Design & Implementation of Online Doctor Appointment System

By

Md Sifat Mahmud
ID: CSE2103024093

Supervised by
Md. Zahidul Hasan

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 & Implementation of Online Doctor Appointment System**" submitted by Md Sifat Mahmud (CSE2103024093) 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.

Board of Examiners

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Md. Zahidul Hasan
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DECLARATION

I, hereby, declare that the work presented in this report is the outcome of the investigation performed by me under the supervision of Md. Zahidul Hasan, Lecturer, Department of Computer Science and Engineering, Sonargaon University, Dhaka, Bangladesh.

I reaffirm that no part of this project has been or is being submitted elsewhere for the award of any degree or diploma.

Countersigned	Signature
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(Md. Zahidul Hasan)	Md Sifat Mahmud
Supervisor	ID:CSE2103024093

ABSTRACT

This project focuses on the **Design and Implementation of Online Doctor Appointment System (ODAS)** aimed at digitizing and optimizing the conventional healthcare experience. Traditional hospital systems are often plagued by inefficiencies, including lengthy queues, manual documentation errors, and delays in obtaining medical consultations. The primary goal of this research is to develop a comprehensive, scalable, and secure web-based system to address these critical issues.

The system was developed using **PHP** for server-side scripting, **MySQL** for robust data management, and front-end technologies like HTML, CSS, and JavaScript. A defining feature of this DAS is the integration of **WebRTC** technology, enabling secure, **real-time audio-video communication** between patients and doctors, thereby facilitating remote consultation and follow-up.

The database structure was built using tables for doctors, users, appointments, doctor schedules, prescriptions, and call signals. Key modules include user-friendly patient registration, dynamic appointment booking and scheduling, secure messaging, digital prescription generation, and an administrator panel for system oversight.

The implemented system successfully reduces patient waiting times, minimizes administrative overhead, and provides instant access to healthcare professionals. Testing confirmed the system's reliability and its ability to manage large volumes of data and concurrent real-time sessions, thereby proving its efficacy as a modern solution for efficient healthcare delivery.

ACKNOWLEDGMENT

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

I am fortunate to have had the kind association as well as supervision of **Md. Zahidul Hasan**, Lecturer, Department of Computer Science and Engineering, Sonargaon University. His heartfelt and valuable support, with **his** best concern and direction, acted as a necessary resource to carry out this project.

I would like to convey my gratitude to **Brig. Gen. (Retd) Prof. Habibur Rahman Kamal** (Dean, Faculty of Science & Engineering) and special gratitude to the honorable departmental head **Prof. Bulbul Ahamed** (Pro Vice Chancellor (Acting) & Head, Department of Computer Science and Engineering) for their kind concern, discretion, friendly behavior, and precious suggestions.

I am also thankful to all my teachers throughout my education for exposing me to the beauty of learning. Finally, my deepest gratitude and love go to my parents for their unwavering support, encouragement, and endless love.

LIST OF ABBREVIATIONS

CPU	Central Processing Unit
CSS	Cascading Style Sheets
HTML	Hypertext Markup Language
RAM	Random Access Memory
ROM	Read Only Memory
SQL	Structured Query Language
PHP	Hypertext Preprocessor
UI/UX	User Interface / User Experience
JS	JavaScript
DFD	Data Flow Diagram
DAS	Doctor Appointment System
ERD	Entity-Relationship Diagram
UML	Unified Modeling Language
XAMPP	Cross-Platform (X), Apache, MySQL, PHP, and Perl

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CHAPTER 1

INTRODUCTION TO DOCTOR APPOINTMENT SYSTEM

1.1 Introduction

There is an urgent need for an efficient, reliable, and easily accessible digital platform that can handle huge amounts of patient data and other operational activities in the healthcare industry. Most clinics in Bangladesh and elsewhere still maintain appointments, records, and doctor scheduling on paper. The drawbacks of these systems are long queues, schedule overlaps, redundancy in data, and poor security—factors that further deteriorate the quality of health service and raise operational costs.

The "Design & Implementation of Online Doctor Appointment System" project proposes a web-based digital solution with a centralized design to address these inefficiencies. The proposed system will allow the three major users—Admin, Doctor, and Patient—to manage all outpatient administrative functions safely and effectively. This system has been developed using the **PHP/MySQL** stack and tested locally in Windows 10 using XAMPP. It utilizes a normalized database structure that guarantees data integrity and scalability for appointment storage, doctor schedules, patient records, and prescriptions. Management changes from being fragmented to an integrated model, highly effective through automation and centralization of the process.

1.2 Objectives

The specific, measurable, achievable, relevant, and time-bound goals for the project are:

- **Database Design:** A normalized, optimized MySQL database design consisting of 13 tables representing the entities within the system (Admin, Doctor, and Patient) and their relationships regarding appointments, prescriptions, and scheduling.

- **Module Development:**

    - **Patient Module:** Provides facilities for self-registration, finding a doctor based on specialty, and booking appointments.
    - **Doctor Module:** Allows doctors to manage profiles, set schedules, approve appointments, and create prescriptions.
    - **Admin Module:** Used to verify doctors, manage users, and send global notifications.

- **Automated Scheduling:** Reduces conflicts and waiting times by simplifying the appointment creation cycle.

- **Information Security:** Ensures secure access, password hashing, role-based access control, and protection against SQL Injection.

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1.3 Stakeholders

- **Admin:** Manages the entire system, including doctors and patients.
- **Doctor:** Manages schedules and consults with patients.
- **Patient:** Books appointments and receives medical consultation.

1.4 Technology Used

Category	Technology	Purpose
Server-Side Logic	PHP 8.1+	Execute business logic and process forms
Database	MySQL 8.0+	Provides storage and management for system data with relational integrity
Environment	XAMPP on Windows 10	Provides Apache and MySQL for local hosting
Front-End	HTML5, CSS3	Constructs the layout and design of the web application
Interactivity	JavaScript	Adds validation and dynamic UI features

1.5 Expected Benefits

- **Time Saving:** The online system saves valuable time for everyone. Staff are no longer tied up on the phone, and patients can book appointments efficiently.
- **Reduced Chaos & Wait Times:** Eliminates the need for physical visits just to book an appointment, leading to shorter lines and a more peaceful atmosphere.
- **24/7 Convenience:** Allows patients to book appointments anytime without disrupting their day.

CHAPTER 2

PROBLEM STATEMENT

2.1 Introduction

The current landscape of appointment scheduling in healthcare is characterized by manual, time-consuming processes that create inefficiencies for both clinics and patients. While the development of an initial Doctor Appointment System presented solvable technical challenges—such as "Not Found" errors and image display issues that were resolved through cache management—a more fundamental problem persists.

The existing system, though a step forward, remains limited in functionality and fails to fully capitalize on the potential of digital health. This is a significant gap, especially in the context of the growing interest in **telehealth**. However, patient adoption drivers for such digital solutions are not yet fully understood. Therefore, the core problem is the absence of a fully integrated, convenient, and trustworthy online appointment system that meets modern patient expectations.

2.2 Solution

Through iterative prototyping and team collaboration, we successfully designed an intuitive patient dashboard that delivers a seamless and user-friendly appointment booking experience. The solution integrates real-time scheduling, secure data management, and remote communication capabilities to bridge the gap between patients and doctors.

CHAPTER 3

LITERATURE REVIEW AND FEASIBILITY STUDY

3.1 Introduction

A literature review surveys journals, articles, books, and other research sources to provide a theoretical framework and define research concepts. An online clinical appointment system enables patients to book healthcare appointments conveniently, securely, and efficiently through internet-connected devices, which has become especially important in developing countries.

3.2 Background

This project aims to automate the Doctor Appointment System to streamline patient management and medical service delivery. It addresses key healthcare challenges such as access, equality, quality, and cost-effectiveness. It enables patients—especially the elderly or those in remote areas like Bangladesh—to consult doctors remotely, reducing outpatient visits and improving timely healthcare access.

3.3 Feasibility Study

A Feasibility Study is a crucial step in system analysis and design. It evaluates potential solutions to ensure they meet user requirements.

3.3.1 Operational Feasibility

Ensures the system meets the operational needs of users. The GUI-based system is user-friendly for non-technical users and improves efficiency.

3.3.2 Technical Feasibility

The system is developed on the Windows 10 platform with 6GB RAM and a Core-i3 processor, making it technically feasible with available hardware and software resources.

3.3.3 Economic Feasibility

Assesses cost-effectiveness. The system minimizes operational costs (like paper and phone bills) while maximizing efficiency, providing a positive financial return for stakeholders.

3.4 Challenges

Every project faces challenges, and the Online Doctor Appointment System is no exception. It requires users to have internet-connected devices like computers, laptops, smartphones, or tablets, and relies on doctors promptly checking notifications and confirming bookings. Consequently, a lack of internet access or delayed responses can limit the system's **effectiveness**, especially as it is a relatively new healthcare solution in Bangladesh.

The challenges faced by the system include:

- Patient's Acceptance
- Lack of Interest in Adopting New Technology
- Lack of Proper Marketing
- Trust Issues of Patients
- Awareness of People, Especially in Rural Areas
- Lack of Expert Team to Run the Startup Company

3.5 Benefits

The online scheduling system is a web-based platform that allows individuals to conveniently and securely book appointments and reservations through any web-connected device such as computers, laptops, smartphones, and tablets. Once a date and time are selected, the system provides booking confirmation and records the details for future reference.

The main benefits of the Doctor Appointment System are as follows:

1. **Time Saving:**
Traditional phone bookings consume a significant amount of time, often requiring several minutes for each appointment. Online booking allows patients to schedule appointments quickly and efficiently, saving time for both patients and healthcare staff. For example, a phone-based system typically takes four minutes to book 100 patients, whereas the online system significantly reduces this time.

2. **Reduce Transportation Costs**
Patients, especially those in rural areas, often need to travel long distances to consult a doctor, which can be both time-consuming and costly. Online consultations reduce the need for such travel, saving on transportation costs and making it easier for patients to access medical advice.

3. **Medical Access for People without Health Insurance**
Lack of adequate health insurance can be a barrier to receiving medical care. Many online platforms offer cash-pay treatment options that do not require health insurance or referrals, providing more accessibility for those without coverage.

4. **Medical Access for People in Rural Areas**
Living in rural areas often means long distances to the nearest healthcare facility. The online system provides a quick and convenient way for rural residents to contact doctors and receive timely medical advice without the need to travel long distances.

5. **Reduced Exposure to Pathogens**

Long waits in doctors' offices and waiting rooms expose patients to the risk of infectious diseases like COVID-19, flu, and other viruses. Online treatment allows patients to stay home, reducing exposure to these risks and helping to protect both patients and medical professionals.

6. **Care for Babies and Children**

Babies often get sick at night or suddenly develop fevers. Parents can quickly contact doctors through online platforms for guidance, avoiding unnecessary trips to the hospital and receiving timely advice and diagnoses.

7. **Doctors Get to Stay Home Too**

During the pandemic, many medical offices closed or reduced operating hours. Virtual consultations enabled doctors and therapists to treat patients safely from their homes or offices, ensuring continuity of care and offering flexible hours, even on weekends

8. **Support for People with Chronic Conditions**

At-home monitoring tools that transmit data to healthcare professionals can help detect new symptoms or worsening conditions. This allows for early interventions, reducing the risk of medical emergencies and ensuring patients receive timely care.

9. **Online Psychiatric Support**

The pandemic has made it challenging for many people to access mental health services. Online systems provide support for individuals experiencing stress, anxiety, depression, and other mental health issues, offering accessible and continuous care.

CHAPTER 4

ANALYSIS AND DESIGN OF PROPOSED SYSTEM

4.1 Use Case Modeling and Description

A use case model is a representation of how different types of users interact with the system to achieve a particular goal. It describes the following:

- Goals of the users
- Interactions between the users and the system
- Required behavior of the system to satisfy these goals

A use case diagram typically consists of the following components:

1. **The System:** What is being described?
2. **Actors:** Who is using the system?
3. **Use Cases:** What the actors want to achieve.

