CLINIC MANAGEMENT SYSTEM

CST3390 Final Report

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Abstract

The "Clinic Management System" project's purpose is to computerize the Front Office Admin of a hospital in order to generate software that is user-friendly, simple, quick, and efficient all at a reasonable price. The administrative functions of the front desk will be computerized in order to achieve this goal. It is involved with the process of acquiring information on patients, such as searching for patients, viewing patient diagnoses, enrolling patients, amending patients, removing patients, finding for patients, and related operations. Historically, this task was completed by hand. The most fundamental function of the system is to register and keep track of the details of both patients and doctors, as well as to obtain these data as and when they are required, and to also alter these details in a significant way. In order to log into the System, you will need both a username and a password. An administrator and a physician are the only ones who can access it. They are the only ones who can access the database. The information can be accessed with little effort. The data is very well protected for individual usage, as well as the processing is completed in a very timely manner.

Establishing hospitals and clinics is one of the many ways that third-world countries are working towards meeting the demand for access to medical care. Paper is still used for many aspects of day-to-day operations at a variety of treatment facilities, in contrast to the situation in hospitals and clinics located in European nations, where employees are provided with access to computers to assist them in doing their duties. The concept of automating the management and administration of medical clinics is gaining traction in a number of developing nations, particularly those in Southeast Asia.

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1.0 INTRODUCTION.

Clinic Management System (CMS) exists because everything needs to be done efficiently and effectively in the age of technology. The use of CMS may enhance the quality of care provided to patients and the effectiveness of hospital operations as a whole, leading to less stress for doctors and nurses and a simpler structure for health system. The Clinical Maintenance System is Windows-based software designed for patient record registration, management, and simple access. The system will be utilized at a hospital or clinic to help the register, physicians, and maintain patient records for easy access and reference. All of these actions are normal and would be burdensome on the staff if done manually, thus the requirement for effective, user-friendly software solutions that would assist relieve the workload on clinic/hospital workers. Currently, a large number of commercial and governmental hospitals preserve and maintain books with patient information instead of electronic databases. This method of data preservation is quite formal; yet, it has the drawbacks of potentially losing data due to poor bookkeeping practices, the vulnerability of the books themselves to damage and decay, and the inability to recover lost books. Implementing this system in such organizations will improve record keeping, ensure data integrity over longer periods of time, and streamline data access. As an added bonus, it guarantees truthful and transparent patient information.
In addition to its use in increasing productivity in a range of disciplines, computers are also put to use in a number of other applications. These applications include the scheduling of appointments with medical professionals and the maintenance of patient records.

1.1 THE OLD SYSTEM:

When a patient arrives at the hospital to pick up their prescription drugs, the first thing they need to do under the existing system is purchase an identity card. This card will feature the patient's name, in addition to any other pertinent information, and a specific card identification number. The patient will then wait in the waiting room for the processing of their card while the card is being processed in addition to being provided with a file jacket that holds the card and contains columns for the diagnosis provided by the physician, the drugs that are suggested, and the date at which the card is expected to arrive, the recipient is also given the card. After the patient's paperwork has been received, they will be placed at the back of the line to see a doctor. With the current system in place, filing cabinets are used for the purpose of holding individual patient cards within the framework of a file. This can be found in both paper and electronic files. This system is incredibly difficult in terms of tracking down a record file, and it is also slow in terms of the processing of records, the amount of space occupied by the file, and the amount of time spent waiting while the receptionist collects the patient file.

1.2 Problem statement.

The vast majority of medical facilities across the country, including clinics and hospitals, have not yet implemented the latest technology, which might improve their management and overall profitability. As a direct consequence of this, the vast majority of them still use analogue technology to collect and process the data.

Significant use of space.

Using paper to track information necessitates a considerable amount of space over time. This may be seen in many areas where analogue systems are used.

Methods of backup that are inefficient

Old systems, particularly analogue systems, may not provide adequate methods for backing up data, and as a result, data might be lost completely if it is destroyed or misplaced. This might lead to the institution's demise.
Analog systems do not allow effective user monitoring; therefore, staff are more likely to conduct frauds unnoticed and get away with it.

Lack of prompt updating:

As there is much paperwork involved, adjusting various kinds of information, including patient records or immunization details of a child, can be challenging.

Lack of immediate retrievals:

For instance, the user will need to search through a variety of registries to collect data about the patient's past, making it incredibly difficult to both recover the information and discover specific information. Because of this, it's inconvenient and wastes time.

Preparation of accurate and prompt reports:

This becomes a challenging undertaking because information is difficult to acquire from the several registers that are available.

1.3 Objectives of the system

The patient's medical history can be accessed from multiple sources using the information provided by clinic information systems. The data must be stored in a safe location, and the system must exercise control over who can access the data under specific conditions. These systems improve the ability of medical practitioners to coordinate care by making it possible to access a patient's medical history and visit log at the exact location and moment that this information is required. CIS provides both internal and external communication with various sources of medical care.
The CIS can exercise control over organizations, which refers to the clinic or hospital, as well as official documentations, situation reports, and personal data. Furthermore, the CIS stores in a safe location patients' information, including patients' medical histories and prescriptions.
The CIS has the potential to safeguard enterprises against things like handwriting errors, overstock difficulties, scheduling conflicts involving workers, and official paperwork inaccuracies. Whereas The goal is to personalize and build an integrated software system to design and build an online scheduling and appointment booking system. Contributes to the Effective Administration of the Clinic. And to construct a database to reduce manual interaction at the hospital. Enhance the productiveness of work.

Reducing operational expenses.

Because a single system will be put up to monitor and handle loads of the institution's operations, superfluous spending will be cut. The remaining monies will be used to upgrade the infrastructure and other amenities at the institution.

1.4 The New System:

The major goal of this innovative programme is to help doctors keep track of their patients' medical histories, including their diagnosis, drugs, and other pertinent information. The time-consuming processes and laborious work required to locate and compile a patient's record in the older system will be handled by the new system. In a nutshell, the management's ability to perform their daily tasks in an efficient manner will be improved as a result of this because it will be able to produce the essential documents on time.

1.4.1 Benefits

1. The planned strategy for working:

The activities that will take place within the organization will be meticulously planned and coordinated. The information will be retrieved and stored effectively thanks to the fact that the data will be appropriately organized and filed away in data repositories.

2. Accuracy:

The system will function with a higher degree of precision overall. It guarantees that any information that originates from the center is reliable, in addition to ensuring that every action is carried out properly.

3. Reliability:

As a result of the factors that were discussed before, the reliability of this system will be quite good. The fact that there will now be appropriate storing of information is the reason why the system's reliability would be much improved.

5. Getting information right away:

its primary objective. At any time that the user needs it, any kind of information could be accessed by them.

6.Easy to Operate:

The user will have an easy time operating the system, and it will be designed in such a way that it can be developed in a short amount of time and still be affordable to the user.

2.0 SOFTWARE REQUIREMENT SPECIFICATION

Product Perspective:

This Clinical Patients Data Management System is a standalone system that manages all of the operations that take place within the Clinic or Hospital. These activities may include scheduling appointments, collecting patient information, and billing patients.
As a result of ineffective data management, the medical facility faces a great deal of difficulty when seeking to both access past data and manage the data that is presently being collected. This is due to the fact that the data management is so ineffective. When compared to the manual approach, the fully automated Clinic management system that has been built as part of this project offers significant improvements in terms of reliability, efficiency, and performance which eliminates the disadvantages caused by the manual system. The use of a database for storing details about clients, workers, and other organizations will make it easier to access, retrieve, and search for the information, in addition to making it possible to manipulate the data. The access restrictions and privilege levels that are provided will result in a significant increase in the amount of protection that is provided by the system. The technology allows for easier control of the medical center's activities as well as concurrent access to those activities.

2.1 System Interfaces:

User Interfaces:

- A comprehensive analysis of the inputs that go into the system as well as the outputs that come out of it is presented in this part. In addition to this, it offers a description of the

interfaces for the hardware, software, and communications, as well as providing basic prototypes of the user interface.

- HTTP is going to be utilized as the protocol.
- The number 80 will be used for the Port number.
- There must be a logical address for the system that is formatted using IPv4.

Hardware:

Laptop/Desktop computer: When patients enquire about their doctor or anything else, the purpose of this is to provide information for them. It is necessary to have a very powerful computer in order to carry out such an action; otherwise, patients would have to wait a significant amount of time to receive what they have requested.

Wi-Fi router - In clinics, Wi-Fi routers are utilised not just for internetwork operations but also for the straightforward transmission of data from individual computers to the clinic's central server.

Software Interfaces:

- Xampp v3.3.0: Use for Localhost to run the application.
- MYSQL DATABASE: Database connectivity and management
- OS Windows 7/8/8.1-: Extremely friendly to new users and a popular operating system

2.2 System Specifications

Programming Language used:

Front End: PHP

PHP stands for Hypertext Preprocessor and it is a server-side programming language that may be used with any platform that can display HTML. Recursively abbreviated from PHP, PHP is a popular open-source programming language that is especially well-suited for web development.

At the moment, there are more than a half a million domains that run on PHP. A significant portion of PHP's syntax is taken directly from C. Java and Pearl, plus a few features that are specialised to PHP tossed in for good measure. Web developers will be able to swiftly write pages that are generated dynamically, which is the primary purpose of the language. By enabling you to include straightforward scripts directly into your HTML files, PHP does away with the requirement for a large number of little computer - generated imagery programmes. Because it places all of the

components of a web page inside of a single HTML file, it also makes it simpler to administer massive websites. As the primary focus of PHP is on server-side programming, it essentially allows you to do anything.

Back End: MYSQL

MySQL is a free and open-source RDBMS. MySQL is a database management system that is both quick and versatile. It is a Relational Database Management System that supports multiple users, multiple threads, and excellent performance.

MySQL, a relational database management system, is one of the most widely used systems on the internet. MySQL Database has emerged as the most widely used open-source database due to the fact that it can be downloaded for free and is supported by virtually any operating system. MySQL is compatible with the Unix, Windows, and Mac operating systems. MySQL is utilised for the apps that run on the internet since it is very secure and also has a good speed. MySQL was created to manage massive amounts of data at a very rapid speed in order to address the challenges that were caused by the solutions that were already available. MySQL is a database management system that has a wide range of applications, although the majority of its use is in online applications that run on the internet.

