**eMed: A Web and Mobile-based Application for RXCue Pharmacy – A Digital Marketing Approach**

An

Application Development Project

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**CHAPTER I**

**INTRODUCTION**

**Project Context**

Over the past several years, many pharmacies have found it difficult to retain staff and pay competitive salaries, resulting in staff shortages in the pharmacy and nursing sections. At the same time, the state and federal governments, the Institute of Safe Medication Practices (ISMP), and the JCAHO are emphasizing the need to reduce medication errors (Kimble & Chandra, 2001). Fortunately, advancements in technology provide healthcare professionals with the tools to achieve this mandate for a safer health delivery system.

Currently, a substantial shortage of pharmacists exists. Hospitals treat sick patients with complex drug therapies, while nursing homes and assisted living facilities face high drug use. The reports of federal Health Resources and Services Administration encompass an outstripped supply and medication shortages. The demand for pharmacy services is growing for specialized needs (Knapp, 2002), therefore, as developers, we made the decision to integrate statistical analysis and predictive functionality into the administrative interface. This enhancement enables us to monitor the distribution of clients based on their addresses, making it simpler to identify optimal locations for new branch openings. Additionally, this empowers us to forecast the demand for medicines over the next three years, aiding in better inventory management and resource allocation.

Other studies describe technology-based pharmacy as a user-friendly resource that can enhance the efficient management of pharmaceutical inventories within pharmacy operations (Verano\_ Revitalizing Health Service with E-Pharmacy\_, n.d.).

RXCUE Pharmacy, located in Calero, Calapan City, Oriental Mindoro, faces various manual problems in its traditional pharmacy operation. These issues encompass prescription filling errors, inventory tracking inefficiencies, sales and billing inaccuracies, and the potential for regulatory non-compliance due to outdated record-keeping methods. Moreover, relying on face-to-face communication with clients and suppliers can limit accessibility and responsiveness, while also impeding data analysis and reporting.

Within the context of our project, it is crucial to recognize that healthcare services stand as a cornerstone of human well-being. They constitute an indispensable requirement for individuals to engage in their daily activities with efficiency and vitality. This understanding forms the backdrop against which we delve into our project's objectives and significance.

To address these challenges, the researchers decided to develop an "eMed: A web and mobile based application for RXCue Pharmacy - A Digital Marketing Approach ", which can improve customer satisfaction, and enable better services while keeping up with evolving industry standards.

**Objectives of the Study**

Generally, this study aims to develop a system entitled "eMed: A web and mobile based application for RXCue Pharmacy - A Digital Marketing Approach ", that seamlessly integrates web, desktop, and mobile platforms to enhance medication management, facilitate customer transactions, improve branch expansion decisions, and ensure patient convenience.

Specifically, it aimed to

1. Design and deploy a user-friendly pharmacy system accessible through web browsers (Web), providing administrative and cashier functions via desktop (Admin/cashier/branch), and a client interface via mobile devices (Mobile).
2. Develop an automated notification system for medication expiration, allowing pharmacy staff to proactively manage and restock expired medicines to ensure patient safety.
3. Enable online browsing of available medicines with the option to reserve for walk-in pick-up, integrating an appointment number system to expedite the in-store transaction process.

**Scope and Limitations**

The scope of this project is to develop and implement a web and mobile-based application for RXCUE Pharmacy with a focus on integrating digital marketing strategies in Calapan City, Oriental Mindoro. The study will encompass the design, development, and deployment of the system, targeting improved efficiency in pharmacy operations. There are three users in the system; the admin, cashier, and the users. The admin can add new pharmacy branches and manage users for each branch including location details and contact information. On the other hand, cashier can check the availability of medicines in real-time, providing accurate information to clients, and can also process online purchases for clients, maintaining seamless operations between online and in-store transactions. Lastly, users can access an e-commerce feature, allowing them to browse and purchase medicines online. The system will be accessible in desktop, web, and mobile devices and will be available online so that its users can easily access it. The research will cover a six-month implementation period, with ongoing monitoring and evaluation.

**Definition of Terms**

In order to further explain the study in an explicit way, the researchers defined the words operationally as:

* **PHP** - PHP is an open-source server-side scripting language that many developers use for web development. It is also a general-purpose language that you can use to make lots of projects, including Graphical User Interfaces (GUIs) (Chris, 2021).
* **SMS** – In this study, it is a process where SMS was use as notification to notify the users for website promotions and updates as well as the availability of the medicine.
* **eMed** – In this study, eMed is the name of the web and mobile application. It serves as a specific identifier for the developer’s project.
* **Web and Mobile based Application** – In this study, web and mobile based application is a software that operates on both web browsers and mobile devices, allowing users to access its features and functions and cater a diverse range of users and their preferred platforms.
* **RXCue Pharmacy** – In this study, RXCue Pharmacy serves as the client organization, and the study's primary focus is directed toward addressing their needs and requirements.
* **Digital Marketing** - In this study, digital marketing refers to the use of online strategies to engage clients of RXCue Pharmacy for promotions and important announcements.

**CHAPTER II**

**REQUIREMENT SPECIFICATION**

This chapter explained the specific requirements and functionalities necessary for the effective completion of our project.

