



Connected Care: Bridging Gap in Digital Healthcare Access

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Abstract: The existing healthcare management systems are fragmented, requiring users to rely on multiple platforms for doctor appointments, medicine delivery, and diagnostic services. This leads to inefficiencies, a lack of coordination, and delays in accessing healthcare web application that integrates key services into a single platform. The proposed system enables users to book appointments, provide test centers, order medicines, provide medication reminders, and contact RMPs. The platform provides a seamless user experience, secure data management, and real-time updates by leveraging modern web technologies. The result is an efficient, Scalable, and reliable system that improves patient convenience and healthcare provider efficiency by resolving existing system limitations

Index Terms – Digital Healthcare Application, Online Doctor Appointment, Online Medicine Delivery, Medicine Reminders, Diagnostic Center, MERN Stack.

I. INTRODUCTION

Using technology in healthcare has transformed the way medical services are delivered, making them faster, easier, and more accessible to all. The goal of this study is to develop a healthcare web application that integrates vital features such as booking appointments, ordering and delivering medicines, locating test centers, medication reminders, and RMP's contact details. The application goal is to tackle common healthcare concerns and make it more convenient for users by combining these features on a single platform.

The application is implemented to improve the user experience by simplifying critical healthcare processes. Patients may easily communicate with doctors through online appointment scheduling, which eliminates the need for physical visits and reduces waiting times [2][3][5]. This feature is especially helpful for people who live in distant places or have mobility issues. Additionally, this platform offers a medicine delivery feature, which allows users to place orders and have their medicines delivered right to their medicines [7]. This application reminds users to take their medicines [1] and reorder them as necessary to encourage medication adherence. This feature not only improves health outcomes but also promotes increased patient engagement and compliance.

The diagnostic feature simplifies the process of finding nearby test centers for users. With a directory of diagnostic facilities, this platform simplifies the process of finding reliable and accessible options for blood tests, scans, and x-rays. This feature ensures that users can make informed choices about their health without any delays. If the user has minor health problems, they can reach out to RMPs through this application. The application is primarily focused on scalability and user-friendliness. It is a significant forward step in modernizing healthcare solutions by offering practical, efficient, and accessible options for both users and providers.

II. LITERATURE SURVEY

Ahmed Imteaj et al. [1], implemented a smartphone-based Android application to improve healthcare accessibility in Bangladesh. This application includes hospital information, enabling users to access required healthcare centers with ease. Online cabin booking facilitates smooth hospital stay planning for patients. Doctor appointment booking enables users to locate and schedule consultations with specialists at their convenience. Emergency services provide easy access to critical healthcare assistance during emergencies. A medication reminder feature ensures that patients stick to their treatments, enhancing medication adherence. The BMI calculator that is integrated helps the users monitor their health and stay healthy. Two major modules: an administrator module and a user module. The user module offers convenient access to healthcare services, which enhances the efficiency and accessibility of medical assistance. The application enhances patient convenience and the delivery of healthcare services.

Venkatesh Rallapalli et al. [2], provide an online doctor appointment system designed to simplify healthcare access and improve efficiency. Patients can make appointments, search for doctor profiles, and obtain prescriptions. The system offers real-time doctor

availability, enabling users to schedule visits at their convenience. Secure communication features allow for easy interaction between doctors and patients. Doctors can efficiently manage their schedules, minimizing administrative tasks. Automated reminders inform patients of their appointments. The system reduces the patient waiting time considerably by making the booking process more efficient. It maximizes overall healthcare service delivery by enhancing efficiency and accessibility. Doctors and patients equally gain from a more coherent and convenient appointment system. It maximizes time management, patient satisfaction, and overall medical consultations.

V. Vijayarveswari et al. [3], developed a system that consists of two modules, Patients and doctors, to enable the effective scheduling of appointments. Patients can register, log in, schedule appointments, and view confirmations with ease. They can check the availability of doctors and schedule visits according to their preferences. Doctors can control their schedules, update availability, and change appointments when necessary. The system enables doctors to alert patients in case of changes in schedules, enabling effective communication. Automated reminders keep patients aware of their future appointments, minimizing missed appointments. Physicians can effectively manage their schedules, reducing administrative burden. The system improves healthcare accessibility and simplifies appointment management for both physicians and patients.

