Design & Implementation of Doctor Appointment System

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Supervised by
Sabrina Tasnim

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)
May 2025

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APPROVAL

The project titled "**Design & Implementation of Doctor Appointment System**" submitted by Asadul Islam (CSE2103024070), Istak Hossain (CSE2103024066),Al Amin (CSE2103024014) and MD. Shakil (CSE2001019018) to the Department of Computer Science and Engineering, Sonargaon University (SU), has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering and approved as to its style and contents.

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DECLARATION

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

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ABSTRACT

The Doctor Appointment System is an online platform designed to streamline the process of scheduling appointments between healthcare providers and patients. This system aims to enhance the overall efficiency, accessibility, and convenience of healthcare services by automating the traditional appointment booking procedure. It features a simple, user-friendly interface that allows patients to easily book, reschedule, or cancel their appointments with doctors, ensuring a hassle-free experience. Key functionalities of the system include patient registration, doctor profile management, appointment scheduling, and automatic notifications. The system ensures the confidentiality of patient information through encrypted storage of medical records, providing a secure environment for both patients and healthcare professionals. It also helps in managing doctor availability, reducing waiting times, and optimizing the scheduling of healthcare services.

Furthermore, the Doctor Appointment System not only improves patient satisfaction but also assists healthcare professionals in managing their schedules effectively, leading to better time management. This project represents a step toward the modernization of healthcare services, improving operational efficiency and patient care while supporting a more streamlined approach to medical appointment management.

ACKNOWLEDGMENT

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

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We would like to convey our gratitude to **Brig. Gen. (Retd) Prof. Habibur Rahman Kamal**, (Dean, Faculty of Science & Engineering) and special gratitude to our 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.

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

LIST OF ABBREVIATIONS

ASP.NET	Active Server Pages .NET
C#	C-Sharp
CPU	Central Processing Unit
CSS	Cascading Style Sheets
HTML	Hypertext Markup Language
RAM	Random Access Memory
ROM	Read Only Memory
SQL	Structured Query Language

LIST OF TABLES

Table 4.1.1	Use case description of admin……..	10
Table 4.1.2	Use Case Description of Doctor……...	11
Table 4.1.3	Use Case Description of Patient……...	12
Table 5.1	Testing Implementation……	31
Table 5.2	Testing Schedule……..	33

LIST OF FIGURES

Figure 4.1	Use Case Diagram……..	9
Figure 4.3	Data Flow Diagram……	14
Figure 4.4	Flowchart……	15
Figure 4.5	Screenshots of Database tables…….....	16 - 17
Figure 4.6.1	Screenshots of Home Page…….	18
Figure 4.6.2	Screenshots of Admin Login Page…….	18
Figure 4.6.3	Screenshots of Admin Dashboard Page…….	19
Figure 4.6.4	Screenshots of Doctor Add Page……	19
Figure 4.6.5	Screenshots of Manage Clinic……	20
Figure 4.6.6	Screenshots of Add New Staff Page …….....	20
Figure 4.6.7	Screenshots of Patient Sign Up & Login Page……...	21
Figure 4.6.8	Screenshots of Patient Dashboard Page…….	21
Figure 4.6.9	Screenshots of Patient Select Department……..	22
Figure 4.6.10	Screenshots of Patient Select Doctor…….	22
Figure 4.6.11	Screenshots of Patient See Doctor Profile…….	23
Figure 4.6.12	Screenshots of Patient select booking slots……	23
Figure 4.6.13	Screenshots of Patient booking doctor……...	24
Figure 4.6.14	Screenshots of Patient see current appointment…….	24
Figure 4.6.15	Screenshots of Patient see bill history……	24
Figure 4.6.16	Screenshots of Doctor see his profile…….	25
Figure 4.6.17	Screenshots of History of Treated Patients……	25
Figure 4.6.18	Screenshots of Doctor See Pending Appointment…….	26
Figure 4.6.19	Screenshots of Doctor See Today's Appointment…….	26
Figure 4.6.20	Screenshots of Doctor See Today's Appointment…….	27
Figure 4.6.21	Screenshots of Doctor See Today's Appointment…….	27
Figure 4.6.22	Screenshots of Our Services Section…….	28
Figure 4.6.23	Screenshots of Our About Section…….	28
Figure 4.6.24	Screenshots of Our Privacy Policy Section……	29
Figure 4.7.2	Website Working Procedure……..	30

TABLE OF CONTENTS

Title			Page No.
APPROVAL…….			ii
DECLARATION ……			iii
ABSTRACT ……...……			iv
ACKNOWLEDGEMENT ……..……			v
LIST OF ABBREVIATION …….…….			vi
LIST OF TABLES …….…….……			vii
LIST OF FIGURES…….…….……			viii
CHAPTER 1			1 – 2
INTRODUCTION TO DOCTOR APPOINTMENT SYSTEM			
1.1	Introduction ……..……...		1
1.2	Objectives……...……		1
1.3	Stakeholders…….……...		1-2
1.4	Tools		2
	1.4.1 Hardware ……...		2
	1.4.2 Software…….		2
	1.4.3 Languages……..		2
1.5	Expected Benefits……		2
CHAPTER 2			3 – 3
PROBLEM STATEMENT			
2.1	Introduction ……		3
2.2	Solution …….…….		3
CHAPTER 3			4 – 7
LITRATURE REVIEW			
3.1	Introduction……..……		4
3.2	Background ……..…….……..		4
3.3	Feasibility Study……..		4
	3.3.1	Operational Feasibility……	4 - 5
	3.3.2	Technical Feasibility……..	5
	3.3.3	Economical Feasibility…….……...	5
3.4	Challenges……		5 - 6
3.5	Benefits……		6 - 7
CHAPTER 4			8 – 30
ANALYSIS AND DESIGN OF PROPOSED SYSTEM			
4.1	Use Case Modeling and Description…….……...……..		8 - 9
	4.1.1	Use Case Description of Admin…….……	10
	4.1.2	Use Case Description of Doctor…….……	11
	4.1.3	Use Case Description of Patient…….……	12
4.2	E-R Diagram……...		13
4.3	Data Flow……		14
4.4	Flowchart…….....		15
4.5	Snapshot of Database…….....		16 - 17

4.6 Snapshot of Front-End…… 18
4.6.1 Home Page……. 18
4.6.2 Admin Login……. 18
4.6.3 Admin Dashboard…….. 19
4.6.4 Doctor Page…… 19
4.6.5 Manage Clinic……. 20
4.6.6 Add New Staff Page ……. 20
4.6.7 Patient Sign Up & Login Page……... 21
4.6.8 Patient Dashboard…….. 21
4.6.9 Patient can Select Department…… 22
4.6.10 Patient can Select Doctor…… 22
4.6.11 Patient can See Doctor Profile…… 23
4.6.12 Patient can Select Booking……. 23
4.6.13 Patient can Booking Doctor…… 24
4.6.14 Patient can See the Current Appointment……... 24
4.6.15 Patient can See Bill History…… 24
4.6.16 Doctor Can See His Profile……..... 25
4.6.17 History of Treated Patients…….. 25
4.6.18 Doctor can See Pending Appointment……..... 26
4.6.19 Doctor can See Today's Appointments…… 26
4.6.20 Everyone can See Our Doctor List……... 27
4.6.21 Everyone can Contact & Message Our Team……... 27
4.6.22 Everyone can See Our Services Section……... 28
4.6.23 Everyone can See Our About Section…….. 28
4.6.24 Everyone can See Our Privacy Policy Section……. 29
4.7 Implementation Requirements…….. 29
4.7.1 Requirement Collection and Analysis…….. 29
4.7.2 Design Requirement……. 30

CHAPTER 5 31 – 34
IMPLEMENTATION AND TESTING
5.1 Testing Implementation …… 31
5.1.1 Test Approach …….. 32
5.1.2 Automation Testing …….. 32
5.1.3 Manual Testing…….. 32
5.1.4 Black Box Testing……. 32
5.1.5 Equivalent Class Partition……. 32
5.1.6 Boundary Value Analysis…….. 33
5.2 Pass/Fail Criteria…… 33
5.3 Testing Environment……. 34
5.4 Test Results and Reports……... 34

CHAPTER 6 35 - 37
CONCLUSION AND FUTURE WORK 35

6.1 Conclusion ……..... 35
6.2 Future Works …… 36
6.3 Limitations…… 36
6.3.1 Lack of IT Staff…….. 37
6.3.2 No In-person Consultations…… 37
6.3.3 Decreased Care Continuity……. 37

REFERENCES ……..…… 38

CHAPTER 1

INTRODUCTION TO DOCTOR APPOINTMENT SYSTEM

1.1 Introduction

In the digital age, online systems are transforming various sectors, including healthcare. Patient empowerment is growing in popularity and application. Due to the increasing possibilities of the Internet and eHealth, many initiatives that are aimed at empowering patients are delivered online [2]. The Doctor Appointment Booking System is designed to provide an efficient way for patients to book, reschedule, and cancel appointments with doctors. Unlike traditional methods, this system offers a seamless, user-friendly solution that improves accessibility and reduces inefficiency. The system simplifies appointment management by allowing patients to schedule consultations online, while also sending reminders to reduce missed appointments. In emergencies, it enables patients to quickly contact available doctors and book urgent consultations. Integration with electronic medical records allows doctors to access patients' medical history, enhancing diagnosis and treatment. Additionally, the system uses cloud-based technology for data storage and retrieval across devices, ensuring easy integration with existing healthcare systems. It also helps manage large volumes of patient data, providing insights into appointment patterns through digital analytics. This reduces administrative work, minimizes errors, and improves overall patient care, making the system highly beneficial for both patients and healthcare providers.

1.2 Objectives

The Doctor Appointment System is designed specifically for patients who reside in remote areas and face difficulties attending clinics regularly due to transportation costs. This system aims to provide easy access to medical consultations, especially for patients requiring emergency first-aid treatment. We designed a telemedicine model for diagnosis of common, acute illness to compare telemedicine and in-person evaluations on reproducibility of diagnosis and treatment.[4]

The system ensures 24/7 availability of first aid treatments, allowing patients to contact doctors via online messages. It also provides protocols for managing issues such as liability, negligence, doctor-patient relationships, treatment management, informed consent, continuity of care, emergency referrals, medical records, and patient privacy.

Furthermore, the system improves the efficiency of record maintenance, reducing the time spent managing patient information. By eliminating errors in patient data management, it provides a streamlined and efficient approach for doctors, enhancing the overall patient care experience.

1.3 Stakeholders

The " Doctor Appointment System" has three main stakeholders:

a) Admin: the admin manages the system, registers doctors and patients, oversees security, and generates reports to ensure smooth operation.

b) Doctor: Doctors manage their schedules, update availability, and interact with patients through online consultations.

c) Patients: Patients book appointments, reschedule or cancel if needed, and communicate with doctors for consultations and follow-ups.

1.4 Tools

1.4.1 Hardware

- Processor: Intel Core i3 7th Gen (3.9 GHz)
- RAM: 8 GB
- SSD: 256 GB
- Hard Disk: 1 TB

1.4.2 Software

- SQL Server Management Studio
- Visual Studio Code

1.4.3 Languages

- Front-end:
    1. HTML
    2. CSS
    3. Bootstrap
    4. JavaScript
- Back-end:
    1. C#
    2. MySQL

1.5 Expected Benefits

The Doctor Appointment System provides patients with the flexibility to book appointments at any time of the day. Patients can schedule their appointments before going to bed, early in the morning, or even on weekends when their usual clinic might be closed. This eliminates much of the hassle for receptionist staff, who no longer need to handle phone calls all day. Instead, they can simply log into the system and view who has booked an appointment.

Time Saving: Traditional appointment booking systems require significant time, with staff spending much of their day on the phone. This online booking system saves time, as patients no longer need to interrupt their busy schedules to call their healthcare provider. For example, a phone booking system might take an average of four minutes to book an appointment for just one patient. Our system, however, streamlines the process and reduces this time.

Monetary Savings: In a traditional doctor's office, staff may be required to collect payments for appointments, sometimes in an unethical manner to speed up the process. The online system removes this issue, ensuring transparency and reducing the reliance on in-person payments.

