



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** III **Month of publication:** March 2026

DOI: <https://doi.org/10.22214/ijraset.2026.77716>

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Meet Doc: The Telemedicine Solution for Redefining Healthcare Access

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Abstract: *Efficient appointment scheduling is essential for improving healthcare service delivery and reducing administrative workload in medical practices. This paper presents a Smart Appointment Booking System, a web-based application designed to streamline doctor-patient appointment management. The system enables users to view available time slots and book appointments according to their preferences, while automatically restricting booked slots to prevent conflicts and double bookings. It also supports appointment cancellation to enhance user flexibility and experience. In addition to scheduling, the system incorporates a financial management module that allows doctors to record daily earnings and automatically generate monthly income reports. The application is implemented using ASP.NET for the user interface and an SQL database for secure and reliable data storage. The proposed system improves operational efficiency, minimizes manual errors associated with traditional scheduling methods, and ensures accurate appointment tracking and financial reporting. Overall, the Smart Appointment Booking System provides a scalable and user-friendly solution for modern healthcare appointment and revenue management.*

Keywords: *Appointment Booking System, Healthcare Management System, ASP.NET, Online Scheduling, Medical Information System, SQL Database, Web-based Application.*

I. INTRODUCTION

In traditional healthcare systems, patients who need medical consultation are required to visit hospitals or clinics in person and wait until the doctor becomes available. This process often involves long queues and uncertainty in obtaining appointments.

Furthermore, if a doctor cancels an appointment due to emergencies or unforeseen circumstances, patients usually remain unaware until they physically arrive at the hospital, resulting in inconvenience, wasted time, and reduced service efficiency.

With the rapid advancement of mobile and web communication technologies, digital healthcare solutions have emerged as effective tools to address these limitations. Online appointment booking systems enable patients to schedule consultations remotely, reducing waiting time and improving accessibility to healthcare services. Such systems also help healthcare providers manage appointments more efficiently and maintain accurate patient records.

This paper proposes a Smart Online Hospital Management and Appointment Booking System designed to simplify and automate the process of scheduling doctor appointments. The system allows patients to register, login securely, view hospitals and doctors, and book appointments based on preferred date and time slots. Once an appointment is confirmed, the selected slot is reserved to prevent double booking, and the patient receives confirmation notifications. Additional features include viewing hospital location on maps and contacting doctors or hospitals through phone or email.

From the practitioner's perspective, the system provides secure storage of patient information and supports efficient appointment management. Doctors can access the portal using unique credentials and maintain their schedules effectively. Compared with traditional manual scheduling methods, the proposed system improves operational efficiency, enhances patient experience, and reduces administrative workload.

II. RELATED WORK & SHORT COMINGS

1) Zhanget al.(2014)–Web-Based Medical Appointment System:

Zhang and colleagues developed a web-based medical appointments scheduling system that allowed patients to register online, view doctor availability, and book appointments remotely. The system reduced manual scheduling workload and improved hospital service efficiency.

Limitation: The system lacked real-time synchronization of appointment slots and did not provide automated notifications for cancellations or schedule changes. It also offered limited mobile accessibility.

2) Gupta and Denton (2016) – Appointment Scheduling in Healthcare Systems:

Gupta and Denton studied healthcare appointment scheduling models and highlighted the benefits of electronic booking systems in reducing waiting times and improving resource utilization. Their work provided theoretical frameworks for efficient patient–doctor scheduling.

Limitation: The research focused mainly on mathematical scheduling models rather than implementing a complete patient-accessible online booking application. Practical deployment and user interface aspects were not addressed.

3) Prasad et al. (2018) – Android-Based Doctor Appointment Application:

Prasad and associates developed an Android-based doctor appointment application that enabled patients to search hospitals, view doctors, and request appointments through mobile devices. The system improved accessibility and convenience for users.

Limitation: The application lacked secure data management and did not include advanced features such as real-time slot locking, financial tracking, or integrated hospital management modules.

4) Ramesh et al. (2019) – Online Hospital Management System:

Ramesh and colleagues proposed an online hospital management system integrating patient registration, appointment booking, and basic medical record storage. The system digitized hospital administrative processes and reduced paperwork.

