there is the ability to search the users who register in the system through various factors. Also, if the moderator wants to generate a detailed report related to that user, the moderator can do it. Through the role base access control functions, the moderator can give access to the profiles created. For example, if the moderator creates a profile for a new financial manager, the moderator can grant permission to that financial manager to access only the financial management part of the system. Then the financial manager cannot access other parts such as inventory management, employee management, etc. through user permission management. Requesting p. related to the user profile created by the moderator It is possible to grant access or reject the access request. Also, the moderator can view and manage the activity log of all users.

5.1.2 ORDER AND CART MANAGEMENT

One of a pharmaceutical shop's most crucial components is the order fulfillment system, and when it is out of date, the business suffers. The majority of the risk of human error will be fully eliminated if we continue to employ a manual order fulfillment system. Our pharmacy management system's drop-down menus and pre-programmed SKU numbers make it impossible to enter data erroneously or choose the wrong goods. It will also guarantee accurate information entry and interpretation, so there shouldn't be any confusion. A sales professional is also informed of any incomplete orders or information that was typed incorrectly. Thus, there won't be as many returns and refunds. And also, there is less possibility that customers will receive something that doesn't meet their constantly changing wants when they have the freedom to

modify types and quantities whenever they want without worrying about confusing correspondence with a salesperson.

Besides, through our e-prescription facility customers are more facilitated. Erroneous medical judgments are frequently the result of prescription errors and prescribing mistakes, and they can significantly injure patients. E-prescriptions are provided through our pharmacy management system and are produced utilizing electronic health records. Because they reduce paperwork and confusion, they are user-friendly and economical. Another advantage is that mistakes in medication administration are eliminated. Sharing emails and SMS is simple as pharmacy operations become data driven. Especially in our system customers who are taking the same medicine monthly can request for refilling, which are for previously uploaded prescriptions. Therefore, customers can easily order the same set of medicine without uploading the prescription again and again.

Our automated order fulfillment technology eliminates the need for pharmacists to worry about juggling many jobs. When an order is placed, the system automatically moves it from one software to another, connecting QuickBooks, the warehouse, and other programs. As a result, there is no need to be concerned about outdated or inaccurate inventory, bookkeeping, product, or customer information.

5.1.3 DELIVERY MANAGEMENT AND PAYMENT MANAGEMENT

The pharmacy management system is a crucial platform that offers pharmacy delivery services and aids in data storage, e-prescription provision, report provision, and other functions.

During the present era, people have been able to adapt to global digitization. The different online platforms offering distinct services and products have drawn customer's attention for the last few years. A fundamental part of daily living has always been the pharmacy, and during the outbreak, pharmacy delivery services were crucial. Consumers would rather buy medications online than visit a pharmacy.

Pharmacy service providers or owners can allow clients and patients the freedom to track their prescription deliveries in real time by using pharmacy medicine delivery tracking software. As a

result, the delivery services' path may be found, and the recipient receives pharmaceutical supplies on schedule. This eliminated the lack of healthcare-related supplies or medications and improved the immediate delivery of medications.

Pharmacy service providers find it simple to run business operations and maintain the proper operation of systems with the aid of the pharmacy delivery system. A unique digital platform that provides the best mode of ordering and delivery pharmacies helps customers to get medicine delivery at their doorstep. The platform is developed with extensive strategies and advanced technologies to offer a seamless user experience.

A common problem with most patients has been the uneasy to read doctor's pen and paper prescription. There are times when this cause confusion among patients' parties, and they end up buying the wrong medicines. This can be detrimental to health.

A company's financial transactions are conducted on a platform known as a payment management system. Together with other aspects of cash management, it deals with expenses and cash disbursements. It is a crucial facet of how a business operates. Payment always concludes with a successful commercial transaction, regardless of the type of service.

The ability to track invoices and payments, which may keep organizations organized, and the capacity to manage several payment methods, which can be useful for firms that accept different forms of payments, are some of the benefits. Automating payments can also save time and money.

Customer can apply payment methods.

- Cash on delivery- (without prescription)
- Cards
 - credit cards
 - debit cards
 - visa/Master cards

After we complete the payment, a receipt will be issued to confirm it.