Sustaining Tranquility: When patients are unwell, they typically need to visit a doctor and wait in long queues, leading to a chaotic environment. The online system reduces the need for physical visits to book appointments, helping maintain a peaceful atmosphere by eliminating long waiting times and the rush at the doctor's office.

CHAPTER 2

PROBLEM STATEMENT

2.1 Introduction

The Doctor Appointment System faced a few challenges during development, such as occasional "Not Found" errors and image display issues. However, our team was quick to find solutions, such as clearing the cache and restarting the server. These problems were resolved with some research and collaboration.

There is growing interest in telehealth, the use of technology to support the remote delivery of health care and promote self-management—as a potential alternative to face-to-face care for patients with chronic diseases. However, little is known about what precipitates interest in the use of telehealth among these patients [3].

The current system has room for improvement in terms of convenience for patients. While it's primarily manual, our goal is to provide a fully online solution that is easy to use and trustworthy. By addressing the limitations of the existing system, we aim to enhance the booking experience for patients.

Our focus is on:

- Expanding accessibility across platforms.
- Streamlining the appointment process.
- Building trust in the online system.

We're committed to solving these challenges to create a more efficient and user-friendly Doctor Appointment System.

2.2 Solution

We encountered challenges in designing a user-friendly patient dashboard, particularly in determining the essential features and layout. After reviewing demo examples and discussing with our team, we successfully created a website that meets our goals. The result is a Doctor Appointment System that is easy to use and intuitive for patients, offering a seamless booking experience.

CHAPTER 3

LITRATURE REVIEW

3.1 Introduction

A literature review surveys journals, articles, books, and other research sources, providing a foundation for the theoretical framework of a study. It defines the concepts and objectives of research on specific topics. An online clinical appointment system allows patients to book appointments via online registration, offering a convenient, accessible, and secure method. In recent years, healthcare has become a critical service, especially in developing countries, with online systems providing an efficient and safer way for patients to access healthcare.

Online appointment technology allows patients to book appointments online through internet-connected devices, such as computers, tablets and smart phones [1].

3.2 Background

This project focuses on automating the Doctor Appointment System in the corporate sector, aiming to streamline patient management and medical service delivery. Hospitals play a crucial role in providing medical services for a variety of health issues caused by factors like climate, stress, and workload. Effective hospital management requires careful tracking of daily activities, patient records, and doctor schedules. Key challenges in healthcare, both in developed and developing countries, include access, equality, quality, and cost-effectiveness.

The Doctor Appointment System addresses these challenges, especially in remote or isolated areas, by allowing patients to consult doctors without traveling long distances. This system is particularly beneficial for elderly or bedridden patients. It reduces the need for outpatient visits and enables remote monitoring, leading to cost savings in medical care. In Bangladesh, where healthcare access is limited due to financial and resource constraints, this system can reduce costs, ease the burden on hospitals, and provide timely healthcare to rural patients. As the system gains adoption, it will significantly improve healthcare access and delivery.

3.3 Feasibility Study

A feasibility study is a key step in analyzing and designing a system. It evaluates the potential solutions to ensure that they meet the user requirements and are flexible for future changes. While all projects are feasible with unlimited resources and time, a feasibility study assesses the practicality of the solution under real constraints.

The feasibility study consists of three parts:

1. **Operational Feasibility**: Ensures that the system will meet the operational needs of users and stakeholders.
2. **Technical Feasibility**: Examines if the proposed solution can be implemented with the available technology and infrastructure.
3. **Economic Feasibility**: Assesses whether the project is financially viable, considering the costs and expected benefits.

3.3.1 Operational Feasibility

Operational feasibility assesses how effectively a proposed system addresses the identified problems and opportunities. It also evaluates how well the system meets the requirements defined during the analysis phase. The proposed Doctor Appointment System is fully GUI-based, making it user-friendly and easy for even non-technical users to understand. Training sessions have been provided to ensure users are comfortable with the system. Feedback from clients shows that they are satisfied with the system, as it has significantly reduced their workload and improved efficiency.

3.3.2 Technical Feasibility

Technical feasibility assesses whether the required technology for the system exists, how challenging it will be to build, and whether the organization has the necessary expertise. The Doctor Appointment System is developed on the Windows 10 platform, with a configuration of 8GB RAM and a Core-i3 7th Gen processor, which makes it technically feasible. The assessment focuses on evaluating the current hardware and software resources of the organization and their suitability for the proposed system's requirements.

3.3.3 Economical Feasibility

Economic feasibility involves analyzing the costs and benefits of the proposed project. This study focuses on determining the financial viability of the Doctor Appointment System by evaluating all costs associated with its development. This includes the costs for hardware, software, design, development, and operational expenses. Additionally, ongoing maintenance and support costs are considered.

The purpose of this assessment is to quantify and identify the expected benefits, both tangible and intangible, that the system will provide. By comparing these benefits with the projected costs, we aim to determine whether the project will be economically beneficial for the organization. This analysis ensures that the project is not only feasible from a technical and operational standpoint but also provides positive financial returns, making it a worthwhile investment for the stakeholders involved.

3.4 Challenges

Every project comes with its own set of challenges, and the Doctor Appointment System is no exception. Despite its advantages, we encountered several hurdles during development and implementation. Being a web-based system, the process requires users to have access to devices such as computers, laptops, smartphones, or tablets. However, if users do not have these devices or lack internet connectivity, they may not be able to access the system, limiting its effectiveness.

Another key challenge is ensuring that doctors promptly check notifications and confirm patient bookings. If the doctors fail to do so, the system’s core function of scheduling appointments efficiently becomes compromised, rendering the system ineffective.

As a relatively new healthcare solution in Bangladesh, the online doctor appointment system faces multiple challenges, including:

- Limitation of Technical Resources
- 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 an 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

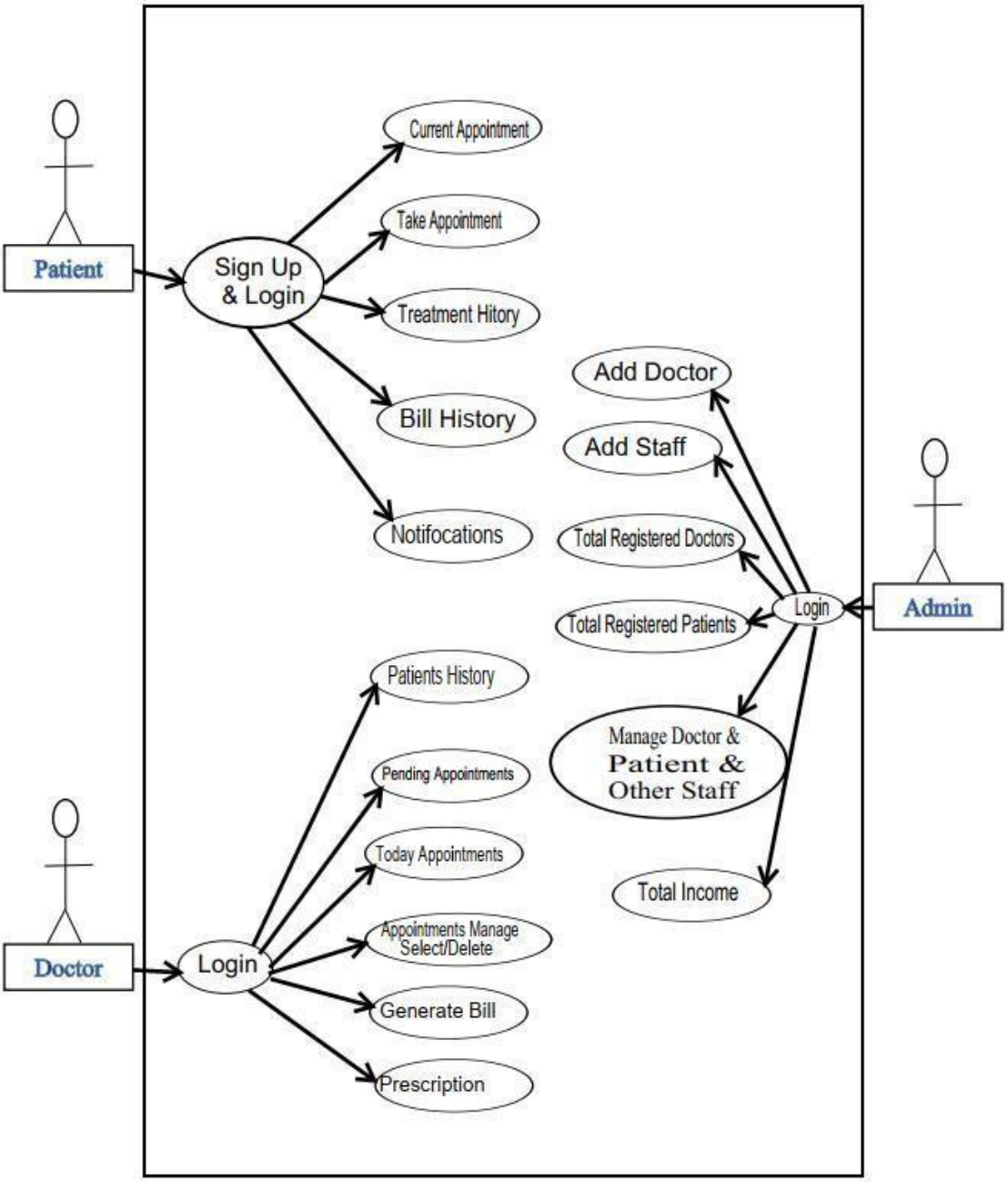


Figure 4.1 Use Case Diagram

4.1.1 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, patients, and other staff details.
	Click on “Add Doctor” to register a new doctor with specialization info.
	Click on “Add Staff” to add new system staff.
	Click on “Manage Doctor & Patient & Other Staff” 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 “Total Income” to check the hospital/clinic’s income summary.

Table 4.1.1 Use case description of admin

4.1.2 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 on “Patients History” to see the treatment records of patients.
	Click on “Pending Appointments” to view appointments not yet handled.
	Click on “Today Appointments” to see same-day schedules.
	Click on “Appointments Manage Select/Delete” to organize appointments.
	Click on “Generate Bill” to prepare the patient’s billing details.
	Click on “Prescription” to write and upload patient prescriptions.

Table 4.1.2 Use Case Description of Doctor

4.1.3 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 “Treatment History” to view medical records.
	Click on “Bill History” to check payments and past bills.
	Click on “Notifications” to read messages and reminders from the system.

Table 4.1.3 Use Case Description of Patient

4.2 E-R Diagram

An ER (Entity-Relationship) diagram is a graphical representation of entities and their relationship to each other. It is typically used in computing for organizing data within a database or information system. An Entity is a piece of data, object, or concept that describes what data should be stored. A Relationship defines how data is shared between entities.

Entity

Entities are represented by rectangles in an ER diagram. An entity is an object or concept that has existence in the real world. It includes all those things about which data is collected. A weak entity is an entity that must be defined by a foreign key relationship with another entity, as it cannot be uniquely identified by its own attributes alone.

Attributes

Attributes are represented by ovals in an ER diagram. A key attribute is a unique and distinguishing characteristic of the entity. For example, an employee's social security number could be the key attribute of an employee entity.

Entity Set

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

4.3 Data Flow Diagram

A Data Flow Diagram (DFD) is a method used for the development of the Online Doctor Appointment System. It represents the system's major processes and alternatives that generate the internal flow of project management.

Additionally, the data stores are properly categorized to illustrate the structure of the doctor appointment system. Note that the DFD is an important part of the doctor appointment system as it complements other diagrams by explaining the activities, behaviors, interactions, and structure of the system.

