ODOOxCHARUSAT HACKATHON 2025

- **Problem Statement Title-** Rural healthcare gaps demand real-time medical assistance and health monitoring.
- **Theme-** Health and Wellness
- **Team Name:** NextGen
- **Member Information:**

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PROBLEM STATEMENT

Problem Statement :

Rural healthcare gaps demand real-time medical assistance and health monitoring.

Problem Analysis :

In rural communities, there is limited access to hospitals, delayed emergency response, and poor health monitoring that results in avoidable health emergencies. This poor infrastructure disproportionately burdens rural communities with increased mortality and poor health status. It is essential to overcome these challenges in order to enhance quality of life and minimize healthcare disparities in underprivileged areas.

Target Audience

1. Primary Users:

- Rural residents requiring emergency medical assistance and health monitoring.
- Medical professionals (doctors, nurses, paramedics) providing on-ground support.

2. Secondary Beneficiaries:

- Hospitals and clinics preparing for emergencies.
- Local medicine stores and pharmacies.
- Government and NGOs working on rural healthcare initiatives.

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PROPOSED SOLUTION

Brief Explanation:
Our web app provides real-time emergency medical assistance, health monitoring, and medicine access for rural areas, bridging healthcare gaps through technology.

Approach:

1. **Emergency Response**: Scans for nearby medical professionals to provide immediate help.
2. **Health Monitoring**: Tracks vitals (BP, sugar, temp) and predicts next checkups.
3. **Medicine Access**: Shows nearby stores, delivery times, and alternate options.
4. **Hospital Prep**: Informs hospitals about emergencies for better preparedness.

Uniqueness:

1. Combines emergency response, health tracking, and medicine access in one platform.
2. Uses data to predict health needs and set up dark stores for quick delivery.
3. Offline first aid and real-time updates make it reliable in low-connectivity areas.
4. Focuses on rural-specific challenges, unlike urban-centric healthcare apps.

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FRAMEWORKS/TECHNOLOGIES

Tech Stack Overview:

Frontend: UI with HTML/CSS, Mapbox/Google Maps API for location services.

Backend: PHP (Laravel) for RESTful API and DB interactions.

Database: MySQL for relational data storage.

Real-Time Communication: Web Sockets/Firebase for real-time updates and notifications.
Cloud & Hosting: AWS/Google Cloud for hosting, Firebase for real-time DB & auth.

Machine Learning: Python (TensorFlow/Scikit-learn) for data analysis of health.

Offline Functionality: PWA for offline use of critical features.

Reasoning:

- **Scalability:** AWS/Google Cloud accommodates expanding user demand.
- **Ease of Use:** PHP (Laravel) and Node.js provide developer-friendly environments.
- **Cost-Effectiveness:** Low-cost tools (MySQL, Tailwind CSS) save costs; cloud platforms are on a pay-as-you-go basis.
- **Real-Time Capabilities:** Web Sockets/Firebase allows for real-time updates.
- **Offline Availability:** PWA provides availability offline in low-connectivity regions.

Assumptions & Constraints:

•**Assumptions:** Users have smartphones with basic internet; hospitals and medical staff will adopt the platform; health devices can integrate via APIs.
•**Constraints:** Limited rural connectivity may impact real-time features; compliance with data privacy laws (e.g., HIPAA) is required; initial cloud and API setup costs exist.

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FEASIBILITY AND IMPLEMENTATION

Implementation Strategy:

1. Research & Planning : Conduct surveys, collaborate with hospitals and local authorities.

2. MVP Development: Develop and deploy core features (emergency response, health monitoring) in a pilot rural region.

3. Data Collection & Analysis: Collect user information to improve predictive models and service optimization.

4. Scaling & Expansion: Add sophisticated features (delivery of medicine) and scale up based on pilot inputs.

5. Monetization: Provide value-added features to hospitals, tie up with pharma companies.

Effectiveness:

Emergency Response: Ambulance tracking and scanning in real time facilitate rapid medical care; pre-notification of hospitals ensures improved preparedness.

Health Monitoring: Real-time vital monitoring and predictive analytics provide proactive healthcare.

Medicine Access: Integration with local stores facilitates quick delivery of medicine; alternative options facilitate shortfalls.

