Agriwealth: Iot Based Farming System in India

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Introduction

The Internet of Things (IoT) is transforming the agriculture sector, unlocking a plethora of opportunities to increase efficiency and productivity. IoT enabled sensors and other devices offer farmers an unprecedented level of visibility into their operations, enabling them to make more informed decisions and optimize their resources. In India, IoT based farming systems are becoming increasingly popular, as they provide farmers with access to real time data and insights into their crops and soil conditions. By leveraging their data, farmers can take proactive steps to improve crop yields, reduce water and fertilizer use, and increase their profits.

Discussion

The aim of this research is to investigate the potential of using Internet of Things (IoT) technology for improving farming practices in India. Specifically, the research will explore how IoT based systems can be used to enhance precision farming, increase crop yields, reduce inputs, optimize irrigation, and improve farm management and decision making (Kumari, A., *et al* 2019). Additionally, the research will investigate the economic, environmental, and social implications of such systems, while also identifying potential benefits and drawbacks associated with their use in the Indian context.

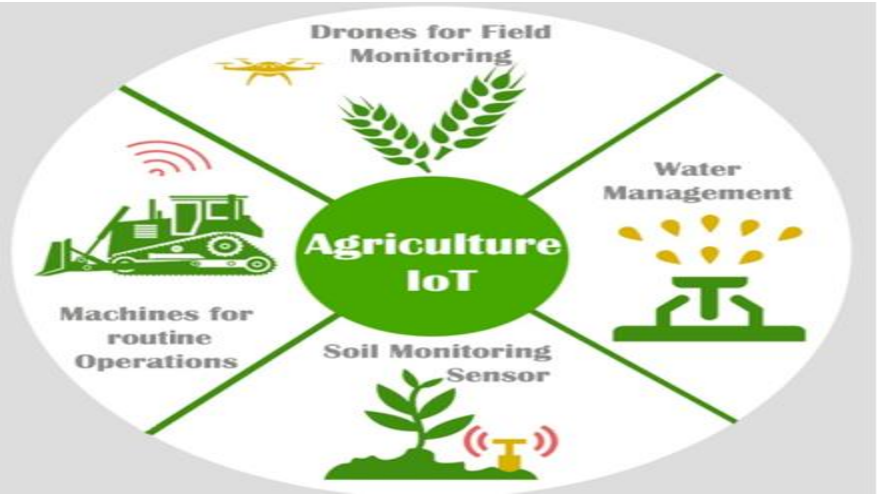

Figure 1: IoT agriculture domain

(Source: www.javatpoint.com)

IoT based farming systems are becoming increasingly popular in India. This technology helps farmers to monitor and control the environment in their fields, enabling them to increase crop yields and reduce costs. IoT sensors can be used to measure soil moisture, temperature, humidity and sunlight in a field, as well as track plant health and detect pests or diseases (Kumar, S., *et al* 2021). They can also be used to control irrigation, fertilization and spraying systems. IoT technology can also be used to monitor the health of livestock, track their location and identify any potential health issues in real time. This technology can help farmers to increase the efficiency of their farms and reduce the environmental impacts of their operations.

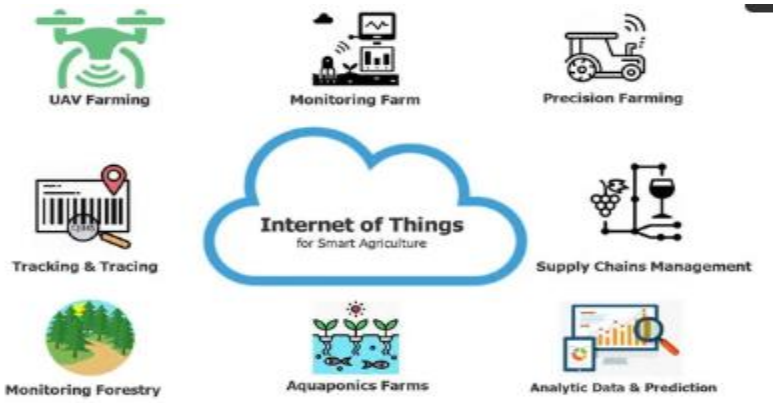

Figure 2: IoT agriculture domain

(Source: www.mdpi.com)

IoT based farming systems are becoming increasingly popular in India as the country continues to modernize its agricultural sector. IoT technology is helping to increase efficiency, reduce costs, and improve yields. This system provides better weather patterns and better prediction of the climate (Lorenz, P., *et al* 2020). IoT based farming systems can be used in a variety of ways, including better weather monitoring systems and irrigation systems. IoT based farming systems are becoming increasingly popular in India as more and more farmers are beginning to understand the benefits of connecting their farms to the internet.

