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AI for Bharat Hackathon

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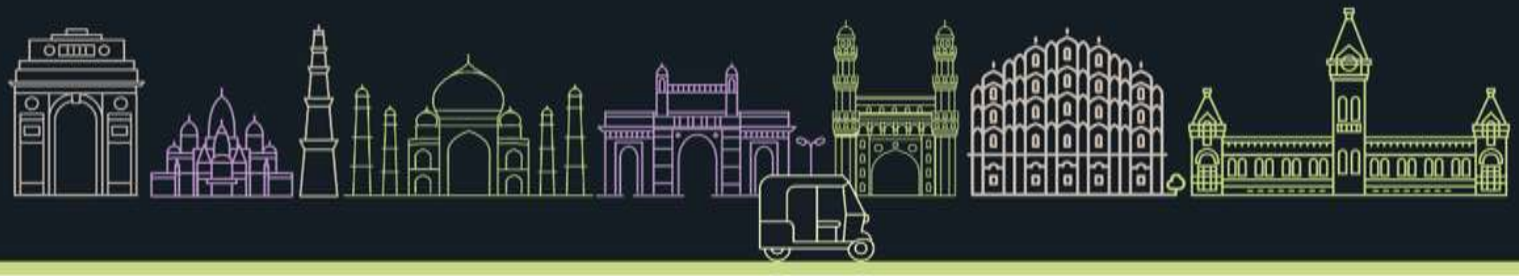


Team Name : Logic Labs

Team Leader Name : Mathavan G

Problem Statement : Improving access to real-time agricultural insights for the farming communi by translating complex plant bio-signals into vernacular voice alerts using AI.

- **Brief about the Idea:**

- **Project Name: Pasumai Kural (The Green Voice)**

- **Concept:** Developing a low-cost, AI-powered wearable "Bio-Clip" for plants that captures electrical signals (Plant Electrophysiology) and translates them into real-time voice alerts in Indian languages.

- **Impact:** Moves from "Soil-centric" to "Plant-centric" farming, allowing crops to communicate their needs (water, pests, nutrients) directly to the farmer.

Your solution should be able to explain the following:

- How different is it from any of the other existing ideas?
- Unlike satellite or soil sensors, this is "ECG for Plants"—direct biological feedback from the crop itself.

- How will it be able to solve the problem?
- Existing sensors only monitor soil. Our AI detects "Internal Plant Stress" (thirst or pests) 48 hours before visible symptoms appear, preventing up to 30% yield loss.

- USP of the proposed solution?
- **Vernacular AI Feedback.** No complex apps; the plant's stress is converted into a natural Tamil voice call via **AWS Lex** and **Bhashini API**.

List of features offered by the solution

It is always better to add a few visual representations (drawings/sketches/illustrations etc.) to your presentation, it adds to the power through which it reaches the audience.

List of Features:

•**Non-Invasive Bio-Clips:** Reusable leaf sensors.

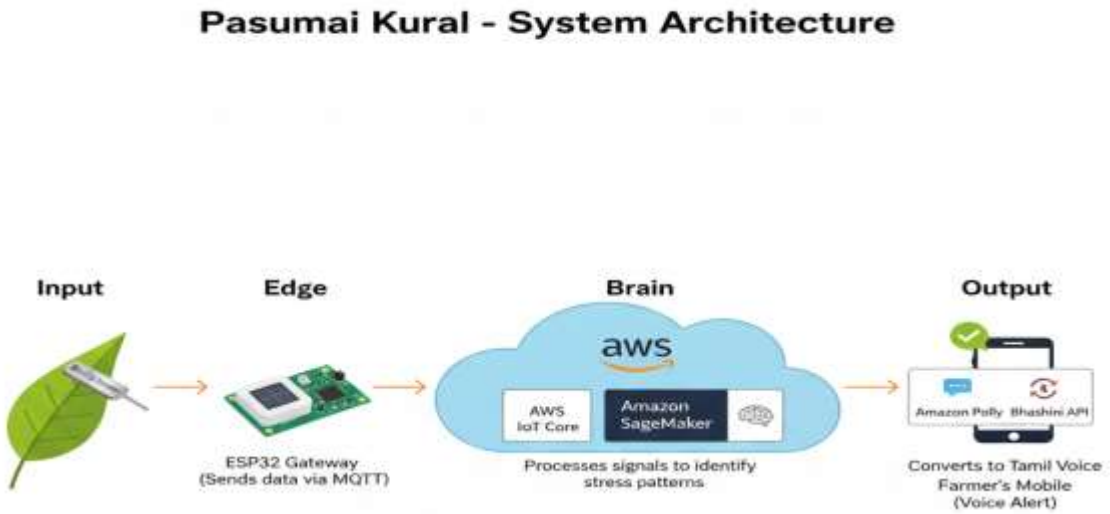
•**AI Stress Decoder:** Differentiates between thirst, pests, and nutrient lack.

•**Zero-Literacy Interface:** Direct voice alerts in Tamil/local languages.

• **Visual Representation (Sketch idea):** Draw a simple "Sad Plant" with a clip on its leaf connected to a Cloud icon, which then sends a "Speech Bubble" in Tamil to a farmer's phone.

Process flow diagram or Use-case diagram

Add a flow diagram or a use case diagram or an architecture diagram.

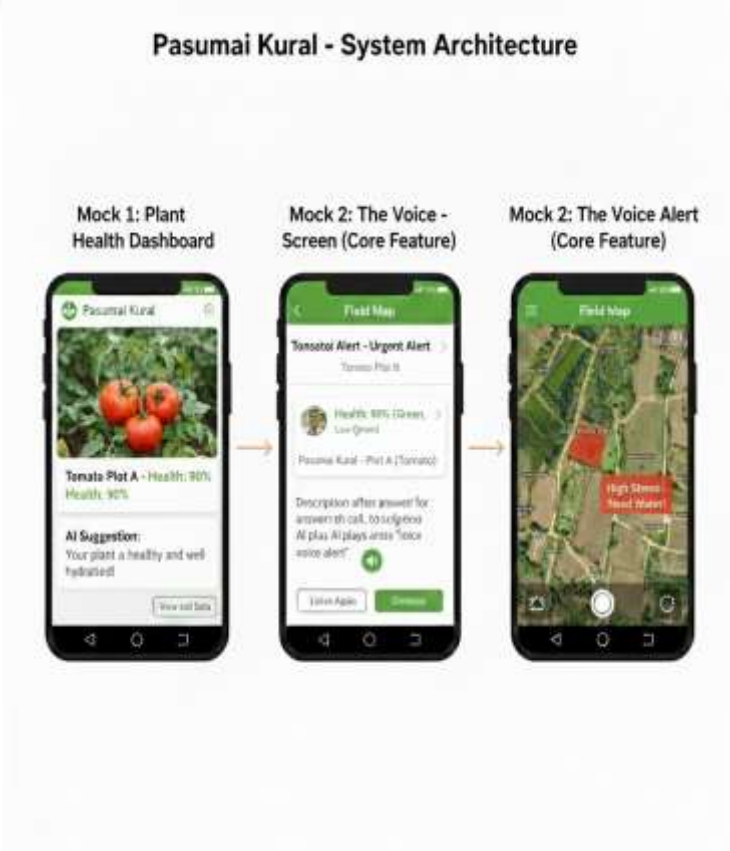


Wireframes/Mock diagrams of the proposed solution (optional):

Plant Health Dashboard: Real-time monitoring of crop "Mood" and health status.

Vernacular Voice Alerts: Localized AI voice calls (Tamil) to bridge the digital divide.

Precision Stress Map: GPS-integrated satellite view with **Red Hotspots** for targeted action.



Architecture diagram of the proposed solution:

- **Real-time Health Dashboard:** Plant "Mood" & Health monitoring.
- **Vernacular Voice Alerts:** Multi-language (Tamil) AI voice calls.
- **Precision Stress Map:** Red-zone GPS hotspots for targeted irrigation.

Technologies to be used in the solution:

Cloud: AWS IoT Core, AWS SageMaker, AWS Lambda, Amazon Polly.

AI/ML: Deep Learning (LSTM/CNN) for signal pattern recognition.

Language: Bhashini API for Indian language translation.

Hardware: Micro-electrodes, ESP32 Solar Hub, LoRaWAN. macha 8th slide intha content ok va macha

Estimated implementation cost (optional):

- **Hardware:** ₹1,500 - ₹2,000 per field hub (covers 1 acre with indicator crops).
- **Operating Cost:** Minimal (AWS Free Tier initially; then pay-as-you-go).
- **Business Model:** Subscription-based "Soil & Plant Health" service (approx. ₹300/month).

Add as per the requirements for the hackathon:

Step 1: Bio-Signal Capture – Micro-electrodes detect electrical signals (Action Potentials) from the indicator plants.

Step 2: Edge Processing – The **ESP32 Solar Hub** collects raw data and transmits it via LoRaWAN to the cloud.

Step 3: AI Analysis (The Brain) – **Amazon SageMaker** runs Deep Learning models (**LSTM/CNN**) to identify stress patterns before physical signs appear.

Step 4: Cloud Integration – **AWS IoT Core** triggers **AWS Lambda** to process the urgency of the alert.

Step 5: Voice Generation – **Amazon Polly + Bhashini API** converts the technical data into a natural Tamil voice message.

Step 6: User Action – The farmer receives an automated call and checks the **Stress Map** for precise irrigation.

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Thank You