

VISÃO GERAL

1. Project Overview

Leaftix Microgreens, an avant-garde vertical farming project, is poised to revolutionize the agricultural sector by expanding its research and development capabilities. This initiative is designed to refine their proprietary technology and penetrate untapped markets, thereby solidifying their position as a leader in sustainable agriculture.

1.2 Problematic

The microgreens market is dominated by a few large-scale producers, such as AeroFarms, Bowery Farming, and Fresh Origins, who use advanced technologies, such as indoor vertical farming, hydroponics, and aeroponics, to grow and distribute microgreens. These technologies enable them to produce high-quality and consistent microgreens all year round, with minimal water and land use, and to deliver them to various markets, such as supermarkets, restaurants, and online platforms. However, these technologies also entail high capital and operational costs, which make them inaccessible and unaffordable for small and medium producers, who account for more than 80% of the microgreens market.

Small and medium producers face several challenges in growing and selling microgreens, such as high labor costs, low yields, variable quality, short shelf life, and limited market access. They rely on manual methods, such as soil-based cultivation, hand-seeding, hand-watering, hand-harvesting, and hand-packing, to produce microgreens, which are time-consuming, labor-intensive, and prone to errors and contamination. They also have difficulty in controlling the environmental factors, such as temperature, humidity, and light, that affect the growth and quality of microgreens. As a result, they often experience low and inconsistent yields, poor and variable quality, and high post-harvest losses. Moreover, they have limited access to the lucrative markets, such as supermarkets and restaurants, due to the lack of certification, standardization, and traceability of their products, and the high transportation and distribution costs.



The project Leaftix Microgreens aims to offer a low-cost and high-tech solution for small and medium producers of microgreens, that will enable them to optimize their production and distribution processes, and to increase their profitability and competitiveness in the market. The solution will use machine learning and big data to monitor and control the environmental factors, such as temperature, humidity, and light, that affect the growth and quality of microgreens, and to provide real-time feedback and recommendations to the producers. The solution will reduce the production costs, increase the yields and quality, extend the shelf life, and expand the market access of the microgreens, thus creating value for both the producers and the consumers.

2. Scope of the Project

The project's ambit encompasses the enhancement of vertical farming methodologies, which are at the vanguard of agricultural innovation. This approach not only facilitates the perennial cultivation of fresh produce but also judiciously conserves vital resources such as arable land, water, and energy. Moreover, it significantly mitigates the carbon footprint associated with traditional farming by curtailing the need for extensive transportation, storage, and refrigeration.

2.1 Solution Description

The Leaftix microgreens solution is a three-phase project that aims to optimize the production of microgreens using smart devices and artificial intelligence.

Phase 1: The customer purchases the Leaftix product, which is a plug and play smart device that connects to the Wi-Fi network through a web or mobile interface. The device monitors the temperature and humidity of the production environment using smart sensors and sends the data to the Leaftix cloud in a secure and encrypted way. The Leaftix cloud processes the data and provides real-time or consolidated reports to the producer on the climatic conditions of the environment. This reduces the producer's stress and anxiety when they are away from the production site.

Phase 2: The customer can access the system through a web or mobile interface and have remote control over the temperature, humidity, lighting, gas detection and visual monitoring of the environment. This phase also involves the standardization of installation and maintenance of the sensors and other devices required for production control.

Phase 3: The customer enjoys the full automation of microgreen production. Based on the data collected in phases 1 and 2, artificial intelligence models are developed to analyze the production flow, the variables that influence the quality and quantity of microgreens, and the optimal settings for each variable. The models can also

automatically monitor and adjust the variables to ensure a healthy and optimal production. This phase only involves the creation and implementation of the artificial intelligence models using the customer's own local data.

