CropCare

~Empowering Farmers with Crop Disease Insights and Prevention Reports

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Supporting Farmers with Accurate Diagnostics, Progress Tracking, and Sustainable Practices.....

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PROBLEM AND WHY IT MATTERS

Agriculture is the backbone of many economies, especially in countries like India. However, crop diseases remain a major threat to food security and the livelihood of farmers.

Real-World Impact:

- Crop loss due to diseases can reduce yields by 20% to 40%, leading to huge economic losses.
- Many small-scale farmers lack access to expert guidance or timely diagnosis.
- Delayed or incorrect diagnosis results in the spread of diseases, affecting entire harvests.

Challenges Farmers Face:

- Lack of on-ground agricultural experts in rural areas.
- Difficulty in identifying symptoms of crop diseases accurately.
- Limited awareness of prevention and treatment methods.
- Dependence on manual observation, which is time-consuming and error-prone

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CHALLENGES IN PRE-EXISTING PLATFORMS

Limited Advisory Depth

Recommend ations often focus on pesticide-based solutions and may lack tailored prevention techniques

User Experience

Reviews show many apps score poorly on advance features such as report generation, & multilingual support

Accuracy & Contextual Reliability

Many rely on high-quality images in controlled settings—poor lighting or similar-looking visual symptoms can lead to misdiagnosis

No Real-time Weather Context

Most apps do not factor in local weather conditions when suggesting disease causes or prevention

Key Features

AI-Powered Crop Disease Detection

- **Image Capture & Upload :** Farmers can click or upload images of affected crops.
- **EfficientNet** : ONNX Model Integration: Lightweight and accurate ML model classifies crop diseases with ~95% accuracy.

Smart Weather Integration

- **Live Weather Data Fetch:** Pulls temperature, humidity, wind, etc., via OpenWeather Meteo API.
- **Weather-Informed Advice:** Adjusts disease explanation and prevention based on environmental conditions.

Multilingual Disease Report Generation

- **Agentic LLM Service:** Uses Groq + LLaMA3-70b-8192 to generate rich, context-aware reports.
- **Weather-Aware Prompting:** Combines local weather data with disease name for customized output.
- **Multilingual Output:** Reports are generated in Hindi, Marathi, and English, enhancing accessibility.

Farmer-Friendly Report Content

Detailed Report Includes:

- Disease description
- Visible symptoms
- Likely causes
- Actionable prevention techniques

Simple Language & Local Terminology: Easy to understand, region-specific phrasing.

TECH STACK

Machine Learning

- Model: EfficientNet
- Inference Service: Groq Client for high-speed inference along with LLaMA-70b-8192 (for intelligent report generation and supports multilingual languages with high accuracy for “Hindi” , “Engilsh” & “Marathi”)