5.1.4 INVENTORY MANAGEMENT

Inventory management aims at reducing procurement and carrying costs, while maintaining an effective stock of products to satisfy customer demands.

Cost management is one of the most important tasks performed in inventory management. There are many types of costs associated with inventory in pharmacy management system. They are the net amount the pharmacy pays for the products (placing and receiving orders, stocking and paying bills.), costs associated with product storage and costs incurred as a result of crises e.g. theft or damage. All those costs are managed in inventory management. From a financial viewpoint, efficient inventory management enhances net profits by reducing the cost of procured pharmaceutical products and associated operational expenses.

Another important step in inventory management is Control Stock management. Unavailability of a product when needed may cause the pharmacy management system to lose a customer and it causes inconvenience to the prescribing doctor and may adversely affect patient's wellbeing especially when the product is an essential lifesaving one. Because of this, when the stored products reach a critical limit or a date that is about to expire, a message is sent to the moderator and informed about it.

Tracking inventory, Generating, and analyzing reports is also a tasks of inventory management. The Inventory Manager can track all our system sales and supplies, see what is low in stock, and get basic financial reporting and analyze it.

5.1.5 SUPPLIER MANAGEMENT

In the pharmacy management system, Supplier management is becoming more and more crucial because more pharmaceutical products and raw materials are being outsourced. Customers or system users can't use this management system, only supplier managers can use this. And supply management system helps pharmacists to stay notified and organized. This concludes supplier communication management, performance tracking, and evaluation. The supplier manager can log in to the system. In supplier management, the system is handled by the supplier manager.

Through the supply management system, the medicines required for the order within the pharmacy system are dispatched from the stored stock to the required quantity. On the other side, the supply management system can manage supplier relationships and communication with pharmacists. The expiration date of the medical products in this system, how many orders go out of stock at the same time, and how many orders have been issued for the products are included. Also, the supplier manager will generate a report about that data. And the supply manager can get a service catalog report. The supply management system also has the order owner's details record. And get an annual report at the end of the year. Also, you can update the expiration dates of the new products, how many new products have been brought, and which products are the least available in stock. Also, it is possible to delete products previously in stock and no longer available from the system.

5.1.6 EMPLOYEE MANAGEMENT

- Collect employee details.
- Create employee profile and register them.
- Update employee profiles.
- Adding payroll regarding the post.
- Tracking employee attendance and time off.
- Monitor performance and record it.
- Make monthly report.

This function covers all the aspects of the employee management process. Employee management developed as a solution to avoid the inconvenience of managing employee profiles and tracking attendance.

Manager can create employee profiles and register them. First of all, manager needs to login the system then manager can create new profile and register employee. Then the employees can login to the system with login credentials. Manager can update employee information if they need. Profiles also can be removed after the employee leaving the job.

Adding payroll of the employees is also covers in this function. After the manager provides basic salary, OT rate, OT hours and bonus salary, the system will calculate the total salary and add payroll to the employee profile.

The system can also record employee attendance at this function. With this part the manager can easily track employee attendance and monitor the performance of employees. After obtaining the attendance in a month, the system will generate a monthly attendance report.

5.1.7 CUSTOMER SERVICE MANAGEMENT AND FINANCIAL MANAGEMENT

Customer service management (CSM) and financial management are essential aspects of an online pharmacy management system. Good customer service improves brand reputation, ensures customer satisfaction, and promotes customer loyalty. The system should allow customer service representatives to manage customer inquiries and issues, including tracking case status, creating notes, and solving issues. And also, the system can manage customer contact information by storing, updating, and deleting the contact records which were collected by the various kind of communication channels like phone, email, chat, and social media. The system has the capability to track key performance indicators (KPIs) and measure customer satisfaction levels.

Financial management handles all the financial activities in the system. It makes decisions about how to allocate financial resources and manage monitoring financial performance. In financial management, there are financial analysts, accountants, managers, product owners, etc. Under financial management, there are different sectors such as financial planning & analysis, budgeting, and management. Financial planning sets financial goals and creates the path to achieve them in an effective manner and reduces financial risks, such as market risk and credit risk. The system should allow for creating and managing budgets, including the ability to set targets, track progress and adjust plans. And also, the system can enable the management of financial transactions, the generating of financial statements and reports, and the updating of accounts. It also tracks financial data to identify trends and make informed decisions about financial strategies like promotions.

