Design and Implementation of a Pharmacy Management System

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Submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SONARGAON UNIVERSITY (SU)

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APPROVAL

The project titled "**Design and Implementation of a Pharmacy Management System**" submitted by Didarul Alam (CSE1902017006), Resma Akter (CSE1902017026) Tareq Hosan Boby (CSE1902017031) Md Touhiduzzaman Khan Mridul (CSE1902017050) and Wasik Hasan Tuser (CSE1902017071) to the Department of Computer Science and Engineering, Sonargaon University (SU), has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering and approved as to its style and contents.

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DECLARATION

We, hereby, declare that the work presented in this report is the outcome of the investigation performed by us under the supervision of **Abu Said Md. Rezoun, Lecturer,** Department of Computer Science and Engineering, Sonargaon University, Dhaka, Bangladesh. We reaffirm that no part of this project has been or is being submitted elsewhere for the award of any degree or diploma.

Countersigned

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ABSTRACT

In particular, this Pharmacy Management System Project in PHP focuses mainly on maintaining medicine records and sales. To be more precise, the system helps to keep a number of sales and medical records. Also, the system contains a sales report section too. In addition, the system allows adding up the medicine record with their respective categories. Evidently, this project contains an admin panel only. In an overview of this web application, the user can simply add up medicines for further steps. Here, the user has to provide a number of details in order to add a new medicine. Such as bar code, medicine name, category, remarks, quantity, expiry date with cost, and selling price. As a result, the system automatically displays the total profit margin for each. In fact, this simple pharmacy system project in PHP clearly helps in the sales management side as its main motive.

ACKNOWLEDGMENT

At the very beginning, we would like to express my deepest gratitude to the Almighty Allah for giving us the ability and the strength to finish the task successfully within the schedule time.

We are auspicious that we had the kind association as well as supervision of **Abu Said Md. Rezoun, Lecturer,** Department of Computer Science and Engineering, Sonargaon University, whose hearted and valuable support with best concern and direction acted as necessary recourse to carry out our project.

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We are also thankful to all our teachers during our whole education, for exposing us to the beauty of learning.

Finally, our deepest gratitude and love to my parents for their support, encouragement, and endless love.

LIST OF ABBREVIATIONS

CPU	Central Processing Unit
ER	Entity Relationship
HTML	Hyper Text Markup Language
PC	Personal Computer
RAM	Random Access Memory
SDLC	Software Development Life Cycle
UI	User Interface

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Introduction to Pharmacy Management System

The “Pharmacy Management System” has been developed to override the problems prevailing in the practicing manual system. This system is designed for the particular need of the company to carry out operations in smooth and effective manner. These systems will ultimately allow to manage resources.

1.1 What is Pharmacy Management System?

It is an online tool that records, supports, and enables complex automation of routine processes for pharmacy operations. This helps simplify, streamline and automate workflows, processes such as drug stock control, billing, customer management, medical claims management, prescription processing within pharmacies and pharmacy chains dietary supplements, hygiene items, medical supplies.

1.2 History of Pharmacy Management System:

The pharmacy management system, also known as the pharmacy information system, is a system that stores data and enables functionality that organizes and maintains the medication use process within pharmacies. These systems may be an independent technology for the pharmacy's use only, or in a hospital setting, pharmacies may be integrated within an inpatient hospital computer physician order entry (CPOE) system.[1] Necessary actions for a basic, functioning pharmacy management system include a user interface, data entry and retention, and security limits to protect patient health information.[2-3] Pharmacy computer software is usually purchased ready-made or provided by a drug wholesaler as part of their service. Various pharmacy software operating systems are common place throughout the many practice settings.[4-6]

1.3 Pharmacy Management System Principle:

The principles of a Pharmacy Management System revolve around optimizing pharmacy operations, enhancing patient care, and ensuring the safe and effective use of medications. Here are some key principles:

Efficiency and Workflow Optimization: Pharmacy Management Systems aim to streamline processes and workflows, reducing manual tasks and optimizing operational efficiency. This includes features such as automated prescription processing, inventory management, and integration with other healthcare systems to eliminate duplicate data entry and facilitate seamless information flow.

Integration and Interoperability: Seamless integration with other healthcare systems, such as electronic health records (EHRs), physician order entry systems, and insurance billing systems, is essential for efficient data exchange and coordinated patient care. Interoperability ensures that information flows smoothly across different platforms, improving medication management and care coordination.

Reporting and Analytics: The system should offer robust reporting and analytics capabilities, allowing pharmacy managers to track key performance indicators, monitor inventory levels, analyze medication utilization patterns, and identify areas for improvement. Data-driven insights can help drive operational and clinical decision-making.

1.4 Global top Pharmacy Management System Platforms:

- Lazz Pharma LTD
- Wellbeing Pharmacy
- Blue Print Pharmacy
- Popular Pharmacy
- Islamia Pharmacy
- WellSky CareTend
- Backstage
- FrameworkLTC
- PioneerRX
- PharmaTrader

1.5 Pharmacy Management System Service in Bangladesh

In Bangladesh, several pharmacy management system services are available to help pharmacies streamline their operations and improve efficiency. These systems are designed to automate various tasks, such as inventory management, sales tracking, prescription management, and customer records. Here are a few pharmacy management system services commonly used in Bangladesh:

Medistar: Medistar is popular pharmacy management software in Bangladesh. It offers features like inventory management, point-of-sale (POS) system, prescription management, billing, and reporting. It also integrates with barcode scanners to simplify the process of managing stock.

MedRx: MedRx is another widely used pharmacy management system in Bangladesh. It provides modules for managing inventory, sales, purchases, and prescriptions. Additionally, it offers features like expiry date tracking, supplier management, and financial reporting.

ePharma: ePharma is a comprehensive pharmacy management system service that caters specifically to the needs of pharmacies in Bangladesh. It includes modules for inventory control, sales, purchase orders, prescription management, and customer records. It also offers a mobile app for pharmacies to manage their operations on the go.

1.6 Some Pharmacy Management System services in Bangladesh

- Lazz Pharma LTD
- Wellbeing Pharmacy
- Blue Print Pharmacy
- Popular Pharmacy
- Islamia Pharmacy

1.7 The Future of Pharmacy Management System

The future of pharmacy management systems holds immense potential for transforming medication management and patient care. With increasing interoperability, these systems will seamlessly integrate with other healthcare platforms, allowing for efficient data exchange and coordinated care. The integration of artificial intelligence and machine learning will empower pharmacy management systems to offer advanced medication decision support, predictive analytics, and personalized recommendations. Pharmacists will be able to expand their roles by utilizing these systems for clinical services like medication therapy management and comprehensive medication reviews. Patient engagement will be enhanced through patient-facing components, such as mobile apps and portals, enabling medication adherence support and direct communication with pharmacists. The rise of telepharmacy and remote dispensing will be supported, ensuring accessibility to medications in underserved areas or during emergencies. Blockchain technology will enable secure drug traceability, safeguarding the authenticity and integrity of medications. Advanced data analytics will allow pharmacies to identify trends, manage population health, and contribute to public health initiatives.

1.8 Technology Information:

To develop online based pharmacy management system different technologies need to be used. Here are the list of technologies and their details which are used to develop this platform (Table 1.1).

Technology Information		
SL	**Name**	**Details**
1	Bootstrap	Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains HTML, CSS and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.
2	Javascript	JavaScript, often abbreviated as JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for webpage behavior, often incorporating third-party libraries.
3	jQuery	jQuery is a JavaScript framework designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax. It is free, open-source software using the permissive MIT License. As of Aug 2022, jQuery is used by 77% of the 10 million most popular websites.
4	Ajax	Ajax is a set of web development techniques that uses various web technologies on the client-side to create asynchronous web applications. With Ajax, web applications can send and retrieve data from a server asynchronously without interfering with the display and behaviour of the existing page.
5	PHP	PHP is a general-purpose scripting language geared toward web development. It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1993 and released in 1995. The PHP reference implementation is now produced by The PHP Group.
6	SQL	Structured Query Language, abbreviated as SQL, is a domain-specific language used in programming and designed for managing data held in a relational database management system, or for stream processing in a relational data stream management system.
7	MySQL	MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter My, and "SQL", the acronym for Structured Query Language.