User Interaction: Medication reminders, health warnings, and offline first aid guidance improve accessibility and adherence. Scalability: Built to facilitate growth with more users and more features

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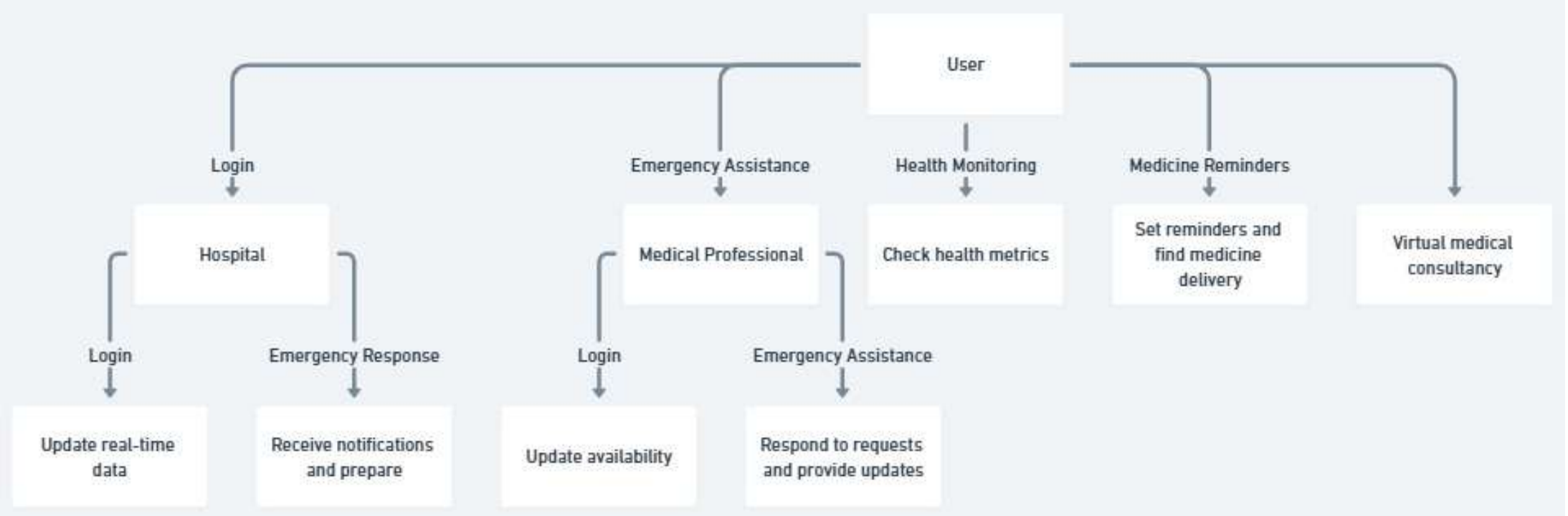
UI/UX MOCKUP



Technology Stack :

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SYSTEM DESIGN AND ARCHITECTURE

