



Mansoura University  
Faculty of Computers and Information  
Department of Information Systems



Your Green Guardian, Every Hour

Agri Lens  
نظام زراعي ذكي يعمل بالذكاء الاصطناعي

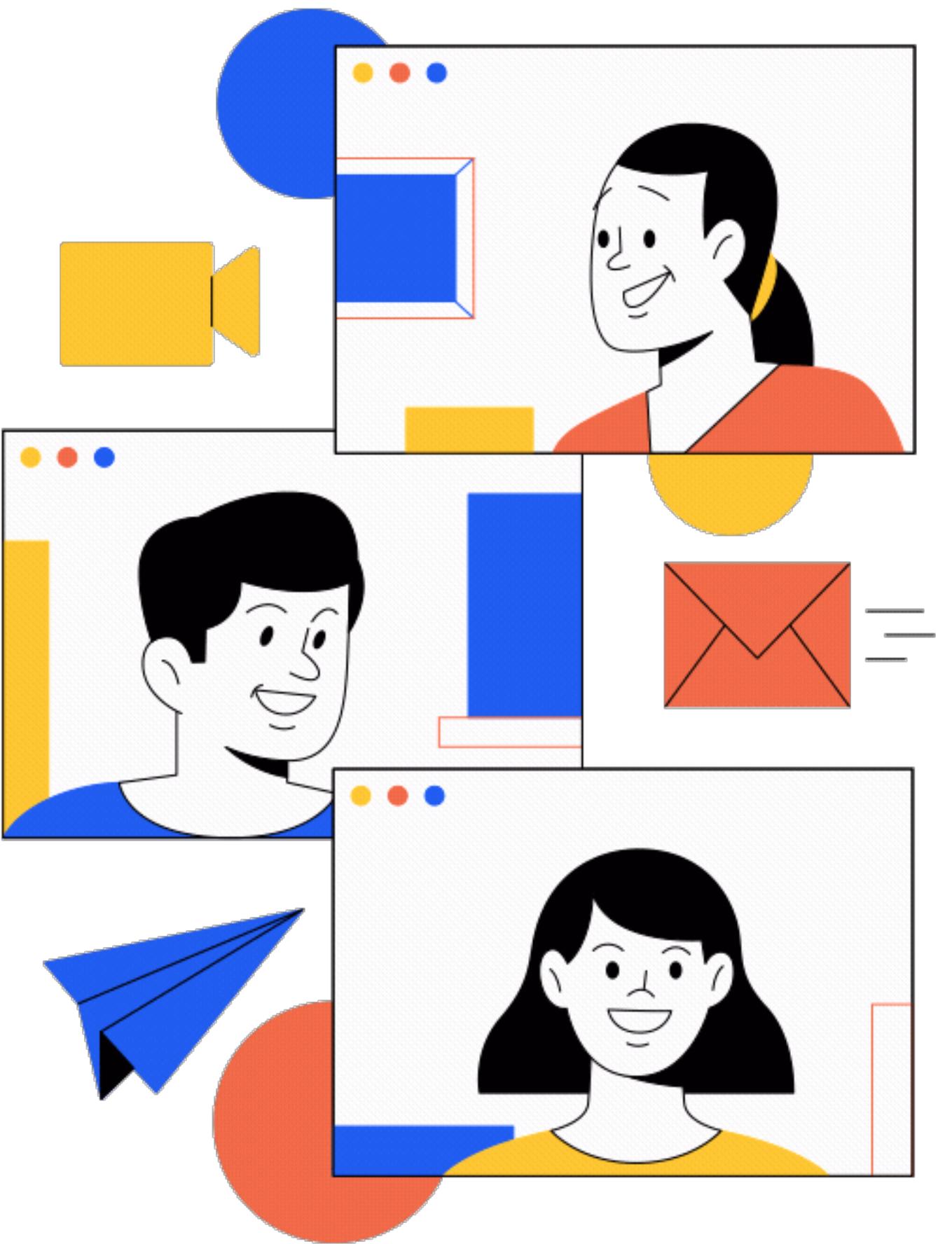
Supervised by  
Assoc.Prof. Samir El-Mougy  
Eng. Mai Mohamed

# AGENDA



- 1 Introduction**
- 2 Problem overview & Project Objectives**
- 3 Previous work (competitors' study)**
- 4 System Analysis & Architecture**
- 5 Technology and Tools**
- 6 Future Work**
- 7 Time plan**
- 8 Team Roles**
- 9 References**

# INTRODUCTION





**Your Green Guardian, Every Hour**

**"Bridging the Gap Between Traditional Farming and Smart Agriculture to Empower Farmers and Enhance Sustainability"**

# PROBLEM STATEMENT

**Farmers face challenges in:**

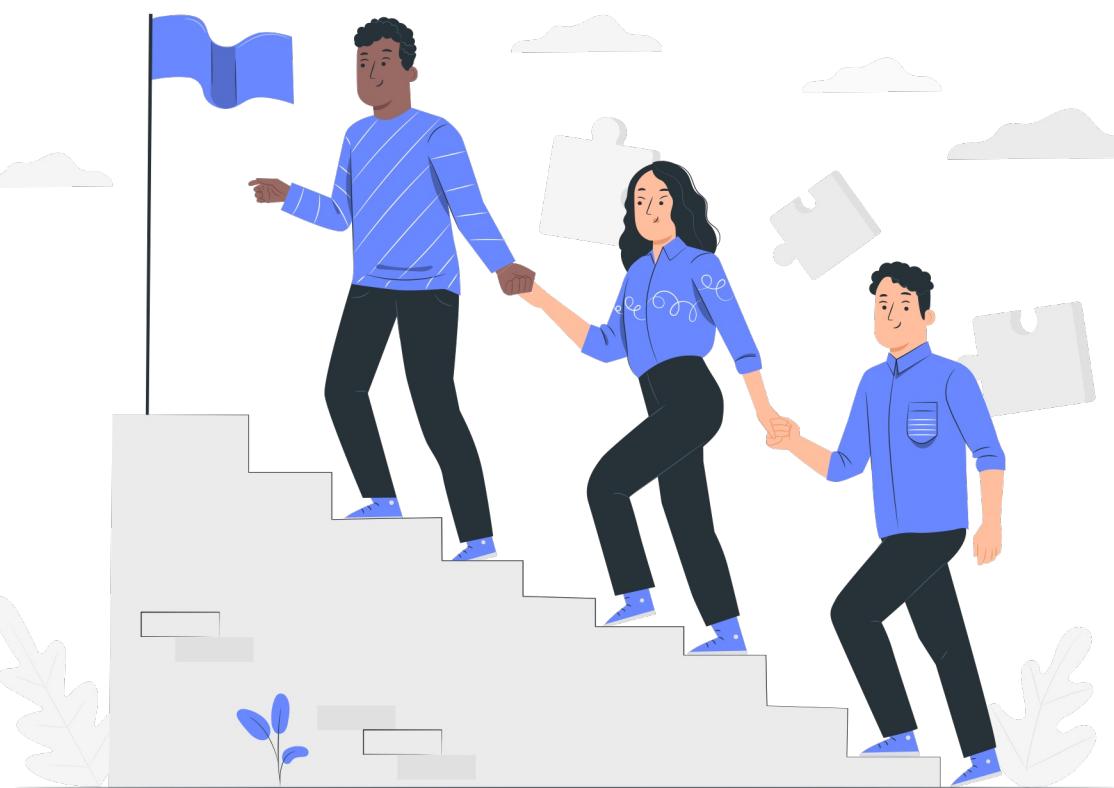
- Dealing with unpredictable climate and resource wastage
- Detecting crop diseases early and preventing yield loss
- Managing soil health and optimizing fertilizer use
- Reducing high operational costs and labor shortages
- Adopting sustainable farming practices amid water scarcity
- Accessing affordable and scalable precision farming solutions
- Integrating AI-driven insights into traditional farming methods



