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IoT based Smart Farming

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Abstract – *Technologies like Internet of Things (IOT) has revolutionized each and every aspect of an individual's life by introducing intelligence and smartness into the systems. The main aim of combining farming and an intelligent IOT system is to make it cost-effective and reduce the production of waste. The IOT based Smart farming system proposed here is integrated with Arduino, essential sensors and a Wifi module that can collect useful data to generate a smart system. This system can be tested on actual fields to improve its performance.*

Key Words: IOT, Arduino, sensors, Wi-Fi module

1. INTRODUCTION

The main technology used here is IOT. IOT can be defined as the combination of 2 components that have been used to name it: Internet and Things. Things represent the actual physical entities such as sensors, computing units, communication equipment etc., whereas the Internet represents the connection and inter-relation between these Things. This system will enable a farmer to collect data regarding the physical quantities such as soil content including moisture, composition of gases, seed health, fertility etc. remotely before continuously sending it to a central analytical system through a communication network consisting of Wi-Fi modules and gateways. The farmer based on the analysis can take decisions to improve his crops.

1.1 IOT Enabling Technologies

IOT proves to be a very strong support system in various upcoming non-technical apparatuses. The major components of IOT are:

WSN: Wireless sensor networks have nodes and sensors to accumulate various sorts of data.

Communication Protocols: It is the most important components that ensures connectivity and exchange of data over the entire system.

Embedded System: It has both software and hardware to perform pre-defined tasks.

Big Data Analytics and Cloud Computing: Cloud computing makes it ubiquitous with features like IaaS, PaaS, SaaS, Daas and the Big Data methods help in analysis.

1.2 Benefits of IOT Based Smart Farming

1. Data access, collection and management will easy.
2. Accuracy of these systems will improve food product quantity and quality.
3. Land use efficiency will increase drastically.
4. IOT systems may lead to cost effectiveness, improving sustainability and profitability for the farmers.

2. MODULES AND COMPONENTS

2.1 Arduino Uno

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

2.2 Wi-Fi Module

ESP8285 is a Wi-Fi module developed by Espressif systems. It is used in Internet of Things. It uses the Microprocessor Tensilica Xtensa Diamond Standard 106 Micro created by the company Tensilica. This module has VOIP, APSD, and Bluetooth interfaces with power consumption <1mW.

2.3 Moisture Sensor SEN-13322

It consists of two electrodes and it depends on the resistance of the soil between the electrodes: the wetter the soil, the more conductive it is (the less resistance it has). Those aren't quite reliable, and they're often very cheap to produce and quick to degrade.

2.4 Alternating Current Adapter

An AC adapter, AC/DC adapter, or AC/DC converter is a type of external power supply, often enclosed in a case similar to an AC plug. Other common names include plug pack, plug-in adapter, adapter block, domestic mains adapter, line power adapter, wall wart, power brick, and power adapter.

3. ALGORITHM

STEP 1: START.

STEP 2: CONNECT TO EACH MODULE AND INITIATE ALL DEIVCES AND NODES.

STEP 3: COLLECT DATA LIKE TEMPERATURE, HUMIDITY, MOISTURE ETC.

STEP 4: PROPOGATE DATA TO CLOUD STORAGE.

STEP 5: FEED DATA TO A BIG-DATA ANALYSIS MODULE.

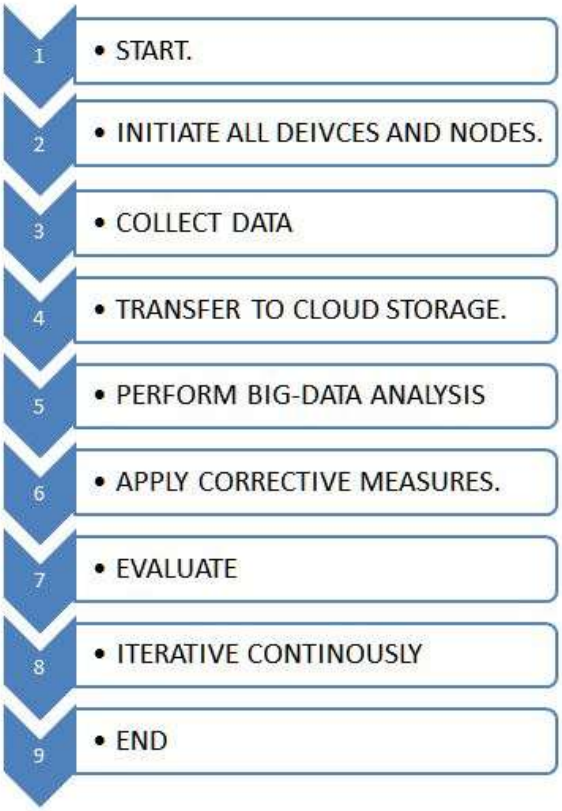
STEP 6: GENERATE CORRECTIVE MEASURES.

STEP 7: EVALUATE THE BEST OPTION.

STEP 8: REPEAT UNTILL EXPECTED RESULT.

STEP 9: END.

4. FLOW CHART



5. FUTURE SCOPE

This system due to its vast applications, flexibility and usability can extend its to millions of users. The study of observed trends can be seen as follows:

Year	Number of Users
2000	6.2 Million
2010	24.9 Million
2020	96.3 Million
2030	132.3 Million
2040	278.5 Million
2050	496.9 Million

Tab 1.1. These figures are estimated from study presented by Agriculture dept. of Illinois University.

6. CONCLUSION

An efficient and extremely helpful Smart Agriculture System has been put forth, which was formed by collaborating natural process of farming with the cutting-edge technology, IOT.

7. REFERENCES

[1] E. Borgia, D. G. Gomes, B. Lagesse, R. Lea, and D. Puccinelli, Internet of Things: Research challenges and Solutions".," vol. 89, no. 90, pp. 1–4, 2016.

[2] R. Jain, "A Congestion Control System Based on VANET for Small Length Roads", vol. 2, no. 1, pp. 17–21, 2018, DOI: 10.33166/AETiC.2018.01.003.

[3] P. Tadejko, "Application of Internet of Things in logistics-current challenges," vol. 7, no. 4, pp. 54–64, 2015.

[4] A. Mazayev, J. A. Martins, and N. Correia, "Interoperability in IoT Through the Semantic Profiling of Objects," IEEE Access, vol. 6, pp. 19379–19385, 2018.

[5] J. Cooper and A. James, "Challenges for database management in the internet of things" IETE Technical Review,vol.26,no.5,pp.320–329,2019