Project Synopsis

Name : Dinuka Liyanage

Project Title : Fishermen Safety and Weather Alert System

Problem Statement:

In Sri Lanka lots of fishermen have to face unpredictable weather conditions. This reason leads to many negative effects such as accidents, lost boats, and delayed rescues. When we talk about the current situation within the country fishermen do not have access to real time weather alerts and emergency communication. Because of that there is a huge threat to the life of the fishermen. Andalso lack of weather updates makes it hard for them to plan their journeys. Fishermen in Sri Lanka still rely on traditional methods, which are not always reliable because of not having a proper system.

Objectives of the proposed system:

- Provide real-time weather updates based on fishermen's location.
- Alert fishermen before any unfavorable/dangerous weather conditions happen.
- Allow fishermen to send an SOS distress signal with GPS location with limited internet access.
- Notify coast guards and emergency responders for quick rescues.

Proposed Solution:

As the solution to the above mentioned problem we propose to implement a mobile application which has the following features.

- Fetches real-time weather data using the OpenWeather API even within the limited internet access.
- Uses Google Maps API to track fishermen's locations.
- Offline SOS Distress Signal - Allow fishermen to send SOS and push notifications even without the internet using SMS technology.
- Boat-to-Boat Communication System - Allow nearby fishermen to communicate via radio-style when they need to communicate.
- Fishermen Community Alerts - this is a feature where all fishermen can get together. They can report dangers, like rough waves or missing boats to warn others through the community.

- Automated Emergency Protocol - If a boat hasn’t moved for 2-3 hours in dangerous weather, the system automatically notify coast guards.
- Multilingual Support- Include Sinhala and Tamil languages for better accessibility.
- AI-based weather risk predictions - Instead of just showing 24-hour forecasts here we are going to use AI to predict wave heights, wind changes, and possible storms.
- Provides voice alerts in Sinhala/Tamil for accessibility.
- Battery efficient system- Ensure the system works on low power. (as fishermen may not always have charging facilities.)

Technology Stack:

- Frontend: React Native
- Backend: Node.js + Express
- Database: Mongo DB
- APIs Used: OpenWeather API, Google Maps API, Twilio (for SMS)

Expected Outcomes:

Through the proposed system we expected to have following outcomes,

- Fishermen receive timely weather alerts before venturing out.
- Faster rescue responses during emergencies. (Real-time GPS tracking & live location sharing help fishermen to share their location with family or coast guards)
- Improved safety and communication for the country's fishing communities.
- Reduced Fishermen Deaths & Accidents
- With real-time data, fishermen can plan their fishing trips more efficiently. So it increases the fishermen's productivity.
- Boost in Local Fishing Economy