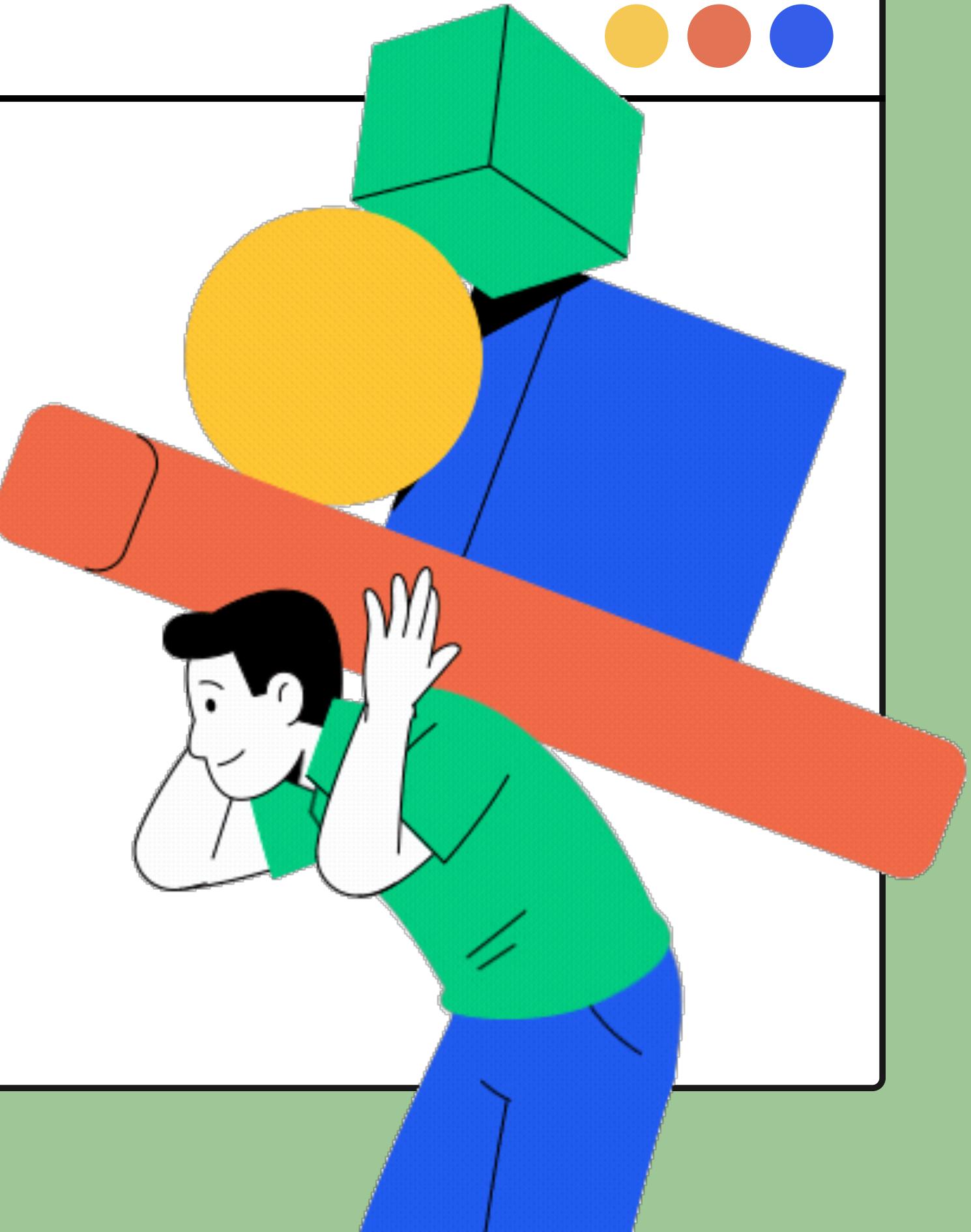
# PROJECT OBJECTIVES

We aim to bridge the gap between traditional farming and modern AI-driven precision agriculture. To achieve this, we are developing an AI-powered smart farming system that will:

- Enable farmers to monitor soil health, water levels, and crop conditions in real time.
- Provide early disease detection using AI-powered cameras to minimize yield loss.
- Automate pest and disease control, reducing chemical usage and increasing efficiency.
- Offer data-driven insights to help farmers optimize resource usage and improve productivity.
- Support sustainable agriculture by reducing water and fertilizer waste.



# RELATED WORK



# Plant Village

## Pros:

- 1. Research-Backed** – Developed with strong scientific backing.
- 2. Free Access** – Available for research purposes.
- 3. Good for Learning** – Helps researchers study plant health trends.

## Cons:

- 1. Limited Disease Detection** – Can only detect 5 diseases.
- 2. Not Commercially Available** – Primarily for research, not for mass adoption.
- 3. Requires Expertise** – Maintenance needs expert knowledge.
- 4. Scalability Issues** – Not designed for large expansions.

The screenshot shows the Plant Village website. At the top, there is a navigation bar with links for 'About' (which is highlighted in yellow), 'Team', 'Blog', 'Donate', 'PV 🌱', 'CETC IL', 'Contact us', and 'MORE'. On the far right, there are 'Profile' and 'SIGN IN' buttons. Below the navigation, a main message reads: 'We help smallholder farmers across Africa, Asia and the Americas adapt to climate change'. It also mentions 'Originated at PennState' and a link to 'Help us reach more farmers' with a 'Donate ❤️ & support farmers →' button. To the right of the text is a photograph of two women in a field, one wearing a pink shirt and a white hat, the other wearing a colorful headscarf, both looking at a smartphone.

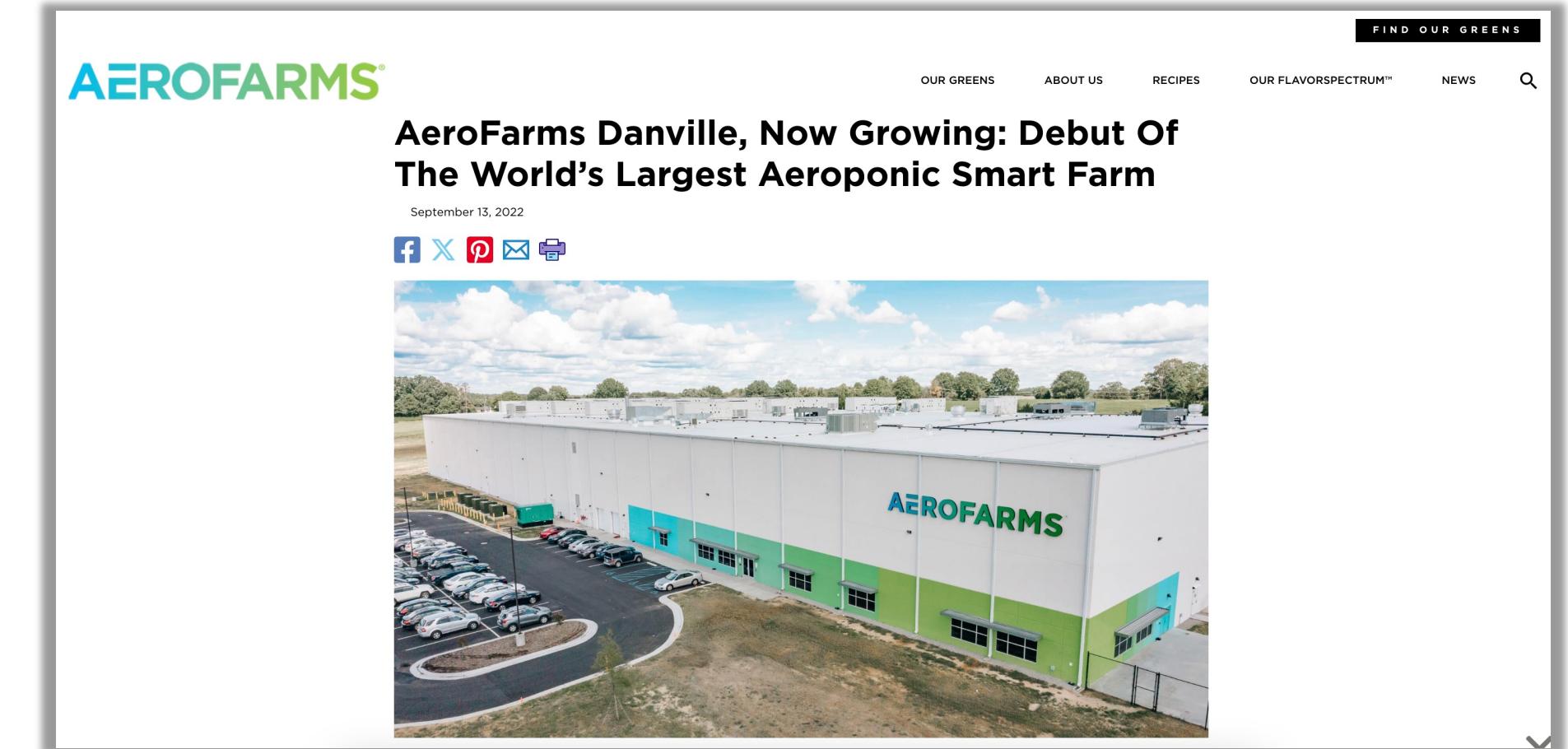
# Aero Farms Smart Farm

## Pros:

- 1. Real-Time Monitoring** – Provides instant insights for immediate action.
- 2. Enterprise-Level Scalability** – Can support large commercial farms.

## Cons:

- 1. High Cost** – Requires millions in investment, limiting accessibility.
- 2. Limited Disease Detection** – May rely on external testing.
- 3. Professional Maintenance Needed** – Requires a dedicated team for upkeep.