Mr. Atharva S. Wankhade et al. [4], which was designed to simplify healthcare by enabling features like symptom analysis, appointment booking, live health monitoring, and emergency SOS alerts. It also facilitates simple communication between patients and doctors, reducing waiting times and simplifying administrative tasks. The platform enhances efficiency, patient satisfaction, and healthcare delivery by providing features like real-time scheduling and secure data management.

Ari Subhi et al. [5], designed as a modern solution aimed at simplifying healthcare access. Patients can easily schedule online appointments without having to spend hours waiting in hospitals and clinics. Users can see doctors' availability in real time, making it easy for them to select an appropriate appointment time. Secure data management keeps patient records secure, maintains confidentiality, and adheres to healthcare standards. Efficient administrative tasks are minimized by the platform, enabling healthcare providers to dedicate more time to patients. Increasing patient-doctor communication results in coordinated treatment and superior capabilities that maximize resource utilization for medical facilities. Through its effective and user-friendly design, it enhances healthcare services. The platform ensures accessibility, efficiency, and patient satisfaction in healthcare.

Mohammad Waqar Bhat et al. [6], implemented a secure online medicine delivery system that provides biometric authentication and data encryption to ensure safe and accurate delivery. Patients are registered based on their biometric information, which is encrypted and stored securely to avoid unauthorized use. The system keeps sensitive patient information confidential and adheres to healthcare standards. It ensures secure transactions and prevents unauthorized purchases and fraudulent activities, validating every order. Secure authentication increases trustworthiness and reliability, making online medicine delivery more secure for consumers. Secure authentication simplifies the ordering system, offering a convenient experience. Automated tracking enables patients to track their orders in real time for increased convenience. Overall, it provides a safe, effective, and reliable option for drug delivery, enhancing access and patient trust.

Viraj Butani et al. [7], proposed Dr. Zone, an Android-based application that can handle doctor appointments, an online medicine delivery system, and an NGO support integration feature. It has three modules: appointment scheduling, online medicine delivery, and NGO support. Patients can register, search for experts, check doctor availability, and book appointments with ease. Doctor can schedule their calendars, set availability, and optimize patient consultations. The app minimizes physical visits, increasing the accessibility and convenience of healthcare. It guarantees a timely medication supply, enhancing treatment compliance and patient care. The NGO module supports healthcare assistance for poor patients. An easy-to-use interface increases navigation and usability for patients and physicians. Secure communication options ensure smooth doctor-patient interactions and appointment reminders. DrZone generally streamlines healthcare accessibility, enhances medication supply, and increases patient engagement.

Shafaq Malik et al. [8], introduced an Android application and a web-based admin panel. Users are allowed to register, search for physicians, schedule appointment timings, and get real-time reminders. The application provides a user-friendly interface to make booking appointments easy and efficient. Patients can see physicians' profiles, check for timings, and book visits with ease. Automated reminders remind users about appointments. The web-based admin panel supports administrators in keeping doctor and patient records in synchronization. Admins can monitor appointments, schedule updates, and ensure system optimization. The system facilitates better interaction between doctors and patients, maximizing healthcare accessibility. With its elegant design and functionality, it provides a streamlined experience for everybody. The application simplifies the management of appointments and maximizes efficiency in healthcare services.

A Siddiqui et al. [9] developed the doctor appointment system using MongoDB, Express.js, and React.js to enhance scheduling and patient-doctor communication. It features an intelligent scheduling algorithm that optimizes appointment allocation and reduces wait times. Secure messaging and telehealth consultations improve accessibility and patient engagement. The system helps minimize no-shows and enhances operational efficiency in healthcare facilities. Despite initial challenges like staff resistance and technical disruptions, it proved highly beneficial. The system simplifies scheduling, making it more efficient and user-friendly. It also ensures better resource utilization for healthcare providers. Patients experience improved access to medical services and timely consultations. Overall, it enhances healthcare service delivery and patient satisfaction.