By considering the above functions performance, scalability, security, reliability, availability, and usability are the non-functional requirements, and database management, integration with other systems, data analysis, and reporting and compatibility are the technical requirements of these functions. In having effective finance management, it helps the system to operate efficiently and profitably, and in another way, it ensures that it meets the needs of the customers and maintains a high level of service quality.

5.1.8 DOCTOR MANAGEMENT AND MARKETING & PROMOTION MANAGEMENT

Doctor management is developed as a solution to avoid difficulties caused when doctor ordering medicines and items physically. The doctor can create an order for their dispensaries. It is the purpose of doctor management.

Doctor must log in to the system. If he didn't register to the system, he should register first. The doctor can view his profile and change his details.

The doctor should be able to search for items by name and he can add items and medicines to the order. The doctor can place orders under two methods. He can choose under Emergency Order or Normal Order.

After the order is confirmed, the doctor can purchase the order. The system will generate a report of purchased items and medicines.

The marketing and promotion management has developed a solution to avoid difficulties caused when marketing medicines and items to customers physically. The system admins can create marketing campaigns, offers and promotions to increase their sells. It is the purpose of this function.

The marketing management admin can add a marketing campaign and he can view the campaign.

The promotion management admin can add a promotion and he can end the promotion. And he can notify the customers about ongoing promotions.

5.2 FUNCTIONAL REQUIREMENTS

Customer

- Log into the system.
- Register to the system.
- Reset the password.
- View profile details.
- Edit profile.
- View previous purchases.
- See all the items at store.
- Add items to the cart.
- Remove items from the cart.
- Search for items by entering the item name.
- Add delivery details.
- Edit delivery details.
- View order delivery details with status.
- Purchase items from the store.
- Refill request.
- Send customer feedback.
- View promotional message.
- View notification.
- Mange payment option.

Inventory Manager

- Log in to the system.
- Update to the system.
- Add new medicine detail to system.
- View all medicine available.
- Delete medicine details.
- Update medicine details.
- Add product image.
- View product image.
- Delete product image.
- Edit product image.
- Add a new category.
- Delete category.
- Edit category.
- View category.
- Update stock level.
- View stock level.
- Generate stock level report.
- View stock level alert message.

HR manager

- Register the employees to the system.
- Manager can login to the system.
- View details about the registered employees.
- Edit employee related details.
- Remove employees from the system.
- Mark attendance of employees.
- Calculate the salaries of employees by considering the attendance.
- Search for employees by entering employee name.
- Add salary details.

- Generate salary report of employees.
- Employee payroll management.
- View employee resignation list.
- View all order details with status.

Delivery Manager

- Assign drivers to each order.
- View all the drivers' details.
- Log in to the system.
- Update log in credentials.
- Generate delivery reports.

Delivery Driver

- Register to the system as a driver.
- View my profile.
- View orders that need to be delivered by one delivery driver.
- Update delivery status.

Supplier Manager

- Log in to the system as an employee.
- Add details of medicine suppliers.
- Update details of suppliers.
- Delete details of suppliers.
- View details of all suppliers.
- Generate Supplier reports.
- Update supplier agreement.
- Manage supplier order details.
- Create service catalog report.

Doctor

- Log into the system.
- Register to the system.
- View profile details
- Edit profile.
- See all the medicines and items.
- Search for items and medicines by entering the name.
- Add items to the order.
- Remove items from the order.
- View order summary.
- Add delivery details.
- Edit delivery details.
- View order delivery details with status.
- Purchase the order.
- Generate a report on the items purchased.

Customer service manager

- Log into the system
- Add promotion.
- View promotion.
- Remove promotion.
- Notify customers.
- Manage customer inquiries and issues.
- Manage customer contact details.
- provide information about products and services.
- monitor customer feedback and reviews.
- Add marketing campaign.
- Remove marketing campaign.
- View marketing campaign.

Financial manager

- Maintain the records of all transactions.
- Manage salaries and expenditures.
- Create budget.
- Generate reports.
- Manage loss and profit.