Frontend

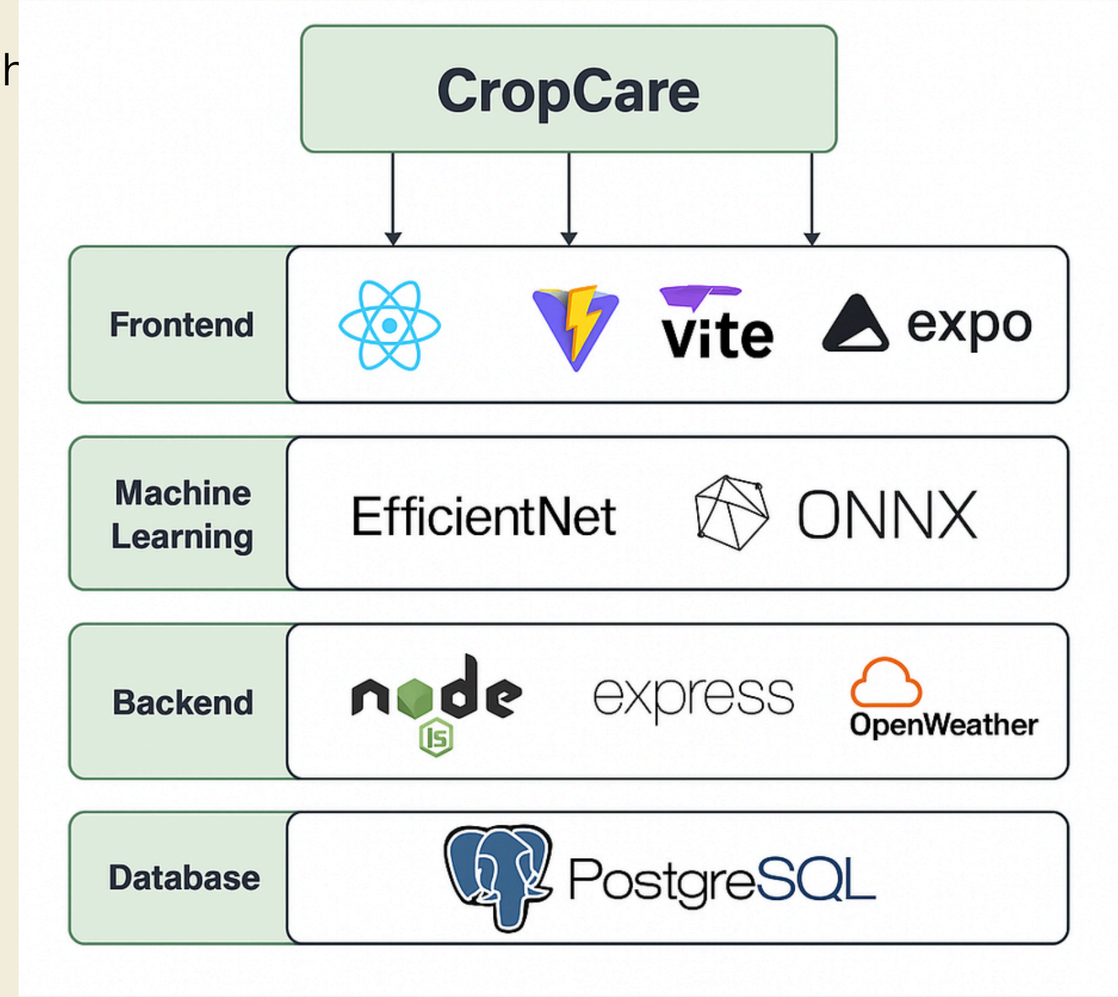
- Framework: React Native
- Platform: Android

Backend

- Runtime: Node.js
- API & Logic Handling: Express.js

Database

- Database: PostgreSQL
- Storage: Crop image uri, predicted disease, user reports



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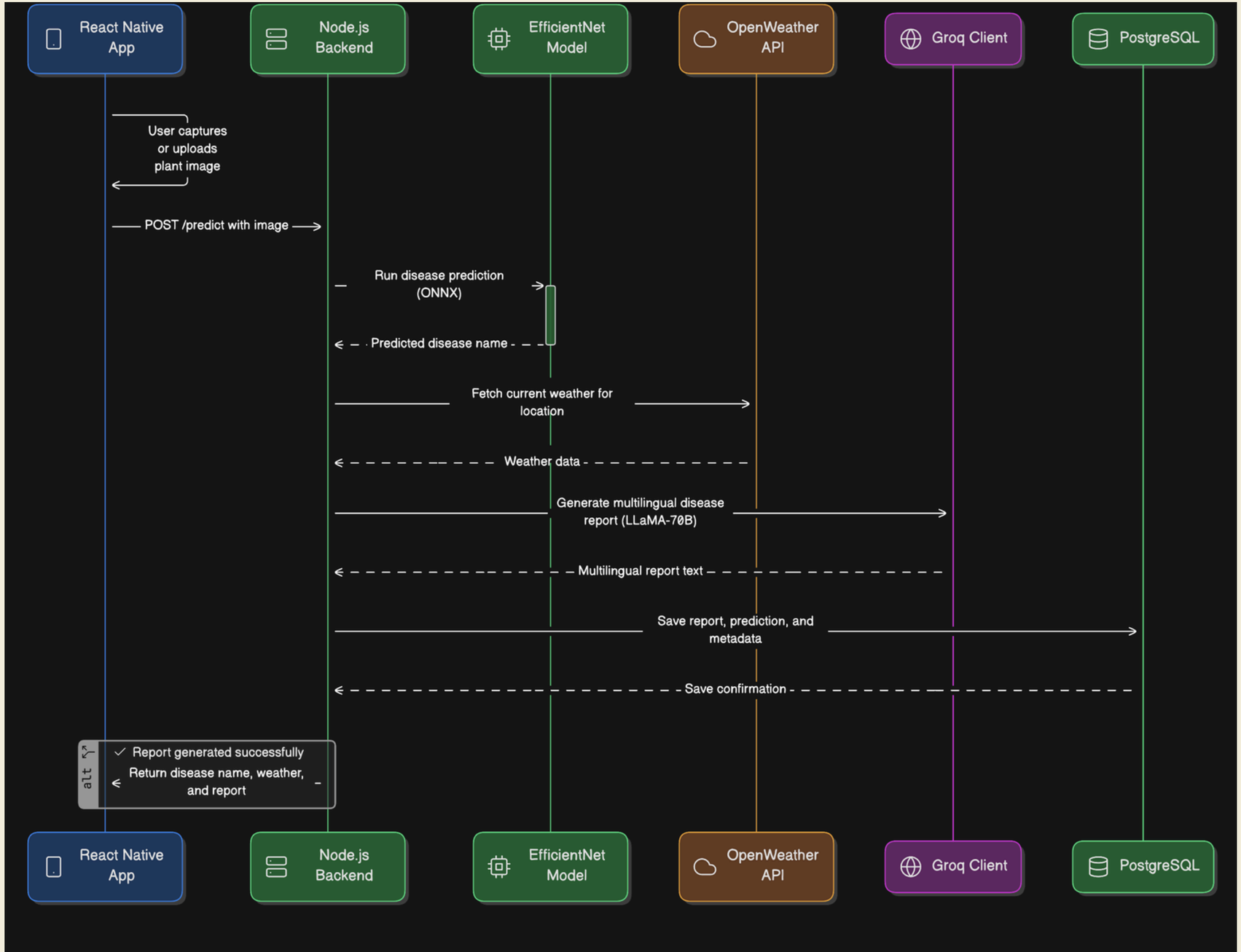
Summary Flow of App