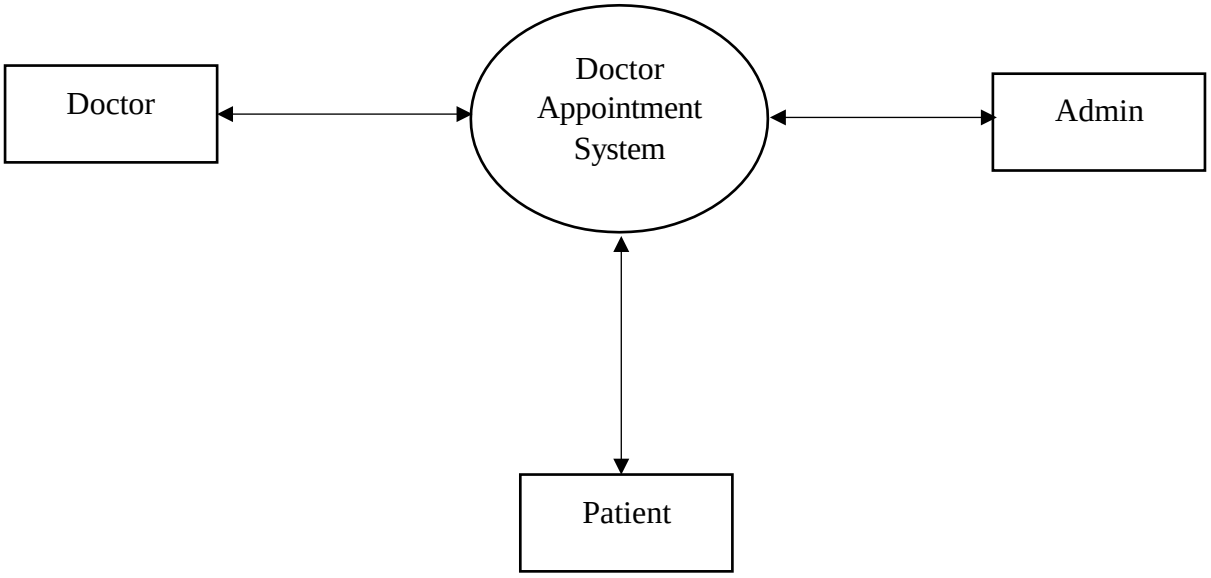


Figure: 4.3 Data Flow Diagram

The importance of the Data Flow Diagram for the Online Doctor Appointment System is to show the developers the actual activities happening within the system. This is done by managing the system's data flow at various levels.

4.4 Flowchart

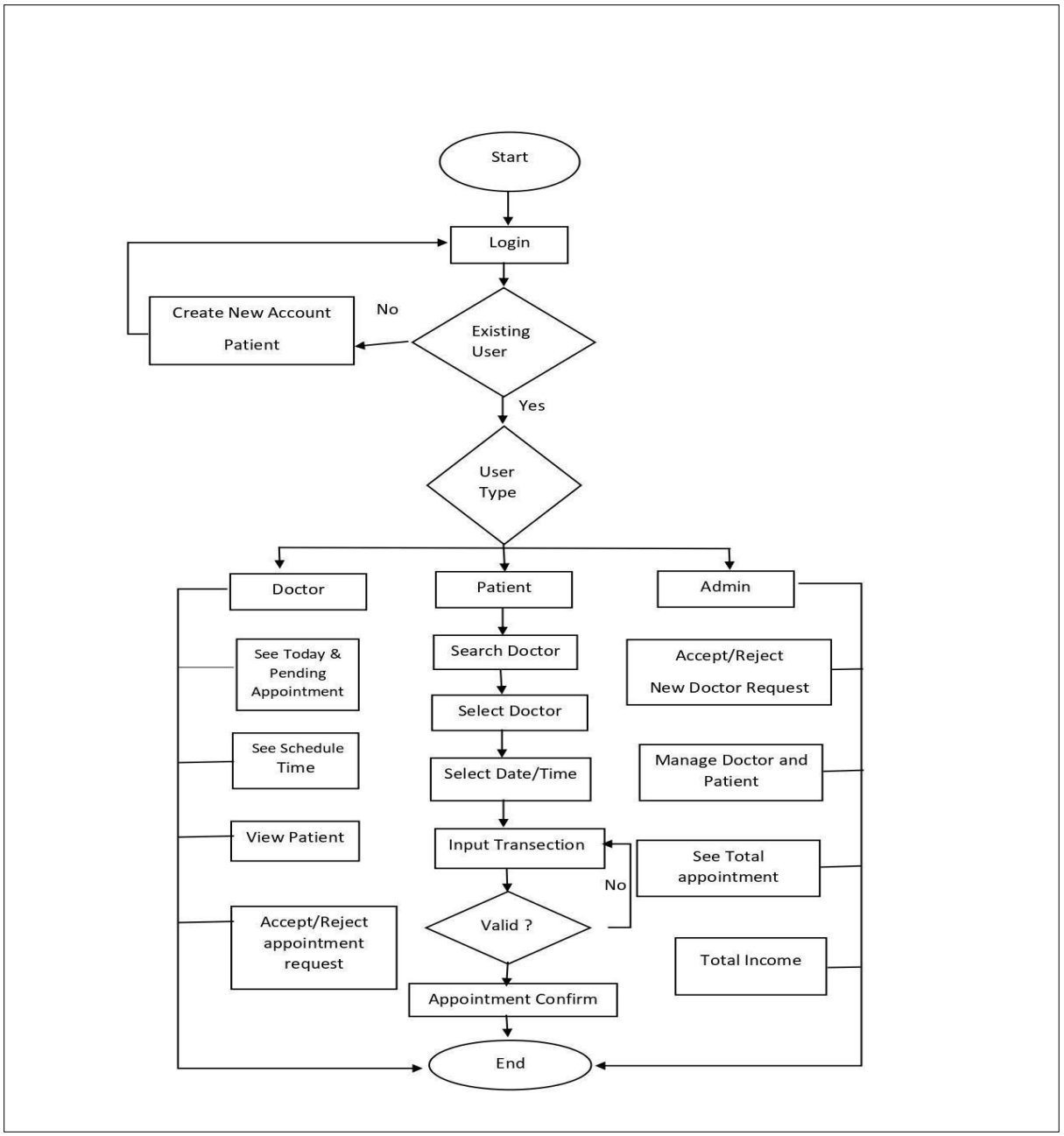
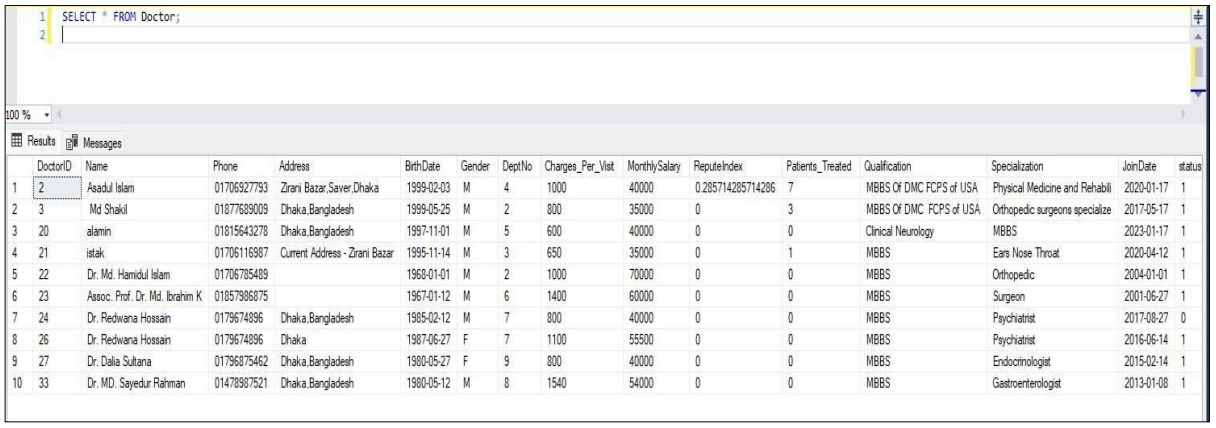


Figure 4.4 Flowchart

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:

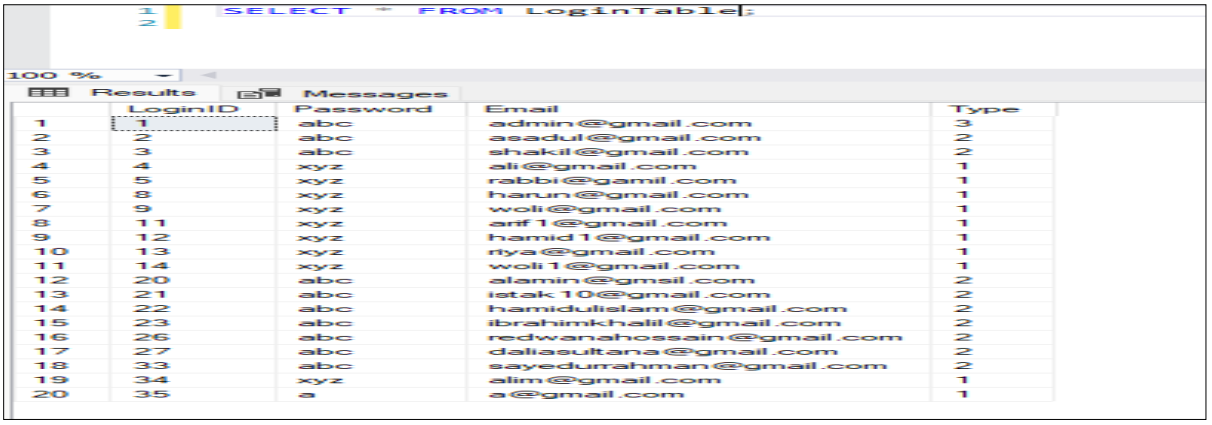


```
SELECT * FROM Doctor;
```

Results | Messages

	DoctorID	Name	Phone	Address	BirthDate	Gender	DeptNo	Charges_Per_Visit	MonthlySalary	ReputeIndex	Patients_Treated	Qualification	Specialization	JoinDate	status
1	2	Asadul Islam	01706927793	Zirani Bazar,Saver,Dhaka	1999-02-03	M	4	1000	40000	0.285714285714286	7	MBBS Of DMC FCPS of USA	Physical Medicine and Rehabili	2020-01-17	1
2	3	Md Shakil	01877689009	Dhaka,Bangladesh	1999-05-25	M	2	800	35000	0	3	MBBS Of DMC FCPS of USA	Orthopedic surgeons specialize	2017-05-17	1
3	20	alamin	01815643278	Dhaka,Bangladesh	1997-11-01	M	5	600	40000	0	0	Clinical Neurology	MBBS	2023-01-17	1
4	21	istak	01706116987	Current Address - Zirani Bazar	1995-11-14	M	3	650	35000	0	1	MBBS	Ears Nose Throat	2020-04-12	1
5	22	Dr. Md. Hamidul Islam	01706785489		1968-01-01	M	2	1000	70000	0	0	MBBS	Orthopedic	2004-01-01	1
6	23	Assoc. Prof. Dr. Md. Ibrahim K	01857986875		1967-01-12	M	6	1400	60000	0	0	MBBS	Surgeon	2001-06-27	1
7	24	Dr. Redwana Hossain	0179674896	Dhaka,Bangladesh	1985-02-12	M	7	800	40000	0	0	MBBS	Psychiatrist	2017-08-27	0
8	26	Dr. Redwana Hossain	0179674896	Dhaka	1987-06-27	F	7	1100	55500	0	0	MBBS	Psychiatrist	2016-06-14	1
9	27	Dr. Dalia Sultana	01796875462	Dhaka,Bangladesh	1980-05-27	F	9	800	40000	0	0	MBBS	Endocrinologist	2015-02-14	1
10	33	Dr. MD. Sayedur Rahman	01478987521	Dhaka,Bangladesh	1980-05-12	M	8	1540	54000	0	0	MBBS	Gastroenterologist	2013-01-08	1

Total Register Doctor & Patient and Admin:

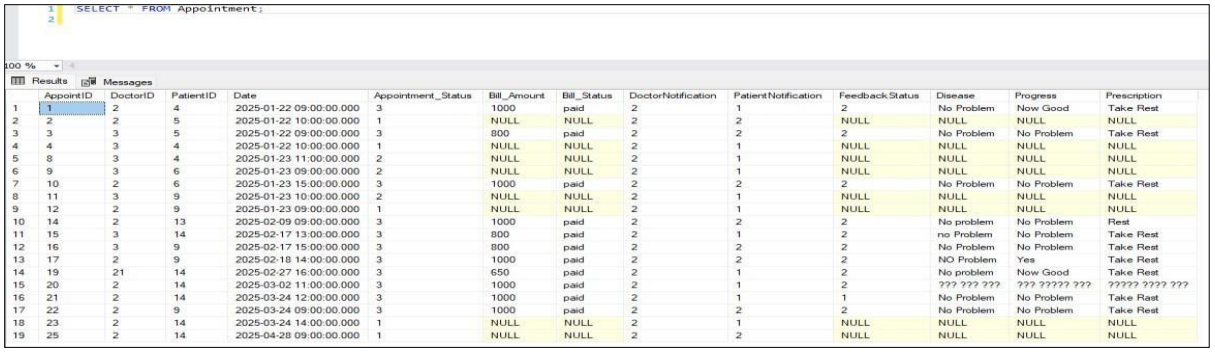


```
SELECT * FROM LoginTable;
```

Results | Messages

	LoginID	Password	Email	Type
1	1	abc	admin@gmail.com	3
2	2	abc	asadul@gmail.com	2
3	3	abc	shakil@gmail.com	2
4	4	xyz	ali@gmail.com	1
5	5	xyz	rabbi@gamil.com	1
6	8	xyz	harun@gmail.com	1
7	9	xyz	woli@gmail.com	1
8	11	xyz	arif1@gmail.com	1
9	12	xyz	hamid1@gmail.com	1
10	13	xyz	riya@gmail.com	1
11	14	xyz	woli1@gmail.com	1
12	20	abc	alamin@gmail.com	2
13	21	abc	istak10@gmail.com	2
14	22	abc	hamidulislam@gmail.com	2
15	23	abc	ibrahimkhalil@gmail.com	2
16	26	abc	redwanahossain@gmail.com	2
17	27	abc	daliasultana@gmail.com	2
18	33	abc	sayedurrahman@gmail.com	2
19	34	xyz	alim@gmail.com	1
20	35	a	a@gmail.com	1

Total Appointment History:



```
SELECT * FROM Appointment;
```

Results | Messages

	AppointID	DoctorID	PatientID	Date	Appointment_Status	Bill_Amount	Bill_Status	DoctorNotification	PatientNotification	FeedbackStatus	Disease	Progress	Prescription
1	1	2	4	2025-01-22 09:00:00.000	3	1000	paid	2	1	2	No Problem	Now Good	Take Rest
2	2	2	5	2025-01-22 10:00:00.000	1	NULL	NULL	2	2	NULL	NULL	NULL	NULL
3	3	3	5	2025-01-22 09:00:00.000	3	800	paid	2	2	2	No Problem	No Problem	Take Rest
4	4	3	4	2025-01-22 10:00:00.000	1	NULL	NULL	2	1	NULL	NULL	NULL	NULL
5	8	3	4	2025-01-23 11:00:00.000	2	NULL	NULL	2	1	NULL	NULL	NULL	NULL
6	9	3	6	2025-01-23 09:00:00.000	2	NULL	NULL	2	1	NULL	NULL	NULL	NULL
7	10	2	6	2025-01-23 15:00:00.000	3	1000	paid	2	2	2	No Problem	No Problem	Take Rest
8	11	3	9	2025-01-23 10:00:00.000	2	NULL	NULL	2	1	NULL	NULL	NULL	NULL
9	12	2	9	2025-01-23 09:00:00.000	1	NULL	NULL	2	1	NULL	NULL	NULL	NULL
10	14	2	13	2025-02-09 09:00:00.000	3	1000	paid	2	2	2	no problem	No Problem	Rest
11	15	3	14	2025-02-17 13:00:00.000	3	800	paid	2	1	2	no Problem	No Problem	Take Rest
12	16	3	9	2025-02-17 15:00:00.000	3	800	paid	2	2	2	No Problem	No Problem	Take Rest
13	17	2	9	2025-02-18 14:00:00.000	3	1000	paid	2	2	2	NO Problem	Yes	Take Rest
14	19	21	14	2025-02-27 16:00:00.000	3	650	paid	2	1	2	No problem	Now Good	Take Rest
15	20	2	14	2025-03-02 11:00:00.000	3	1000	paid	2	1	2	??? ??? ???	??? ????? ???	????? ???? ???
16	21	2	14	2025-03-24 12:00:00.000	3	1000	paid	2	1	1	No Problem	No Problem	Take Rast
17	22	2	9	2025-03-24 09:00:00.000	3	1000	paid	2	2	2	No Problem	No Problem	Take Rest
18	23	2	14	2025-03-24 14:00:00.000	1	NULL	NULL	2	1	NULL	NULL	NULL	NULL
19	25	2	14	2025-04-28 09:00:00.000	1	NULL	NULL	2	2	NULL	NULL	NULL	NULL

Total Contact Us

```
SELECT * FROM ContactUs;
```

100 %

Results | Messages

	Id	Name	Email	Phone	Message	SubmissionDate
1	1	Hamid	hamid@gmail.com	01707957793	কিভাবে আপনাদের সাহায্য নিতে পারবো	2025-01-22 10:14:05.850
2	2	hamid	hamid@gmail.com	01706927789	কিভাবে আপনাদের ডাক্তারের সাথে যোগাযোগ করতে পারি	2025-01-25 10:39:12.307
3	3	আরিফ হোসেন	arif@gmail.com	01487986897	কিভাবে আপনাদের ডাক্তারের সাহায্য নিতে পারি	2025-01-28 16:17:19.730
4	4	আরিফ হোসেন	arif@gmail.com	01487986897	কিভাবে আপনাদের ডাক্তারের সাহায্য নিতে পারি	2025-01-28 16:26:07.230
5	5	আমির হামজা	amir@gmail.com	01706927584	কিভাবে সাহায্য পেতে পারি	2025-01-28 16:56:47.390
6	6	হামিদুল ইসলাম	hamid@gmail.com	01748957854	কিভাবে আপনাদের সেবা পেতে পারি, দয়া করে আমাকে জানা...	2025-02-27 09:00:16.693
7	7	Robin	robin@gmail.com	01745879502	Please let me know how I can get your doctor's services!	2025-02-27 09:02:49.190
8	9	শরিফুল ইসলাম	soriful@gmail.com	01798757421	কিভাবে আপনাদের ডাক্তারের বুকিং নিতে পারি!	2025-03-02 08:43:31.967
9	10	hamidul	hamidul@gmail.com	01706914512	কিভাবে আপনাদের ডাক্তারের সাহায্য নিতে পারি	2025-03-24 10:26:48.257

Total Department

```
SELECT * FROM Department;
```

100 %

Results | Messages

	DeptNo	DeptName	Description
1	1	Cardiology	We have the best heart specialists in town .Each one of them is very competent and experienced.
2	2	Orthopaedics	Orthopedic surgeons use surgical means to treat musculoskeletal trauma, infections, tumors. We believe in the best.
3	3	Ears Nose Throat	They are gentle. And are trained to handle kids as well as adults.
4	4	Physiotherapy	Physiotherapists work through physical therapies such as exercise, and manipulation of bones, joints and muscle tissues.
5	5	Neurology	A medical speciality dealing with disorders of the nervous system. It deals with the diagnosis and treatment of all categories of disease.
6	6	Surgeon	We have the best heart specialists in town. Each one of them is very competent and experienced.
7	7	Psychiatrist	Psychiatrists specialize in diagnosing and treating mental health disorders. Our experts provide the best psychological care.
8	8	Gastroenterologist	Gastroenterologists specialize in digestive system disorders. They handle conditions related to the stomach, intestines, and liver.
9	9	Endocrinologist	Endocrinologists treat hormone-related disorders such as diabetes, thyroid diseases, and metabolic disorders.
10	10	Pediatrician	Pediatricians specialize in the medical care of infants, children, and adolescents, ensuring their healthy growth and development.

Total Patient

```
SELECT * FROM Patient;
```

100 %

Results | Messages

	PatientID	Name	Phone	Address	BirthDate	Gender
1	4	Ali Hasan	01768740236	Dhaka,BD	1997-06-27	M
2	5	Rabbi	01489657934	Dhaka	1987-05-12	M
3	6	woli	01769687485	Dhaka	2007-02-07	M
4	7	hamid	01706927785	Dhaka	2015-01-07	M
5	8	harun	01706687793	Dhaka	1998-06-12	M
6	9	Woli	01706787793	Dhaka	1998-07-14	M
7	10	Arif	01706927768	Dhaka	1998-04-12	M
8	11	Arif	01705827791	Zirani Bazar,Saver,Dhaka	1998-12-12	M
9	13	riya	01712365879	Dhaka	1998-12-15	M
10	14	woli	01706927024	Dhaka	1999-12-12	M
11	34	alim	01706927123	dhaka	1998-02-14	M
12	35	as	a	a	2025-03-04	M

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

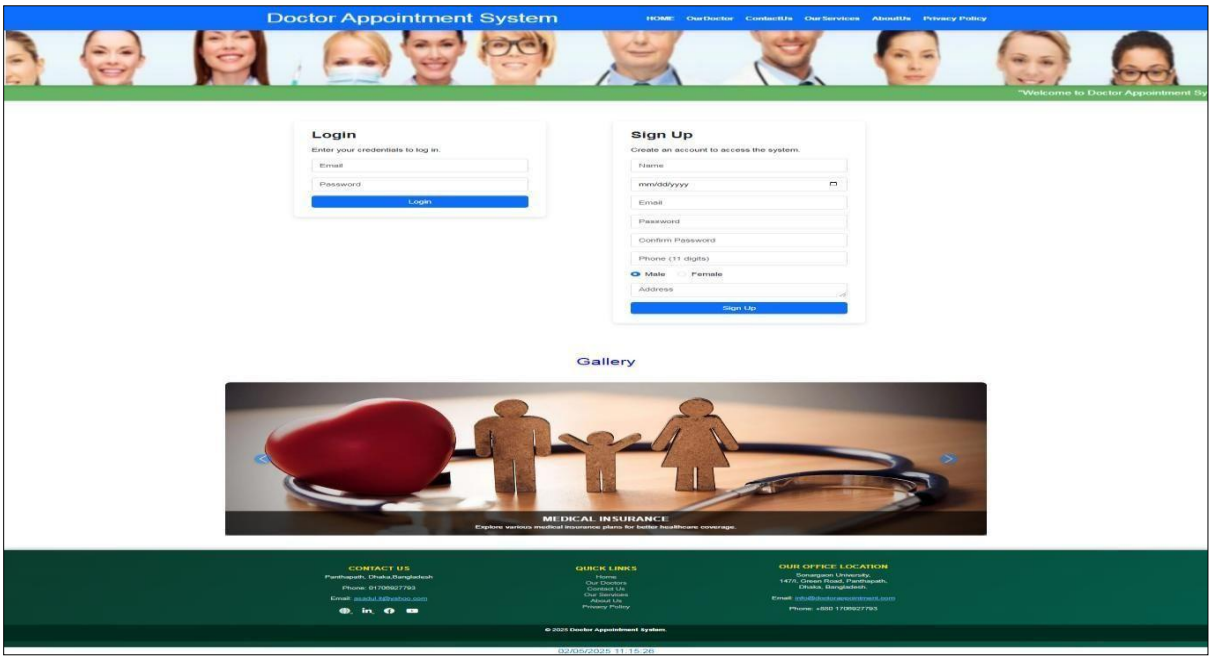


Figure 4.6.1 Screenshots of Home Page

4.6.2 Admin Login Page

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

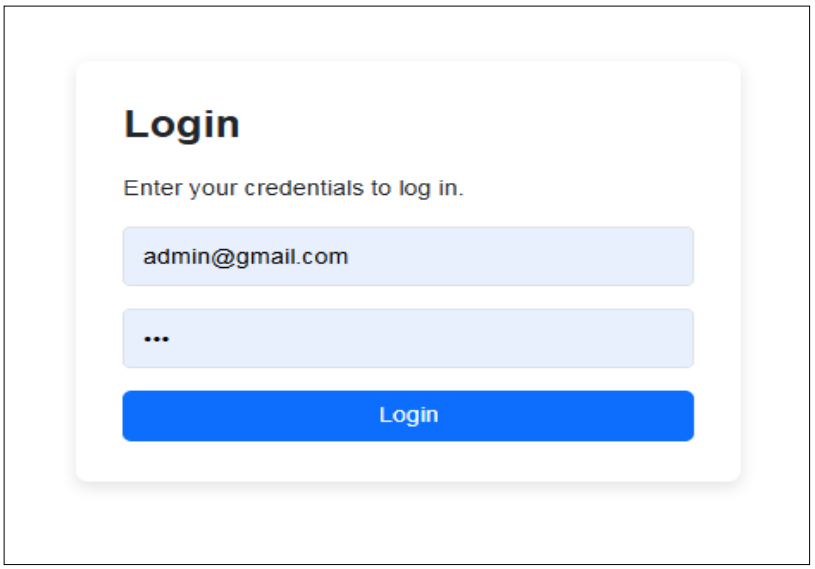


Figure 4.6.2 Screenshots of Admin Login Page

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.