Table 1.1: Technology information

1.9 Objectives

The main objective of the project is to manage the administration of the pharmaceutical store and the database. This project is an analysis of the development and implementation of a pharmacy management system. This is done by creating a database of the available medicines in the shop. The primary purpose of the pharmacy management system is to increase the accuracy and improve the safety and efficiency of the pharmacy store. The goal of this project is to develop software for the effective management of the store. This is a very useful application for the pharmacist, which reduces the work load and it will help you to manage all of the components of the pharmacy, such as Drug Administration, Invoicing, etc., etc. That is, the increase in the efficiency of processing. This will increase the clinical efficiency and patient convenience, in view of the fact that Ethiopia is in the direction of the pharmaceutical care of the patient. It automates tasks, and account management. In a pharmacy, and the bill inspection is an essential process. The pharmacy management system is a easy-to use, so that the user can run a pharmacy without ambiguity. This is the project subject to a pharmacy management system with a high degree of minimization of time and resources, and with the help of that by looking at the drug information, you can use the data in the shortest amount of time possible.

- It is the user friendly application for Pharmacist which reduces the burden and helps to manage all sections of Pharmacy like Medicine management and Billing etc.
- In Pharmacy, Billing management is the key process. Including safe data store about medicine as well as fast searching, delete and update of medicines.
- The pharmacy management system is easy for use so the user can do pharmacy actions without ambiguities.
- This refers the pharmacy management system project highly minimize time and resource by which, searching the medicine data you can get the data in quickest time.
- A summarized list of drugs dispensed to patient can be viewed for monitoring purposes. Also PMS will be able to generate report on the list of drugs dispensed in the polyclinic for a given time period.

Chapter 2

Working Procedure

2.1 Working Procedure

Working is mainly the body of Working Procedure, rules, and a particular procedure or set of procedures for achieving proposed model's objectives. We use SDLC model to complete our project. This project work has completed by following some steps.

Diagrammatic representation of these steps of waterfall model is given below:

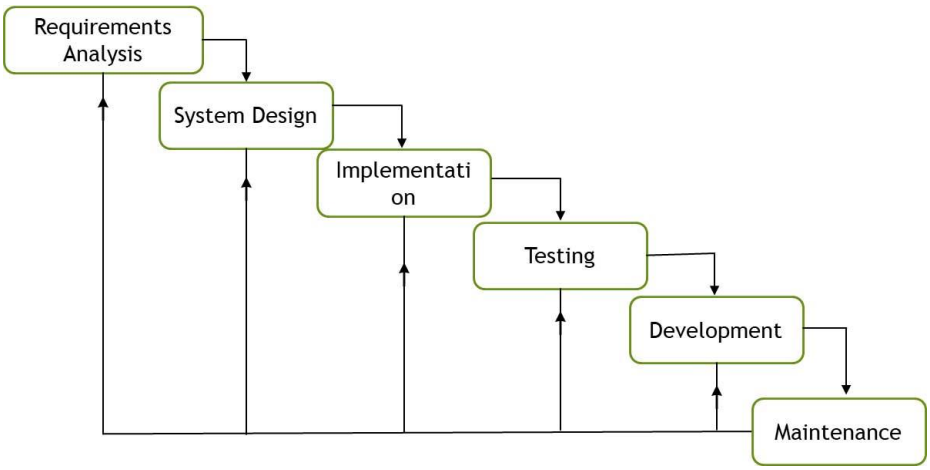

Figure 2.1: SDLC model

2.2 Justification of Procedure

Every software developed is different and requires a suitable SDLC approach to be followed based on the internal and external factors. The SDLC phases are as follows -

- Requirements are very well documented, clear and fixed.
- Product definition is stable.
- Technology is understood and is not dynamic.
- There are no ambiguous requirements.

- Ample resources with required expertise are available to support the product.
- The project is short.

2.3 Description of Procedure

A Description of Procedure is a type of diagram that represents a workflow or process. A Description of Procedure can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task. The Description of Methodology shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows.

2.2.1 Requirement Analysis

Gathering and documenting data for moving forward. All your next phase decisions will be based on the data you've collected on this stage. You will consider client interviews and meetings for the development and customization of the project.

- User actions on the website. What all actions can a user perform on the website besides making a purchase.
- Branches Console & Admin Console.
- Inventory and Logistics Management and Order Fulfilment.
- Only Branch place order and payment.

2.2.2 System Design and Development

System design and development refers to the process of creating and implementing a new computer-based system or improving an existing system to meet specific requirements and solve a particular problem. It involves designing the architecture, components, and functionalities of the system while considering factors like performance, scalability, security, and usability. The process of system design and development typically includes the following steps: Requirement analysis, System design, Implementation, Testing and quality assurance, Deployment, Maintenance and support.

2.2.3 Implementation

With regards to our analysis and system design you will implement your code on this stage. You will apply all system logic and service integration to give your Pharmacy Management System its face.

2.2.4 Testing

All the programs for all possible defects, by running test cases either manually or by automation. The client is involved in the testing phase as well, to ensure all requirements are met.

2.2.5 Maintenance

Installation and maintenance include making the appropriate modification to the product or system or enhancing, changing, or modifying attributes related to performance issues related to the system. Its main role is to improve the performance of the system with the maximum accuracy result of our blink apps output. These progressions raised during the support stage are significantly connected with changes started to be finished by the client or clients after the establishment and testing stage, which includes bugs like imperfections revealed during live employments of the framework or requests raised by the customers. So the customer is furnished with convenient upkeep and backing for the created item. You will really be amazed to know that the effort made in the design and development phase of the product is only 60% effort as compared to the efforts made in the maintenance phase. Maintenance is the generally significant phase of a software life cycle. There are 3 types of maintenance:

- Corrective Maintenance: This sort of upkeep is done to address blunders that were not found during the item advancement stage.
- Perfection Maintenance: This kind of support is done to upgrade the functionalities of the framework in view of the client's solicitation.
- Adaptive Maintenance: Versatile upkeep is typically needed for porting the product to work in another climate like work on another PC stage or with another working framework.

2.4 Requirement Gathering Technique

Whether you are performing a system upgrade or re-platforming altogether, requirements gathering is crucial. Businesses need to establish a water-tight specification for the project with guidance around every feature. That’s where Magpie comes in. We are specialist pharmacy management system consultants who can add invaluable insight to the planning process and make sure your project is a success.

Chapter 3
Analysis of Requirements, Design and Implementation

3.1 Analysis Requirements

Requirements Analysis is the analysis of defining the expectations of the users or client for an application that is to be built or modified. Requirements analysis involves all the acts that are conducted to identify the needs of the different stages of processing. Therefore requirements analysis is analyzed, documented, validate, system requirements and server requirements.

High-quality requirements are documented, actionable, measurable, testable, traceable, helps to identify business opportunities, and are defined to facilitate system design. For this reason, the system is easy to understand and also easy to modify or correct for future

- System requirements
- User requirements

3.1.1 System Requirement

There are two types of requirements in this system requirements phase. Following is the two types of system requirements:

- Hardware requirements
- Software requirements

3.1.2 Hardware Requirements

- CPU: for web 1,6 GHz , for web and database 4 x 1,6 GHz CPU.
- RAM: 4GB.
- Minimum database space: 10GB.
- CPU: Quad 2GHz+ CPU.

3.1.3 Software Requirements

- Bootstrap
- Javascript
- jQuery
- Ajax
- PHP
- SQL
- MySQL
- Xampp

3.1.4 User Requirement

- PC/Laptop/Mobile Device
- Must Have reachable to browser

3.2 Design and Implementation

Design and implementation parts have the same basic functions. The function is regarded as follows:

3.2.1 Data Flow Diagram

A flowchart is a type of diagram that represents an algorithm, workflow, or process. The flowchart can also be defined as a diagrammatic representation of an algorithm (step by step approach to solving a task). The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields.