Data sets used

Potato healthy image
Pepper bell bacterial spot
Pepper bell healthy
Potato early blight
Potato Late blight
Potato healthy

Tomato Bacterial spot
Tomato early blight
Tomato late blight
Tomato leaf mould
Tomato septoria leaf spot
Tomato spider mites

Tomato target spot
Tomato yellowish leaves
Tomato Mosaic
Tomato Healthy

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Millets are nutrient-rich crops exceptionally well suited to dry climatic conditions. In this regard the presidency brought consensus on broader dissemination of research related to millets

Photo Credit :

- Focus on organic farming methods to maintain ecological balance.
- Recommendations for sustainable pesticides/fertilizers only when necessary.
- Encouraging eco-friendly farming practices to promote a greener future.

Future Scope
and
Additional Features

- **Detecting the percentage spread of the disease on the plant.**
- Sharing Reports: Seamlessly send reports to agriculture experts via the app.
- Offline Functionality: Ensure farmers can still use the app without internet access.
- Soil Health Card: Introduce a feature for tracking soil health and improving crop productivity
- Notification System: Alerts on disease outbreaks and treatment recommendations.
- Expansion: Potential to expand the platform for more crops, diseases, and regions.

Impact on Farmers

- **Early Detection and Prevention**

I**mpact:** Prevents major crop losses by identifying diseases in early stages.
Benefit: Reduces the need for emergency pesticide usage and avoids large-scale infestations.

- **Cost Reduction**

Impact: Optimizes input costs by suggesting only necessary and effective treatments.
Benefit: Saves money on unnecessary fertilizers, pesticides, and repeated treatments.

- **Increased Crop Yield**

Impact: Healthy crops lead to better yield and higher income.
Benefit: Helps ensure food security and improves economic stability for farmers.

- **Smart Decision-Making with AI**

Impact: Replaces guesswork with data-backed suggestions and expert-level reports using LLaMA-70b.
Benefit: Builds confidence and knowledge over time, making farmers more self-reliant.

Conclusion

- The CropCare app brings AI into agriculture by helping farmers detect crop diseases early, get multilingual, science-based reports, and apply effective prevention methods.
- With EfficientNet for prediction, LLaMA-70B via Groq for report generation, and a simple React Native UI, it offers speed, accuracy, and ease of use.
- CropCare is more than an app—it's a smart farming assistant that empowers farmers to make informed, timely, and profitable decisions.

“From Diagnosis to Growth” Revolutionizing Farming for a Sustainable Future!