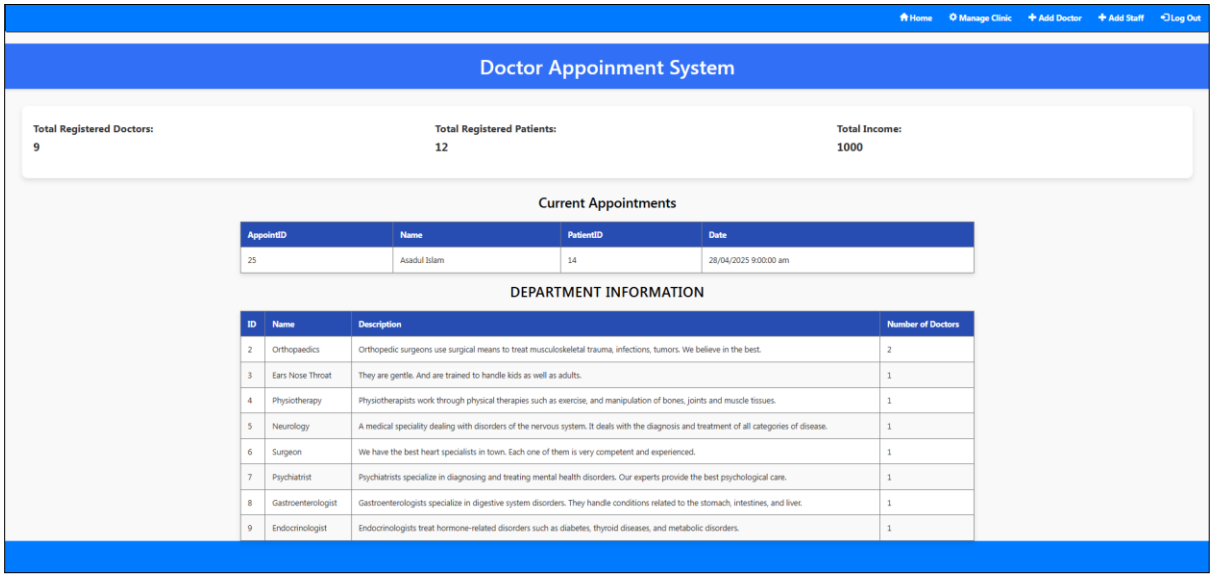


Figure 4.6.3 Screenshots of Admin Dashboard Page

4.6.4 Doctor Add Page

Admin can add new doctors to this page.

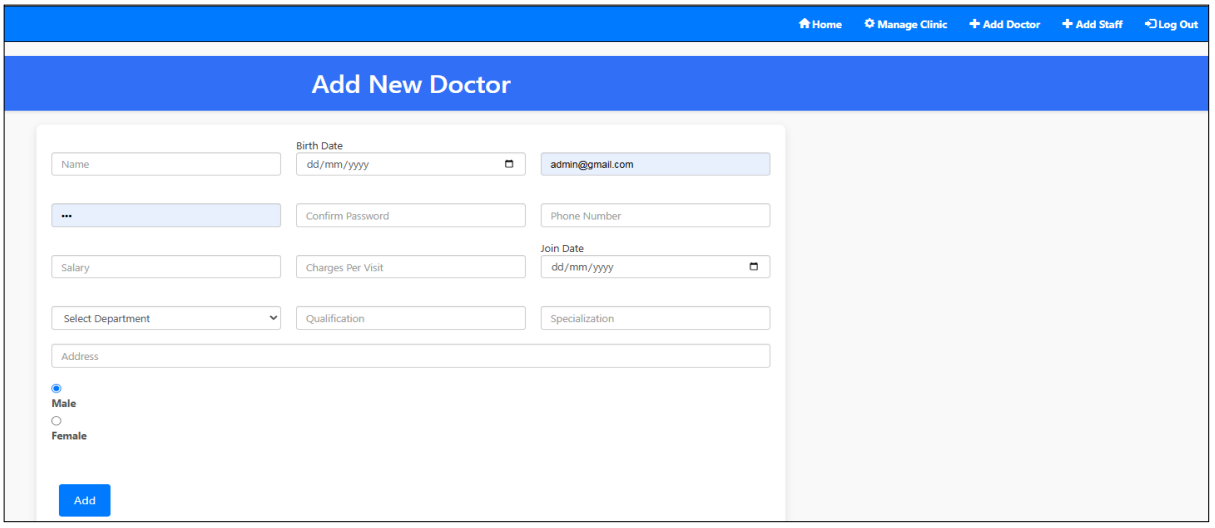


Figure 4.6.4 Screenshots of Doctor Add Page

4.6.5 Manage Clinic

On this page, the admin can manage doctors, patients, and other staff.

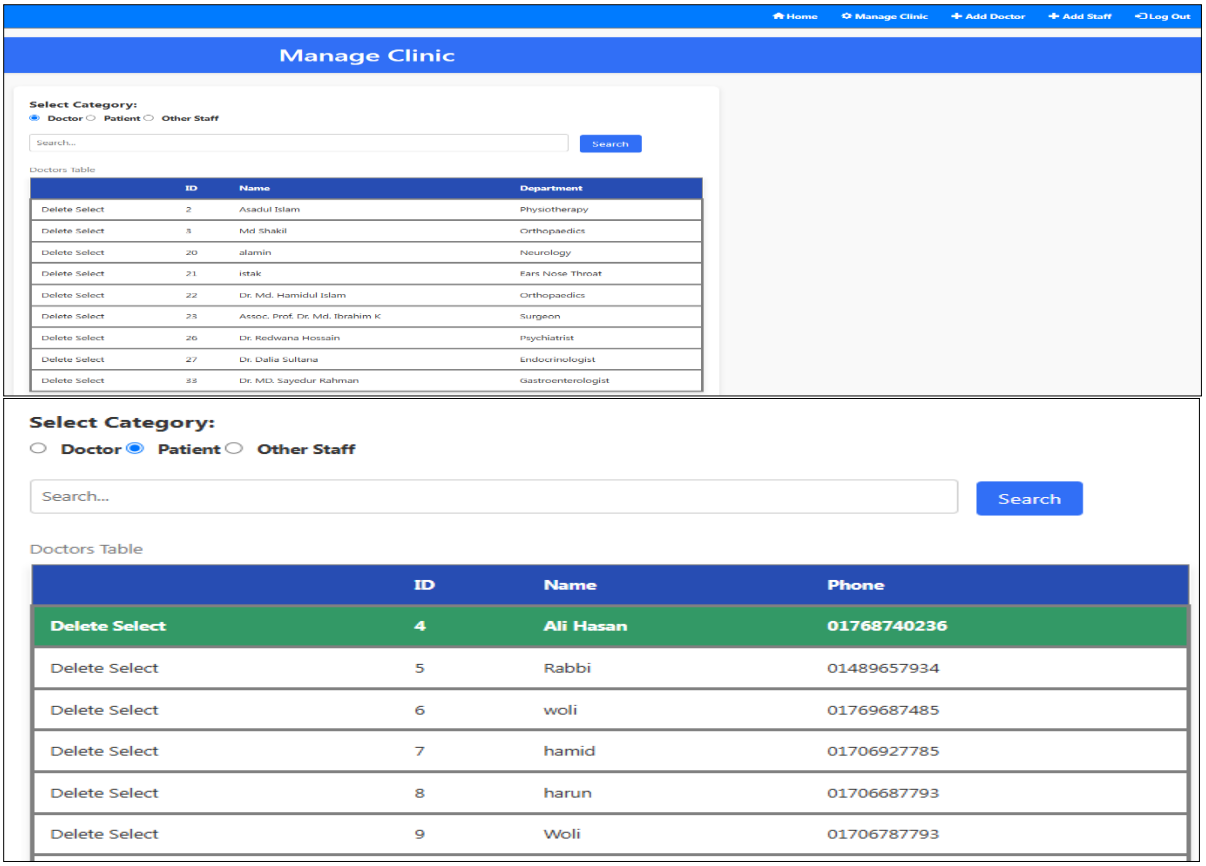


Figure 4.6.5 Screenshots of Manage Clinic

4.6.6 Add New Staff Page

Admin can add new staff to this page.

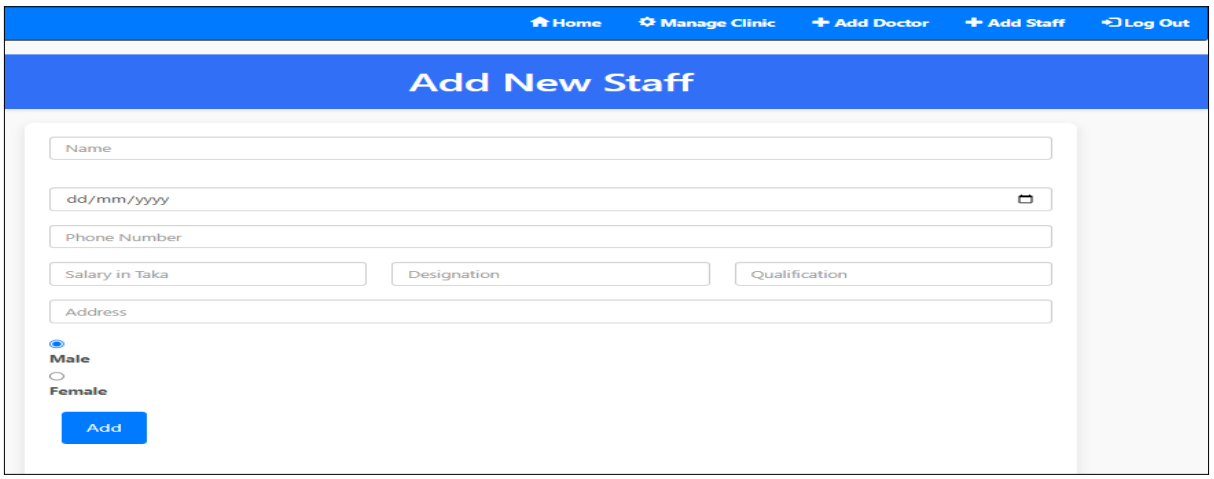


Figure 4.6.6 Screenshots of Add New Staff Page

4.6.7 Patient Sign Up & 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, 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

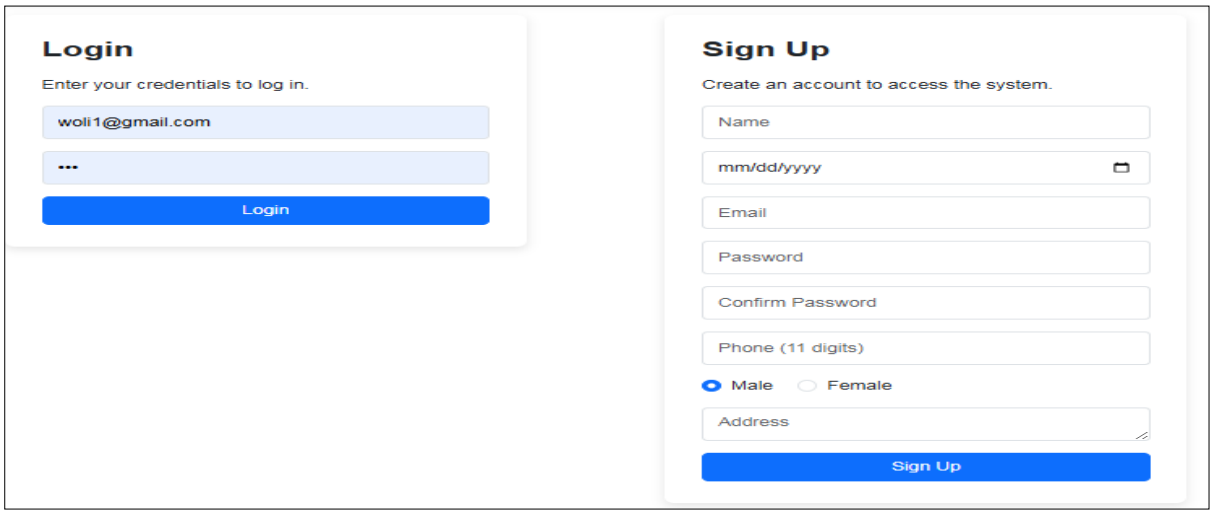


Figure 4.6.7 Screenshots of Patient Sign Up & Login Page

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.