Limitation: The system did not support automated notifications, cancellation handling, or dynamic scheduling based on doctor availability. Scalability and multi-hospital support were also limited.

5) Kumar and Singh (2021) – Cloud-Based Health Appointment Platform:

Kumar and Singh introduced a cloud-based health appointment platform that enabled remote appointment booking and centralized patient data storage. The cloud architecture improved data accessibility and system reliability.

Limitation: The platform required continuous internet connectivity and lacked offline support. Security mechanisms and role-based access control were insufficient for sensitive healthcare environments.

III. LITERATURE SURVEY

Efficient doctor–patient interaction and appointment scheduling systems have been widely studied to reduce patient waiting time and improve healthcare service quality. Traditional hospital appointment systems relied on manual scheduling and queuing models, often prioritizing doctor utilization over patient convenience. With the advancement of web and mobile technologies, online appointment systems have emerged to enhance accessibility, reduce waiting time, and streamline healthcare management.

Early research on patient waiting time defined it as the duration from patient registration to consultation with a physician and receipt of medication. Studies by Fernandes et al. and Jamaiah emphasized that excessive waiting time negatively affects patient satisfaction and healthcare efficiency. Subsequent works categorized waiting time into two components: time to consult a physician and time to obtain treatment or medication. These studies highlighted the need for improved appointment scheduling mechanisms in healthcare centers.

Healthcare appointment scheduling models were later explored using mathematical queuing theory to minimize waiting time and optimize doctor utilization. Harper and Gamlin developed simplified queuing and scheduling models for patient appointments, while Wijewickrama noted that traditional appointment systems primarily minimized doctor idle time rather than patient waiting time. Takakuwa later proposed balanced scheduling approaches considering both patient convenience and doctor availability, emphasizing the importance of integrated appointment management systems.

Computerized patient appointment management systems were introduced to automate scheduling and reduce administrative workload in healthcare centers. Dexter described such systems as applications designed to manage appointments and reduce patient waiting time through structured scheduling. Healthcare facilities adopting computerized appointment systems demonstrated shorter waiting times compared to those without automated scheduling.

With the growth of internet technologies, web-based and online hospital appointment systems were developed to allow patients to book appointments remotely and access healthcare services more conveniently. Rohleder proposed appointment scheduling models based on stochastic patient arrival patterns; however, these models assumed exponential arrival distributions that were difficult to validate in real healthcare environments. Klassen further emphasized that appointment scheduling must align with practical healthcare workflows and clinical constraints rather than purely theoretical models.

Despite these advancements, many existing hospital appointment schemes remain limited by static scheduling, lack of real-time updates, and insufficient integration between patient access and doctor availability. Therefore, there is a need for a smart online doctor appointment booking system that supports real-time scheduling, efficient waiting-time management, and improved doctor–patient interaction.

IV. PROPOSED SYSTEM

Traditional hospital appointment methods suffer from several limitations. Most existing systems rely on manual scheduling, which leads to long waiting times, double bookings, and inefficient utilization of doctors' time. Some digital solutions focus only on appointment booking without providing real-time schedule management, notifications, or integrated patient record storage. In many cases, systems lack usability, automation, and centralized data handling. Therefore, a complete end-to-end solution that supports both efficient appointment scheduling and practical healthcare data management is required.

The proposed system, named Smart Doctor Appointment Booking System, addresses these challenges by integrating appointment scheduling, real-time availability management, automated notifications, and patient record storage within a single web-based platform. The system is designed to provide a convenient and reliable interface for patients while enabling doctors to manage their schedules efficiently.

One of the key strengths of the proposed system lies in its web-based features. The application allows patients to register, search for doctors based on area or specialty, view schedules, book appointments, and receive confirmation and reminder notifications. Doctors can accept or reject appointment requests, adjust their working hours, and track patient appointments through a dedicated dashboard. All appointment and patient data are securely stored in a centralized database, enabling efficient retrieval and management. The proposed system consists of two main modules:

- Patient Module – registration, login, doctor search, appointment booking, cancellation, and notifications
- Doctor Module – schedule management, appointment approval/rejection, and patient tracking

Both modules are integrated into the same web platform, enabling seamless interaction between patients and doctors. When a patient submits an appointment request, the system checks the doctor's availability, reserves the selected time slot, and updates the database automatically. This integrated scheduling and data management approach improves accuracy, reduces waiting time, and enhances healthcare service efficiency.

