SMART INDIA HACKATHON 2025

VEDSAGAR

- **Problem Statement ID – SIH25039**
- **Problem Statement Title- Integrated Platform for Crowdsourced Ocean Hazard Reporting and Social Media Analytics**
- **Theme- Disaster Management**
- **PS Category- Software**
- **Team ID- 103752**
- **Team Name- Coders4Bharat**

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Proposed Solution: Smart Disaster Response System

01 Integrated Disaster Reporting
Crowdsources geotagged user reports and social media feeds (Twitter, Reddit, etc.) to detect and visualize real-time ocean hazards using AI.

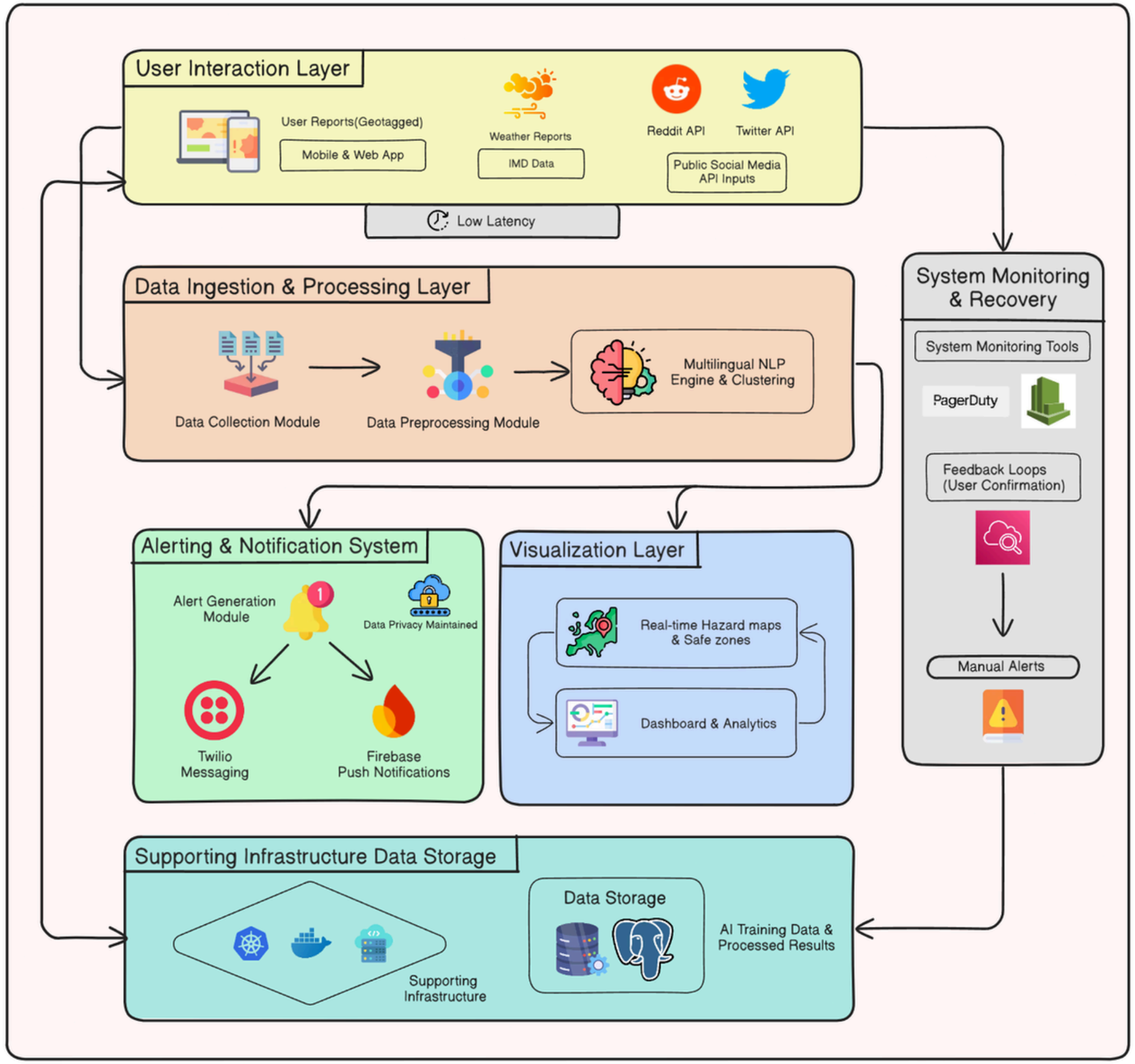
02 AI-driven Alert Mechanism
Automated NLP and clustering models provide region-specific, disaster-type-targeted alerts, ensuring users receive timely and relevant warnings.