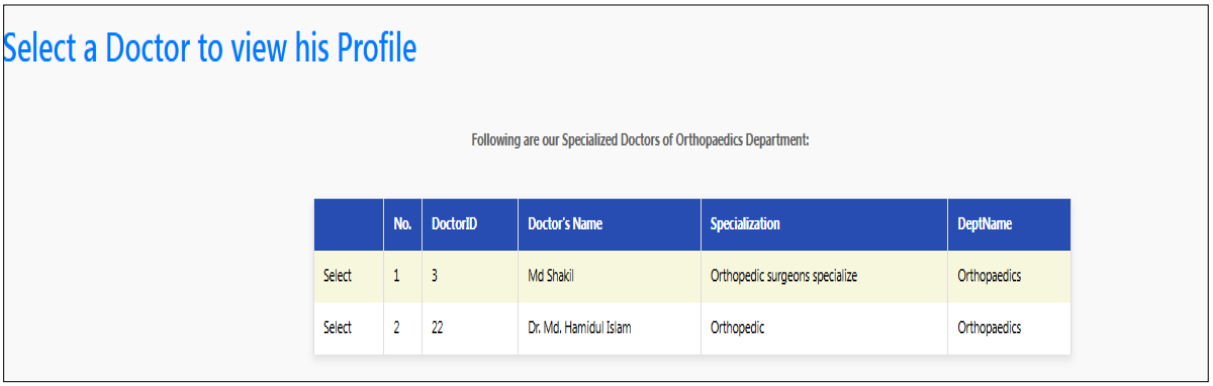


Figure 4.6.10 Screenshots of Patient Select Doctor

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.

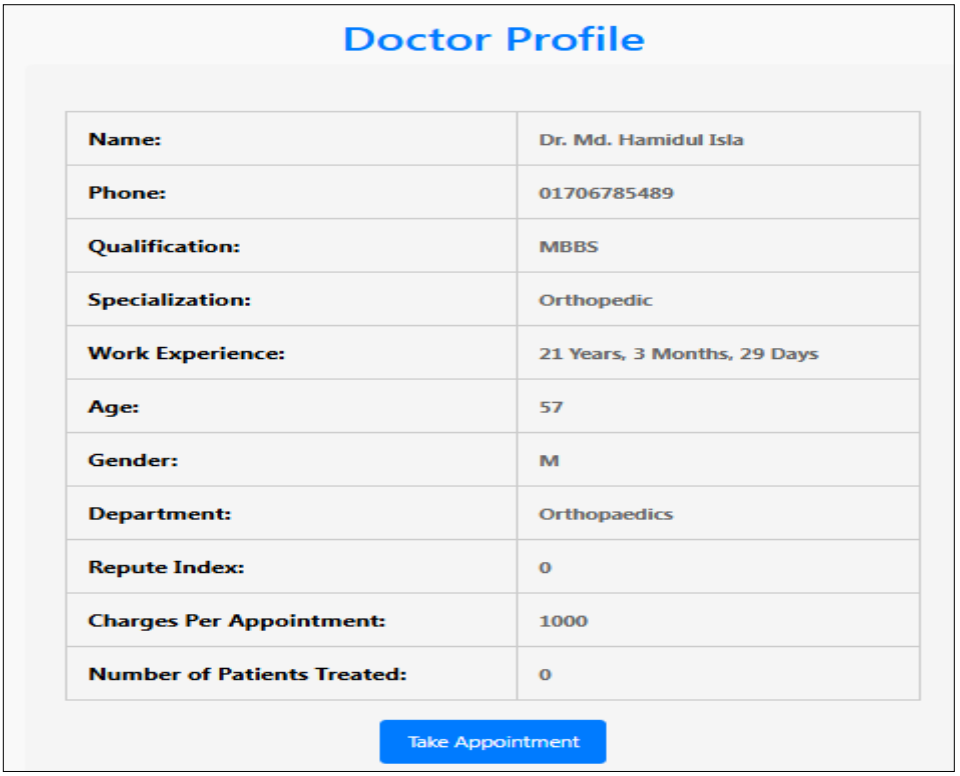


Figure 4.6.11 Screenshots of Patient See Doctor Profile

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.

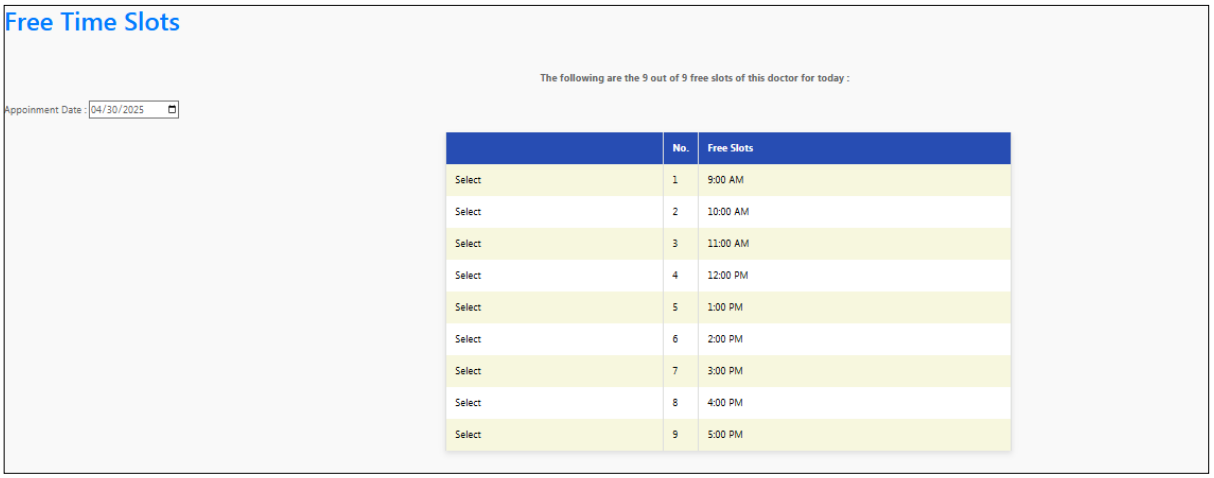


Figure 4.6.12 Screenshots of Patient select booking slots

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.

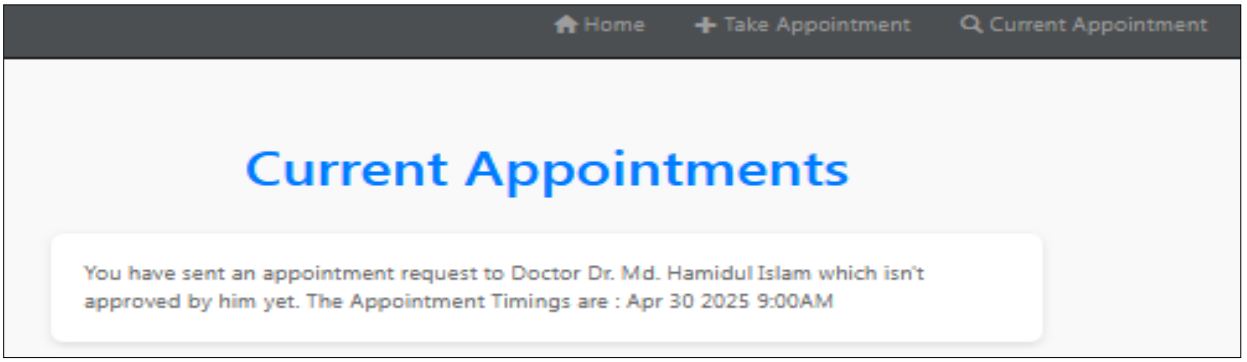


Figure 4.6.14 Screenshots of Patient see current appointment

4.6.15 Patient can See Bill History

In this section, patients can view their billing history, including consultation fees, payment dates, bill numbers, payment status, and downloadable receipts if available.

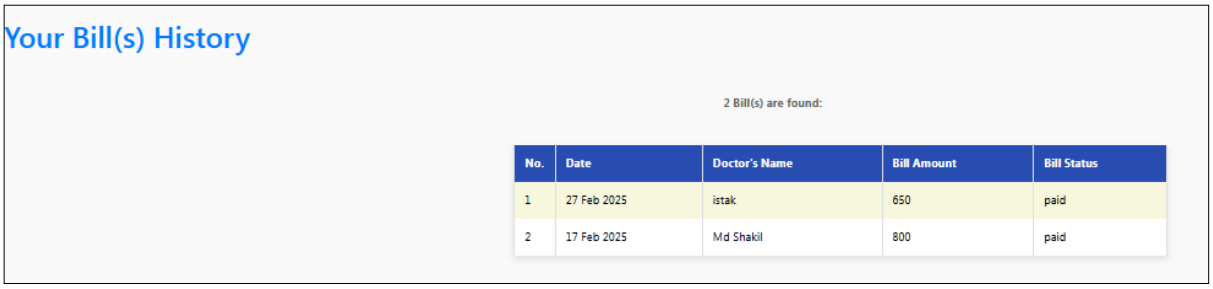


Figure 4.6.15 Screenshots of Patient see bill history

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.

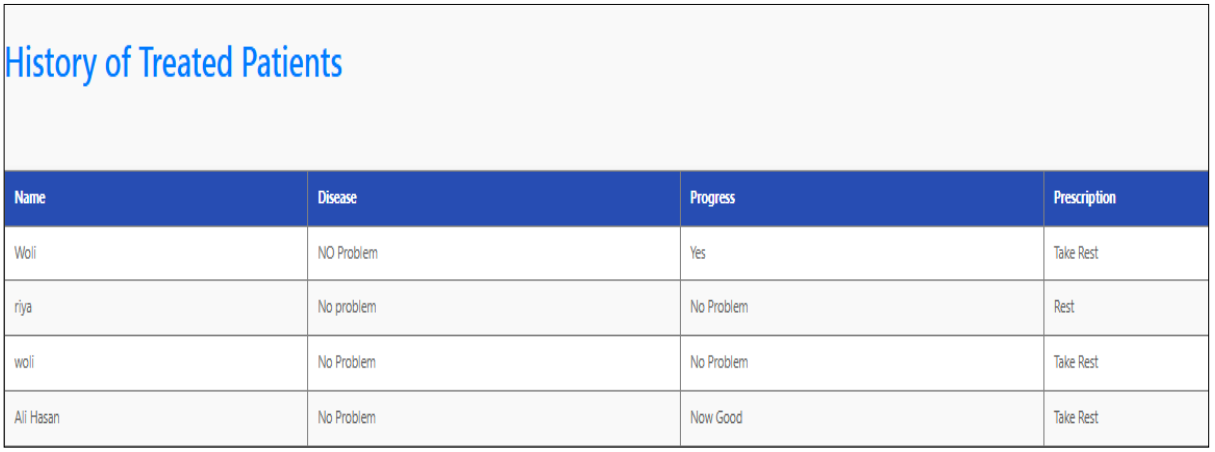


Figure 4.6.17 Screenshots of History of Treated Patients

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.