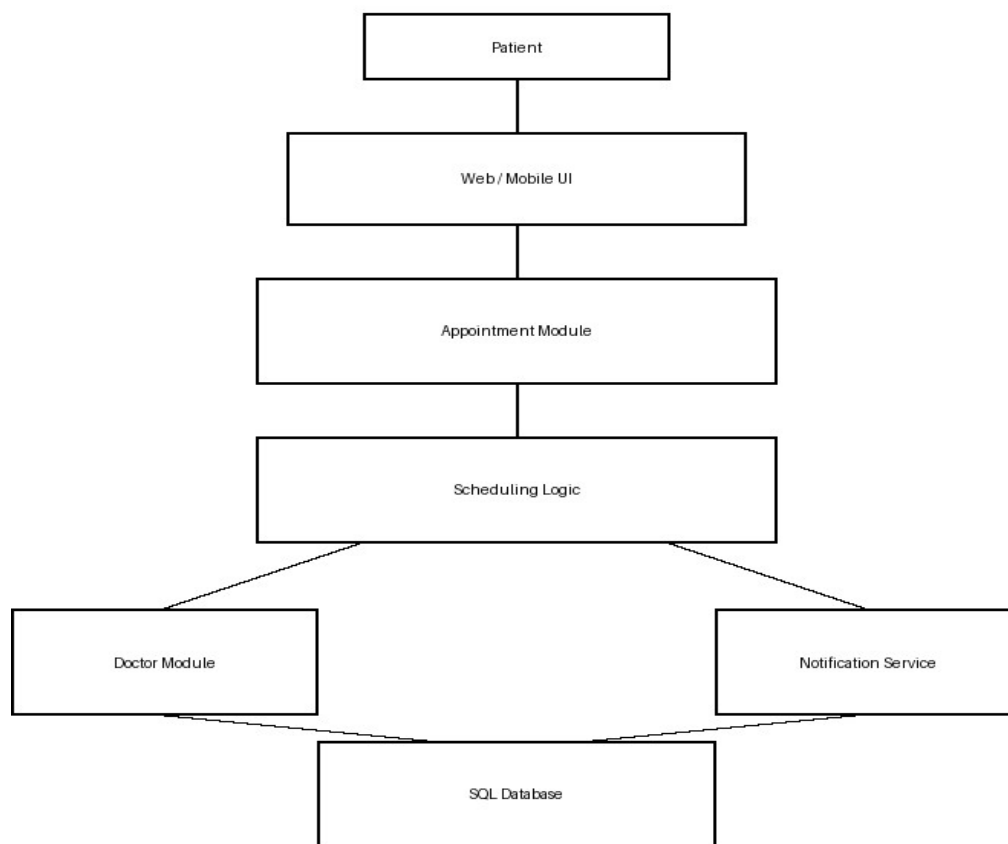


Fig.1. System Architectural Flow

The system architecture of the proposed Smart Doctor Appointment Booking System is designed to automate appointment scheduling and healthcare interaction in an efficient and user-friendly manner.

The workflow begins when a patient accesses the web application and logs into the system. The interface, developed using ASP.NET technology, serves as the primary interaction layer between users and the application.

After login, the patient selects a doctor using filtering options such as area-wise or specialty-wise search. The application retrieves doctor profiles and schedules from the database and displays available time slots. When the patient selects a preferred slot, the appointment management module verifies availability and temporarily locks the slot to prevent double booking.

The request is then forwarded to the doctor module. The doctor can accept or reject the appointment based on schedule feasibility. Once a decision is made, the system updates the database and sends a confirmation or rejection notification to the patient. Additionally, the system automatically generates a reminder notification prior to the appointment time to reduce missed consultations.

All appointment details, user information, and schedule data are stored in the database storage and retrieval module. This component enables doctors to view daily appointments, track patients, and manage schedules efficiently. Patients can also view appointment history and cancellation status. The centralized database ensures data consistency, security, and accessibility.

Overall, the architecture demonstrates interaction between user input, scheduling logic, database processing, and notification delivery. The system reduces waiting time, eliminates scheduling conflicts, and improves healthcare workflow efficiency.

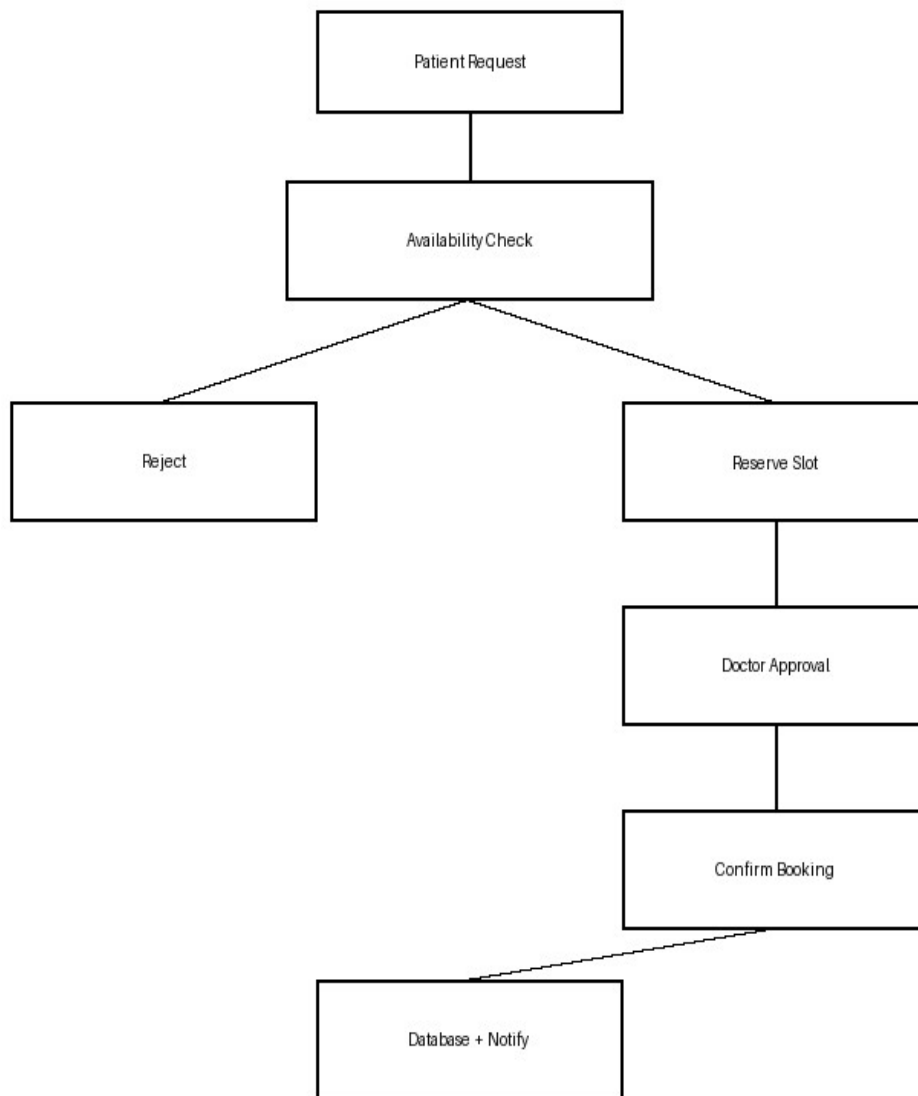


Fig.2.AppointmentSchedulingModuleArchitecture

The appointment scheduling mechanism forms the core of the Smart Doctor Appointment Booking System. It is responsible for managing doctor availability, preventing slot conflicts, and ensuring efficient time allocation.

Unlike traditional manual scheduling, the proposed system automatically validates appointment requests against real-time doctor schedules.