III. PROPOSED METHODOLOGY

3.1 Online Doctor Appointment

Fig. 1 illustrates how to book a virtual appointment with a doctor. There are three types of users. They are:

1. Doctor: The doctor can log in with the credentials that have been provided by the admin. They can view the patient's details. Also, the doctor can accept or reject the appointments.

2. Patient: The patient can create an account with fields name, email, phone number, and password. After creating the account, the patient can log in with credentials. After the successful login, the user can search for a required specialist. If the specialist is available, the user can select the doctor and book the slot based on the scheduled date and time. If the specialist is not available, they can search again. If the doctor accepts the appointment, the patient can choose a payment method and proceed to pay. If the doctor rejects the appointment, the patient can book again.
3. Admin: The admin can manage the doctors and patients. And also provide the credentials to doctors.

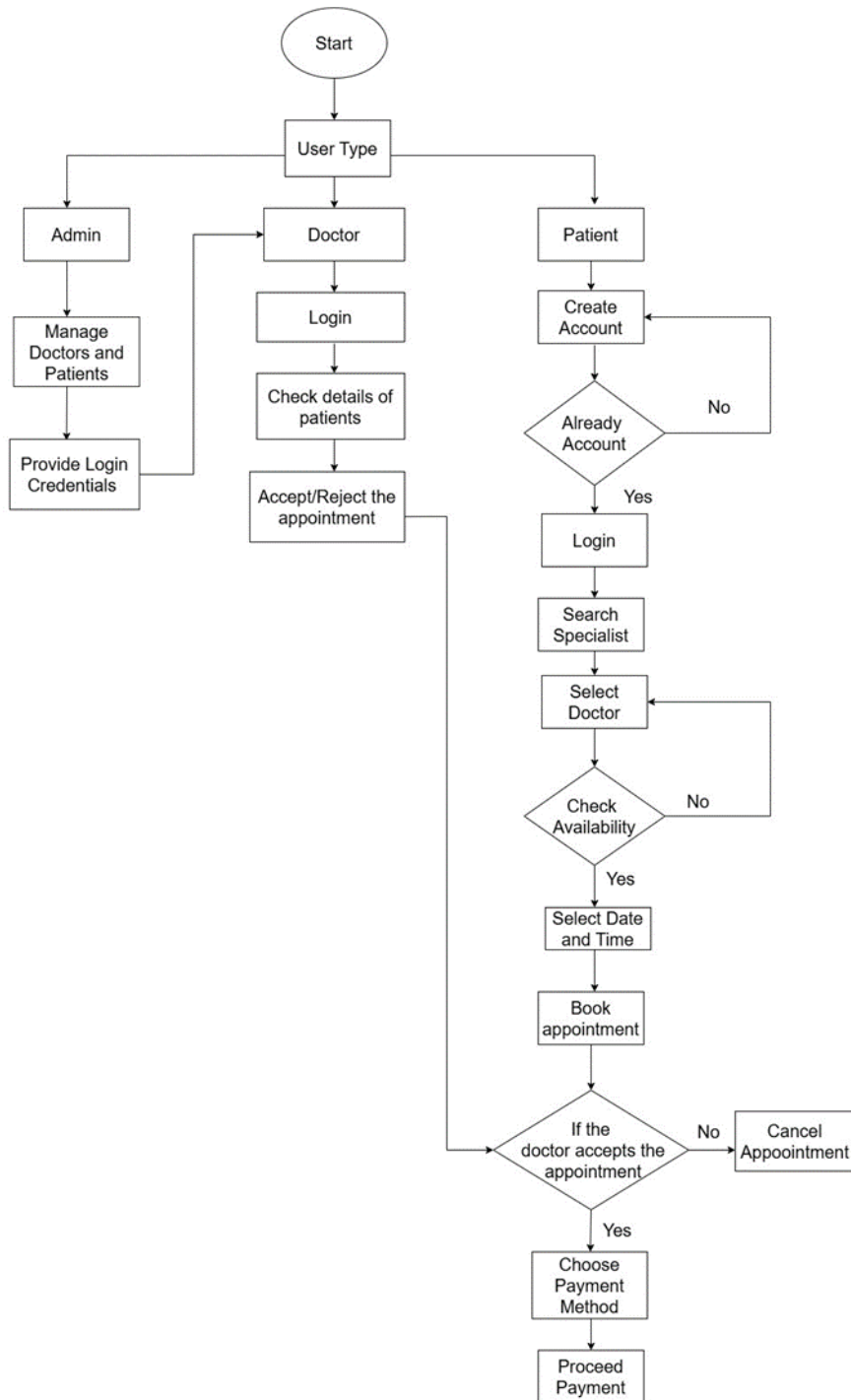


Figure 1: Flowchart of Online Doctor Appointment

3.2 Medicine Delivery

User can order the medicines to be delivered to their doorstep. Users can select the medicine and add it to the cart. After that, the user can buy the medicine.

3.3 Diagnostic Center