This model helps ensure that the correct system is developed by capturing the requirements from the user's perspective. For example, every time a user tries to log in, the system will perform email and password verification. If there is an issue with the email or password, the system will display a login error.

Actors in the system:

1. Admin
2. Doctor
3. Patient

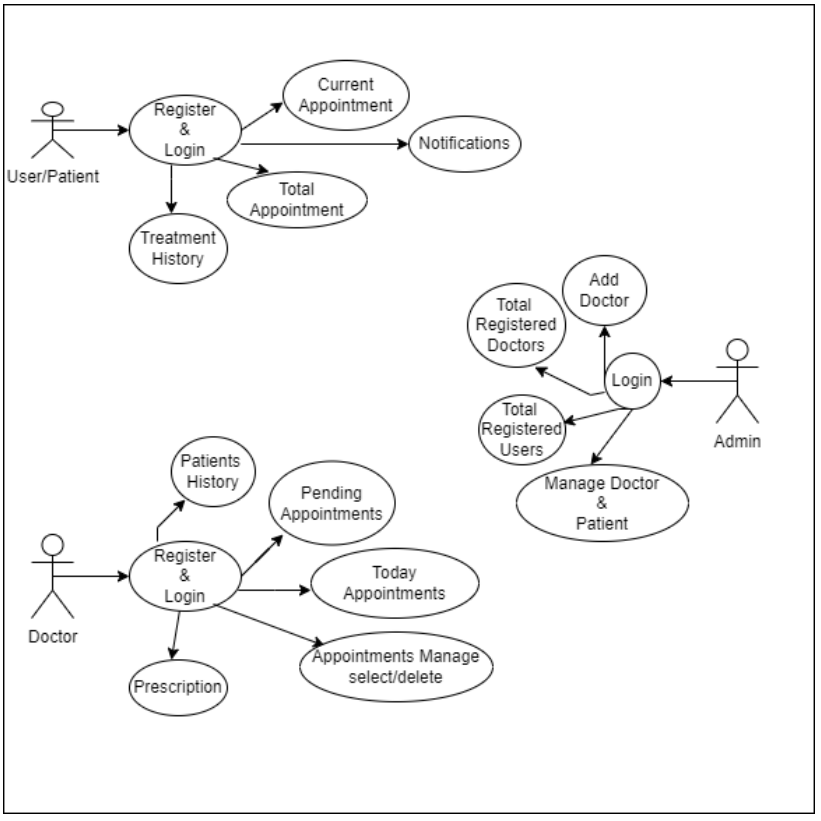

Figure 4.1 Use Case Diagram

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Table 1 Use case description of admin

Main Target	Admin can login into the system and manage doctors, staff, patients, users, and appointment list.
Success Status	Admin successfully log in to the system and can add doctors/staff, view registered users, manage all users and income.
Failed Status	Admin failed login and cannot access user management or appointment data.
Secondary Actor	Admin
Main Scenario	Admin browses the system
	Select “Admin Login” to open login page.
	Enter username and password then click on “login” button.
	Open a dashboard with total registered doctors, patient’s details.
	Click on “Add Doctor” to register a new doctor with specialization info.
	Click on “Add new Doctor” to add new system staff.
	Click on “Manage Doctor & Patient” to edit or remove user info.
	Click on “Total Registered Doctors” to view list and info of doctors.
	Click on “Total Registered Patients” to see full list of patients.
	Click on "Appointment" to check if the user has made an appointment.

Table 2 Use Case Description of Doctor

Main Target	Doctor can login into the system and manage appointments, patient history, bills, and prescriptions.
Success Status	Doctor successfully logs in and can access patient info, manage appointments, and generate bills or prescriptions.
Failed Status	Doctor login fails; unable to access system data or patient records.
Secondary Actor	Doctor
Main Scenario	Doctor browses the system
	Select “Doctor Login” to open login page.
	Enter credentials and click “login”.
	Click and "View Requests" to view Check all pending and approved appointment requests.
	Click on “Manage Schedule” to view Update available time slots to allow new appointments.
	Click on “Today Appointments” to see same-day schedules.
	Click on “Appointments Manage Select/Delete” to organize appointments.
	Click and "Write Prescriptions." Send digital prescriptions to patients securely?
	Click on “Chat with Patients” to Respond to messages and provide quick support.

Table 3 Use Case Description of Patient

Main Target	Patient can sign up/login to take appointments, view history, and receive notifications.
Success Status	Patient successfully logs in and can take appointments, view history, and receive updates.
Failed Status	Login fails; patient cannot book or view appointments and treatment info.
Secondary Actor	Patient
Main Scenario	Patient interacts with the system:
	Select “Sign Up & Login” to register or log in.
	Enter credentials and click “login”.
	Click on “Take Appointment” to book a new appointment.
	Click on “Current Appointment” to view upcoming scheduled visit.
	Click on “Doctor” to view all doctor information.
	Click on “Prescriptions” to check Exam & Medicine.
	Click on "Messages" to read messages and chat with the doctor via messages & share files.

4.2 E-R Diagram

An ER (Entity-Relationship) diagram is a graphical representation used in computing to organize data within a database, where entities represent data objects or concepts to be stored and relationships define how these entities share or connect their data.

Entity

In an ER diagram, entities are represented by rectangles and refer to real-world objects or concepts about which data is collected, while a weak entity depends on a key foreign relationship with another entity because it cannot be uniquely identified by its own attributes alone.

Attributes

In an ER diagram, attributes are represented by ovals, and a key attribute is a unique identifying characteristic of an entity, such as an employee's social security number serving as the key attribute for the employee entity.

Entity Set

An entity set is a collection of entities of the same type that share the same properties or attributes.

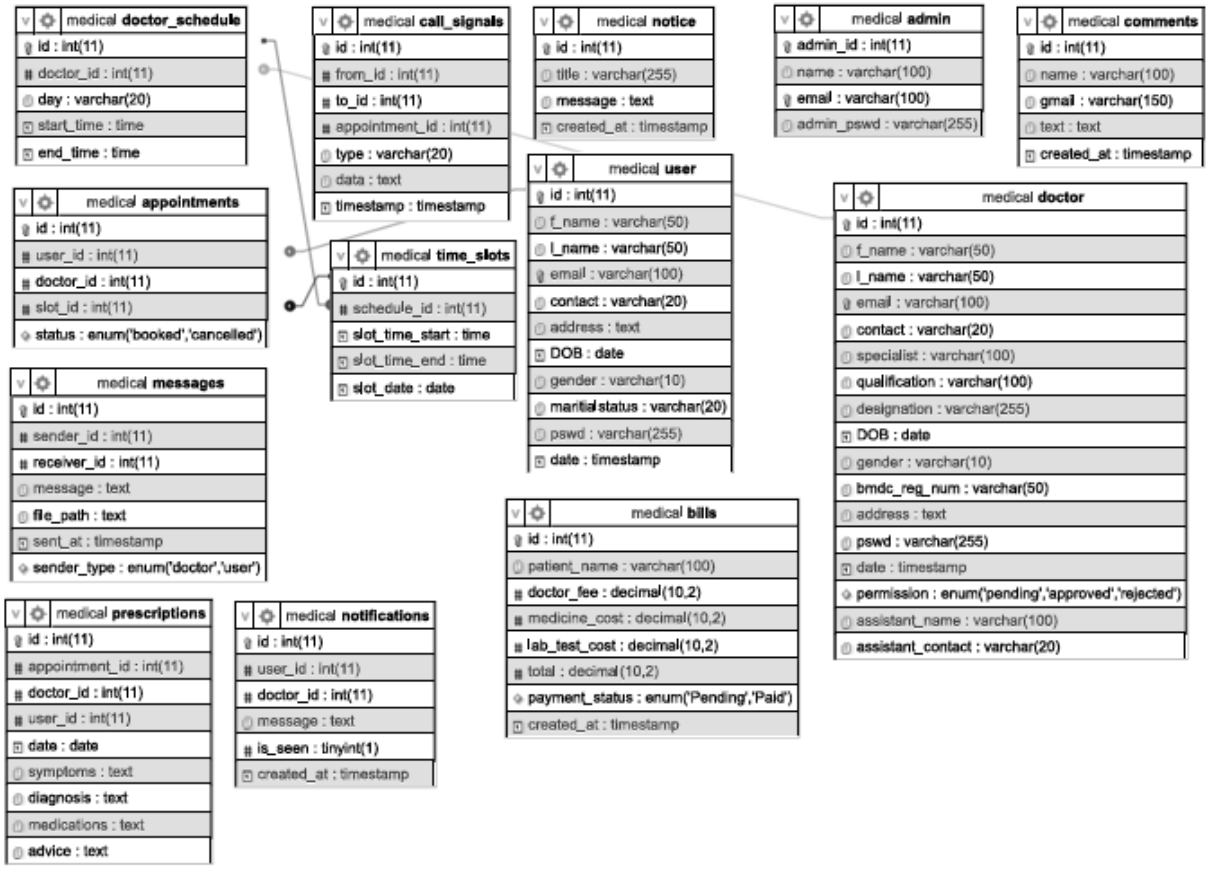


Figure: Full System Entity-Relationship Diagram (ERD) of 12 Tables.

4.3 Data Flow Diagram

A Data Flow Diagram (DFD) is used in developing the Online Doctor Appointment System to represent its major processes and data flows, with categorized data stores illustrating the system's structure, and it serves as an essential component that complements other diagrams by explaining the system's activities, behaviours', interactions, and overall structure.

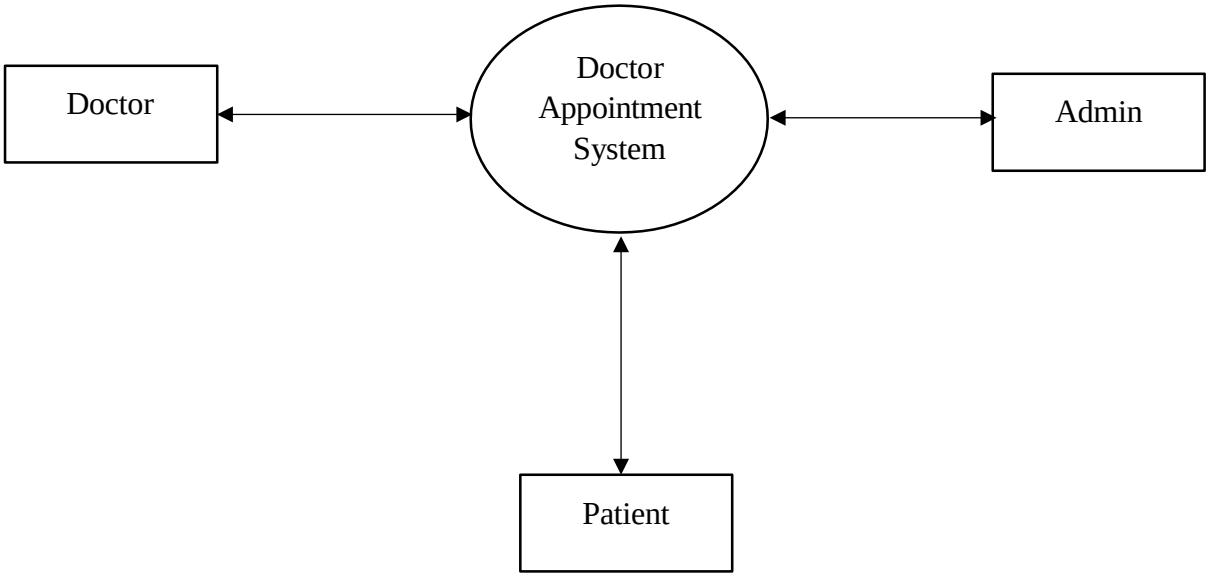


Figure: 4.3 Data Flow Diagram

The Data Flow Diagram is important for the Online Doctor Appointment System because it helps developers understand and visualize the actual activities within the system by managing and illustrating data flow across different levels.