2.2 Project Deliverables

Project Deliverables The project deliverables are the tangible and measurable outcomes that will be produced by the project. They are aligned with the project objectives and the customer's needs. The project deliverables are divided into three categories, corresponding to the three phases of the project:

- **Phase 1:** These are the deliverables related to the design and development of the product, which is the smart device that monitors and collects data from the production environment. The phase 1 deliverables include:
 - A design document that outlines the features and specifications of the Leaftix product, such as the components, software, data capture, and data transmission methods.
 - A production plan that describes the steps and resources needed to manufacture and distribute the Leaftix product in any scale and market.
 - A web server cloud that hosts the multiplatform application, the database, and the alarm system for the system.
 - A database that stores and manages the data collected by the device in a secure and encrypted way.
 - A multiplatform application that enables the producer to access and view the data collected by the Leaftix product in real-time or in aggregated reports.
 - An alarm system that alerts the producer via SMS, email, mobile notifications, or smart calls when the climatic variables measured by the Leaftix product deviate from the predefined thresholds.
- **Phase 2 Deliverables:** These are the deliverables related to the implementation and standardization of the system, which is the multiplatform interface that allows the customer to access and control the production environment remotely. The phase 2 deliverables include:
 - A standardization project that defines the specifications and requirements for installing and integrating the electrical, hydraulic, and electronic devices in the production environment.
 - An enhancement project that improves the functionality and usability of the web or mobile interface, enabling the customer to send commands to the sensors and devices in the production environment.
 - A training program that educates the installation team on how to install and configure the Leaftix system in the production environment.
 - A follow-up plan that monitors and evaluates the performance and satisfaction of the customer after the installation of the Leaftix system.

- **Phase 3 Deliverables:** These are the deliverables related to the automation and optimization of microgreen production using artificial intelligence. Phase 3 outcomes include:
 - Creation of one or more artificial intelligence models that analyze and optimize production variables based on the data collected in phases 1 and 2.
 - A hardware device that deploys the AI models into the production environment and allows it to make decisions using its own local data.
 - A monitoring system that tracks and evaluates the decisions made by artificial intelligence models and the impact on the quality and quantity of production.
 - A learning system that updates and improves artificial intelligence models based on feedback and results from the monitoring system.

3. High-level Requirements

1. Infrastructure and Equipment:

- Installation of state-of-the-art racking and shelving solutions to maximize spatial efficiency.
- Deployment of energy-efficient LED lighting to foster optimal plant growth.
- Implementation of climate control systems to regulate temperature, humidity, and ventilation.
- Establishment of an irrigation network, complete with pumps and conduits, to ensure precise water distribution.
- Integration of sensors and monitoring devices to continuously assess environmental parameters and plant vitality.

2. Software Development:

- Creation of a bespoke software suite tailored to streamline the management of vertical farming operations.
- Design of an intuitive user interface that prioritizes ease of navigation and operational efficacy.
- Development of a comprehensive data analytics framework to interpret agricultural data and refine cultivation strategies.
- Incorporation of stringent security protocols to safeguard sensitive data and adhere to regulatory standards.

3. Installation and Training:

- Recruitment of skilled technicians and engineers to oversee the meticulous installation and calibration of the farming apparatus.
- Provision of exhaustive training programs to equip personnel with the requisite knowledge to operate the system proficiently.

4. Research and Development:

- Allocation of resources towards the exploration of innovative features and the enhancement of existing technologies to maintain a competitive edge.
- Execution of rigorous testing procedures under diverse conditions to validate system reliability and performance.

4. Affected Parties

The project's success is contingent upon the collaborative efforts of a diverse array of stakeholders. This includes a team of adept technicians and engineers responsible for the precise installation and fine-tuning of the vertical farming infrastructure. Additionally, the project will necessitate the training of staff members to ensure they are well-versed in the nuances of the system's operation. The local community stands to benefit significantly from this endeavor, as it promises to deliver a consistent supply of fresh, locally sourced produce.

5. Affected Systems and Business Processes:

The Leaftix Microgreens expansion project will have a profound impact on several systems and business processes, which are integral to the company's operational framework. The following delineates the affected areas:

1. Agricultural Production System:

- The core of Leaftix Microgreens' operations, the agricultural production system, will undergo a significant transformation. The introduction of advanced vertical farming technologies will enhance crop yields, improve quality, and ensure a consistent supply of produce. This system will be augmented with sophisticated equipment and automation to streamline the cultivation process.