Moderator

- View all registered customer profile
- Delete customer profile
- Edit customer profile
- Add Manager Account
- View manager account
- Delete manager account
- Manager role base access controlling
- Logging
- Permission management
- View user Activity log
- Search Customers and managers profile

5.3 NON-FUNCTIONAL REQUIREMENTS

- Usability – All direct stakeholders should be able to use this web application in an easy and convenient manner. The users of the system should be able to navigate between the pages without any difficulty. The workflow of the entire system must be easily understood and self-explanatory.

- Performance – Customers should be able to purchase items quickly, reducing the waiting time. All pages of the system should be loaded immediately on the browser in a seamless manner for enhanced user experience.
- Security- The data stored in the database should be protected as this information is highly confidential and vulnerable as it contains all business-related data, along with the personal data of Customers and employees. Only authorized personnel are allowed to login to the system. All passwords are encrypted before being entered into the system to ensure maximum security,
- Availability – The system should be available 24 hours for customers to purchase items at any time they want. All purchases should process through the system at any given time and place they want without any delay. All employees should be able to login to the system and perform necessary operations regardless of the time or place.
- Reliability - All calculations done by the system, on both the customer and employee side should be accurate. Correct data should be passed between the client side and the server side when requests are made by users from the web server.

5.4 TECHNICAL REQUIREMENTS

- Internet Connection required.
- High data quality required.
- Human error detection - The application must be able to detect when people have made errors and notify and advise about such discrepancies.
 - Ex: JavaScript data validations etc.
- Technical devices are required - A PC or mobile.
- Technical knowledge is required to navigate through the web application.

6 **LITERATURE REVIEW**

Overall, these articles demonstrate the importance of pharmacy management systems in improving the efficiency, safety, and effectiveness of pharmacy operations. They also highlight

the challenges facing pharmacies in implementing these systems and provide recommendations for successful adoption.

A pharmacy management system is a piece of software that aids in managing the day-to-day activities of pharmacies, such as inventory control, prescription filling, client information, invoicing and payment, and other administrative functions. A review of the pharmacy management systems literature is provided below:

The International Journal of Scientific and Research Publications article "Pharmacy Management Systems: A Complete Overview" by Deepak K. Sharma gives a thorough review of the many kinds of pharmacy management systems that are offered on the market. The article lists the important aspects that pharmacies should take into account when choosing a system and compares the features and advantages of various systems.

Sanaa S. Al-Shaikh and Hassan M. Al-article Obaidi's "Pharmacy Management Systems: A Study of Their Existing Capabilities and Future Trends" gives a thorough examination of the present capabilities and market trends for pharmacy management systems. The essay explains how technology might assist pharmacies overcome the difficulties they have in managing their business operations.

The American Journal of Health-System Pharmacy article "The Effect of Pharmacy Information Systems on Pharmacy Practice" by Jeffrey A. Johnson examines how these systems affect pharmacy practice. The advantages of employing these systems are emphasized in the paper, including enhanced patient safety, increased effectiveness, and decreased medication errors.

The Journal of Pharmaceutical Sciences and Research article "An Study of Pharmacy Management Systems and Its Function in Optimizing Medication Usage" by Rajashree K. Rane and Rakesh P. Kolhe examines the function of pharmacy management systems in medication use optimization. The essay goes over how these systems can enhance patient outcomes, decrease medication mistakes, and increase medication adherence.

A review of pharmacy management system implementations in developing countries is presented in Yasir Imran and Ali Afzal's article, "A Review of Pharmacy Management System Implementations in Developing Countries," which was published in the Journal of Pharmacy

Practice and Research. The essay describes the difficulties these nations have in implementing new technologies and offers suggestions for doing so successfully.

These papers show the value of pharmacy management systems in raising the efficacy, safety, and efficiency of pharmacy operations overall. They also highlight the difficulties pharmacies will face in putting these systems in place and offer suggestions for successful adoption.

