# HOSPITAL MANAGEMENT SYSTEM

## COURSE PROJECT REPORT

**18CSC303J – DATABASE MANAGEMENT SYSTEM**
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***Submitted by***


**V. R. RISHENDRA – RA2111026010221**


***Under the Guidance of***


**Dr. Anitha D**

Assistant Professor, Department of
Computational Intelligence


***In partial satisfaction of the requirements for the degree of***

**BACHELOR OF TECHNOLOGY**
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**with specialization in Artificial Intelligence**



**SCHOOL OF COMPUTING**

**COLLEGE OF ENGINEERING AND TECHNOLOGY**

**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

**KATTANKULATHUR - 603203**


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**KATTANKULATHUR – 603 203**

**BONAFIDE CERTIFICATE**

Certified that this Course Project Report titled **"Hospital Management system"** is the bonafide work done by **V.R. Rishendra-RA2111026010221**who carried out under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other work.


**Dr. Anitha D**
**Assistant Professor**
**Department of Computational Intelligence**
**School of Computing**
**SRM Institute of Science and Technology**
**Kattankulathur, Chennai-603203**

**Dr. R. Annie Uthra**
**Professor and Head of the Department**
**Department of Computational Intelligence**
**School of Computing**
**SRM Institute of Science and Technology**
**Kattankulathur, Chennai-603203**

# ABSTRACT

The Hospital Management System (HMS) is a meticulously organized computerized system meticulously designed and programmed to efficiently handle the day-to-day operations and management of hospital activities. The primary objective of the project is to streamline and automate the front office management of the hospital, aiming to develop software that is not only user-friendly but also simple, fast, and cost-effective.

At its core, the system serves the pivotal function of approving appointments made by patients and subsequently storing their details along with those of the doctors. It enables seamless retrieval of these details whenever necessary and allows for meaningful manipulation of the data to facilitate various hospital processes.

The HMS operates on an authentication-based system, ensuring that only registered users can access its functionalities. This stringent security measure is implemented to safeguard user data and information, thereby maintaining confidentiality and privacy.

The Hospital Management System incorporates a range of essential features to streamline operations and enhance patient care. Appointment management lies at its core, facilitating efficient scheduling and approval of patient appointments to optimize doctor's time slots. Alongside this, the system ensures comprehensive storage and retrieval of patient details, including medical history, demographics, and contact information, enabling personalized care and treatment. Doctor information management is also central, maintaining a database of doctor profiles with specialties, availability, and contact details to aid in appointment allocation and patient referrals.

Security is paramount, with robust authentication mechanisms implemented to restrict access to sensitive patient data, reducing the risk of unauthorized access or breaches. Data protection measures such as encryption fortify the system against unauthorized access, tampering, or theft, safeguarding patient information. Additionally, a user-friendly interface is prioritized, ensuring hospital staff can swiftly adapt to the system, navigating it intuitively to perform tasks efficiently. This comprehensive approach not only enhances operational efficiency but also elevates the quality of patient care within the healthcare facility.

## TABLE OF CONTENT

# CHAPTER 1

# INTRODUCTION

In the modern healthcare landscape, the efficient management of hospital operations is paramount to ensure the delivery of high-quality care while maximizing resource utilization. The HMS project addresses this need by providing a user-friendly, secure, and versatile platform that caters to the diverse needs of hospital administrators, medical staff, and patients alike.

## Key Features:

The HMS project boasts a plethora of features geared towards simplifying hospital management and enhancing the patient experience:

Appointment Management: The system streamlines the appointment booking process, allowing patients to schedule appointments with ease while optimizing doctor's schedules for efficient utilization of time and resources.

Patient and Doctor Registration: Each patient and doctor is assigned a unique identifier within the system, enabling seamless tracking of their information and interactions within the hospital ecosystem.

Data Storage and Retrieval: The HMS project automatically stores and organizes patient and staff data, ensuring easy retrieval and manipulation when needed. This facilitates better decision-making and improves the overall efficiency of hospital operations.

User Authentication and Security: Access to the system is restricted through robust authentication mechanisms, safeguarding sensitive patient information and ensuring compliance with data protection regulations.

Modular Structure: The system is divided into four modules - Admin, Schedule, Doctor, and Patient - each serving specific functions tailored to the roles and responsibilities of hospital personnel

## 1.1 SOFTWARE MySQL

In the development of our comprehensive Hospital Management System (HMS), MySQL stands as the cornerstone of our database infrastructure, providing the robust foundation upon which our project is built. MySQL, a widely-used open-source relational database management system, offers a reliable and scalable solution for storing, managing, and retrieving vast amounts of data efficiently.

Data Management and Storage:
MySQL facilitates the efficient management and storage of diverse datasets essential to our hospital management system. From patient information and medical records to staff profiles and inventory data, MySQL efficiently organizes and stores critical information, ensuring accessibility and reliability at all times. Its robust relational database model enables seamless handling of complex relationships between different data entities, facilitating efficient query execution and data retrieval.

Security and Reliability:
Security is paramount in the healthcare industry, where sensitive patient information and operational data must be safeguarded against unauthorized access and breaches. MySQL provides robust security features, including user authentication, access control mechanisms, and encryption capabilities, ensuring the confidentiality, integrity, and availability of data within our system. Additionally, MySQL's reliability features, such as transaction support and data replication, guarantee data consistency and durability, minimizing the risk of data loss or corruption.

Integration and Compatibility:
MySQL's compatibility with a wide range of programming languages, frameworks, and development tools makes it an ideal choice for our project. Whether integrating with backend server-side technologies or front-end user interfaces, MySQL seamlessly interoperates with various components of our system, facilitating smooth data exchange and communication. Its support for standard SQL syntax and industry-standard protocols ensures compatibility with existing systems and technologies, simplifying integration efforts and reducing development time.

In summary, MySQL serves as the backbone of our Hospital Management System, providing a reliable, scalable, and secure platform for managing data, optimizing performance, and ensuring seamless integration with other system components. With MySQL powering our database infrastructure, we can confidently deliver a robust and efficient solution that meets the demanding requirements of the healthcare industry while providing a superior experience for both healthcare professionals and patients.

## 1.2 ADVANTAGE OF MySQL

Cost-Effectiveness: MySQL's open-source nature provides a cost-effective solution for building the Hospital Management System, minimizing licensing fees and reducing overall project costs.

Scalability: With MySQL, the Hospital Management System can seamlessly scale to accommodate the growing volume of patient records, medical data, and administrative information as the hospital expands its services.

Reliability: MySQL's reliability features ensure the consistent availability and integrity of critical data, such as patient details, medical records, and inventory information, minimizing the risk of disruptions to hospital operations.

Performance: MySQL's optimized query execution and indexing mechanisms enable fast retrieval and processing of data, ensuring quick response times for patient admissions, medical consultations, and administrative tasks.

Security: MySQL's robust security features, including user authentication and access control mechanisms, safeguard sensitive patient information and operational data from unauthorized access and breaches, maintaining the confidentiality and integrity of data.

Compatibility: MySQL's compatibility with various programming languages and frameworks simplifies integration with other system components, such as the patient management module, medical records module, and administrative functionalities, ensuring seamless communication and data exchange.

Community Support: MySQL's large and active community of developers and users provides access to resources, forums, and documentation for troubleshooting and optimization, ensuring continuous support and improvement of the Hospital Management System.

# CHAPTER 2
# PROJECT FEATURES AND OBJECTIVES

## PROJECT FEATURES:

### Appointment Management:

- Facilitate efficient scheduling and management of patient appointments.
- Optimize doctor's time slots to ensure maximum utilization of resources.
- Provide a user-friendly interface for easy appointment booking and modification.

### Patient Information Management:

- Store comprehensive patient information, including medical history, demographics, and contact details.
- Ensure secure and organized storage of patient data for easy retrieval and manipulation.
- Enable healthcare professionals to access patient records quickly and accurately during consultations.