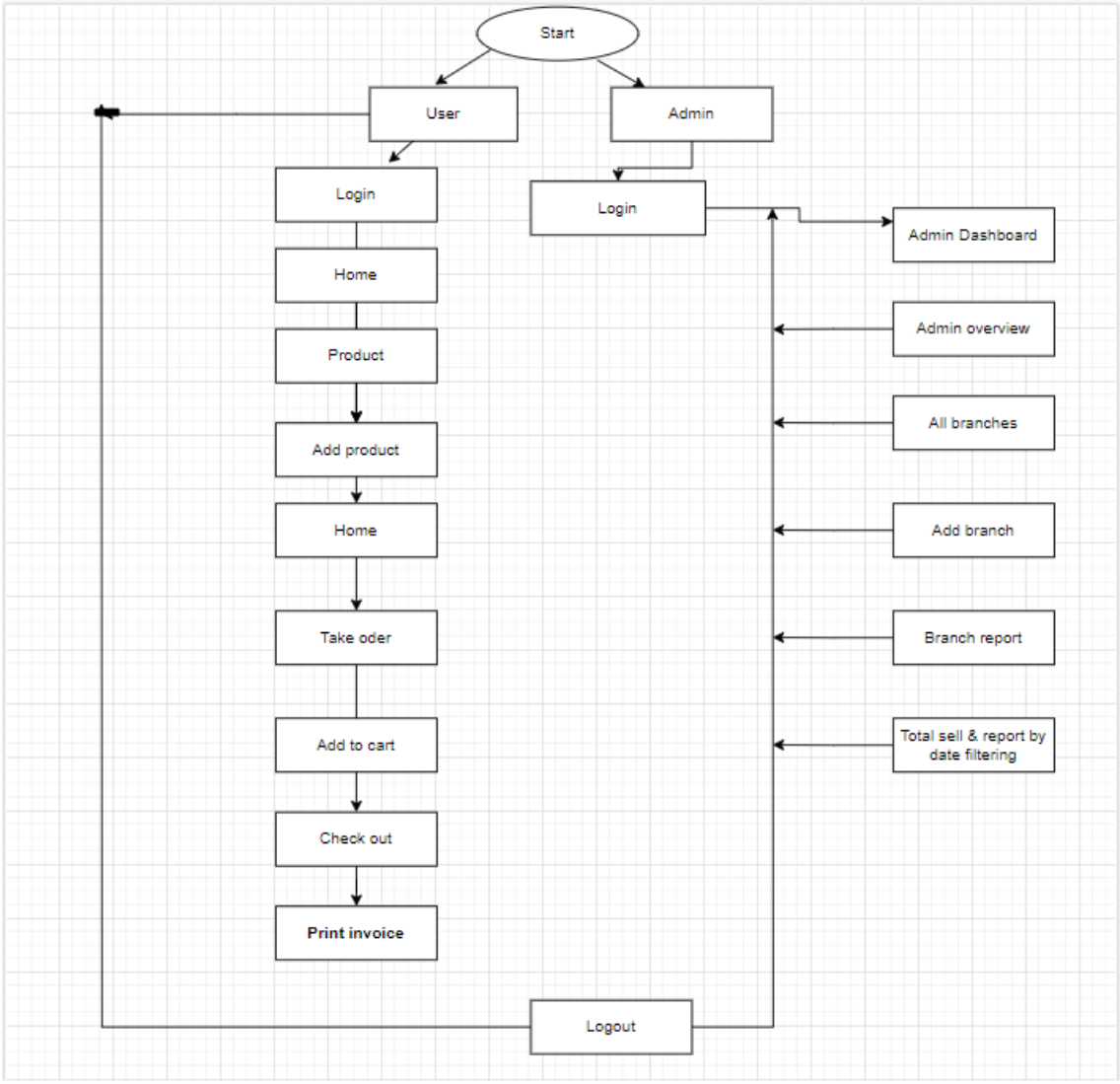

Figure 3.1: Data Flow Diagram

First, a login request needs to make with a username and password. If they are valid, the login will be successful. Here, the branch manager will get his individual profile access. The Admin will get the read/write and all the other access

3.2.2 Use Case Diagram

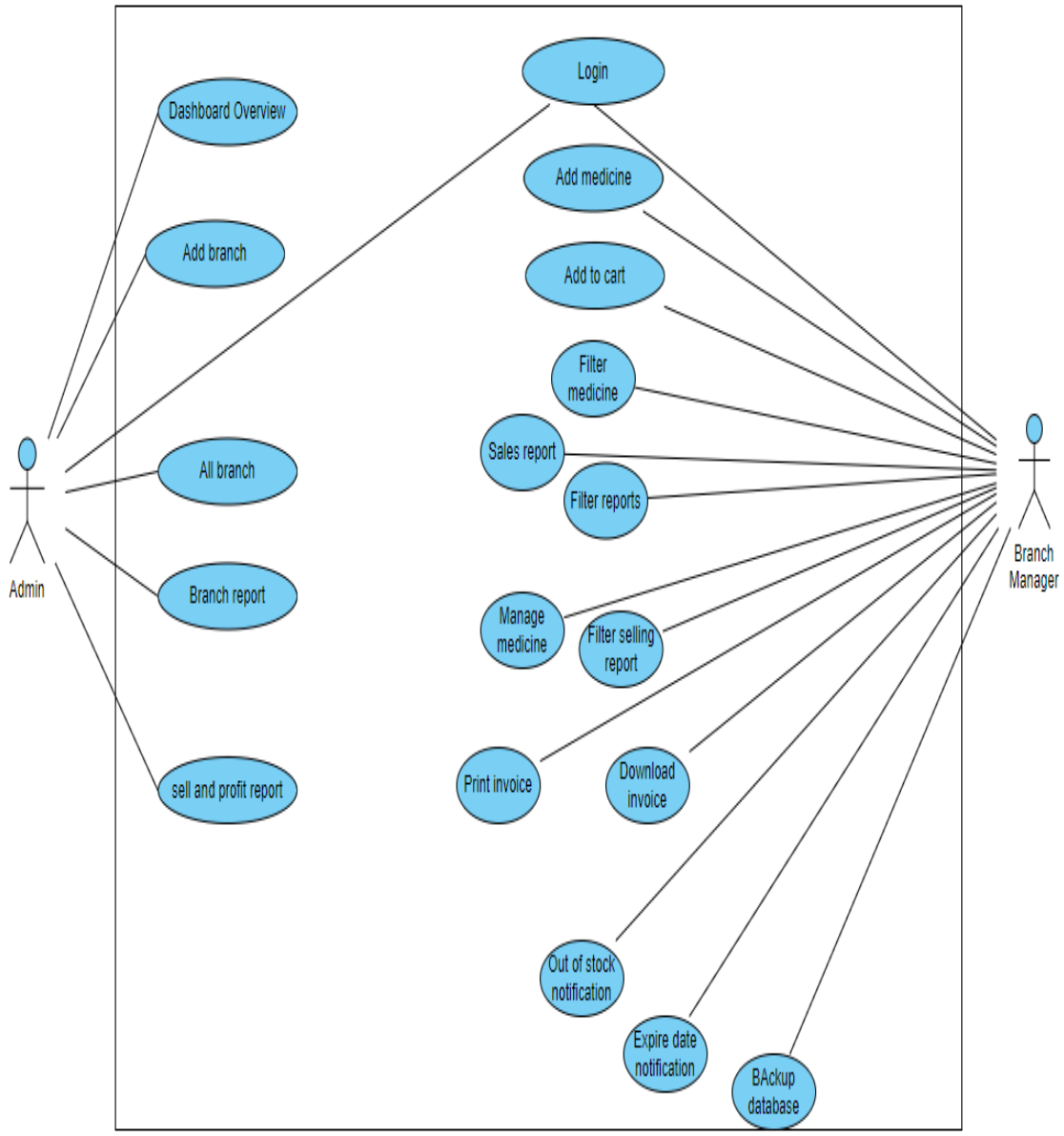

Figure 3.2: Use Case Diagram

Add branches: If admin want a create new branches, request to register page. A register page opens and asks for total Information about the branches.

Login: The administration can login by entering their username and password. The system verifies is the name and password matches. If not matched, error messages show to the branch manager.

Add medicine: After login branch manager can add medicine in system.

Category Wise Search medicine: The administration can search medicine by barcode, name, profit margin, and register date on the product page.

Sales report: After sell medicine, the administrator can view a list of sales reports. After every successful sale transaction, the system gathers the information and displays it under this section. Additionally, the administrator can filter between starting and ending dates for the sales report.

Checkout: After adding to the cart medicine the administrator can check out.

Print Invoice: After sell medicine the administration print invoice for customer.

Manage medicine info: The administration to update product info including price, brand.etc. And system updates in the database and also delete.

3.2.3 ER Diagram

Here is an ER diagram about the Pharmacy management system database. An Entity Relationship Diagram (ERD) shows how entities (such as people, objects or concepts, etc.) relate to each other in a particular system. Generally, an ERD does not define business processes, but graphically displays business data patterns. In this case, the entity can be regarded as a noun and the relation can be considered as a verb.

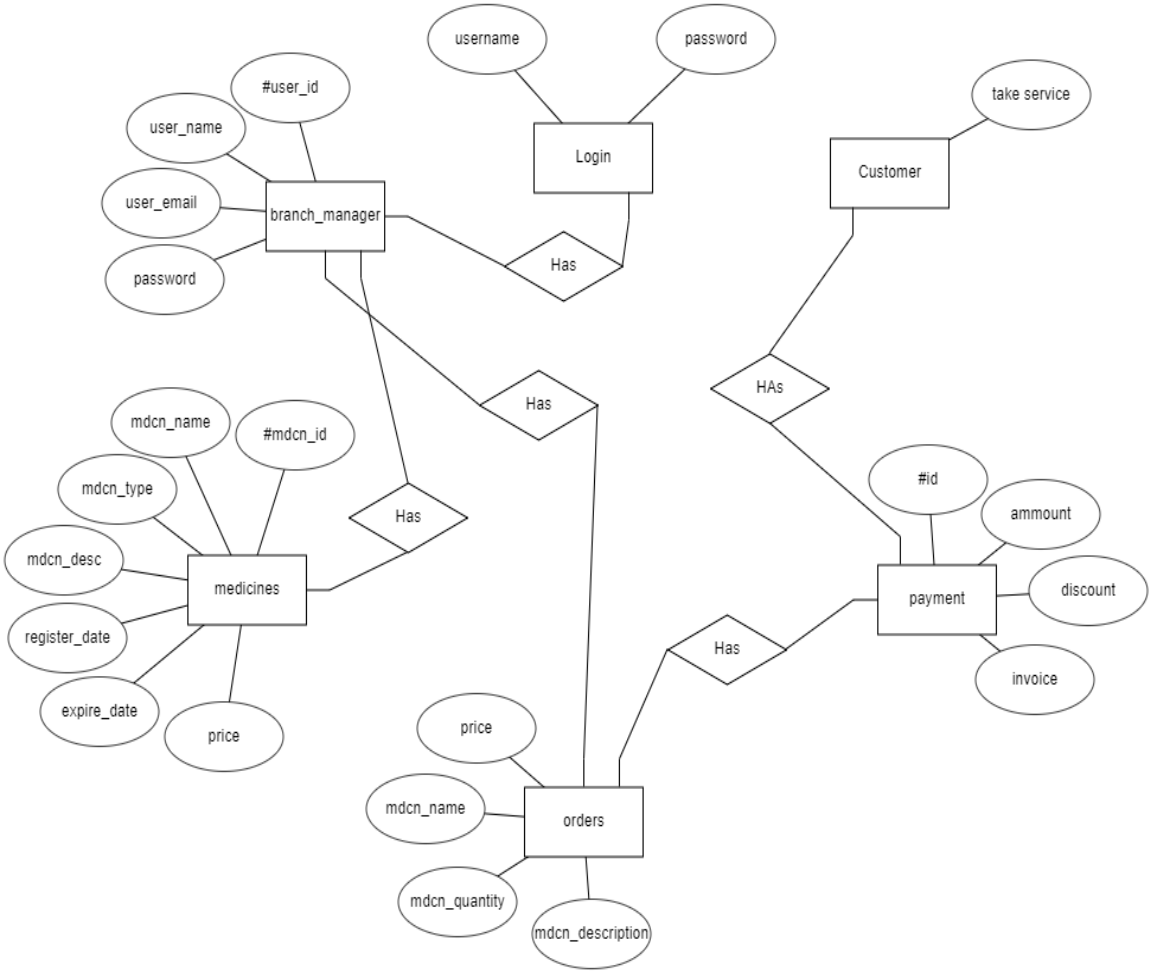

Figure 3.3: ER Diagram

Chapter 4
Project Description

Here is our Project Screenshot Start. Here we will be able to see Admin, Branch Manager and Sales information.

4.1 Admin Dashboard

This is our Admin Dashboard Page. Here we will be able to see all branches, total sell and total profit and contribution of branches with pi chart information of this platform. From this dashboard we can also add and manage branches.

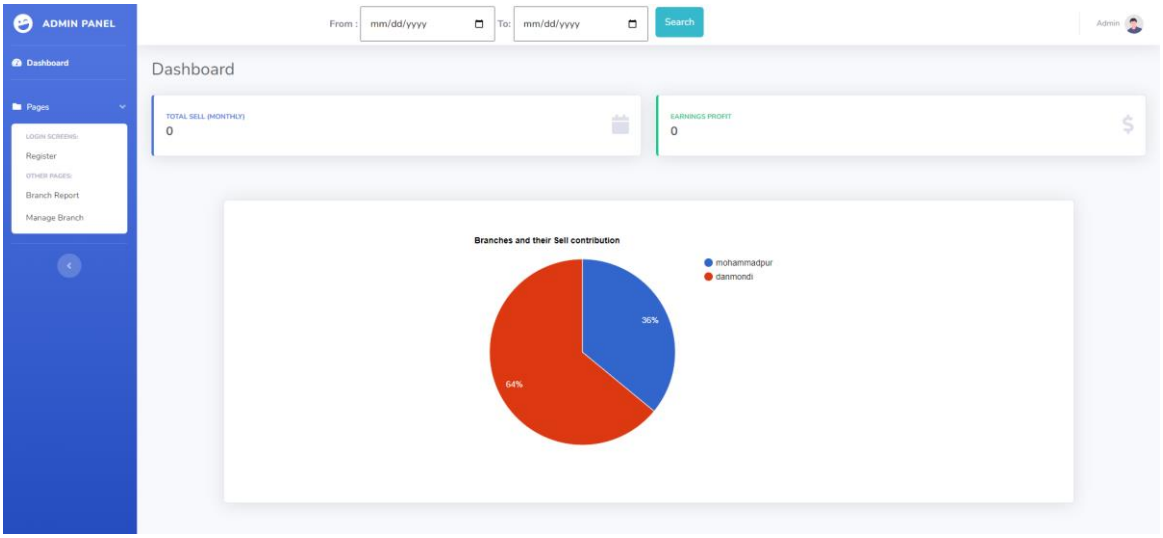

Figure 4.1: Dashboard Overview

4.1.1 All branches list:

Here we can see all branches list of this platform.

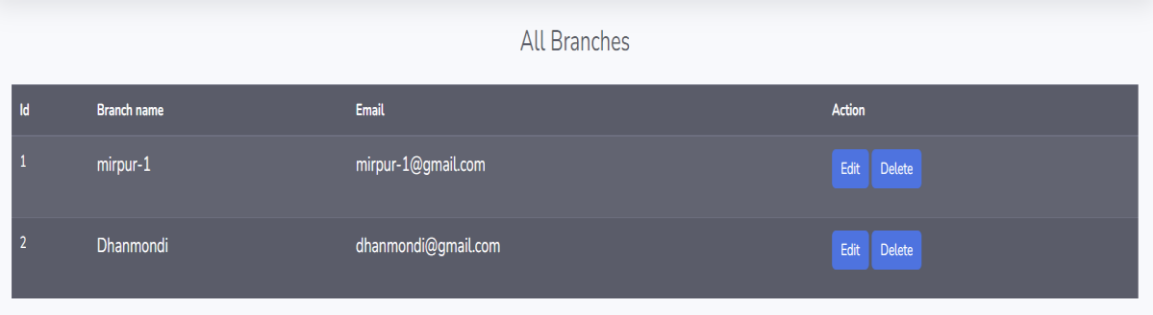

Figure 4.2: All branches list

4.1.2 Register Branch:

Here we can see branch register form of this platform.