03 Personalized Safe Zone Recommendations
Real-time map highlights dynamically updated safe locations, tailored to the type of disaster, empowering users to take immediate action.

04 Interactive Request Mapping
Allows users and rescuers to submit or view requests for help, food, or rescue after a disaster—each mapped with popup details for instant situational awareness.

05 Proactive Risk Visualization
Integrates live meteorological and agency data to display color-coded risk zones, helping users avoid high-risk areas before disaster strikes.

06 Comprehensive Notification System
Pushes real-time alerts and safe zone updates directly to user devices for rapid action and safety.



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Technical Approach

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1. Frontend (Mobile & Web App)

- React Native or Flutter for cross-platform mobile apps
- React.js or Vue.js for interactive web dashboards
- Features: Geo-tagged hazard reporting, real-time alert feeds, map visualization, multilingual support

2. Backend

- Python (Flask/FastAPI) for REST/GraphQL APIs
- Apache Kafka or AWS Kinesis for real-time streaming
- User & report management with secure, scalable API design

3. AI/ML

- Python with TensorFlow, PyTorch, Scikit-learn, JAX
- NLP models for multilingual hazard report and social media text processing

4. Cloud & Infrastructure

- Docker forx containerized application
- MongoDB/DynamoDB for reports and PostgreSQL for analytics

5. Notifications

- Twilio for SMS, voice, WhatsApp alerts
- Firebase Cloud Messaging for push notifications
- Multi-channel failover and alert escalation mechanisms

6. Security & Monitoring

- OAuth2/SSO for user authentication, JWT for API authorization
- AWS CloudWatch and PagerDuty for infrastructure monitoring and alerting

Process for implementation

Develop Modular Web & Mobile Apps

Build user-friendly interfaces for reporting and alerts

Integrate Real-time Data Streams

Connect to social media and crowdsource hazard reports

Deploy AI-Based Alert Engine

Use AI to analyze data and trigger alerts

Visualize Dynamic Maps & Alerts

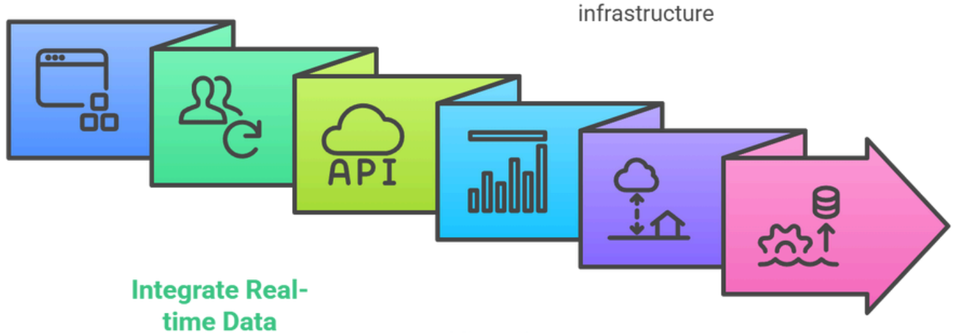
Display hazard zones and safe zones on interactive dashboards

Launch & Scale on Cloud

Deploy the platform on scalable cloud infrastructure

Ongoing Updates & Optimization

Continuously improve with feedback and AI accuracy



Technologies to be used

Prototype Link:
https://ved-sagar.vercel.app/

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Feasibility & Viability

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Technical Feasibility:

Uses **scalable cloud infrastructure** and **APIs** for **fast, reliable** crowd-sourced hazard reporting and **real-time alerts**. AI/ML automates hazard classification with ongoing improvement.

Market Feasibility:

Fills **early warning gaps** in vulnerable coastal communities with accessible mobile, SMS, and **social media integration** for **low-connectivity**, **multilingual** users.

Scalability:

Leverages pay-as-you-go cloud services and open data, enabling **low startup costs** and easy, **phased scaling** based on use and feedback.

Challenge : Data accuracy (false/missing reports)

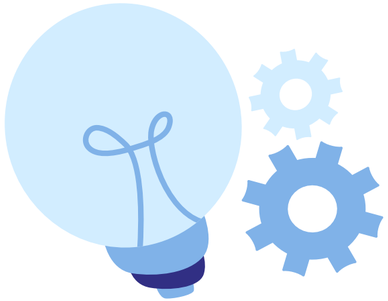
Strategy : AI validation and multi-source cross-checks

