SmartFarmer - IoT Enabled Smart Farming Application

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INTRODUCTION:

Smart farming, also known as e-agriculture, refers to agricultural equipment that digitally gather, store, analyze, and distribute electronic data and information. Smart agriculture is a wide term that encompasses agricultural and food production practices that are enabled by Internet of Things, big data, and sophisticated analytics technologies. When we talk about the Internet of Things, we usually mean the addition of sensing, automation, and analytics technologies to modern agricultural processes. Using these technologies, we achieve more efficiency, higher quality, and lower resource use than traditional agriculture.

Smart Husbandry is a strategic approach that focuses on furnishing the husbandry assiduity with the structure to use sophisticated technologies for shadowing, monitoring, automating, and assaying conditioning, similar as big data, the pall, and the internet of effects(IoT). Smart husbandry, frequently known as perfection husbandry, is software- managed and detector- covered. The combination of the expanding global population, the adding demand for advanced crop yield, the need to use natural coffers efficiently, the rising use and complication of information and communication technology, and the adding need for climate-smart husbandry is adding the significance of smart husbandry.

OBJECTIVE:

Essentially, "smart farming" is the use of information and data technology to optimize diverse farming processes. The emphasis is on data availability and how farmers may use the information obtained sensibly. The objective is to boost product quality and quantity while optimizing human labor productivity. Or, to put it another way, producing more food with less investment and the same amount of land. The technology utilized in smart farming mainly comprises IoT and robotics. Farmers may use these instruments to monitor agricultural conditions without having to visit the field. This enables them to make judgments for the entire farm, a lot, or even a single plant.

Smart farming is not just for huge agricultural enterprises. It can also help family farms, organic farms, and other small businesses. The entire smart farming process is softwaremanaged and sensor-monitored, lowering overall prices, boosting overall yield, improving availability quality, and, ultimately, improving customer experience. Automation has provided significant gains in production efficiency, quality, and sustainability.

LITERATURE SURVEY:

[**1**]. In this report held in 25 mar 2022-Smart farming technology innovations – Insights and reflections from the German Smart-AKIS hub .This paper explores farmers' and other stakeholders' perceptions and attitudes towards SFT in Germany with a multi-actor approach. Quantitative and qualitative data show that while there are generally positive attitudes, farmers are less enthusiastic with regard to expected positive effects of SFT for the environment. Also, there is still a number of adoption barriers on the technology level as well as due to an unfavorable institutional and infrastructural environment. Although a multi-actor approach was practiced, close cooperation of practitioners with developers were not frequently observed nor could they be easily supported through action-research. Notwithstanding, through the multi-actor approach, a comprehensive situational picture of SFT appraisal was composed and, a general raise of awareness among the respective AKIS actors generated.

[**2].** Report Published in February 2021-Unmanned Aerial Vehicle (UAV) Based Sustainable Smart Farming. To reach the goal of sustainable agriculture, smart farming is taking advantage of the Unmanned Aerial Vehicles (UAVs) and Internet of Things (IoT) paradigm. These smart farms are designed to be run by interconnected devices and vehicles. Some enormous potentials can be achieved by the integration of different IoT technologies to achieve automated operations with minimum supervision. This paper outlines some major applications of IoT and UAV in smart farming, explores the communication technologies, network functionalities and connectivity requirements for Smart farming.

[**3**]. Report held in June 2021- smart Farming using AI and IoT.To survive in this world the occupation of farming plays an important role as it provides maximum needs for human beings to live in this world. But in the advancement of the technologies with the invention of the Internet of Things, Automation (Smarter technologies) is replacing the traditional methodologies which in cause resulting in wide range improvement of the Fields. Now we are in the state of automation where the upgradation of smarter technologies is improving day by day in maximum sectors starting from smart homes, waste management, vehicles, industries, Farming, health, grids, and so on. In the field of Farming, the improvement with the implementation of Automation is also taking place with the invention of the Internet of Things, Artificial Intelligence, Machine Learning, etc. Applications related to precision agriculture and technologies related to farm management and robotic automation etc. will benefit the environment a lot and will increase the overall efficiency.

[**4].** In this report held in February 2022."Analysis of barriers to circularity for agricultural cooperatives in the digitalization era".This study aims to propose a novel framework for barriers to circularity within cooperative supply chains. The barriers in the adoption and implementation of circular economy principles are examined within a framework.

[**5].** This report published in January 2019.Smart farming IoT platform based on edge and cloud computing.Biosystems Engineering .Precision Agriculture (PA), as the integration of information, communication and control technologies in agriculture, is growing day by day. The Internet of Things (IoT) and cloud computing paradigms offer advances to enhance PA connectivity. Nevertheless, their usage in this field is usually limited to specific scenarios of high cost, and they are not adapted to semi-arid conditions, or do not cover all PA management in an efficient way. For this reason, we propose a flexible platform able to cope with soilless culture needs in full recirculation greenhouses using moderately saline water. It is based on exchangeable low-cost hardware and supported by a three-tier open source software platform at local, edge and cloud planes. At the local plane, Cyber-Physical Systems (CPS) interact with crop devices to gather data and perform real-time atomic control actions. The edge plane of the platform is in charge of monitoring and managing main PA tasks near the access network to increase system reliability against network access failures. Finally, the cloud platform collects current and past records and hosts data analytics modules in a FIWARE deployment. IoT protocols like Message Queue Telemetry Transport (MQTT) or Constrained Application Protocol (CoAP) are used to communicate with CPS, while Next Generation Service Interface (NGSI) is employed for southbound and northbound access to the cloud. The system has been completely instantiated in a real prototype in frames of the EU DrainUse project, allowing the control

of a real hydroponic closed system through managing software for final farmers connected to the platform.

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