2. Supply Chain Management:

- The supply chain will be optimized to accommodate the increased output from vertical farming. This includes refining procurement processes for raw materials, improving inventory management, and establishing robust distribution networks to ensure timely delivery of fresh produce to the market.

3. Data Management and Analytics:

- A pivotal component of the project is the development of a custom software platform. This system will revolutionize data management by providing real-time insights into production metrics, environmental conditions, and crop health. The analytics capability will enable data-driven decisions, fostering continuous improvement in operational efficiency.

4. Human Resources and Training:

- The expansion project necessitates the enhancement of human resource capabilities. This involves recruiting specialized personnel, such as agronomists and data scientists, and providing comprehensive training to existing staff. The goal is to cultivate a workforce that is adept at leveraging the new technologies and processes.

5. Research and Development:

- The R&D department will be invigorated with additional resources to pursue innovative projects. This will include exploring new crop varieties, testing alternative farming techniques, and developing proprietary technologies that can provide a competitive edge in the market.

6. Financial Management:

- The financial management system will be impacted by the capital investment required for the project. Budgeting, forecasting, and cost control measures will be critical to ensure the project's financial viability. Additionally, the potential increase in revenue streams from expanded operations will need to be effectively managed.

7. Regulatory Compliance and Sustainability:

- As Leaftix Microgreens embraces new technologies, adherence to regulatory standards and sustainability practices will become increasingly important. The company will need to ensure compliance with agricultural regulations, environmental laws, and industry certifications.

In conclusion, the Leaftix Microgreens project is set to catalyze a paradigm shift in the company's systems and business processes. By embracing innovation and sustainability, the company is poised to not only enhance its operational capabilities but also contribute positively to the broader agricultural landscape. The strategic overhaul of these systems will pave the way for a future where technology and ecology converge to create a more resilient and efficient food production ecosystem.

6. Scope-only exclusions

In the pursuit of clarity and precision, it is imperative to delineate the parameters that fall outside the purview of the Leaftix Microgreens expansion project. These exclusions are critical to maintaining focus on the project's primary objectives and ensuring the efficient allocation of resources. The following are the exclusions from the project scope:

1. Non-Vertical Farming Techniques:

- Traditional farming methods and horizontal cultivation practices are explicitly excluded from this project. The initiative is solely dedicated to enhancing vertical farming operations and will not encompass investments in conventional agricultural methodologies.

2. External Logistics and Distribution:

- While the project will optimize the supply chain for increased production, the external logistics and distribution networks, including third-party transportation and warehousing services, are not included in the scope. These aspects are considered ancillary services and are managed separately from the core project.

3. Retail Operations:

- The project does not cover the establishment or expansion of retail outlets or direct consumer sales channels. The focus remains on production and supply chain improvements, with retail operations being a distinct business function.

4. Non-Agricultural Product Development:

- The development of products unrelated to vertical farming, such as software unrelated to agricultural management or non-agricultural equipment, is outside the scope of this project.

5. Land Acquisition:

- The acquisition of additional land for expansion is not included in the project scope. The project is designed to maximize the use of existing

controlled environments and does not entail the purchase of new real estate.

6. Market Research and Marketing Campaigns:

- Comprehensive market research and the execution of marketing campaigns are not within the scope of this project. While market expansion is a goal, the specific activities related to market analysis and promotion are managed by the marketing department.

7. Post-Harvest Processing:

- Activities related to post-harvest processing, such as packaging, branding, and value-added product creation, are not included in the project. These processes are part of a separate operational workflow.

8. International Expansion:

- The current project scope is confined to domestic market expansion. Plans for international growth and export operations are not included and may be considered in future initiatives.

By establishing these scope-only exclusions, Leaftix Microgreens ensures a concentrated effort on the core components of the project, thereby optimizing the use of resources and maintaining strategic alignment with the company’s vision. This disciplined approach to project management will facilitate a more streamlined and effective execution of the expansion initiative.

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