Challenge : Low user engagement in remote areas

Strategy : Awareness drives and simple, multilingual UI

Challenge : Connectivity issues during disasters

Strategy : Offline syncing and cloud backups



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Impact & Benefits

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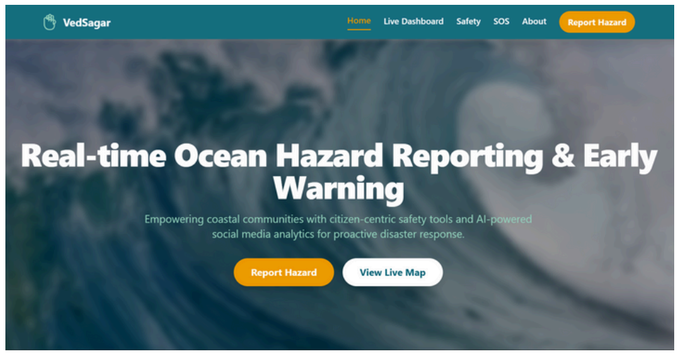
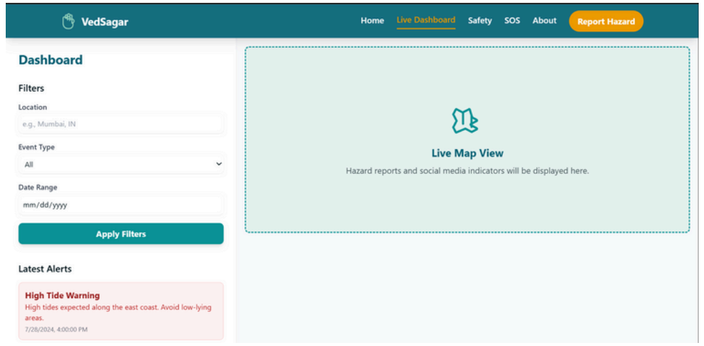
Potential Impact

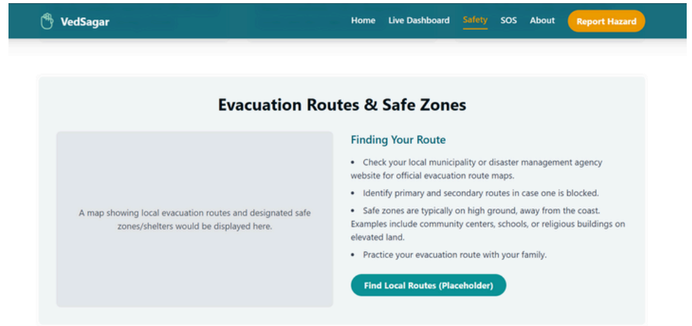
- Provides real-time alerts and safety info to coastal residents, local communities, and disaster agencies.
- Empowers users to report hazards and request help, improving response speed and coordination.
- Builds public trust in early warning systems and emergency management.

Solution Benefits

- **Social:** Reduces loss of life, increases disaster preparedness, and fosters community participation.
- **Economic:** Limits damage, reduces recovery costs, and protects livelihoods in coastal areas.
- **Environmental:** Enables quicker mitigation actions that help preserve coastal habitats and reduce environmental harm.







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Research & References

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References :

- **INCOIS:** https://incois.gov.in/
- **IMD:** https://mausam.imd.gov.in/
- **IMD uses climatology, wind, surge:** https://rsmcnewdelhi.imd.gov.in/uploads/climatology/hazard.pdf
- **IMD uses global-standard forecast:** https://www.sciencedirect.com/science/article/pii/S2225603218301140
- **NDRF:** https://www.ndrf.gov.in/
- **ISCRAM:** https://iscram.org/
- **Datasets:** https://www.kaggle.com/datasets
- **DL Approaches for Multilingual NLP:** https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5206962
- **Density-Based Spatial Clustering:** https://www.dbs.ifi.lmu.de/Publikationen/Papers/KDD-96.final.frame.pdf
- **Risk Assessment of Coastal Hazards:** https://www.sciencedirect.com/science/article/pii/S0964569125002029

Prototype Link: https://ved-sagar.vercel.app/

Video Exaplanation: https://youtu.be/b48MtEMRcrs

Feature	Our Platform	GDACS (Global Disaster Alert)	NDMA App (India)	Common Social/Digital Alert Systems
Crowdsourced Hazard Reporting (App & Web)	✓	✗	✓	✗
Social Media Data Ingestion (Twitter, etc.)	✓	✗	✗	✓
Real-Time Push/SMS/Email Alerts	✓	✓	✓	✗
Geotagged Incident Mapping	✓	✓	✓	✗
AI/ML Hazard Classification	✓	✗	✗	✗
Public & Authority Dashboards	✓	✓	✓	✗
Low/No-Internet Support (SMS fallback)	✓	✗	✓	✗
Multichannel Notification Integration	✓	✓	✗	✓
Event Streaming/Real-Time Analytics	✓	✗	✗	✗
User/Authority Feedback Loop	✓	✗	✗	✗
Privacy & Data Compliance	✓	✓	✓	✗
Automatic Failover/Recovery	✓	✗	✗	✗