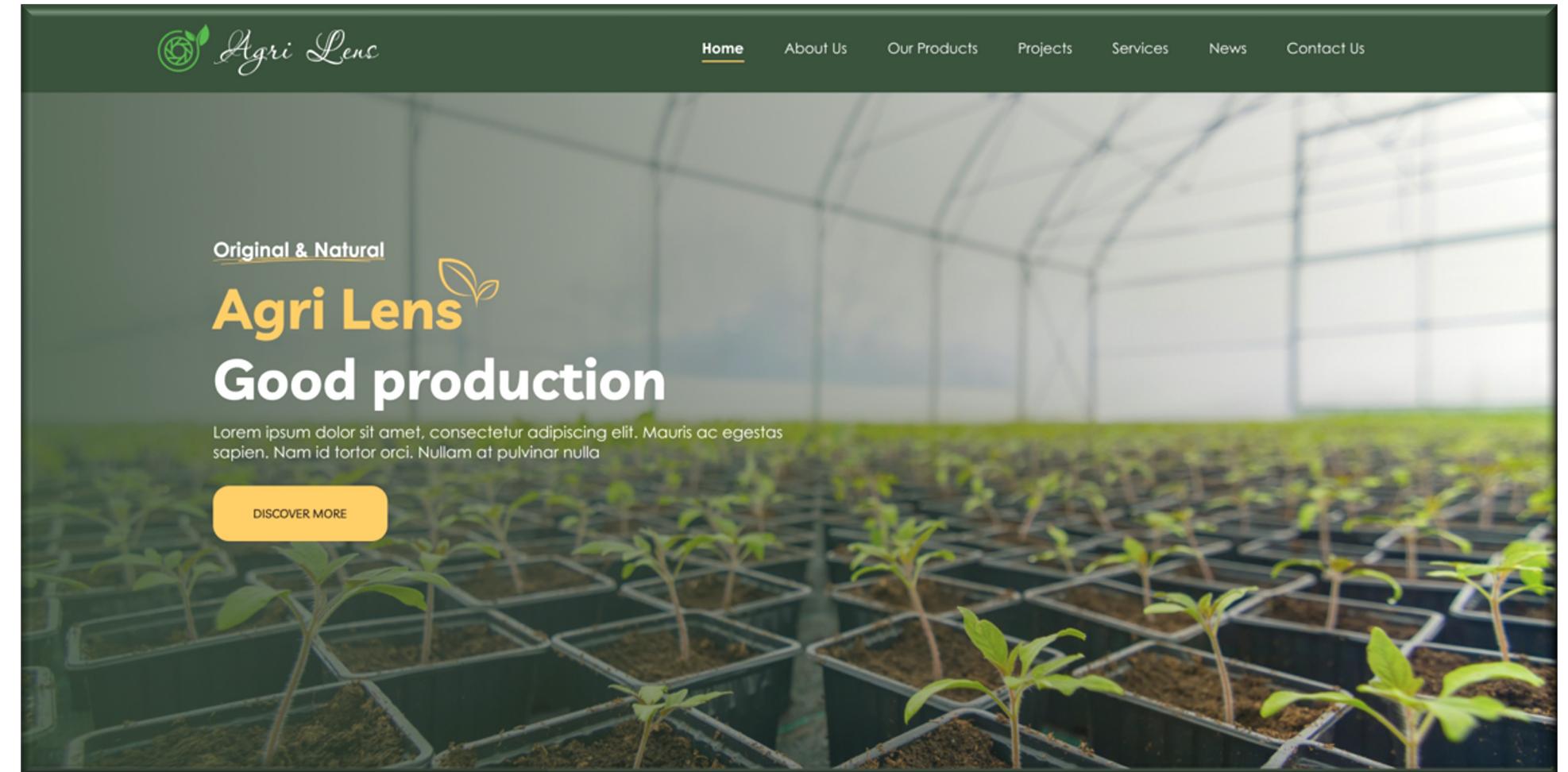


# Agri Lens

## Ex: Our System

### Pros:

- 1. Affordable** – Low cost (\$200-\$300), making it accessible to small farmers.
- 2. Frequent Monitoring** – Hourly updates provide real-time insights.
- 3. User-Friendly** – DIY-friendly maintenance allows farmers to make repairs.
- 4. Scalable** – Modular design supports flexible expansion.
- 5. Advanced Disease Detection** – Identifies 8+ diseases for early intervention.



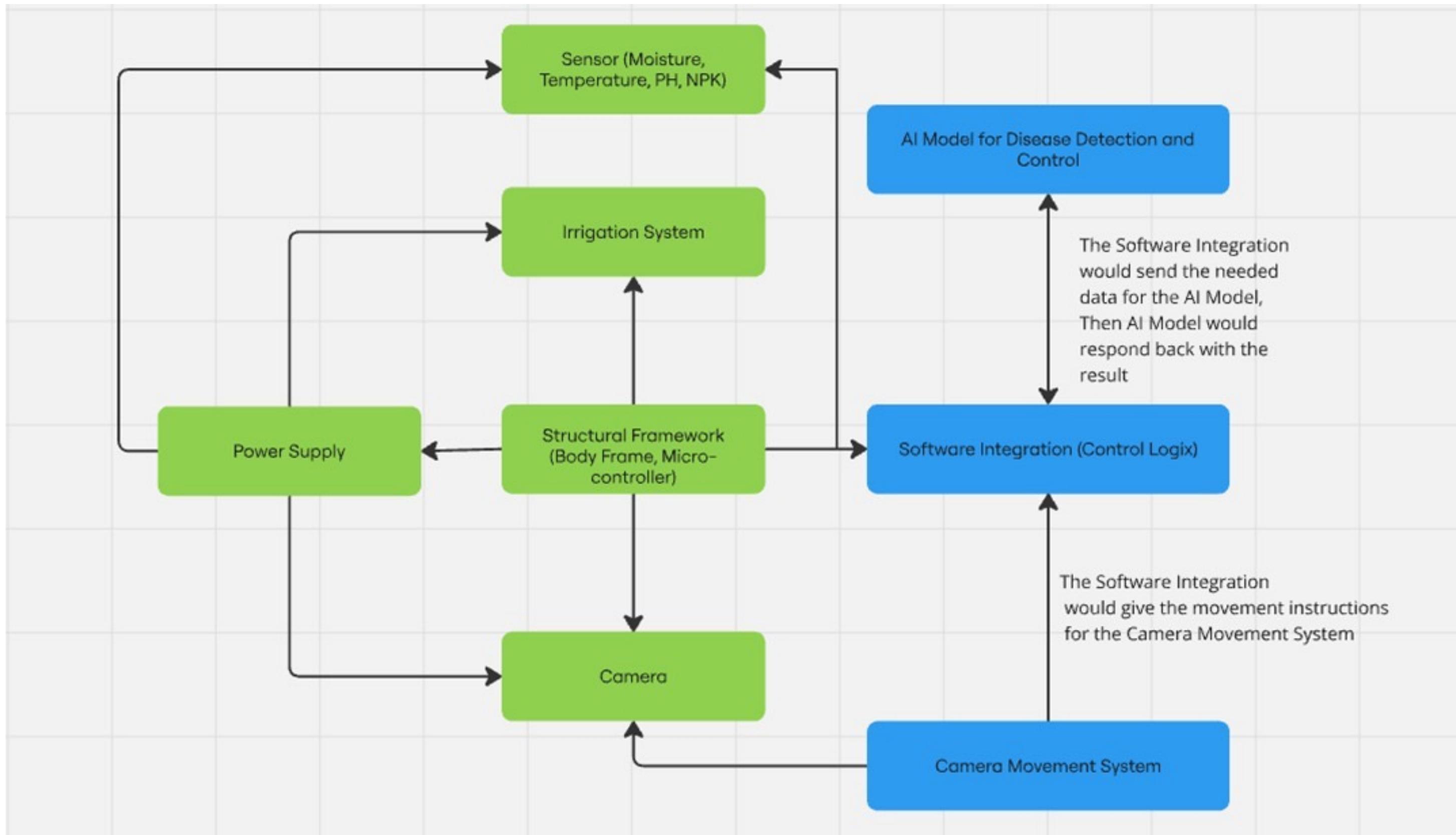
### Cons:

- 1. Limited to Small Farms** – May not meet the needs of large-scale commercial farms.
- 2. Manual Adjustments Needed** – Farmers may need to make occasional system tweaks.

