Team Details

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Problem Statement: Potato Disease Classification

The Potato Disease Classification project aims to develop a machine learning model capable of accurately identifying various diseases affecting potato plants based on images of their leaves. This project leverages computer vision techniques and deep learning algorithms to diagnose common potato diseases, helping farmers and agricultural professionals take timely and appropriate action to manage and treat these diseases.

Opportunities:

•**Global Reach**: Usable by potato farmers worldwide, addressing a common agricultural issue.
•**Market Expansion**: Adaptable for other crops, opening new agricultural sectors.
•**Collaborations**: Partnerships with agricultural institutes for enhanced accuracy.
•**Support Potential**: Opportunity for government and NGO backing, especially in developing regions.
•**IoT Integration**: Potential for integration with agricultural IoT devices for real-time monitoring.

- How different is it from any of the other existing ideas?

•**Advanced AI Techniques**: High accuracy with deep learning and transfer learning models.

•**User-Friendly**: Designed for non-technical users with a simple, smartphone-accessible interface.

•**Real-Time Diagnosis**: Instant disease identification, unlike many existing solutions.

•**Comprehensive Database**: Continuously updated dataset for accuracy and relevance.

- How will it be able to solve the problem?

•**Accurate Detection**: Identifies diseases early, reducing crop loss and improving yield.
•**Resource Optimization**: Helps in precise pesticide use, cutting costs and environmental impact.
•**Farmer Empowerment**: Reliable tool for effective crop management without expert dependency.
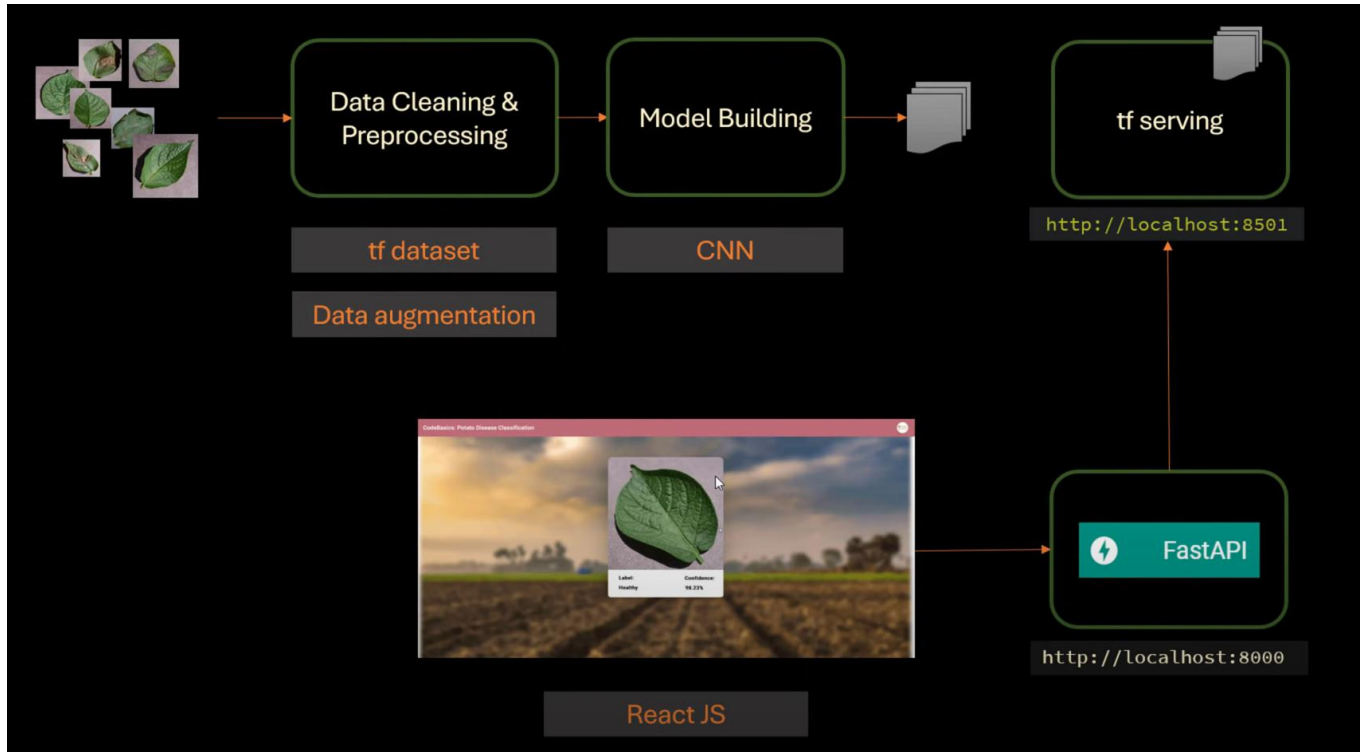•**Educational Resource**: Provides knowledge about diseases and management practices.

