IOT AND GREEN AGRICULTURE

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ABSTRACT

The Internet of Things (IoT) is a collection of global data, web-connected objects, or things, and is a critical component of the future Internet. IoT focuses on process automation by minimising human engagement. IoT receives data through sensors, processes it through controllers, and completes automation processes through actuators. The Internet of Things in agriculture and farming is focused on automating all parts of farming and agricultural processes in order to increase efficiency and effectiveness. Traditional livestock management techniques (such as cattle identification) are not entirely automated and suffer from several inefficiencies, including increased human involvement, labour costs, energy usage, and water usage. The review's fundamental objective is to analyse IoT sub-verticals, gather data for measurements, and build applications using technology. It is critical to find the most thoroughly explored sub-verticals, data collecting, and technologies in order to develop future IoT applications.

KEYWORDS: IOT, Green Agriculture, Model, Process

INTRODUCTION

To address current agricultural difficulties, researchers have concentrated on smart agricultural and farming automation systems powered by the Internet of Things. The Internet of Things (IoT) is a network of things that uses software intelligence, sensors, and pervasive access to the Internet to clearly identify components. The Internet of Objects (IoT) is the collection of data from Internet-connected devices or things through gadgets, sensors, and actuators. Numerous academics have concentrated their efforts on developing smart systems for monitoring and managing agricultural factors with the goal of increasing output and efficiency. Intelligent systems gather data for measurements in order to provide precise findings that may be used to take appropriate action. Smart agricultural systems are now being used to gather data on environmental characteristics such as temperature, humidity, soil moisture, and pH. Researchers have used smart agricultural systems to increase the efficiency of farm processes by collecting precise sensor data from a variety of various sensors. The majority of research has been on sub-verticals such as water management, crop management, and smart farming with the goal of automating operations while minimising human interaction, costs, energy usage, and water usage.

Agriculture and farming automation processes minimised human involvement and increased efficiency. The reason for this is because every country's population is reliant on agriculture, and as such, users of these resources should maximise their use of water and land. Additionally, to enhance profitability, it is critical to have high-quality production and crop management. Thus, IoT-based agricultural management systems are critical for a nation that relies heavily on agriculture. The new solutions created with the help of IoT technology have mitigated the disadvantages of previous ways and brought several benefits to farmers. For instance, IoT-based water management systems gather environmental data like as temperature, water level, and humidity and give correct irrigation scheduling. Additionally, crop management systems designed with IoT monitor temperature, humidity, and soil moisture levels through sensors, giving farmers with sufficient information to manage their crops accordingly. In general, these IoT-based solutions aid in the reduction of human involvement, energy consumption, and cost in the sector of agriculture. Additionally, agricultural applications based on the Internet of Things have been deployed in the areas of pest control, weather monitoring, nutrient management, and greenhouse management.

The Internet of Things in agriculture collects large amounts of data about the agricultural environment through sensors. It develops, analyses, and manages models based on big data in order to promote more sustainable agricultural production. The Internet of Things may be used to gather data in an efficient and cost-effective manner. Climate variability, water scarcity, soil fertility, and pesticides all have a role. Agriculture will benefit from the IoT. Water is necessary for agriculture and farming. Farmers are completely reliant on rainfall to meet all of their agricultural demands.

IOT, RFID AND WSN

IoT may also be characterised as a fusion of heterogeneous networks, including chip technology, that progressively expands in reach as Internet applications like as logistics, agricultural, smart communities, intelligent transportation, control, and tracking systems increase in popularity. According to studies, by 2020, IoT items will be semi-intelligent and will play a significant role in human social life. In comparison to other technologies, as examined in our analysis, Wi-Fi and mobile technology are the technologies that have a broad range of demand in agriculture and farming for monitoring land and water resources.

While our findings indicate the outcomes in this manner, another research examined the use of RFID, a Wireless Sensor Network (WSN) technology that may be efficiently utilised to boost agricultural output in order to satisfy the expanding requirements of the rising population. In impoverished nations with slow Internet speeds, alternative IoT technologies such as low-power, short-range IoT networks, low-rate wireless PANs (LoRaWAN), or low-power and wide-area networks are used instead of Wi-Fi.

Additional research suggests that WSNs are employed in a variety of applications, including health monitoring, agricultural, environmental monitoring, and military applications, while our study reveals the agricultural sector's utilisation of IoT. Our studies indicate that agriculture is the principal source of revenue in emerging nations, particularly those with a large geographical area, such as India.

CONCLUSION

Our remarks from the peer-reviewed articles of the last one decade, when considering the possible applications in the Internet of Things, showed that water management, followed by smart farming, animal management and the same proportion, is the greatest IoT sub-vertical consideration .. The observation shows that the most important sensor data collection for measurement is ambient temperature, environmental humidity and other sensor data are also collected for IoT applications, such as soil humidity and soil pH. Wi-Fi has the biggest demand for agricultural and agricultural uses, followed by mobile technologies. In the agricultural and agricultural industry other technologies like ZigBee, RFID, Raspberry pi, WSN, Bluetooth, LoRa and GPRS have less demand. In comparison with the agricultural sector, the farming industry uses IoT for automation at a lower degree. This survey might help academics identify new approaches and solutions in the present agricultural period and make the automation process more efficient and effective to achieve the positive commercial results for agriculture and agriculture.

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