Indoor Vertical and Greenhouse Farming Controlled by Artificial Intelligence

Name of the Organisations Involved

- VertiYard UG, Germany
  Urban Farming Company

Challenges Identified

- **High demand for fresh and locally grown produce**

This trend has gained momentum in recent years due to a growing consumer preference for food that is both nutritious and sustainably sourced. Fresh produce retains more nutrients compared to produce that has been transported long distances or stored for extended periods. Locally grown produce often tastes better and has superior quality, as it is harvested at peak ripeness and doesn't need to withstand long transportation.

- **High production cost of current indoor vertical farming technology**

This challenge revolves around the substantial initial investment and operational expenses associated with implementing and maintaining indoor vertical farming systems. Factors contributing to high costs may include the need for specialized equipment, advanced climate control systems, energy-intensive lighting, and technology for automated processes. Addressing this challenge requires innovations in technology, resource optimization, and exploring cost-effective solutions to make indoor vertical farming financially sustainable.

- **Low crop diversity in the Indoor vertical farming**

This challenge involves a limitation in the variety of crops that can be effectively grown in indoor vertical farming environments. Certain crops may not adapt well to the controlled conditions of vertical farms, leading to a restricted range of produce. To overcome this challenge, efforts must be directed towards developing and optimizing cultivation techniques that accommodate a broader diversity of crops.

Goals and Solution

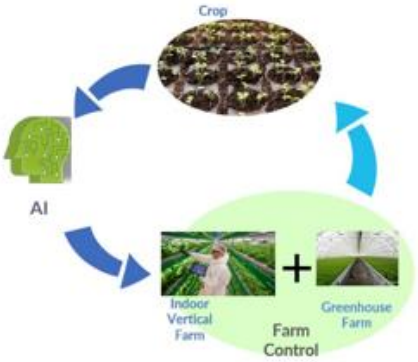
As the demand for fresh and sustainable food continues to grow, a hybrid vertical farming technology **VertiYard** has been developed that supports locally grown vegetables, leafy greens, and herbs. This is achieved through cutting-edge farming methods, controlled by AI. This allows people to produce fresh vegetables at competitive price around the year. Employing artificial intelligence (AI) to oversee crops in a Hybrid farm (a blend of Indoor Vertical Farm and Greenhouse Farm) lowers production costs.

Purchasing locally grown produce supports local farmers and the regional economy, which can have positive effects on job creation and community development. Consumers are increasingly concerned about the carbon footprint associated with food transportation. Buying locally grown produce reduces the emissions related to shipping and distribution. This aligns with our broader goal of fostering a greener, healthier, and more sustainable future for both our planet and its inhabitants.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them. Project number: 2021-1-DE02-KA220-VET-000034651

Actions Taken



- Concept of the Hybrid Farm has been identified.
- Sensors and cameras needed to monitor the crop has been identified.
- Potential small-scale farm for developing and testing AI has been identified.

The technology is still under development is yet to be tested and implemented.

Benefits and Impact

- The technology reduces the production cost of the Indoor vertical farming technology.
- Increase the yield compared to the conventional greenhouse farming.
- Increase the diversity of crops grown in Indoor vertical farming.
- After applying VertiYard, the revenue is increased by reducing the operation cost.
- Urban consumers benefitted by everyday fresh produce and our AI crop monitoring technology can also help local farmers to optimize their crop production and increase yield.
- Having a profitable Urban farming technology in Europe.

Image: Young plants growing very large plant commercial Greenhouse. Source: wayhomestudio on Freepik

Image: Leafy greens. Source: iFarm

Contact Information

Richard Chandradoss
Email: richard@vertiyard.com
Website: www.vertiyard.com
Social media: www.linkedin.com/company/vertiyard-ug/

Prepared by

Richard Chandradoss (VertiYard), Wolfgang Kniejski (INI-Novation GmbH)

Application Area
☒ Plants ☒ Terrain

Digital Technology in the Value Chain
☒ Agronomic Services

Digital Technologies
☒ Sensor Technology ☒ Artificial Intelligence (AI) ☒ Vertical Farming

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them. Project number: 2021-1-DE02-KA220-VET-000034651