Application Server: Xampp Server

The Apache HTTP Server is the primary component of XAMPP, which is a cross-platform web server solution stack bundle that is both open source and free to use. The MySQL database, as well as script interpreters for the PHP and Pre-programming programming languages

The software is made available to the public under the provisions of the GNU General Public License. It functions as a free web server that is able to deliver dynamic pages. There are versions of XAMPP available for both Linux and Microsoft Windows. Solaris, as well as Mac OS X, and is most commonly utilized for tasks involving web development. When you are developing dynamic webpages with programming languages such as PHP, JSP, or Servlets, you can benefit from utilizing this software.

Software used in this project

Front End : PHP
Back End : My SQL
Application Server : Xampp Server
Operating System : Windows, Linux.

Hardware Requirement:

- Core i5 processor: 2GB Ram.
- 20GB of hard disk space in terminal machines
- 1TB hard disk space in Server Machine

Software Requirement

- Xampp v3.3.0
- Windows 7 or above operating system
- Visual studio Code
- MySQL server /Phpmyadmin

Non-Functional Requirement

When the system is used in a medical facility, it is absolutely necessary to verify that everything is operating as it should, with a special emphasis on the operation of the system while the facility is open for business.

There are only a few criteria that aren't functional, and they are stated below:

- Usability

It is necessary for the system to achieve its own goals. It is expected that all of the program's components and functions will be usable. It is essential to make certain that each function contributes something valuable to the overall system.

- Responsiveness

  In order to cut down on the amount of time that patients, as well as doctors and nurses, have to spend waiting, the system must reply to every request made by users in a very

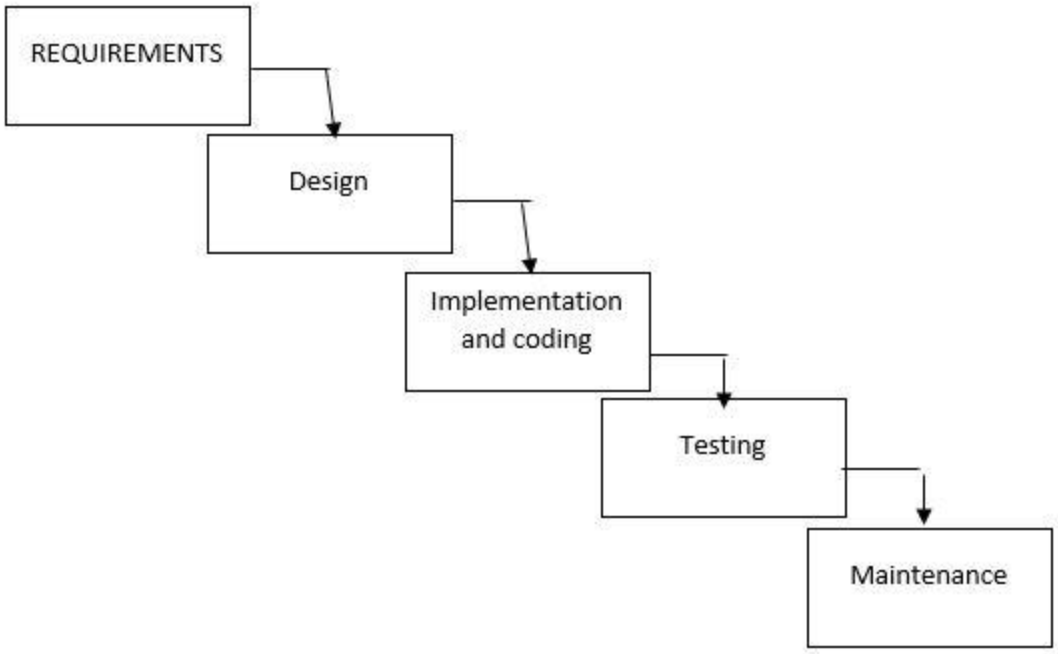
short amount of time. When it comes to the implementation of the system, responsiveness is one of the primary concerns.

3.0 Software project plan

Type of process model used

The waterfall technique combined with the incremental approach is the one I have used while developing my system. The waterfall method stipulates that all stages must be finished in their entirety before going on to the following one. At the conclusion of each stage, a review is carried out in order to determine whether or not the project is on the right path, as well as whether or not it should be continued.
This approach is acceptable due to the following benefits:

- Simple and straightforward to comprehend and navigate.
- One phase at a time is processed and completed.
- This model's rigidity makes it easy to maintain; for example, each phase includes well-defined deliverables and a process for conducting reviews.
- It functions very well for more manageable projects whose requirements are clear.



Design

- Create the user interface for the healthcare facility management system.
- Build out the infrastructure of the medical center's administration system.
- Create many aspects of the medical center's management system.

Implementation

- Develop a working model of the clinic management system.
- Set up the Windows data input system for the clinics management framework.
- Implement clinic management system modules/sections

3.1 The Computerized system's rationale

Reduce Cost

The development of a software application with the capability of reducing the operational costs of a business is the objective of my project. There will be no need to purchase stationery, which will result in a reduction in the costs of operating.

Reducing errors

By incorporating a thorough system of checks and balances, my code has drastically reduced the incidence of inaccurate data capture.

1. 1. Developed and built an appointment scheduling platform that can be accessed online

2. Created a database that helps to establish a paperless environment while also assisting in the maintenance of record storage facilities.

3. developed technological breakthroughs that helped the clinic's bottom line and contributed to its creation.

4. Reduce to zero the possibility of the patient's personal records being misplaced.

5. The capacity to improve one's decision-making.

Increase revenue

The result will result in improved interaction with the customers. My software's primary purpose is to improve the overall experience of patients by making the working environment simpler to traverse. This will, in the long run, result in a rise not only in the number of satisfied patients but also in revenue.

Increased efficiency and effectiveness.

Ensuring that information regarding every patient and their previous medical records can be accessed quickly and easily in order to improve both efficiency and accuracy.

Input and Output data.

Inputs

- Patients Details
- Doctors Details
- Admin details

Outputs

- Prescription:
  From the Patient portal, prescriptions can be downloaded directly into a mobile device.

3.2 System functions.

The following is a list of the functions of various system elements:

a. **Some of the capabilities of the clinic management system software include**

- The system will facilitate hospital access to his workers.
- Reduce your use of paper (books) and embrace the digital way of life.
- Workers' clashing time is reduced because booking is done online.
- Give the administrator permission to update all system-related information.

b. **Hardware functions**

The sole way to enter data into the system will be through the use of the keyboard, despite the fact that the system will be able to accept a wide range of data types. When the information is presented in a visual format, analysing the data will be less difficult and more convenient for the people who use and maintain the system. The information that needs to be maintained is going to be written down onto the hard disc of the device.

c. **Patients' functions**

Before being allowed to utilise the system, patients are going to have to go through the steps of the registration process first. Please be prepared for the fact that you will be asked to supply your personal information and data in order for it to be merged into the system.

d. **Functions to be provided by Data**

The information is initially entered into the system by the administration, which is followed by the system processing the data and displaying it for the administrator as well as the doctors to examine.

e. **Functions provided by the administrator**

In order for the administrator to carry out their responsibilities, they are required to log in to the server using their own personal account. To ensure that all of the information regarding the contacts for the rising workers and physicians is as current as possible, it is the duty of the administrative staff to monitor and maintain the database.
In the event that any adjustments are made to the system, he or she will also carry out an update on the entirety of the system.

4.0 Literature Review

Introduction

In this part of the article, I discussed hospital management problems from the past, the present, and the future. Because the staff in the school clinic were the primary source of information, I questioned my co-workers to find out what they might possibly know about the disease. It was also a significant source of knowledge because there was a large amount of content that could be found on the internet, in addition to other credible sources.

Methodology: To gather the most accurate information, I looked through the internet for information on the topic.

Kenya Clinics and Hospitals

Today, Kenya boasts an abundance of both medical clinics and hospitals. The hospitals are separated into a few distinct categories according to the level of care and standard of service that each one offers. There are two distinct varieties of medical clinics and hospitals in Kenya.
Private
Public (Government hospitals)

4.1 LITERATURE REVIEW (1)

The systems that are now available are rarely used. This is because the workflow in clinics is more complicated in comparison to other institutions. Additional concern is that the bulk of our country's current systems do not match the requirements of physicians and other medical professionals. Registration at hospitals, as well as the methods of work to be done, varies. Before such a patient may obtain treatment from doctors, they must first register.
The individuals in charge of the enrolment process must check that the individual has not ever received healthcare services. If the patient has had hospitalisation, attending is important for locating their file, which contains the information of that particular person.

When it comes to the process of registering, the person in charge is typically someone who works in the administration office. Patients who are interested in receiving therapy in the Outpatient Department will get a registration form from this responsible owner. Patients are required to reveal personal details about themselves. Patients who come at the clinic with significant injuries sometimes find that they are not able to fill out the paperwork on their own. As a result, another person must do so on their behalf before the Outpatient Department will allow them to undergo treatment. Due to the nature of the situation, the information that is presented may be somewhat inaccurate. Because of this, if a patient is able to do it themselves, they are required to re-register, which results in the data being duplicated, the loss of time, and the increased work for medical employees, notably the registrant. They are tasked with locating

inaccurate patient's data from the past that is stored in the archive, which consists of hundreds of files that include patient-related information.
Here is a list of issues that employees working in hospitals face:

1. The manually registration process causes a repetition of data and increases the amount of work that must be done by the individual in charge. Since the patients have undergone treatment from the clinic in the past, the staff needs to look through the archive to find information on that particular patient.

2. The employees who work for this organisation (which provides healthcare) and the findings of the survey both indicate that they are overworked and require extra staff members.

3. The mismanagement of patient data and privacy, as well as the fact that critical information on students is openly available to anybody

4.There is no data that has been backed up. If data pertaining to a patient has been lost, it cannot be promptly retrieved, if it can even be restored at all.

On the other hand, after doing research into other healthcare systems that are analogous to the one, I am working on, I would like to discuss such systems.

Soft-Clinic:

The Soft-Clinic application is a software package that is now on the market. Their company, JVS Group, was established in the United States of America; however, their office is now in India. About 500 medical professionals in India as well as abroad are currently making use of the Soft-Clinic software, which was developed with the intention of catering to the needs of all doctors. Soft-Clinic has been recognized as one of the Top Clinical Governance Software's by several different Doctors and Surgeons Associations. It is available for use by any and all medical professionals, as well as by small hospitals and nursing homes, for the purpose of completely computerizing their respective facilities.

Strengths:

The system comes with fundamental elements that, when combined, make the clinics' workflows much easier to manage. This automated method is able to replace the majority of the paper work that needs to be done. The user-friendliness of this software is increased by its uncomplicated interface, which features navigation on the left. Users may have an easier time finding what they are looking for by utilizing the navigation on the left.

Weaknesses:

This system contains all of the modules that I hope to solve in the future. On the other hand, their presenting approach is not very favorable to users in any way. For instance, A really poor

design choice was made for the booking module, which contains a list of several colours in each row. In addition to that, the registration form has a number of fields that need to be filled out.

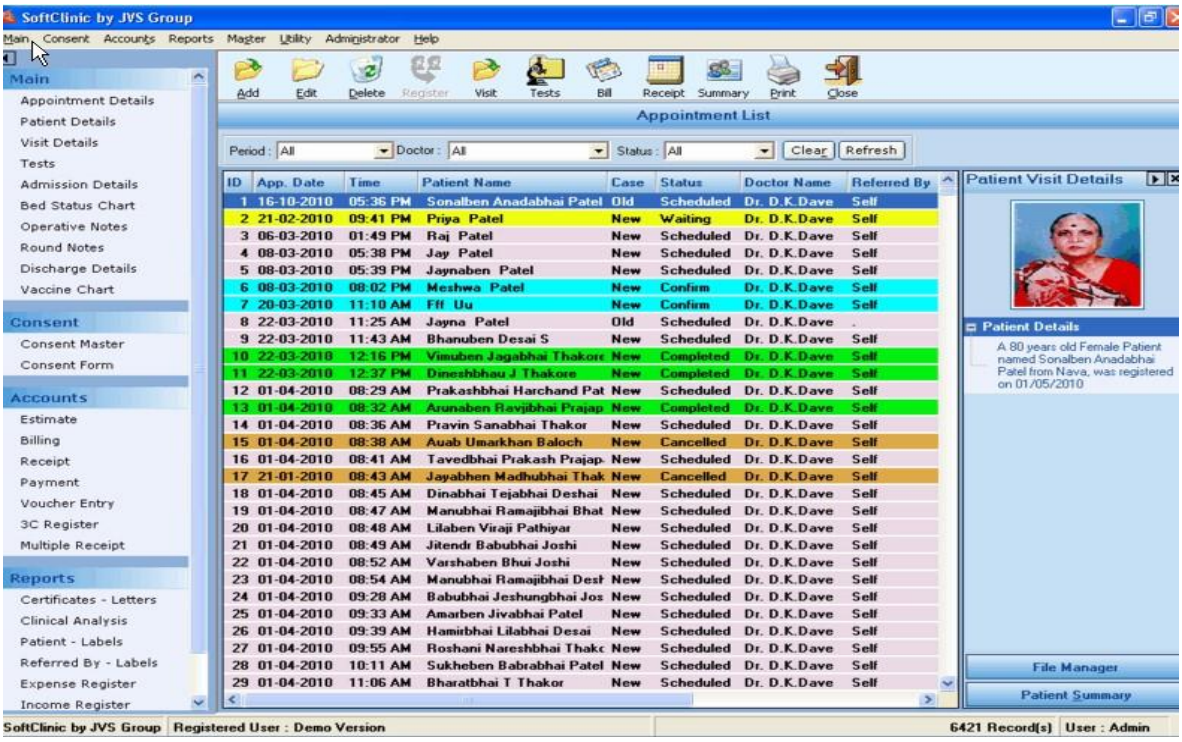


Figure 4.1 Appointment System in Soft-Clinic

Solve the weaknesses:

Because an extremely colourful design can give the impression that the company is not serious about its work, we need to give careful consideration to the design as one of the other aspects.

Clinic-Plus:

Clinic-Plus, developed by TRM NETT SYSTEMS is a comprehensive software solution for managing clinics that is now available on the market. The adoption of this software solution, which is not only user-friendly but also comprehensive, will result in significant time savings for the clinics. Because of this technology, medical clinics are able to significantly lessen the burden of administration and management, allowing them to devote more of their resources to providing high-quality medical care.

Strengths:

It is possible to streamline the frequently used to explain of a nursing assistant and a physician in a clinic by utilising the fundamental characteristics of the program. In addition, all of the information that is kept in the clinic, including records, inventories, and patient information, is entered into a database and can be retrieved quickly and easily at any time.

Weaknesses:

There are just two modules—patient enrolment and wait list—that are currently available in this system, and I chose those three modules to upgrade. Those two modules are the only ones currently available. As the system does not provide appointment components, the nurse will need to jot down the specifics of the appointment utilizing paper.

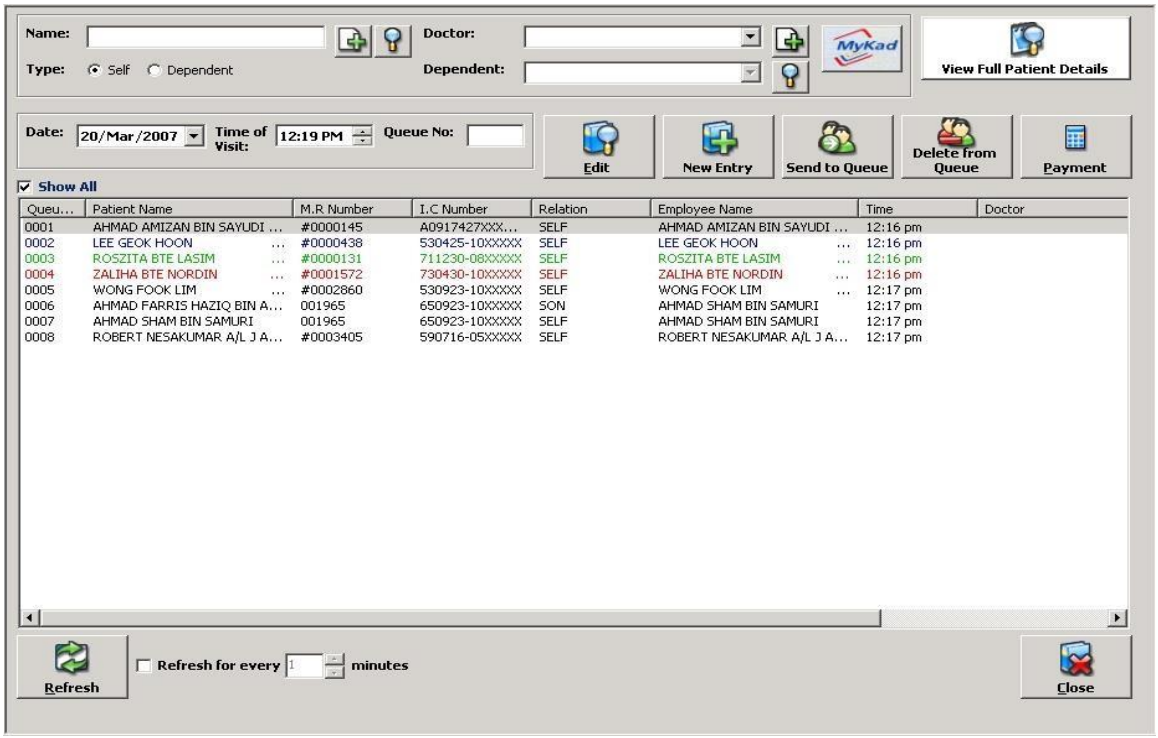


Figure 4-2 Queue List in Clinic-Plus

The waiting list module is insufficient to significantly alter the flow of the process as it now stands. From what can be seen in the image of Fig 4.2, The clinician must still manually update the patient's information into the queuing system. It only shows the arrival time, and there is no

indication of when one should leave the building; hence, we are unable to determine which queue should be used for appointments and which should be used for visits.

Solve the weaknesses:

The addition of an appointment module is required in the Clinic-Plus system in order to address the issues that were raised earlier in this paragraph.

4.2 Methodology:

A research design is a well-organized plan for investigating a scientific subject.
I choose the waterfall model for my system architecture, which will be executed as follows:

Analysis and definition of requirements

I will confer with system users to determine the system's services, constraints, and objectives. This will be accomplished using a variety of research methodologies.
I shall outline them and use them as a system specification.

System and software development

For the purpose of allocating requirements across hardware and software systems, I shall design an overarching architecture. In this article, I will define and explain the fundamental abstractions of software systems and the relationships between them.
The public can now access the software system (after testing and reaching perfection)

Maintenance and operation

The webpage will go live and be used by the public. Fixing bugs, improving the way the system is implemented, and adding features as needed are all part of this process.
The following advantages make the waterfall methodology suitable for addressing the challenges I face in my work.
It is going to be slow and easy to uncover issues as I continue to work with the entire system.
It is straightforward to set up and manage going forward.

5.0 System Design

USE CASE DIAGRAM:

A use case diagram can be used to depict the activity that occurs within a system. This gives the developers with assistance in understanding what the users require from the system. The stick figure is meant to represent someone who works in the field of acting.

The use case diagram is an excellent tool for acquiring an overall picture of the system and for expanding on who can perform certain actions and, more importantly, what they cannot do. Also, the use case diagram can elaborate on who can perform specific tasks.

In a use case diagram, use cases and actors are both depicted, and the diagram also shows how the use cases and actors communicate between each other.

• To put into words what the system needs in order to function optimally from the user's perspective.
• An actor might be the person who ultimately uses the system.

A graphic representation of a use case looks like an ellipse that is enclosed by a solid line and contains nothing more than the use case's name. A use case is a description of a series of actions in a process. The term "use case diagram" refers to a specific type of behavioral diagram. This type of diagram depicts a number of use cases along with the people that are engaged and the interaction that takes place between them. As was noted before, this conversation connects the players and the use cases together in a way that is meaningful. In the real world, a real-world object or occurrence can be represented by a stand-in known as an actor.

