

CAREHUB

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Abstract—The CareHub is a web-based platform designed to simplify medical appointment scheduling. It enables patients to view real-time doctor availability and book, reschedule, or cancel appointments with ease. Automated reminders reduce missed consultations, while separate dashboards for patients, doctors, and administrators ensure smooth workflow management. By digitizing appointment booking, the system minimizes manual errors, reduces waiting times, and enhances patient experience.

Index Terms— CareHub, online appointment scheduling, real-time availability, healthcare management, automated reminders.

INTRODUCTION

Healthcare institutions often face challenges in managing patient appointments efficiently. Traditional methods such as phone calls or in-person booking result in long waiting times, scheduling conflicts, and missed appointments. The CareHub addresses these issues by providing a web-based solution that allows patients to book consultations online, while doctors can manage their schedules and availability in real time. The system aims to improve accessibility, reduce manual errors, and enhance overall patient satisfaction.

EXISTING SYSTEM

In the existing manual system, patients book appointments either by phone or by visiting clinics directly. This approach lacks real-time visibility of doctor availability, often leading to long waiting times and scheduling conflicts. Furthermore, there are no automated reminders or cancellation handling mechanisms, which increases the likelihood of missed appointments.

PROPOSED SYSTEM

The proposed system introduces an online platform that integrates real-time doctor availability with automated booking, rescheduling, and cancellation features. Doctors can manage their schedules and time slots, while patients receive instant notifications and confirmations. The system ensures transparency, reduces waiting times, and improves workflow efficiency for both patients and healthcare providers.

SYSTEM ARCHITECTURE

The CareHub is implemented using Next.js for the frontend, providing interfaces for patients and doctors. Appointment booking and slot management are handled through Next.js API routes. Supabase serves as the database for storing user details, appointments, and schedules. Secure authentication is achieved using JWT-based role control. A notification service delivers email and SMS alerts for confirmations and reminders.

The system architecture includes patient and doctor interfaces, API routes, and Supabase database.

LITERATURE SURVEY

Several studies have explored online healthcare appointment systems. Joshi et al. (2019) proposed a Python-Django based system but lacked user feedback and had poor UI. Meena and Nandhini (2020) developed a PHP-MySQL system without real-time updates. Gupta (2020) introduced an admin panel but did not include reminders. Sharma and Patel (2021) built an Android-based system but lacked multi-device synchronization. Kumar and Singh (2022) integrated AI chatbots but faced accuracy issues. A MERN-stack solution (2023) offered advanced features but was complex to set up and not mobile-optimized.

Table 1. Literature Survey of Doctor Appointment Systems

Year	Author(s)	Title	Technology Used	Limitations
2019	Joshi et al.	E-healthcare appointment scheduling system	Python-Django	Poor UI, no user feedback
2020	Meena & Nandhini	Online doctor appointment system using web application	PHP-MySQL	No real-time updates
2020	Gupta	Doctor appointment booking system with admin panel	Web-based	No reminder feature
2021	Sharma & Patel	Smart health care appointment system using Android	Android	No multi-device sync
2022	Kumar & Singh	AI-based online medical consultation and booking system	AI chatbot	Accuracy issues
2023	ResearchGate Comm.	Doctor appointment web application	MERN stack	Complex setup, not mobile-optimized

FLOWCHART

The workflow begins with user login or registration, followed by role selection (patient or doctor). Patients can browse doctors, select time slots, and book appointments. Doctors manage availability, confirm bookings, and update schedules. Notifications are sent for confirmations, cancellations, or reminders.

