1. Project Title AquaAlert: Integrated Platform for Crowdsourced Ocean Hazard Reporting and Social Media Analytics

2. Problem and Solution

a. Definition – the "Why" and the "What"

Why: India's coastline is exposed to frequent ocean hazards like tsunamis and storm surges. Standard early warnings from INCOIS rely mainly on scientific models and sensors, but ground-level, real-time reports from local communities and insights from social media are often missing or delayed, creating gaps in situational awareness.

What: The solution is a unified digital platform that lets citizens, volunteers, and disaster managers submit hazard observations and integrates social media analytics. This augments traditional warnings with crowdsourced, real-world data and public sentiment analysis.

b. Industry domain – the "Where"

Where: Serves the disaster management and maritime safety sector in India, focusing on coastal hazard mitigation. Stakeholders: INCOIS, local authorities, coastal communities, maritime officials, and emergency responders.

c. Solution provided – the "How" and core technology domain

How:

- Integrated web/mobile platform offering:
- Geotagged, offline-friendly reporting for hazards by multiple user roles
- Real-time dashboard and maps aggregating crowdsourced and social data
- NLP engine for hazard-related trends and sentiment analysis
- ML-driven verification on-device, auto data sync
- Risk scoring by combining live reports with official data
- Community verification (YES/NO voting)

Core Technologies: Google ML Kit (media auth), YOLOv8n (visual hazard detection), DistilBERT (text classification), AWS (backend), NLP models, local DB and API for offline sync.

d. Impact seen / expected – quantifiable – metrics preferable

- Social: Faster, broader community reporting, better situational awareness
- Economic: Reduced disaster losses by early alerts and faster response
- Environmental: Quicker action against threats with live tracking
- Technological: Works in low-network zones, minimizes manual workload, multilingual reach
- Operational: Accelerated, data-driven decision-making; improved safety for remote areas
- Quantifiable Outcomes: Lower response times, expanded reporting coverage, multi-source hazard intelligence, and reduced manual analysis for disaster teams—directly improving over legacy early-warning models, though precise metrics depend on future deployment scale.

3. Current status and future viability – the "what next"

a. Current Status

Development Phase: Prototype

Completed:

- Web and mobile UI prototypes functional
- Defined tech stack (Google ML Kit, YOLOv8n, DistilBERT, AWS)
- Process flow designed and documented
- Mobile app supports geotagging and offline use

In Progress:

- Backend and API routes
- DynamoDB database setup
- Social media integration pipelines
- Positioned as a disaster management software solution, fully functional for hackathon evaluation.

b. Future plans and relevance – target market size, competitive differentiators

Target Market: Coastal India—state governments, INCOIS, maritime agencies, and communities across 8,000 km of coastline.

Competitive Differentiators:

- Offline-first architecture for low connectivity
- On-device ML (YOLOv8n, ML Kit) for fast hazard detection
- Role-based credibility weighting for data trust
- Multilingual support for regional access
- Hyper-local risk scoring with INCOIS and crowdsourced data
- Social media trend analysis via NLP
- Community verification before analyst review

Future Scope:

- AI-driven forecasting with official data
- Inter-agency API sharing
- Blockchain timestamps for authenticity

c. Business Model

- Citizens use it free; officials access via government provision
- Public safety focus; no direct monetization
- Possible B2B model with maritime and state agencies

d. Sponsor / type of support available / required

Support Needed:

- AWS infrastructure for scaling

- Social media API partnerships
- INCOIS system integration
- Funding for backend and security hardening
- Training for end-users and communities
- Regulatory and compliance alignment

e. Top 3 risks and its mitigation plan

- **Network Constraints** – High severity. Use offline cache, lite app design, and queued uploads.
- **Data Reliability** – Critical risk. Apply community voting, role-based weighting, ML filtering, and official data cross-checking.
- **API Dependence** – Medium-high. Diversify sources, optimize costs, use SLAs, caching, and open-source alternatives.

4. Recognition received if any

5. Project Team Details: Team Primus

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