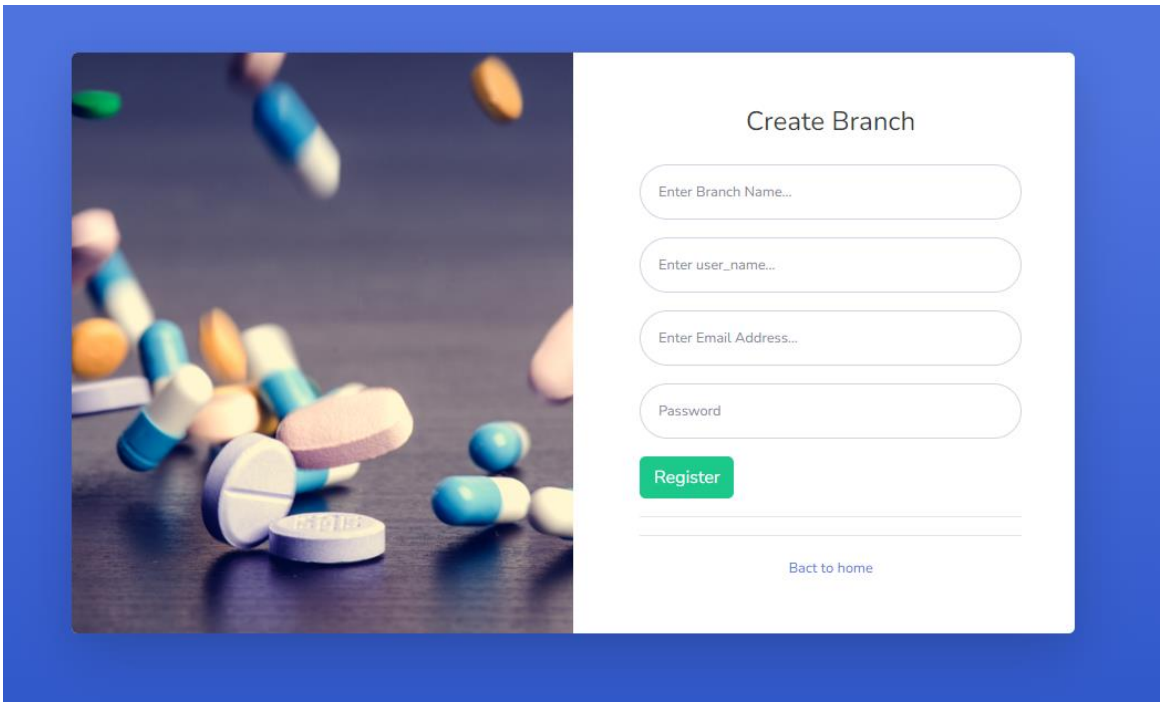

Figure 4.3: Register Form

4.1.3 Branch report:

Here we can see branch report information of this platform.

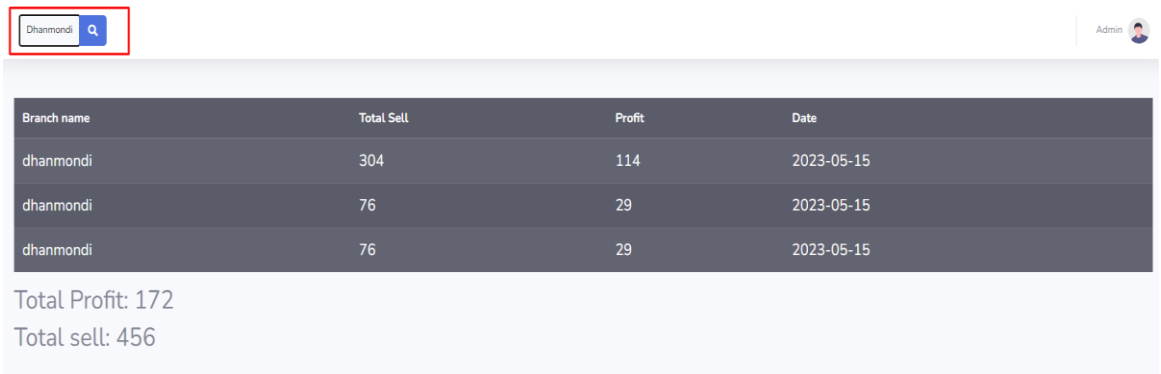

Figure 4.4: Branch Report

4.1.4 Total sell and earning filtering by date:

From this dashboard we can see the list of all the sales and profit filtering by date that has been made on the system.

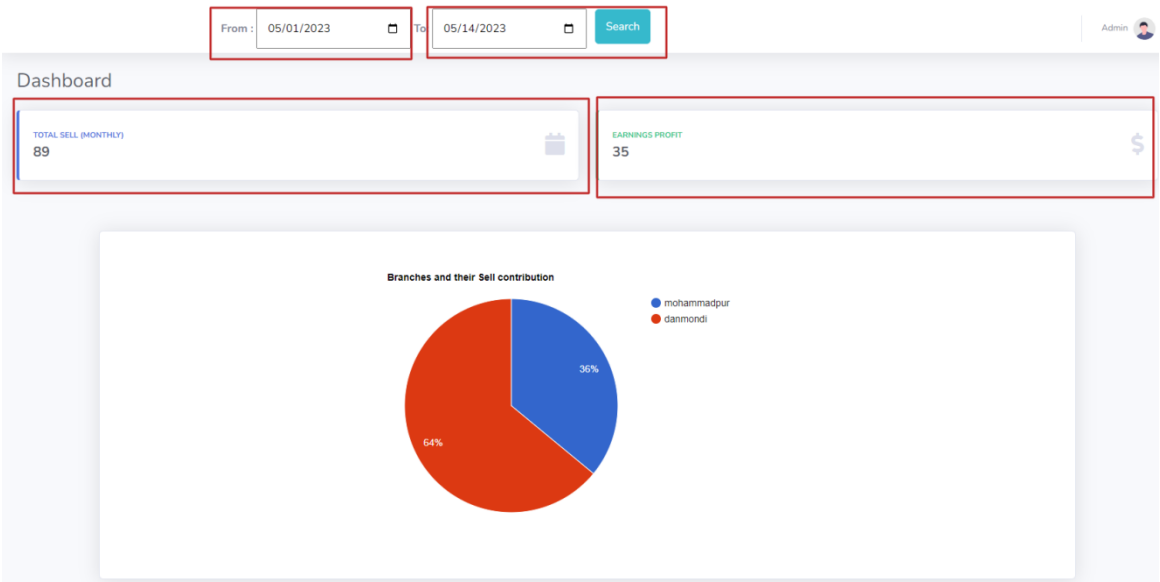

Figure 4.5: Total sell and earning filtering by date

4.1.5 Admin Login page:

Here is the admin login page of this platform.

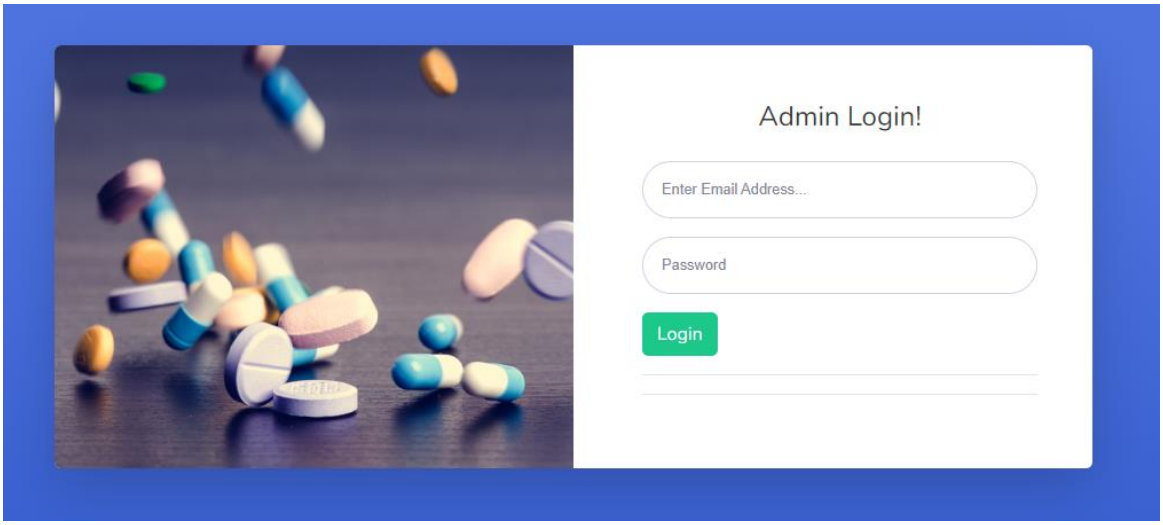

Figure 4.6: Admin Login Page

4.2 Branch Login Page

Here is the login page of this platform. In login page at first two icon. “User Name” and “Password” icon.

