**Executive Summary**

*This section should include a brief overview of the project, highlight key project performance ratings and highlights, summarize the key lessons learned, and next steps or remaining actions.*

**Letter of transmittal**

July, 20th, 2021

Nguyen Vi Khang

Smart Agriculture Team.

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CEO

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Dear Mr. Hoang:

Within the attached report and document, you will find information about SmartAgri application and its components.

This document is a summary of the Smart Agriculture application, a project that helps the farmers to obtain better information about their farms and market states. Using mobile applications as our main platform, we aim for a large number of farmers to join the Smart Agriculture network to strengthen the Vietnamese farmers community. The attached documents detail how our application works and its efficiency. Such advancements that our application provides will help increase the quality of agricultural products in Vietnam.

Thank you for reading this letter. We appreciate your consideration and look forward to working with you. Please review the official report and documents and respond with your thoughts.

Sincerely,

Nguyen Vi Khang

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# A. Project introduction

## I. Problems

The area of arable land for agriculture is gradually shrinking.

Climate change creates natural disasters and develops epidemics.

The increasing demand of consumers for the quality of harvested products.

Competition from foreign enterprises.

Few smart agriculture products.

## II. Proposed solution and goals

Create an automatic farming digital tool that gives the most appropriate control activities for cultivation, to lighten the burden on farmers and optimize productivity and yields.

Smart Agri - a hybrid app for farmers to control their agricultural works as well as their productivity. Aim to help the farmers grow agricultural products with high productivity, controllability, and quality assurance according to the wishes of farmers and market demand. With accurate data analysis, Smart Agri evaluates environmental indicators and gives the appropriate activities for the best cultivation.

# B. Project scope

## I. Goals

Very few smart agricultural products can help farmers grow hydroponic plants, monitor irrigation, control themselves overtime → optimize productivity and yields.

Agricultural technology products with low prices → wide range of customers.

Industrialization of agricultural technology → synchronizing products.

Farmers need not spend a significant amount of time acquiring farm data.

Farmers have access to more accurate natural disaster alerts and weather information.

## II. Deliverables

Dolphin Team expect to create a technical blueprint of the app's functions such as:

Allow the user to keep an eye on their farm by showing weather states, temperature, moisture,...

Collects data about the farm, market demands and other elements and analyzes them for the farmers' needs.

Warns the farmers if there are any threats such as storms, droughts, insect seasonality,....

Allows the user to input their own data about their farm, so that the app can give better advice to them.

The output of this project will include the technical design paper, UI/UX design and prototyping of Smart Agri.

## III. Exclusions

The Dolphin team will not perform the program implementation (outsource) directly, it will be technical implementation by a third-party service, Dolphin owns the copyright on Trademark, Industrial Design, Layout Diagram, Integrated Circuit Layout. And the commercial part of the product will be done by a team of dolphin partners.

## IV. Constraints

* Project's budget
* Project's timeline
* Human resources  
  ​- Manpower: 5 members of group Dolphins  
  ​- Source of data for research: Google, books

## V. Assumption of risk

During project analysis and development, we can face risks:

The practical condition may be falsification of data.

Resources, such as tools or machines, can be controlled by other signals for unwanted purposes.

Equipment can be destroyed by wrong management of devices.

Third-party risks may also arise if IoT data needs to be shared between the enterprise and external service providers.

Security teams need to be able to see which endpoints are present at an IP address and then detect specific information about the device, such as where it was manufactured, its model and serial number, and what version of firmware it runs.

# C. Project implementation

## I. Personnel lineup:

* Đăng Lộc - Project manager
* Phước Tùng - Product manager, Strategist
* Vĩ Khang - Technical Architecture
* Thanh Hải - Tester, QA Specialist
* Thu Trang - Business Analyst, Financial Manager

**Keywords:** Productive, Popular, Pleasant

Smart Agri - a hybrid app for farmers to control their agricultural works as well as their productivity.