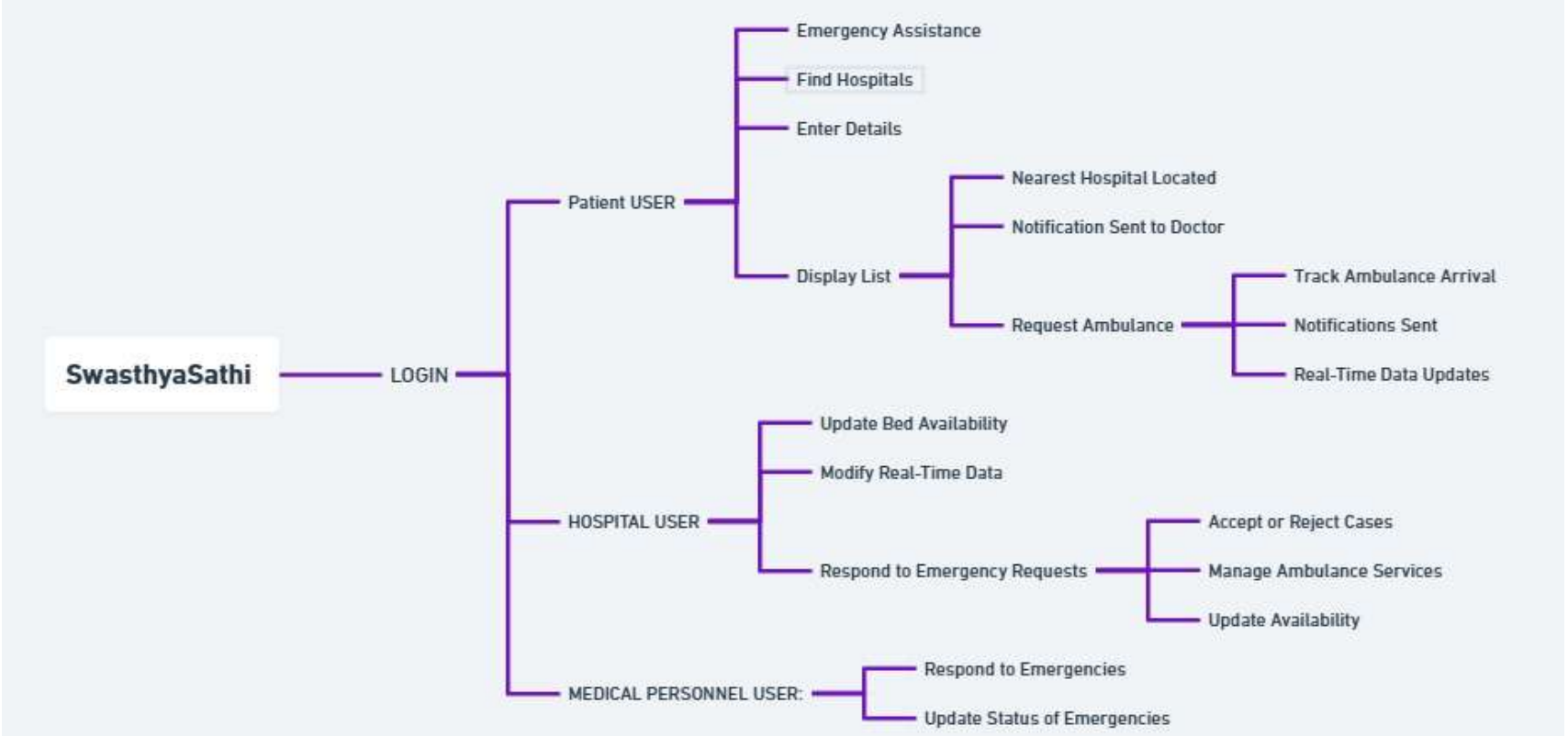
Design Patterns:

MVC: Isolates data logic (Model), UI (View), and user interactions (Controller).

Microservices: Splits functionality into autonomous services (Emergency, Health Monitoring, Medicine Delivery).

Singleton: Guarantees a one instance for essential services such as database connections.

Observer: Allows real-time updating for ambulance location tracking and hospital alerts.



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BUSINESS SCOPE & USE CASE

Use Case Scenarios:

Emergency Response: Finds nearby paramedics and notifies hospitals for quicker critical care.

Medicine Access: Identifies closest pharmacy, estimates delivery time, and recommends alternatives if necessary.

Predictive Healthcare: Provides reminders for checkups using historical health information, guaranteeing preventive care.

Hospital Selection: Directs ambulances to hospitals with vacant beds and physicians in case of emergencies.

Dark Stores: Recognizes medicine shortages in rural locations, allowing for quick delivery through micro-warehouses.

Market Need:

Healthcare Shortage: 65% of India is rural, yet only 37% of doctors cater to them, leading to delayed treatments.

Shortage of Real-time Support: Patients need to travel 30-50 km to reach operational hospitals, with congestion.

Increased Digital Access: 75% of rural India is internet-enabled today, enabling digital health solutions.

Demand for Preventive Healthcare: Chronic diseases such as diabetes need AI-based health monitoring for effective management.
Medicine Supply Gap: 40% of rural patients are deprived of medicines, with the need for faster delivery solutions

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BUSINESS SCOPE & USE CASE

Revenue Model

Freemium Model:
Standard emergency notifications and hospital monitoring are free. Premium subscribers receive AI-powered health monitoring and consultations with doctors.

Hospital & Pharmacy Subscriptions:
Hospitals pay a premium to be seen in top visibility in search results. Pharmacies can post their inventory for real-time medicine tracking.

Dark Store Medicine Delivery:
Partner with pharma distributors and open mini-warehouses and charge a nominal delivery fee for urgent medicine requirements.

Government & NGO Collaborations:
Collaborate with NGOs and health ministries to roll out the platform in under-served areas under healthcare programs.

Advertising & Partnerships:
Make available for promotion by health brands and insurance companies relevant services.

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