ThalaMitra

India’s AI-Powered Blood Companion for Thalassemia Warriors

The Problem:The Challenge Thalassemia Patients Face

- 1 in 8 Thalassemia patients miss timely transfusions
- No real-time blood donor availability
- Patients & families under constant emotional and logistical stress

Our Solution – ThalaMitra

- AI-powered donor-patient matching
- Real-time alerts via WhatsApp & app
- Reward and recognition system for donors
- Builds a support network for Thalassemia warriors

Tech Stack & Tools Used

- **Backend & AI Logic**
- **Python** – Core logic and AI Matcher
- **Scikit-learn / Pandas** – Donor filtering, basic ML
- ◆ **Database**
- **Firebase** – Realtime donor-patient storage *(OR)*
- **MySQL / PostgreSQL** – For structured donor records
- ◆ **Notification System**
- **Twilio API** – SMS alerts
- **WhatsApp Business API** – Donor engagement
- ◆ **Front-End / UI**
- **Streamlit** – Interactive prototype interface *(OR)*
- **Flask + HTML/CSS** – Lightweight UI option
- ◆ **Maps & Location**
- **Google Maps API** – Show nearby donors & hospitals
- ◆ **Deployment (Optional)**
- **Render / Streamlit Cloud / Heroku** – For quick hosting

How It Works – Architecture:System Architecture

Key Features

- AI Matching based on blood type, location & urgency
- WhatsApp + App notification integration
- Monthly donation reminders
- Digital donor medals & appreciation

Impact Story – “Rani”:Meet Rani – A 7-Year-Old Warrior

- Needs blood every 21 days
- ThalaMitra alerts her regular donor in time
- She smiles with strength, and studies with hope

Recognition for Donors

- Digital certificates signed by public officials
- Instagram stories, badges & thank-you reels
- Turns donors into community heroes

Join the Mission:Let’s Save Lives with AI

- Be a part of the *ThalaMitra* movement
- Use technology for compassion
- Together, let’s empower India’s Blood Warriors

Title: ThalaMitra-India's AI-Powered Blood Companion for Thalassemia Warriors

1. Target Problem Statement

Thalassemia patients require regular blood transfusions throughout their life. The existing blood donation ecosystem is fragmented and reactive, leading to last-minute rush, shortage of rare blood groups, and communication gaps between patients, donors, and healthcare providers. The challenge is to create a **real-time system** that:

- Connects patients with suitable donors efficiently
- Encourages recurring donation
- Maintains data privacy
- Integrates with existing government and NGO platforms like e-RaktKosh and Blood Warriors

---

2. Proposed Solution

Our idea is to build a **centralised AI-powered platform** called **ThalaMitra** that serves as a bridge between Thalassemia patients, donors, healthcare professionals, and blood banks.

Core Features:

- **Real-time Donor-Recipient Matching System** using AI algorithms and geolocation
- **Predictive Donor Availability** using ML models based on past donation patterns
- **Seamless Donor Tracking System** with badges, history, and gamified rewards
- **Offline Community Outreach** via public "**ThalaMitra Boxes**" installed in schools, temples, bus stands, and remote villages
- **Integration with e-RaktKosh, Blood Bridge, and hospitals** for automatic sync
- **Use of Social Media for Campaigning**, awareness, and volunteer mobilization

Unique Aspects:

- Combines both online (AI-based tracking and prediction) and offline (community boxes, paper forms) components
- Local language support and chatbot integration
- Donor recognition at national level (certificates from MP/PM/President)
- Storytelling-based motivational outreach

---

3. Technology Stack

- **Frontend:** ReactJS / Flutter (Web + Mobile App)
- **Backend:** Node.js / Django
- **Database:** PostgreSQL, MongoDB
- **AI/ML:** Python (scikit-learn, TensorFlow), Keras, Time Series Forecasting
- **APIs:** Google Maps, WhatsApp Business API, e-RaktKosh APIs
- **Cloud:** AWS / Azure
- **Security:** OAuth 2.0, HTTPS, AES encryption

---

4. Functionality

- **Patients:** Register on the app or drop a request in a nearby ThalaMitra Box. Get matched with nearest available donors. Track transfusion history.
- **Donors:** Receive alerts about upcoming eligible donation dates. Book slots. View contribution history. Earn digital badges and real certificates.
- **Healthcare Providers:** Monitor patient transfusion schedules. Respond to urgent requests.
- **Admins/Government Bodies:** Track system-wide metrics, generate insights, integrate with policies.

Yes, the system will be **modular** and scalable – we can add local language support, SMS-only version, chatbot interfaces for low-literacy users, and integrate wearable health data in future.

---

5. Impact

- **Patients:** Less anxiety, more consistent care, faster matching
- **Donors:** Motivation, engagement, national recognition
- **Blood Warriors:** Operational efficiency, better outreach
- **Healthcare System:** Reduced last-minute shortages, data-backed planning
- **Government:** Opportunity to align with Digital India and Ayushman Bharat goals

---

6. Challenges / Constraints / Risks

- Ensuring **data privacy** and regulatory compliance (especially for health records)
- **Training AI models** effectively with donor and patient behaviour data
- **Connectivity in remote areas** – addressed partially through offline boxes
- Resistance from users initially due to habit – tackled through awareness drives

---

7. Assumptions

- Sufficient historical donation data is available for training models

- Public healthcare institutions will cooperate with the integration
- Social media can be used effectively for mobilisation
- Public places will permit installation of ThalaMitra boxes

---

8. Timeline

During Hackathon (48 hours):

- Build a working prototype of the web + mobile app interface
- Implement AI-based donor prediction module (basic version)
- Demo integration with dummy e-RaktKosh API

Post Hackathon Milestones:

- Pilot in 1 city + 2 rural districts (within 3 months)
- Partner with Blood Warriors for real-time use (6 months)
- National-level deployment with government support (12–18 months)

---

9. Storytelling: A Real-Life Use Case

Part A: The Village Box

In a tribal village in Maharashtra, a 16-year-old Thalassemia patient named Maya drops a handwritten request in a **ThalaMitra Box** kept at the Panchayat. The local volunteer opens the box and uploads all paper slips via the app.

Part B: The AI Alert

In Mumbai, Rohan – a 25-year-old regular blood donor – receives a notification:

"Hi Rohan! Based on your last donation on 15 June, you're eligible to donate again. A Thalassemia patient in Chandrapur needs your blood type. Would you like to help again?"

He confirms. The app guides him to the nearest blood bank. He receives a digital badge and later a **certificate from the MP** of his area.

Part C: Government Integration

State Health Department uses a dashboard to monitor how many Thalassemia patients are matched in rural belts and publishes monthly performance stats. The central government integrates it into **Ayushman Bharat Health Mission**.

---

10. Social Media Integration and Reward Strategy

- **Instagram/Facebook Campaigns:** Share real stories of donors and patients
- **Influencer Tie-ups:** Collaborate with health influencers for awareness
- **Donor Leaderboard:** Top donors shown weekly/monthly with badges
- **Rewards:**
    - Bronze/Silver/Gold digital medals
    - Blood Hero of the Month award
    - Certificates signed by MP/CM/PM
    - National recognition on Independence Day or Republic Day functions

---

Conclusion: Our solution is not just a technical fix – it's a **movement**. By blending AI, community participation, social media, and government support, **ThalaMitra** aims to revolutionize how India handles blood donation for Thalassemia. It makes healthcare more human, accessible, and intelligent.