### Doctor Information Management:

- Maintain a centralized database of doctor profiles, including specialties, availability, and contact information.
- Allow for easy management of doctor schedules and appointment allocations.
- Facilitate seamless communication between doctors and patients through the system.

### Authentication and Security:

- Implement robust authentication mechanisms to control access to sensitive patient information.
- Ensure data security through encryption, access control, and user authentication features.
- Comply with regulatory requirements and industry standards to safeguard patient confidentiality.
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### Data Protection:

- Incorporate data encryption and backup mechanisms to protect against data loss or corruption.
- Ensure data integrity through regular audits and monitoring of database activities.
- Implement disaster recovery strategies to minimize downtime and ensure continuity of operations.

### User-Friendly Interface:

- Design an intuitive and easy-to-navigate user interface for hospital staff and administrators.
- Provide training and support to users to ensure efficient utilization of the system.
- Continuously gather feedback from users to improve usability and enhance user experience.

# Project Objectives:

**Streamline Hospital Operations:**

- Automate routine administrative tasks to improve efficiency and reduce manual errors.
- Enhance communication and collaboration between hospital departments and staff members.
- Optimize resource allocation and utilization to improve overall productivity.
-

Improve Patient Care:

- Provide healthcare professionals with timely access to patient information for better diagnosis and treatment.
- Ensure continuity of care by maintaining accurate and up-to-date patient records.
- Enhance patient satisfaction by reducing wait times and improving service quality.

Enhance Data Security and Compliance:

- Implement robust security measures to protect patient data from unauthorized access or breaches.
- Ensure compliance with healthcare regulations and standards, such as HIPAA, GDPR, and HITECH.
- Maintain data integrity and confidentiality through stringent access controls and encryption techniques.

Increase System Reliability and Performance:

- Ensure high availability and uptime of the hospital management system to support critical healthcare operations.
- Optimize system performance to handle large volumes of data and concurrent user requests efficiently.
- Implement monitoring and maintenance processes to proactively identify and address system issues.

Foster Innovation and Adaptability:

- Continuously evaluate and incorporate new technologies and best practices to enhance system functionality.
- Adapt to evolving healthcare requirements and industry trends to remain competitive and relevant.
- Foster a culture of innovation and collaboration among project stakeholders to drive continuous improvement and excellence.

# CHAPTER 3

# MODULE DESRIPTION

Admin Module:

- This module is designed for administrators to manage the Hospital Management System (HMS).
- Features include user management, system configuration, and access control.
- Administrators can create, modify, or deactivate user accounts, assign roles and permissions, and monitor system activity.
- System configuration options allow administrators to customize settings, such as appointment slots, hospital services, and billing parameters.

Appointment Management Module:

- Patients can request appointments online or through the hospital reception.
- Features include appointment scheduling, rescheduling, cancellation, and reminder notifications.
- Healthcare professionals can view their schedules, manage appointment slots, and access patient information during consultations.
- The module also includes features for tracking appointment status, managing waitlists, and generating reports on appointment trends and utilization.

Patient Information Management Module:

- This module focuses on the storage and management of patient information and medical records.
- Features include patient registration, demographic data capture, and medical history documentation.
- Healthcare professionals can access patient records securely, update medical information, and track patient encounters.

Doctor Information Management Module:

- This module centralizes information related to doctors and healthcare providers.
- Features include doctor registration, profile management, and schedule assignment.
- Administrators can add new doctors to the system, specify their specialties, and set availability preferences.
- Doctors can view their schedules, manage patient appointments, and access relevant patient information.

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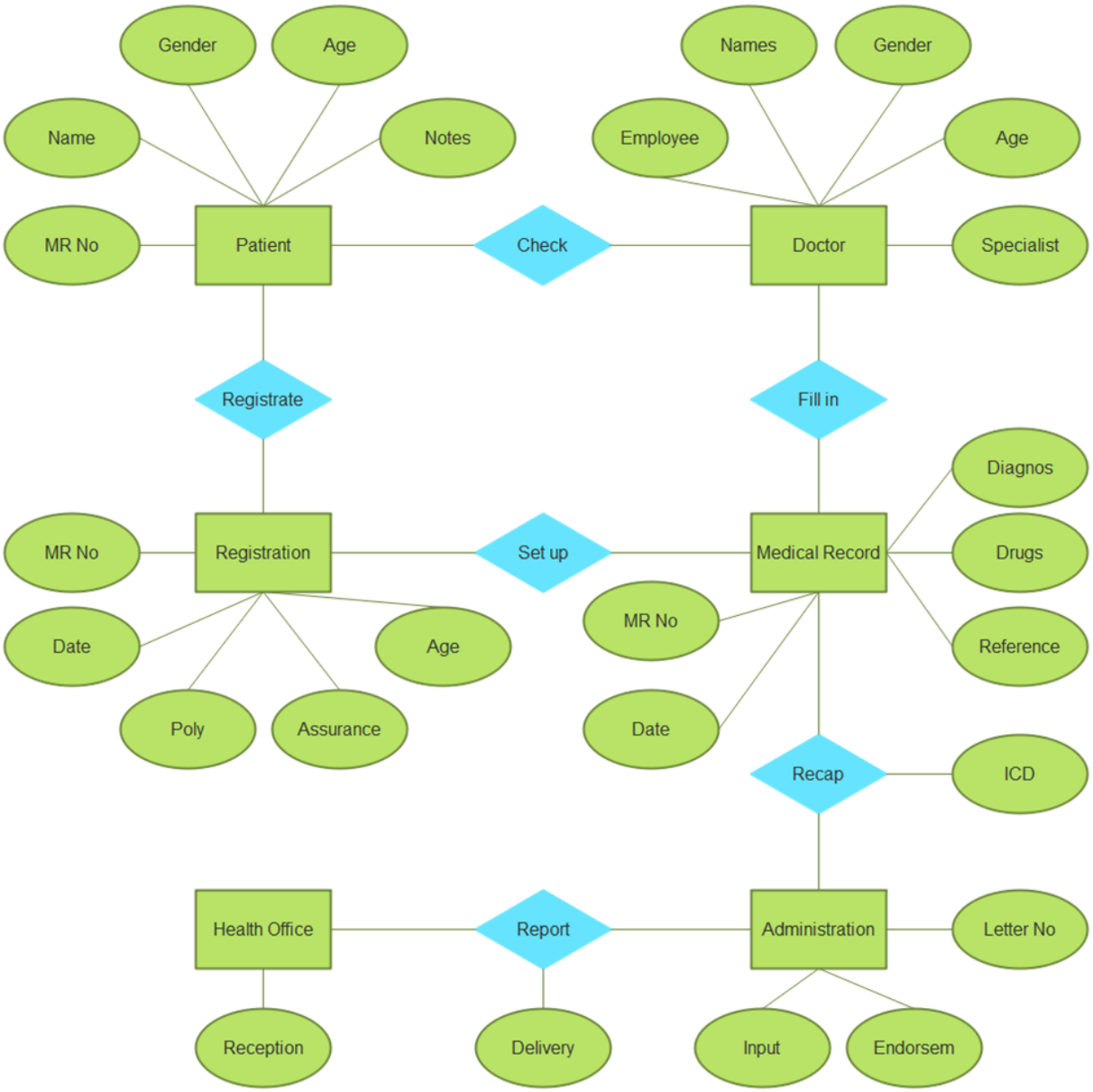
# CHAPTER 4
# BACK-END DESIGN, FRONT-END DESIGN AND CONNECTIVITY
## BACK-END DESIGN



## Entities and Attributes:

Admin Module:
Entity: Administrator
Attributes:

- AdminID (Primary Key)
- Username
- Password
- Full Name
- Email
- Phone Number
- Role

Schedule Module:
Entity: Appointment
Attributes:

- AppointmentID (Primary Key)
- Date
- Time
- DoctorID (Foreign Key)
- PatientID (Foreign Key)
- Status (e.g., confirmed, canceled)

Doctor Module:
Entity: Doctor
Attributes:

- DoctorID (Primary Key)
- Name
- Specialization
- ContactInfo
- OfficeID (Foreign Key)

Patient Module:
Entity: Patient
Attributes:

- PatientID (Primary Key)
- Name
- DateOfBirth
- Gender
- ContactInfo
- Address
- MedicalHistory
- InsuranceDetails

# FRONT-END DESIGN

### 3.2.1 Front-end web development details

•HTML provides the basic structure of sites, which is enhanced and modified by other technologies like CSS and JavaScript.