Admin Panel:

The administrator is in complete command of the system. He or she has access to all of the Clinic's currently maintained information. An administrator may very well be responsible for managing patients, physicians, their departments, and patient data. An administrator has the ability to set up an account for a physician. In order to accomplish this, the administrator needs to establish the doctor's account under a number of different clinical departments. The administrator has access to all of the appointment information and can even register new patients, delete existing ones, and make modifications to a patient's prescription if the attending

physician is unavailable and gives permission for the administrator to do so.

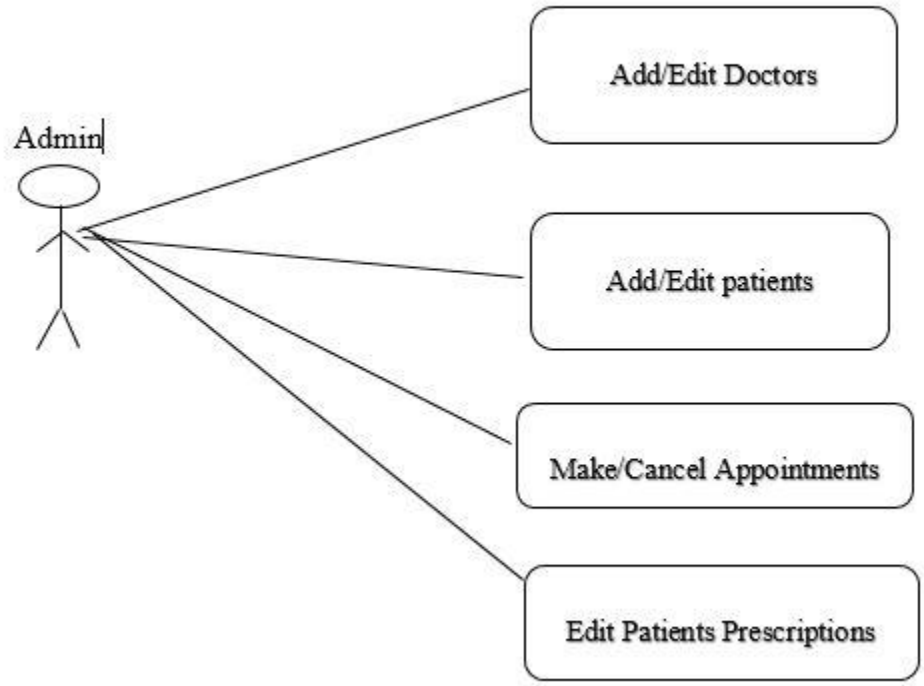


Fig 5.1 Admin Access

Doctor panel:

Every physician will have their very own individual account within the system, which also will grant them access. In this section, the physician is able to view all of the follow - up appointments. Each consultation comes with a variety of choices, all of which are subject to the discretion of the attending physician. The physician is able to check the patient's profile as well as the appointment record once the appointment has been approved. For the remainder, the physician is responsible for maintaining each patient by providing them with feedback on the therapy and writing a prescription that details the medications as well as the appropriate amounts.

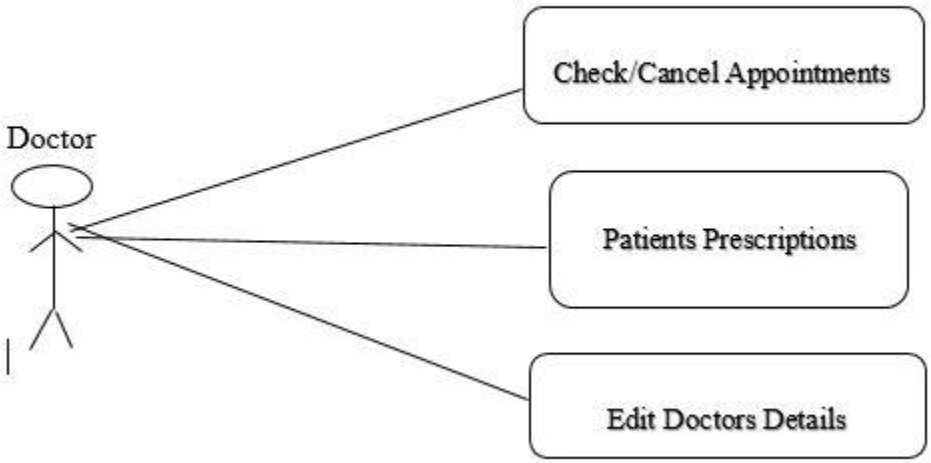


Fig 5.2 Doctor Access.

Patient panel:

After the user has successfully scheduled their very first appointment, they will be able to access the system through a login and view the current status of their scheduled appointments. Every appointment has the "pending" status applied to it by default. Whatever comes first, the medical practitioner must either accept it or refuse it before the patient's therapy may begin. Also, the patient is free to cancel their visits whenever they see fit. A patient can see their prescription history and edit their profile from the panel that is provided for them. In the part for the prescription, the information that is displayed includes the date, the name, and the quantity of the medications, as well as the physician's comments, and the patient can even print off the prescribed medication.

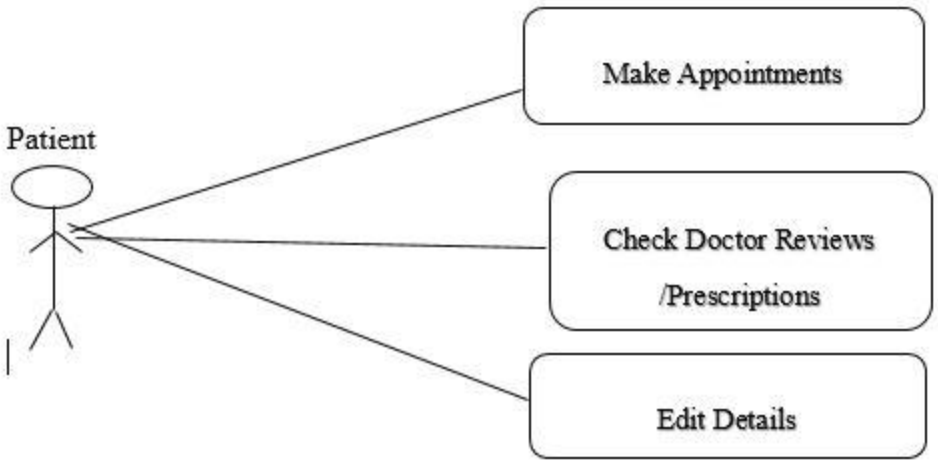


Fig 5.3 Patient Access

6.0 System Implementation

6.1 Implementation:

Login Page

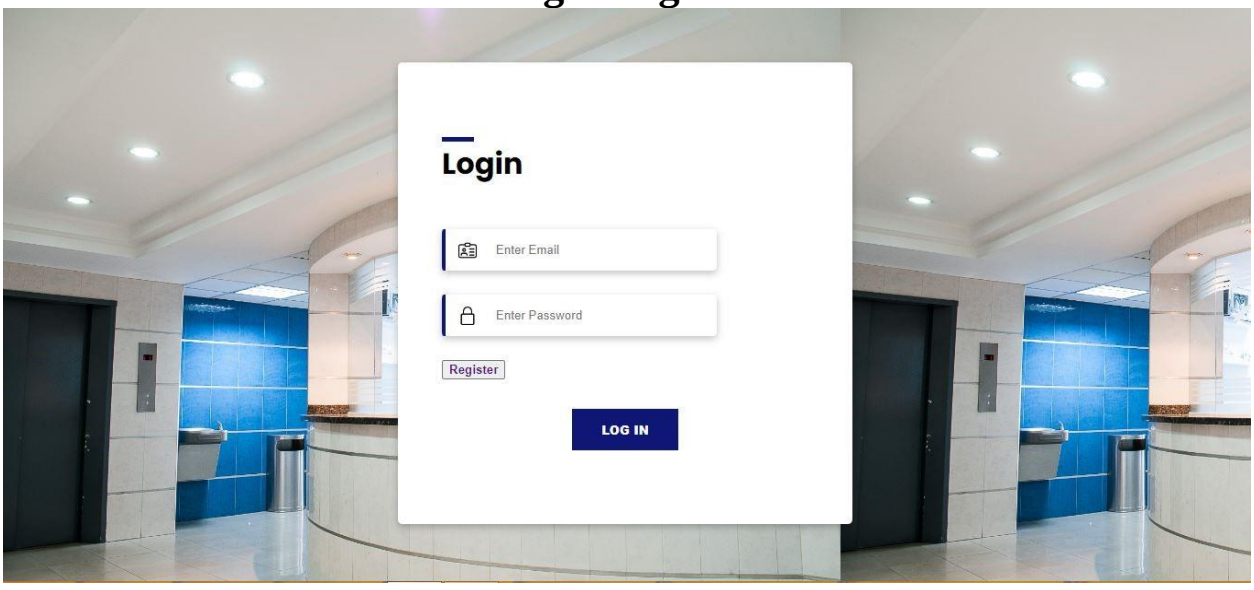


Fig. 6.1 Login Page

In order for the user to successfully log in to the system, they will need to enter their email address and password into the primary window, which is known as the Login page and can be seen in the image that is shown above.