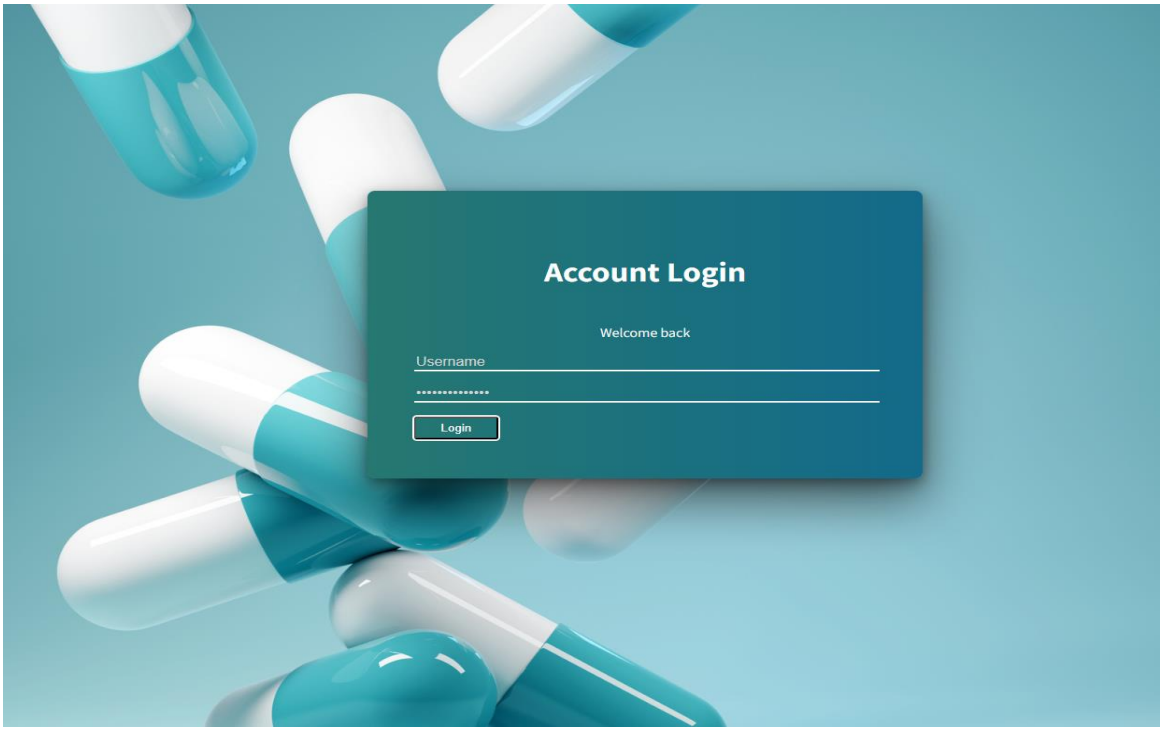

Figure 4.7: Branch Login Page

4.2.1 Branch Homepage

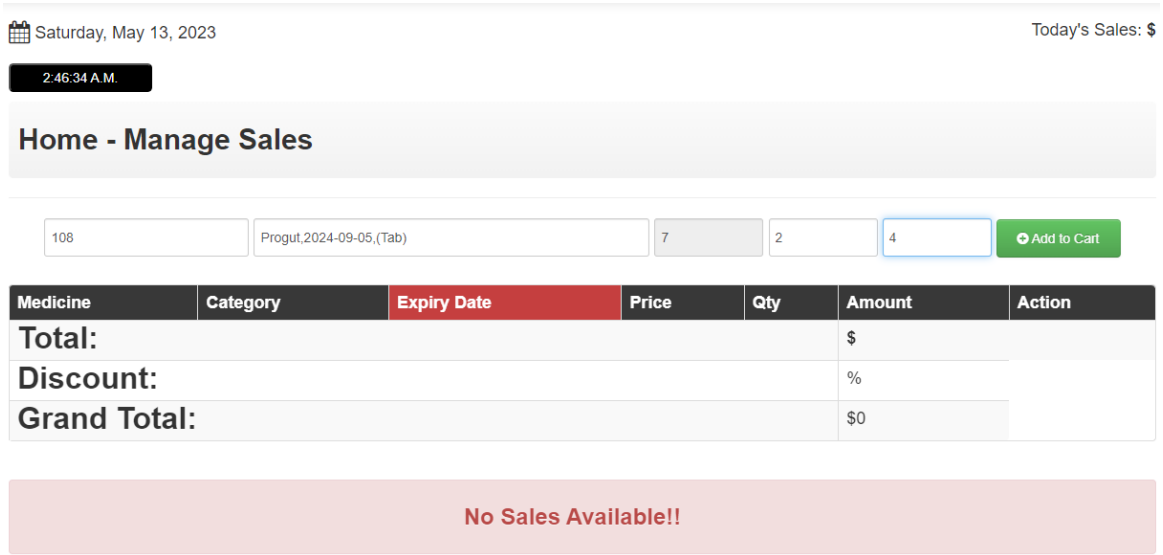

Figure 4.8: Branch Homepage

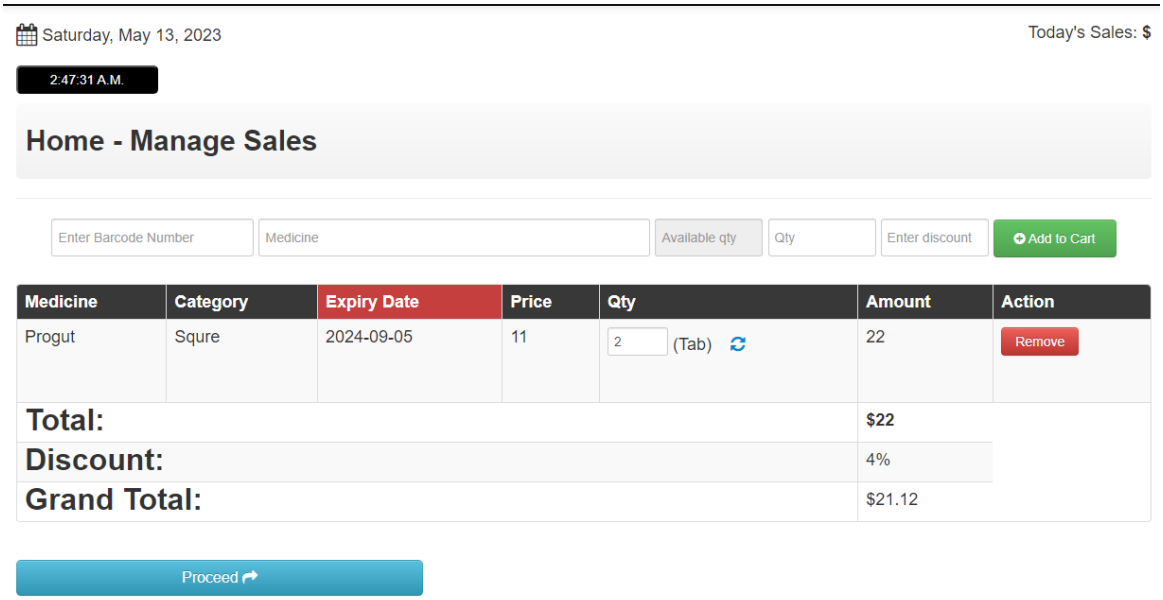

Figure 4.9: Grand total

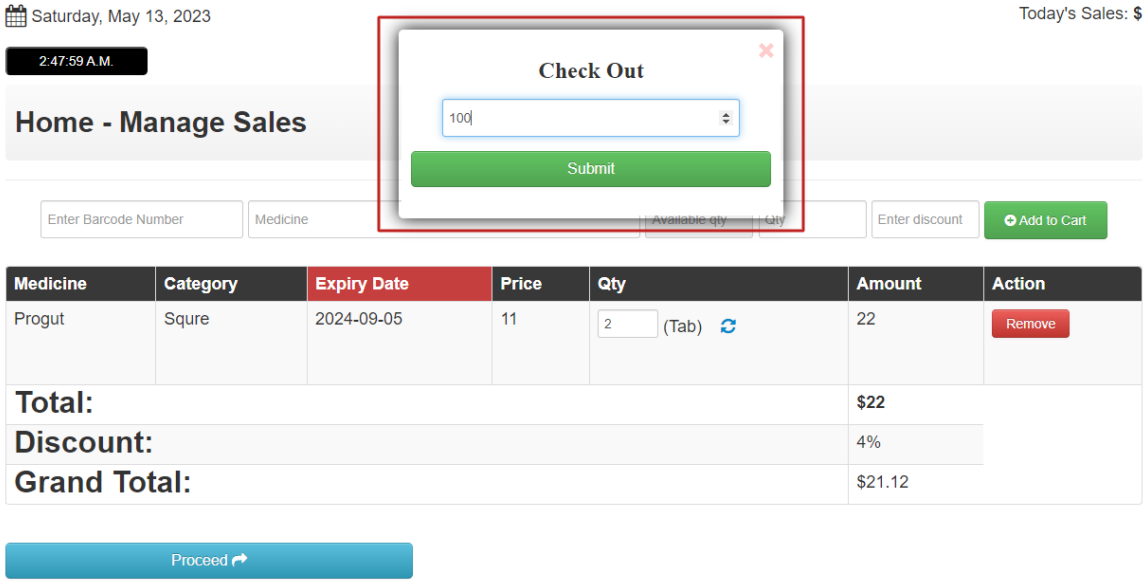

Figure 4.10: Check out

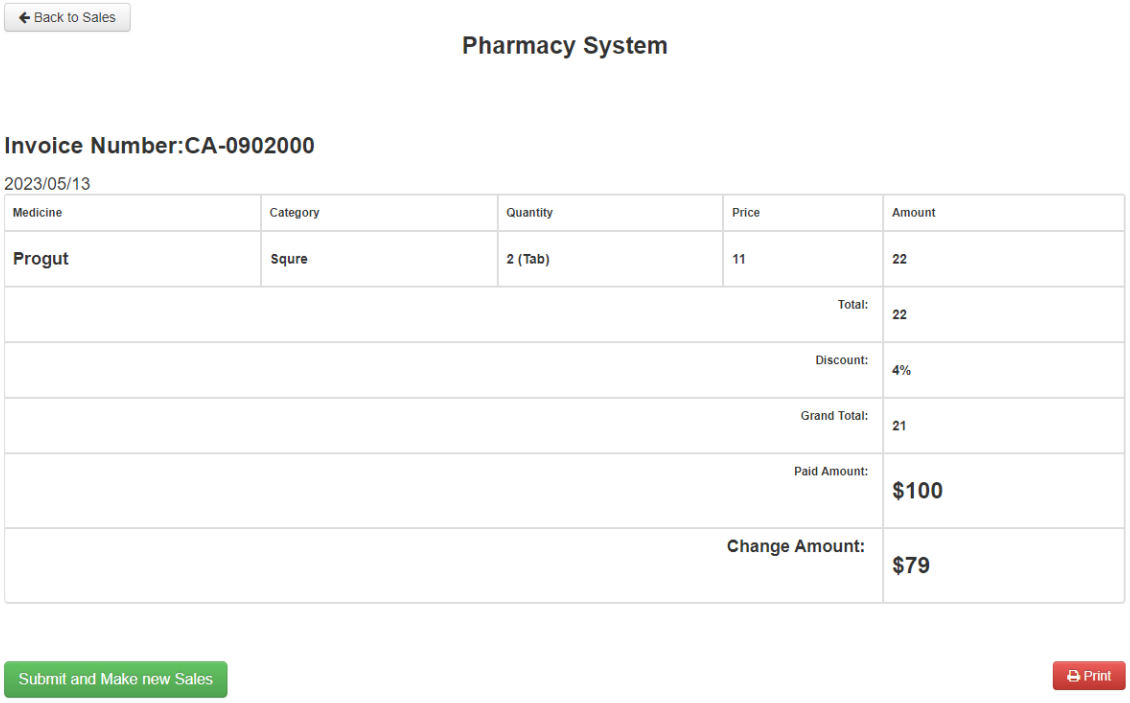

Figure 4.11: Confirm sell

4.3 Product page

To add any medicine first we need to log in to the platform. Then click on "Add Medicine".