• CSS is used to control presentation, formatting, and layout.

• JavaScript is used to control the behavior of different elements.

### HTML

- HTML is at the core of every web page, regardless the complexity of a site or number of
- technologies involved. It's an essential skill for any web professional. It's the starting point
- for anyone learning how to create content for the web. And, luckily for us, it's surprisingly
- easy to learn.

### CSS

- CSS stands for Cascading Style Sheets. This programming language dictates how the HTML
- elements of a website should actually appear on the frontend of the page.

### JavaScript

- JavaScript is a more complicated language than HTML or CSS, and it wasn't released in beta
- form until 1995. Nowadays, JavaScript is supported by all modern web browsers and is used on almost every site on the web for more powerful and complex functionality.

### 3.2.2 Connectivity (front end and Back end):

PHP is an amazing and popular language!

It is powerful enough to be at the core of the biggest blogging system on the web (WordPress)!,It is deep enough to run the largest social network (Facebook)!,It is also easy enough to be a beginner's first server side language!

• PHP is an acronym for "PHP: Hypertext Preprocessor"

• PHP is a widely-used, open source scripting language

• PHP scripts are executed on the server

• PHP is free to download and use

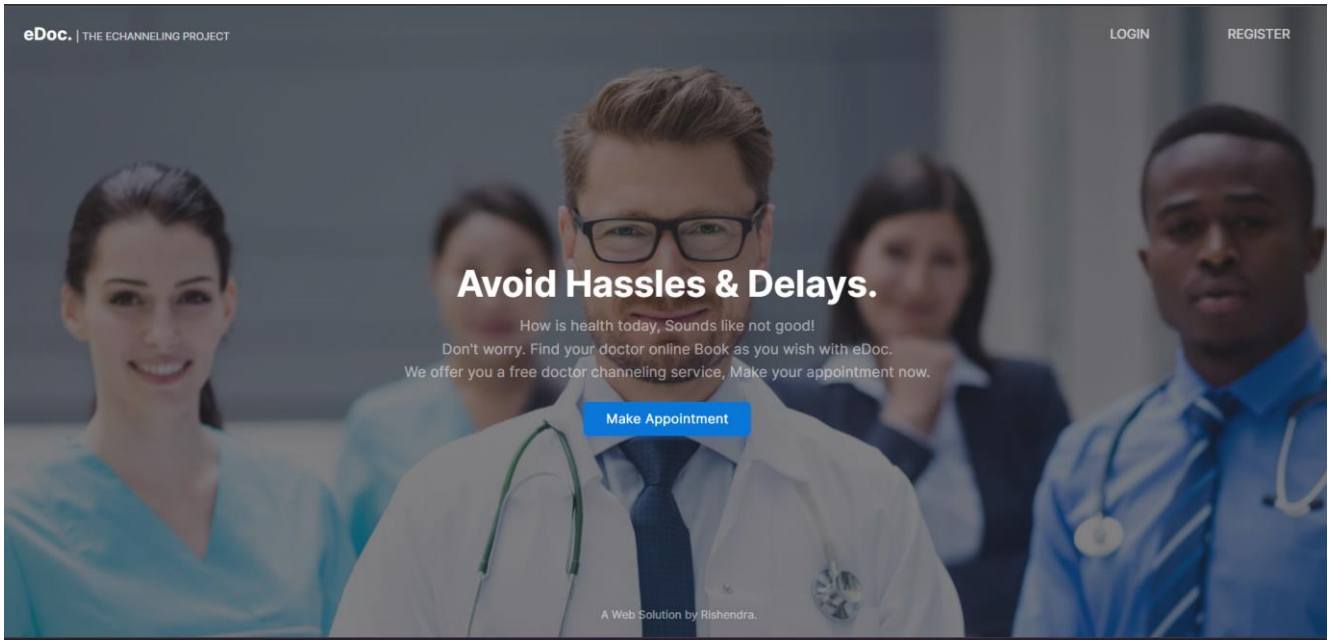
• PHP files can contain text, HTML, CSS, JavaScript, and PHP code

• PHP code are executed on the server, and the result is returned to the browser as plain HTML

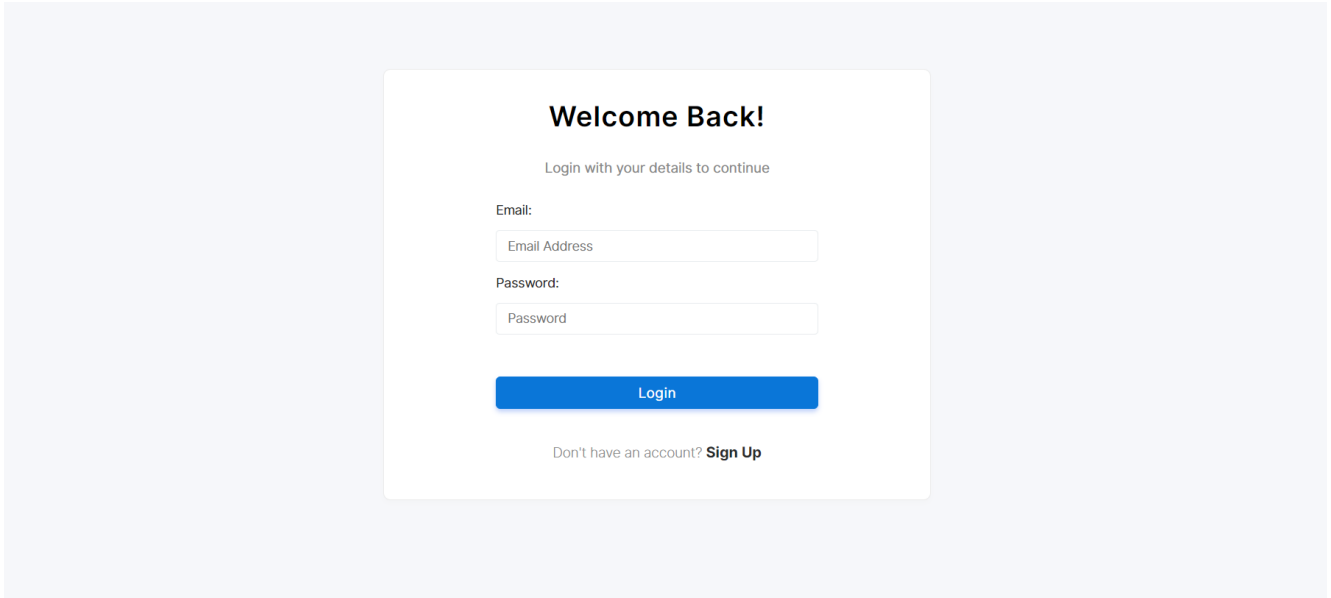
• With PHP you are not limited to output HTML. You can output images, PDF files, and even Flash movies. You can also output any text, such as XHTML and XML.