**Hardware Requirements**

Hardware Requirements refer to the representation of the hardware used by the system. Table 1 below presents the hardware requirements to be used by the project.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hardware** | **Functions** | **Specifications** | | **Unit** |
| **Minimum** | **Recommended** |
| Computer/  Processor | It is used to handle the complex tasks associated with creating a strong, secure, and reliable system to provide us with the computing power we need to ensure our system is optimized for performance and reliability. | Intel  (R) Core  (TM) i3-7020U CPU | i3 and above of version | 1 |
| RAM | It acts as a temporary memory storage for the system. It enables the computer to quickly access the website's data and process it efficiently, providing a faster and smoother browsing experience. | 4GB | 6GB | 2 |
| Android Smartphone | It is used if the customer wants to access the system conveniently and for easy order the products they want. |  |  | 3 |

**Table 1: Hardware Requirements**

**Software Requirements**

Software Specifications refer to the representation of the software used by the system. Table 2 below presents the software specifications to be used by the project.

|  |  |
| --- | --- |
| Software Used | Description |
| Operating System | The researchers chose the Windows 10 operating system because it will suit and can support the system. |
| Visual Studio Code | Visual Studio Code is a code editor that supports development operations like debugging, task running, and version control. |
| Laravel | Laravel is a free and open-source PHP framework that provides a set of tools and resources to build modern PHP applications. |
| phpMyAdmin | phpMyAdmin is a web-based tool for managing MySQL databases. |
| Laragon | Laragon is a web development environment for Windows. |
| GitHub | GitHub is a code hosting platform for version control and collaboration. It lets you and others work together on projects from anywhere. This tutorial teaches you GitHub essentials like repositories, branches, commits, and pull requests. |

**Table 2: Software Requirements**

**Functional Requirements**

Functional requirements specify what the system can do. This will serve as the manual of the system that includes the functional specifications, the process of the system to create reports and the process of data that will be manipulated inside the system.

|  |  |
| --- | --- |
| **ID NO** | **Requirement Description** |
| **Admin Side** | |
| 1.1 | The system should allow the admin to add new pharmacy branches, including location details and contact information. |
| 1.2 | The admin should be able to add and manage users for each branch, assigning roles and permissions as needed. |
| 1.3 | The system should provide the admin with the capability to manage the inventory for each branch, including adding, updating, and tracking medicines and related items. |
| 1.4 | Admin should have access to statistical data, represented in pie graphs, to easily view the percentage of clients in different areas. This aids in data-driven decisions for new branch locations. |
| 1.5 | The system should offer predictive analytics to forecast pharmaceutical needs and trends for the upcoming three years. |
| 1.6 | Admin should be able to conduct digital marketing campaigns, sending SMS, push notifications, and email updates to clients for promotions and important announcements. |
| 1.7 | The system should generate notifications for medicines approaching expiration, following the First-In-First-Out (FIFO) method to ensure medication safety. |
| **Cashier Side** | |
| 1.8 | Cashiers should be able to check the availability of medicines in real-time, providing accurate information to clients. |
| 1.9 | The system should support sales management, allowing cashiers to process transactions efficiently. |
| 2.0 | Cashiers should have access to inventory management features, ensuring the accurate tracking of available medicines and related products. |
| 2.1 | Cashiers can process online purchases for clients, maintaining seamless operations between online and in-store transactions. |
| 2.2 | Cashier can assign appointment number transaction to customer in order to help in organizing and managing customer flow within the premises. |
| 2.3 | Cashier should be able to void cancellation and view the history of product cancelled by the user. |
| **User Side** | |
| 2.4 | Clients should have access to an e-commerce feature, allowing them to browse and purchase medicines online. |
| 2.5 | Clients can schedule appointments through the system, receiving appointment numbers to facilitate quick and convenient in-store transactions for pick-up and payment. |
| 2.6 | Clients should be able to cancel orders and view the cancelled product history. |

**Table 3: Functional Requirements**

**Non-Functional Requirements**

These are requirements that pertain to behavior properties that a system must have. It defines how a system is supposed to be or its system properties. It contains the following:

**Operational Requirement**

Table 4 represents the requirement description that will specify the operating environment(s) in which the system must perform and how these might change over time.

|  |  |
| --- | --- |
| ID No. | Requirement Description |
| 1.1 | The system is compatible with any operating system |
| 1.2 | The system should have an intuitive and user-friendly interface to ensure ease of use for applicants of varying technical expertise. |
| 1.3 | The user interfaces across web, desktop, and mobile platforms should be intuitive, ensuring ease of use for both clients and staff. |
| 1.4 | The system should be accessible 24/7 to accommodate patients who need medicine. |

**Table 4: Operational Requirement**

**Performance Requirement**

Table 4 represents the requirement description that will emphasize the response time, capacity, and reliability of the system.

|  |  |
| --- | --- |
| ID No. | Requirement Description |
| 1.5 | Each web page must load within 2 seconds |
| 1.6 | The user can track their orders 98% of the time without failure. |
| 1.7 | Any user can order and buy the products in the system. |
| 1.8 | The system should respond to user inquiry, such as what medicines are available. |

**ble 5: Performance Requirement**

**Security Requirement**

Table 5 represents the requirement description that will address issues with security, such as who has access to the system's data and must have the ability to protect data from disruption or data loss.

|  |  |
| --- | --- |
| ID No. | Requirement Description |
| 1.9 | The user’s information must be encrypted |
| 2.0 | Only the admin can view the inventory and sales statistics. |
| 2.1 | The user’s must be logged in before they can order or can access the homepage of eMed. |
| 2.2 | Database access should be restricted to authorized personnel only. |
| 2.3 | The system must implement strong authentication mechanisms, such as username/password combinations to ensure that only authorized personnel can access the system. |

**Table 6: Security Requirement**

**Checked and reviewed by:**

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