The scheduling process begins when the patient selects a desired date and time. The system checks the database to determine whether the slot is available. If available, the slot is reserved and marked as booked, preventing further selection by other patients. This real-time slot-locking mechanism eliminates double booking and scheduling errors.

The scheduling module includes three main components:

- AvailabilityVerificationLayer—checks doctor schedule and slot status
- AppointmentProcessingLayer—handles booking, approval, and cancellation
- NotificationLayer—sends confirmation and reminder alerts

The doctor dashboard displays daily appointment counts, enabling doctors to adjust working hours or manage patient load effectively. Hospitals can also utilize this information to optimize resource allocation and reduce idle time.

The database stores appointment records including patient ID, doctor ID, date, time slot, and status. This structured storage enables efficient retrieval of appointment history and reporting. The scheduling architecture ensures reliable appointment allocation, improved doctor time utilization, and reduced patient waiting time.

V. RESULT

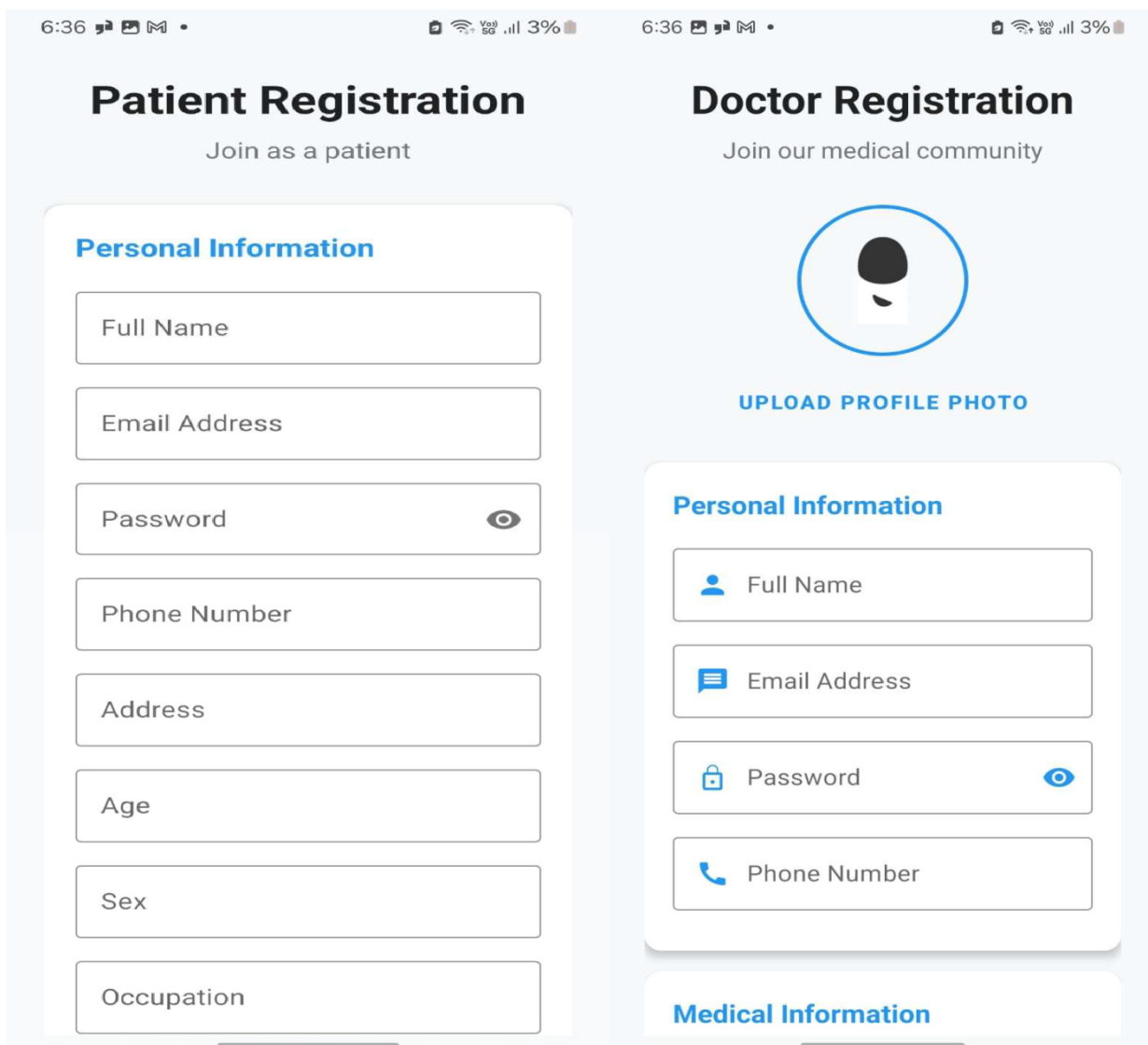