# FRONT-END DESIGN

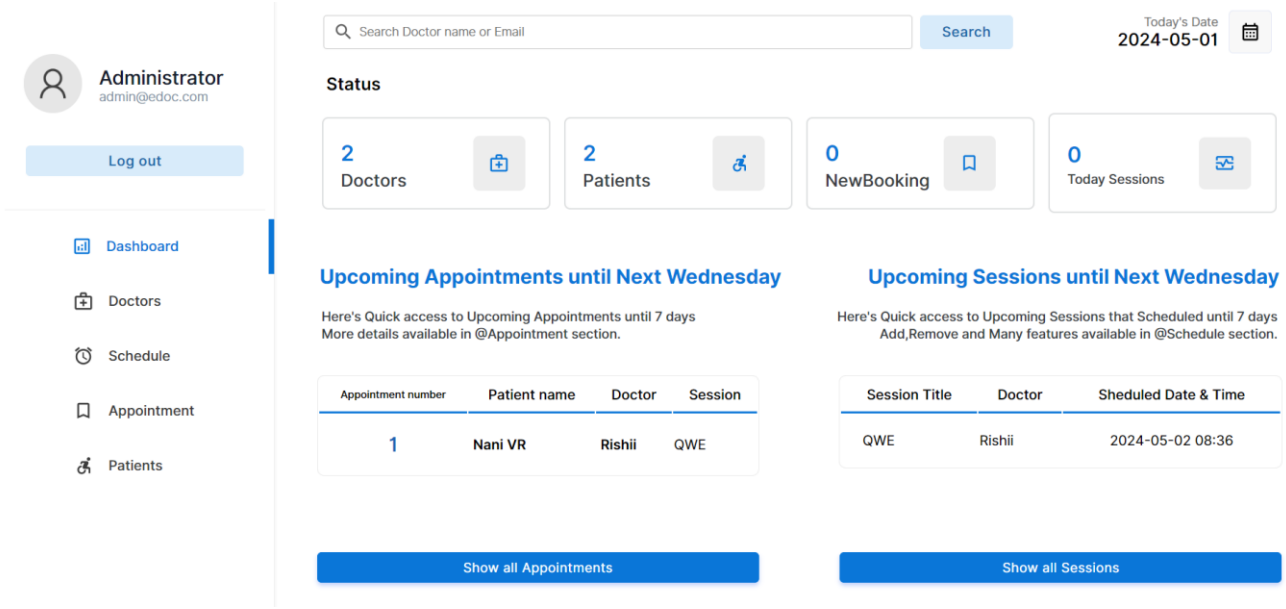
HOME



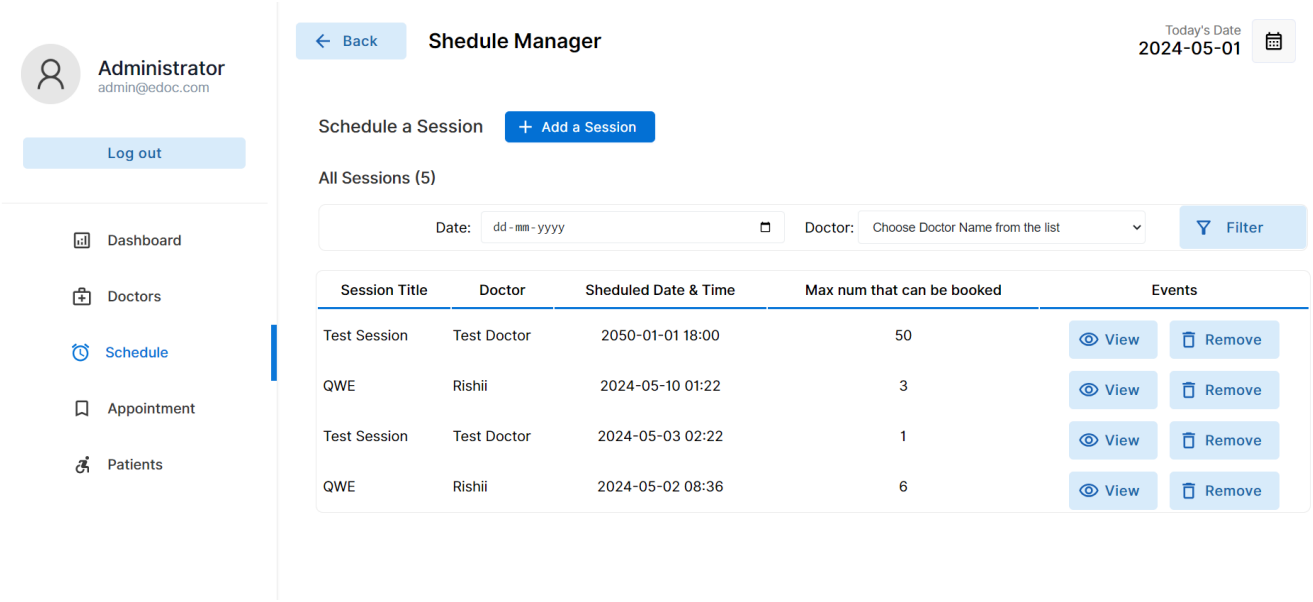

LOGIN



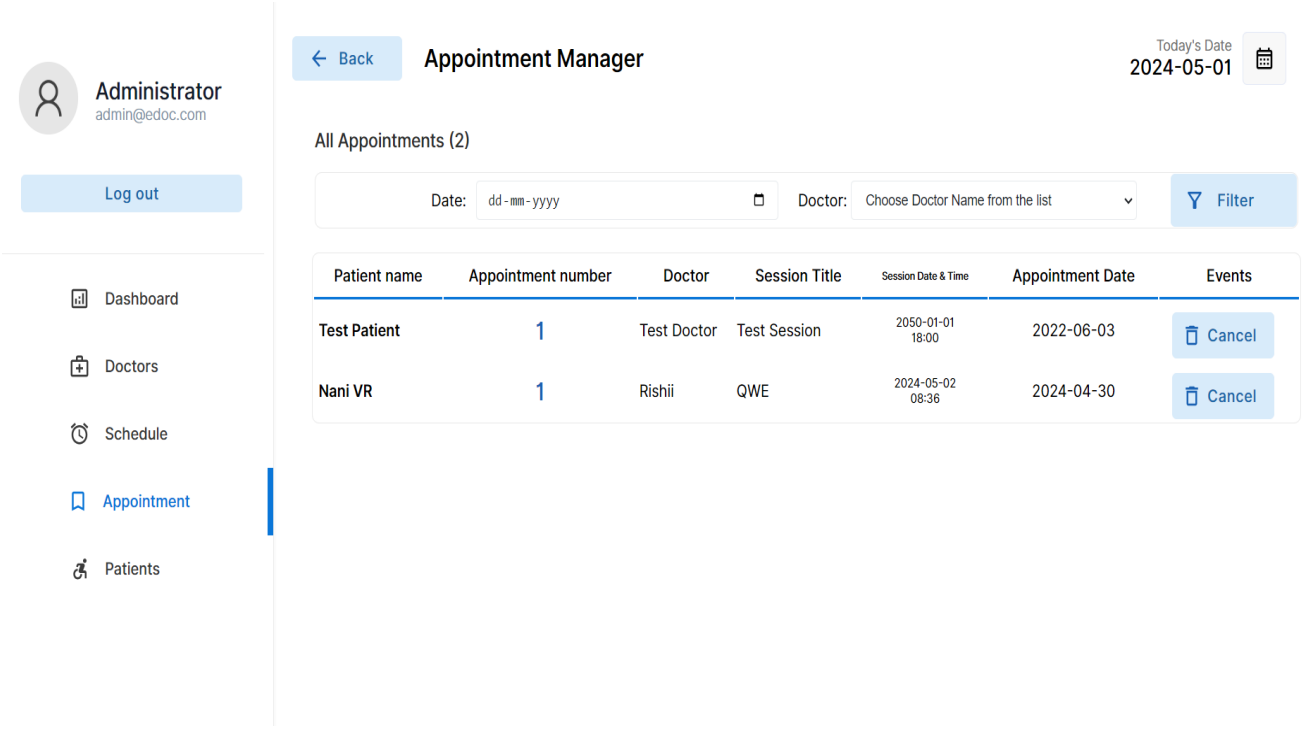
ADIMN HOMEPAGE



