

AIoT-Based Early Warning and Monitoring System for **Natural Disasters and **Dam Flood** **Risks** in Lao PDR**

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Background



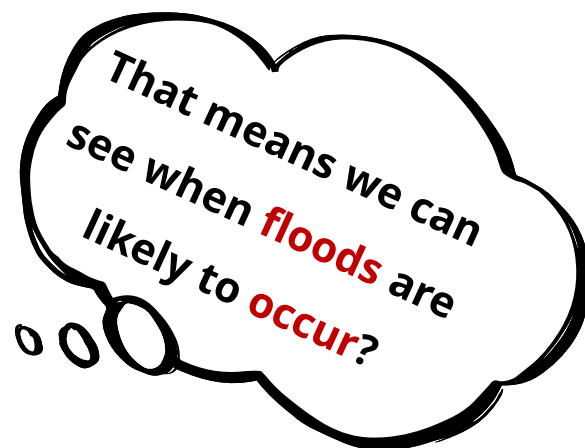
Flooding has become one of the most pressing issues in ASEAN, Mekong Regions including Laos, causing devastating impacts on lives, infrastructure, and agriculture ...



Targets:

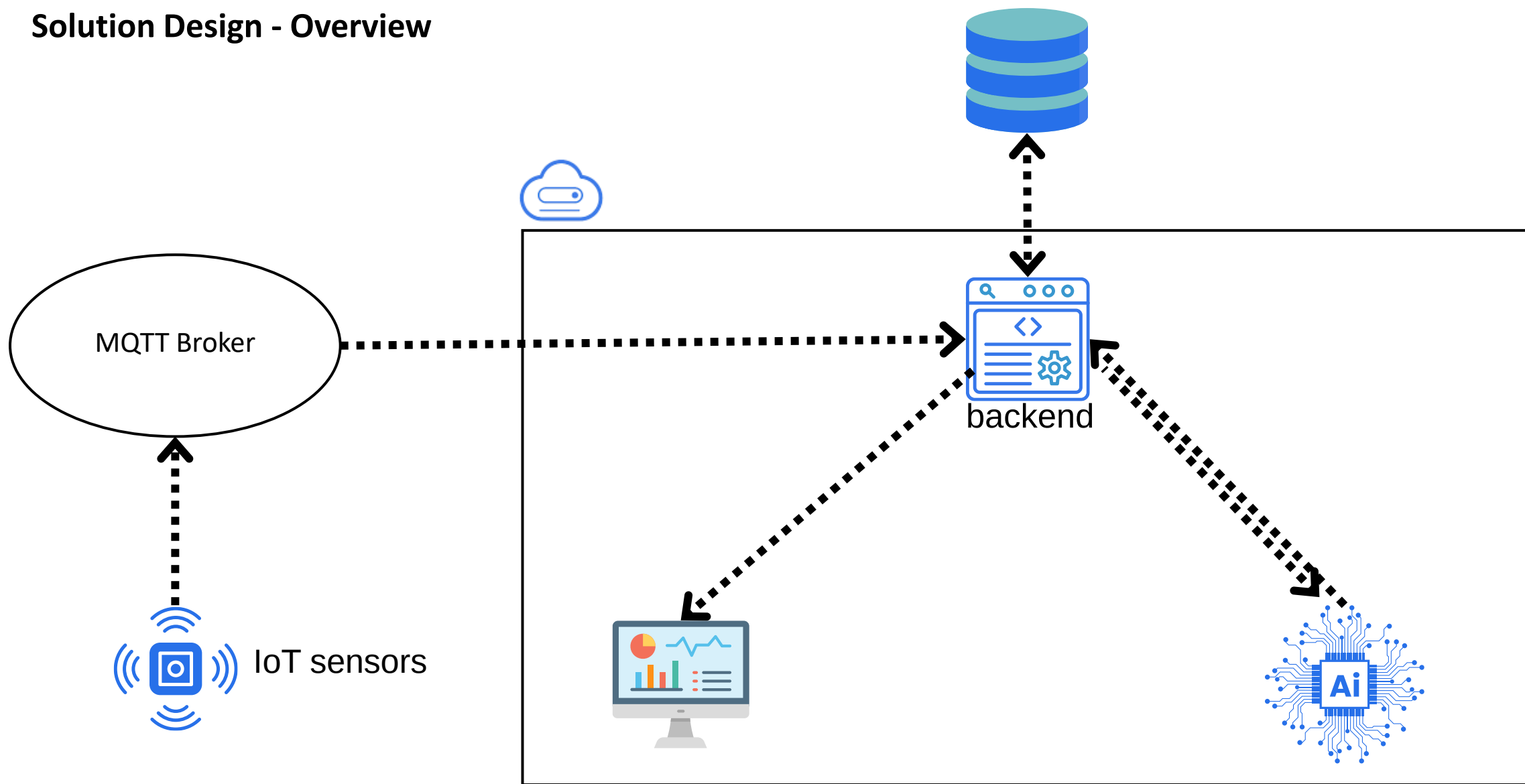
System design integrates **IoT sensors** to collect hydrological data, which is then processed through **AI models for prediction**. The selected parameters include **rainfall, soil moisture, water level, and water flow** – all of which are essential indicators for flood prediction.

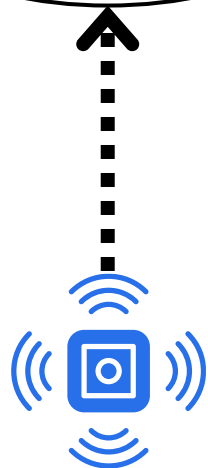
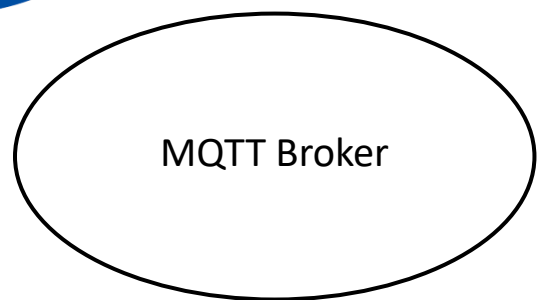
- **Rainfall**: Primary flood driver, linked to intensity and duration.
- **Soil Moisture**: Determines how much rainfall is absorbed or becomes runoff.
- **Water Level**: Real-time monitoring of river and stream levels.
- **Water Flow**: Measures volume and speed of water, indicating potential flood severity.



Predicted data
Early Warning

Solution Design - Overview





IoT sensors



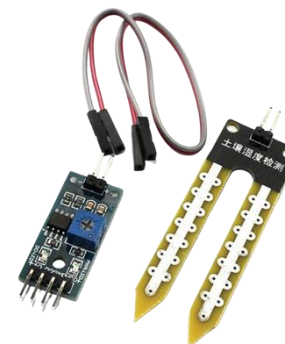
Water level sensor



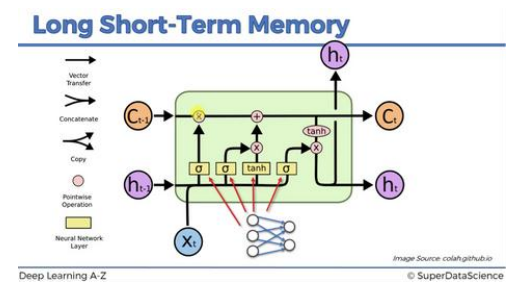
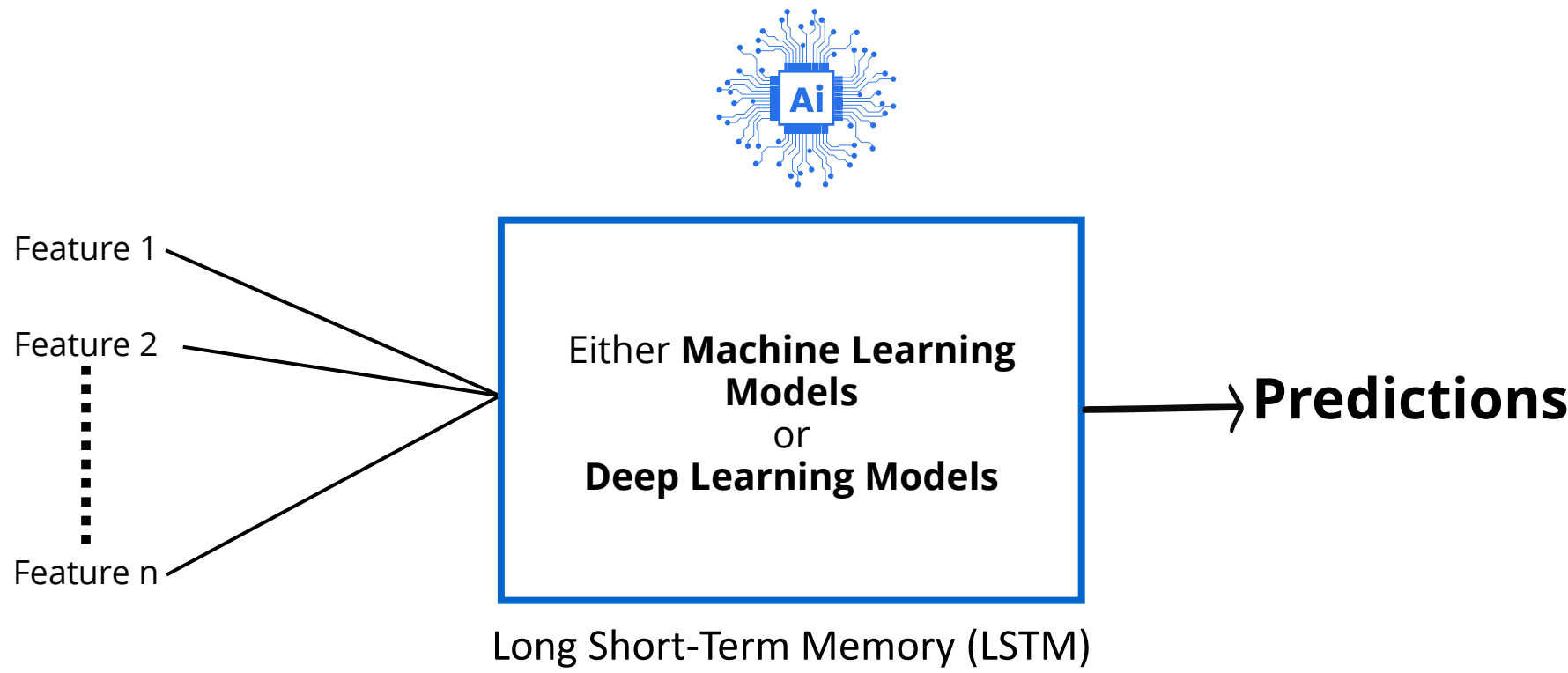
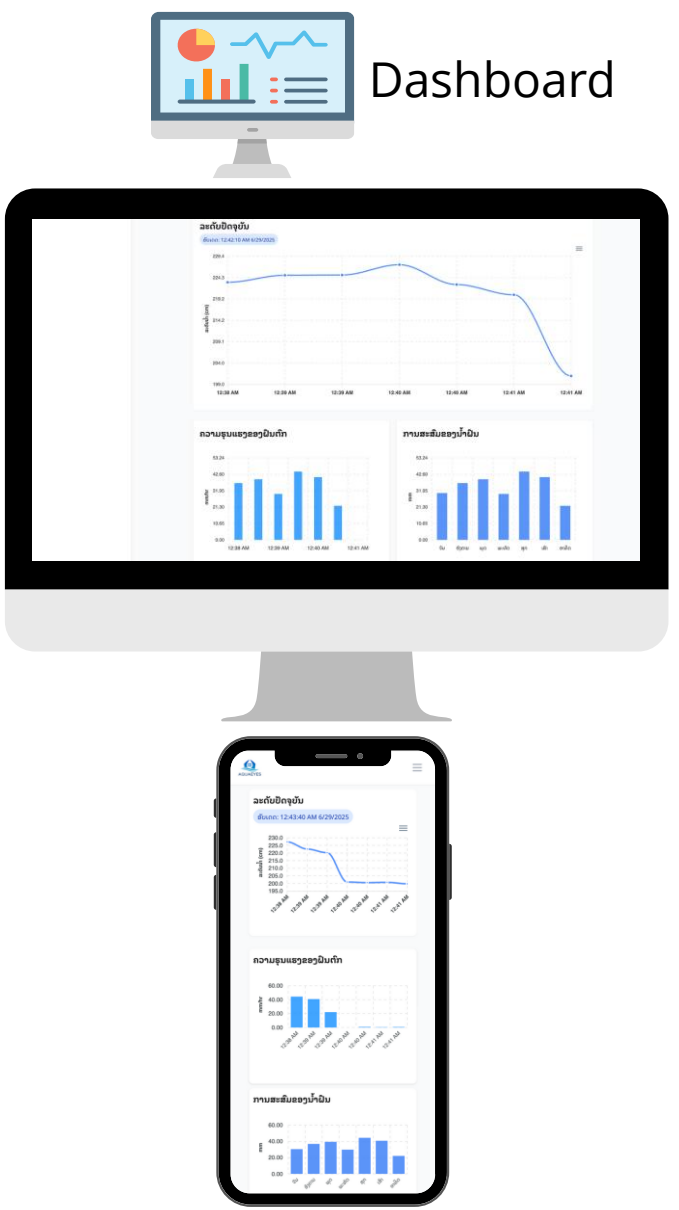
Water flow sensor



