Swecha

AI DAYS 2025
AI For Society

AI POWERED CROP DISEASE AND PESTS DETECTION

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Problem Statement

- Small farmers face significant challenges in identifying and managing crop diseases and pests due to limited access to expert advice and resources.
- Conventional methods for pest and disease control often lack accuracy, personalization, and real-time updates, leading to reduced crop yields.
- Many existing solutions are either too expensive, complex, or inaccessible to farmers with limited technical expertise.
- The need for a seamless, AI-powered platform that delivers accurate, real-time, and easy-to-understand crop health insights remains unaddressed.

Solution Overview

- Leverages advanced AI to analyze plant images, soil data, and weather patterns, identifying crop diseases and pests with high precision.
- Provides personalized, actionable advice on pest and disease management using natural, organic, or conventional methods.
- Offers accurate, up-to-date data insights for smarter decision-making, empowering farmers to act proactively.
- Intuitive interface, voice assistant, and chatbot make the platform accessible and easy to use for farmers of all technical levels.

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Key Features

- AI-powered detection of crop diseases and pests.
- Personalized pest and disease control methods.
- Real-time data insights for smarter decisions.
- Voice assistant and chatbot for easy interaction.
- User-friendly interface for farmers of all skill levels.

Technology Stack

FRONTEND: VITE, REACT, TYPESCRIPT

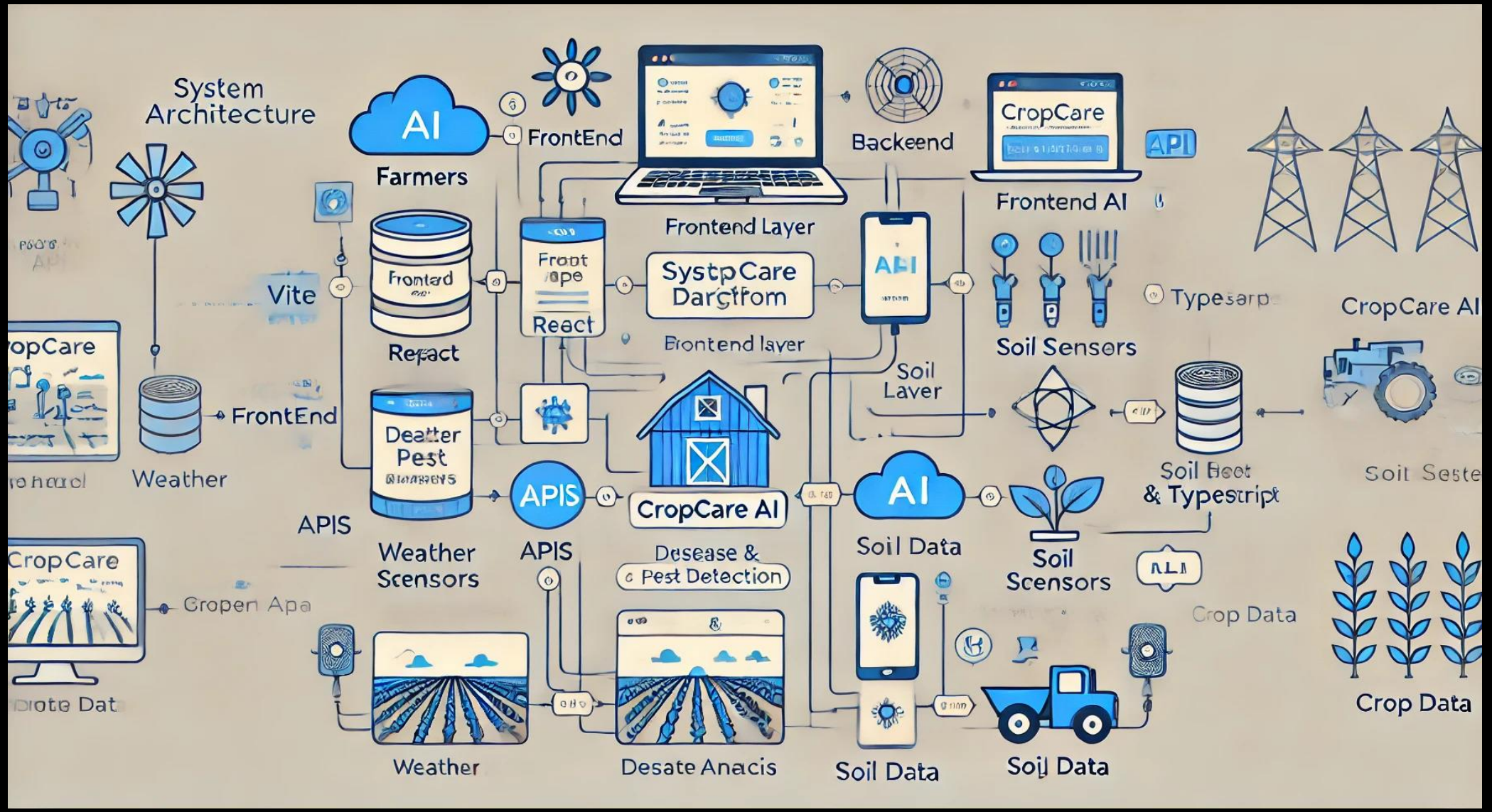
BACKEND: APIS, LLM INTEGRATION

AI/ML: ADVANCED AI MODELS FOR CROP ANALYSIS

USER INTERACTION: VOICE ASSISTANT, CHATBOT

DATA HANDLING: REAL-TIME DATA INTEGRATION FOR INSIGHTS

System Architecture

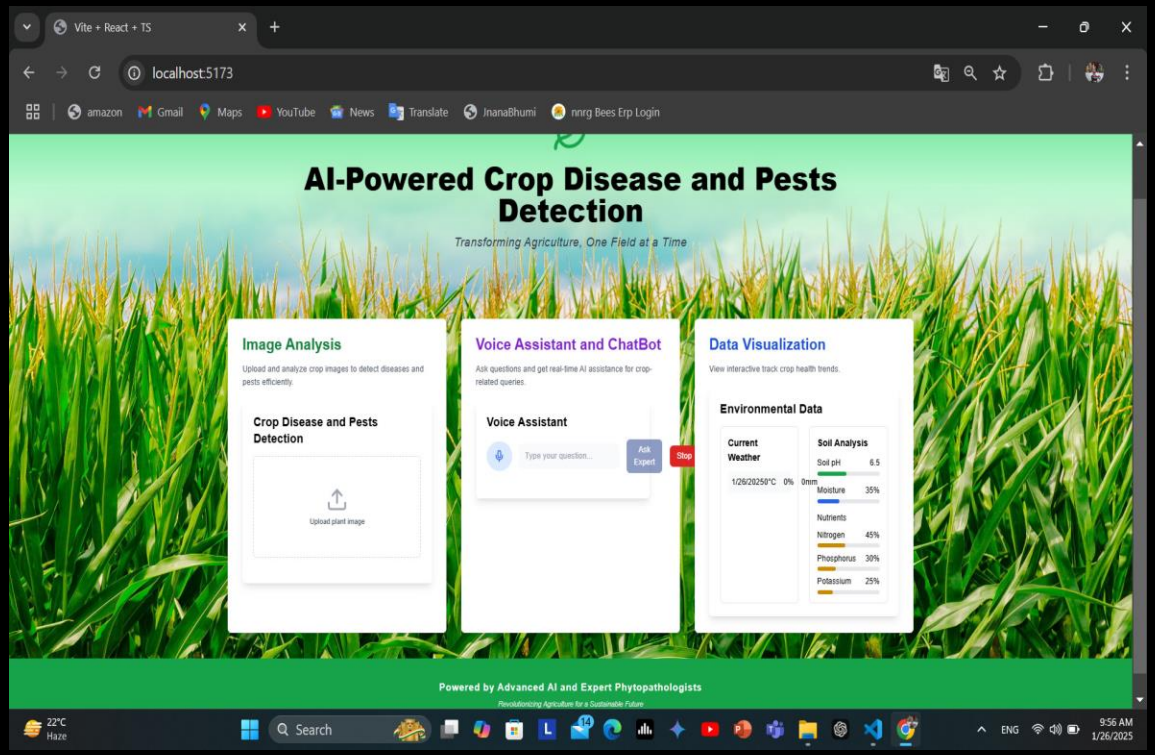


Benefits:

- Early detection of crop diseases and pests.
- Personalized and actionable farming solutions.