In the diagnostic center, user can search for their required location. Based on the user inputs, it will provide available centers in nearby locations.

3.4 Contact information of RMPs and Medication

We are providing RMP's details. If users/patients require any suggestions for their minor issues, the RMPs respond. We are also providing reminders to take their medicine.

IV. RESULT AND DISCUSSIONS



Consult Doctors Online.

Figure 2: Home page

Figure 2 describes the homepage of the application.

Create Account

Please sign up to book an appointment

Full Name

Email

Phone

Password

Already have an account? [Login here](#)

Forgot your password? [Reset here](#)

Figure 3: Patient Sign-up page

Figure 3 shows the user sign-up page. Users can sign up with required fields such as name, email, phone number, and password. If you have an account, you can log in with your credentials.

Login

Please log in to book an appointment

Email

Password

Create a new account? [Click here](#)

Forgot your password? [Reset here](#)

Figure 4: Patient's Login Page

Figure 4 shows the patient login page. Users can log in with credentials. If you don't have an account, you will need to create one.

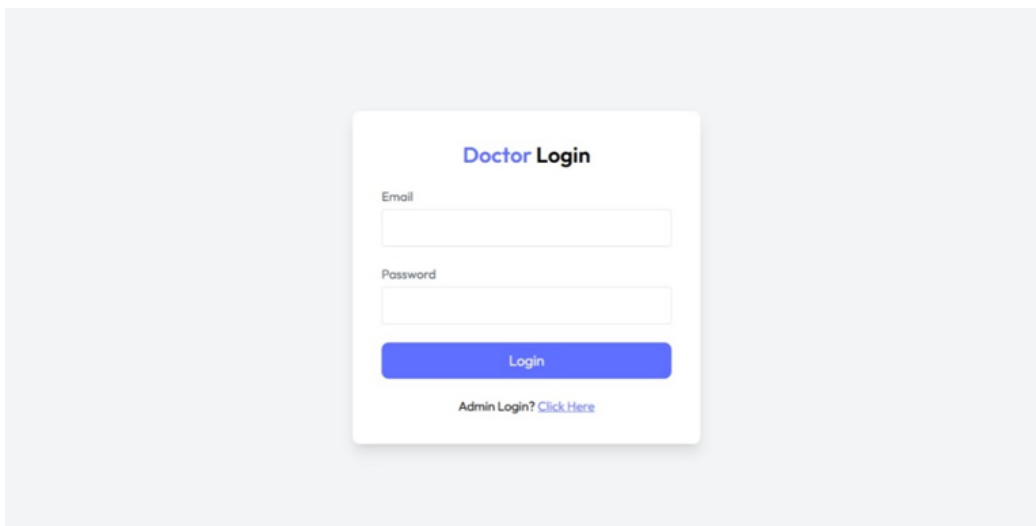


Figure 5: Doctor's Login page

Figure 5 illustrates the Doctor's login page. Doctors can log in with their credentials, which are provided by the admin.