There are three distinct levels of user access that can be granted via this system:

1. Administrator

2. Doctor

3. Patient

Register Page

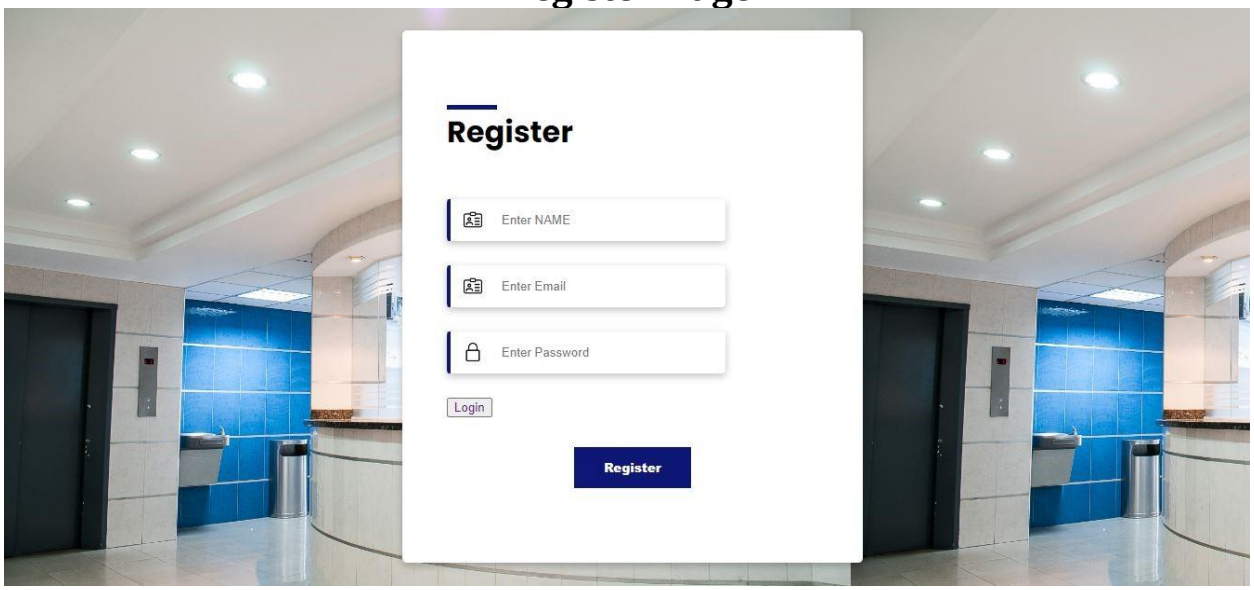


Fig. 6.2 Register Page

The term "Registration page" refers to the image that can currently be seen at the top of this page. As soon as a person completes the registration process, they are provided with the authorization to use the clinic's website in their position as a patient.

LOGIN AS AN ADMIN:

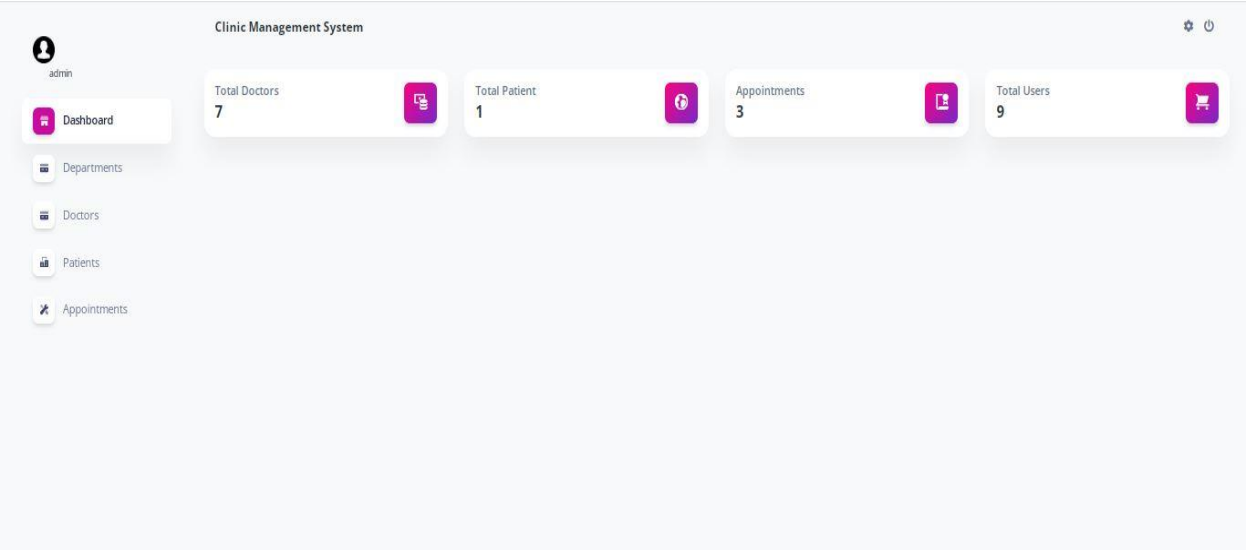


Fig. 6.3 Admin Dashboard

The aforementioned popup will appear on the screen whenever the user logs in with an administrative user account. The administrative dashboard provides access to all of the system features that are displayed in the image that is located above. These functions include The Departments, Doctors, Patients, and Appointments. In contrast, the two icons that are displayed on the right side of the screen are the button to log out of the account and the settings menu, which is where the user can update his details.

Departments

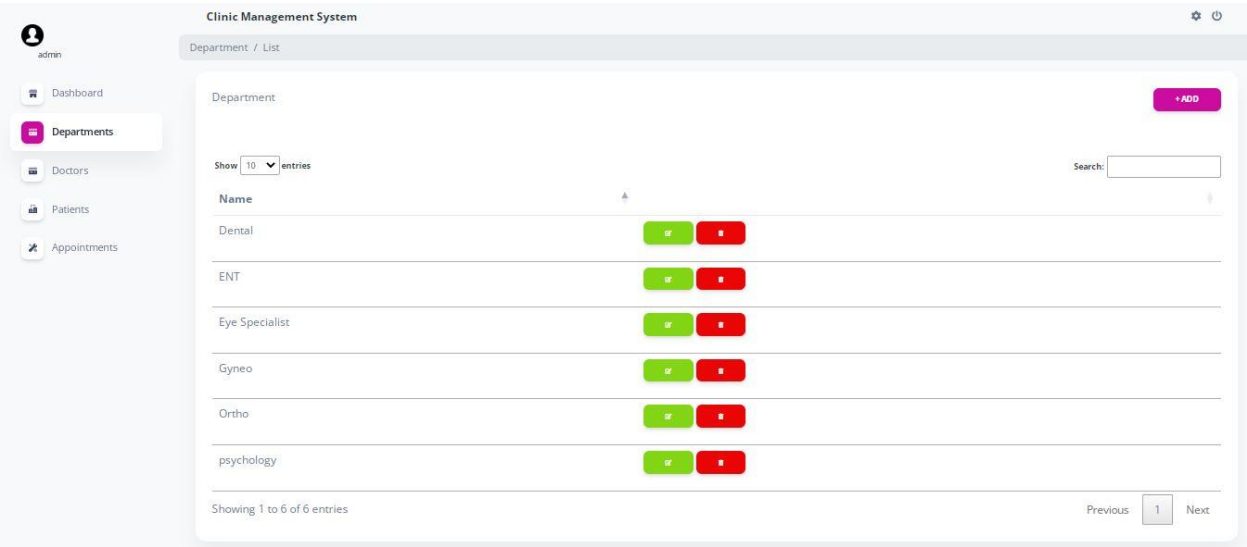


Fig. 6.4 Department Page

This is the Department page, where the Admin can add new departments, change existing ones, or remove any that are not present in the clinic. If a department is not present in the clinic, it can also be removed from this page.

Doctors

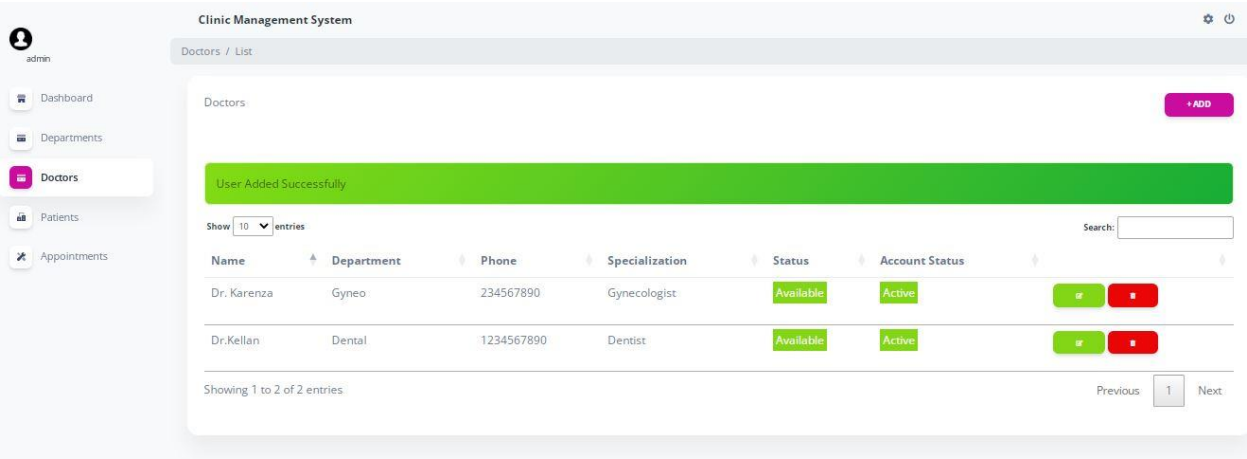


Fig. 6.5 Admin Add Doctors

The image on top displays the doctors who work at the clinic, along with their information. There is also a button labelled "Add" on the image's right side, which allows the Admin to add new doctors (as shown in the image below).