Rainfall sensor



Soil moisture sensor



Proposed Project Impacts: **timely, affordable, and community-centered solutions.**

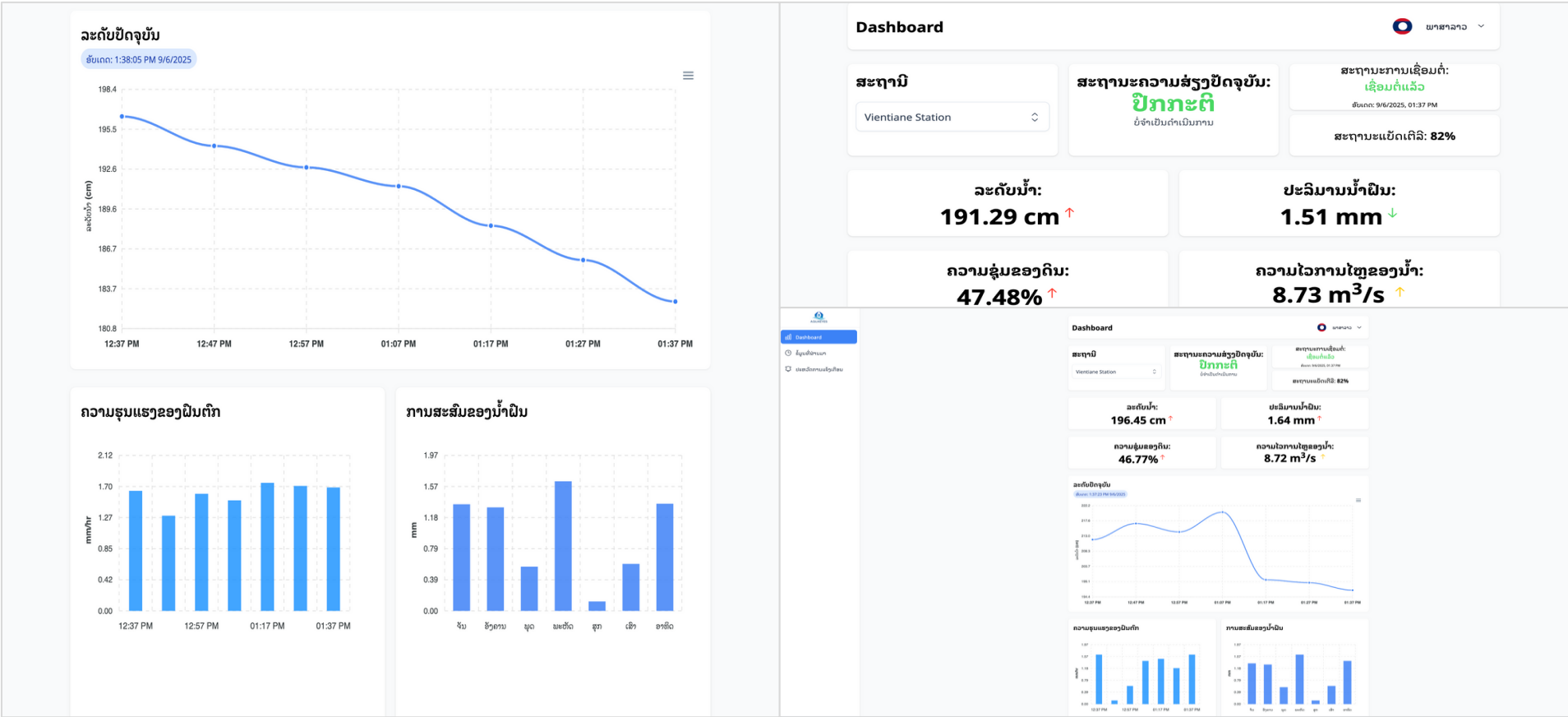
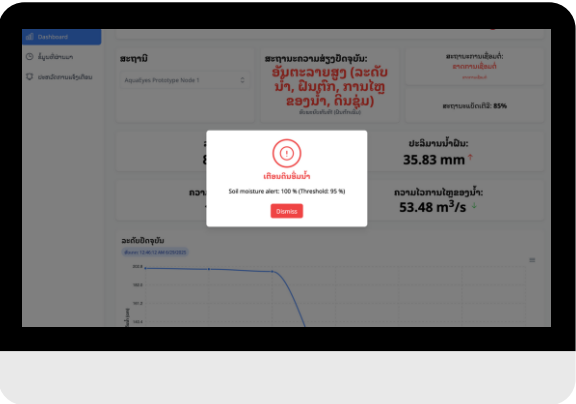
- **Save lives, infrastructure, and agriculture** : By providing **early warnings**, we reduce casualties.
- **Reduce Costs**: Preventing major damages reduces **repair and recovery** expenses.
- **Data-Driven**: Governments - Community gain insights to design better **flood management strategies**.



Implementation



Results: Dashboard



Predicting Floods, Protecting Communities:

“AI + IoT Technology”

1

Target

IoT sensors Integration
AI Model Prediction
Predict floods
Protect communities.

2

Methods

IoT Devices (Rainfall, Water Level, Soil
Moisture, Flow Sensors)
Backend Infrastructure with Database
AI Models for Flood Prediction
User Interface for Alerts
SMS Gateway for rapid community notification

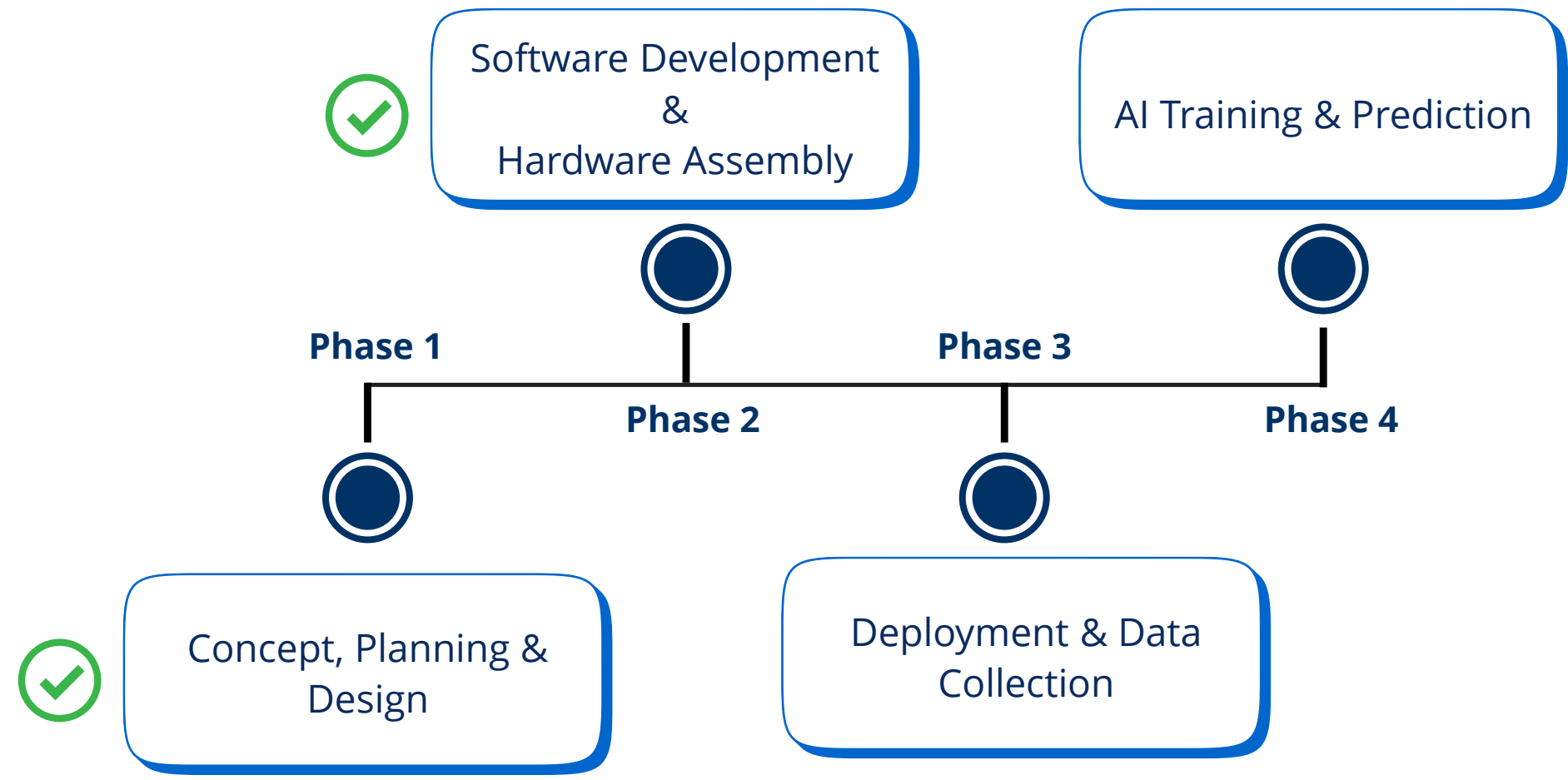
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**Scientific and
Social Impacts**

Save lives, infrastructure, and agriculture
Disaster, Dam Water Release Solutions
Reduce Cost
Data-Driven

Prototype Roadmap:

From **Concept** to **Prediction**



END

THANK YOU VERY MUCH