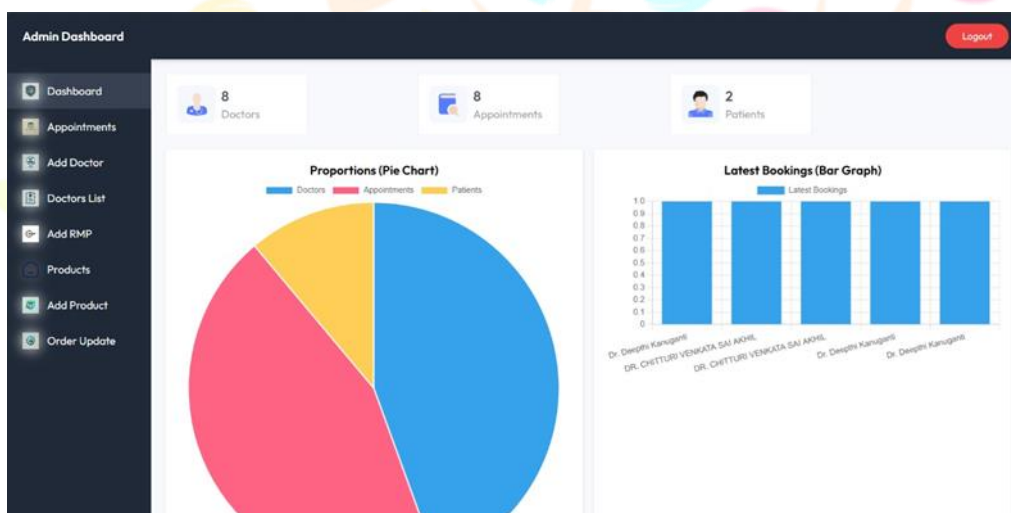


Figure 6: Admin Dashboard

Figure 6 describes the Admin Dashboard. In this dashboard, the admin can see several doctors and patients present. Admin can add the products, add the doctors, RMP's details, view the number of appointments is scheduled and also see the order of status.

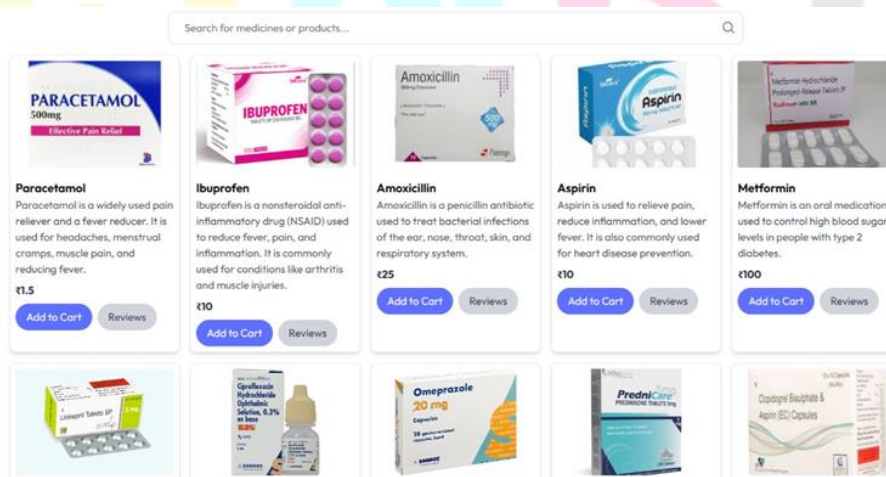


Figure 7: Medicine page

Figure 7 illustrates the Medicine page. On this Medicine page, the user can select one or more medicines based on their requirement. After selecting the required medicines, the user can check out to take the correct medicines or not.