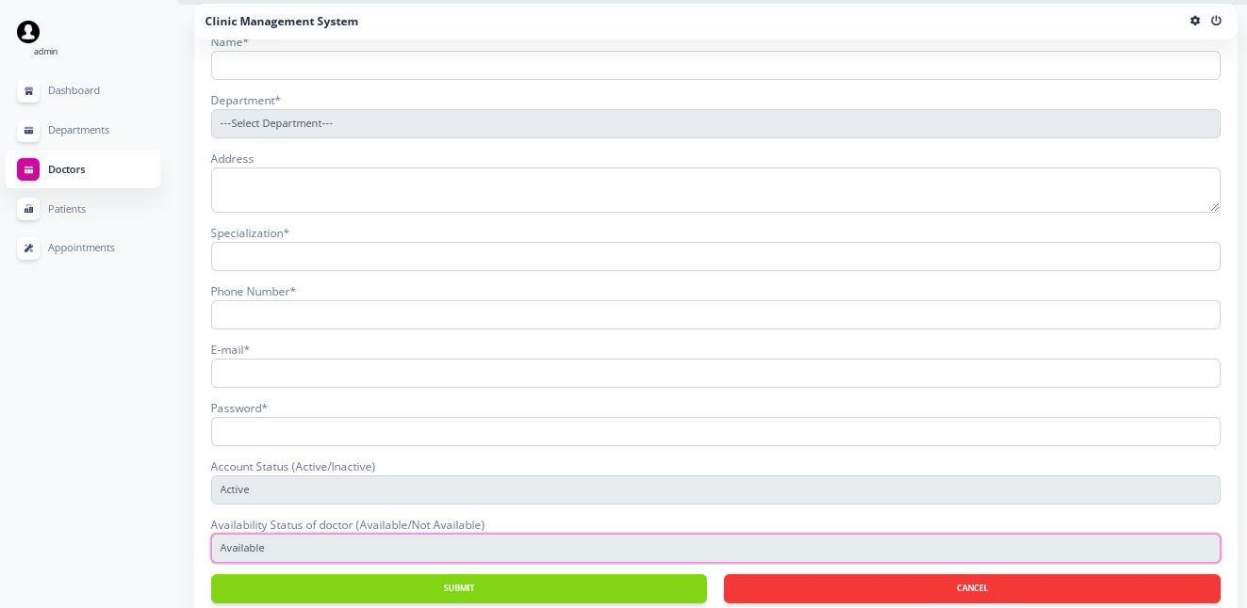


Fig. 6.5.1 Admin Add Doctors

Patients

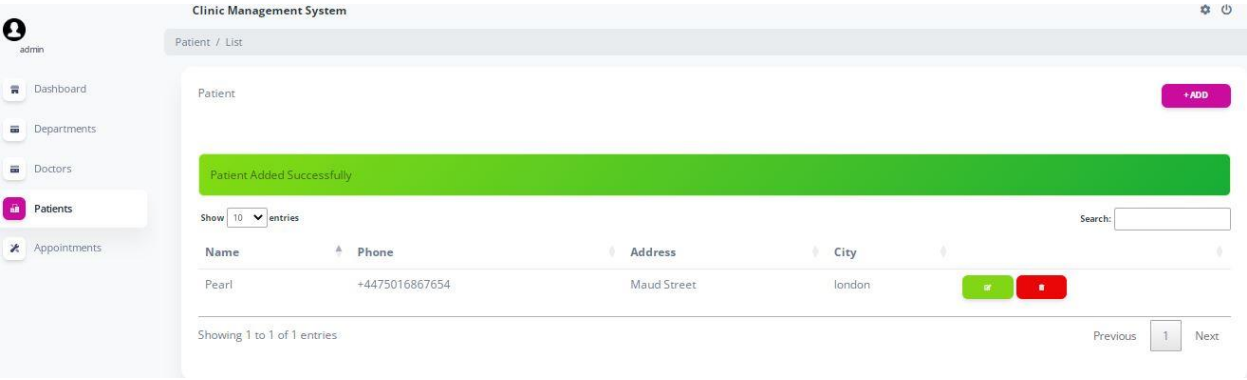


Fig. 6.6 Admin Add Patient Page

The patients who have enrolled at the clinic are shown in the image at the top of the page, together with their personal information and the name of the attending physician that they have selected. Within this portion of the interface, the administrator has the ability to add or remove Patients as required.

Appointments

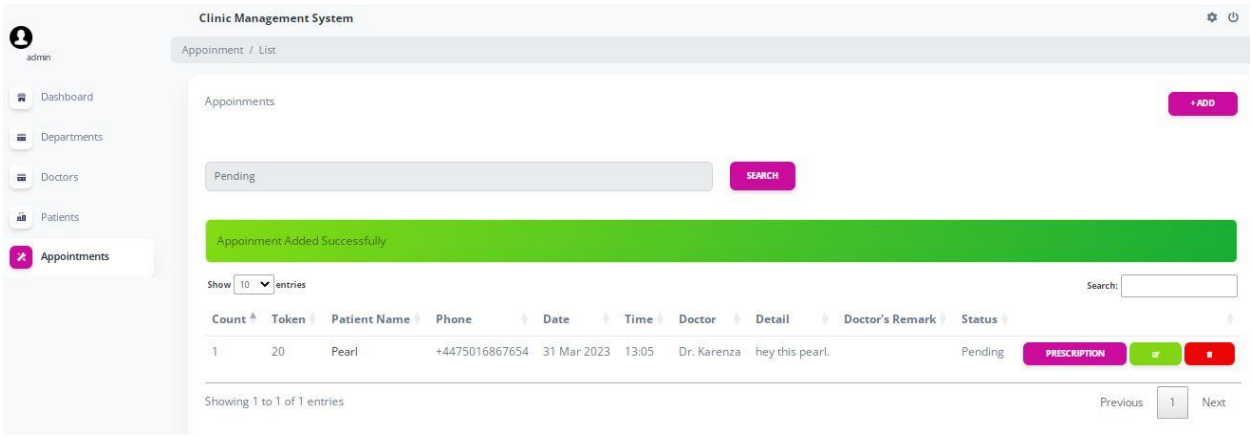


Fig. 6.7 Admin Add Appointment Page.

In the image that can be found above, the appointments are displayed along with the patient's information, the date and time when the appointment is scheduled, and even the doctor's remarks, if they have been provided. Additionally, the image displays the status of the appointment along with the prescription, which can also be printed out. As may be seen in the images below.

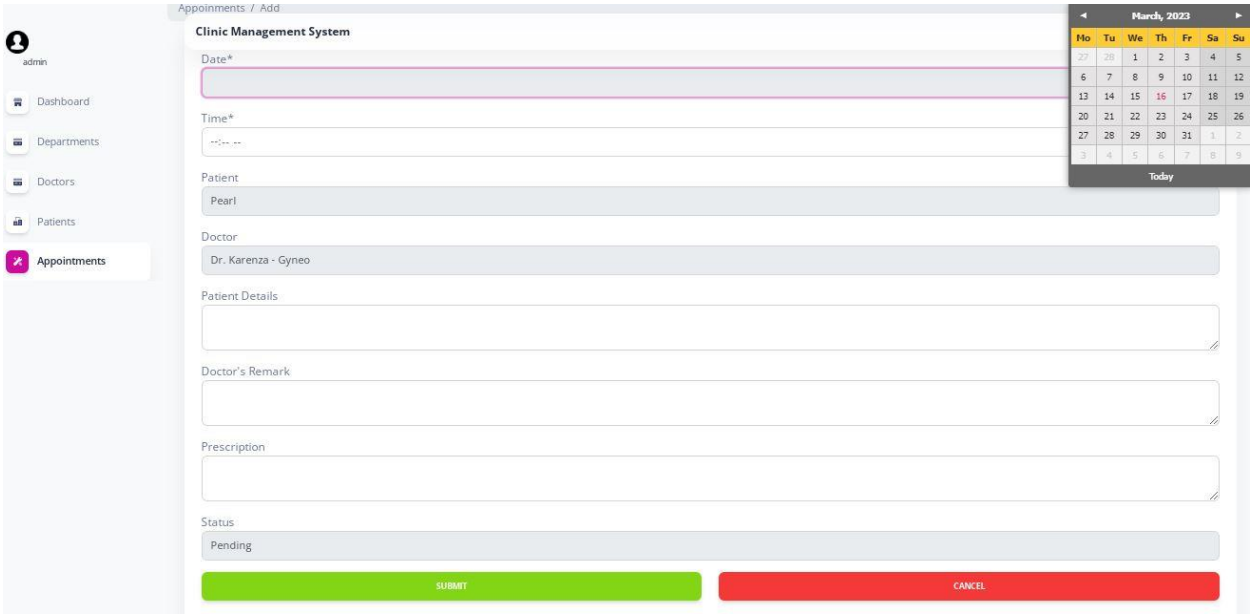


Fig. 6.7.1 Admin Add Appointment.

Prescription

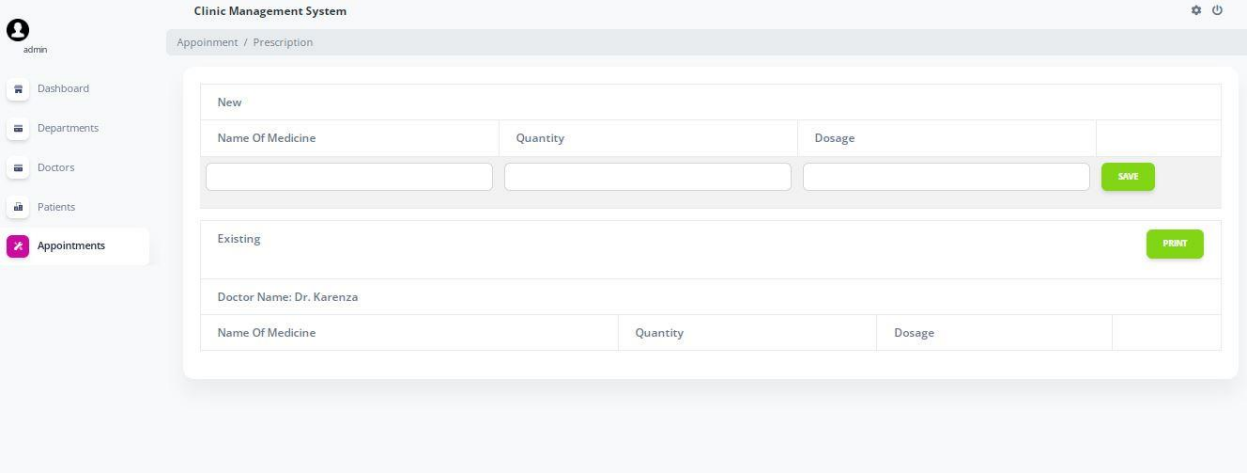


Fig. 6.8 Admin Edit Prescription Page.

Login AS A Doctor

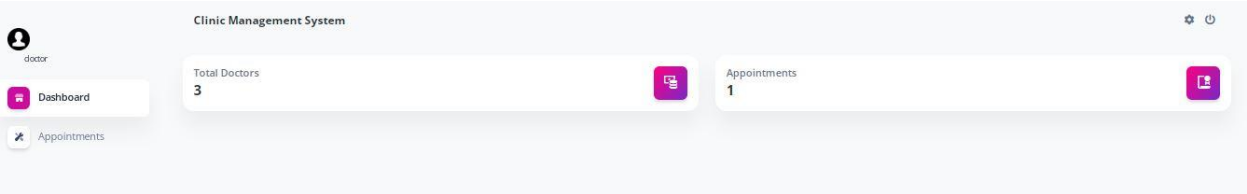


Fig. 6.9 Doctors Dashboard.