When a customer uploads a prescription before they need to order the medication again, they simply click the refill button to send a request to the pharmacy, and the pharmacy will refill their medication using the saved prescription in the pharmacy database. This is one of the new functionalities we show off in our system. As a result, placing an order for medication without repeatedly uploading a prescription is simple for the customer. We will specifically design a feature that will allow doctors to order massive quantities of medication for use in their medical centers. Because it is risky to give out such a large volume of medicine, we rarely pass large amounts of medicine orders to regular clients. Also, a new function called expiration tracking has been added to our system. As a result, the manufacturing date and the expiration date are entered into the system each time fresh stock is added. Because of this, the system manager will be notified if the stock expiration dates are approaching. As a result, the manager can act without spending time physically checking the stock levels. Also, the administrator can search for any drug and view the expiration dates of the stock of drugs.

7 METHODOLOGY

7.1 SE RELATED METHODS

7.1.1 REQUIREMENTS ENGINEERING METHOD.

❖ Interview [1]

An interview is a process used to get information from a person by having them respond orally to questions.



INTERVIEW

❖ **The Benefits of choosing Interview.**

- Building relationships with stakeholders.
- Building relationships with stakeholders through interviews is a fantastic way to increase trust between them and developers.
- Able to gather in-depth information.
- With the help of this method, we can get comprehensive data on our clients' needs, demands, and expectations that other approaches, like surveys, would not be able to do.
- Able to clarify requirement.
- This method provides an opportunity to clarify and confirm requirements that might be ambiguous or unclear.

Alternatives

➤ **Brainstorm**

With this method, participants come together to foster a stimulating and concentrated environment. Its unique selling point is that no ideas are criticized.

➤ **User observation**

It involves closely observing and listening to users as they interact with a product. Even while much more in-depth data can be gathered, watching consumers is a simple approach to get a dispassionate impression of a product.

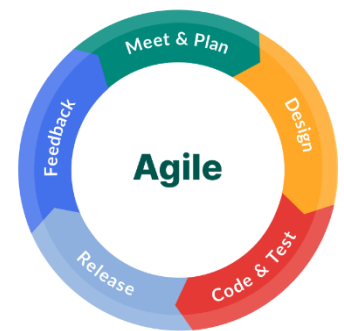
➤ **Questionnaires or surveys**

This is a method for gathering data from many people. This data can be used in one of two ways: either to gather opinions and suggestions or to obtain statistical support for an assumption.

7.1.2 DESIGN METHOD

❖ **Agile [2]**

It is a flexible, iterative approach that features collaboration and feedback between developers, customers, and other stakeholders.



❖ **The Benefits of choosing Agile Manifesto.**

➤ **Higher client satisfaction.**

The Agile manifesto technique, which places a strong emphasis on client interaction and feedback to ensure that the final products satisfy the customer's needs.

➤ **Flexibility and adaptability.**

This approach is made to be flexible and adaptable, allowing teams to react swiftly to shifting requirements.

- Increase collaboration and communication.

This method ensures that all parties are working toward a common objective by improving collaboration and communication between developers, customers, and stakeholders.

- Minimize the risk.

This requirement engineering method mainly relies on delivering functional software regularly, allowing for the early identification and mitigation of risk.

❖ **Alternatives:**

- **Prototyping**

Users get a better understanding of the system being developed. Errors can be detected much earlier. Quicker user feedback is available, leading to better solutions.

- **Waterfall**

This method of development is sequential, and each stage must be finished before going on to the next.

7.1.3 DEVELOPMENT TOOLS & TECHNOLOGIES.

❖ **GitHub [3]**

This is a powerful collaboration tool and development platform for code review and code management. The users can build applications and software, manage the projects, host the code, and review the code.



❖ **The Benefits of GitHub**

- Developers can easily host their code from the repositories and document it by using GitHub.
- The project management features provided by GitHub enable its users to effortlessly coordinate, stay in sync, and complete their tasks.
- GitHub has several features, such as code security, access control for team members, interaction with other applications, etc., that make it a helpful tool.
- GitHub can be housed on computers or in the cloud. Both Windows and Mac OS support it.

❖ **Alternatives:**

➤ **UltraEdit [3]**

UltraEdit is a paid text editor. It has code folding, syntax highlighting, and auto completion. It also has advanced search and replacement capabilities.

➤ **Visual Studio Online**

It is a collection of services. It is fast and easy to plan, build and ship software across a variety of platforms. It is also one of the best tools for software developers that allows organizations to create the perfect development environment.

7.1.4 TESTING METHODS.

❖ **Postman [4]**

Postman offers variety of features for testing APIs. And it can send requests, examine responses, and perform automated testing.



➤ **The Benefits of Postman**

- User-friendly.

Postman offers a user-friendly interface that makes it simple to develop and maintain APIs.

- Enhance teamwork.

Enhance teamwork by enabling you to share collections and work together with other team members to manage and update API tests.

- Postman includes an automated test.

A variety of tools are available in Postman for automating API tests. Writing test cases and running tests in bulk are both included. This makes checking if our APIs are functioning as intended easier.

❖ **Alternatives:**

- **Thunder client**

This is a lightweight addon for Visual Studio Code's REST API Client.

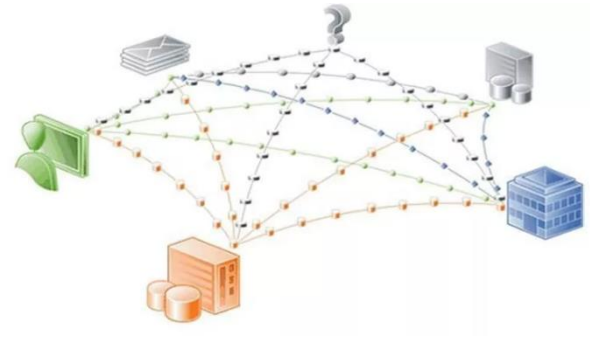
- **Testfully** [5]

Testfully is a platform for "API integration testing" and "API monitoring" that is hosted in the cloud. Users create their own test cases, which are then executed manually or automatically.

7.1.5 - INTEGRATION METHODS.

- **Star integration** [6]

In this instance, links between all the subsystems are essentially created throughout the integrating process (each subsystem is connected to every other one). A complete system's connection diagram resembles a star or a plate of spaghetti (it depends on the number of connections).



✓ **The Benefits of Star integration**

- Eliminate Error.
- Real Reporting.
- Care About Customer Care.

❖ **Alternatives:**

- **Vertical integration**

It's impossible to bring new functionality by reusing existing subsystems.

- **Horizontal integration (Enterprise Service Bus)**

This is an extremely flexible approach. It's possible to add, replace or modify any part of the system without affecting the others. You just need to implement the appropriate interface between a new subsystem and the ESB.

7.2 - TOOLS AND TECHNOLOGIES

We have decided to use MERN Stack to carry out the project. [7]

- MongoDB
- Express
- React JS
- Node JS

1. MongoDB [7]

- Mongo DB is an open-source document-oriented database program.
- It is classified as a NoSQL database program.
- This is written in C++, JavaScript, and python.
- Mongo DB is developed by Mongo DB Inc
- Enables profound developer agility through its flexible data model.



MONGODB LOGO

✓ The Benefits of MongoDB

- Modular data structure

This is a document-oriented database, which is, it stores data in JSON like document that can have variety of structure. This makes it easy to store and manage complex data.

- Community support

There is a sizable and active community here, and there are a ton of resources online that can help us learn and solve any problems.

- High performance

This was created with high performance and low latency in mind, and has query optimization, automatic indexing, and memory processing.

❖ Alternatives:

- **Cassandra**

A distributed NoSQL open-source database called Cassandra can handle a lot of data on inexpensive servers. To provide high availability without a single point of failure, it is a decentralized, scalable storage system that can manage enormous volumes of data across several commodity servers.

- **Rethink DB**

Rethink is a document-oriented database that is free and open source and was created to make it easier to distribute real-time updates for query results to applications.'

- **Couchbase**

This NOSQL database is also built for scalability and excellent performance.

2. Express JS [7]

- Express JS is a free open-source software, and it is a back-end web application framework for Node JS.
- It is written in JavaScript.
- This is used for designing and building web applications.



EXPRESS JS LOGO

✓ The Benefits of Express JS

- Easy to learn and customize.

It is easy to learn and use for people who have experience in Node.js or JavaScript.

- Simplistic and Flexible.

