

PCCOE International Grand Challenge: 2025
Pune, India

Theme: AI for Climate Change

Title: AI for Disaster Forecasting & Response

Team Members details

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Outline

- Problem Statement/Idea
- Objectives
- Proposed Solution/Architecture
- Unique features/Innovation
- Expected Outcomes
- Conclusion

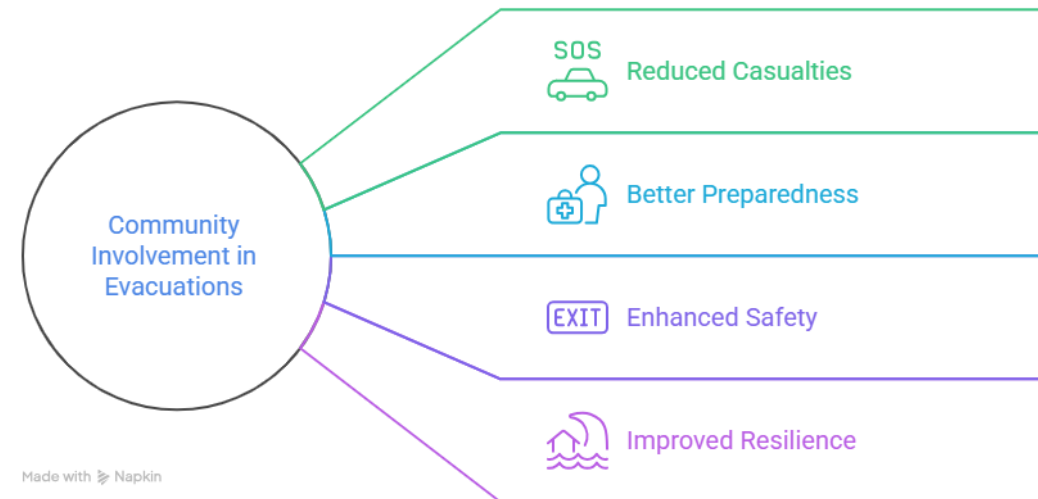


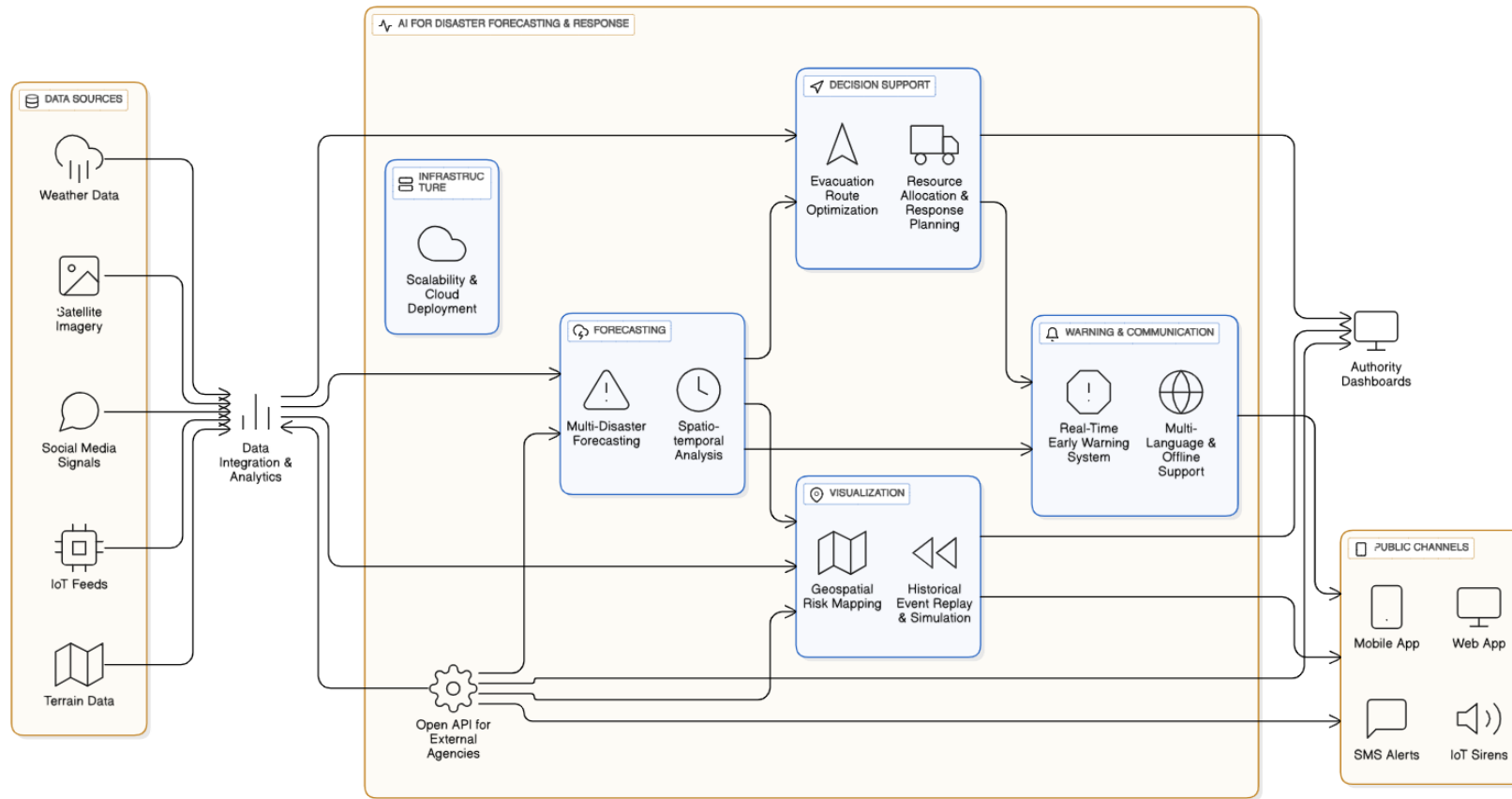
Problem Statement

- Natural disasters such as floods, cyclones, and heavy rainfall are becoming more frequent and severe due to climate change.
 - Hundreds of millions of people experience natural disaster-induced disruption to their lives every year, leading to mass human displacement, economic loss, and environmental degradation. At the light of climate change, and rather than managing their impact independently, a need for intelligent, adaptive, and proactive disaster management systems is particularly strong in a world with increasingly frequent and severe extreme events.
 - Current forecasting and response systems often struggle with delayed alerts, low accuracy, and lack of real-time adaptability, leading to significant human, economic, and environmental losses.
 - An AI-driven disaster forecasting and response system that combines predictive modelling with real-time alerts to enhance preparedness and resilience against climate-related disasters.
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Objectives

- Key goals:
 - To develop an AI-based model which can predict catastrophes like floods, cyclones and heavy rainfall with >85% efficiency.
 - To be able to give a real-time early warning with a notice delay shorter than 5 minutes since the occurrence of the event.
 - Improve emergency response: Cut average evacuation time by 20–30% using AI-driven route suggestions.
- An AI-driven platform for disaster forecasting and response enhances efficiency by delivering faster, more accurate predictions, enabling timely emergency preparedness to save lives. By integrating diverse data sources, it minimizes reliance on costly sensor networks and reduces post-disaster recovery expenses, making it cost-effective. The system ensures accessibility through real-time alerts via mobile apps, SMS, and web dashboards, reaching even remote areas with limited infrastructure. Additionally, it promotes sustainability by strengthening climate resilience, proactively mitigating environmental and human losses through precise, localized disaster management.



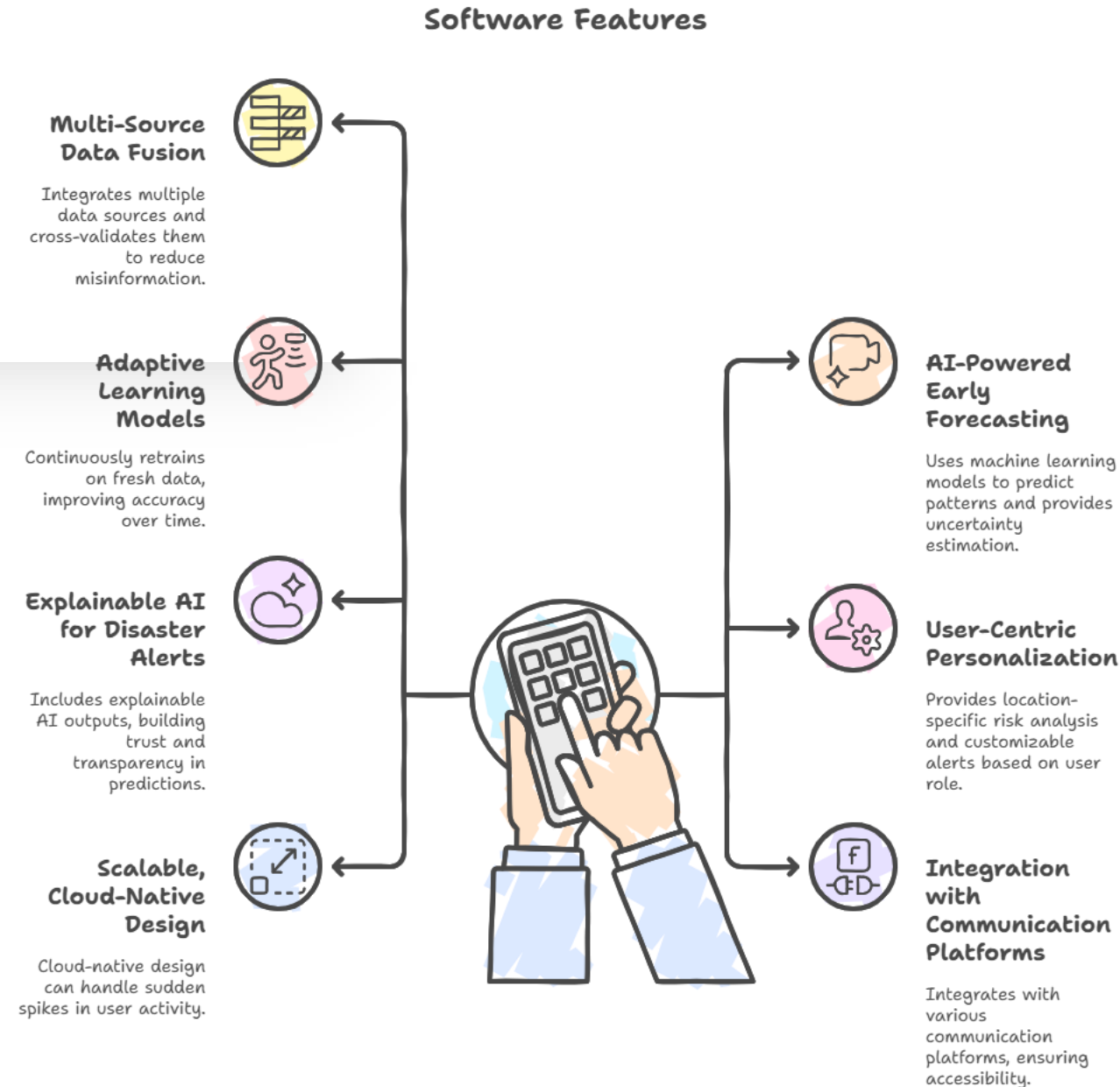


Proposed Solution/Architecture

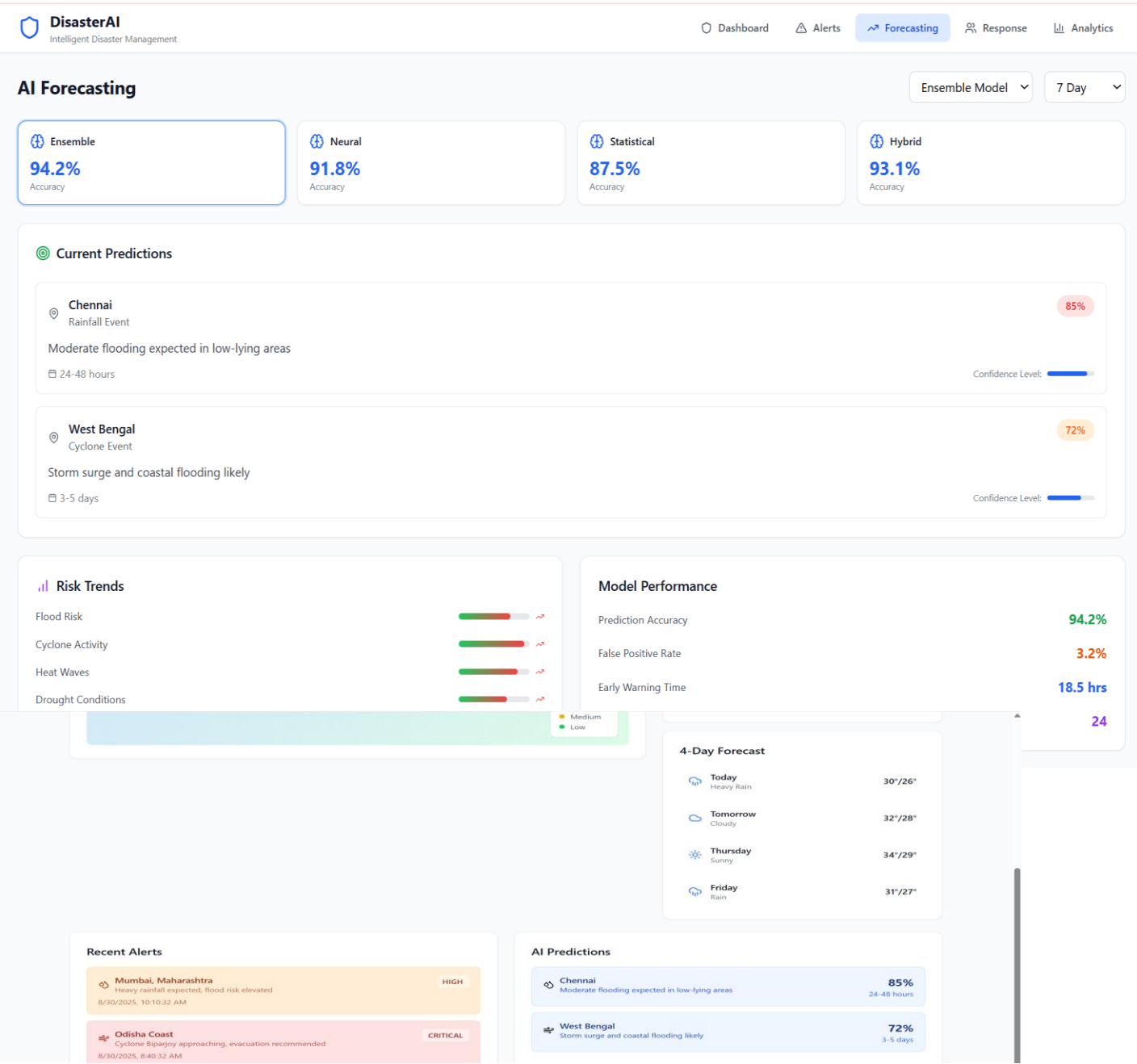
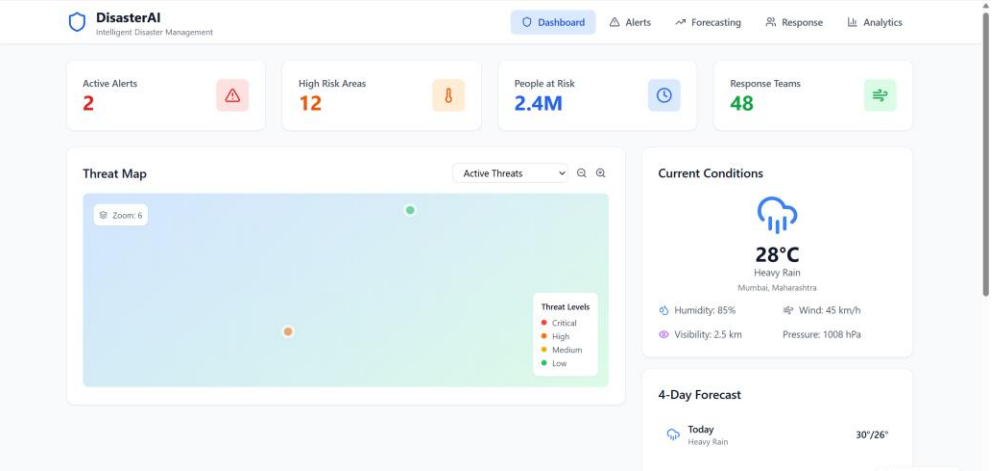
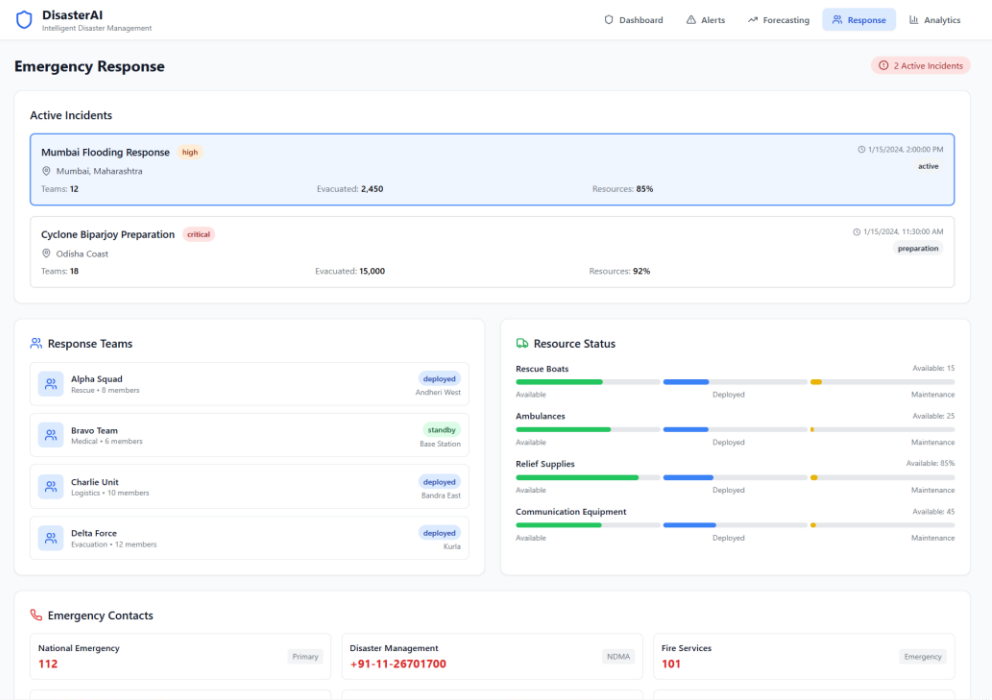
Unique features/Innovation

What Makes It Different from Existing Solutions?

- Not just relaying government alerts – predicts & forecasts with AI.
- No dependency on physical IoT hardware – works anywhere with internet data access.
- Personalized + explainable warnings instead of generic “state-level” alerts.
- Continuous self-improvement through adaptive ML models.



Expected Outcome





Conclusion

- To build an AI-powered disaster early warning system that predicts natural and manmade disasters using multi-source data and machine learning models. The solution delivers personalized, location-specific, and explainable alerts to citizens, industries, and government agencies through scalable cloud-based software.
- Our idea goes beyond relaying government alerts by offering predictive intelligence, transparency, and personalization without relying on expensive IoT infrastructure. It is innovative, scalable, and highly impactful, empowering communities with timely, actionable insights that can save lives, reduce losses, and support better disaster management.