

**Capstone Project Report**

**Report 1 – Project Introduction**

– Hồ Chí Minh, February 2025 –

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# I. Record of Changes

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| Date | A\* M, D | In charge | Change Description |
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\*A - Added M - Modified D - Deleted

# II. Project Introduction

## 1. Overview

### 1.1 Project Information

* Project name: IPAS – Intelligent Pomelo AgriSolutions for pomelo farm management
* Project code: SP25SE070
* Group name: GSP25SE55
* Software type: Web and Mobile App

### 1.2 Project Team

|  |  |  |  |
| --- | --- | --- | --- |
| **Full Name** | **Role** | **Email** | **Mobile** |
| Lê Nguyễn Sơn Vũ | Lecturer | vulns@fe.edu.vn | 0916423938 |
| Bùi Thế Tâm | Leader | tambtse171869@fpt.edu.vn | 0961239341 |
| Huỳnh Phước Tấn | Member | tanhpse173453@fpt.edu.vn | 0947652131 |
| Lê Quang Dũng | Member | dunglqse171858@fpt.edu.vn | 0961287613 |
| Lưu Ái Giao | Member | giaolase172586@fpt.edu.vn | 0847514323 |

## 2. Product Background

In the process of managing and operating a farm, the lack of a centralized, accurate, and timely information system has made it difficult for farmers to optimize agricultural activities. Many farm owners still rely on manual tracking and fragmented management tools, making it challenging to efficiently monitor farm plots, track plant health, and make informed decisions.

Farmers often struggle with keeping detailed records of their crops, including plant status, seasonal planning, and estimated yields. Decision-making related to irrigation, fertilization, and pest control is often reactive rather than proactive due to the lack of integrated climate and environmental data. Additionally, the assignment and tracking of farm tasks remain inconsistent, leading to inefficiencies and delays in operations.

Without a structured approach to farm management, many agricultural activities are hindered by miscommunication, untimely interventions, and the inability to adapt quickly to changing conditions. These challenges highlight the need for a modern solution that enhances operational efficiency and supports data-driven decision-making.

Recognizing these issues, Intelligent Pomelo AgriSolutions (IPAS) was conceived as a response to the growing demand for a smarter, more efficient approach to farm management. By addressing the limitations of traditional methods, IPAS aims to empower pomelo farmers with the tools and insights needed to improve productivity, sustainability, and overall farm performance.

## 3. Existing Systems

### 3.1 Croptracker

* **Description:** Croptracker is a comprehensive farm management software designed specifically for fruit and vegetable growers. Established in 2006, it offers tools to digitize farm records, enhance traceability, and facilitate compliance with food safety regulations.
* **Link:** <https://www.croptracker.com/>
* **System Actors:** Primarily used by fruit and vegetable growers, including farm managers, field workers, and packing staff.
* **Features**
* Digital record-keeping for various farm activities.
* Traceability from seed to sale, aiding in food safety compliance.
* Modules for spray records, harvest tracking, production practices, and labor management.
* **Pros**
* Enhances traceability, which is crucial for food safety audits.
* Comprehensive modules covering various aspects of farm management.
* User-friendly interface with a focus on produce growers.
* **Cons**
* May require time to fully implement and train staff.
* Primarily tailored for fruit and vegetable farms, which might limit its applicability to other types of agriculture.

### 3.2 Farmbrite

* **Description:** Farmbrite is an all-in-one online farm and ranch management software designed to help farmers manage their day-to-day operations from a central location. It provides tools for measuring farm profits, tracking expenses, monitoring crop production, and keeping detailed animal records.
* **Link:** <https://www.farmbrite.com/>
* **System Actors:** Suitable for a wide range of farmers, including those involved in crop production and livestock management.
* **Features**
* Financial management tools to track profits and expenses.
* Crop management features, including planting schedules and harvest records.
* Livestock record-keeping for breeding, health, and production.
* **Pros**
* Comprehensive features that cater to both crop and livestock farmers.
* User-friendly interface with customizable options.
* Positive user reviews highlighting its effectiveness in simplifying farm management.
* **Cons**
* Some users may find certain features complex and may require time to learn.

