DocSpot - Seamless Appointment Booking for Health

Abstract

DocSpot is a user-friendly web application designed to simplify the appointment booking process in the healthcare industry. It enables patients to browse doctors, view their availability, and book appointments seamlessly. Doctors can manage their schedules, and administrators can oversee platform operations. This solution eliminates long queues, reduces appointment conflicts, and promotes digital healthcare services.

Objectives

- To design a responsive and intuitive interface for booking doctor appointments.

- To enable real-time scheduling and conflict-free bookings.

- To provide login access for doctors, patients, and administrators.

- To support appointment history and status tracking.

- To promote a paperless and efficient health consultation process.

Tools & Technologies

Frontend: HTML, CSS, JavaScript, ReactJS

Backend: Node.js, Express.js

Database: MongoDB

Authentication: JWT (JSON Web Tokens)

Version Control: Git & GitHub

Platform Used: VS Code, MongoDB Atlas, Postman

User Roles

1. Patient

   - Register/login

- Search doctors by specialization

  - Book and view appointments

2. Doctor

  - Register/login

  - Set availability

  - View upcoming and past appointments

3. Admin

  - Manage users (Doctors/Patients)

  - Oversee all appointment bookings

System Architecture

1. Frontend: Handles UI interactions and API calls.

2. Backend API: Handles user logic, appointment processing, and authentication.

3. Database: Stores user profiles, appointment data, availability slots, etc.

Key Features

- Secure login with JWT tokens

- Role-based dashboards

- Calendar-based appointment selection

- Search filter for doctor specialization

- Real-time availability management

- Email confirmation of bookings (optional feature)

Functional Requirements

- User Registration & Login

- Booking and Cancelling Appointments

- Role-based dashboard views

- View and manage profile details

- Admin panel for overall monitoring

Non-Functional Requirements

- Responsive Design

- Secure Data Handling

- Fast loading with API optimization

- Scalable architecture for future enhancements

Implementation Overview

- Frontend: Built using React components (e.g., BookingForm, DoctorList, PatientDashboard).

- Backend: APIs in Express.js for CRUD operations, routes for appointments, users, etc.

- Database: Collections for users, appointments, doctors, patients.

Database Schema

Users Collection:

{

  "userId": "UUID",

  "name": "Vasavi",

  "email": "vasavi@example.com",

  "role": "patient/doctor/admin",

  "password": "hashed_password"

}

Appointments Collection:

{

  "appointmentId": "UUID",

  "doctorId": "UUID",

  "patientId": "UUID",

  "date": "2025-07-01",

  "timeSlot": "10:00 - 10:30",

  "status": "booked/cancelled"

}

Testing & Validation

- Manual testing with Postman for API endpoints.

- Form validation on both frontend and backend.

- Functional UI tested for responsiveness across devices.

Future Scope

- Integration with SMS/Email notification services.

- Video consultation feature.

- Appointment reminders.

- Payment gateway integration.

Conclusion

DocSpot is a practical and scalable appointment booking system that bridges the gap between patients and healthcare providers. It ensures seamless communication, easy scheduling, and better management of medical appointments, improving the overall healthcare experience.