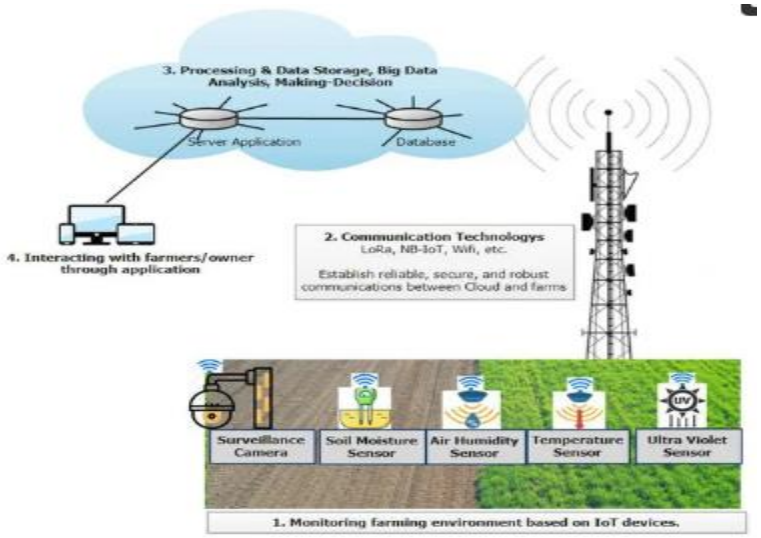

Figure 3: IoT ecosystem architecture

(Source: www.mdpi.com)

In an IoT based farming system, sensors are used to monitor the environment of the farm, track the health of the crops, and provide real time data to farmers. This data can be analyzed and used to make informed decisions about the farm's operations. For example, a farmer could use the data to determine when to water, fertilize, and harvest their crops (Mansoor, V., *et al* 2020). Additionally, IoT systems can be used to detect pests, diseases, and other potential hazards. By connecting farms to the internet, farmers can also access a variety of digital services that can help them increase productivity and profitability. These services include weather forecasting, soil analysis, and pest control. By using IoT based farming systems, farmers in India can drastically reduce their production costs and increase their yield.

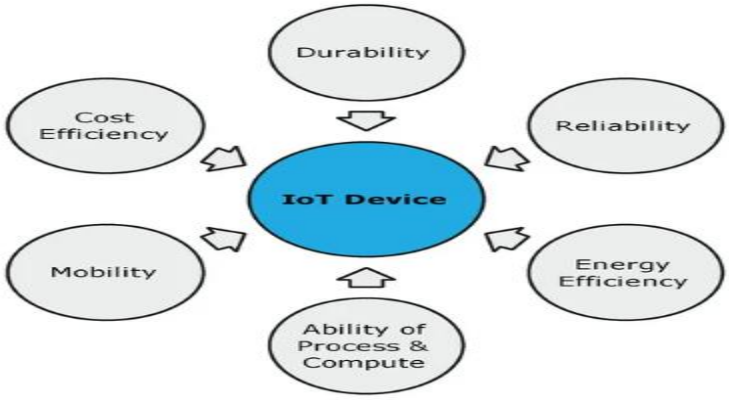

Figure 4: Characteristics of IoT devices

(Source: www.mdpi.com)

There are various types of characteristics of the IoT devices. One of the characteristics is cost effective. IoT based farming systems are cost effective solutions for farmers in India. They make use of affordable hardware and software solutions to monitor, analyze and manage agricultural operations. Another characteristic is automation. IoT based farming systems can automate certain tasks such as irrigation and pesticide application (Shah, M., *et al* 2019). This saves time and resources for farmers, and improves efficiency. Another characteristic is data driven decisions. IoT based systems can collect and analyze data from various sources as sensors, drones and weather forecasts to provide insights into crop health and soil conditions. This helps farmers make better informed decisions about their farming operations.