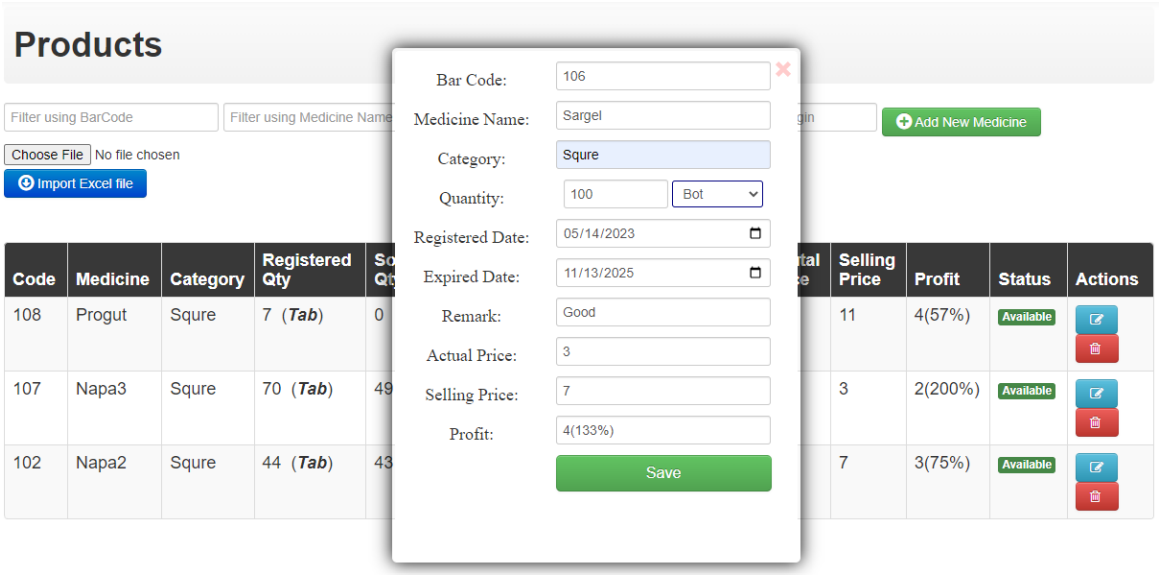

Figure 4.12: Add Medicine

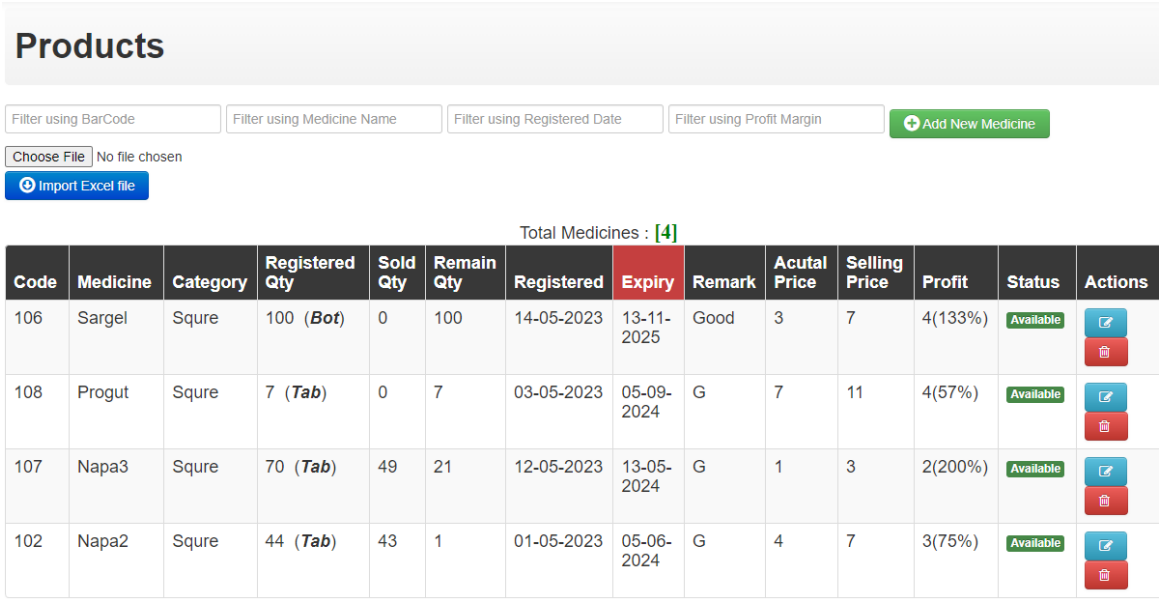

Figure 4.13: Manage Medicine

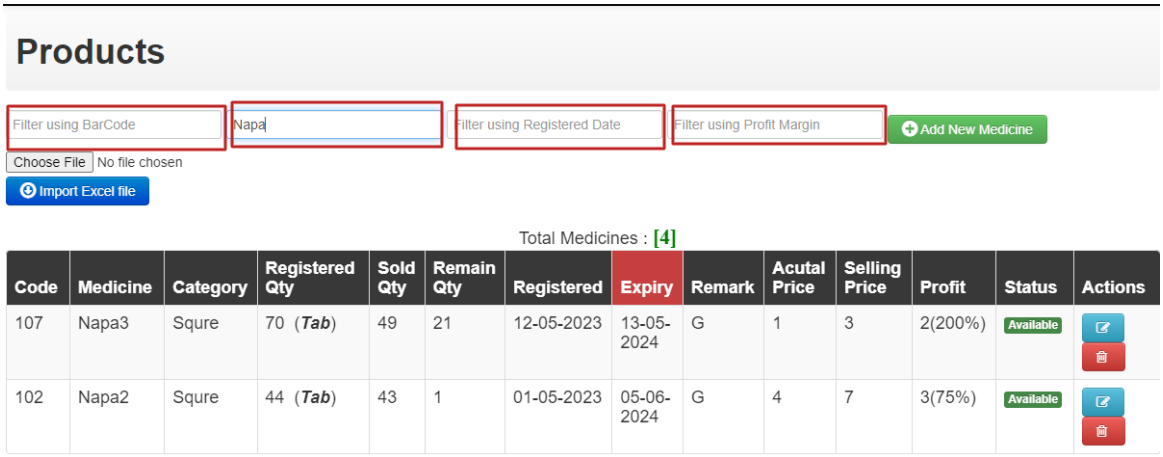

Figure 4.14: Medicine filtering

4.4 Sales report

After-sales medicine needs to go to the “Sales Report” (Figure 4.15). Then see all sale medicine. The system also displays the total sales amount of 24-hrs in the home section.

Figure 4.15: Sales report

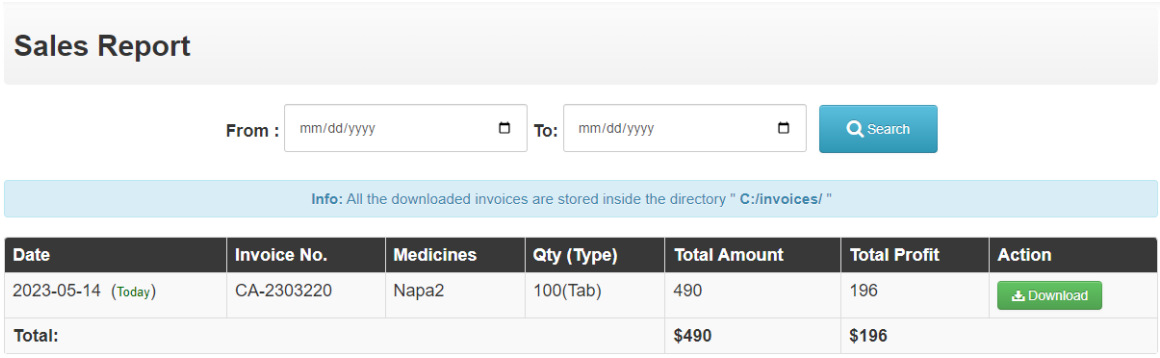

Figure 4.16: Medicine sales report

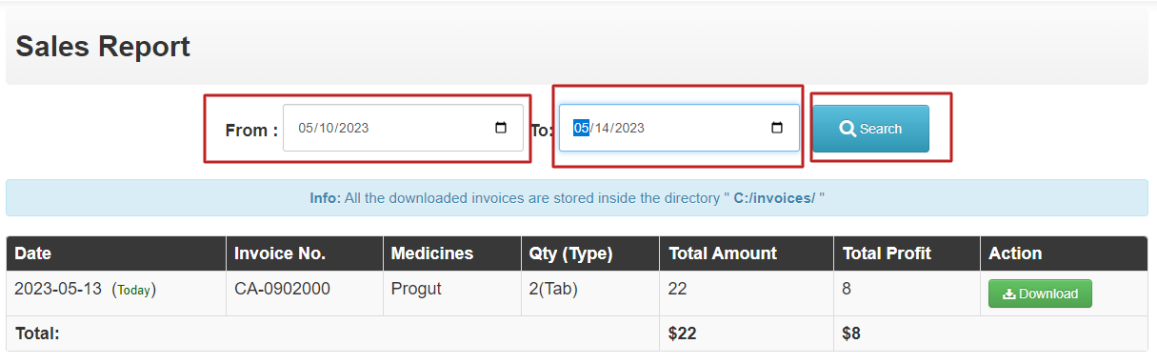

Figure 4.17: Medicine sales report by date

4.5 Notification

When any medicine stock out and expired the system will notify (Figure 4.18), (Figure 4.19),

Figure 4.18: medicine going to expired notification

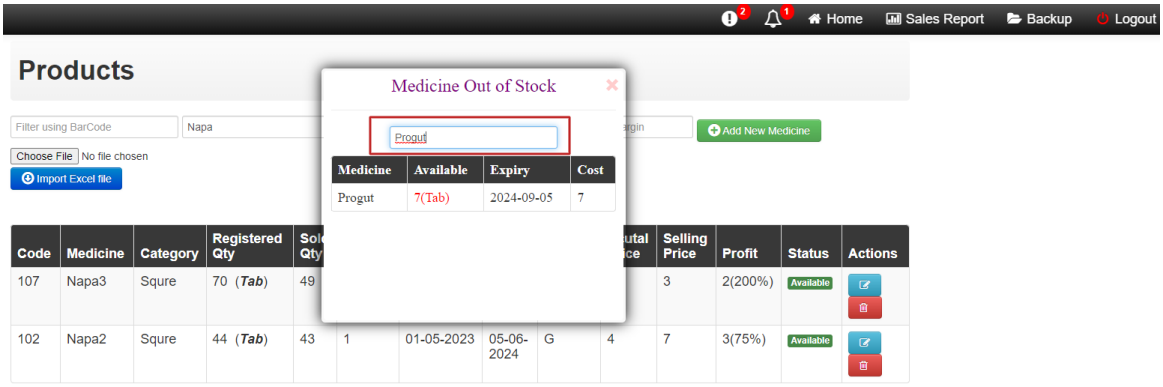

Figure 4.19: medicine out of stock notification

4.6 Invoice

When selling medicine the system will generate an Invoice.

Pharmacy Invoice

Invoice Number:CA-0020090

2023/05/13

Product Name	Category	Qty	Price	Amount
Napa6	Squre	4(Tab)	15	60
Total				60
Discount				3%
Grand Total				58
Paid Amount				**60**
Change Amount				**2**

Thank You

Figure 4.20: final invoice

Chapter 5

CONCLUSION AND FUTURE WORKS

5.1 Limitations

- This platform needs to be made more users friendly.
- Users can not be using any payment system.
- 'Forgot password' option doesn't work.

5.2 Future Works

After overcoming all limitations of this platform one day this pharmacy platform may use as a pharmacy management system platform for Bangladesh. Another this need to be added. This is our first project on pharmacy management system.. From this projects we have learned so many things about different platform like Javascript, CSS & Bootstarp, JQuery, AJAX, Invoice generate, Php, Sql , MySql Database . These knowledge will help us throughout our carrier.In near future, we are planning to we are planning to add a new feature i.e. barcode scanner, payment method. We are working to increase automation in the system to increase user experience greatly. One day we will be able to develop more sophisticated platform.

5.3 Conclusion

In conclusion, In this project is a computer-based solution designed to streamline and automate the various tasks involved in managing a pharmacy. By integrating features such as inventory management, prescription processing, sales, and customer management, it helps pharmacies operate more efficiently and provide better service to their customers. The system facilitates accurate tracking of medication stock, improves prescription processing workflows, simplifies sales and billing processes, and enables effective customer management. While there may be limitations such as customization constraints and integration challenges, implementing a well-designed pharmacy management system can greatly enhance the overall operations of a pharmacy, leading to improved productivity, accuracy, and customer satisfaction.

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