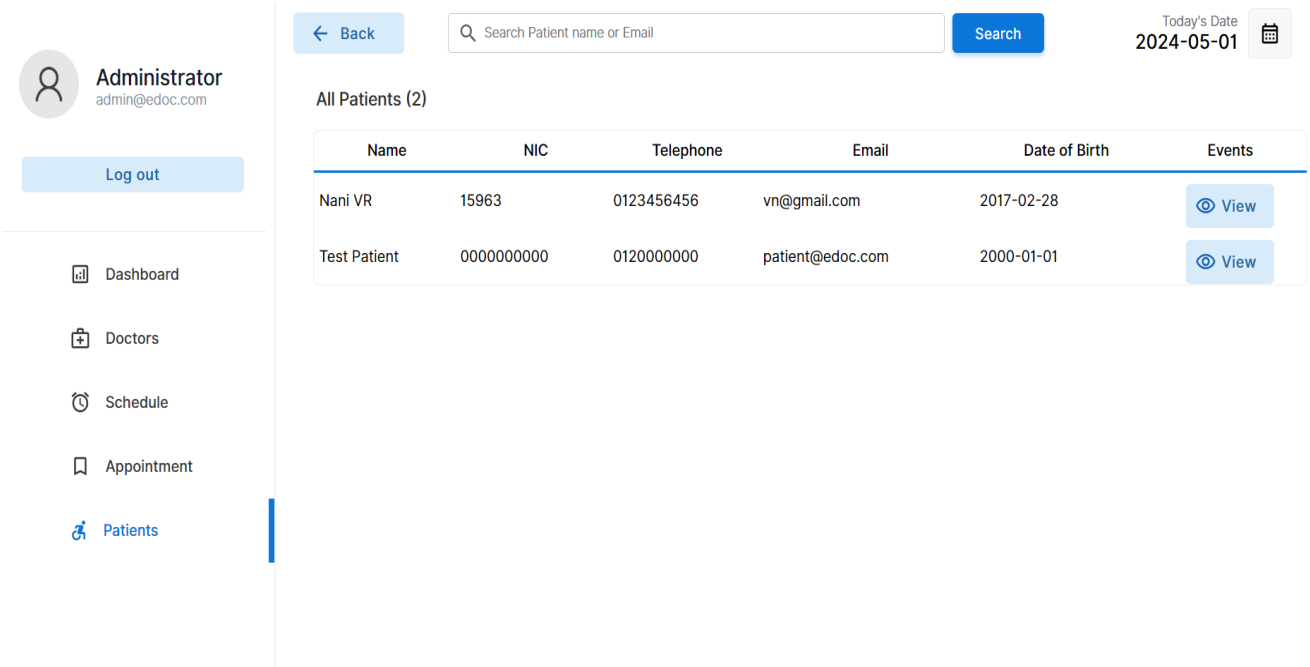

SCHEDULE MANAGER:



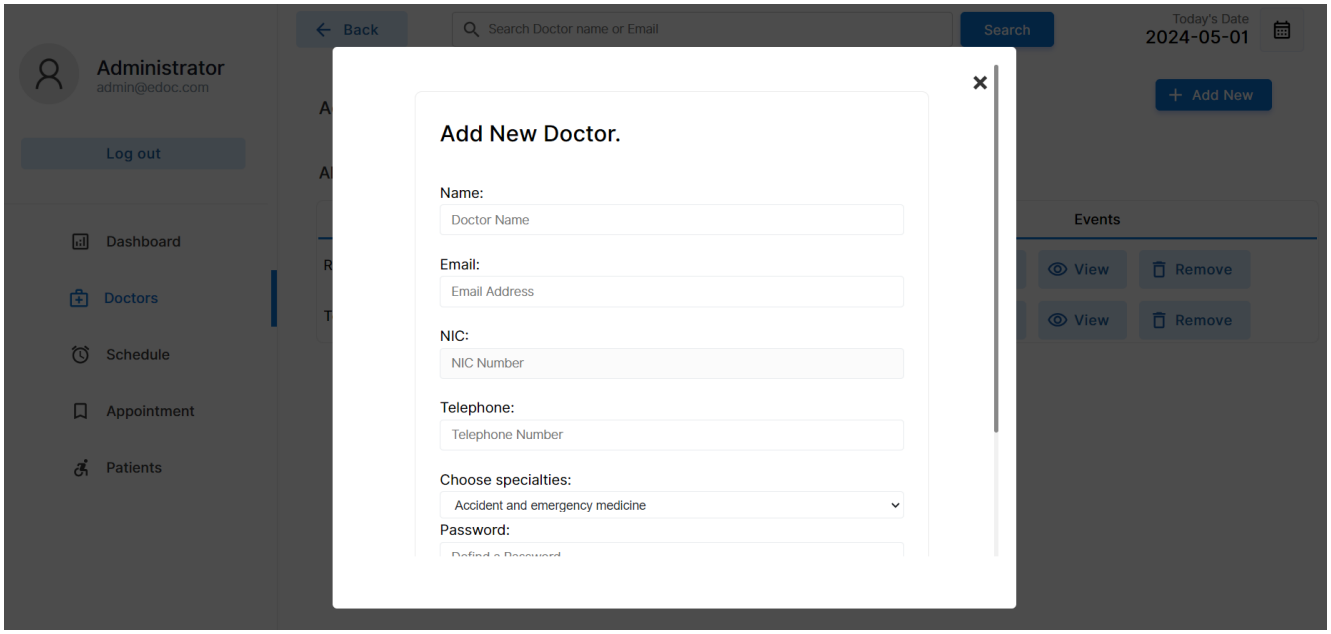
APPOINTMENT MANAGER:

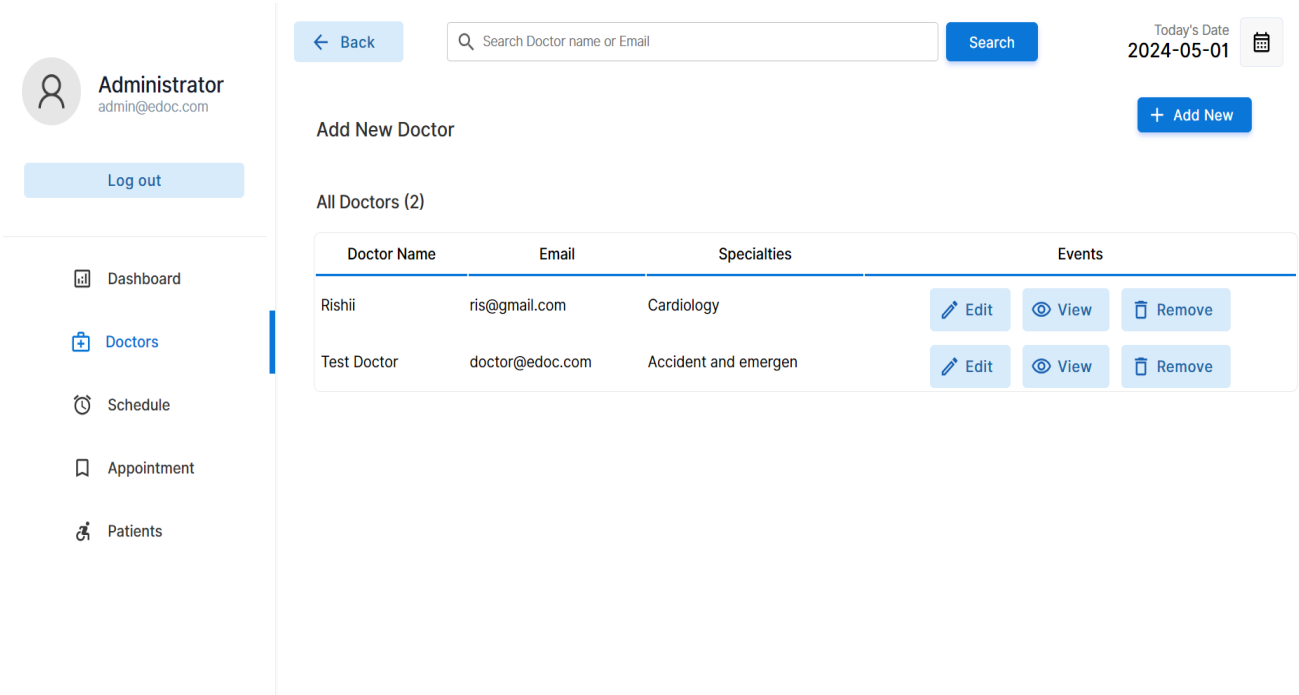



PATIENTS:

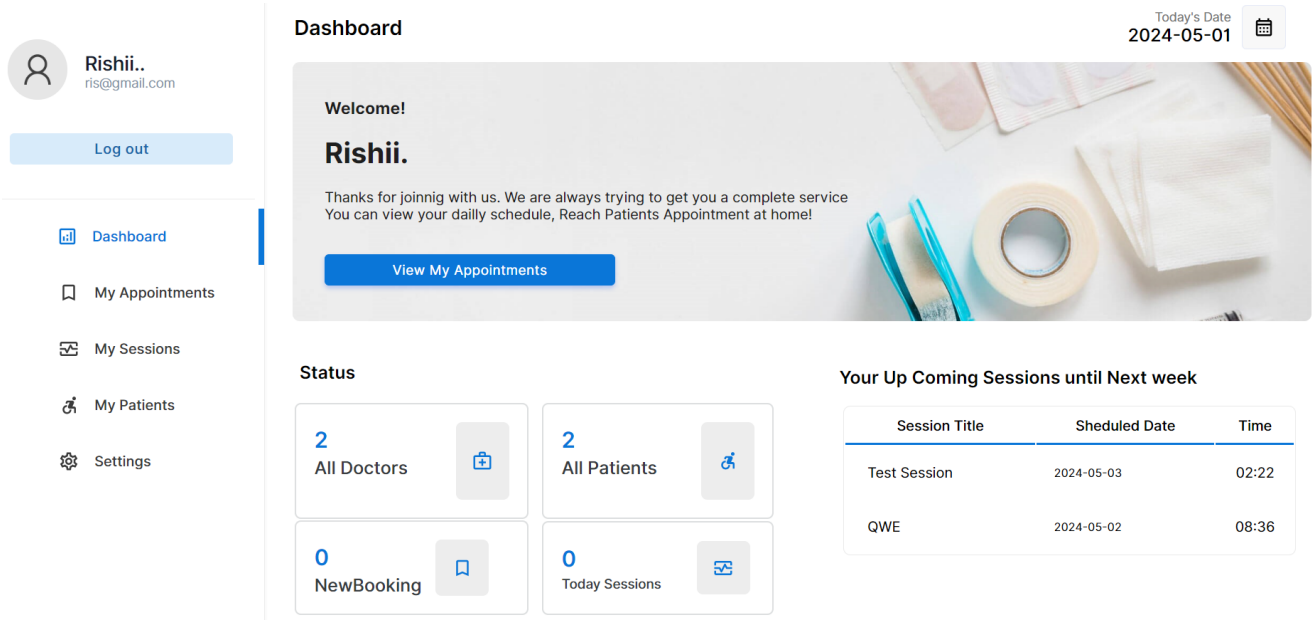


ADD NEW DOCTOR:

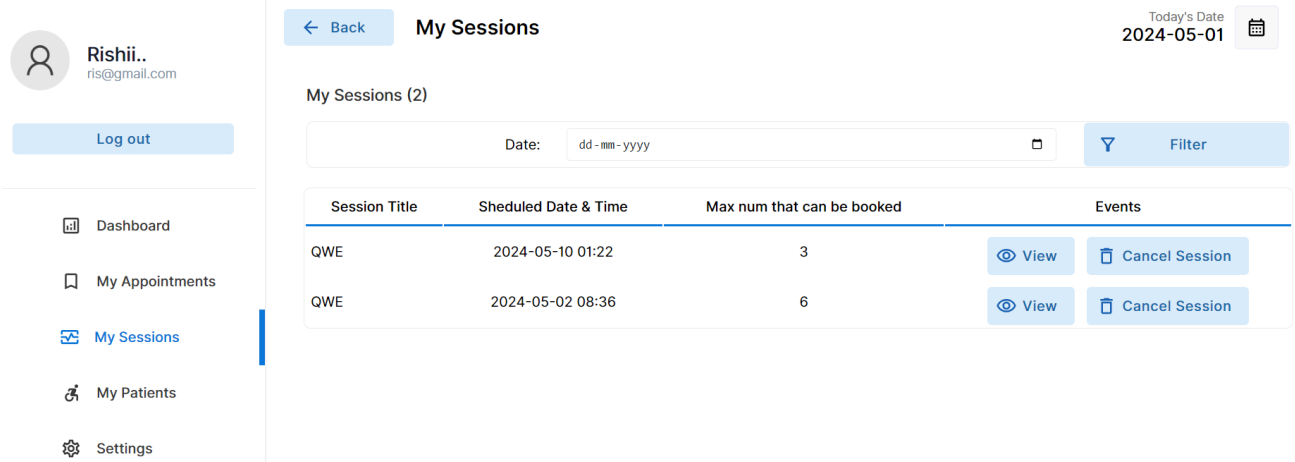


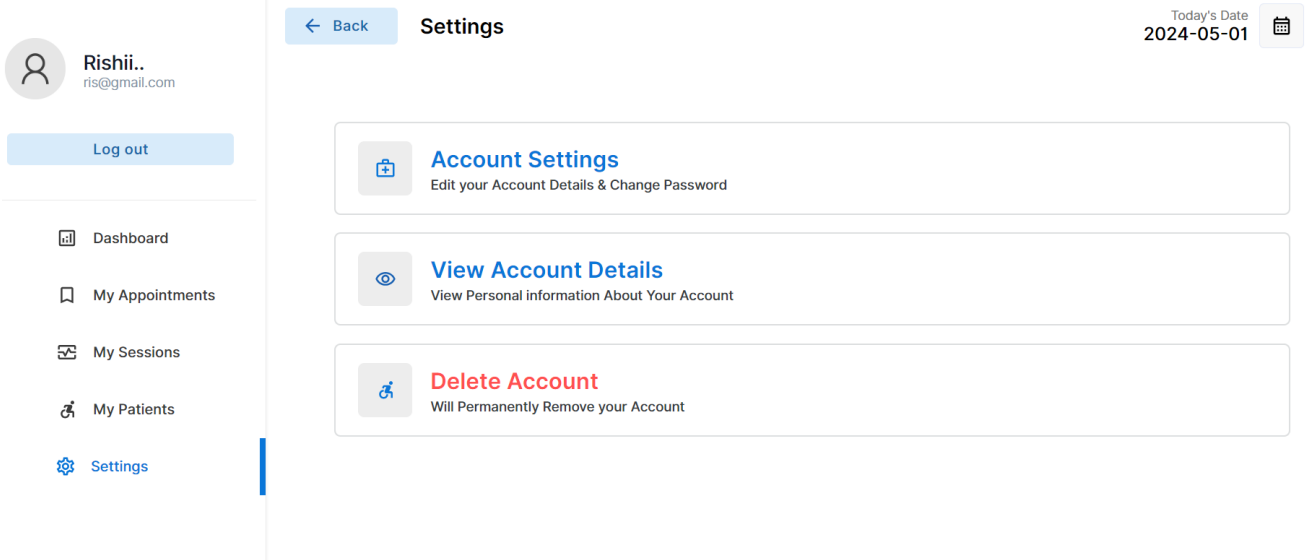
## DOCTOR'S HOMEPAGE



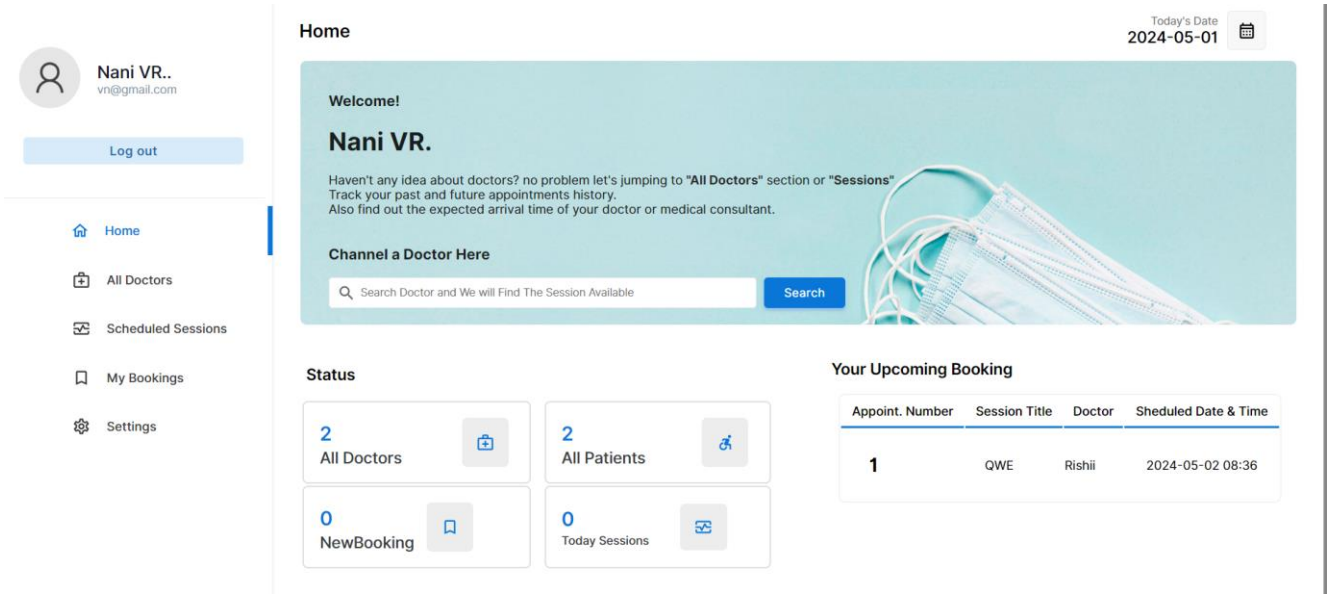

## DOCTOR'S SESSIONS:



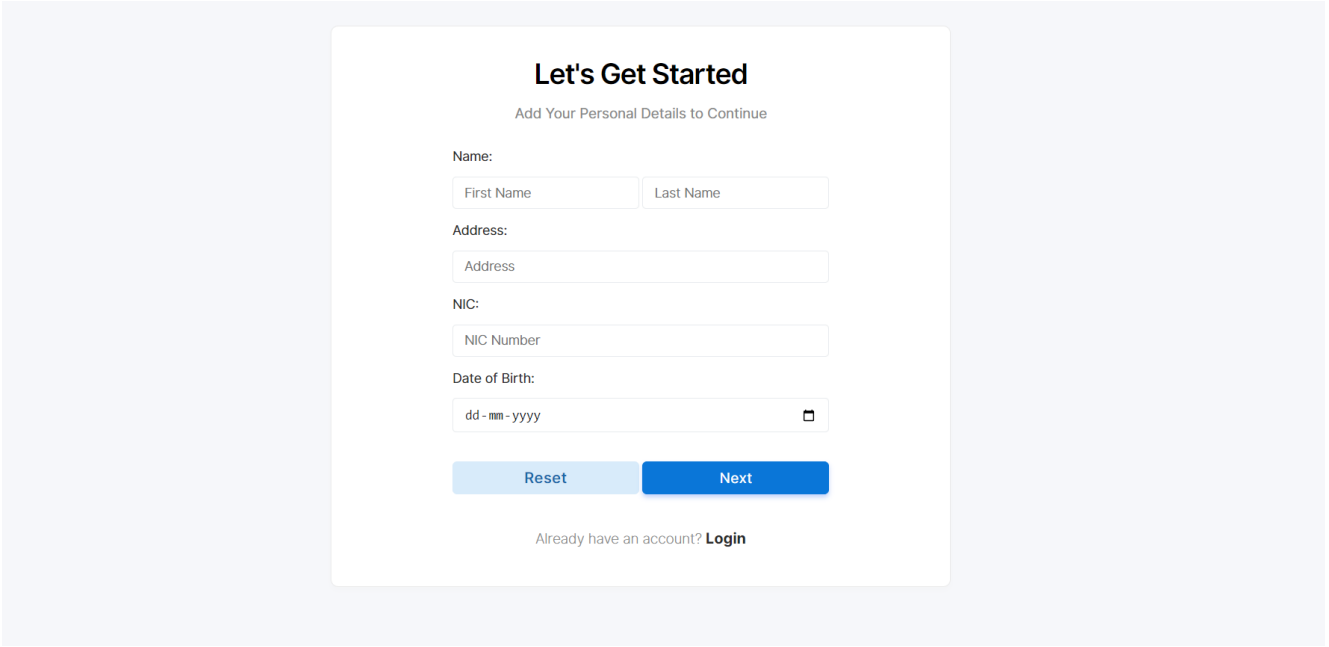

## SETTINGS:



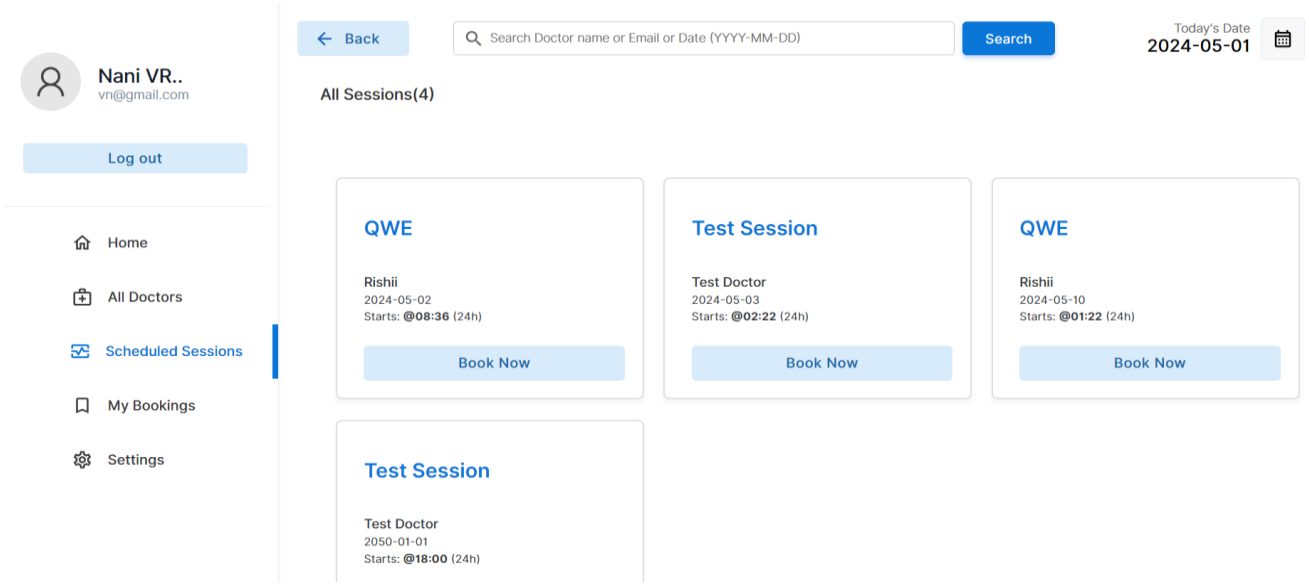
## PATIENT'S HOMEPAGE

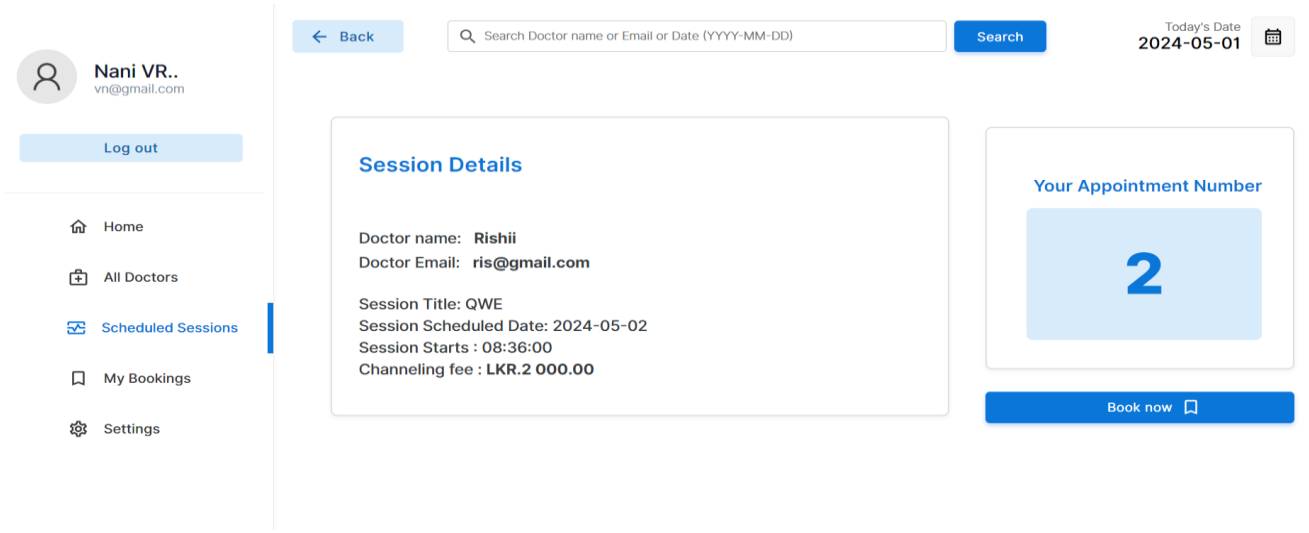



PATIENT'S LOGIN PAGE:

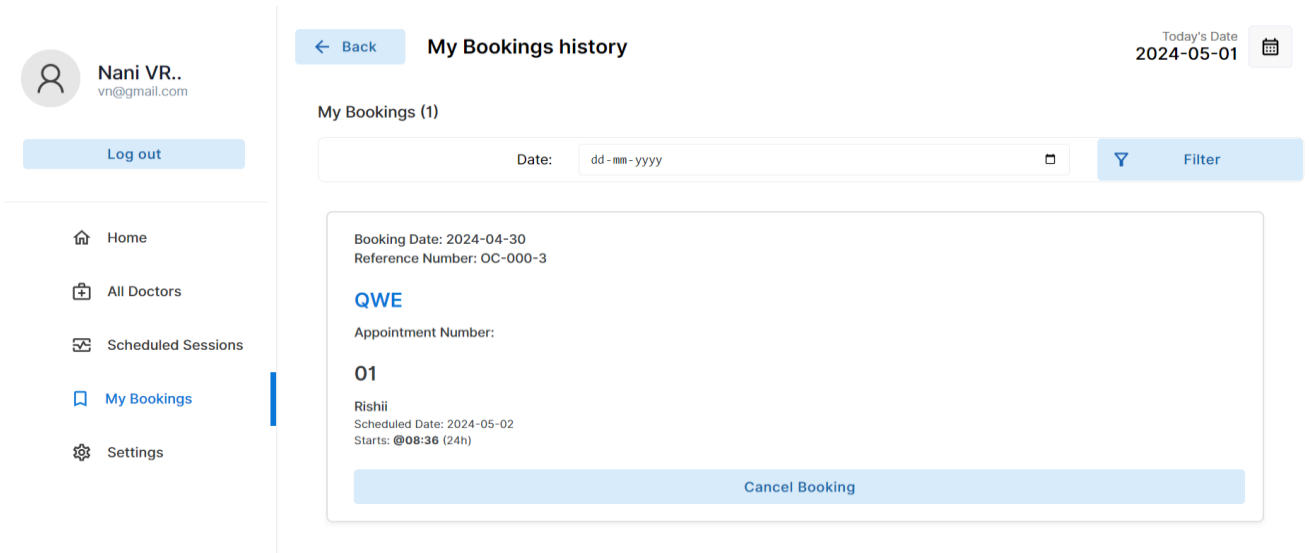


## SCHEDULE SESSION PAGE




## PATIENT'S BOOKINGS



# CHAPTER 5

# APPLICATIONS

Hospital Management Systems (HMS):

- The primary application of the system is in hospitals and healthcare facilities to streamline administrative tasks, manage patient records, and facilitate efficient delivery of healthcare services.

Clinics and Medical Practices:

- HMS can be adapted for use in smaller medical practices and clinics to manage patient appointments, medical records, and billing processes.

Outpatient Care Centers:

- Outpatient care centers, including diagnostic centers and rehabilitation facilities, can utilize HMS to schedule appointments, manage patient information, and track treatment progress.

Specialty Hospitals:

- Specialty hospitals such as orthopedic, cardiac, or cancer centers can benefit from specialized modules within the HMS tailored to their specific medical disciplines.

Nursing Homes and Long-Term Care Facilities:

- Nursing homes and long-term care facilities can use HMS to manage resident admissions, track medical histories, and coordinate care plans among staff members.

Emergency Medical Services (EMS):

- EMS providers can leverage HMS to manage emergency response activities, track patient transports, and communicate with hospitals for seamless patient handoffs.