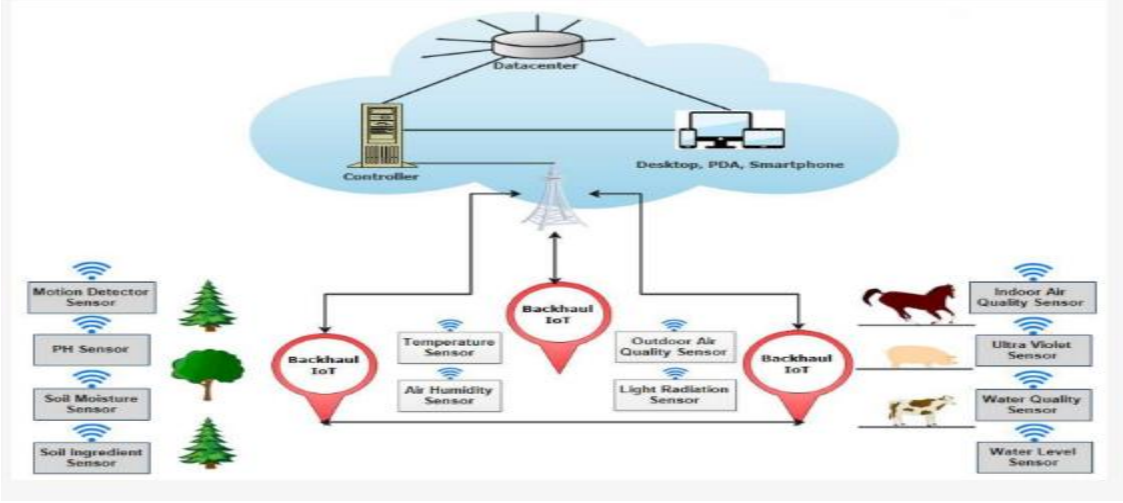

Figure 4: Topology for IoT based smart agricultural system

(Source: www.mdpi.com)

Another characteristic is remote monitoring. IoT based systems allow farmers to monitor and manage their farms from anywhere in the world. This helps farmers stay connected to their crops even when they are away. Another characteristic is improved yields. IoT powered precision agriculture can help farmers reduce costs, increase efficiency, and ultimately maximize the profits from their farmlands (Livanos, G., *et al* 2020). IoT based systems can help farmers improve crop yields by providing data driven insights into soil conditions, crop health and nutrient levels. This helps farmers maximize their crop yields and make more money. Another characteristic is reduced wastage. IoT based systems can help farmers reduce wastage by providing insights into water and fertilizer usage. This helps farmers save money and resources.