Fig. 1 Registration Page

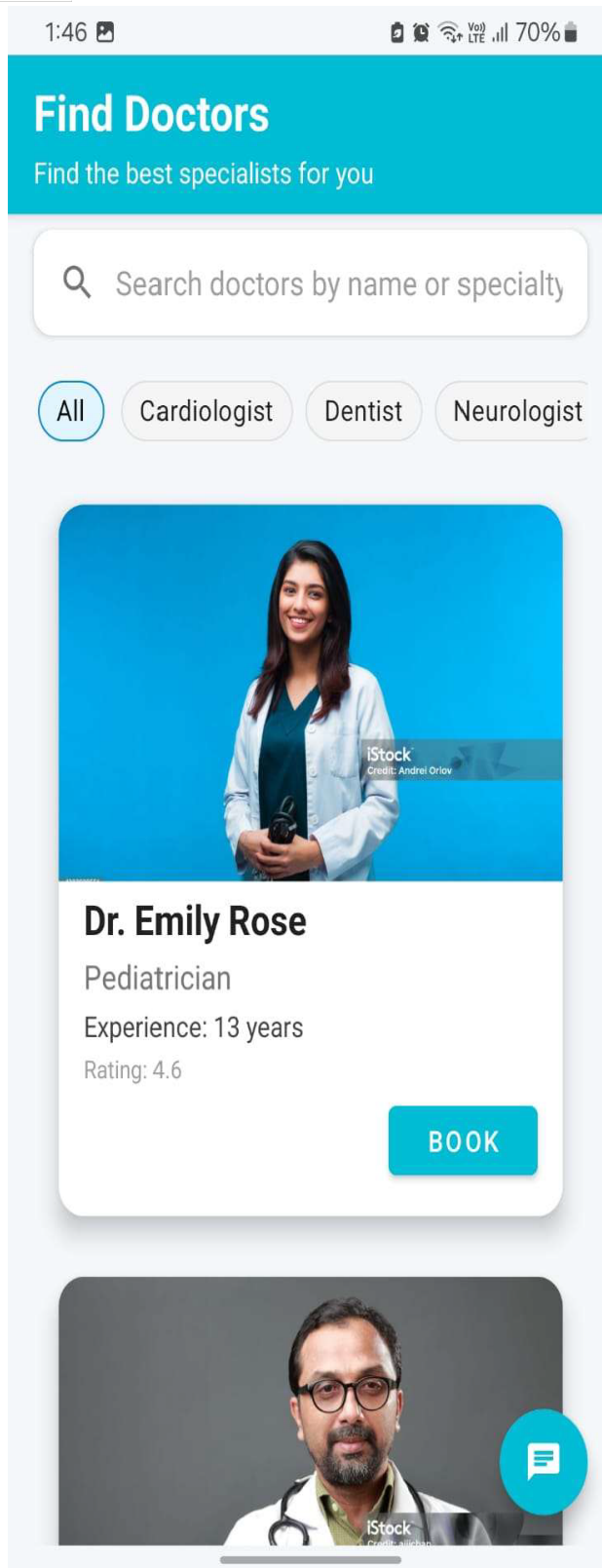


Fig.2FindDoctors

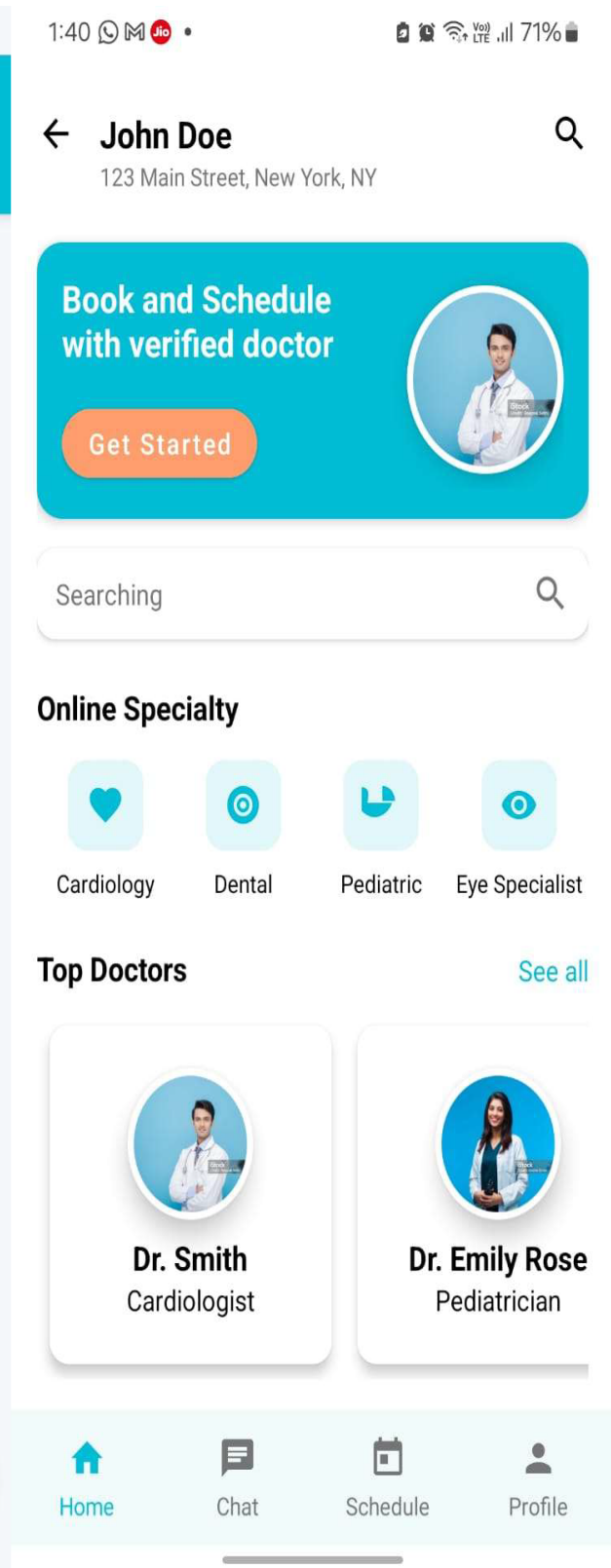


Fig.3HomePage



Dr. Smith
Cardiologist

★★★★★


April 2025

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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

12:00 - 13:00
General skin care appointments

15:00 - 16:00
Regular checkup

BOOK NOW



←

♡

Dr. Emily Rose

Pediatrician

Happy Kids Clinic

800 Patients	13 Experience	4.6 Rating
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About

Passionate pediatrician helping children live healthier lives.