4.4 Flowchart

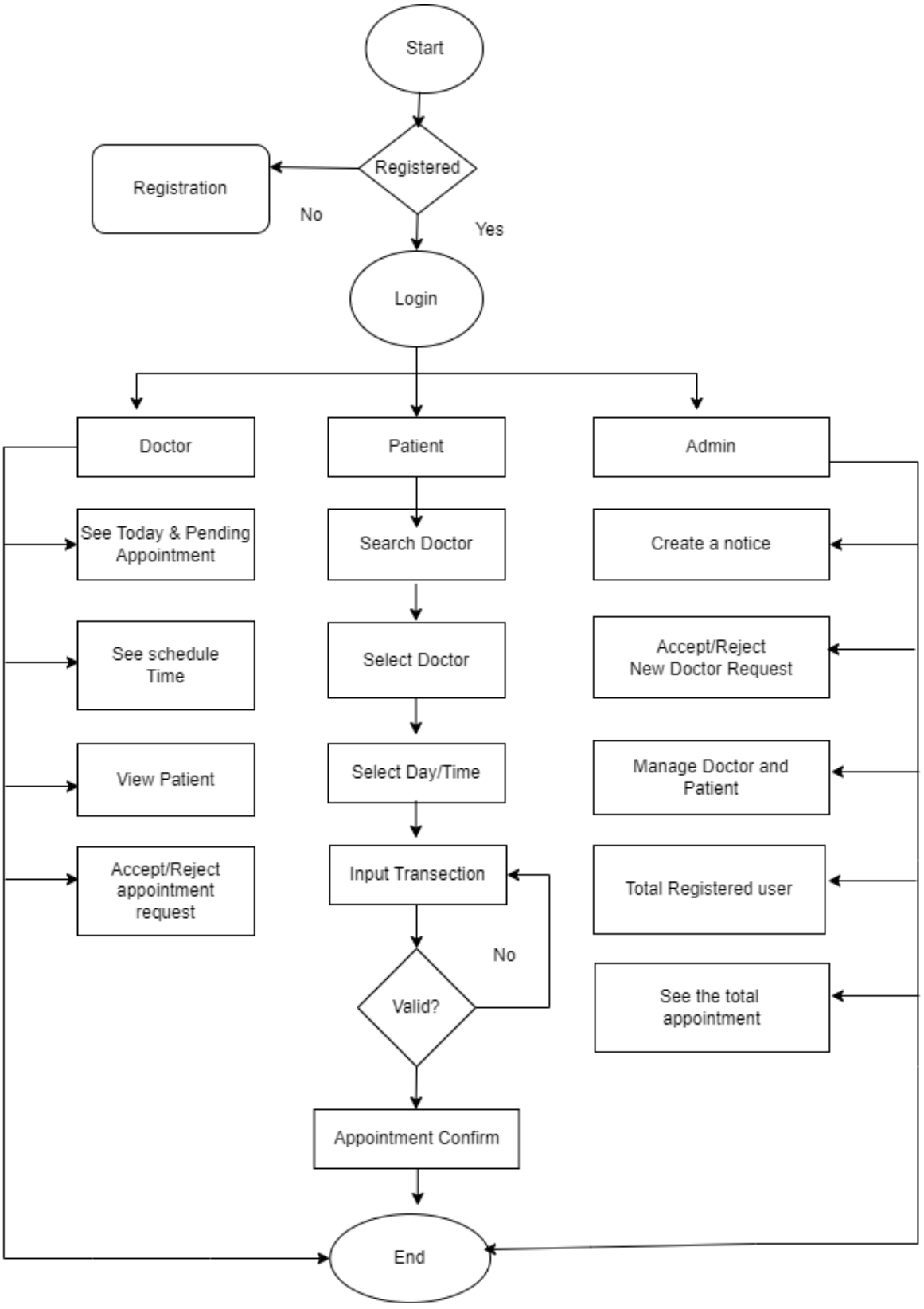
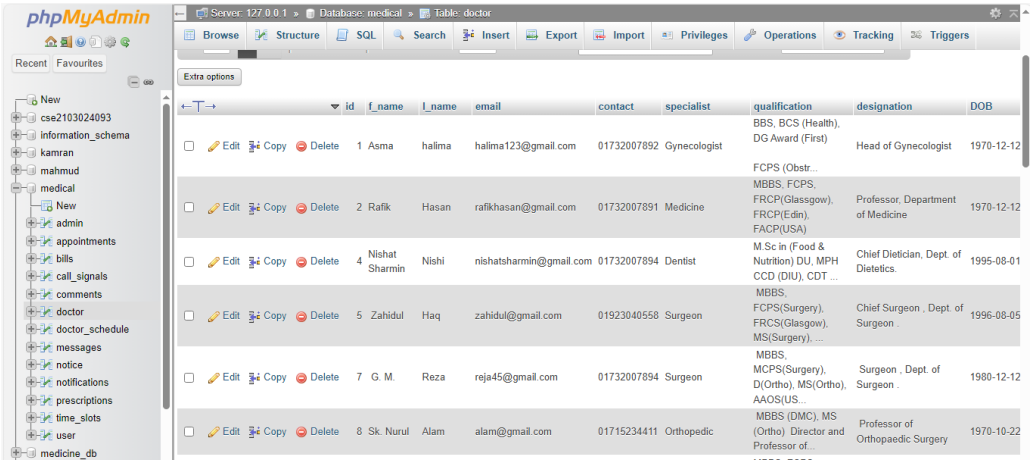


Figure 4.4 Flowchart

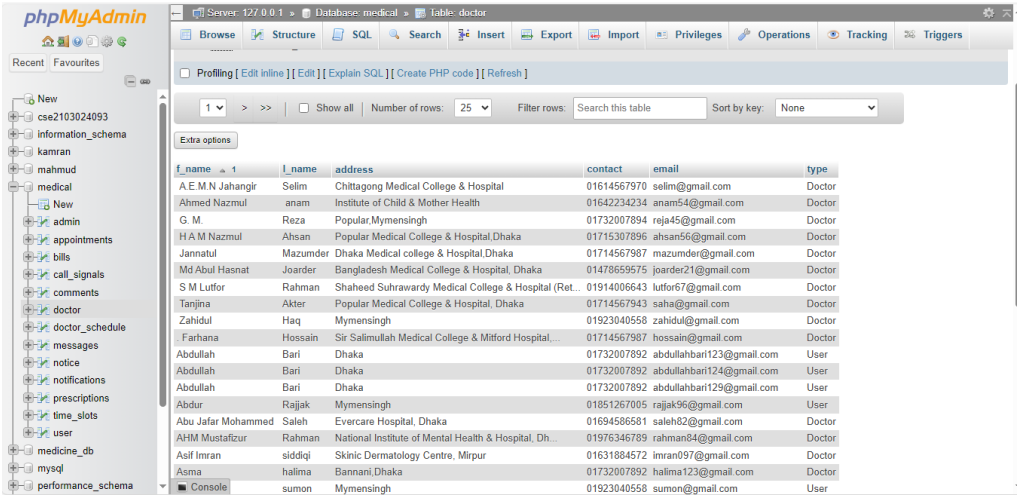
4.5 Snapshot of Database

In this section, a screenshot of our website's database is provided. It stores all the records of Admin, Appointments, Doctor Appointments, Doctor Specialties, and Patients. In our project, we have used Microsoft SQL Server local server software to manage the database efficiently.

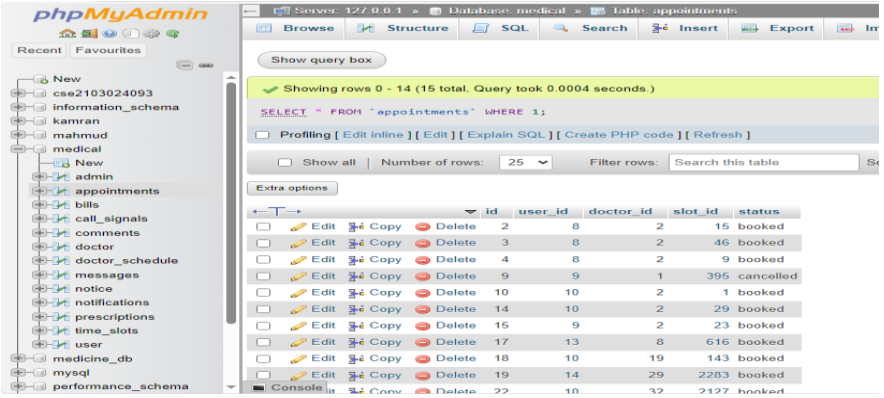
Total Doctors:



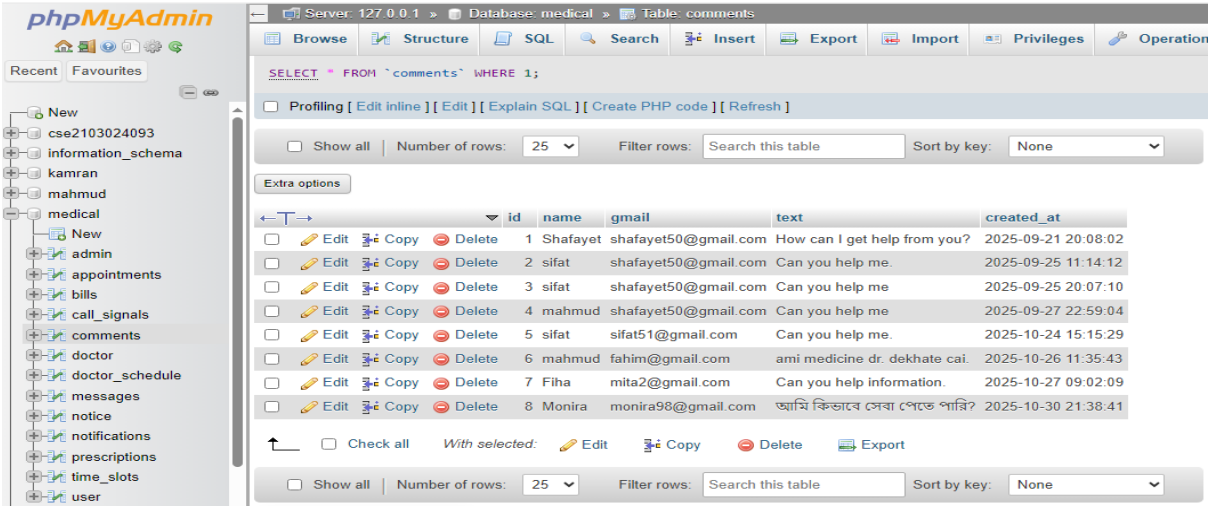
Total Register Doctor & Patient:



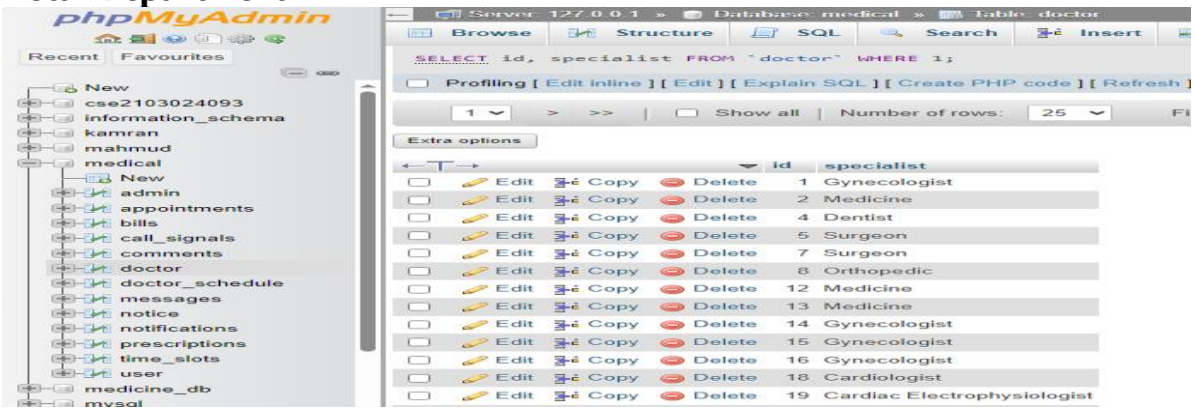
Total Appointment History:



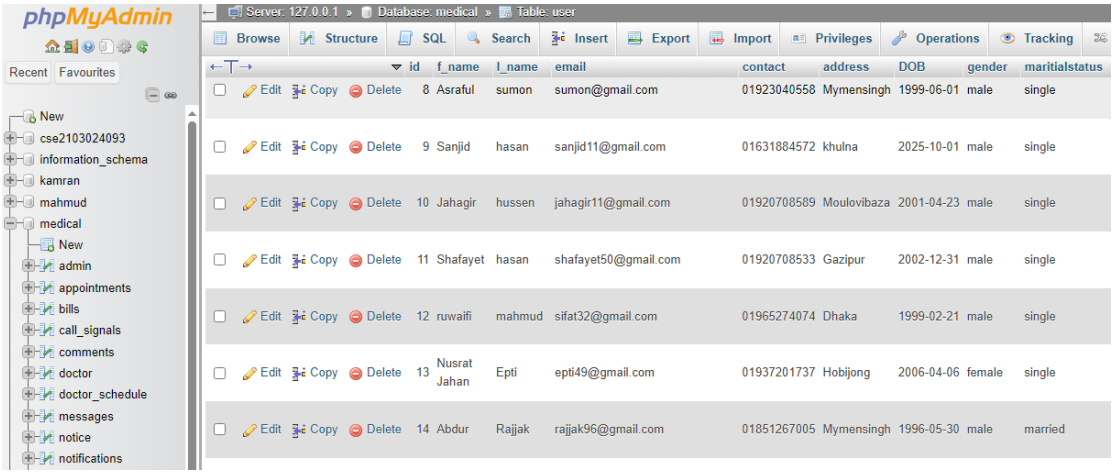
Total Contact Us



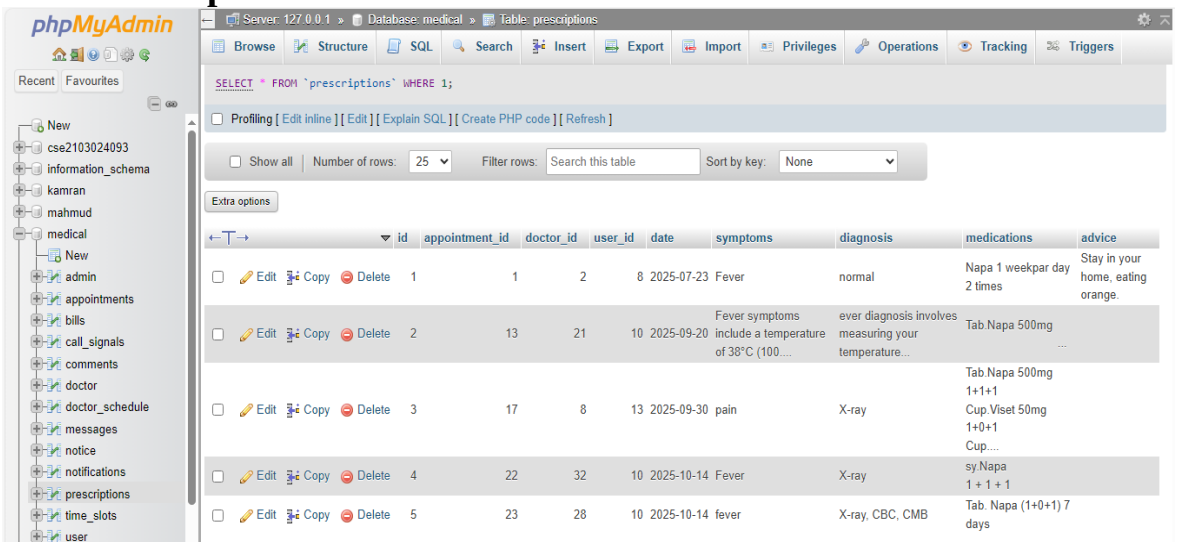
Total Department



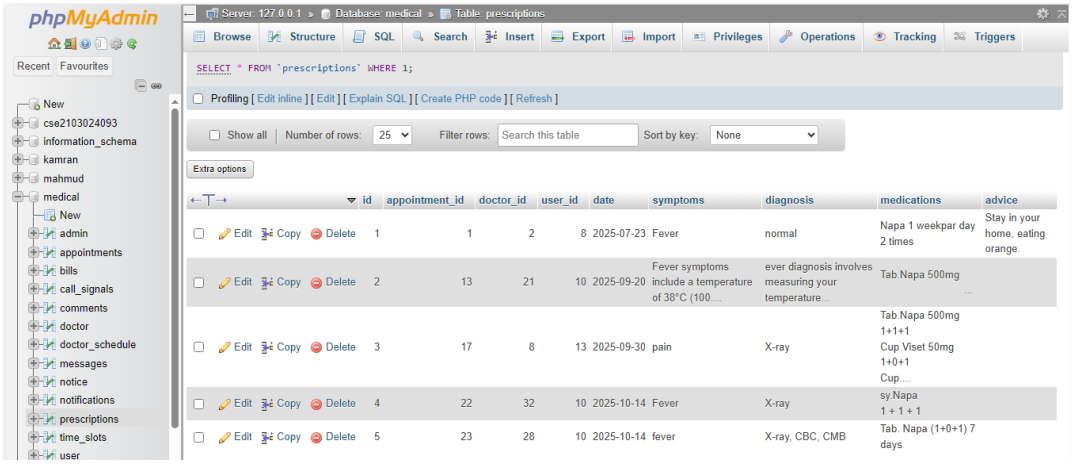
Total Patient



Total Prescriptions



Total time_slots



Total Notice

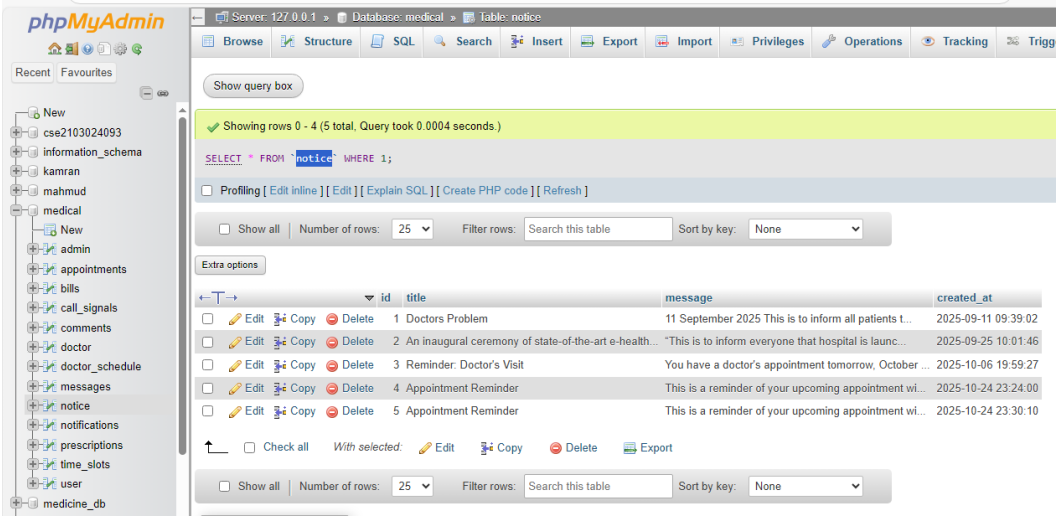


Figure 4.5 Screenshots of Database tables

4.6 Snapshot of Front-End

4.6.1 Home Page

The Home Page is the main landing page of our Doctor's Appointment System website. It is designed to provide an intuitive and user-friendly interface for patients and doctors to easily navigate the system

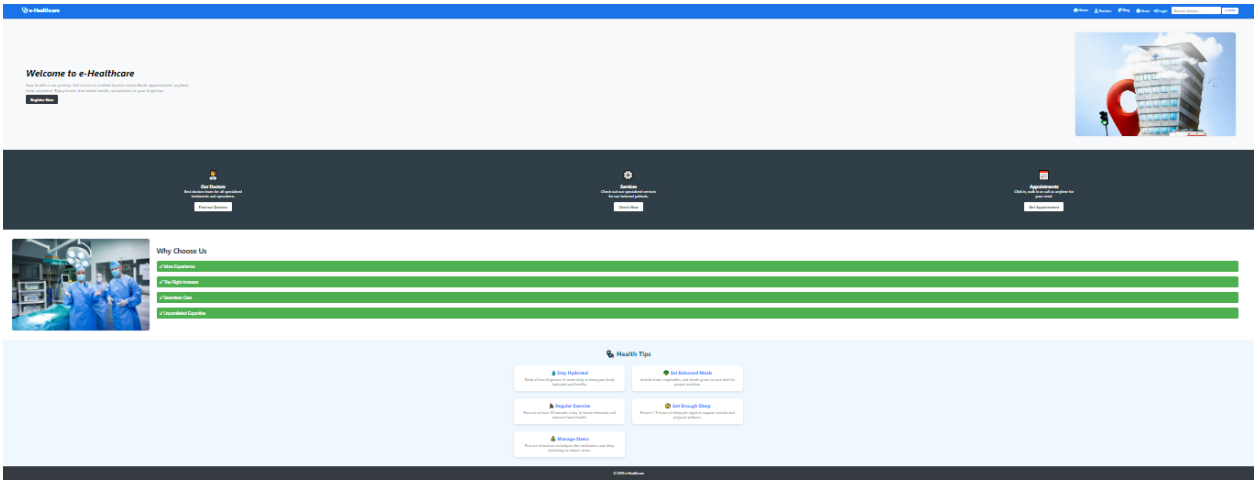


Figure 4.6.1 Screenshots of Home Page

4.6.2 Admin Login Page

Admin can log in with login credentials by clicking on Login.

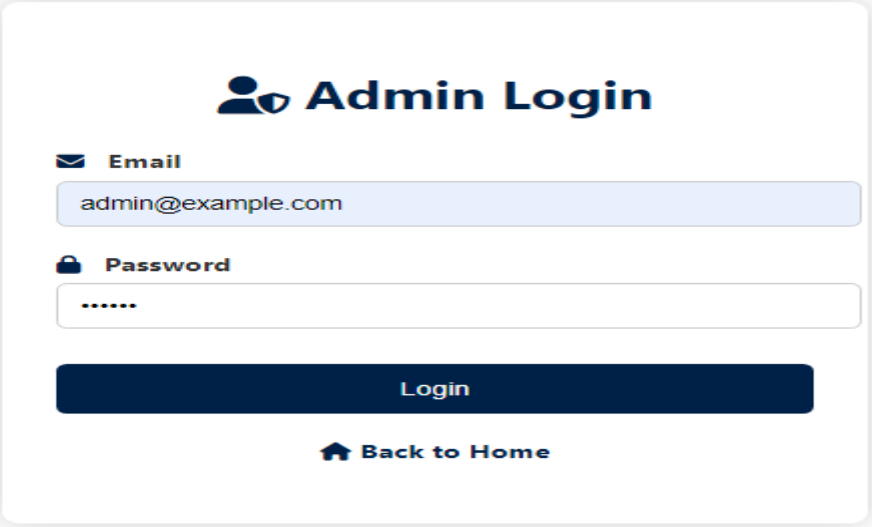


Figure 4.6.2 Screenshots of Admin Login Page

4.6.3 Admin Dashboard Page

This is the admin dashboard page where the admin can view total appointments, create sub-admin roles, and view the doctor and patient lists along with their reviews. Admin can also see the total transactions.