Once the user has logged in as a doctor, the above image is displayed. In it, the total number of doctors in the system as well as the appointments that the currently logged in doctor needs to attend are revealed. The next image demonstrates the doctor's appointments, complete with the patient's information, as well as the date and time of the appointment.

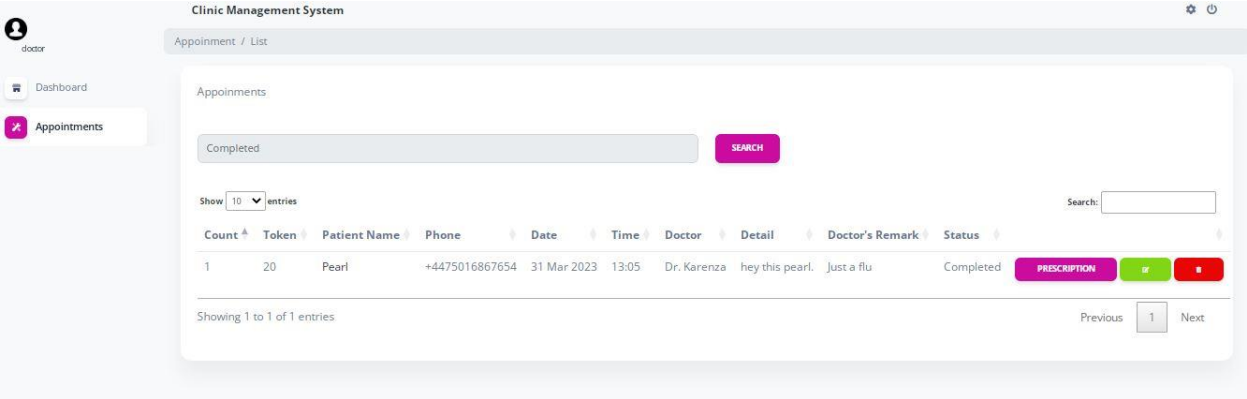


Fig. 6.10 Doctors Appointments.

The doctor writes down his observations, and then, if the patient was seen, he clicks the green button that is situated next to the button that is labelled "Prescription" to mark the patient's record as "Completed." This indicates that the patient's care has been concluded.

The picture that appears below is what you see when you click the green button.

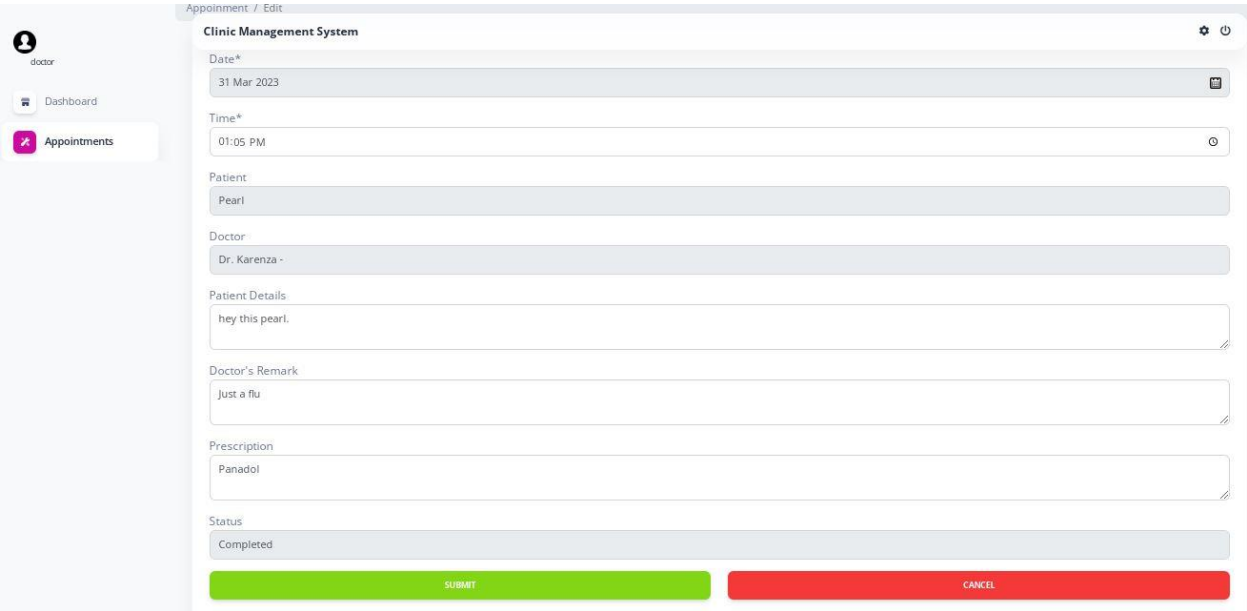


Fig. 6.11 Doctors Edit Appointments.

Doctor’s Prescription for Patient

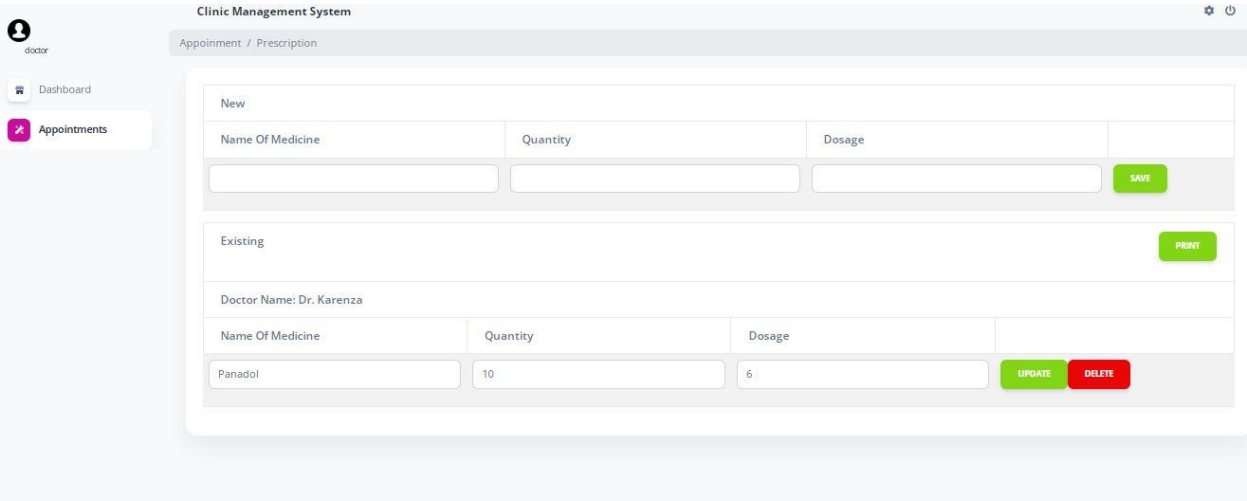


Fig. 6.12 Doctors Add Prescription.

Here is where the doctor will put the patient's prescriptions, which will include the name of the medication, the quantity, as well as the dosage. The doctor will also have the ability to change or update the prescription anytime he sees fit.

Patient Page

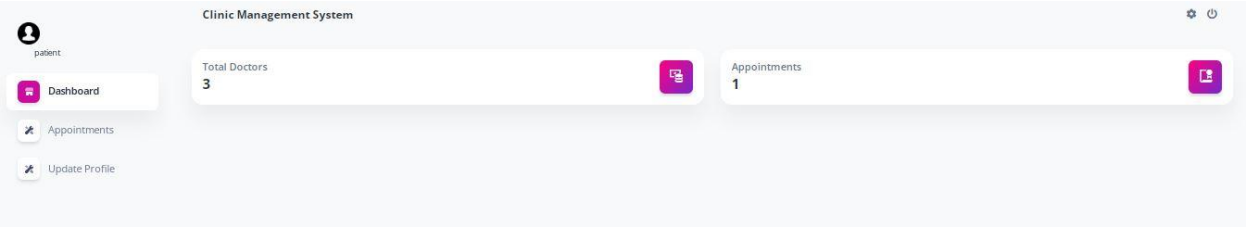


Fig. 6.13 Patient Dashboard.

The image above is the page that appears once a user successfully checks in as a patient. This page has the dashboard, which allows the patient to view the number of doctors and appointments he or she has scheduled, and also includes a button that allows the user to alter their profile. In addition, the buttons to log out and change your password can be found on the right.

In the image that can be found further down on this page, you will find that the patient's appointment, the doctor's prescription, and the doctor's notes are all displayed together.

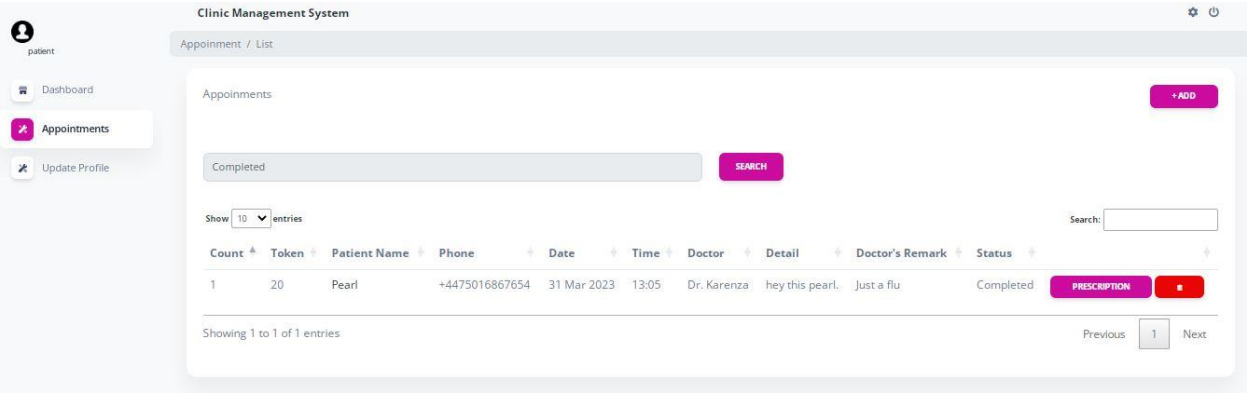


Fig. 6.14 Patient Appointment page.