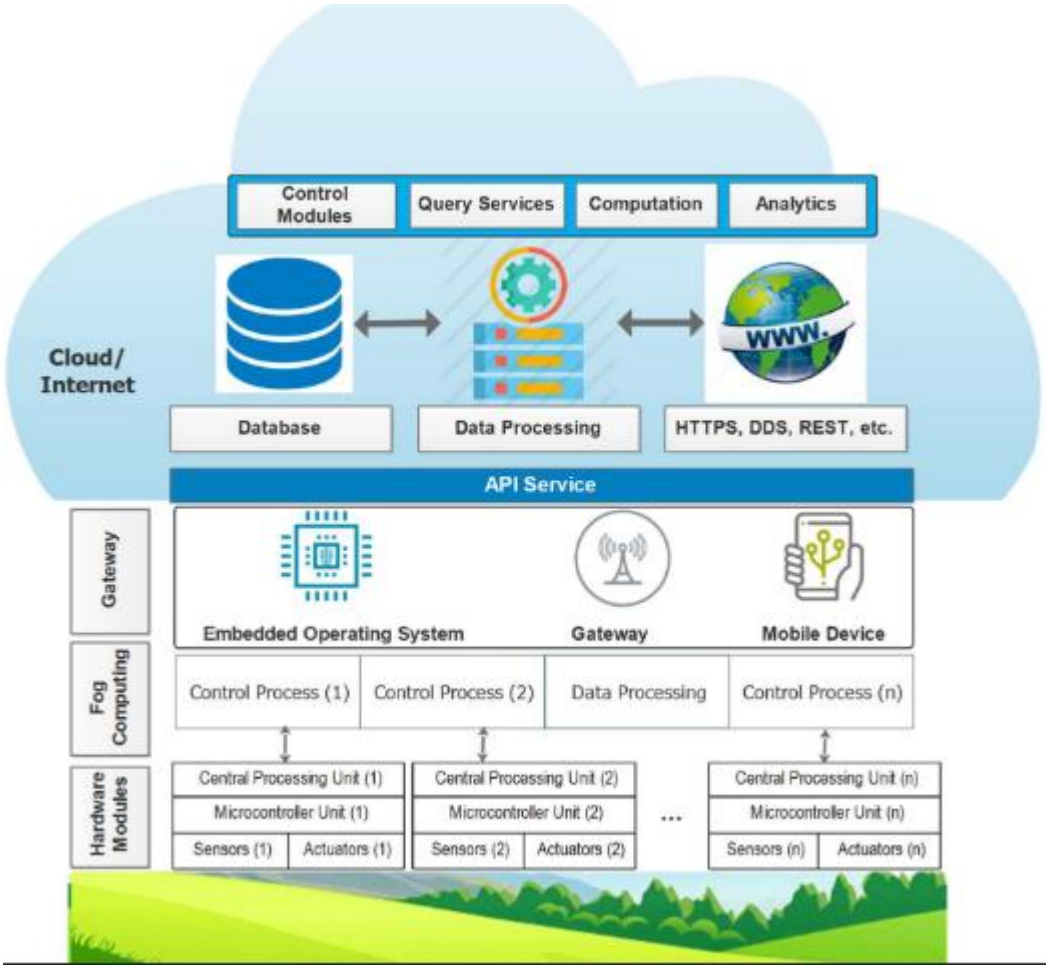

Figure 5: IoT based precision agricultural platform

(Source: www.mdpi.com)

The Internet of Things (IoT) has the potential to transform the agricultural sector in India by creating more efficient, sustainable and profitable practices. IoT technology can be used to monitor crop health, soil moisture, and weather conditions in order to optimize the farming process and reduce wastage (Mohanty, S.P., *et al* 2021). IoT can also be used to track the movement of livestock, monitor water resources, and identify pests and diseases. Additionally, it can be used to automate the irrigation process, reduce the need for manual labor, and even help farmers identify and

connect with new markets. These advances can help Indian farmers increase their productivity, reduce costs, and maximize their profits.