Voice Call | Video Call | Message

Book an Appointment

Fig.4BookDoctorAppointment

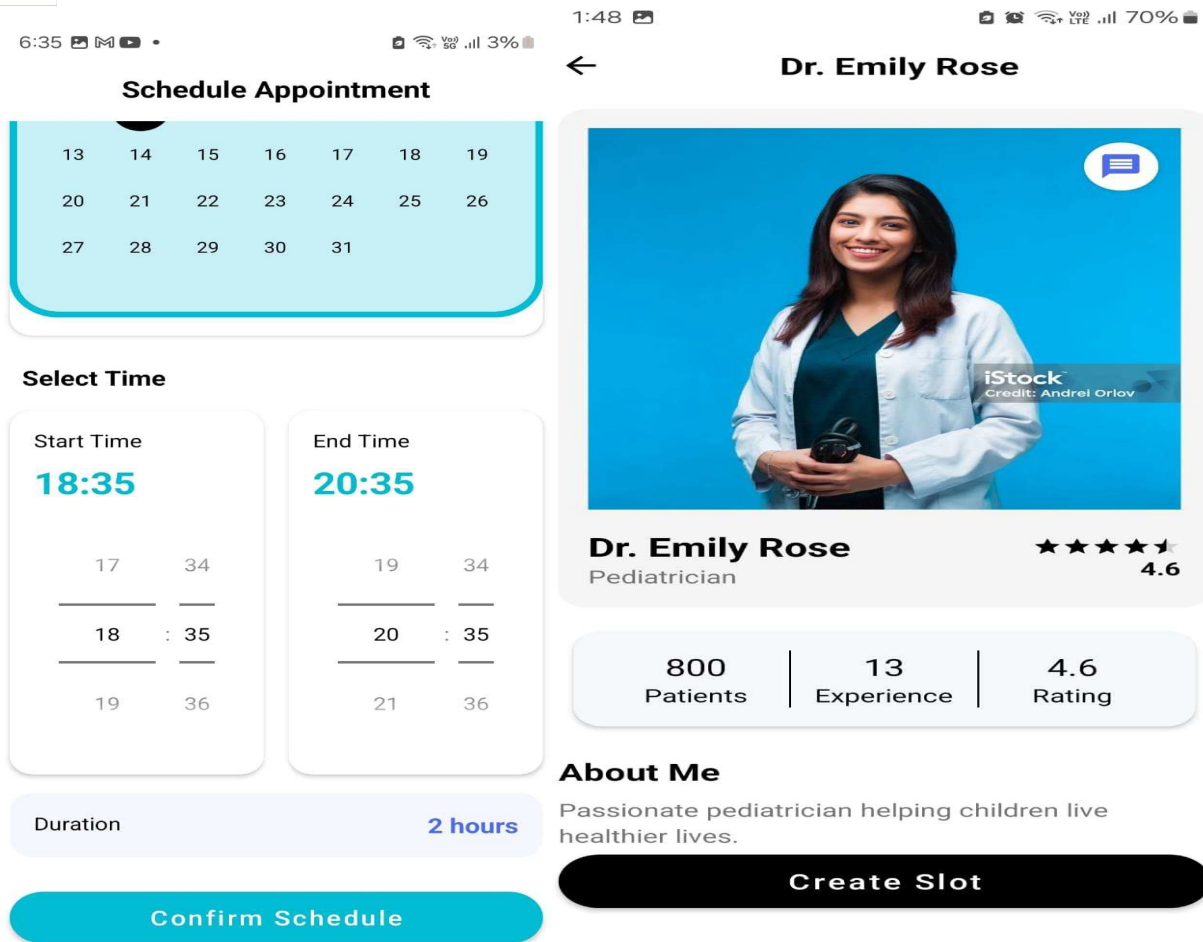


Fig.5 Schedule Confirmation & Slot Create

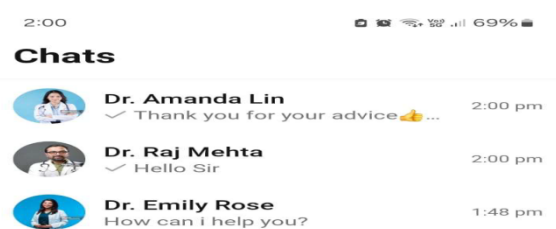


Fig.6 Chats



VI. CONCLUSION & FUTURE SCOPE

This work presents an online doctor appointment booking system that streamlines the process of scheduling medical consultations through a centralized digital platform. The system enables patients to search specialists, view doctor availability, and book appointments efficiently while preventing scheduling conflicts. The implementation demonstrates that a lightweight web-based architecture can effectively support clinic-level appointment management with improved usability and reduced waiting time.

Future enhancements may include mobile application deployment, automated reminders, telemedicine integration, and secure cloud-based health record management to increase accessibility, scalability, and healthcare service quality.

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