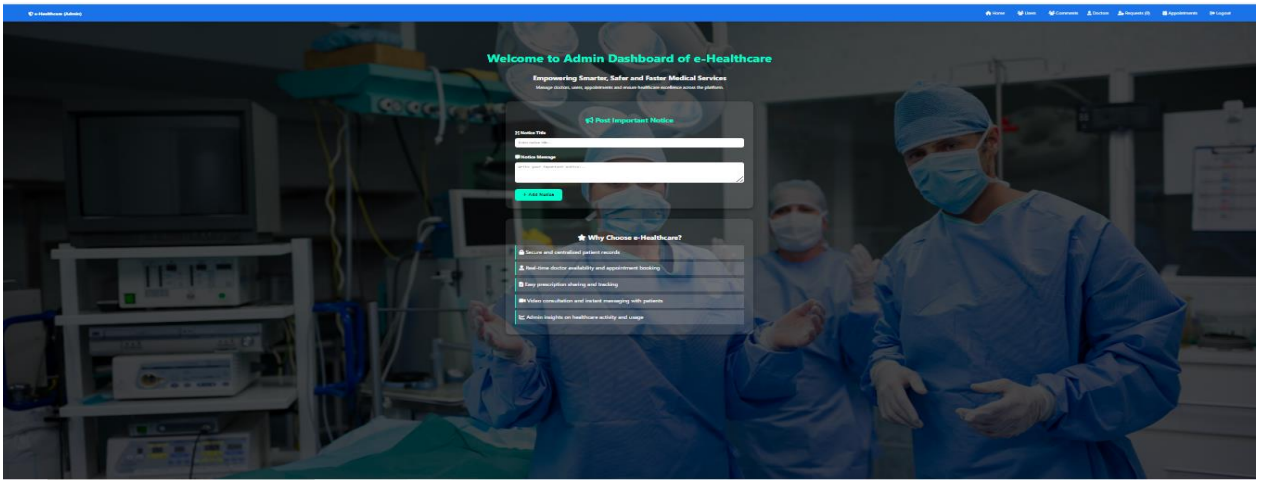


Figure 4.6.3 Screenshots of Admin Dashboard Page

4.6.4 Doctor Add Page

Admin can add new doctors to this page.

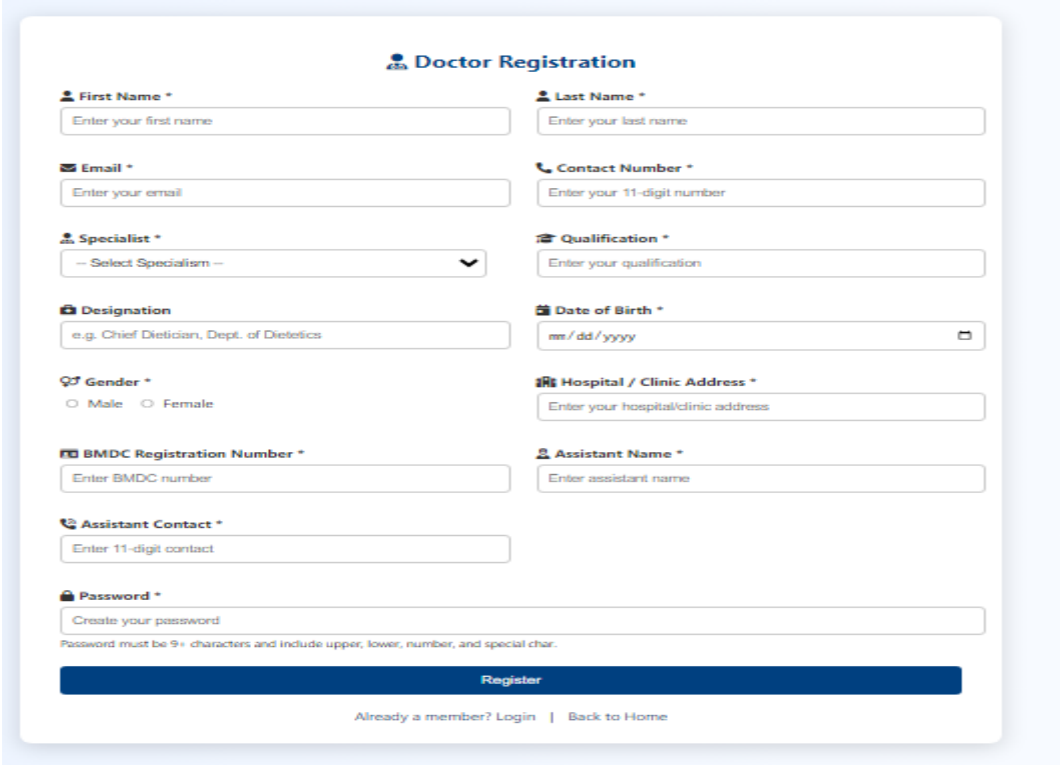
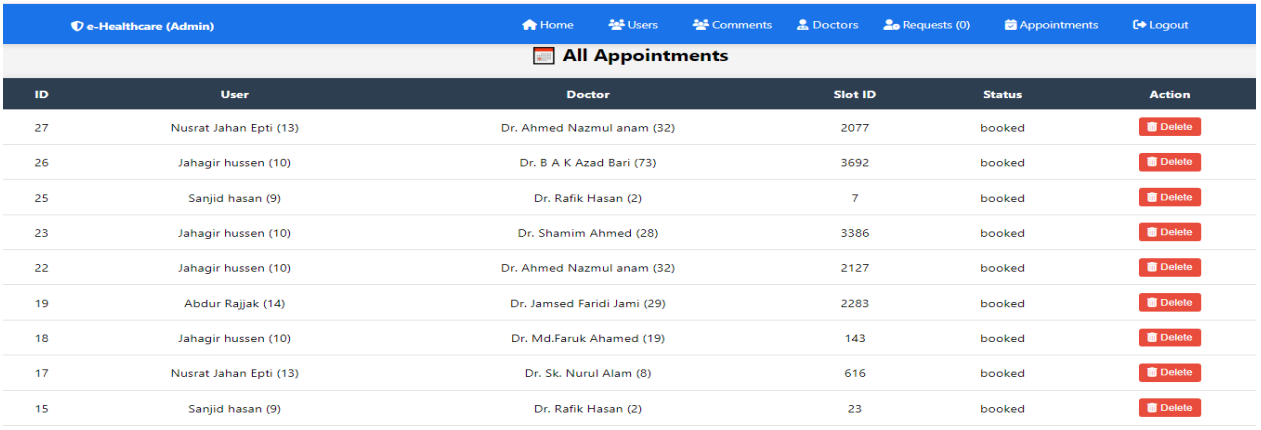


Figure 4.6.4 Screenshots of Doctor Add Page

4.6.5 Manage Clinic

On this page, the admin can manage doctors, patients.



ID	User	Doctor	Slot ID	Status	Action
27	Nusrat Jahan Epti (13)	Dr. Ahmed Nazmul anam (32)	2077	booked	Delete
26	Jahagir hussen (10)	Dr. B A K Azad Bari (73)	3692	booked	Delete
25	Sanjid hasan (9)	Dr. Rafik Hasan (2)	7	booked	Delete
23	Jahagir hussen (10)	Dr. Shamim Ahmed (28)	3386	booked	Delete
22	Jahagir hussen (10)	Dr. Ahmed Nazmul anam (32)	2127	booked	Delete
19	Abdur Rajjak (14)	Dr. Jamsed Faridi Jami (29)	2283	booked	Delete
18	Jahagir hussen (10)	Dr. Md.Faruk Ahamed (19)	143	booked	Delete
17	Nusrat Jahan Epti (13)	Dr. Sk. Nurul Alam (8)	616	booked	Delete
15	Sanjid hasan (9)	Dr. Rafik Hasan (2)	23	booked	Delete

Figure 4.6.5 Screenshots of Manage Clinic

4.6.6 Request Page

Admin can add new doctor to this page.

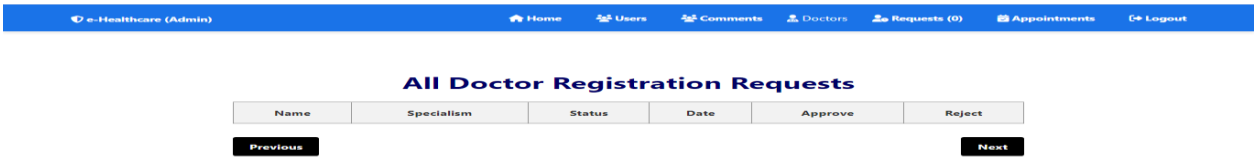


Figure 4.6.6 Screenshots of Add New Doctor registration Requests Page

4.6.7 Patient Register & Login Page

The Patient Sign up & Login Page allows registered patients to access the system using their valid login credentials. Patients need to enter their username/email and password, and then click on the Login button. Upon successful authentication, they are redirected to their dashboard, where they can:

- View of available doctors
- Book appointments
- Check appointment history

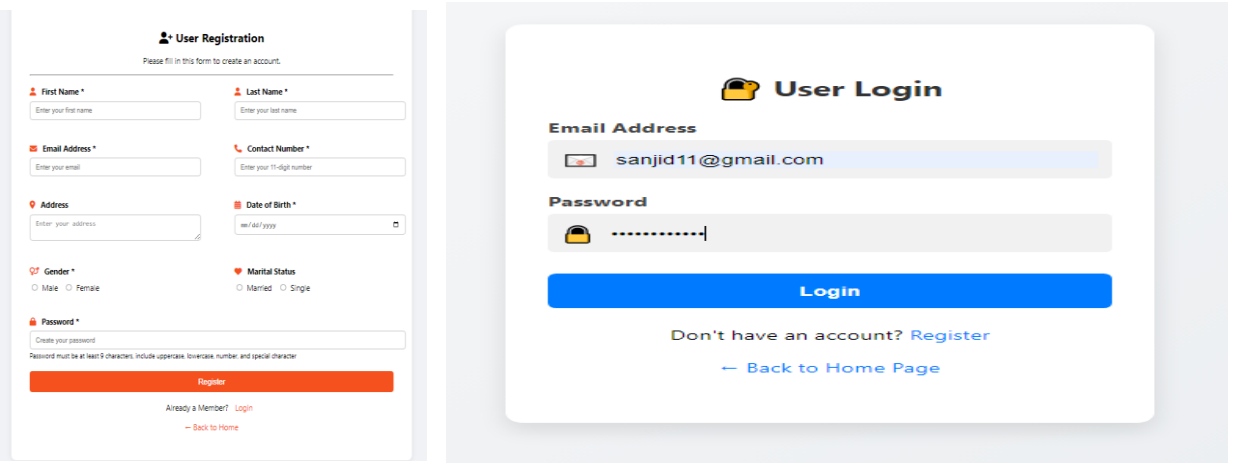


Figure 4.6.7 Screenshots of Patient Register & Login Page

4.6.8 Patient Dashboard Page

Here patients can sec appointment list, prescription, billing and all the related works in this appointment system.