# **SYSTEM ARCHITECTURE AND analysis**

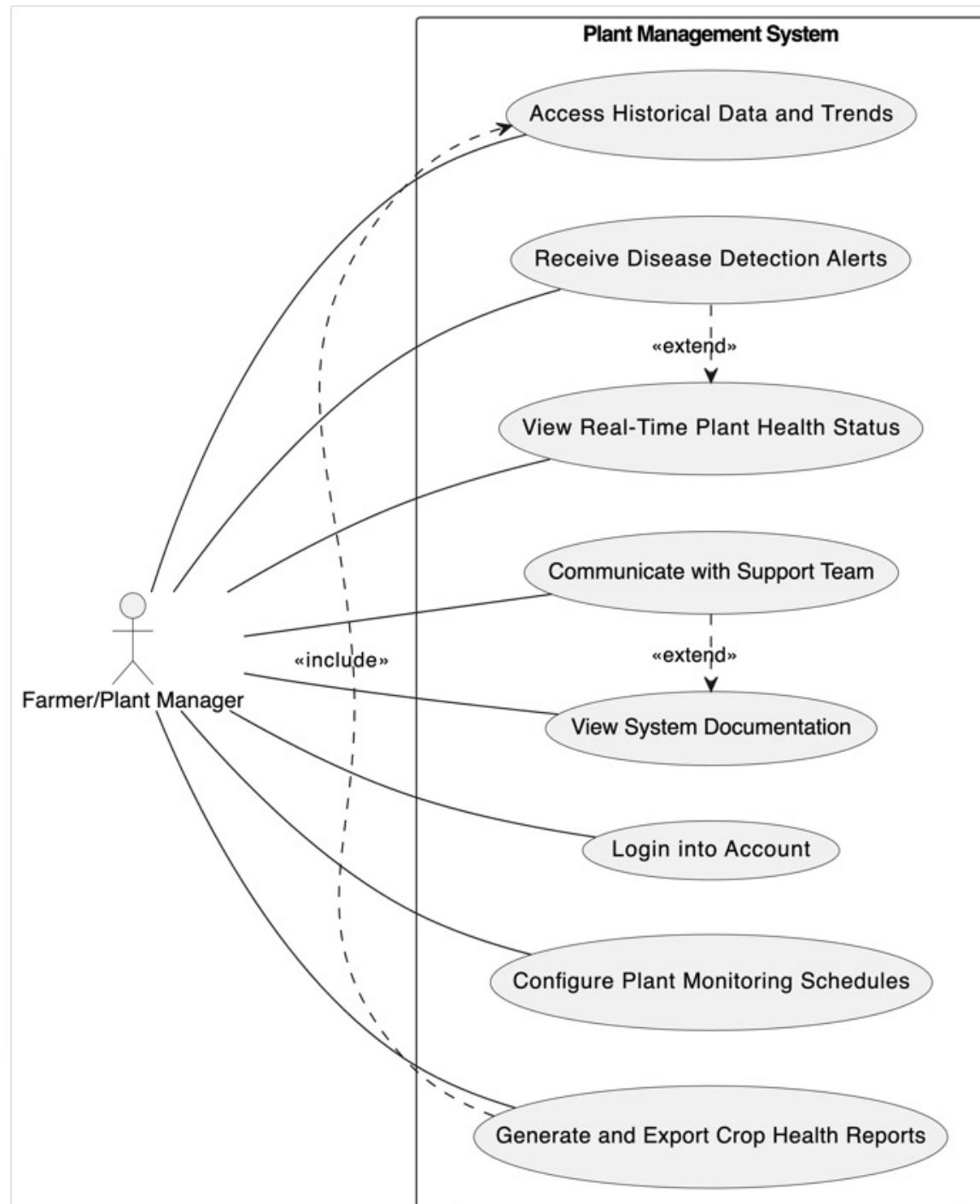


# System Architecture

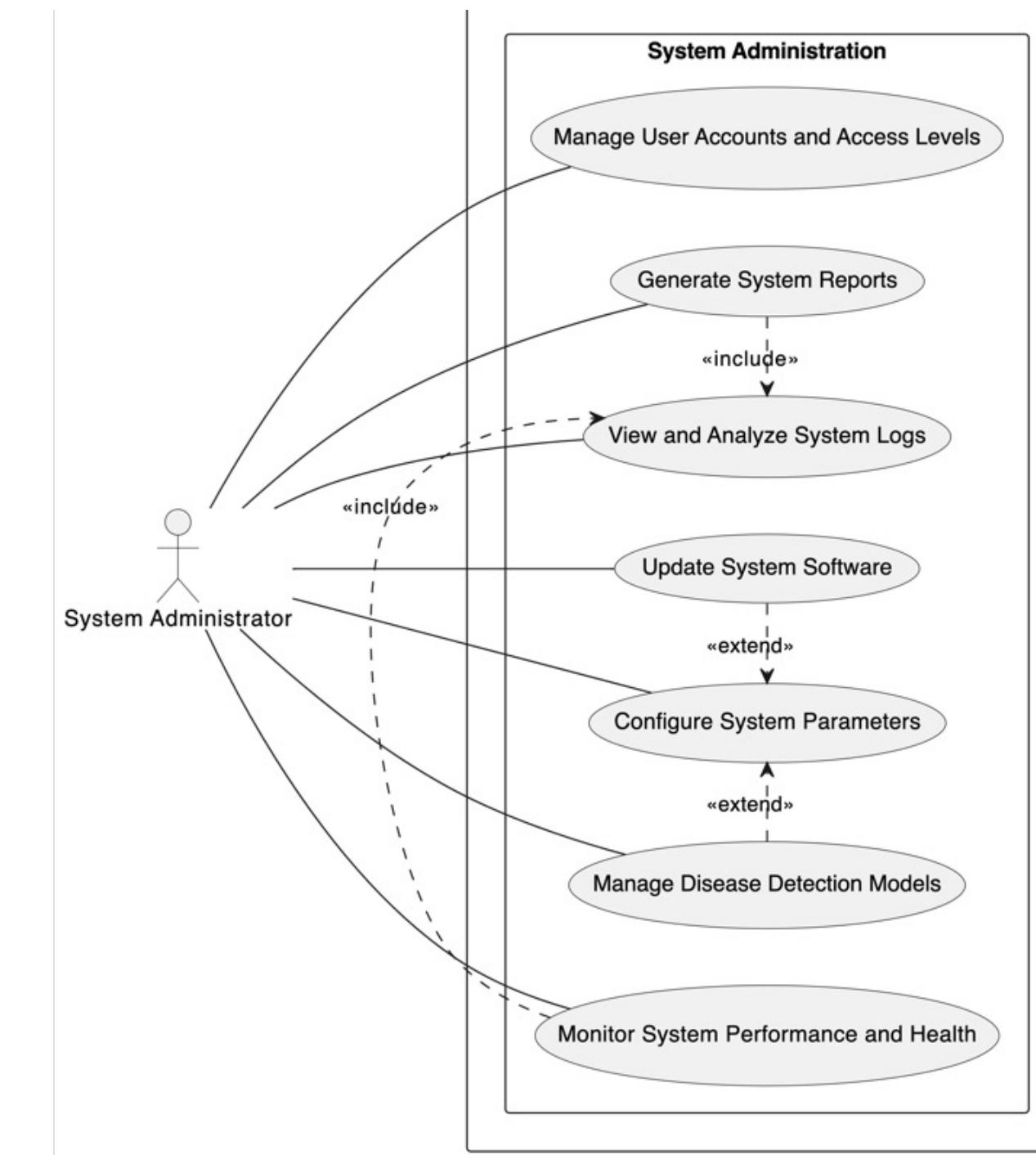


# Use case

## Farmer/Plant Manager

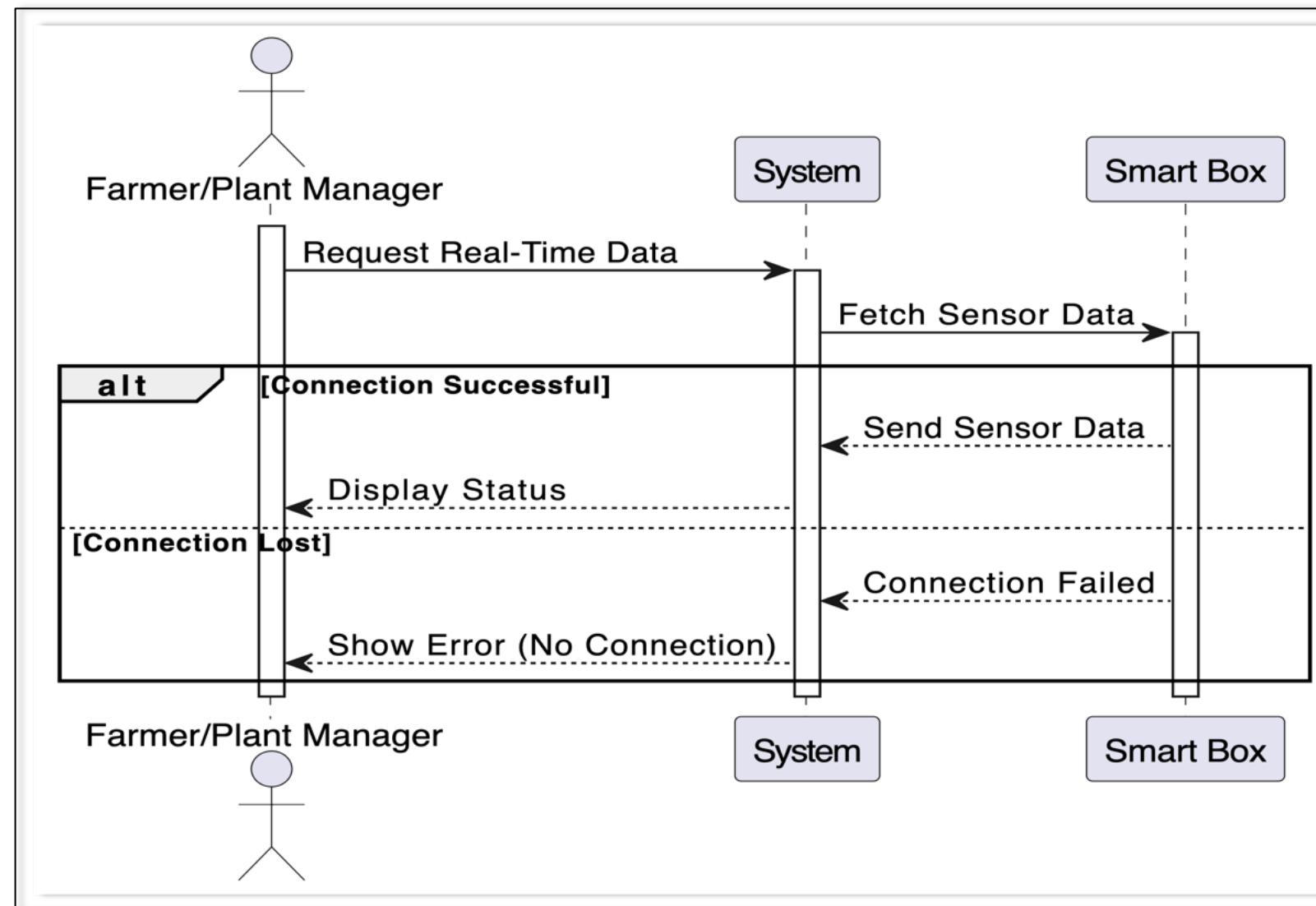


