

# MediQueue – Intelligent Hospital Scheduler

## Problem Statement:

Indian hospitals, particularly in urban and semi-urban locations, suffer from chronic inefficiencies in appointment and patient flow management. The standard first-come, first-served method results in:

- Excessive patient waiting times
- Congested waiting rooms
- Incorrect prioritization of emergency or high-risk cases
- Underutilized doctors and auxiliary staff
- Failure of real-time communication during delays or emergencies

These issues affect both patient satisfaction and operational efficiency, particularly among sensitive populations such as the elderly, children, and critically ill patients.

## Proposed Solution:

MediQueue is an intelligent, patient-focused appointment and queue management system that dynamically reschedules and restores appointments with advanced algorithms. Through patient considerations such as age, medical condition, urgency, and mobility, MediQueue guarantees:

- Increased access to treatment for critical cases
- Lower wait times
- Improved workflows for doctors and medical staff
- Clear, real-time dialogue with caregivers and patients

The system is modular, scalable, and easy to implement within installed hospital infrastructures—utilizable by private hospitals, clinics, government health centers, and telemedicine platforms equally.

## Key Features:

### 1. Patient Profiling & Smart Scheduling

Creates an actionable patient profile with age, health status, medical history, and mobility requirements. Appointments are routed via a rule-based scheduling engine, ensuring high-priority or vulnerable patients are treated earlier.

### 2. Dynamic Queue Management:

The system automatically updates the queue based on emergencies or real-time inputs. Doctors and staff have a priority list, and patients are able to follow their real-time queue status.

### **3. Alerts & Notifications System**

MediQueue provides timely communication via SMS, email, or in-app notifications:

- Appointment confirmations, reminders, updates on the queue, and reschedule notifications are received by patients.
- Medical assistants and coordinators are notified of new bookings, emergency cases, patient check-ins, and missed appointments.
- Custom notification rules enable routing of alerts to duty doctors or caregivers for special needs.

### **4. Multi-Hospital & Doctor Directory**

View doctor availability, specialization, and schedule across departments and partner hospitals by patients.

User-Friendly Interface

Accessible via web and mobile (React.js and Flutter), the portal provides multilingual access and enables caregivers to schedule appointments on behalf of dependents.

### **Technical Implementation:**

Component	Technology Stack
Frontend	React.js (Web), Flutter (Mobile)
Backend	Node.js or Django (Python)
Database	PostgreSQL or MongoDB
Scheduling Engine	Python (rule-based engine with optional ML support)
Notifications	Twilio, Firebase Cloud Messaging
Hosting	AWS, Azure, or Google Cloud for scalability & security

The design is modular, secure, and scalable in the future, and there is also a possibility to integrate it with EMR systems or telehealth platforms.

### **Target Market:**

MediQueue is suited for

- Multi-specialty private hospitals
- Tier 2 and Tier 3 city clinics

- Government-run primary and community health centers
- Telemedicine platforms looking for improved patient flow and triage systems

The platform particularly favors healthcare practitioners with high traffic and restricted ability to manually coordinate or prioritize patients.

### Anticipated Results:

- 30-50% decrease in average patient wait times
- Increased doctor productivity and optimal time utilization
- Quicker and more fair care for emergencies and high-risk patients
- Improved patient experience due to clear communication and transparency
- Better hospital resource utilization and congestion avoidance

### Budget Plan:

Category	Optimized Scope	Cost (INR)
<b>UI/UX Design</b>	Simplified design; use existing UI libraries	₹80,000
<b>Frontend Development</b>	Single mobile app (Flutter) with responsive web view	₹2.5 lakhs
<b>Backend Development</b>	Lean version using Django or Node.js with essential APIs	₹3 lakhs
<b>Scheduling Logic (Core Rules)</b>	Rule-based logic only (no ML yet)	₹1.5 lakhs
<b>Notification System</b>	SMS + Firebase push only (email optional)	₹1 lakh
<b>Cloud Infrastructure</b>	Basic cloud plan (AWS Lightsail / Firebase / Heroku)	₹1.2 lakhs
<b>Database Design</b>	Single DB (PostgreSQL or MongoDB), with basic security layers	₹1 lakh
<b>Admin Dashboard (Lite)</b>	Simplified admin panel for coordinators	₹1.2 lakhs
<b>Testing &amp; QA</b>	Functional and security testing (manual + basic automation)	₹80,000
<b>Deployment &amp; Training</b>	Pilot deployment in <b>1–2 hospitals</b> only	₹2 lakhs
<b>Project Management</b>	Freelance PM or part-time oversight	₹80,000
<b>Contingency Reserve (~8%)</b>	For bug fixes, updates, or minor customizations	₹1.1 lakhs

**Total Estimated Budget: ₹16.2 – ₹17 Lakhs**

# Flow Diagram:

