**Concept Proposal: AI-Optimized Crop Yield Prediction System**

**Objective**: Deploy an IoT-AI pipeline to predict crop yields by analyzing real-time environmental data, enabling data-driven farming decisions.

**System Components**

1. **Sensors**:
   * Soil moisture (capacitive sensor)
   * Temperature & humidity (DHT22)
   * Light intensity (photoresistor/LUX sensor)
2. **Data Flow**:
   * Sensors → Edge Gateway (ESP32/RPi) → Cloud (AWS IoT/Thingspeak) → AI Model → Dashboard
3. **AI Model**:
   * **Inputs**: Sensor time-series data + historical yield records.
   * **Algorithm**: Hybrid LSTM-Random Forest for spatiotemporal prediction.
   * **Output**: Yield forecast (kg/ha) + actionable insights (irrigation/fertilizer alerts).

**Value Proposition**

* **Farmers**: Reduce resource waste + maximize yield.
* **Scalability**: Modular design for multi-crop/multi-field deployment.

[Field]

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├─ Soil Moisture → [Edge Gateway] → [Cloud DB]

├─ Temperature/Humidity → Preprocessing → (Time-Sync)

└─ Light Sensor → Anomaly Detection → [AI Model]

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[Prediction Dashboard]

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(Mobile/Web Alerts)