## System Administrator

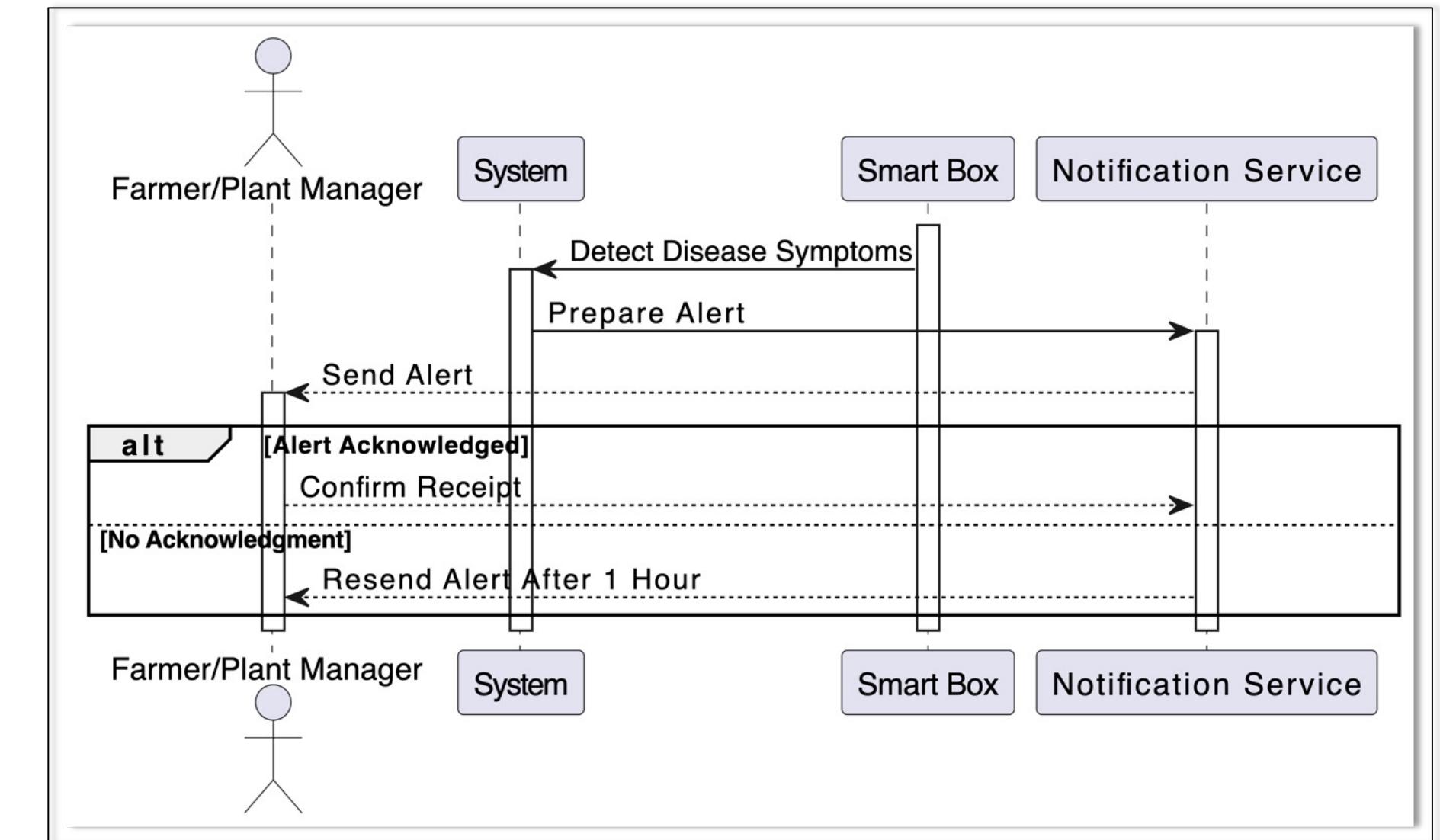


# Farmer/Plant Manager

**View Real-Time Plant Health Status:**

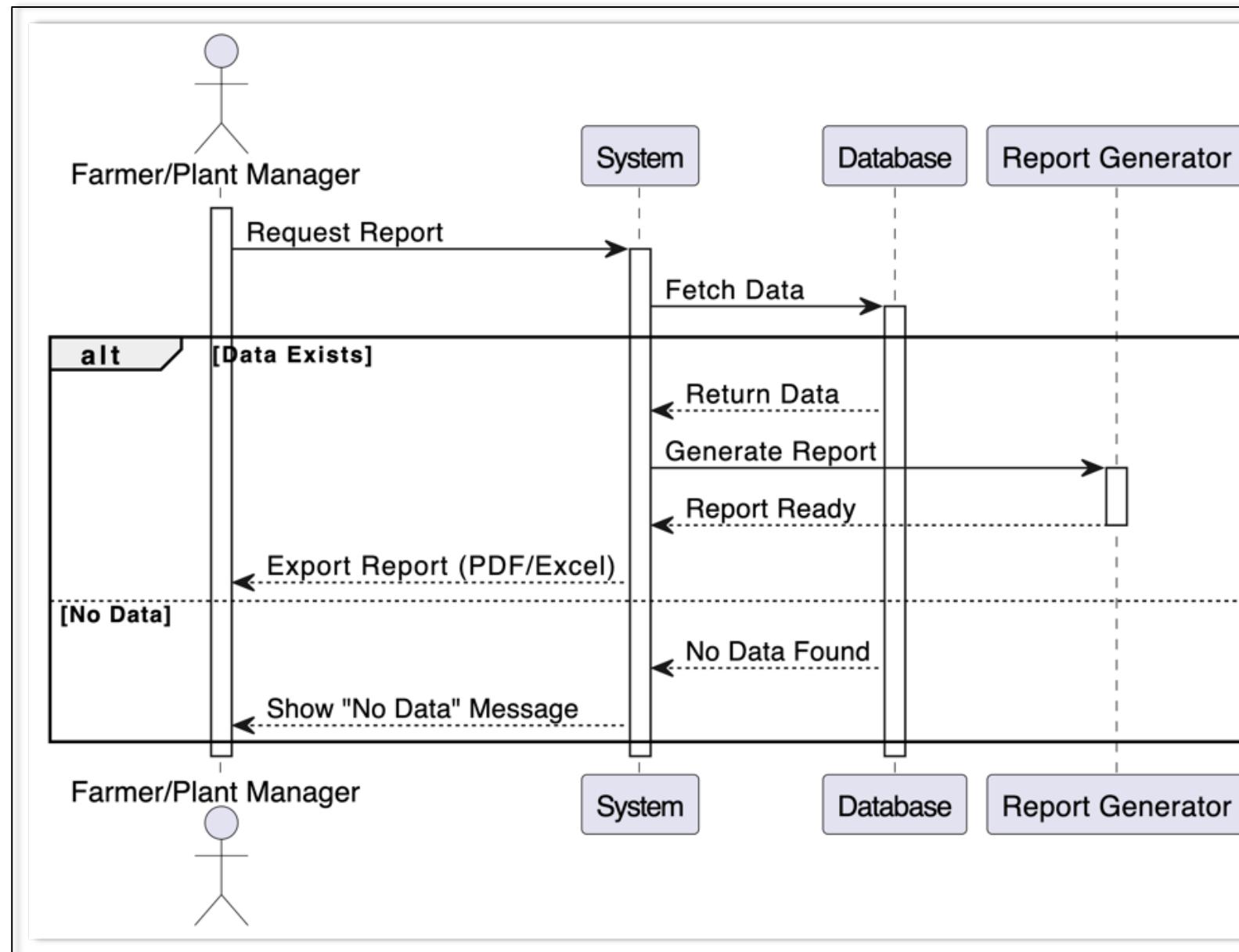


**Receive Disease Detection Alerts:**

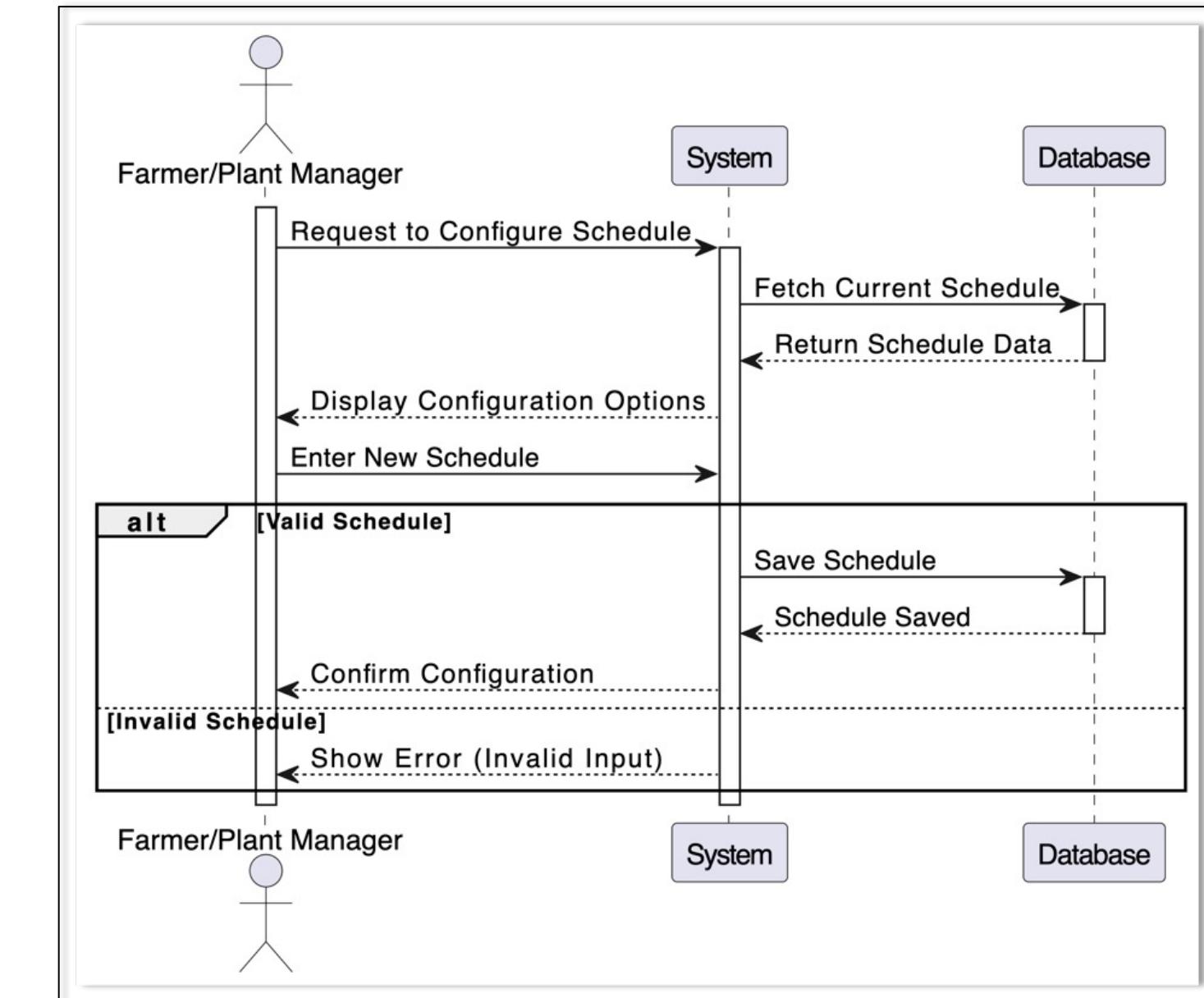