Research report

Trong quá trình làm việc, cả nhóm luôn có những ý tưởng mới mẻ và khác lạ cho ứng dụng Smart Agriculture. Vì tiềm năng của ngành nông nghiệp sử dụng công nghệ cao vô cùng lớn, nên lượng ý kiến mà các thành viên đưa ra luôn rất đa dạng về nhiều mặt khác nhau. Vì để tiếp cận nông nghiệp thông minh, mỗi thành viên đều đi tìm những biện pháp hiện nay đang được sử dụng ở trong nước và nước ngoài. Ví dụ như, áp dụng những thiết bị công nghệ cao, sử dụng database và kết hợp với AI để đưa ra những phân tích chuẩn xác, hay sử dụng nhà kính làm môi trường trồng trọt,...

Tuy vậy, việc áp dụng IoT vào trong việc trồng trọt chăn nuôi của các hộ nông dân, nhưng lại gặp phải nhiều trở ngại. Trong số những trở ngại đó, khó khăn nhất là liên kết giữa nông dân và việc sử dụng công nghệ cao, và tìm đầu ra cho những sản phẩm như thế này. Hơn nữa, việc sử dụng IoT khi chưa nắm rõ về tình hình thị trường sẽ rất mạo hiểm, kết hợp với tình hình dịch bệnh không thể đi nghiên cứu, nắm rõ tình hình của các hộ nông nghiệp trong khu vực, và cả nhóm đã đi đến quyết định : Vẫn sử dụng công nghệ cao vào nông nghiệp, nhưng hãy áp dụng một cách từ từ, chậm rãi để những người dùng có thể theo kịp, và lấy đó làm tiền đề để triển khai những phương pháp tiên tiến hơn.

Trong thời gian đó, luôn có những đóng góp của từng thành viên trong nhóm về việc tạo app Smart Agriculture như thế nào ? Cả nhóm muốn có sự hiện đại trong Sm.Agri, nhưng cũng muốn nó thuận tiện và đơn giản để dễ dàng tiếp cận. Đây là một câu hỏi khó, vì cả nhóm chưa có kinh nghiệm trong việc này, và đã nhắc về tình hình dịch bệnh từ trước, việc thiếu yếu tố thực tế làm cho mọi thứ rất khó khăn. Vì vậy, trưởng nhóm và kĩ thuật viên đi đề xuất, hãy làm những chức năng cơ bản cùng một giao diện bắt mắt nhưng đơn giản, để có thể đáp ứng phần nào nhu cầu của người dùng. Ý kiến đã được cả nhóm thông qua và app Smart Agriculture đã được tạo nên dựa trên ý tưởng này.

+ Marketing + Financial plan + Testing + Commercialize ( chỗ này nên viết sao nhỉ, hay vì yếu tố dịch nên phải dời lại được không ? )

## II. Market needed:

The smart agriculture market is expected to witness a marginal dip in 2021 due to the COVID-19 pandemic, as the movement restriction and lockdowns have resulted in disruptions in the supply chain. However, remote monitoring technology and farm management software tools could lead to higher adoption during the post-COVID-19 period. COVID-19 has disrupted the supply chain of different verticals of the smart agriculture market, including precision farming, livestock monitoring, aquaculture, greenhouse, and forestry. The companies are exploring new opportunities to interact with growers and farmers by leveraging advanced technologies.

1. Agriculture is becoming more technologically advanced.
   1. Helping agricultural production save revenue, boost productivity, decrease prices, and enhance agrarian product quality following international standards while preserving the environment.
   2. Aid farmers in being proactive in their output, overcoming seasonal calculations, reducing reliance on weather, climate, and the status of recovered agricultural land, and meeting market demand for product quality.
2. Developing CNC services for agriculture, as well as creating and growing agricultural industries in using CNC.
   1. Building a complete lifecycle from seed to consumption for each product; product branding.
   2. Taking advantage of and effectively using home resources.