- USP of the proposed solution

•**High Accuracy**: Advanced AI ensures reliable disease detection.
•**Ease of Use**: Simple interface accessible to non-technical users.
•**Real-Time and Automated**: Instant diagnosis and recommendations with automated workflow.
•**Scalability**: Can handle large user volumes and adapt to other crops.
•**Sustainability Focus**: Promotes optimal resource use and reduces pesticide dependency.
•**Community Support**: Facilitates data sharing and collective knowledge among farmers.
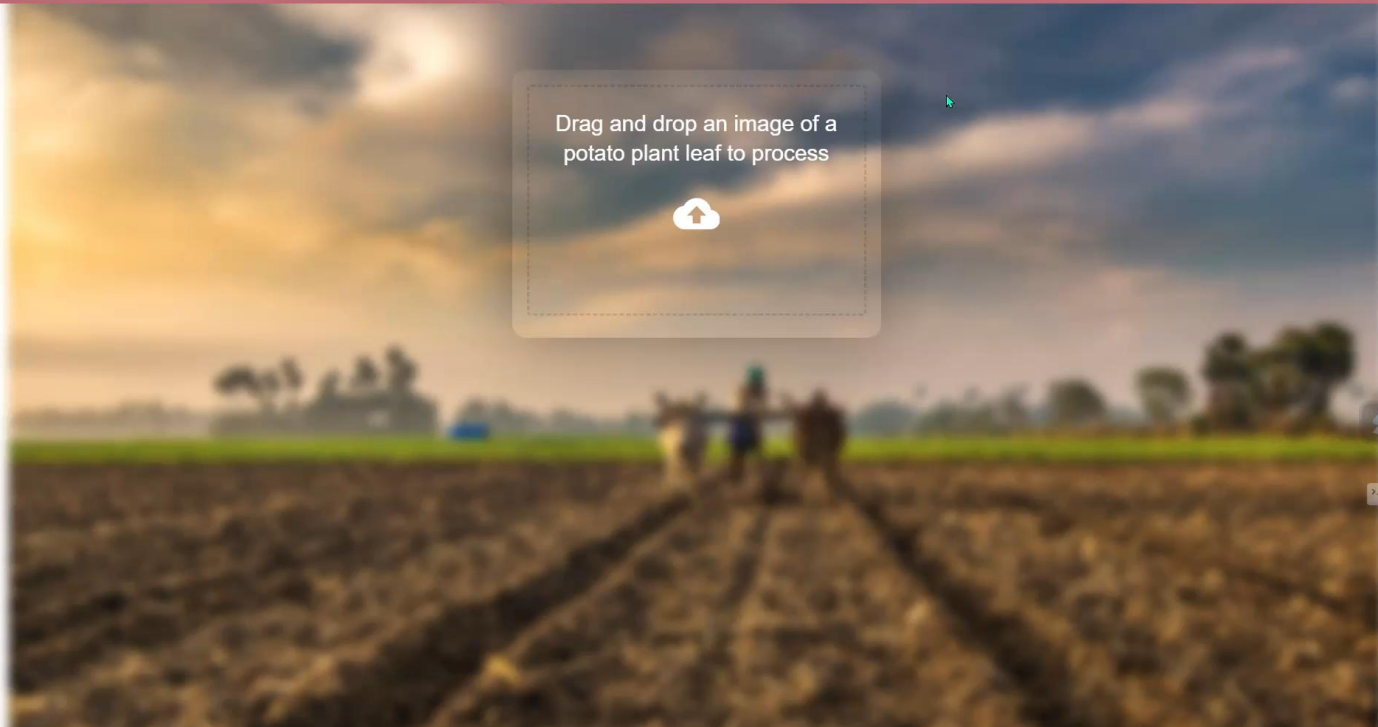
List of features offered by the solution