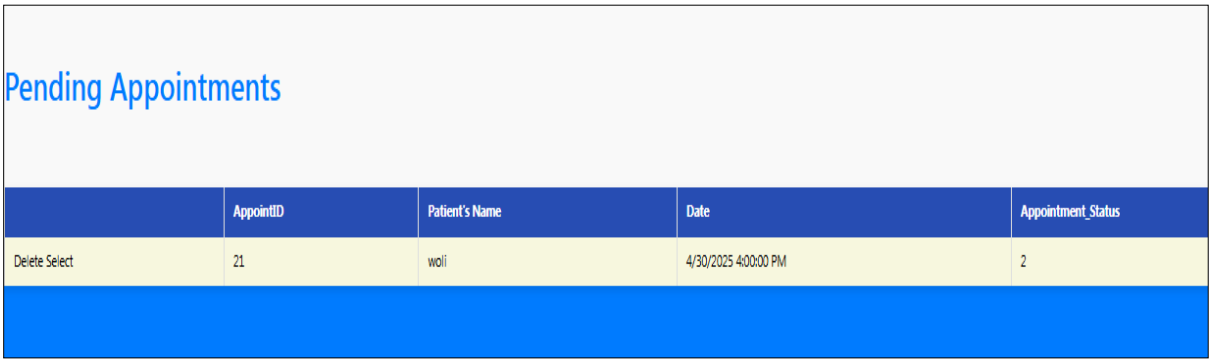


Figure 4.6.18 Screenshots of Doctor See Pending Appointment

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.

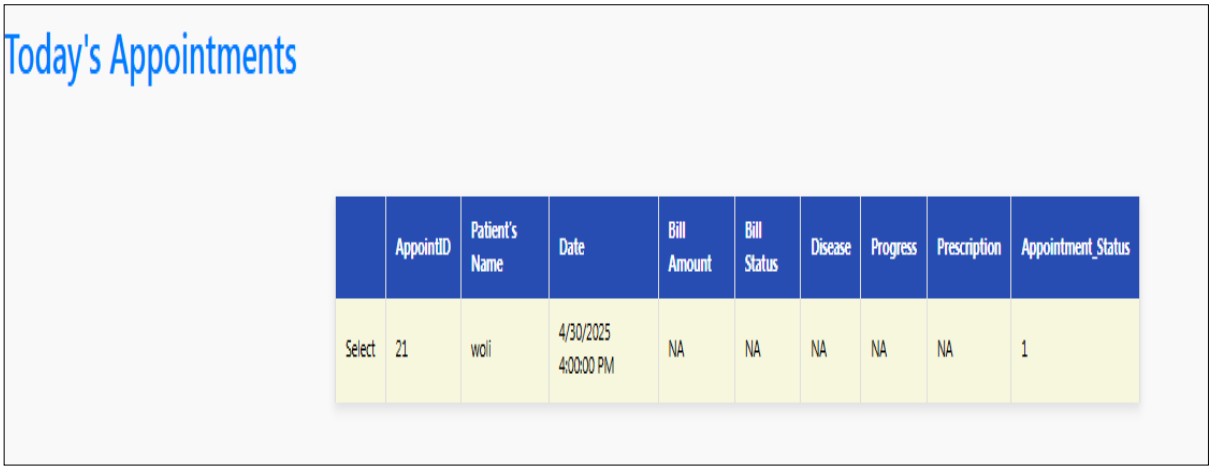


Figure 4.6.19 Screenshots of Doctor See Today's Appointment

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.

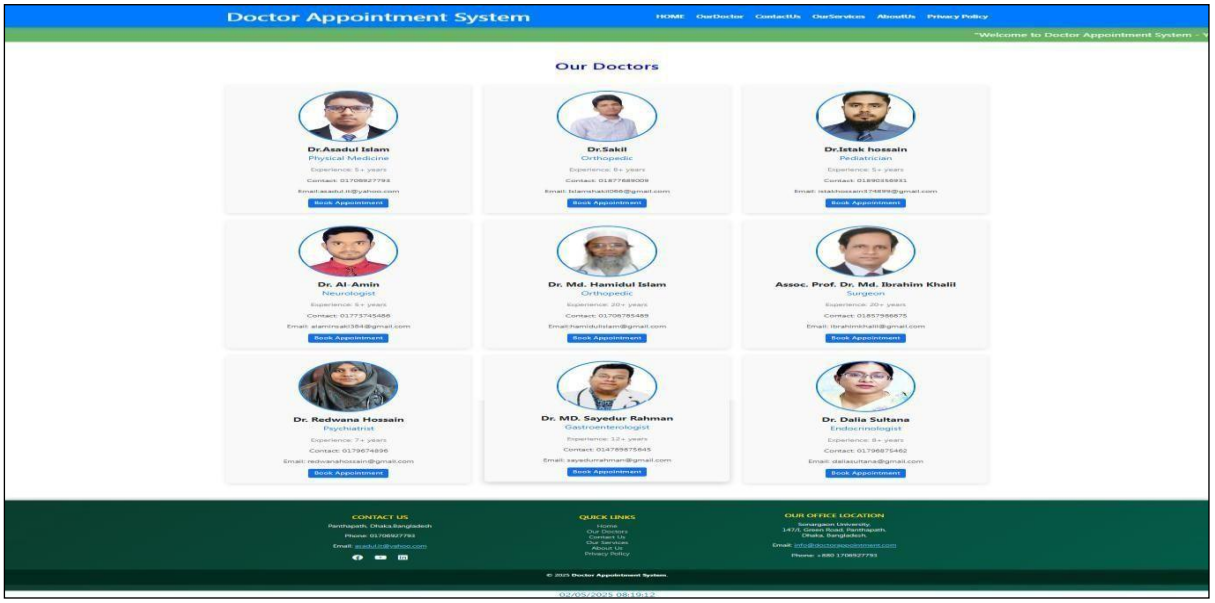


Figure 4.6.20 Screenshots of Doctor See Today's Appointment

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.

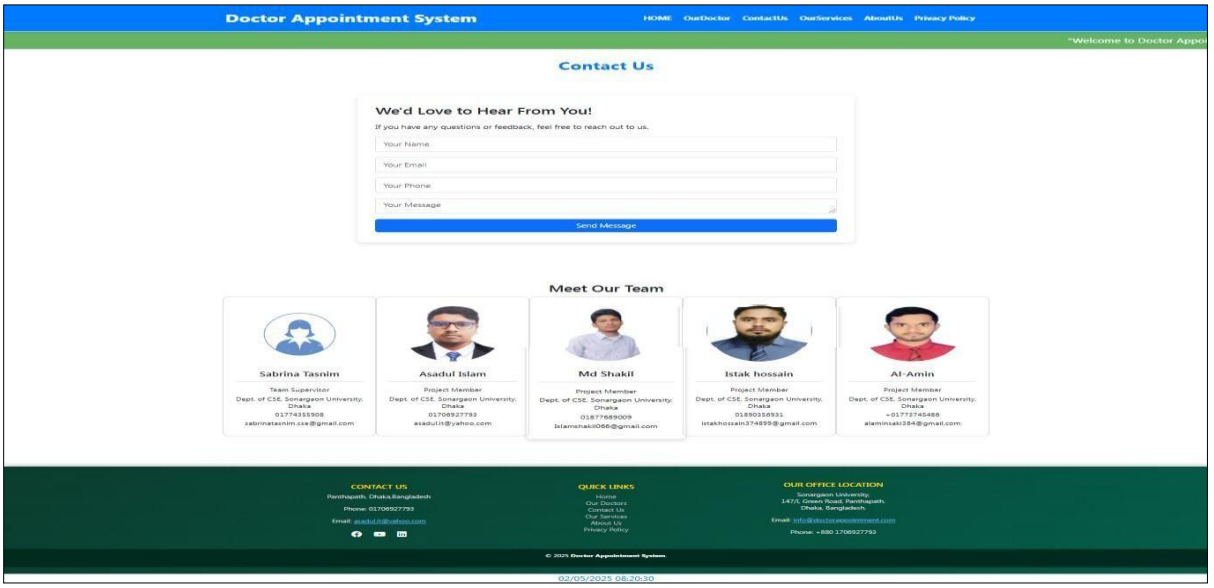


Figure 4.6.21 Screenshots of Doctor See Today's Appointment

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.