# Farmer/Plant Manager

## Generate and Export Crop Health Reports:

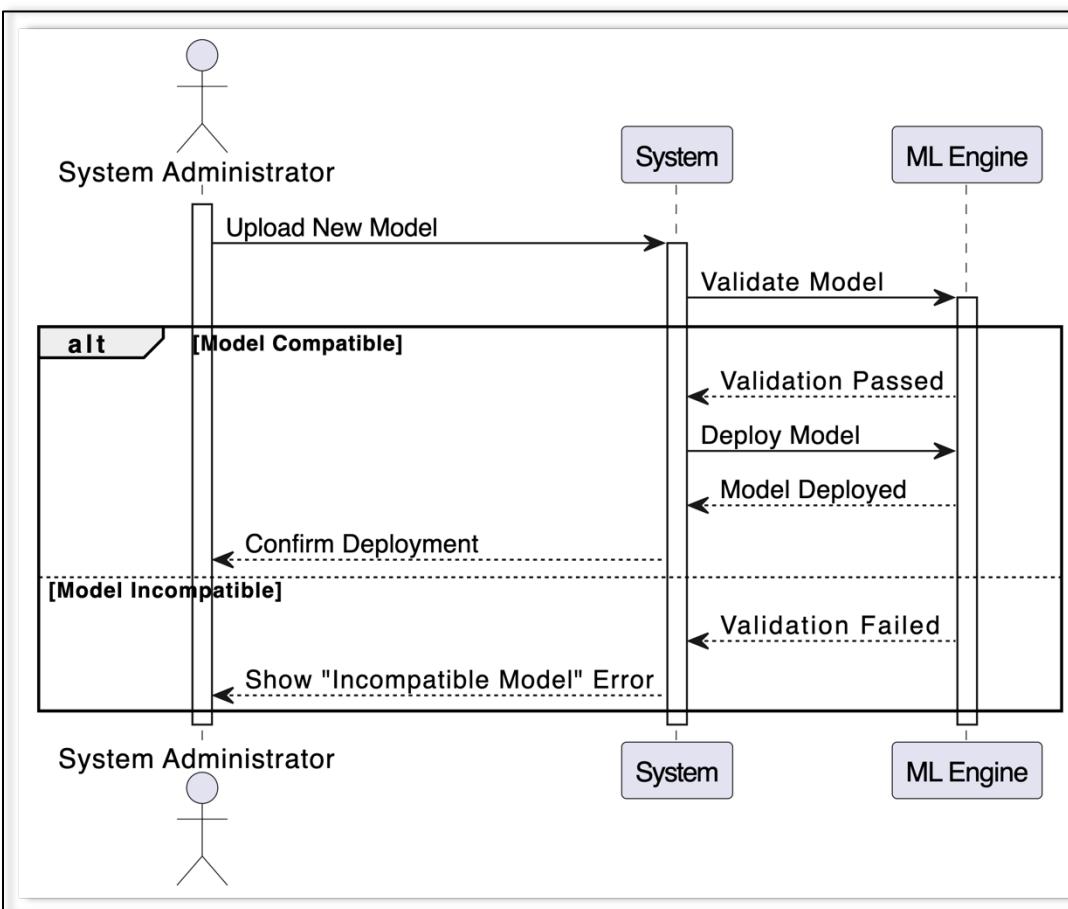


## Configure Plant Monitoring Schedules:

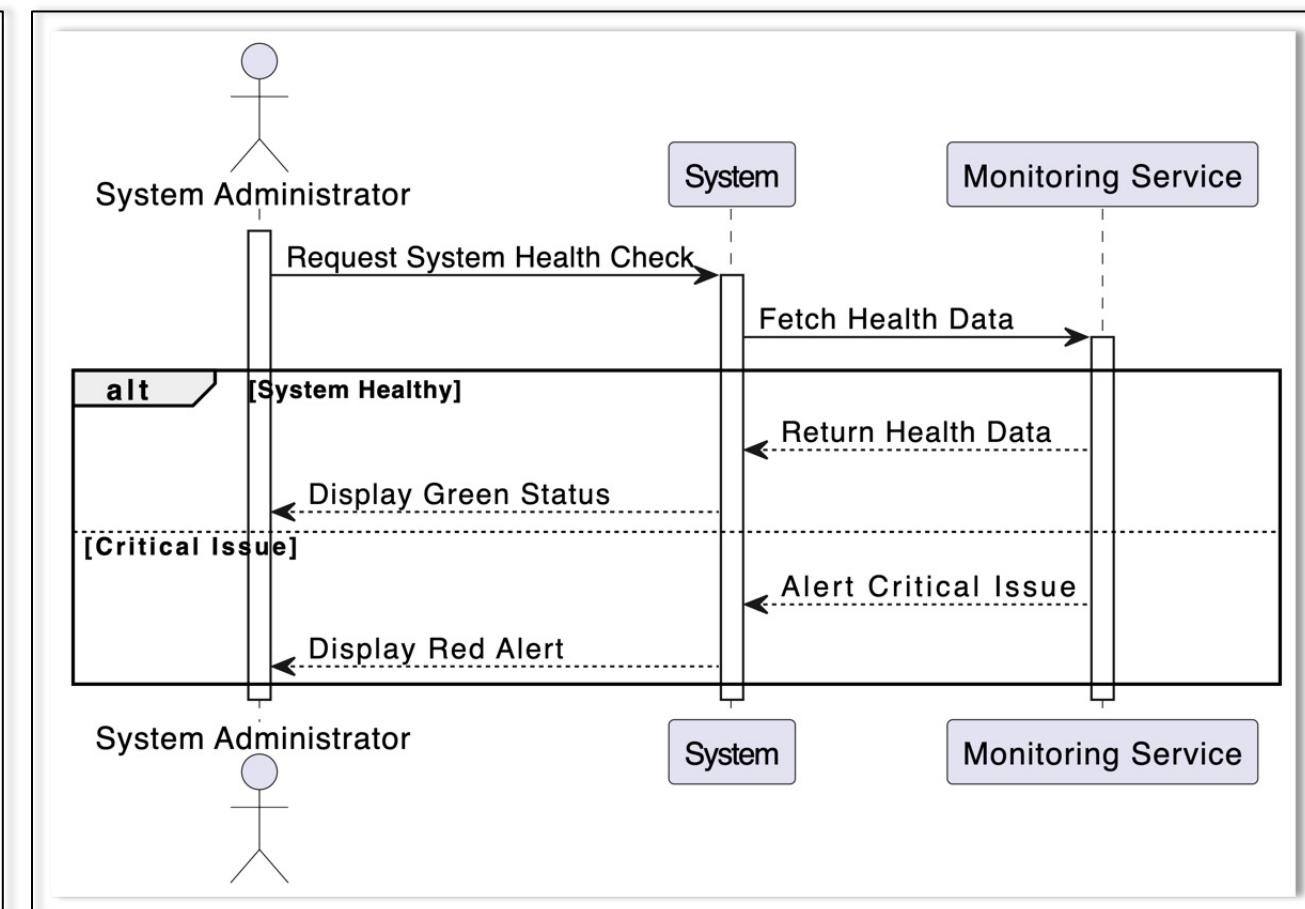


# System Administrator

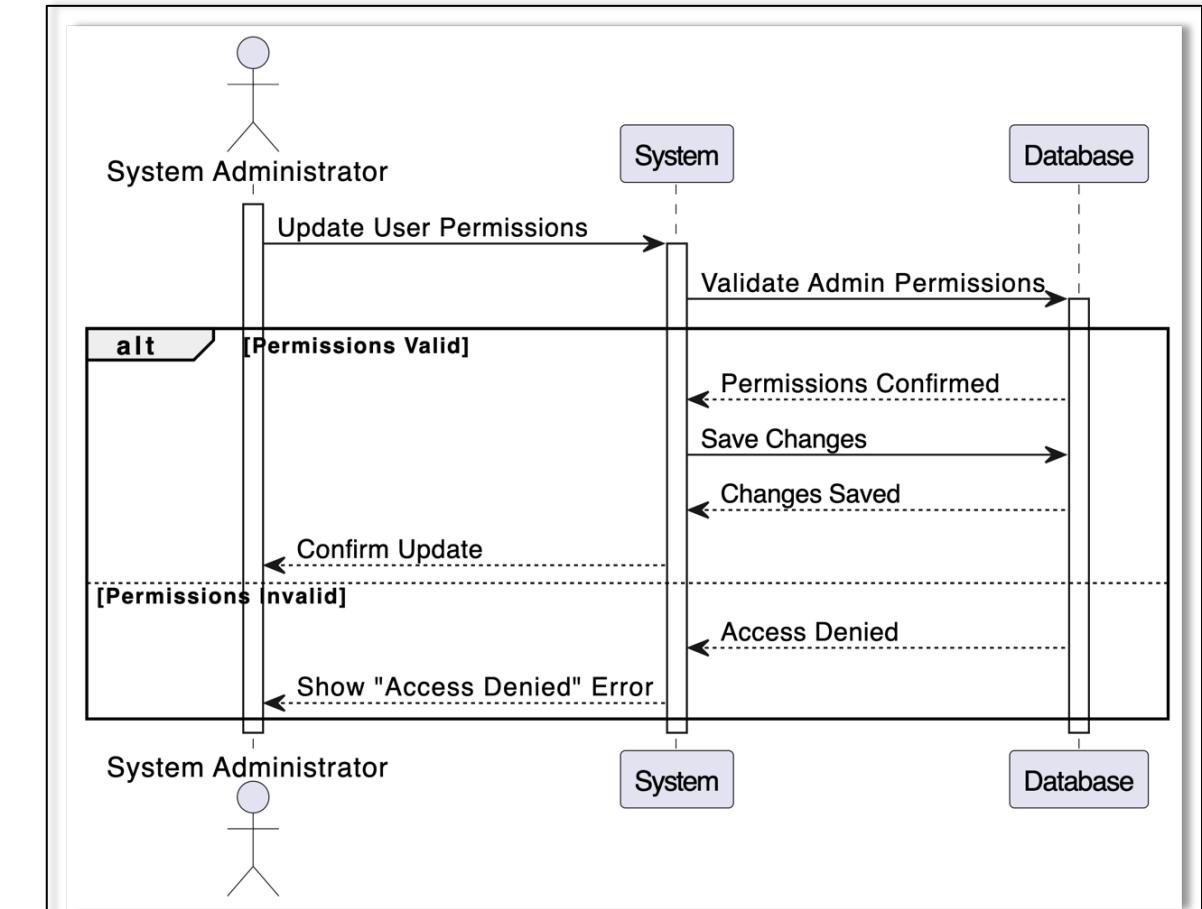
## Manage Disease Detection Models:



## Monitor System Performance and Health:



## Manage User Accounts and Access Levels:

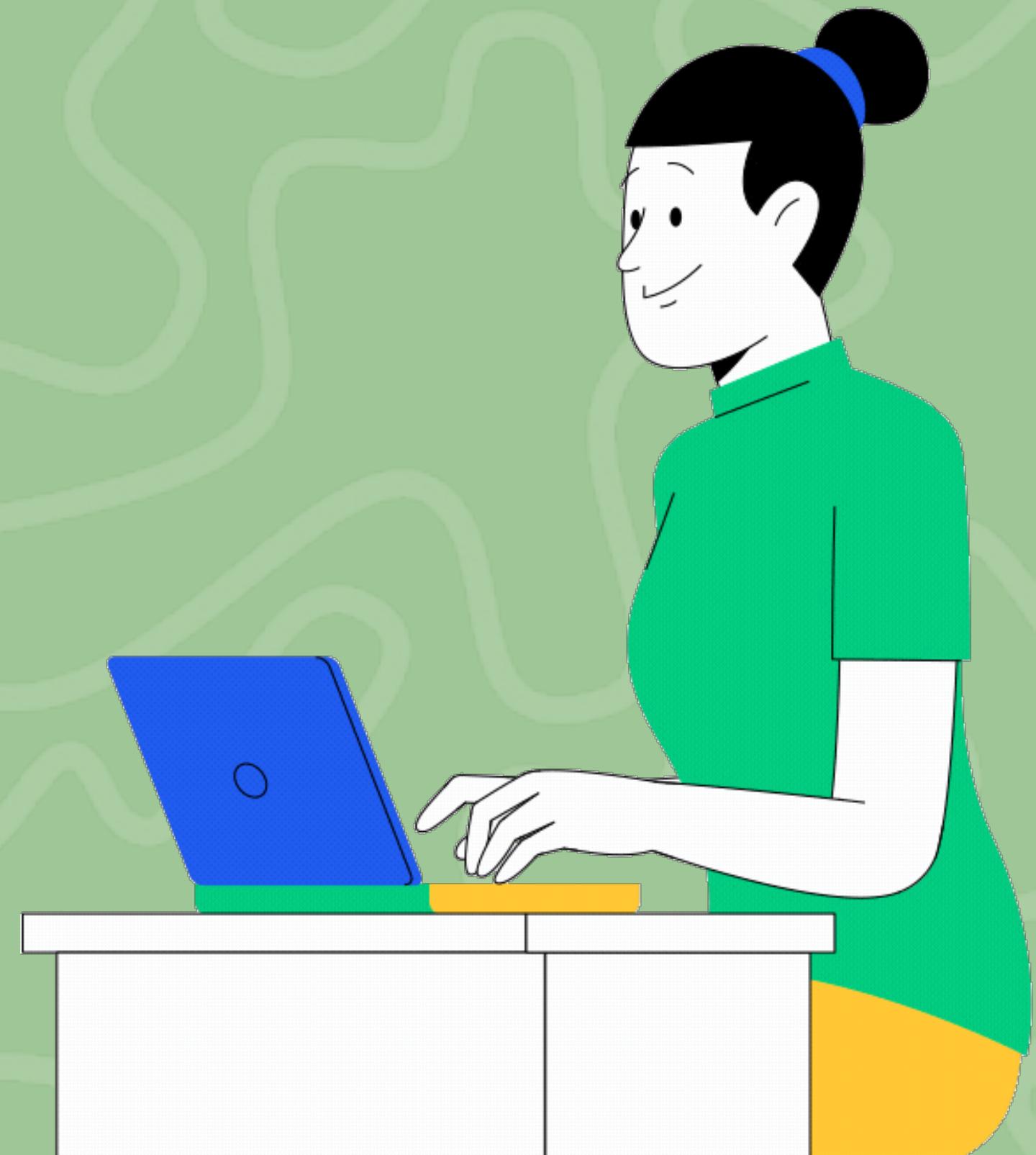




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# MAINUI



# Farmer/Plant Manager

## ● Home And plants

The app interface consists of two main screens:

**Home Screen (Left):**

- Top: "Hi, Mohamed" and user profile icon.
- Section: "My Farm" with a search bar.
- Section: "Your Plants Health" showing three plant status cards:
  - Floor 1 Cell 3: 45% (red circle)
  - Floor 1 Cell 5: 75% (yellow circle)
  - Floor 1 Cell 7: 45% (red circle)
- Section: "Floor 1" and "Floor 2" with placeholder text.
- Bottom: Navigation icons: Home, Timer, History (highlighted), Settings.

**All Plants Screen (Right):**

- Top: "All Plants" with a back arrow.
- List of plants across floors and cells:
  - Floor 1 Cell 3: 45% (red circle)
  - Floor 1 Cell 4: 75% (yellow circle)
  - Floor 1 Cell 8: 45% (red circle)
  - Floor 2 Cell 1: 45% (red circle)
  - Floor 2 Cell 7: 75% (yellow circle)
  - Floor 2 Cell 8: 45% (yellow circle)
- Bottom: Navigation icons: Home, Timer, History, Settings.

# Farmer/Plant Manager

## ● Plant Details & Timer

The image displays two screenshots of a mobile application for managing plants, likely for a greenhouse or farm.

**Left Screenshot (Plant Details):**

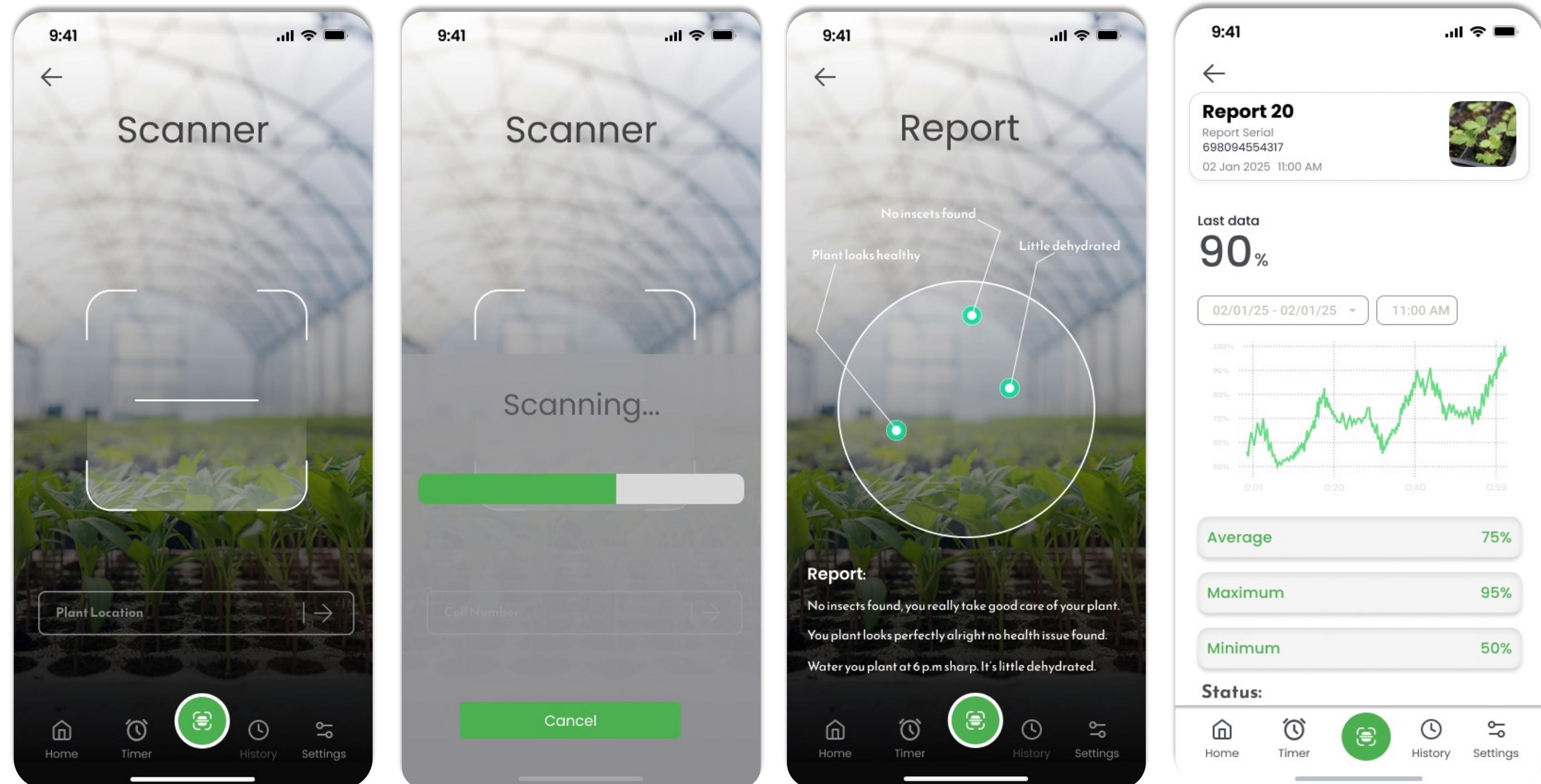
- Header: 9:41, Signal, Wi-Fi, Battery.
- Image: A close-up photo of a strawberry plant with white flowers and small red berries.
- Section: **Floor 1 Cell 3**
- Text: Health Percentage 45%
- Section: **Status:**  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Viverra condimentum eget purus in. Consectetur eget id morbi amet amet, in. Ipsum viverra pretium tellus neque. Ullamcorper suspendisse aenean leo pharetra in sit semper et. Amet quam placerat sem.
- Section: **Recommendation:**  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Viverra condimentum eget purus in. Consectetur eget id morbi amet amet, in. Ipsum viverra pretium tellus neque. Ullamcorper suspendisse aenean leo pharetra in sit semper et. Amet quam placerat sem.
- Bottom Navigation: Home, Timer, History (highlighted), Settings.

