

Project Design Phase

Solution Architecture

Date	23 June 2025
Team ID	LTVIP2025TMID48939
Project Name	Docspot: Seamless Appointment booking For Health

Solution Architecture:

To deliver a scalable, secure, and responsive healthcare appointment platform that works across web and mobile, supports real-time bookings, and integrates multiple user roles like patients, doctors, admins, and support staff.

Goal of the Architecture

- Deliver a scalable appointment booking platform for healthcare services
- Ensure real-time booking and multi-role access (patient, doctor, admin, support)
- Provide secure authentication, responsive interfaces, and centralized management
- Support expansion across regions and integration with third-party services

Layered Architecture Overview

1. Frontend Layer

- Technologies: React.js, Bootstrap, HTML, CSS
- Purpose: User-facing interface for booking, dashboard access, and profile management
- Features: Doctor search, appointment calendar, responsive design

2. Backend Layer

- Technologies: Node.js, Express.js
- Purpose: Business logic handling, API communication, schedule processing
- Features: RESTful APIs, booking engine, user session management

3. Database Layer

- Technology: MongoDB
- Purpose: Store patient profiles, doctor data, appointments, feedback
- Collections: Users, Appointments, Records, Notifications

4. Authentication & Authorization

- Technologies: JWT (JSON Web Token), bcrypt
- Purpose: Role-based login, secure session control
- Roles: Patient, Doctor, Admin, Customer Care Executive

5. Communication Layer

- Technologies: Nodemailer, Twilio (optional)
- Purpose: Email/SMS alerts for confirmations, reminders, password reset

6. Hosting & Deployment Layer

- Platforms: Render, Vercel
- Purpose: Host frontend/backend with auto-deploy and scalability support
- Integration: GitHub CI/CD pipeline for continuous delivery

7. Security & Error Handling

- Practices: Input validation, encryption, API protection
- Add-ons: Rate limiting, audit logs, error tracking
- Purpose: Stability, data integrity, protection against breaches

Example - Solution Architecture Diagram:

