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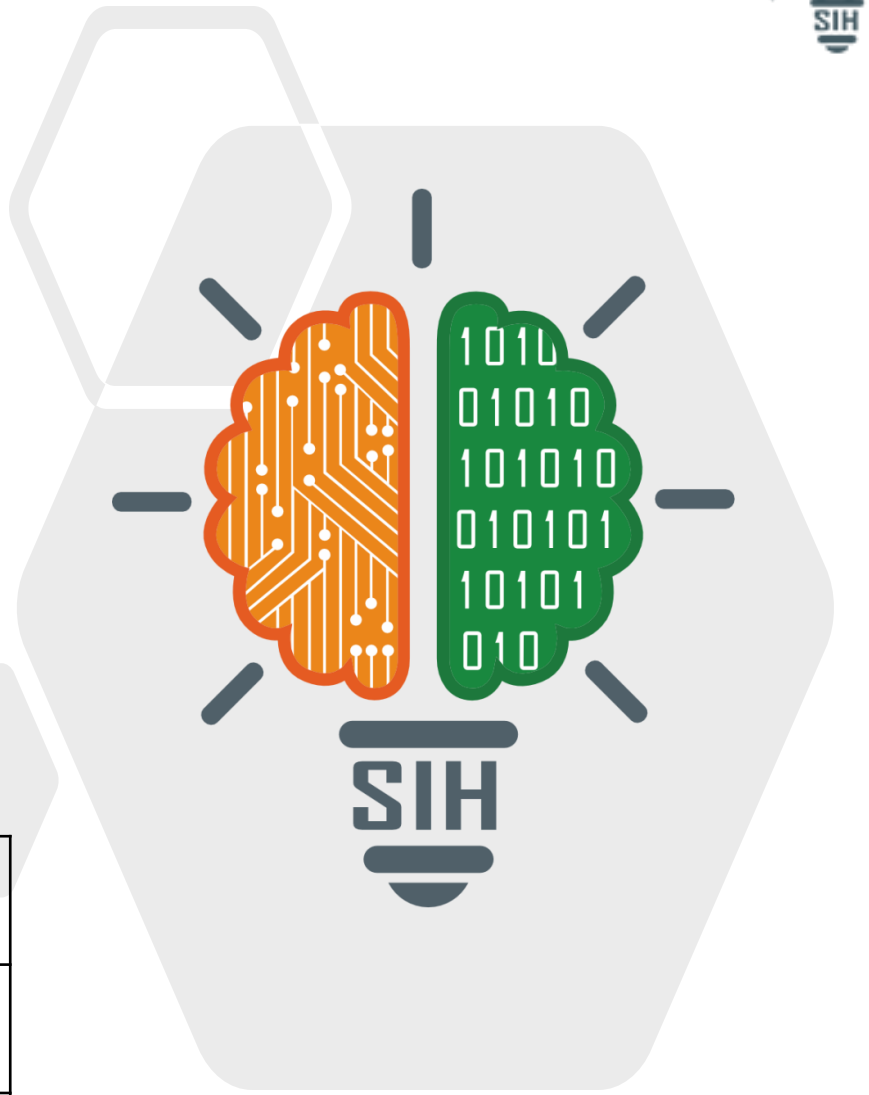
- **Problem Statement ID -** 25018
- **Problem Statement Title -** Telemedicine Access for Rural Healthcare in Nabha.
- **Theme -** MedTech / BioTech / HealthTech
- **PS Category-** Software
- **Team ID-**
- **Team Name -**



Team Members

Prasanna Parashar (Team Leader)	Krishna Kumari
Shikha Sharma	Aditya Kumar Jha
Riya Jha	Ashish Kumar

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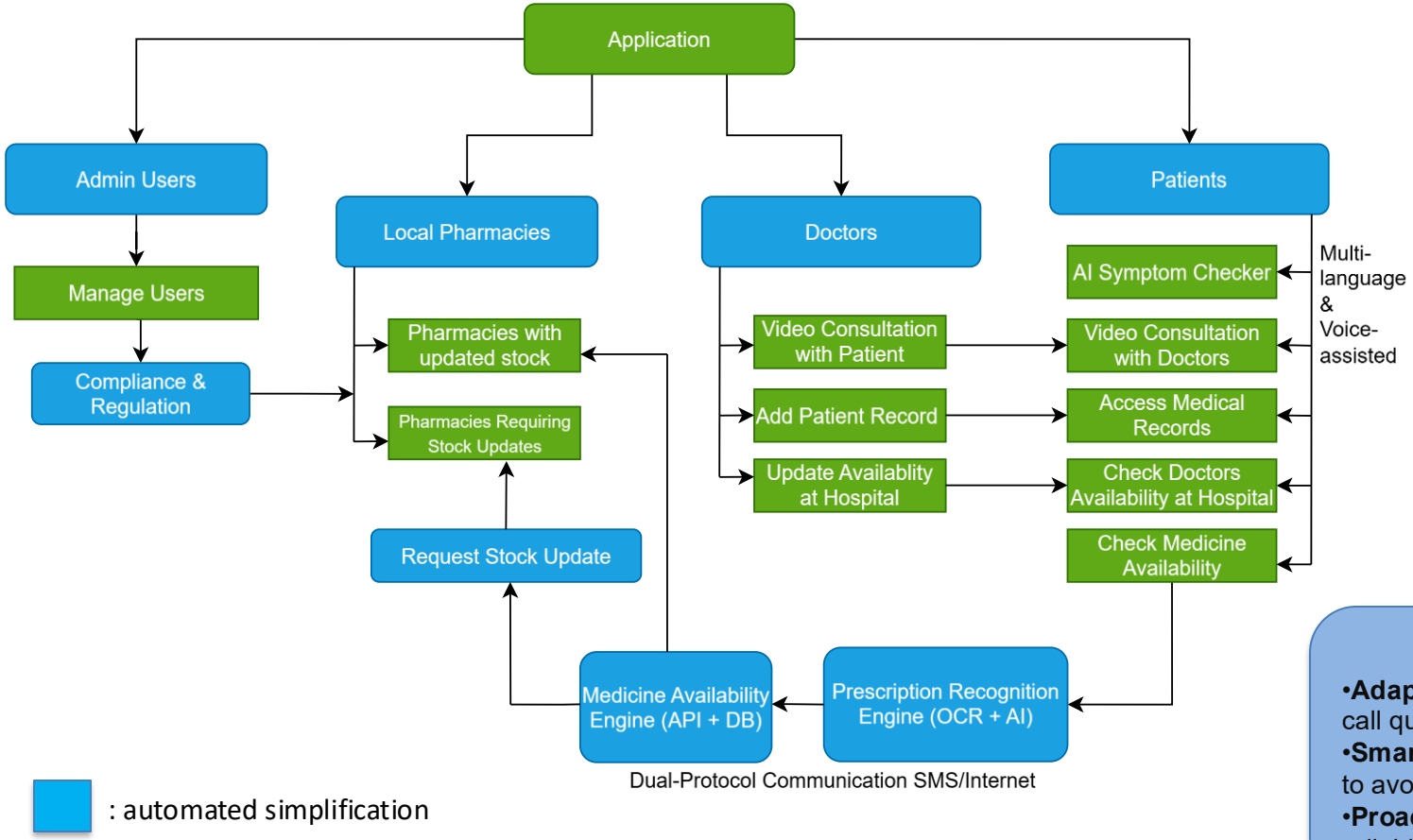
WORKFLOW:



PROPOSED SOLUTION:

1. The platform provides **real-time updates on doctor availability**, preventing patients from making **unnecessary trips** to the hospital.
2. An **AI-powered symptom checker** with voice-assisted, multi-language support offers an easy-to-use, accessible interface for initial health assessments.
3. Telemedicine platform utilizes **adaptive WebRTC** with dynamic bitrate adjustment and **automatic fallback to audio-only** mode to maintain call continuity in low-bandwidth environments.
4. **Prescription recognition engine** processes uploaded prescription images, using OCR and AI to accurately **convert both handwritten** and **printed** medical information into **structured, validated data**.
5. System **tracks pharmacy stock in real-time**, auto-requests updates, and adapts between **SMS/internet** to send patients medicine availability, location, and quantity.
6. Admin users monitor and enforce **regulatory compliance**, ensuring all system operations adhere to healthcare standards.

Innovativeness

- **Adaptive Connectivity:** Auto-switches between video, audio, and SMS to optimize call quality in rural networks.
- **Smart Automation:** Digitizes prescriptions and checks real-time medicine availability to avoid futile travel.
- **Proactive Access:** Ensures pharmacy compliance and live doctor scheduling for reliable low-bandwidth healthcare.

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TECHNICAL APPROACH

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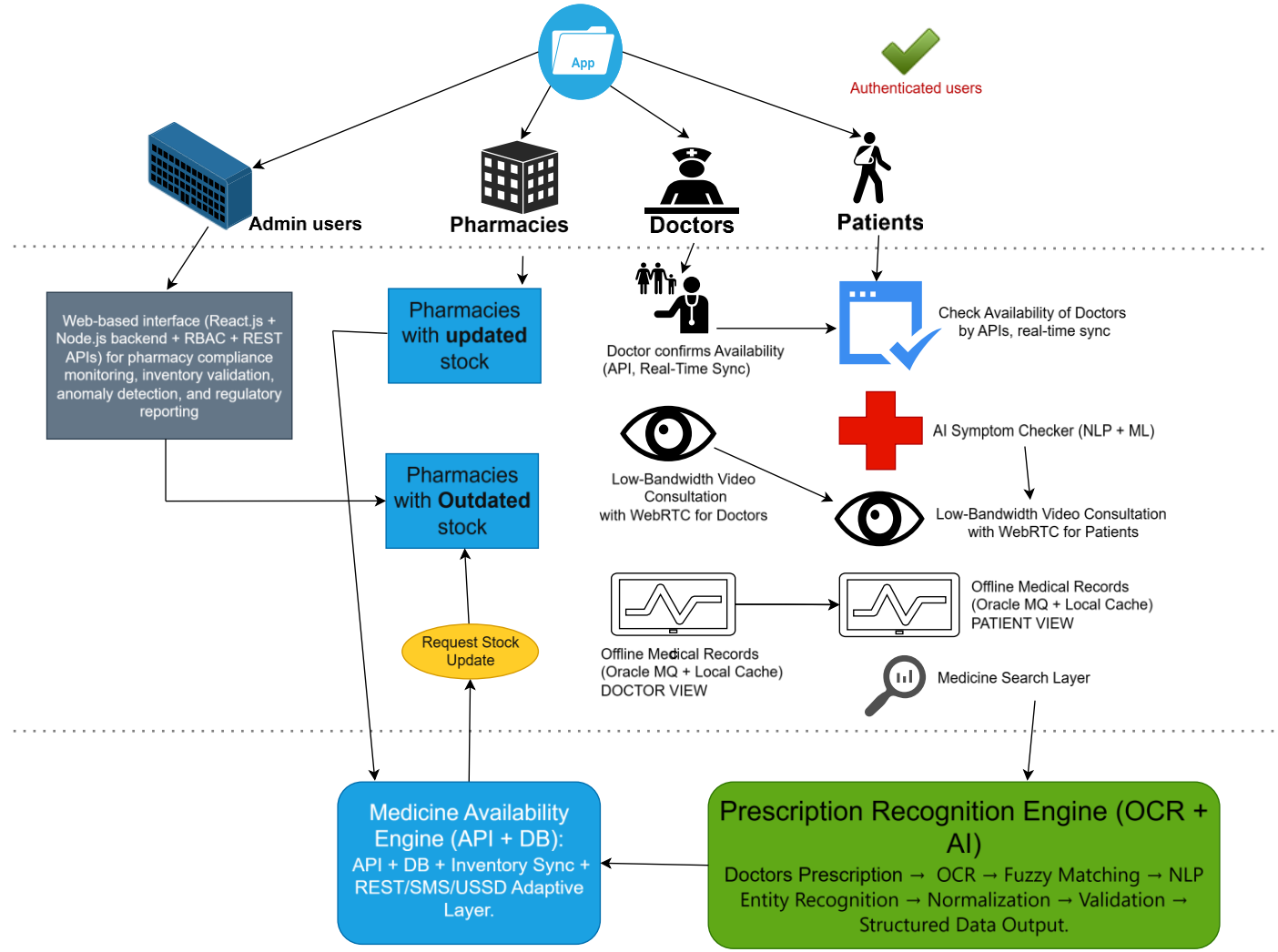
Technology Used

Frontend:
React Native (iOS/Android), WebRTC (adaptive video/audio)
Backend:
Node.js, Socket.IO, JWT, Redis (caching/sessions)
AI:
TesseractOCR (prescription scan), NLP (medicine parsing)
DB:
PostgreSQL (records), SQLite (offline mobile storage)
Communications:
Twilio (SMS/USSD), FCM (notifications)
Infra:
AWS (deployment), Docker (containerization)

Technology Stack

WebRTC, Tesseract OCR, pandas, matplotlib, SQL, mongoDB, aws, node

Program Architecture



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FEASIBILITY AND VIABILITY

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Potential Risks	Strategies
Rural areas may lack stable **connectivity**.	Provide **SMS fallback** and offline storage for sync later.
Patients may struggle with using smartphones/apps.	**Voice navigation**, local languages, and volunteer support.
Limited specialists available for teleconsultation.	Tie up with **hospitals**, **NGOs**, and give teleconsultation incentives.
Handling **sensitive** medical data securely.	**Encryption**, **access control**, and govt health data compliance.
Some pharmacies may not update stock regularly.	Pharmacy **dashboard** with auto stock reminders.

Feasibility

1. **User-Friendly Interface**: Simple design **accessible** to rural patients.
2. **Proven Technology**: Uses WebRTC, OCR, **SMS fallback**, and secure cloud databases.
3. **Offline-First Design**: Works seamlessly even with poor or **no internet**.
4. **Scalable & Multilingual**: Cloud backend with **local language** and voice support.
5. **Doctor & Pharmacy Integration**: Availability charts and stock updates.

Visibility

1. **Scalable Nationwide:** Easily **extendable** to rural areas facing similar challenges.
2. **Low-Cost Deployment:** Uses open-source tools to minimize expenses.
3. **Sustainable Model:** Supported by govt schemes, CSR, and pharmacy subscriptions.
4. **High Impact:** Cuts travel time, **prevents wage loss**, and improves outcomes.
5. **Growing Demand:** Telemedicine in India growing at 31% CAGR.

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IMPACT AND BENEFITS

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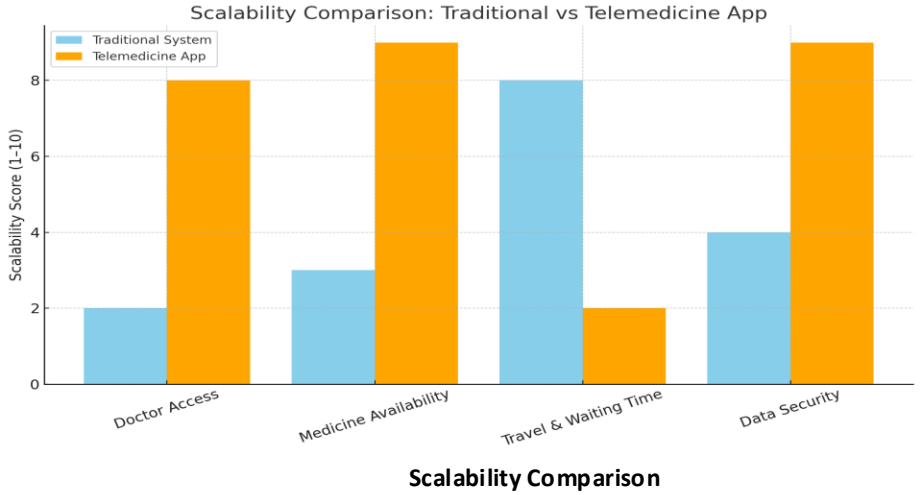
- **Offline medical records** and SMS-based features help even low-internet users.
- Symptom checker helps **identify risks** and guide patients quickly.
- **Encrypted** health records protect patient privacy.
- Real-time availability chart ensures **patients don't travel** unnecessarily.
- **Cuts down wasted trips** to Civil Hospital for daily-wage workers.
- **Instant notifications** when medicines are in stock at nearby pharmacies.



Scalability Comparison

SCALIBILITY

- **Data Security & Privacy:** End-to-end encryption, RBAC, and audits to **protect patient data**.
- **API Integration:** Seamless **link** with govt **health databases**, pharmacy systems, and hospital EMRs.
- **Scalable Beyond Nabha: Replicable across** Punjab and rural India, with multi-language support.
- **Structured Data:** PostgreSQL/MySQL for ACID-compliant storage of **patient records** and **doctor schedules**.
- **Unstructured Data:** MongoDB/NoSQL for scalable storage of prescriptions, **OCR outputs**, and **medical notes**.
- **Cloud Deployment:** AWS/Azure/NIC Cloud with managed databases, containerized AI models, and SMS gateways.

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RESEARCH AND REFERENCES

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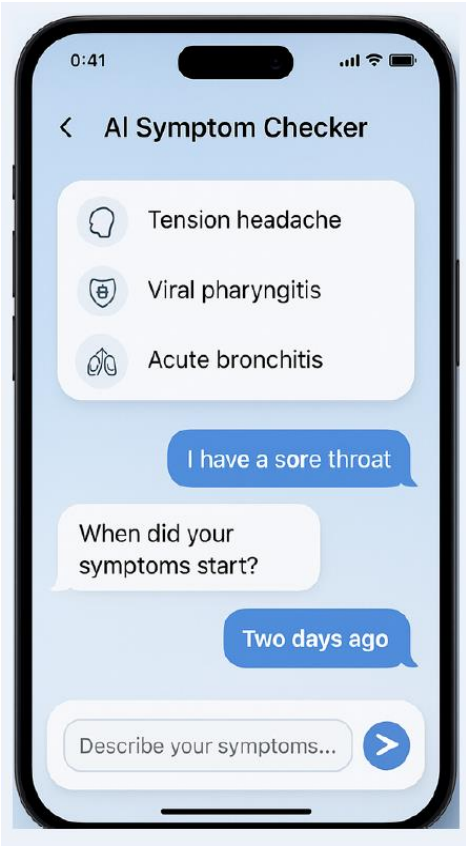
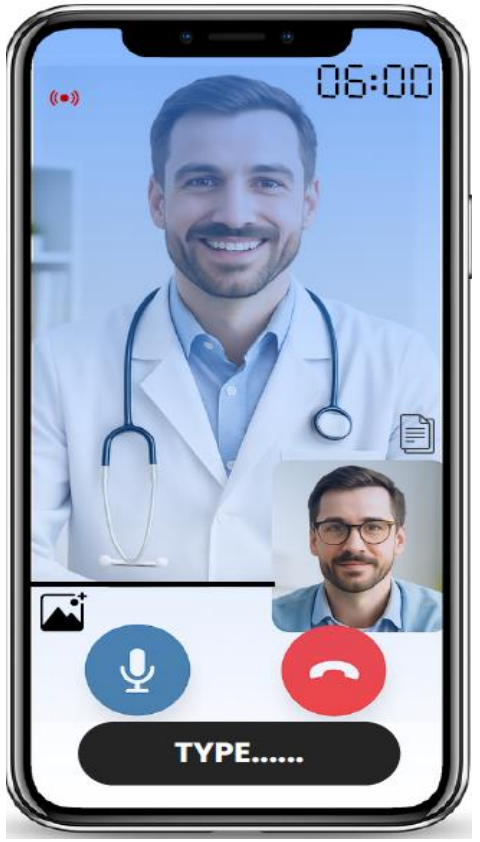
Documentations

- Telehealth App Development : Everything you need to know
- Building for Healthcare: A Technical Guide to Telemedicine App Development
- Telemedicine practice guidelines of India, 2020: Implications and challenges

Research Paper

- A Systematic Review of the Effectiveness of Telemedicine
- Rural community health workers' readiness for mobile-phone based telemedicine
- TeleOR: Real-time Telemedicine System for Full-Scene Operating Room





Prototype Images

Prototype Video