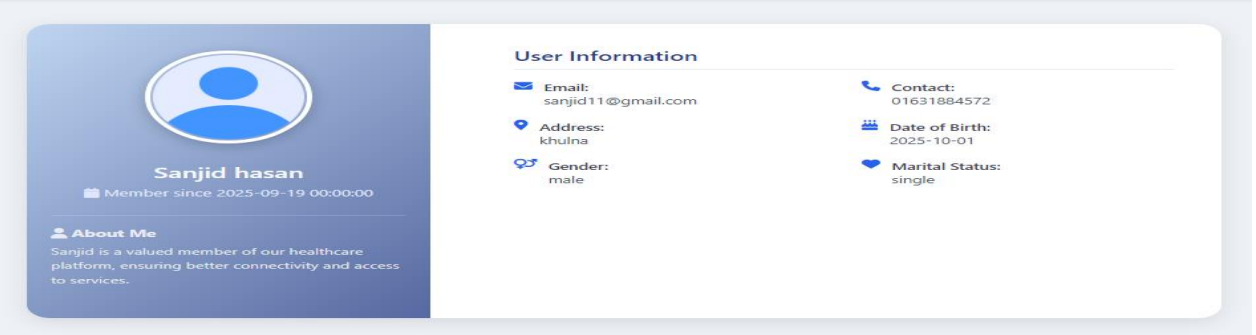


Figure 4.6.8 Screenshots of Patient Dashboard Page

4.6.9 Patient can Select Department

In this section, patients can select a department and choose a specific doctor for their appointment.

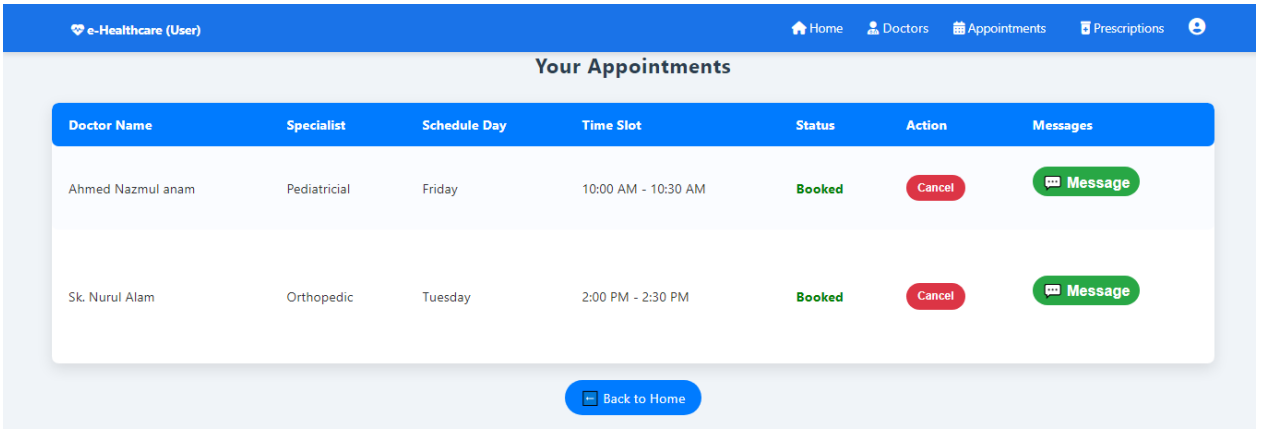


Figure 4.6.9 Screenshots of Patient Select Department

4.6.10 Patient can Select Doctor

In this section, patients can browse and select a specific doctor from the available list to book an appointment.

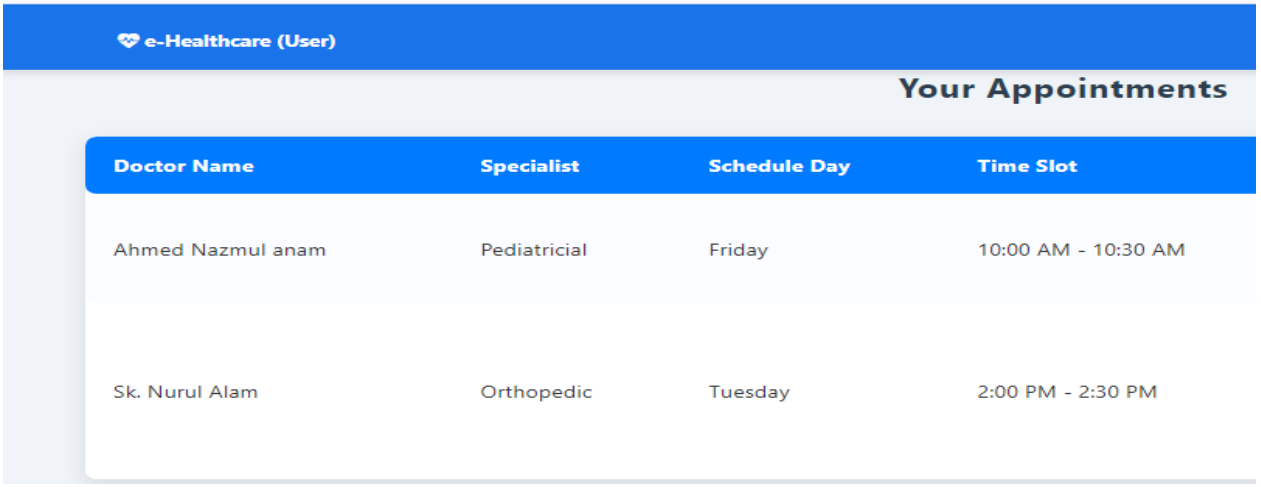


Figure 4.6.10 Screenshots of Patient Select Doctor

4.6.11 Patient can See Doctor Profile

In this section, patients can view the detailed profile of each doctor, including qualifications, specialization, experience, and availability, before booking an appointment.

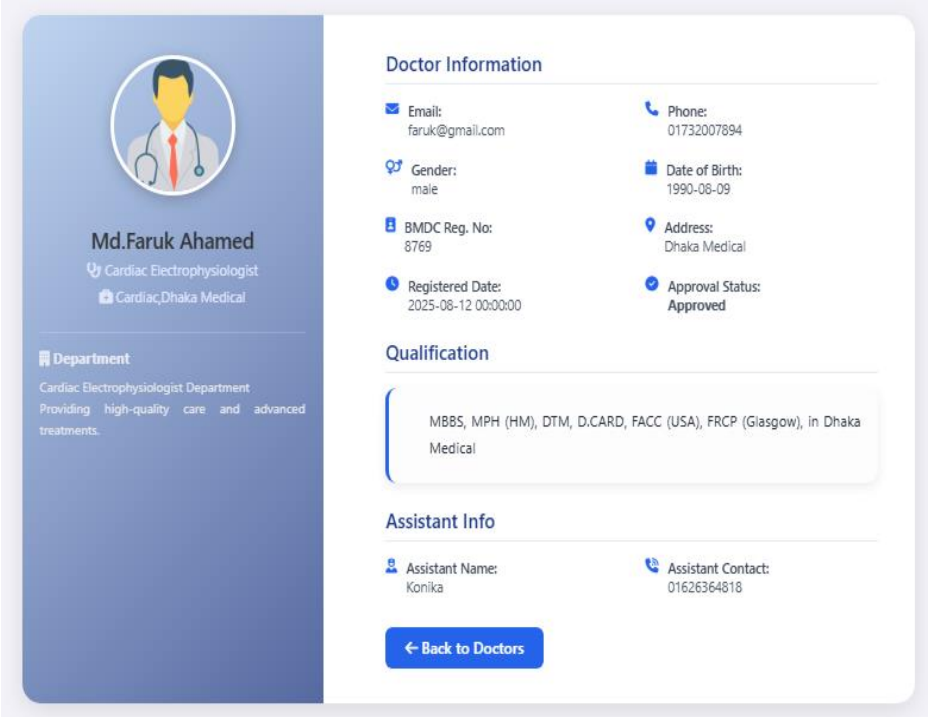


Figure 4.6.11 Screenshots of Patient See Doctor Profile

4.6.12 Patient can Select Booking Slots

In this section, patients can view available time slots for their selected doctor and choose a suitable date and time to confirm their appointment.

Figure 4.6.12 Screenshots of Patient select booking slots

4.6.13 Patient can Booking Doctor

In this section, patients can finalize their appointment by submitting a booking request to the selected doctor. The system stores the request and may notify the doctor for approval or confirmation.

Figure 4.6.13 Screenshots of Patient booking doctor

4.6.14 Patient can See the Current Appointment

In this section, patients can view the details of their currently scheduled appointments, including doctor name, date, time, and appointment status.

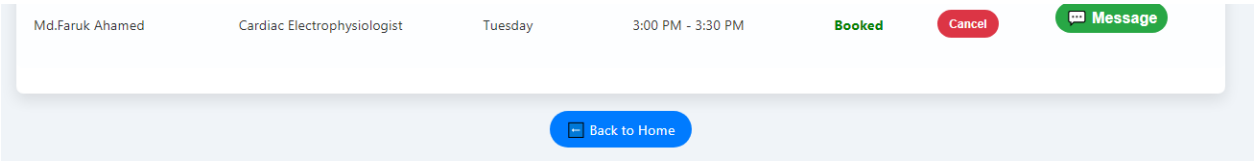


Figure 4.6.14 Screenshots of Patient see current appointment

4.6.15 Patient can See Total Doctor

In this section, patients can view their massage history, including Consultation Specialist, Schedule Day, Time Slot, Status, Action, Appointments and downloadable Prescription if available.

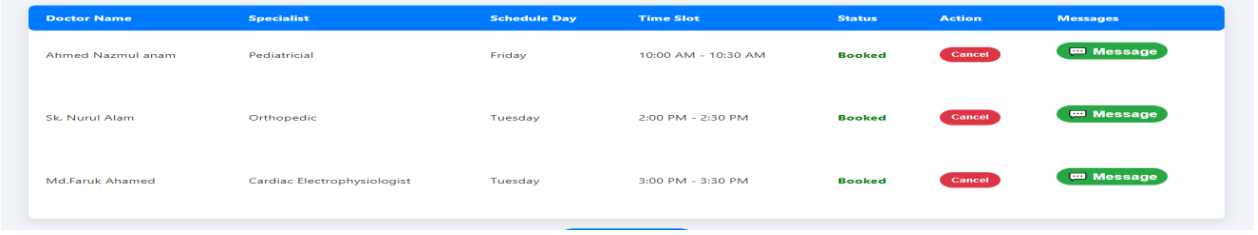


Figure 4.6.15 Screenshots of Patient see Total

4.6.16 Doctor Can See His Profile

In this section, doctors can view their complete profile information, including name, contact details, qualifications, specialization, department, work experience, consultation fees, and current status.

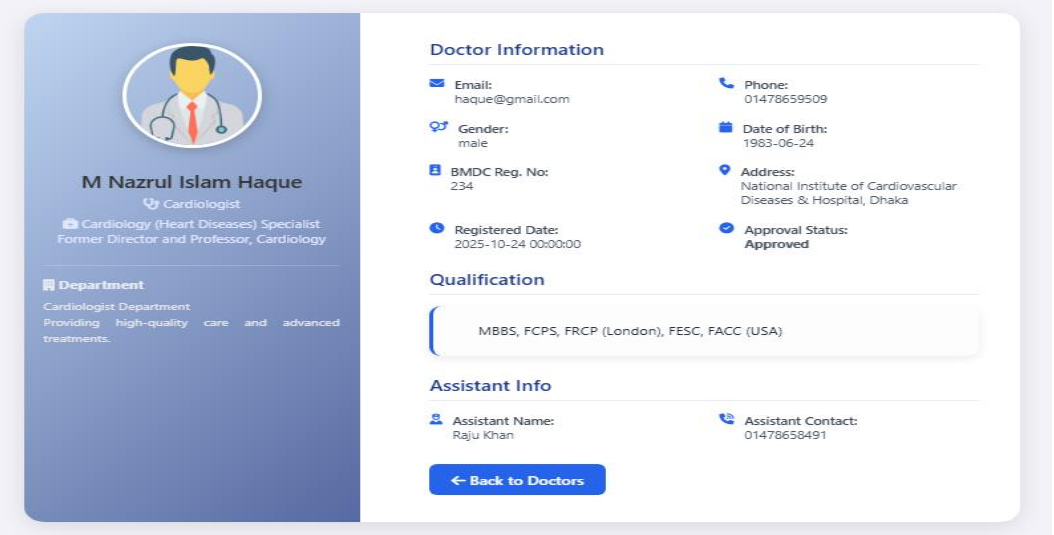


Figure 4.6.16 Screenshots of Doctor see his profile

4.6.17 History of Treated Patients

In this section, doctors can view a history of all the patients they have treated, including patient names, appointment dates, diagnoses (if applicable), and treatment details.

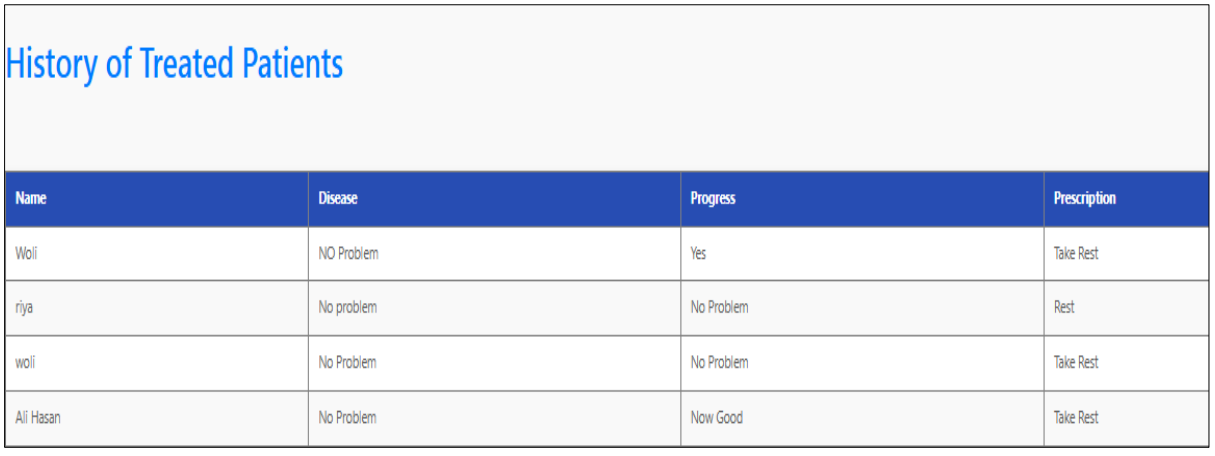


Figure 4.6.17 Screenshots of History of Treated Patients

4.6.18 Doctor can See Pending Appointment

In this section, doctors can view a list of pending appointment requests from patients. The list includes patient details, requested date and time, and an option to accept or reject each request.

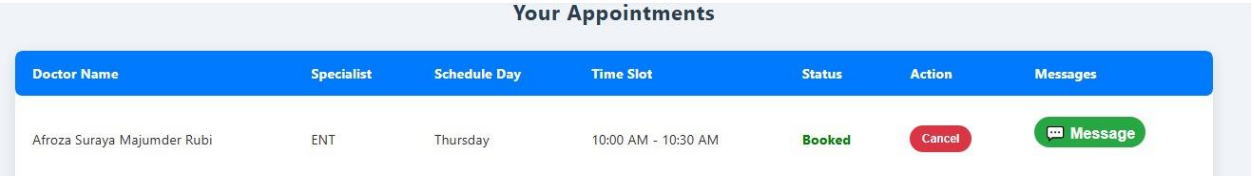


Figure 4.6.18 Screenshots of Doctor See Pending Appointment

4.6.19 Doctor can See Today's Appointments

In this section, doctors can view a list of all appointments scheduled for the current day. The list includes patient names, appointment times, and relevant details to help the doctor prepare for each consultation.

Figure 4.6.19 Screenshots of Doctor See Today's Appointment

4.6.20 Everyone can See Our Doctor List

In this section, all users—including unregistered visitors—can browse the complete list of available doctors. The list displays doctor names, departments, specializations, and basic profile information to help users choose the right doctor.

Full Name	Qualification	Specialist	Contact	BMDC Reg. No	Registration Date
r Aminur Rahman Rafi	MBBS, FCPS (Medicine), MD (Neurology), FRCP (EDIN), FICP (India), FINR (Switzerland), FACP (USA) PhD	Neourologist	01400657865	910	02 Oct, 2025
Hafeza Aftab Rosy	MBBS, MD (Gastroenterology), PhD (Japan)	Gastroenterlogist	01349088543	2134	02 Oct, 2025
Mansur Ahmed	MBBS, MPH, PhD	Hematologist & Immmunologist	01457855698	76455	05 Oct, 2025
Asma halima	BBS, BCS (Health), DG Award (First) FCPS (Obstretics & Gynaecology) MS (Obstretics & Gynaecolo	Gynecologist	01732007892	123	17 Jun, 2025
Rafik Hasan	MBBS, FCPS, FRCP(Glassgow), FRCP(Edin), FACP(USA)	Medicine	01732007891	123	17 Jun, 2025
Zahidul Haq	MBBS, FCPS(Surgery), FRCS(Glasgow), MS(Surgery), FICS Ex. Professor,Departmnet of Surgery,Bangaban	Surgeon	01923040558	23451	03 Aug, 2025
H A M Nazmul Ahsan	MBBS, FCPS, FRCP(Glassgow), FRCP(Edin), FACP(USA)	Medicine	01715307896	6677	03 Aug, 2025

Figure 4.6.20 Screenshots of Doctor See Today's Appointment

4.6.21 Everyone can Contact & Message Our Team

In this section, all users can get in touch with the support or administrative team by filling out a contact form. Users can submit their name, email, subject, and message to ask questions, report issues, or provide feedback.

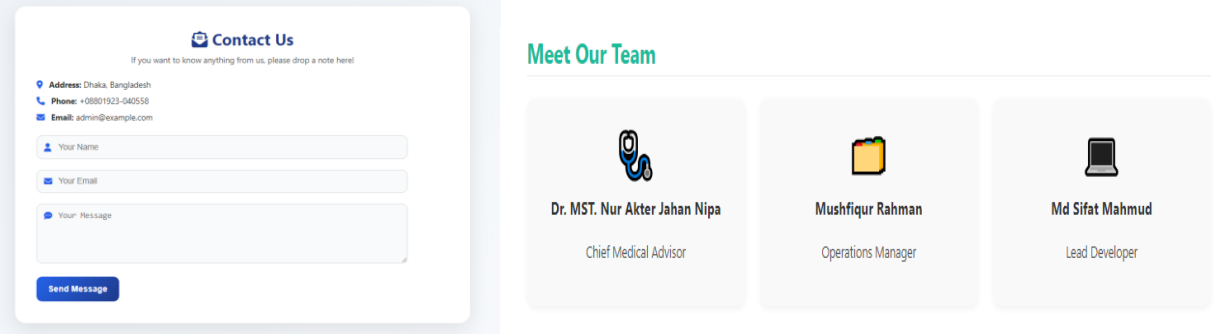


Figure 4.6.21 Screenshots of Everyone See Contact & Message Our Team

4.6.22 Everyone can See Our Services Section

In this section, all users, including unregistered visitors, can explore the various healthcare services offered by the platform.

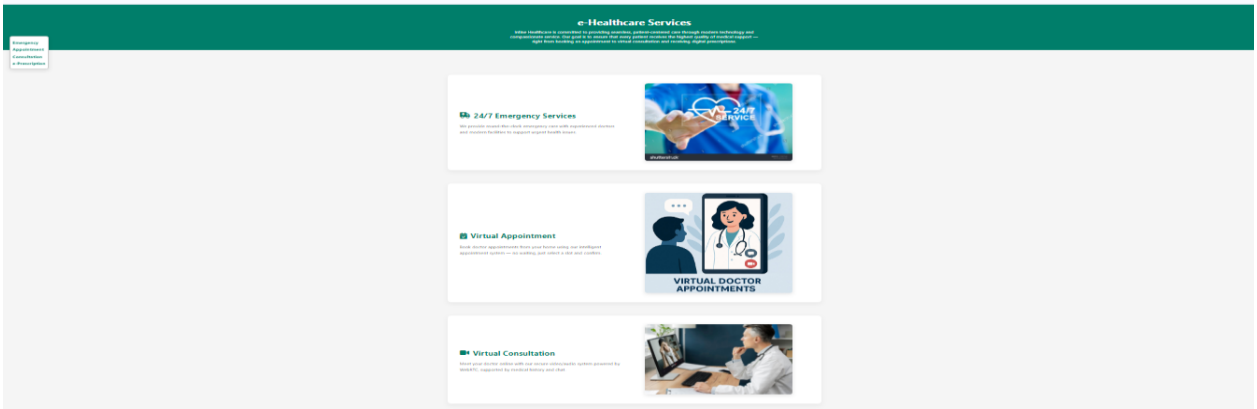


Figure 4.6.22 Screenshots of Our Services Section

4.6.23 Everyone can See Our about Section

In this section, all users—including unregistered visitors—can learn about the mission, vision, and background of the healthcare platform. It provides information about the organization's values, goals, team members, and the quality of care and services offered to patients

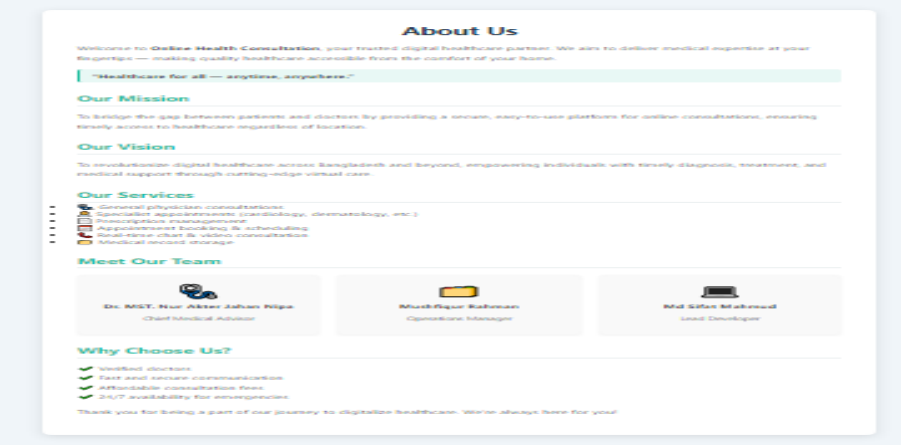


Figure 4.6.23 Screenshots of Our About Section

4.6.24 Everyone can See Our Blog Section

In this section, all users, The file is an HTML structure for a blog post titled "Viral Fever: Symptoms, Causes & Treatment". It includes styled sections covering the Causes, Symptoms, and Prevention of viral fever. The page features a navigation footer with links to a previous page, Home, and an About-us page.

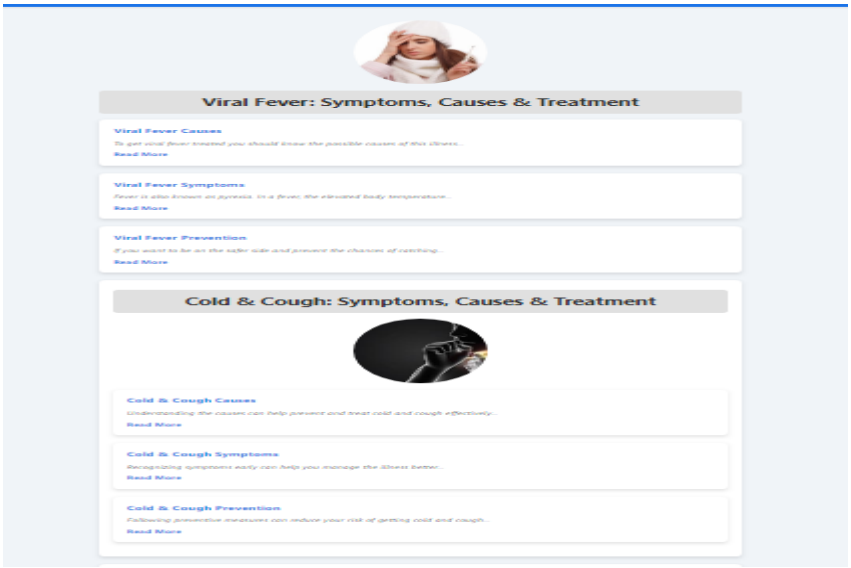


Figure 4.6.24 Screenshots of Our Blog Section

4.7 Implementation Requirements

Based on the design, the system was developed in small modular units, each individually tested via **Unit Testing** to ensure correct functionality and early error identification before integration into the complete, reliable system.

4.7.1 Requirement Collection and Analysis

In this project, requirement gathering was primarily conducted through interviews with various stakeholders involved in the Online Doctor Appointment System. The participants cooperated effectively and provided the relevant information necessary for understanding the system. The insights gained through these interactions offered a clear picture of the system's functionality and helped identify the key users and their specific requirements. This foundational step ensured that the system design would align closely with real-world needs.

4.7.2 Design Requirement

The design and development process of the website was illustrated using various modeling tools, including use case diagrams, use case descriptions, and entity-relationship (E-R) diagrams. The entire system design is user-friendly and intuitive, ensuring that even non-technical users can easily understand the system by reviewing the provided diagrams. Modern and widely adopted design tools such as Google Chrome, Microsoft Edge, and other relevant platforms were utilized during the development. The design is flexible and allows for future modifications or enhancements as required. The working procedure of the website is outlined below.

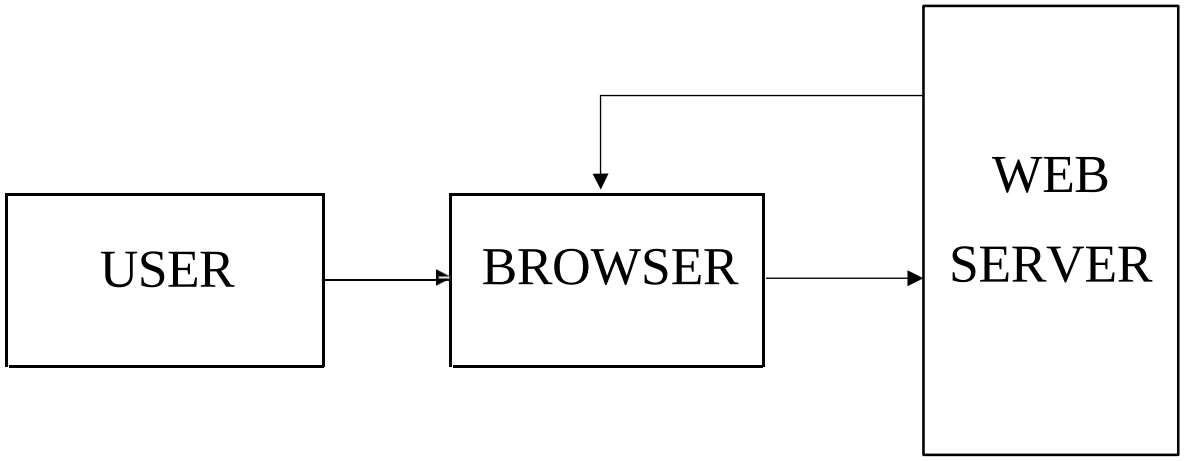


Figure 4.7.2 Website Working Procedure

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Testing Implementation

A new, comprehensive **test suite** was designed to evaluate the unique characteristics of each website feature and functionality, verifying that the system is **reliable, secure, useful, effective, and efficient** while ensuring all components function properly and meet specified requirements.

Table 4 Testing Implementation

Features	Priority	Description
Login	L	Should access the system after successful login.
Logout	L	Session to be destroyed after logout.
Assign Doctor	M	Management can assign doctors.
Doctor profile	M	Admin can browse doctor's info.
Patient profile	M	Admin can browse patient's info.
Appointment List	H	It's the most important part. Admin, doctors and patients know their appointments.
Book Appointment	H	Patients can book appointments.
My Profile	L	Admin and doctors can edit their profile.
Approve Appointment	H	Doctor can approve patient's appointment.
Cancel Appointment Status	H	Doctor can cancel patient's appointment.

Here, L= Low priority, M= Medium Priority, H= High Priority

5.1.1 Test Approach

To complete the testing process, testers must follow a structured approach. There are mainly two types of test approaches:

5.1.2 Automation Testing

Automation testing is a technique that uses specialized tools and applications to execute the software testing life cycle more efficiently and in less time. It enhances the effectiveness and accuracy of the testing process. In automation testing, the tester writes test scripts and uses appropriate software tools to automatically perform testing tasks that would otherwise be done manually. Essentially, it is the automation of the manual testing process to improve speed, consistency, and repeatability.

5.1.3 Manual Testing

Manual testing is the process in which testers manually operate the software application as an end-user to verify that all functions and features are working as expected. Testers follow a predefined set of test cases without using any automated tools. This approach helps identify bugs, usability issues, and unexpected behavior by simulating real user interactions with the system.

5.1.4 Black Box Testing

Black box testing is a software testing method where the tester does not have any knowledge of the internal structure, design, or implementation of the system being tested. The focus is on input and output—verifying that the software behaves as expected based on the given requirements. This method can be used for both functional and non-functional testing, although it is typically applied to functional testing. It is called "black box" because, to the tester, the internal workings of the application are invisible—like looking into a sealed box.

5.1.5 Equivalent Class Partition

Equivalence Partitioning (EP) is a black-box testing technique that divides input data into partitions of equivalent data from which test cases can be derived. It can be applied at any level of testing and is often a good technique to begin with. In this method, it is assumed that all inputs in a particular partition will be treated similarly by the software. Therefore, only one representative test case is needed from each partition. If that test case passes, it is assumed that all other values in that partition would also pass. This approach reduces the number of test cases without compromising test coverage.

5.1.6 Boundary Value Analysis

Boundary Value Analysis is a black box testing technique used to identify defects at the boundaries of input domains rather than within the ranges. This technique assumes that errors are more likely to occur at the edges of input ranges, so it focuses on testing those boundary conditions.

5.2 Pass/Fail Criteria

Test engineers generally define the pass/fail criteria based on which input data works and which doesn't. The criteria are used to assess whether the input meets the system's requirements.

For this system, the Pass/Fail Criteria are as follows:

1. One Criterion Should Always Pass**:**
   - ✓ At least one criterion (e.g., length, format) must always pass for the input tobe considered valid.
2. System Crash Consideration**:**
   - ✓ If the system crashes during processing, it will be considered a failure.
3. Expected Results Must Be Shown**:**
   - ✓ If the system does not show the expected results (e.g., incorrect validation or failure to accept valid passwords), it will be considered a failure.

Key Terms:

- **Pass Criteria**: The conditions under which the input is valid, and functions as expected.
- **Fail Criteria**: When the system crashes or does not produce the expected result.

5.3 Testing Environment

Test engineers need to set up a specific environment, consisting of both hardware and software, to execute the required test cases. This setup is known as the testing environment**.** Sometimes, a network is also necessary for executing the test plan.

Key Areas of the Testing Environment:

- Test Data
- Operating System
- Browser
- Database Server
- Network
- Project Documentation
- Hardware with Server Operating System

5.4 Test Results and Reports

The process of developing test cases helps identify issues in the requirements or design of an application. A test case is a set of conditions or inputs used to verify whether the system meets its specified requirements.

Key Points:

- Test cases help identify faults, errors, or weak points ("break holes") in the system.
- Using proper test cases makes it easier to detect and fix issues.
- 100% error-free systems are nearly impossible, but maximum possible testing should be done to minimize errors.
- Choosing the right test cases is critical for ensuring system reliability and functionality.
- Well-designed test cases increase the chances of detecting hidden defects.

CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 Conclusion

The ODAS project has successfully created a working, secure platform for managing outpatient services. It addresses common problems like double bookings, lost records, and poor communication between staff and patients.

This system brings benefits to doctors**,** patients, and hospitals by offering better time management and streamlined communication.

Key Features for Doctors:

- Receive and manage appointment requests.
- Access patient profiles.
- Set and update their own schedules.
- Provide prescriptions online.

Key Features for Patients:

- Easily booking doctor appointments.
- View doctor availability in real-time.
- Access prescriptions online.
- Communicate with doctors anytime.

Motivated by the increasing vital role of the healthcare system and informed by research into existing platforms and user needs, we developed this **Online Doctor Appointment System**. This system was well-received by stakeholders, who appreciated its potential to provide **convenience and save time** while also reducing overall healthcare costs and minimizing patient waiting times. Despite facing development challenges, the project was successfully completed, and this document outlines its benefits and provides a clear understanding of the system, though its **full potential relies on both doctors and patients following usage guidelines**.

6.2 Future Works

In the future, we are committed to making the **Online Doctor Appointment System** more user-friendly and feature-rich by transforming it into a comprehensive online treatment and hospital management platform. Our immediate plans include adding an online emergency treatment system and, within the next couple of months, introducing a video call consultation feature to promote the platform as a telemedicine service, allowing patients in remote areas timely access to medical advice. Further enhancements will focus on refining the system for better accessibility and power, potentially adding features like automatic SMS/email appointment reminders and online check-in processes, ultimately ensuring timely medical consultation for people regardless of their location.

6.3 Limitations

The Online Doctor Appointment System, like any technology, faces several limitations, which include issues with electronic stability and performance. Users may experience electronic glitches such as unexpected disconnections during important consultations, as well as frustrating lags in chat or audio that compromise communication effectiveness. During peak usage hours, the system's performance can suffer from slow loading times or delayed responsiveness when multiple users access it simultaneously, affecting overall user satisfaction. Additionally, users may occasionally encounter login issues stemming from factors like browser compatibility or session time-out errors. Although the system offers many benefits, the development team acknowledges these challenges and is actively committed to identifying bugs, optimizing performance, and improving overall system reliability to deliver a more stable and efficient platform for all users.

REFERENCES

[1] Ben Frain. (2021). Responsive Web Design with HTML5 and CSS (4th edition)

[2] Marijn Haverbeke. (2019). Eloquent JavaScript: A Modern Introduction to Programming (3rd edition)

[3] Mike McGrath. (2018). JavaScript in easy steps (4th edition)

[4] Mr. Daniel Foreman, Mr. Daniel Charles Foreman. (September 24, 2010). Beginning PHP and MySQL: From Novice to Professional (4th edition).

[5] The Royal Australian College of General Practitioners, "Online appointment technology," [Online]. Available: https://www.racgp.org.au/running-a-practice/technology/business-technology/online-appointment-technology.

[6] "Effectiveness of web-based interventions on patient empowerment: a systematic review and meta-analysis," *PubMed*. [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/20581001/.

[7] L. Edwards et al., "Are people with chronic diseases interested in using telehealth? A cross-sectional postal survey," *J. Med. Internet Res.* [Online]. Available: https://scholar.google.com/.

[8] K. M. McConnochie et al., "Differences in diagnosis and treatment using telemedicine versus in-person evaluation of acute illness," *Ambulatory Pediatrics*, vol. 6, no. 5, pp. 242-247, 2006.

[9] V. Rallapalli et al., "Title of Paper," *International Journal of Engineering Research and Applications*, vol. 12, no. 4, Series-III, 2022. [Online]. Available: https://www.ijera.com/papers/vol12no4/Ser-3/I1204034852.pdf.

[10] S. M. Hosseini, S. A. Boushehri, and K. Allahhamzadeh, "Challenges and solutions for implementing telemedicine," *BMC Health Services Research*, 2020. [Online]. Available: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-023-10488-6.