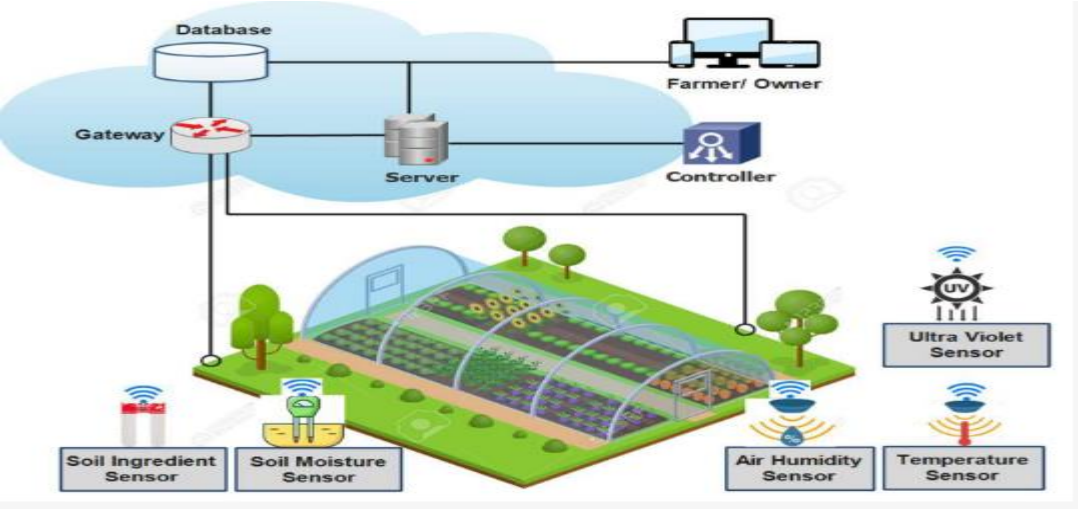

Figure 6: IoT application for monitoring farming conditions

(Source: www.mdpi.com)

Conventional agricultural practices are changing into smart farming as farmers are incorporating new technology, such as precision agriculture, automated systems and sensors, to increase productivity and reduce their environmental impact. Precision agriculture is a practice that uses GPS guided tractors and combines to minimize inputs and maximize yields. Automated systems and sensors allow farmers to collect data quickly and accurately, allowing them to make informed decisions (Satpute, V.R., *et al* 2019). This data can be used to optimize crop growth, such as when and where to apply fertilizer, pesticide, and water. Smart farming also includes the use of drones and robotic machines to monitor crop health, detect pest or disease outbreaks, or assess soil conditions. Additionally, farmers are using data analytics to monitor their crops and make better decisions. By using these tools, farmers can become more efficient, increase yields, and reduce their environmental impacts.

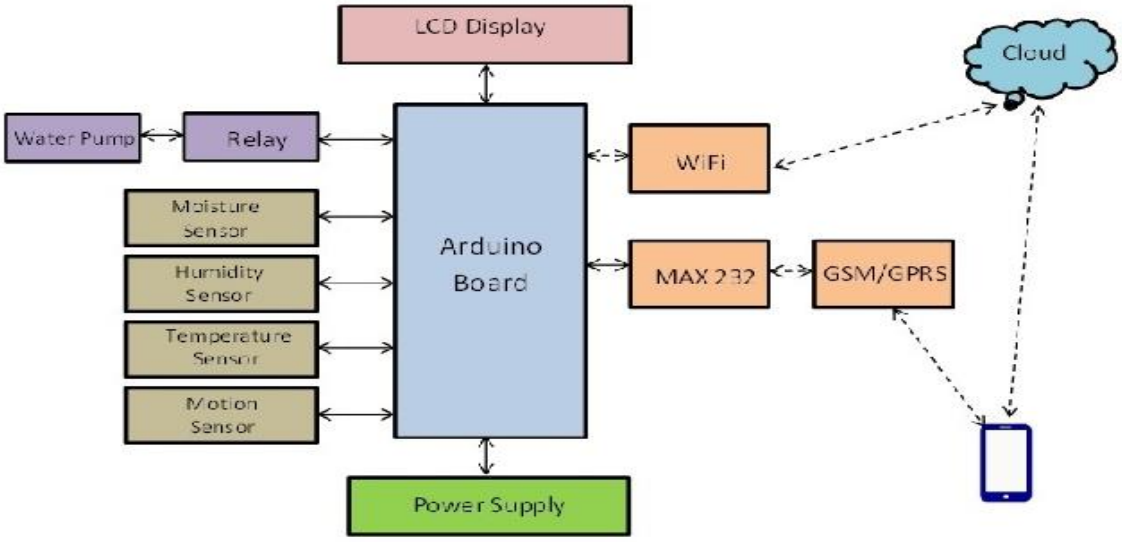

Figure 7: IoT application architecture

(Source: www.semanticscholar.org)

The future scope of IoT in agriculture in India is very bright. IoT technology can help farmers increase their crop yield and productivity, reduce wastage of resources, improve the quality of their products, and automate the entire process. IoT technology can also be used to monitor soil health, water quality, and weather conditions, in order to predict crop yield and adjust farming practices accordingly. IoT powered precision agriculture can help farmers reduce costs, increase efficiency, and ultimately maximize the profits from their farmlands (Arora, S., *et al* 2020). This system will enable farmers to monitor their crops more closely and make more informed decisions about their farming practices. Additionally IoT can be used to automate agricultural processes and simplify the management of agricultural supply chains. The Government of India has also taken initiatives to promote the use of IoT in agriculture, such as setting up digital agriculture zones and providing incentives to farmers to adopt IoT enabled farming practices.