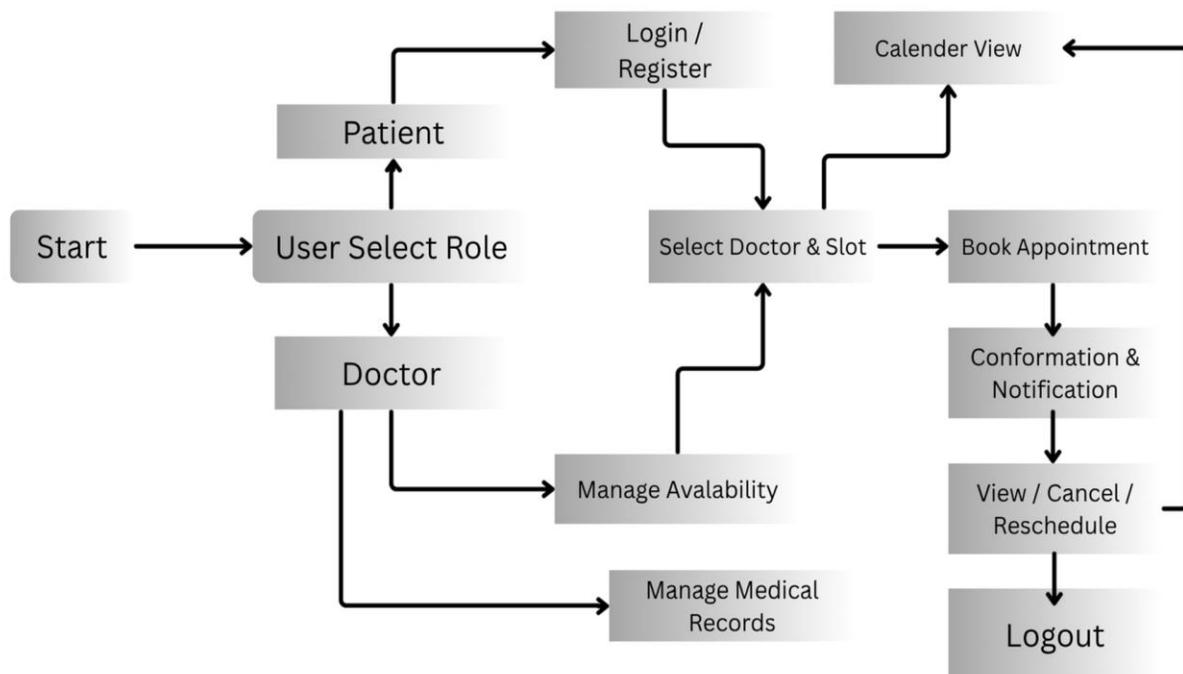


Fig. 1. Flowchart of CareHub

PATIENT REGISTRATION AND AUTHENTICATION

The system provides secure signup and login for both patients and doctors. Authentication is implemented using hashed passwords and token-based login. Role-based access control ensures that patients and doctors have distinct privileges. Profiles include personal details and appointment history, with strong protection against unauthorized access.

DOCTOR PROFILE AND SCHEDULE MANAGEMENT

Doctors can configure available days and time slots, update specialization details, and manage holidays or emergencies. The system provides real-time updates of available slots and allows doctors to view upcoming and past appointments.

APPOINTMENT BOOKING AND CANCELLATION

Patients can browse doctors by specialty and location, view real-time slot availability, and book instantly. They can cancel or reschedule appointments, with booking history maintained for reference. Slot validation prevents double-booking and ensures smooth scheduling.

REAL-TIME NOTIFICATIONS

The system sends automated email and SMS alerts upon successful booking. Reminder notifications are delivered before appointment times, while cancellations or delays trigger instant alerts. Users can customize notification preferences.

BOOKING CONFLICT AND SLOT VALIDATION

The platform prevents overlapping appointments by validating time slots before confirmation. Doctor schedules are updated automatically after each booking, ensuring accurate availability. Conflict attempts are logged for audit purposes.

CONCLUSION

The CareHub provides a smart, reliable, and user-friendly solution for healthcare appointment scheduling. Built with Next.js and Supabase, it ensures secure data handling and fast performance. Patients benefit from reduced waiting times and improved accessibility, while doctors gain efficient schedule management. Overall, the system enhances healthcare delivery by minimizing errors and streamlining workflows.

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