PLANTANIA – AI-BASED PLANT DISEASE DETECTION PLATFORM

PLATFORM: Streamlit (Python Web App)
THEME: Agri-Tech and Sustainability

PROBLEM STATEMENT

Farmers often struggle to identify plant diseases accurately and in time, leading to significant crop loss and reduced agricultural productivity. Access to expert botanists or agronomists is limited, especially in rural regions. There is a pressing need for an accessible, real-time tool that can aid in the early detection and prevention of plant diseases.

SOLUTION

Plantania is a web-based AI application that allows farmers to upload images of infected plants and receive instant predictions of the disease, along with its symptoms and recommended preventive measures. Built using image recognition and machine learning, Plantania aims to democratize access to plant healthcare, enabling sustainable farming through early intervention and informed decision-making.

HOW AI TOOLS WERE USED JUDICIOUSLY AND INNOVATIVELY

- **Image Detection:** Leveraged **OpenCV** for real-time image processing to detect and segment infected regions on plant leaves.
- **Machine Learning Models:** Utilized **TensorFlow** to build and train deep learning models capable of classifying various plant diseases with high accuracy.
- **Web Integration:** Used **Streamlit** to deploy a responsive, easy-to-use web application for farmers with minimal technical know-how.

TECH TOOLS USED

- **Programming Language:** Python
- **AI and ML Frameworks:** TensorFlow, OpenCV

- **Web Application Development:** Streamlit
- **Future Enhancements:** Integration of a botanist contact system and multi-species support.

GO-TO-MARKET STRATEGY (INFORMATION AND AWARENESS PLATFORM)

- **Farmer Training Camps:** Conducted awareness drives and demo sessions in agricultural villages.
- **Digital Outreach:** Launch of a mobile-responsive web app accessible through regional language support.
- **Partnerships:** Collaborate with agricultural NGOs, local cooperatives, and Krishi Vigyan Kendras (KVKs) for wide dissemination.
- **Expert Access:** Provide a built-in feature to connect farmers with disease-specific botanists for expert guidance.

SOURCES OF REVENUE

- **Subscription-Based Access:** Offer freemium access with premium disease libraries and expert consultancy.
- **Agri-Tech Tie-Ups:** Collaborate with agrochemical companies for in-app promotion of verified remedies.
- **Government Grants:** Apply for agri-innovation schemes under CSR and sustainability-focused initiatives.

LEARNING EXPERIENCE ACHIEVED

- Understood the integration of machine learning with real-world problems in agriculture.
- Gained experience with image classification using deep learning tools.
- Built a practical, deployable web application using modern AI frameworks.
- Developed awareness of end-user needs and optimized for farmer accessibility.

CERTIFICATIONS AND RECOGNITIONS

- Conceptualized and presented by **Dwij Verma**, AVM Juhu, Mumbai, Maharashtra
- Featured as a promising innovation in agricultural technology in Top 200 Summit of INSPIRE MANAK AWARDS ’23 – BUILDING AI READINESS AMONG YOUNG INNOVATORS BOOTCAMP held in Bangalore.

MAGNITUDE OF IMPACT CREATED

- Designed to benefit **millions of farmers** by reducing crop losses through early detection.
- Provides a **cost-effective** and **quick solution** to traditionally time-consuming disease identification processes.
- Potential to revolutionize rural farming practices with **accessible AI technology**.

FUTURE SCOPE

- Expand database to cover **multiple plant species and diseases**.
- Add regional **language support and voice command inputs** for greater accessibility.
- Implement a **mobile version** of the app for offline use in low-connectivity areas.
- Integrate a **botanist network** for real-time consultation.