

MediSched: Technical Approach Document

MediSched is an AI-powered medical appointment scheduling system designed to streamline booking, patient intake, and management for healthcare providers. This document outlines the technical approach taken to design, develop, and deploy the application based on the provided architecture and technology stack.

Architecture Overview

The system is structured as a modern web application leveraging server-side rendering, client-side interactivity, and AI-assisted scheduling. Key considerations include scalability, responsiveness, security, and usability across devices.

Key Features

- Interactive Dashboard with charts and metrics
- Upcoming Appointments with search and print functionality
- AI-Powered Scheduling using Firebase Genkit
- Comprehensive Patient Intake via single-page form
- Automated Appointment Confirmation with QR code
- Appointment History with search and export options
- Responsive Design for desktop and mobile devices

Technology Stack

- Framework: Next.js (App Router)
- Language: TypeScript
- Styling: Tailwind CSS
- UI Components: ShadCN UI
- Generative AI: Firebase Genkit
- Charting: Recharts
- Forms & Validation: React Hook Form & Zod

Development Approach

1. **Setup & Initialization**: Initialize Next.js with TypeScript and TailwindCSS configuration. 2. **UI Development**: Build responsive layouts using TailwindCSS and ShadCN UI components. 3. **Dashboard & Charts**: Integrate Recharts for dynamic visualization of patient and appointment data. 4. **AI Integration**: Use Firebase Genkit to provide AI-powered scheduling recommendations. 5. **Form Handling**: Implement patient intake and validation using React Hook Form & Zod. 6. **Confirmation & QR Codes**: Generate appointment confirmations with QR codes for verification. 7. **Testing & Deployment**: Run on local environment (`npm run dev`), then deploy on Firebase hosting.

Deployment Strategy

The application can be deployed on Firebase Hosting for scalability and integration with Firebase Genkit. The provided development server link confirms successful setup and execution. Continuous deployment pipelines can be integrated for automated testing and rollouts.

Conclusion

MediSched combines modern web technologies with generative AI to create a seamless, efficient, and intelligent scheduling experience for medical providers and patients. The outlined technical approach ensures maintainability, scalability, and ease of future enhancements.