- **High Accuracy**: Advanced deep learning models ensure precise disease detection.
- **Real-Time Diagnosis**: Instant results upon image upload.
- **User-Friendly Interface**: Accessible via smartphones and computers, designed for non-technical users.
- **Comprehensive Database**: Covers a wide range of potato diseases.
- **Automated Workflow**: Fully automated from image upload to diagnosis and treatment recommendation.
- **Resource Optimization**: Recommends specific treatments to minimize pesticide use.
- **Scalability**: Handles large data volumes and user interactions efficiently.
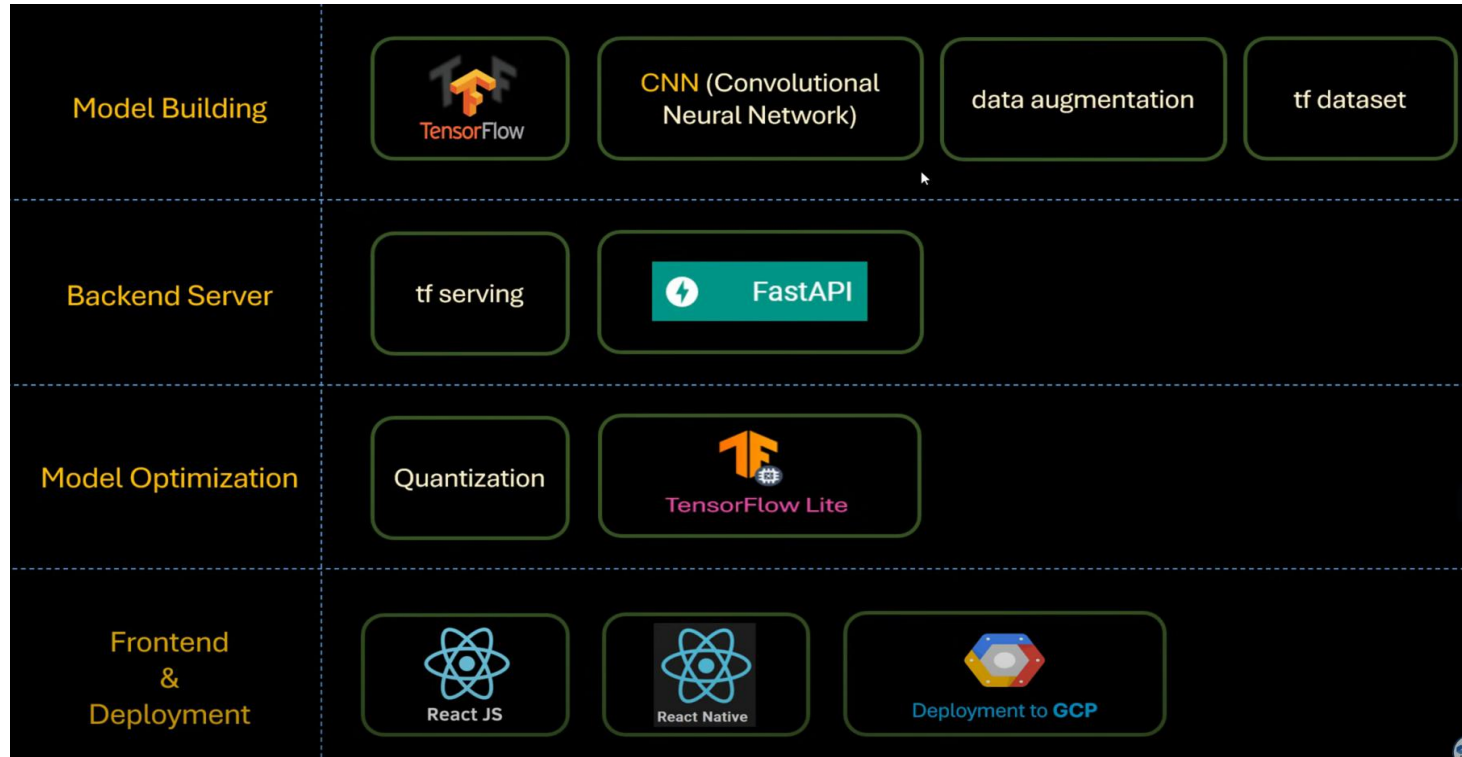
Process flow diagram or Use-case diagram

Architecture diagram of the proposed solution

Technologies to be used in the solution:

Model Building	TensorFlow	CNN (Convolutional Neural Network)	data augmentation	tf dataset
Backend Server	tf serving	FastAPI		
Model Optimization	Quantization	TensorFlow Lite		
Frontend & Deployment	React JS	React Native	Deployment to GCP	

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GITHUB REPO: https://github.com/ArjunRajputGLA/Potato_Disease_Classification