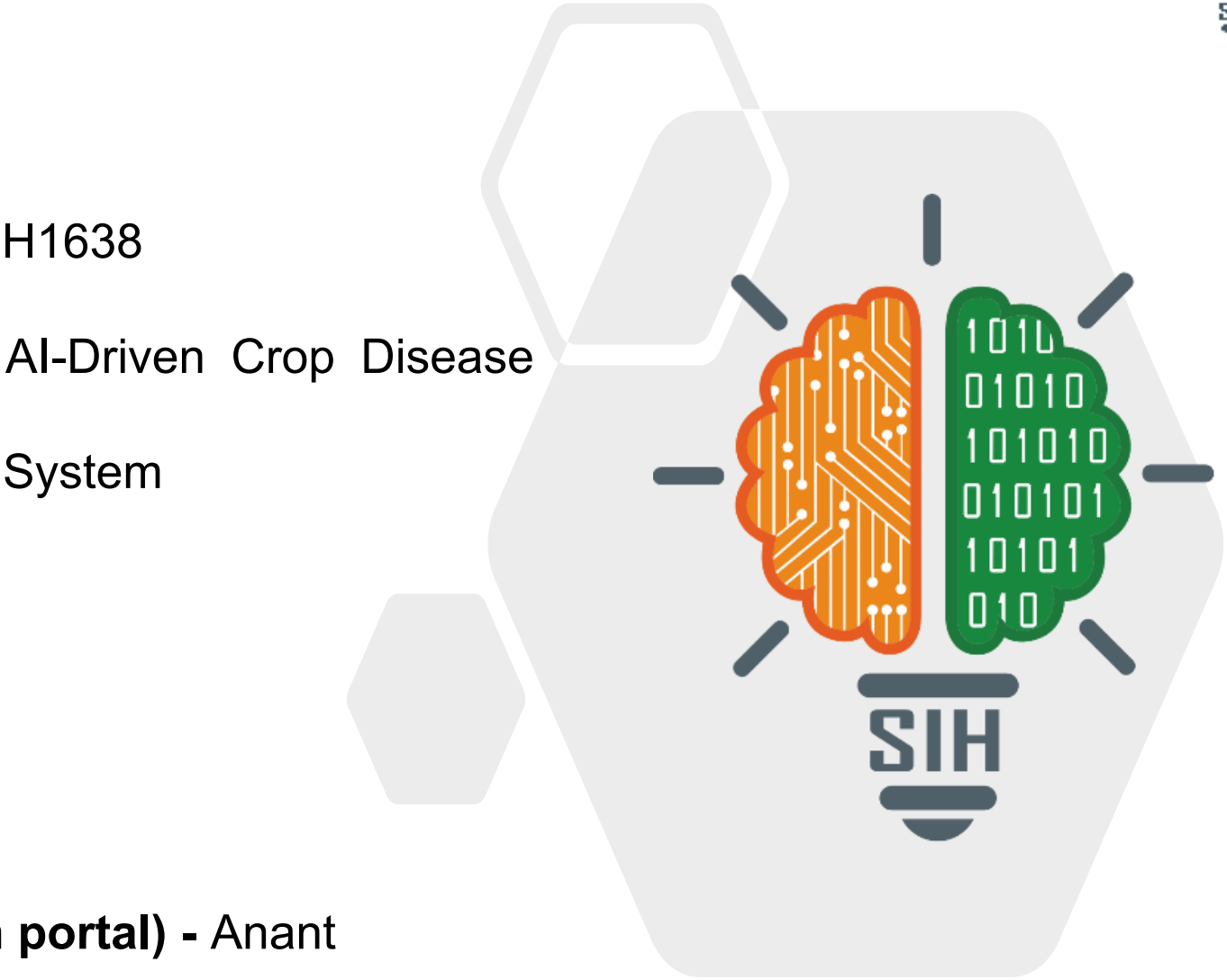
SMART INDIA HACKATHON 2024

SMART INDIA HACKATHON 2024

- **Problem Statement ID –** SIH1638
- **Problem Statement Title-** AI-Driven Crop Disease Prediction and Management System
- **Theme-** Miscellaneous
- **PS Category-** Software
- **Team ID- -** TC40
- **Team Name (Registered on portal) -** Anant



ArogyaKrishi

Proposed Solution:

- **Real-Time Image Analysis** for monitoring crop health and early disease detection.
- **Immediate Disease Prediction** for fast diagnosis.
- **Risk Mapping** to identify high-risk areas.
- **Proximity-Based Alerts** notify farmers of nearby risks.
- **Anonymous Reporting** and **Disease History Tracker** for secure reporting and tracking.
- **Intelligent Crop Management Recommendations** for tailored interventions.
- **Multilingual Support** ensures accessibility across different languages.
- **Adaptive Learning** refines predictions with new data.

