Abstract: Development of a Medical Consultation Booking Web Application (MediConnect)

The medical consultation booking web application was designed to streamline the process of scheduling, managing, and confirming doctor's appointments online. The primary goal was to enhance communication between patients and healthcare providers while offering a convenient, self-service solution for appointment management. The project was developed using a combination of frontend and backend technologies, with a focus on scalability, user experience, and real-time functionality. The project is beneficial for all players in the healthcare industry to allow patients to access experts and manage their own appointments based on availability. Below is a detailed breakdown of the technical approach, key features, and lessons learned during the development phase.

Technical Approach and Implementation

The web application was built using a modular architecture to ensure scalability and maintainability. The frontend was developed with HTML, CSS, and JavaScript, providing a responsive and intuitive interface for both patients and doctors. The interface allows users to browse doctors' working hours (Monday to Friday, 8:00 AM–6:00 PM), book 2-hour appointment slots, and manage their appointments with options to cancel or reschedule. Real-time notifications were integrated to keep users informed about confirmations, reminders (sent 24 hours and 1 hour before the appointment), and cancellations. The backend was implemented using the Django REST Framework, chosen for its robustness and ability to handle complex business logic securely. The framework managed API requests, user authentication, and appointment scheduling, ensuring seamless communication between the frontend and the database. For the initial development phase, SQLite was used as the lightweight, file-based database to store user data, appointment schedules, and messaging information. While SQLite is sufficient for early testing, the architecture allows for migration to a more scalable database like PostgreSQL if need be.

A key feature of the application was the simulated payment system, which marked appointments as "Paid" upon transaction completion, providing a realistic user experience. Additionally, the in-app messaging system facilitated direct communication between patients and doctors, further enhancing the platform's usability. The system also included an inbox feature for patients and

doctors to confirm or cancel appointments, and all users received real-time updates about appointment changes and slot availability from the system.

Lessons Learned

The development process provided valuable insights into the challenges and opportunities of building a web application for the healthcare sector. One of the primary lessons was the importance of thorough testing, particularly for real-time features like notifications and updates. Ensuring that reminders and cancellations were triggered accurately required meticulous attention to detail and extensive debugging. In testing phases there were problems with visualizations which led to implementation of roles so as to define what each user can do and what they can see on their dashboards. Feedback during testing highlighted the importance of a clean and intuitive interface. Some users may struggle with navigating the appointment booking process, which led to iterative design improvements including displaying appointments on the home page and availability of cancellation options also. Also, initially in the design the doctors did not have expert fields which were included so the patient can pick the kind of doctor they want to see like paediatrician or cardiologist and so on. This underscored the value of user-centred design and the need to incorporate feedback loops early and often. Finally, the project reinforced the significance of well-defined user roles and security, especially when handling sensitive medical and payment information. Implementing robust authentication and data encryption measures for real world use scenarios is critical to building trust with users and ensuring compliance with privacy regulations.

Conclusion

The medical consultation booking web application successfully addressed the need for a streamlined, user-friendly solution for managing doctor appointments. By leveraging modern web technologies and focusing on real-time communication, the project delivered a functional and scalable platform. The lessons learned during development ranging from technical challenges to user experience refinements will inform future improvements and similar projects. This implementation not only achieved its initial objectives but also provided a foundation for further innovation in digital healthcare solutions.