**Right Screenshot (Timer):**

- Header: 9:41, Signal, Wi-Fi, Battery.
- User Profile: Hi, Mohamed, My Farm, Search bar.
- Section: Your Plants Health >
- Image: Three small images of plants labeled Floor 1 Cell 3, Floor 1 Cell 5, and Floor 1 Cell 7, each with a circular overlay showing a percentage (45%, 75%, 45%) and a color-coded border (red for 45%, yellow for 75%).
- Section: Set time
- Time Input: H M  
00 59  
01 00  
02 01
- Buttons: Cancel, Save (highlighted).
- Bottom Navigation: Home, Timer, History (highlighted), Settings.

# Farmer/Plant Manager

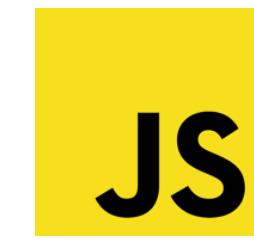
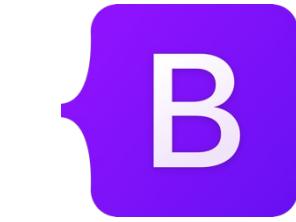
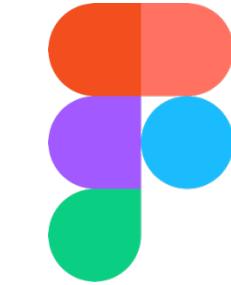
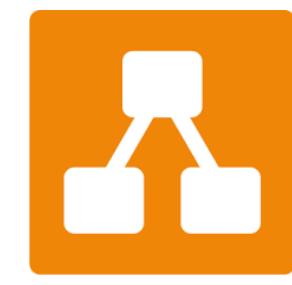
## ● Scanner & Report



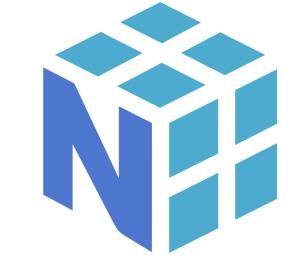
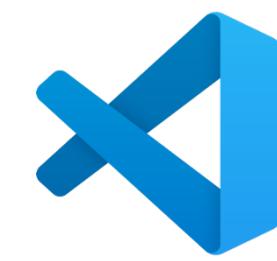
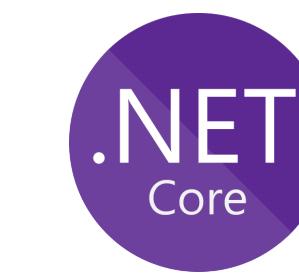
# BUSINESS MODEL

Key Partners	Key Resources	Value Propositions	Customer Relationships	Customer Segments
<b>Agricultural Research Institutions:</b> Collaboration for testing and validation of AI models.	<b>Intellectual Property &amp; Technology:</b> Proprietary AI algorithms, data analytics platforms, and patents for sensor integration. <b>Human Resources:</b> Data scientists, agronomists, hardware engineers, and customer support. <b>Physical Resources:</b> Manufacturing facilities, inventory, and field testing sites. <b>Financial Resources:</b> Funding from investors, revenue from sales and subscriptions. <b>Partnerships &amp; Networks:</b> Collaborations with research institutions, hardware suppliers, and governmental/NGO partners.	<b>Increased Productivity:</b> Early disease detection and real-time monitoring lead to higher yields. <b>Resource Efficiency:</b> Save up to 50% on water and fertilizer through data-driven insights. <b>Cost Reduction:</b> Reduce operational costs with AI-driven automation and decision-making. <b>Sustainability:</b> Promote environmentally friendly practices by reducing resource waste.	<b>Dedicated Account Managers:</b> Assigned to large-scale customers for personalized service. <b>Community Building:</b> Workshops and webinars for knowledge sharing. <b>24/7 Support:</b> Technical support hotline and chatbot for instant assistance.	<b>Small &amp; Medium-Scale Farmers:</b> Looking for affordable automation and decision-making solutions to increase yield and reduce resource waste. <b>Agribusinesses:</b> Seeking advanced analytics for precision farming and crop monitoring. <b>Governments &amp; NGOs:</b> Focused on sustainability and supporting agricultural development initiatives.
Cost Structure			Channels	Key Activities
<b>Manufacturing Costs:</b> Production of smart farming kits (approx. \$200/unit).	<b>Digital Infrastructure:</b> Cloud computing for AI analytics and secure customer data management.		<b>Direct Sales:</b> Through the company's website and local distributors.	<b>R&amp;D and Product Development:</b> Continuous improvement of AI models, sensor hardware, and decision-making algorithms.
<b>R&amp;D Costs:</b> AI model development and sensor technology enhancement.			<b>Partner Networks:</b> Government programs, NGO collaborations, and agricultural cooperatives.	<b>Pilot Projects &amp; Field Testing:</b> Collaboration with farmers to test and validate the solution under real-world conditions.
<b>Sales &amp; Marketing:</b> Advertising, farmer outreach, and awareness campaigns.			<b>Exhibitions &amp; Trade Shows:</b> Participation in agricultural expos to showcase the product.	
Customer Support:	Subscription Plans:	Revenue Streams	Consulting & Training Services:	Government & NGO Partnerships:
Maintenance services and training programs.	<b>Hardware Sales:</b> <ul style="list-style-type: none"><li>Sale of smart farming kits that include AI cameras and environmental sensors (NPK, temperature, humidity).</li><li><b>Pricing:</b> \$450 per unit with a manufacturing cost of \$200.</li></ul> <b>Subscription Plans:</b> <ul style="list-style-type: none"><li>AI-powered analytics for crop disease detection, soil monitoring, and precision farming recommendations.</li><li><b>Pricing:</b> Monthly or annual plans based on the number of sensors and farm size (e.g., \$15/month per farm).</li></ul>		<ul style="list-style-type: none"><li>Expert consultancy for farmers on adopting smart agriculture techniques.</li><li>Training workshops on hardware setup, data analytics, and AI-driven decision-making.</li></ul>	<ul style="list-style-type: none"><li>Large-scale contracts for deploying smart farming solutions to promote sustainable agriculture.</li><li>Collaboration on pilot projects aimed at supporting small and medium-scale farmers.</li></ul>

# TECHNOLOGY AND TOOLS



Dart



# FUTURE WORK



- Enhanced AI & Machine Learning Integration.
- Advanced IoT & Sensor Integration.
- Mobile & Web App Enhancements.
- Improve UI/UX for better farmer accessibility.
- Integration with Government & Agricultural Agencies
- Expansion of Data Analytics & Visualization.
- Implement solar-powered IoT sensors and devices.
- Introduce AI chatbots for farming-related queries.
- Add Maintenance Person as a actor for the system.
- Add plants and their diseases



# REFERENCES

- **Academic Papers & Research:**
  - [An Instance Segmentation Model for Strawberry Diseases Based on Mask R-CNN](#)
- **Existing Platforms & Projects:**
  - [PlantVillage](#)
  - [AeroFarms](#)
- **AI Assistance and Technical Support:**
  - [ChatGPT](#)

# Acknowledgments

- **Professors and Engineers Who Helped Us**
- Professor at the College of Agriculture
- Agricultural Engineers
- Mechatronics Engineers

# CONCLUSION

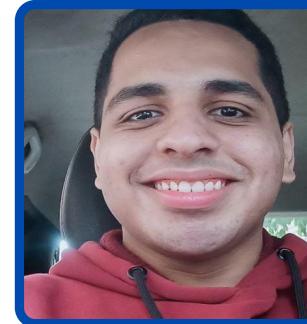


Agri Lens ,Our project revolutionizes agriculture by integrating AI, real-time monitoring, and automation to enhance efficiency, sustainability, and productivity. By empowering farmers with data-driven insights and smart solutions, we bridge the gap between technology and traditional farming, ensuring optimized resource usage and improved crop yields. This innovation paves the way for a more resilient and food-secure future. A stylized graphic featuring a green rice plant with yellow grains and a red rocket ship with a blue flame, positioned next to the text.

# TEAM



**Ibrahim Hegazi**  
AI developer



**Basel Mohamed**  
Flutter



**Ahmed Osama**  
Back-End



**Ibrahim Mohamed**  
Front-End



**Abdelaleem Mohamed**  
Business Analyst



**Mohamed Tharwat**  
UI/UX



**Zeyad Emad**  
Front-End



**Ibrahim Saber**  
Back-End

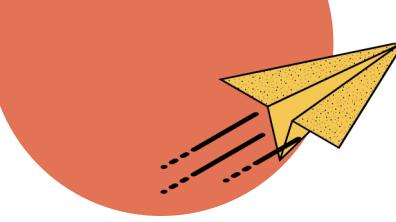


**Ahmed Ashraf**  
Flutter



**Ahmed Khalaf**  
AI developer





# Agri Lens

**THANK  
YOU!**





**Your Green Guardian, Every Hour**