Real Time Analytics

Multilingual Support

Remote Location Support

Message Alert Support

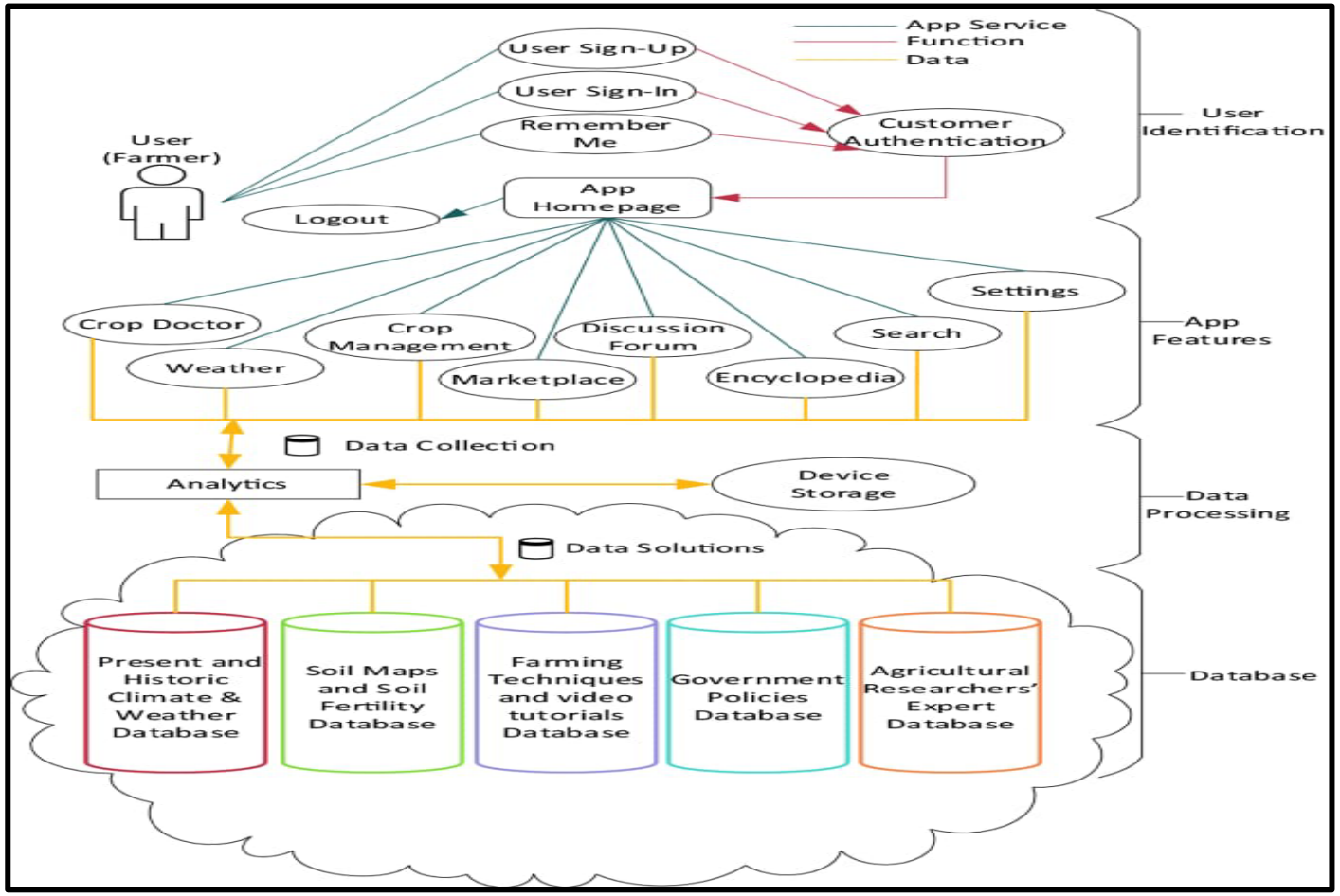
ChatBot Support

AI Driven Solution

TECHNICAL APPROACH

SMART INDIA HACKATHON 2024

Model Architecture:



Technology Stack:

FEASIBILITY AND VIABILITY

Feasibility Analysis:

- **High Feasibility**: Advanced **ML models** and **cloud deployment** enable real-time disease prediction.
- **Scalability**: Supports **multilingual** features
- **Personalized Alerts**: Farmers get alerts based on **crop type**, **region**, and **disease severity**.