- Improved crop yield through informed decision-making.
- Accessible platform for farmers of all technical levels.
- Time and cost savings with real-time insights.

Monitoring Dashboard

- Real-time crop health updates
- Insights on weather and soil data
- Pest and disease trend analysis
- Chatbot and voice assistant integration
- Customizable reports for farmers



AI Features :

- **AI Detection**: Accurate identification of crop diseases and pests from images and data.
- **Control Methods**: Real-time advice on pest control using tailored solutions.
- **Data Insights**: Up-to-date information for informed decision-making.
- **Voice & Chatbot**: Easy interaction through voice commands and chatbot assistance.

Impact:

- Environmental sustainability
- Resource conservation
- Improved crop yields
- Cost reduction
- Scalable solution

Future Enhancements

- **Advanced AI Models**: Incorporate machine learning for improved disease prediction and pest behavior analysis.
- **Mobile Application**: Develop a mobile app for on-the-go access to features and alerts.
- **Community Forum**: Create a platform for farmers to share experiences and solutions.
- **Integration with IoT Devices**: Connect with sensors for real-time monitoring of soil and environmental conditions.

Business Potential & Future Prospects

- **Scalable Model**: The pole-based system can be implemented across different regions in India and beyond, benefiting small farmers.
- **Sustainability Focus**: The system encourages sustainable farming practices, promoting organic and natural pest control methods.
- **Partnership Opportunities**: Potential to collaborate with agricultural organizations, government bodies, and NGOs to enhance farmer outreach.
- **Subscription Model**: A recurring revenue model through subscription services for data monitoring and expert advice.
- **Future Enhancements**: Integration with drone technology for aerial monitoring, expansion to more crops, and predictive models for climate impacts.


Thank
you