

TEAM DETAILS:

- Team Name: *Spark Squad*
- *Team leader Name: Isha Sharma*
- Problem Statement: Integrated Platform for Crowdsourced Ocean Hazard Reporting and Social Media Analytics.

Problem Statement & Solution Overview

Problem statement:

- Ocean hazards often go unnoticed or reported late.
- Lack of real-time systems and manual validation slow response.
- Connectivity gaps delay rescue and emergency action.

Solution:

- AI-enabled platform combining public reports and social media data.
- Real-time hazard heatmaps with verified alerts.
- Direct NGO notifications with SMS support in low-network areas.

Opportunity:

a. How is it different from existing solutions?

- Combines crowdsourced reports + AI-based social media analytics on a single platform.
- Supports SMS-based reporting, unlike most internet-dependent systems.
- Uses auto-verification to reduce false or spam alerts.

b. How will it solve the problem?

- Enables real-time detection of ocean hazards.
- Generates live risk heatmaps for faster decision-making.
- Sends instant verified alerts to NGOs and authorities.

Key Features Offered by the Solution:

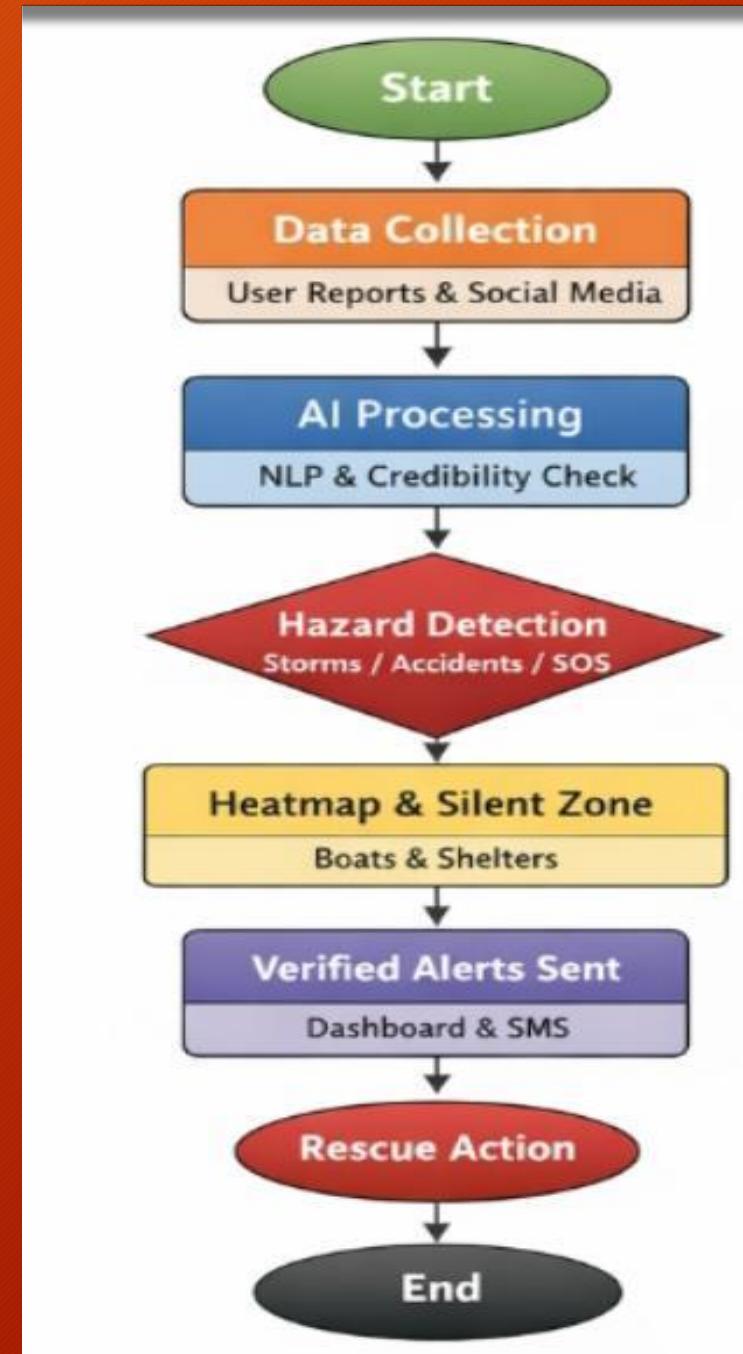
-  Crowdsourced Hazard Reporting (App & Web).
-  AI-Based Social Media Analytics.
-  Live Ocean Risk Heatmaps.
-  Auto-Verification of Reports.
-  Instant Alerts to NGOs & Authorities.
-  SMS-Based Reporting & Alerts .

Google Technologies Used:

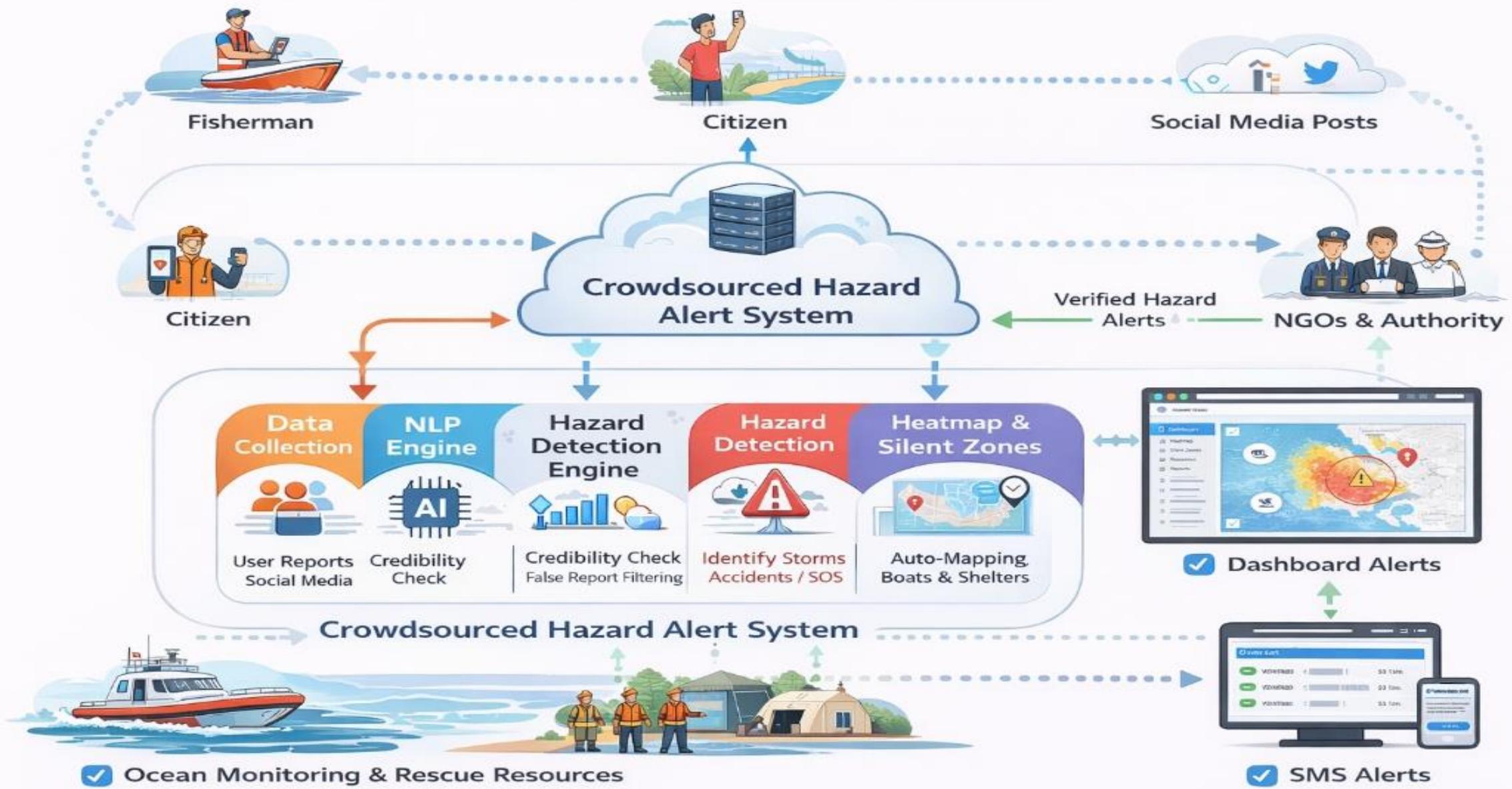
-  Google Cloud Platform (GCP) - Hosting & scalability
-  Firebase - Real-time data, authentication & alerts
-  Google Cloud AI / NLP APIs - Social media analysis
-  Google Maps API - Live maps & heatmaps
-  Firebase Cloud Messaging (FCM) - Instant notifications.

PROCESS FLOW DIAGRAM

1. Collect data from users, social media, and SMS.
2. Analyze data using AI and NLP.
3. Verify reports automatically.
4. Detect ocean hazards.
5. Generate heatmap and silent zones.
6. Map nearby rescue resources.
7. Send verified alerts to NGOs.
8. Perform rescue operations.



Architecture Diagram of Proposed Solution



Snapshots of the MVP

- **User Hazard Reporting** - Simple app/web reporting with location.
- **AI Social Media Analysis** - Detects disaster-related posts in real time.
- **Live Risk Heatmap** - Visual map of high-risk ocean zones.
- **Silent Zone Alerts** - Flags communication drop areas.
- **Auto NGO Alerts** - Verified alerts sent instantly.
- **SMS Fallback** - Works in low-internet areas.

Future Development:

- Integration with official weather & ocean agencies → ensures accurate data.
- Multilingual & voice-based reporting → supports fishermen & coastal users.
- AI-based predictive alerts → identifies hazards in advance.
- Expansion with IoT sensors & satellite data → enables real-time monitoring.
- Machine learning model improvement using historical disaster data.
- Public early-warning notifications for tourists and coastal residents.