This just offers the capabilities that are necessary for creating web applications, and it gives developers the freedom to alter and expand its functionality as necessary.

- Compatible with a wide range of different libraries and frameworks.

Examples include Mongo Database, REACT, and many others. This makes it simple to integrate with already-existing tools and technologies.

- A sizable and vibrant developer community

This technology has a sizable and vibrant developer community that actively contributes to its development and offers help through forums, documentation, and tutorials. which makes it simple to access resources and assistance when we need it.

❖ **Alternatives:**

- **Nest**

This well-liked web application framework helps developers create scalable and effective server-side applications.

- **Koa**

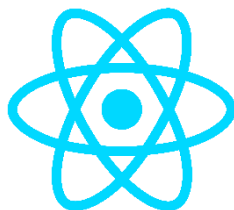
This is a straightforward and lightweight Node.js web application framework. The idea of middleware is the foundation for this.

- **Backbone JS**

Backbone JS is a lightweight JavaScript that offers a range of functionality and tools for creating single-page apps. The Model-View-Controller (MVC) architecture is the foundation for this.

3. React JS [7]

- React JS is a free and open-source front-end JavaScript library.
- It is a platform that can be used as a base in the development of mobile applications.
- It's fast, scalable, flexible, powerful, and has a robust developer community that is rapidly growing.



REACTS JS LOGO.

✓ The Benefits of React JS

- Easy to learn.

React is simple to understand; developers with JavaScript experience can pick it up quickly.

- Flexibility.

From minor components to entire applications, this may be utilized to create both simple and complicated user interfaces.

- A sizable community and ecosystem.

This has a sizable and vibrant community and a wealth of tools and libraries to expand its capability and address everyday issues.

- It uplifts developers' productivity.

❖ **Alternatives:**

- **Vue.js**

This is a front-end JavaScript framework for creating single-page applications and user interfaces.

- **Ember JS**

Ember is a component service framework that concentrates on the construction of the entire online application.

- **Angular.js**

Written in JavaScript, Angular.js is a JavaScript framework that can be added to web pages. It is also distributed as a JavaScript file.

4. Node JS [7]

- Node JS is a free and open-source server environment.
- It runs on different platforms like Windows, Linux, Mac OS X, UNIX, etc.
- It uses JavaScript on the server.
- Can generate dynamic page content.



NODES JS LOGO

✓ **The Benefits of Node JS**

- Easy to learn.

Since JavaScript is among the most widely used programming languages, the majority of front-end developers are proficient in it.

- Large community.

Node.js is fortunate to have a sizable and engaged developer community that consistently contributes to its advancement and enhancement.

- Easy Scalability.

One of the main benefits of Node.js is that programmers find it simple to scale applications both horizontally and vertically. By adding further nodes to the current system, the applications can be scaled horizontally.

❖ Alternatives:

- **Deno**

Deno is a safe contemporary JavaScript runtime. it developed to overcome some of Node.js's restrictions and problems.

- **Meteor**

A full-stack JavaScript framework called Meteor enables programmers to create web applications from a single source of code.

7.3 GANTT CHART

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|
| Definitions & requirement analysis | | | | | | | | | | | | |
| Planning | | | | | | | | | | | | |
| Page UI designing | | | | | | | | | | | | |
| Database designing | | | | | | | | | | | | |
| Coding the structure | | | | | | | | | | | | |
| Development | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | |
| Testing | | | | | | | | | | | | |
| Launching the web application | | | | | | | | | | | | |

7.4 WORK BREAKDOWN STRUCTURE

| Name | Function | Description |
|----------------------|---------------------------|---|
| Kumara M.G.S.D. | User Management | <ul style="list-style-type: none"> • Create user profile. • Delete user profile. • Update user profile. • View user profile. • Manager profile create. • Search customer. • Generate customer profile details. • Generate customer activity log. • Password reset. • User role base access control. |
| Sepala S.N. | Employee management | <ul style="list-style-type: none"> • Create employee profile. • Update existing employee profile. • Delete employee details. • View employee profile. • Search employee. • Calculate employee salary. • Adding payroll to employee profile. • Getting attendance. • Generate attendance report. |
| Kusumsiri W.A.N.P.M. | Customer Order Management | <ul style="list-style-type: none"> • Add new purchase order. • View purchase order. • Update order details. |