# CHAPTER 6

# CONCLUSION

The Hospital Management System (HMS) represents a critical tool in modern healthcare administration, offering a comprehensive solution for managing hospital operations, patient care, and administrative tasks. Through its robust features and functionalities, HMS enhances efficiency, improves patient outcomes, and promotes a patient-centered approach to healthcare delivery.

By streamlining appointment scheduling, patient information management, and doctor-patient interactions, HMS optimizes resource utilization, reduces administrative burden, and enhances the overall quality of care. Its modular design allows for customization to suit the unique needs of different healthcare settings, from large hospitals to small clinics and specialty care centers.

Furthermore, HMS plays a pivotal role in ensuring data security, compliance with healthcare regulations, and seamless integration with other healthcare systems and technologies. With its ability to centralize and organize vast amounts of data, HMS empowers healthcare professionals to make informed decisions, deliver personalized care, and improve patient outcomes.

In conclusion, the Hospital Management System is not just a software solution but a cornerstone of modern healthcare management. Its adoption leads to operational excellence, cost-effectiveness, and enhanced patient satisfaction, ultimately contributing to the advancement of healthcare delivery and the well-being of patients worldwide. As healthcare continues to evolve, the importance of HMS in driving efficiency, innovation, and patient-centric care will only continue to grow.

# CHAPTER 7

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