When a patient wish to schedule another appointment, they can do so by pressing the Add button, which is depicted in the photo that can be found above. This will allow the patient to add the new appointment to their calendar. The picture that may be found below demonstrates this point quite clearly.

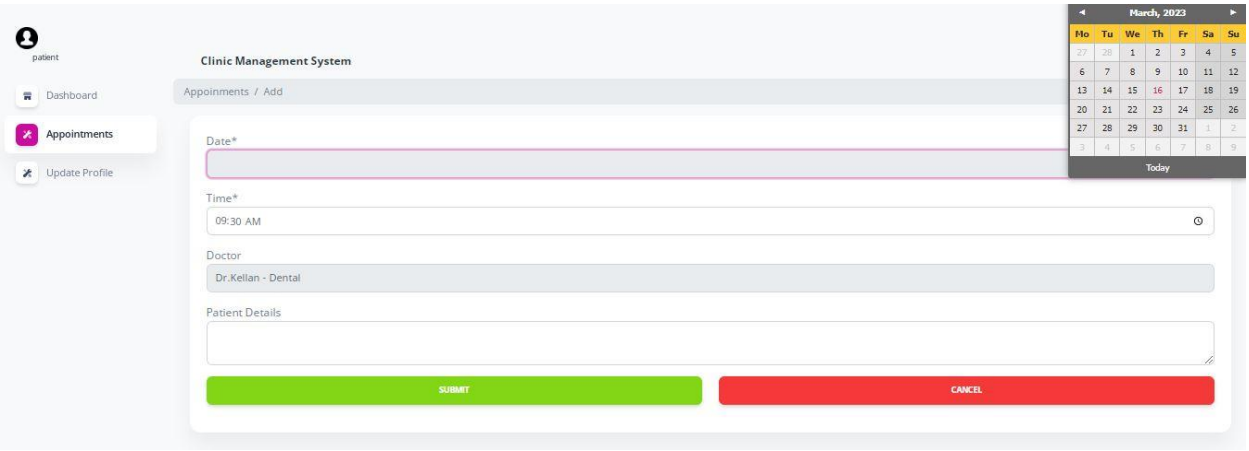


Fig. 6.15 Patient book Appointment page.

On this page, the user can make changes to their profile information, such as their name, where they live, what city they live in, and how old they are. Individuals are also able to change their blood group in this section.

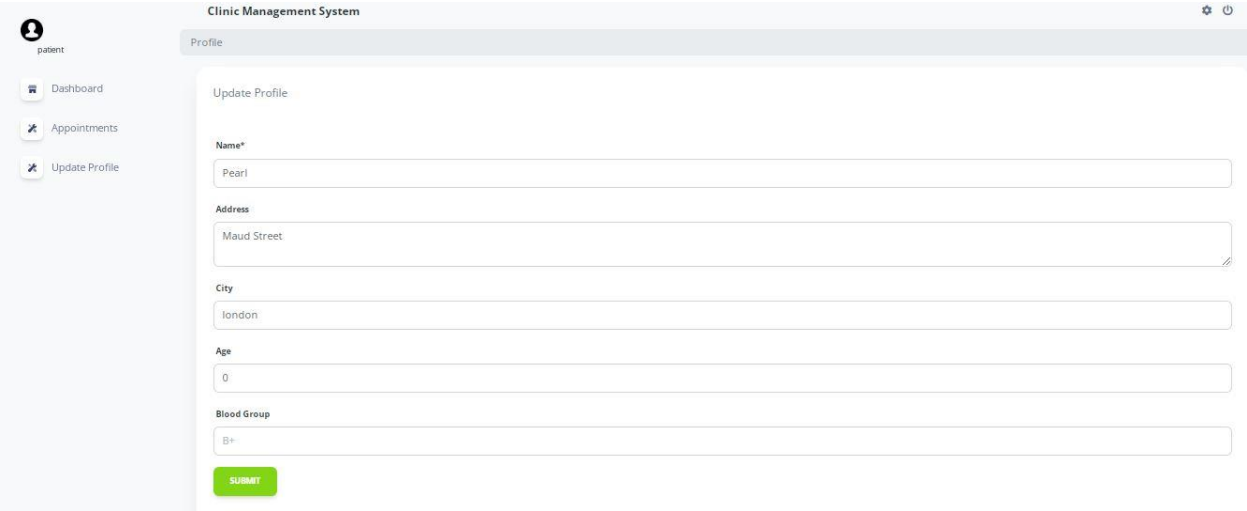


Fig. 6.16 Patient Update Detail page.

7.0 System Testing

7.1.1 Login Testing

Objectives: So that only staff who have been verified can log into the portal.

No.	Procedure for Evaluation	Completion of Step	What We Anticipate to Happen	Result
1	Please log in with the correct username and password.	To access the user account, ensure that both the username and password that you enter are accurate.	The user was able to log in without any problems.	Pass

2	Enter an invalid username or password.	Input a strange login name and password, such as "Xyz" and "456," to log in.	The user will be denied access and an error message will be displayed.	Pass
3	Set the password and username blank.	Enter nothing into the input field.	The user is prompted to log in and enter a password for increased security.	Pass

7.1.2 Patient Edit Module Testing

Objective: In order to make sure that the data pertaining to patients can be updated and saved.

No.	Procedure for Evaluation	Completion of Step	What We Anticipate to Happen	Result
1	Do some manual editing on the individual patient details.	Fill out the patient's information in the designated field.	The text box can be used for whatever the user desires.	Pass
2	Putting the patient's information into the system to be saved.	After you have finished updating all of the patient details, click the button that says "Update Patient."	The most recent information regarding the patient was successfully saved into the database.	Pass

7.1.3 The addition of Module Testing for Employees

Obj: in order to provide absolute assurance that the Admin can correctly register the workers.

No.	Procedure for Evaluation	Completion of Step	What We Anticipate to Happen	Result
1	Staff information must be entered into the system.	When you've finished filling out the form, click the "Add" button.	The employee information was entered into the database without any problems.	Pass

7.1.4 Edit Staff Module Testing

Objective: To allow for the updating and saving of employee information in a central data-base.

No.	Procedure for Evaluation	Completion of Step	What We Anticipate to Happen	Result
1	Edit personnel information by manual.	Fill up the specific text box with the staff's information.	The user is free to enter anything they like into the text area without encountering any difficulties.	Pass
3	Put the staff's information into the system.	After all of the details have been changed, press the "Update" button.	The most recent details of the staff have been successfully stored in a database.	Pass

8.0 Conclusion and future Scope

Evaluations

When attempting to evaluate the system that has been built, it is of the utmost importance to go back at the predefined functions, goals, and objectives and examine how well the system meets those expectations in respect to the predefined functionalities, goals, and objectives.

At the beginning of this project, the primary purpose was to build a system that would allow for the storing, retrieval, and updating of clinic records in a manner that is both quicker and more efficient. In this regard, the system performed up to the standard expected of it.

Future Scope:

This project's long-term goal is to one day be implemented in hospitals that are technologically backward and still employ antiquated methods of running their clinics and hospitals. At the moment, this system is functioning on a Localhost server; but, in the future, I want it to work on a domain so it's possible to sell it to hospitals and clinics and then improve it so that it satisfies the standards of those institutions.

CONCLUSION

The thought to develop this Web page about a Clinic Management System came to my mind at the peak of COVID. With the heightened risk of spreading of the infection people feared going to clinics even though they required treatment immediately. Additionally, with hospitals under immense pressure it was quite cumbersome for hospital to contain the spread of the virus in their premises and waiting areas.

The main purpose of the Web page is reducing wait times at clinics and hospital premises which in in turn reduces the spread of infection. The Web page is designed in a way that it allows patients to book appointments with the relevant consultants remotely. As a result, patients would then only be visiting the hospital and clinic at the time of the appointment. This increases efficiency levels of the staff as well as appointment booking are processed via the Web page instead of manually.

The Web page also allows patients to go back to doctor notes in case they have missed making notes of instructions shared by the consultants.

To summarise here, through the Web page I have been able to achieve the main objective of making appointment booking hassle free increasing efficiency both for patients and hospital/clinic staff.

Further, the Web page also acts as a database for patient records making the process of maintaining such records efficient.

An internal web-based platform system is what we mean when we talk about the clinic management system. It makes the task easier for the nurses and the physician, and it also improves the efficiency of the business process that involves the patients, the nurses, and the physician. The challenges that arise in the clinic, particularly in the countries of the Third World, are the focus of this research. While utilising this system, It is expected that the workers at the facility would be able to carry out their responsibilities in a manner that is both more successful and more efficient. The amount of time that patients have to wait to be seen will be cut down, and the majority of the administrative tasks will be completed using a computer rather than by hand.

The time spent completing the task was definitely gratifying in its own right. I am thankful that this experience was able to drive home the point that it is critically important for me to make plans, designs, and put into practise the information that I have acquired in my theoretical books. When I was working by myself, it assisted me in releasing my creative potential.

Following a substantial amount of labour and time spent on the project, it was brought to a successful conclusion. Many cycles of compilation, debugging, error correction, and bug freeness

were put into this project. The Clinic Management System also received improved dependability and usability by way of the integration of new features and increased interactivity.

Everything about this project, from its inception to its current state, is a direct result of the user's input. There are no flaws in the product, as determined by the established testing criteria. This system also has a few features that can be added to it to make it more flexible, and those features can be merged. The following is a list of the future points that need to be considered:

Includes separate modules for the pharmacy, the laboratory, the bed allotment, and a great deal more besides and featuring a section dedicated to answering the most common inquiries.

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Appendix

Ethical Approval:

Middlesex University London

Computer Science REC

The Burroughs
Hendon
London NW4 4BT

Main Switchboard: 0208 411

5000 06/12/2022

APPLICATION NUMBER: 24575

Dear Moses Adrian Indrias and all collaborators/co-investigators

Re your application title: Clinic Management System

Supervisor: Stylianos Kapetanakis **Co-**

investigators/collaborators:

Thank you for submitting your application. I can confirm that your application has been given APPROVAL from the date of this letter by the Computer Science REC.

The following documents have been reviewed and approved as part of this research ethics application:

Although your application has been approved, the reviewers of your application may have made some useful comments on your application. Please look at your online application again to check whether the reviewers have added any comments for you to look at.