Potential Challenges & Risks:

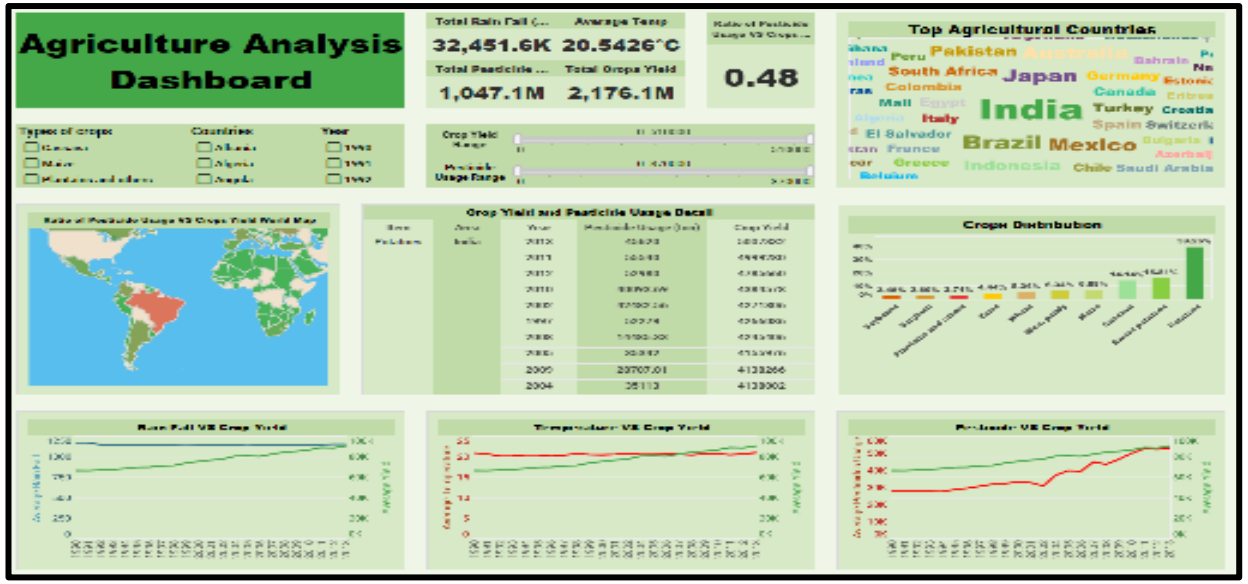
- **Data Quality**: Poor data leads to **inaccurate predictions**
- **Accuracy of AI Models**: Risk of **false positives** and **false negatives** cases.
- **Environmental Variability**: Presence of **Diverse conditions.**

Viability Analysis:

- **Early Detection**: Detects diseases early, lowering **treatment costs** and preventing spread.
- **Early Detection**: Detects diseases early, lowering **treatment costs** and preventing spread.

Strategies for Overcoming Challenges:

- **Real-Time Feedback**: Use a **feedback mechanism** to improve model predictions.
- **Environmental Variability**: **Adaptive algorithms** handle changing conditions.
- **AI Model Accuracy**: Use **cross-validation** and **ensemble methods** .
- **Transfer Learning**: Leveraging **pre-trained models.**



IMPACT AND BENEFITS

- **Economic Benefits**: Lowers disease management costs, increasing **productivity**.
- **Environmental Impact**: Optimizes pesticide/fertilizer use, promoting **sustainability**.
- **Data-Driven Decisions**: Provides real-time insights for **efficient farm management**.
- **Resilience**: Enhances farming practices and **reduces risks** of disease outbreaks.
- **Uniqueness:** **1.Identify crop diseases 2.Predict disease outbreaks 3.Recommend preventive measure 4.Optimize resource allocation 5.Enhance agricultural productivity 6.Real-time performance 7.User-friendliness 8.Scalability**

Right Choice of Fertilizer

Increased Yield

Right Amount

Healthy Crops

RESEARCH AND REFERENCES

1. **Development of Machine Learning Methods for Accurate Prediction of Plant Disease Resistance (2024):** *https://www.sciencedirect.com/science/article/pii/S209580992400243 1*

2. **Chinese cabbage leaf disease prediction and classification using Naive Bayes VGG-19 convolution deep neural network (2024) :** *https://ieeexplore.ieee.org/document/10407076*

3. **Image-based crop disease detection with federated learning (2023):** *https://www.nature.com/articles/s41598-023-46218-5*

4. **Deep learning-based crop disease prediction with web application (2023) :** *https://www.sciencedirect.com/science/article/pii/S266615432300271 5*

5. **Seasonal Crops Disease Prediction and Classification Using Deep Convolutional Encoder Network (2019):** *https://link.springer.com/article/10.1007/s00034-019-01041-0*

6. **Cropin app link**: *https://www.cropin.com/farming- apps#:~:text=Cropin%20Grow%20is%20a%20robust, stakeholders%20in%20the%20agri%2Decosystem.*