| | | |
|----------------------|----------------------|--|
| | | <ul style="list-style-type: none"> • Processing order management • Customer order history management. • Refill request. • Prescription order management. • Order cancellation management. • Order return management. • Customer order reporting and analytics. • Order fulfilment management. |
| | Cart Management | <ul style="list-style-type: none"> • Add new item to cart. • Remove item from cart. • Modifying items in the cart. • Checking items availability. • Calculate the total cost of the order. |
| Herath. D.C. | Delivery Management | <ul style="list-style-type: none"> • Log in to the system. • View all order details with status. • Assign drivers to each order. • View all the driver's details. • Update log in credentials. • Generate delivery reports. • Cancel order delivery. • Add order delivery. • Manage delivery drivers. |
| Pathirana V.P.E.P.V. | Supplier Management | <ul style="list-style-type: none"> • Log in to the system as an employee. • Add details of medicine suppliers. • Update details of suppliers. • Delete details of suppliers. • View details of all suppliers. • Generate Supplier reports. • Update supplier agreement. • Manage supplier order details. • Create service catalog report. |
| Prasad P.A.J. | Inventory Management | <ul style="list-style-type: none"> • Log in to the system. • Update to the system. • Add new medicine detail to system. • View all medicine available. • Delete medicine details. • Update medicine details. • Add product image. • View product image. • Delete product image. • Edit product image. |

| | | |
|-----------------------------|-----------------------------|---|
| | | <ul style="list-style-type: none"> • Add a new category. • Delete category. • Edit category. • View category. • Update stock level. • View stock level. • Generate stock level report. • View stock level alert message. |
| Seneviratne D.M.O.C. | Doctor Management | <ul style="list-style-type: none"> • Log into the system. • Register to the system. • View profile details • Edit profile. • See all the medicines and items. • Search for items and medicines by entering the name. • Add items to the order. • Remove items from the order. • View order summary. • Add delivery details. • Edit delivery details. • View order delivery details with status. • Purchase the order. • Generate a report on the items purchased. |
| Jayakody J.A.D.H.S. | Customer Service Management | <ul style="list-style-type: none"> • Log into the system • Add promotion. • View promotion. • Remove promotion. • Notify customers. • Manage customer inquiries and issues. • Manage customer contact details. • provide information about products and services. • monitor customer feedback and reviews. • Add marketing campaign. • Remove marketing campaign. • View marketing campaign. |
| | Financial Management | <ul style="list-style-type: none"> • Maintain the records of all transactions. • Manage salaries and expenditures. • Create budget. • Generate reports. • Mange loss and profit. |

8 EVALUATION METHOD

This system provides access to customers and employees with the aim of increasing sales by highlighting the quality of the business as a grant responsibility. This web application was built after concluding many phases of requirements analyzing, system analyzing, designing, testing.

One of the main requirements of the client, was the system to be easily used by any customer or employee even without more knowledge about technology. Another crucial aspect is how easy the system is to use for both customers and employees. The web application was routinely checked by the team members to find any errors. Several tests were run from the viewpoint of a consumer, including tests of form submission time, page load time, pop-up message reception time, and easy navigation. According to a previously conducted study, the loading times for websites, pop-up notifications, and form submissions were all within the range of 1-2 seconds.

The interfaces were created using straightforward elements to make it simple for users to browse between pages and carry out necessary operations without difficulty. One of the key demands of the client was that the system be simple enough for any customer or employee to use, even if they had little experience with modern tools. This need was noted as being of the utmost importance when building the web application in order to make a product that is easily accessible to everyone. All users who tested the web app from the perspective of a customer or an employee agreed that the content was simple to grasp and that the workflow and navigation could be completed without any problems.

To produce a final product that satisfies the development team as well as the client, each demand was taken into account and given importance. To determine how the capabilities should be implemented on the web pages, research was conducted on different pharmaceutical applications and platforms. To make the system more usable, all these functionalities were altered appropriately. The features' flow was authorized at the final evaluation, and the usability had significantly improved.

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