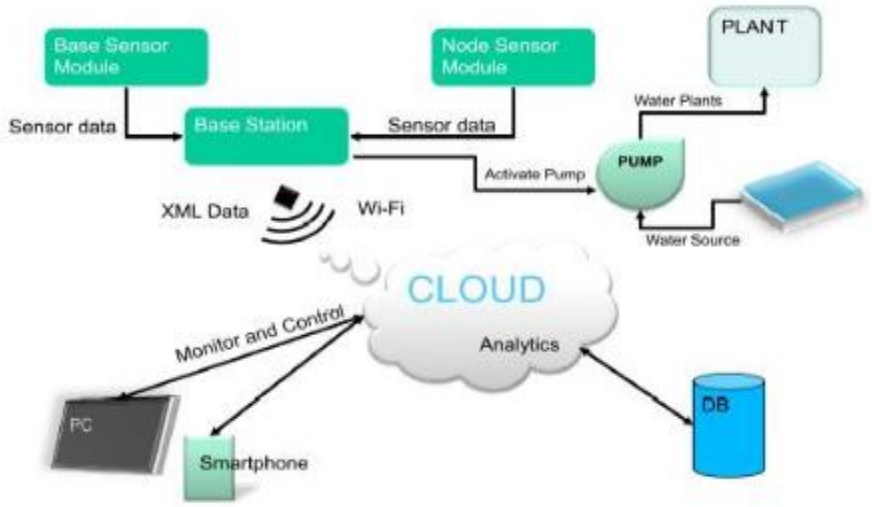

Figure 8: Architecture of the sensor

(Source: jase.tku.edu.tw)

The cost of deploying IoT in agriculture in India can vary depending on the type and scale of the project. Generally, the cost of a basic IoT system in agriculture can range from around rupees fifty thousand to rupees 1.5 lakhs. Additionally, the cost of maintaining the system can range from rupees five thousand to rupees ten thousand per month. IoT based precision agriculture in India is the use of Internet of Things (IoT) technology to improve the efficiency of Indian agriculture. This includes the use of sensors and other IoT devices to monitor solid, water and weather conditions, crop yields, and other factors that affect crop health. The data then can be used to optimize irrigations, fertilizer, and pesticide applications, and to optimize planting and harvesting times. This helps farmers reduce costs, increase yields, and improve the overall sustainability of their operations. **[*Refer to Appendix 1*]**

Conclusion

The IoT based farming system in India promises to revolutionize traditional farming practices and usher in a new era of digital agriculture. This system will enable farmers to monitor their crops more closely and make more informed decisions about their farming practices. With the increasing availability of mobile devices, sensors, and cloud computing, farmers will have access to real time data and insights to help them optimize their production. The benefits of an IoT based farming system in India are numerous and include improved yields, increased efficiency, better

management of resources, and reduced costs. All of these factors will help farmers to become more profitable, which in turn will contribute to India's economic growth.

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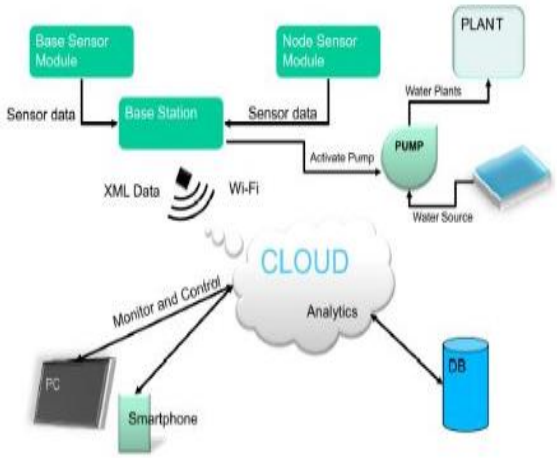
Appendices

Appendix 1: Architecture of the sensor



(Source: jase.tku.edu.tw)