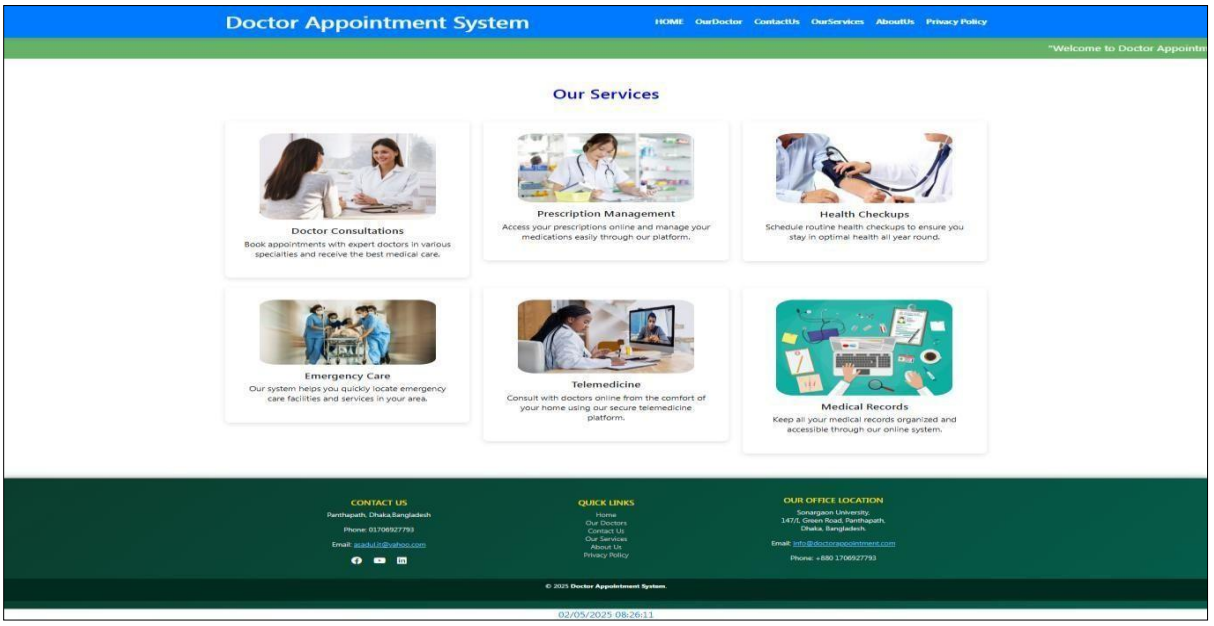


Figure 4.6.22 Screenshots of Our Services Section

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

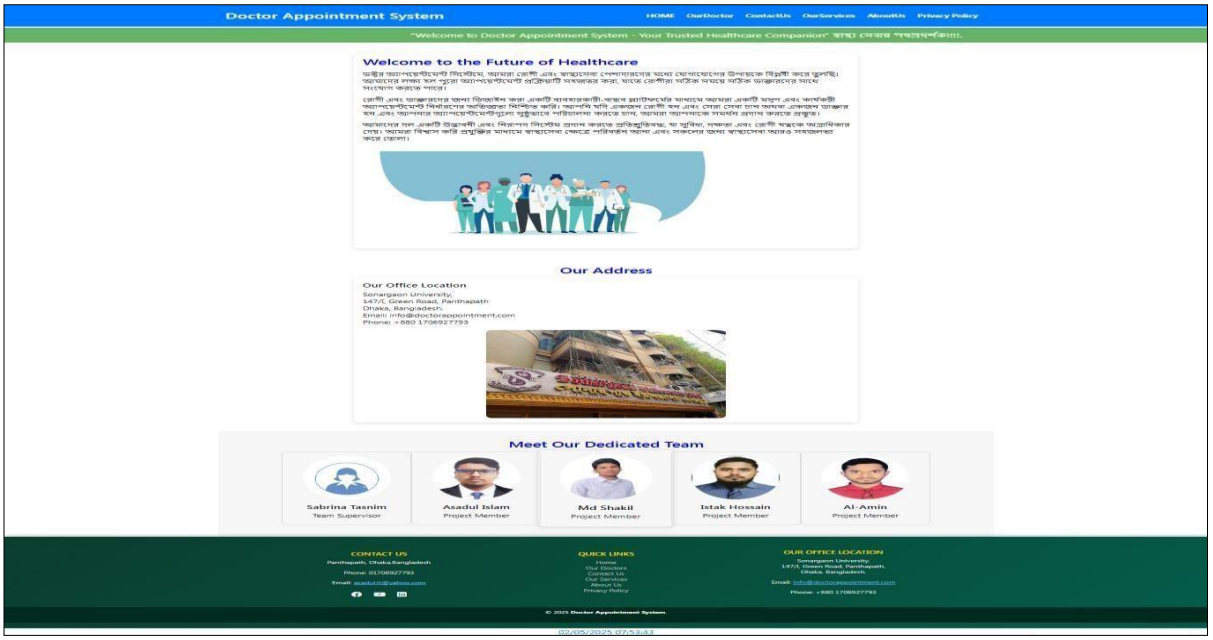


Figure 4.6.23 Screenshots of Our About Section

4.6.24 Everyone can See Our Privacy Policy Section

In this section, all users—including unregistered visitors—can read the platform's privacy policy, which outlines how personal data is collected, used, stored, and protected. It explains user rights, data confidentiality measures, third-party sharing practices (if any), and the commitment to maintaining user privacy in compliance with applicable laws and regulations.

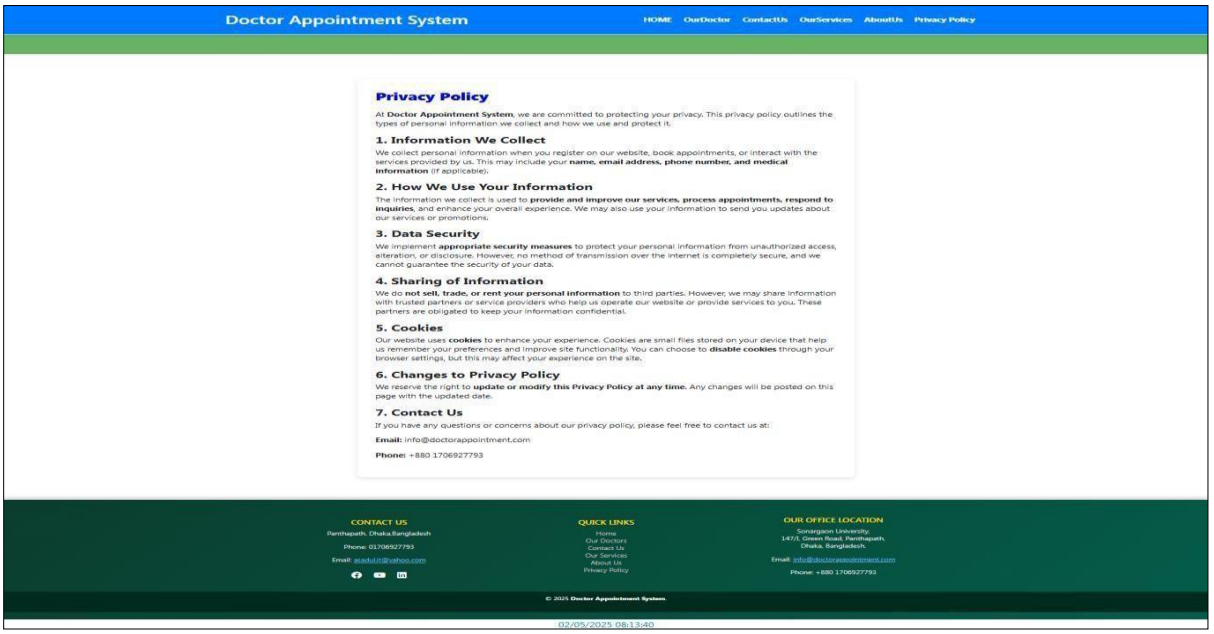


Figure 4.6.24 Screenshots of Our Privacy Policy Section

4.7 Implementation Requirements

Based on the system design, the development process began by creating the system in small modular units. Each unit was developed individually and tested for its specific functionality through a process known as Unit Testing. This approach ensured that each component worked correctly before being integrated into the complete system. By validating each unit during development, errors were identified and corrected early, leading to a smoother integration phase and a more reliable final system.

4.7.1 Requirement Collection and Analysis

In this project, requirement gathering was primarily conducted through interviews with various stakeholders involved in the 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.

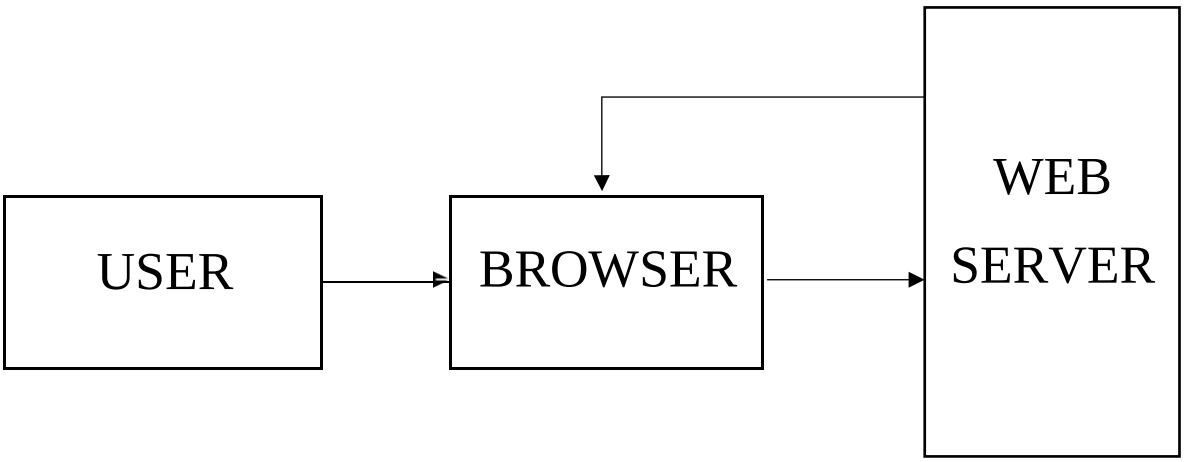


Figure 4.7.2 Website Working Procedure

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Testing Implementation

A new test suite was created to evaluate the features and functionalities of the website. Each feature and functionality have it's unique characteristics, and to ensure the system is reliable, secure, useful, effective, and efficient, comprehensive testing was designed. Testing is essential to verify that the system works properly and meets the specified requirements, ensuring that all components function as expected.

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.

Table 5.1 Testing Implementation

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 to be 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.

TEST PHASH	TIME
Testing plan creation	2 weeks
Test specification	1 week
Unit Testing	During Development time
Validating use case	3 weeks

Table 5.2 Testing Schedule

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 Doctor Appointment System is a web-based application designed to address the issues of manual messaging and appointment booking by allowing users to schedule appointments according to their preferences. It provides an efficient solution where users can view available booking slots and choose their desired date and time. This is a web-based system that deals with the issue of managing and booking appointments according to user's choice/necessity. Patients can select doctors based on their medical needs and they can look at their details and reviews to learn more[5].

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.

Day by day, the healthcare system is becoming a vital part of our society. This motivated us to develop this system after researching existing platforms and understanding user needs. People we interacted with expressed satisfaction with the concept, as it provides convenience and saves time.

Our analysis shows that a Doctor Appointment System can reduce overall healthcare costs and minimize patient waiting times**.**

Though we faced various challenges during development, we successfully completed the project. However, to achieve the full potential of the system, both doctors and patients must follow the usage guidelines.

Overall, this document gives a clear understanding of the project and its benefits in the modern healthcare environment.

6.2 Future Works

In the future, we are very keen to improve and update our Doctor Appointment System to make it more user-friendly and feature-rich. We plan to add several new functionalities, including an online emergency treatment system, to provide users with immediate support when required. Our main objective is to transform the system into a comprehensive online treatment and hospital management platform where both doctors and patients can experience a better and more efficient healthcare environment.
We are actively exploring innovative features and ideas to implement in the upcoming versions of the system. One of our top priorities is to promote this platform as a telemedicine service by introducing a video call consultation feature. This will allow patients to receive medical advice from doctors remotely, without needing to visit the hospital physically. We hope to implement this feature within the next couple of months.
As technology continues to play a critical role in healthcare, it is essential to move toward more advanced solutions. Future enhancements will refine the system further and make it more powerful and accessible. With the increasing disease burden in society, it is necessary to ensure that even people in less privileged or remote areas can get timely access to medical consultations without having to travel long distances. The framework we have developed can be further expanded to meet these needs, and we are committed to continuing our efforts to support and improve the healthcare system through technology.

Online appointment systems may also come with additional features, such as automatic SMS or email appointment reminders and online check-in processes when patients arrive for appointments [1].

6.3 Limitations

As with any technology-based system, the Doctor Appointment System also comes with certain limitations. One common issue user may experience is electronic glitches, such as unexpected disconnections during consultations with doctors. This can be particularly frustrating when a patient is in the middle of an important discussion. Additionally, there may be occasional lags in chat or audio, making communication less effective and potentially confusing for both parties.
Another limitation arises when multiple users access the system simultaneously. During peak hours, the application may experience slow performance or delayed loading times, which can affect user satisfaction. Patients expecting a fast and smooth experience may find it inconvenient when the system does not respond quickly.
In some instances, users may also face login issues. These problems can be caused by various factors, including browser compatibility, internet connectivity, or session timeout errors. While such occurrences are not frequent, they do impact the user experience.

We acknowledge these limitations and are actively working to address them. Our development team is committed to identifying bugs, optimizing performance, and improving system reliability. Although the Doctor Appointment System offers many benefits, understanding and resolving these challenges is essential to delivering a more stable and efficient platform for both doctors and patients.

6.3.1 Lack of IT Staff

The study revealed eight main challenges that inhibit the widespread use of telemedicine in Iran. These challenges include policy weaknesses, uncertainty around operating mechanisms, inadequate communication and telecommunication infrastructure, insufficient cultural infrastructure, lack of electronic requirements, redundant bureaucracies, legal gaps, and economic factors. Furthermore, four key solutions to these challenges were identified. These include a national commitment to the development of telemedicine, the establishment of a telemedicine roadmap, the enhancement of e-health requirements and infrastructure, and the preparation of the community to accept telemedicine as a viable option for healthcare delivery [6].

6.3.2 No In-person Consultations

While technology and online treatment have simplified the way we communicate with healthcare providers, they also eliminate the essential element of in-person interaction. For patients who value face-to-face consultations with their doctors, the Doctor Appointment System may not provide the same level of comfort or satisfaction. Additionally, many medical conditions require physical examinations to accurately assess the patient's condition and ensure appropriate treatment. This limitation cannot be addressed through an online platform alone, making in-person visits still necessary for proper medical care in certain cases.

6.3.3 Decreased Care Continuity

The Online Doctor Appointment System often connects patients with available healthcare providers on demand, which can lead to decreased continuity of care. In such cases, the consulting doctor may not have access to the patient's previous medical history, records, or treatment plans. This lack of continuity can negatively impact diagnosis accuracy, disease management, and overall treatment quality, as effective healthcare depends heavily on a comprehensive understanding of a patient’s medical background. However, this limitation can be addressed by integrating improved data management and record-sharing solutions within the healthcare system.

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