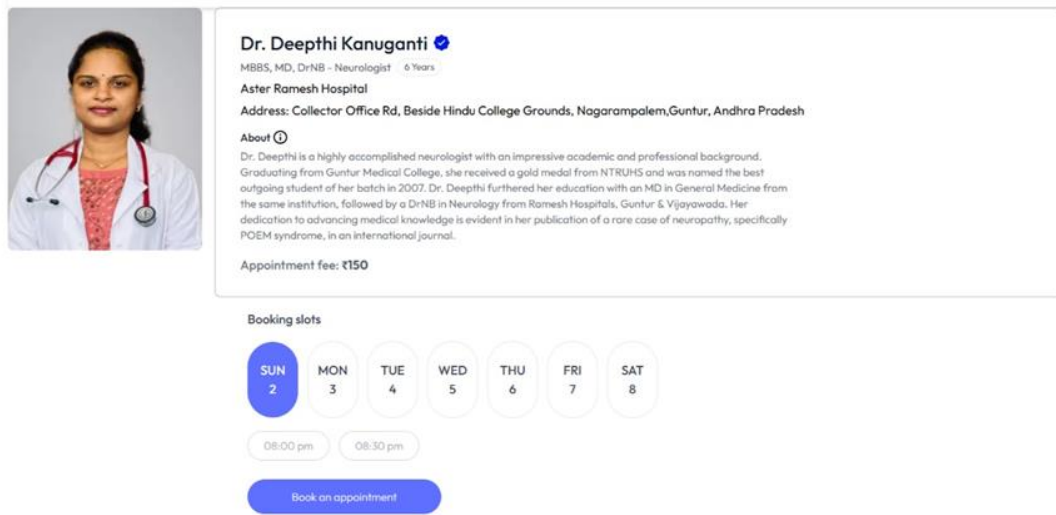


Figure 8: Appointment Booking page

Figure 8 describes the complete details of the selected doctor, and the user can schedule the appointment by scheduling date and time.

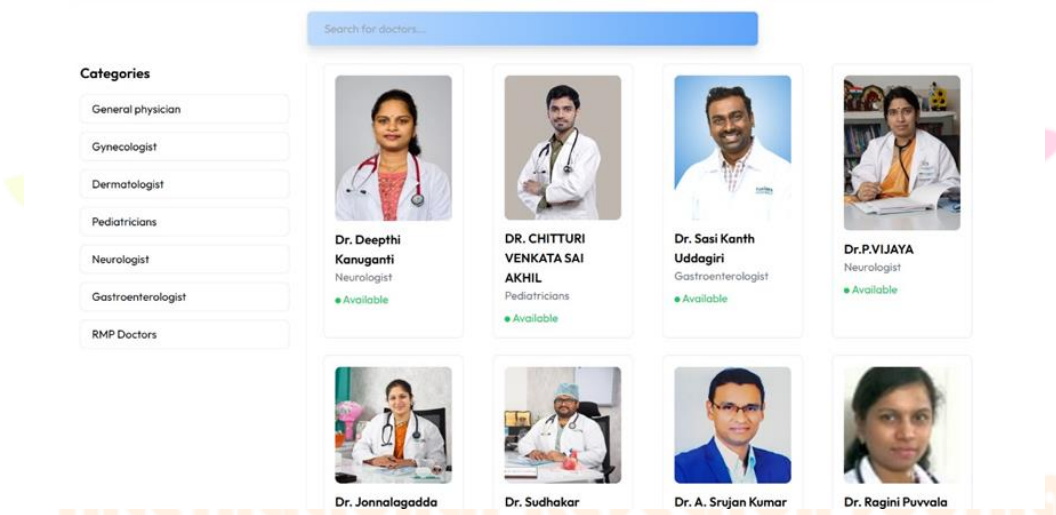


Figure 9: All Doctors Page

Figure 9 describes all the available doctors in different specialization. User can select specialization based on their need. After selecting the specialization, the application will display all the available doctors in that specialization.

V. CONCLUSION

The Connected Care system, built using the MERN stack, enhances digital healthcare access by offering essential medical services. It allows patients to book online appointments, search for diagnostic centers, and set medication reminders. Users can conveniently purchase medicines online and access the contact details of RMPs. The application simplifies healthcare services, reducing the need for physical visits and improving patient engagement. Future enhancements may focus on add-on features in the healthcare..

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