## III. Analysis

In order to improve our business situation in the right direction and build solid development foundations, we use the SWOT model to analyze the project.

|  |  |
| --- | --- |
| **Strength** | **Weaknesses** |
| * Agricultural is the key( fundamental,...) economic sector of Viet Nam * Tools for data collection, synthesis, analysis, and statistics, as well as an extensive collection of industry documentation | * The need for supply chain partners for buying and selling products comes from high-tech farms. * The high-tech farm can be pretty expensive. |
| **Opportunities** | **Threats** |
| * Because the government promotes technology in agriculture, Smart Agri will likely make a significant investment. * People tend to buy clean, safe products from food chains, which is an advantage for expanding smart agriculture. | * Because Vietnam has such a diverse range of plants, it might be challenging to cover them all. * Agriculture's Aging Population * If we don't have any safeguards, rivals can easily take information and data from consumers and suppliers. |

## IV. Competitor

# D. Project timeframe

[Active view of project task management](https://sharing.clickup.com/g/h/5-12294707-7/557f8003bf1d837)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Milestone | Description | Assignee | Begin Date | Target End Date | Completed Date |
| Phase 1: Kick-start | Research, strategize & plan; Develop ideas | All members | 05/11/2021 | 05/12/2021 | 05/12/2021 |
| Assumption of risk | Tùng, Khang, Trang | 05/11/2021 | 05/12/2021 | 05/12/2021 |
| Project introduction | All members | 05/11/2021 | 05/12/2021 | 05/12/2021 |
| Project proposal | All members | 05/13/2021 | 05/19/2021 | 05/19/2021 |
| Phase 2: Run-up | Industry, Market & Business research | All member | 05/25/2021 | 06/06/2021 | 06/12/2021 |
| App feature description | Tùng | 06/15/2021 | 06/23/2021 | 06/20/2021 |
| Contents | Khang, Trang, Hải | 06/22/2021 | 06/27/2021 | 06/26/2021 |
| Target audience | Trang, Hải | 06/22/2021 | 06/25/2021 | 06/25/2021 |
| Technical design | Khang | 06/27/2021 | 07/17/2021 | 07/13/2021 |
| Visualization UI/UX design & app prototype | Lộc, Tùng | 06/27/2021 | 07/18/2021 | 07/19/2021 |
| Phase 3: Closure | Completing paperwork, documentations | Lộc, Tùng, Khang | 07/10/2021 | 07/20/2021 | 07/20/2021 |
| Self-assessment of project | Lộc, Trang | 07/11/2021 | 07/18/2021 | 07/17/2021 |
| Takeaway experiences | All members | 07/18/2021 | 07/21/2021 | 07/20/2021 |

# E. Features

Smart Agri is an investment and delivery service app that offers these services:

* Online Grocery delivery
* Farm investment service
* News
* Farms map
* Knowledge

It also offers a Cashless payment solution all in one to all the customers. Smart Agri helps customers to get several convenient and helpful investment services on every farm, having a grocery delivery from your preferred farm at your doorstep or address, and all are cashless payments. Whatever you need or want to get invested or delivered just explore from here and Smart Agri is what you have covered.

***Paraphrase: Pick up your phone and open Smart Agri, and get several helpful investment services on every farm. Get your picked grocery delivered right at your doorstep, using cashless payment. Feel free to explore, because Smart Agri is always here at your service.***

## I. Become a Customer with Smart Agri

### Download the app.

Signup/Login up with valid details and start investing, exploring food, grocery, finding farms etc.

## II. Customer App Features

**1. Registration**: A new user can register themselves with their valid details such as First Name, Second Name, Email ID, etc, more required things.

**2. Login**: A user can log in with their mail id, apple iCloud, Facebook and generate a password.

**3. Home Screen Service**: A user can search required services, view service details and view the category and sub-category of the services.

**4. Investment:**

**a. Portfolio**

That can see the whole dashboard where customers can view total cost value, total market value, total investment, total profit/loss, etc. With some graphics presentation.