## 4. Business Opportunity

The agricultural industry is embracing digital tools, but many pomelo farms still struggle with managing large-scale operations efficiently. Traditional farming methods and fragmented systems lead to challenges in tracking land plots, assigning tasks, and making informed decisions. Existing solutions, like Croptracker and Farmbrite, lack a comprehensive, integrated approach, especially for tasks such as land plot visualization, task automation, and AI-powered crop care.

IPAS (Intelligent Pomelo AgriSolutions) solves these problems by offering a comprehensive platform that combines AI-driven crop monitoring, real-time weather integration, automatic task assignment, and interactive farm mapping. This platform allows farm owners to create visual maps of their land plots, monitor crop status in real time, and receive AI-powered advice tailored to each crop’s needs. Additionally, the system automates task management, ensuring that farm employees are assigned timely tasks based on weather conditions and crop requirements.

As the demand for smart farming grows, IPAS provides a scalable, cost-effective solution that helps pomelo farms optimize land management, improve task efficiency, and make informed, data-driven decisions. By integrating multiple technologies into one platform, IPAS supports precision agriculture and sustainable farming practices, making it a valuable tool for improving productivity and farm management efficiency.

## 5. Software Product Vision

For pomelo farm owners and managers looking to optimize farm operations and crop management, IPAS - Intelligent Pomelo AgriSolutions is an all-in-one digital platform that combines AI-driven crop care recommendations, real-time weather integration, task automation, and interactive farm mapping. This platform allows users to streamline farm management, improve productivity, and make data-driven decisions that enhance both crop health and operational efficiency. Unlike traditional methods and fragmented tools, IPAS offers a comprehensive, easy-to-use solution tailored to the needs of modern, tech-savvy farmers, helping them meet the growing demand for sustainable and precision farming. By integrating cutting-edge technologies, IPAS empowers farm owners to manage their resources efficiently, adapt to environmental challenges, ultimately contributing to smarter farming and higher yields.

## 6. Project Scope & Limitations

### 6.1 Major Features

**FE-01:** **Farm Plot Management**:

Users can create and manage visual maps of farm plots, including adding, deleting, and editing the dimensions and crop information for each plot.

**FE-02: AI-powered Crop Care**:

The platform offers real-time, AI-driven consulting and crop health monitoring. The AI provides recommendations on optimal irrigation, fertilization, and pest control based on environmental conditions, while also using image recognition to analyze crop photos, detect pests or diseases, and offer tailored treatment recommendations.

**FE-03: Task Automation, Care Plan Creation & Assignment**:

Upon the creation of a care plan, the system will automatically generate worklogs for tasks based on the defined crop care schedules and weather conditions. Tasks will be assigned to employees, and their progress will be monitored, including updates on the status of completed tasks and reporting any anomalies.

**FE-04: Weather Integration**:

The system integrates real-time weather data to help farm owners make informed decisions about irrigation, fertilization, and pest control.

**FE-05: Plant Propagation**:

The system allows users to manage and track the propagation of plants through cutting, including recording the details of each propagated plant.

**FE-06: Harvest Management**:

The system tracks harvested crops, categorizing them into different grades recording quantities and customer information for each order, without e-commerce transactions.

**FE-07: Package-Based Access Control**:

Users can access platform features based on their subscription packages.

**Ảnh có chứa ảnh chụp màn hình

Nội dung do AI tạo ra có thể không chính xác.**

### 6.2 Limitations & Exclusions

**LI-1: Geographical Limitations**: Initially, the platform will be designed for pomelo farms, with plans for future expansion to other crops.

**LI-2: Data and Hardware Integration**: Initial release will have limited integration with external systems and devices (IoT), with future updates potentially expanding support.

**LI-3: Warehouse Management**: The platform will not focus on warehouse management and inventory systems for the initial release.