**b. Price Board**

The price board brings you the whole scene of the farm market, with different categories from popular to long-term or even short-term. Besides it, the price board’s sub-feature includes a piece of data of a specific farm that you can count on to decide whether to invest or not.

**5. E-com service**

You can buy any fresh produce like fruit, vegetables, or even rice, which are supplied from a reputation farm. With E-com service, you have lots of offers, sub-service:

**a. Apply Offer/Discount/Coupon:** The customer has an option to apply an available coupon, offer and discount to get a discount.

**b. Payment Method:** Customers can pay according to their suitability.

**c. GPS Tracking:** The customer has a real-time tracking system where users can track their exact location of delivery.

**d. Rewards:** Grab offers reward features to their customers with exclusive things.

**6. Forum/Knowledge**

Bring awareness to farmers about the importance of implementing knowledge

SmartAgri also provides knowledge about agribusiness, supply chain management & experiences in applying 4.0 technology to agricultural production.

Guide them chronologically on what to do during a growing season.

Recommendations of processes of crop production such as:

* Soil management
* Water management.
* Cropping system management
* Fertilization
* Planting/sowing
* Crop maintenance
* Protection management
* Harvesting
* Storage

**7. Map**

Find a farm near you, easy to track, and have a whole scenario of the farm before deciding to invest.

**8. News**

Daily updates of social, economic, and commercial news, especially in the field of agriculture. There is also news about legislation, politics that directly affect agribusiness

# F. Technical Stack

### 1. Operating systems: iOS iOS mobile app development is in such high demand because these applications always perform extremely well. This platform is fast, reliable, and easy to use, with few bugs remaining in the final build of any app.

### 2. Servers and load balancing: Amazon Web Services Amazon Web Services(AWS) offers reliable, scalable, and inexpensive cloud computing services.

### 3. Data storage and querying: PostgreSQL PostgreSQL is used as the primary data store or data warehouse for many webs, mobile, geospatial, and analytics applications.

### 4. Backend Frameworks: Spring Boot (Spring Security JWT, Spring Security O2, Spring cloud Consul, Spring Data JPA, WebFlux)

Spring Boot helps you to create stand-alone, production-grade Spring-based Applications that you can run. We take an opinionated view of the Spring platform and third-party libraries so that you can get started with minimum fuss. Most Spring Boot applications need very little Spring configuration.

Spring boot goals are:

* Provide a radically faster and widely accessible getting-started experience for all Spring development.
* Be opinionated out of the box but get out of the way quickly as requirements start to diverge from the defaults.
* Provide a range of non-functional features that are common to large classes of projects (such as embedded servers, security, metrics, health checks, and externalized configuration).
* Absolutely no code generation and no requirement for XML configuration.



### 5. Frontend Frameworks: Angular Angular ensures easy development as it eliminates the need for unnecessary code. It has a simplified MVC architecture, which makes writing getters and setters needless. Directives can be managed by some other team, as these are not part of the app code.

### 6. API services: Google Apigee Deployment flexibility with Apigee hybrid AI-powered API monitoring Monetize your digital assets with APIs Manage microservices as APIs

### 7. Monitoring and performance tools: Datadog Datadog is a monitoring service for cloud-scale applications, providing monitoring of servers, databases, tools, and services, through a SaaS-based data analytics platform.

### 8. Message Broker: Message RabbitMQ A message broker acts as a middleman for various services (e.g. a web application, as in this example). They can be used to reduce loads and delivery times of web application servers by delegating tasks that would normally take up a lot of time or resources to a third party that has no other job.

### 9. AI service: OpenCV OpenCV is the huge open-source library for computer vision, machine learning, and image processing and now it plays a major role in real-time operation which is very important in today's systems. By using it, one can process images and videos to identify objects.

### 10. Version control: Github Offers the distributed version control and source code management functionality of Git, plus its own features.