SMART FARMER USING IOT

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ABSTRACT

Internet of Things (IoT) technology has brought revolution to each and every field of common man's life by making everything smart and intelligent. IoT refers to a network of things which make a self-configuring network. The development of Intelligent Smart Farming IoT based devices is day by day turning the face of agriculture production by not only enhancing it but also making it cost-effective and reducing wastage based Smart Farming System assisting farmers in getting Live Data (Temperature, Soil Moisture) for efficient environment monitoring which will enable them to increase their overall yield and quality of products. The IoT based Smart Farming System being proposed via this report is integrated with Arduino Technology mixed with different Sensors and a Wifi module producing live data feed The product being proposed is tested on Live Agriculture Fields giving high accuracy over 98% in data feeds.

INTRODUCTION

OVERVIEW

The objectives of this report are to proposed IoT based Smart Farming System which will enable farmers to have live data of soil moisture environment temperature at very low cost so that live monitoring can be done. The structure of the report is as follows: chapter I will cover over of overview of IoT Technology and agriculture-concepts and definition, IOT enabling technologies, IOT application in agriculture, benefits of IOT in agriculture and IOT and agriculture current scenario and future forecasts. Chapter 2 will cover definition of IOT based smart farming system, the components and modules used in it and working principal of it. Chapter 3 will cover

algorithm and flowchart of the overall process carried out in the system and its final graphical output. chapter IV consist of conclusion, future scope and references.

IOT TECHNOLOGY AND AGRICULTURE

CONCEPT AND DEFINITION

Internet of things IOT consists of two words Internet and Things. The term things in IOT refers to various IOT devices having unique identities and have capabilities to perform remote sensing, actuating and live monitoring of certain sort of data. IOT devices are also enable to have live exchange of data with other connected devices and application either directly or indirectly, or collected data from other devices and process the data and send the data to various servers. The other term internet is defined as Global communication Network connecting Trillions of computers across the planets enabling sharing of information. Thus, the IOT can be define as:" A dynamic Global Network Infrusture with self-configuring capabilities based on standard and inter operable communication to protocol where physical and virtual things have identities, physical attributes, and virtual personalities and use intelligent interfaces and are seamlessly integrated into the information network, often communicate data associated with user and their environment."

An ideal IoT device consists of various interfaces for making connectivity to other devices which can either be wired or wireless. IoT devices can be of various forms like wearable sensors, smart watches, IoT smart home monitoring, IoT intelligent transport systems, IoT smart health devices etc.

IOT APPLICATIONS IN AGRICULTURE

With the adoption of IoT in various areas like Industry, Homes and even Cities, huge potential is seen to make everything Intelligent and Smart. Even the Agricultural sector is also adopting IoT technology these days and this in turn has led to the development of IOT.

BENEFITS OF IOT IN AGRICULTURE

The following are the benefits of IoT in Agriculture:

- IoT enables easy collection and management of tons of data collected from sensors and with integration of cloud computing services like Agriculture fields maps, cloud storage etc., data can be accessed live from anywhere and everywhere enabling live monitoring and end to end connectivity among all the parties concerned.
- IoT is regarded as key component for Smart Farming as with accurate sensors and smart equipment's, farmers can increase the food production by 70% till year 2050 as depicted by experts.

OVERVIEW OF THE PROJECT

DEFINITION IOT BASED SMART FARMING SYSTEM

IoT based SMART FARMING SYSTEM is regarded as IoT gadget focusing on Live Monitoring of Environmental data in terms of Temperature, Moisture and other types depending on the sensors integrated with it. The system provides the concept of "Plug & Sense" in which farmers can directly implement smart farming by as such putting the System on the field and getting Live Data feeds on various devices like Smart Phones, Tablets etc. and the data generated via sensors can be easily shared and viewed by agriculture consultants anywhere remotely via Cloud Computing technology integration. The system also enables analysis of various sorts of data via Big Data Analytics from time to time.

COMPONENTS AND MODULES

In this section, various components and Modules being used for IoT based SMART FARMING SYSTEM development is discussed:

ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328(datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs),6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button

SENSORS

TEMPERATURE SENSOR-DS18B20

The DS18B20 temperature sensor provides 9-bit to 12-bit Celsius temperature measurements and has alarm function with non-volatile user-programmable upper and lower trigger points. The DS18B20 has 64-bit serial code which allows multiple DS18B20s to function on same 1-wire bus. Technical Specifications: Unique 1-Wire.

POWER SUPPLY

RECHARGEABLE BATTERY

The sealed lead-acid (SLA) 12V, 9Ah rechargeable battery is rated at a 5-hour (0.2) and 20-hour (0.05C) discharge. Longer discharge times produce higher capacity readings because of lower losses. The lead-acid performs well on high load currents. This battery act as an internal power supply for the whole circuit.

BATTERY CHARGING CIRCUIT WITH TRANSFORMER

The circuit acts as a 12-volt battery charger for Lead Acid battery. It gives 12 volt and 5 Amps current for quick charging of the battery. If the battery is partially discharged, full charge will be attained in one hour. The circuit is connected with a 0–14-volt 5 Ampere Step down transformer to convert AC to DC. Since pulsed DC is good for Lead Acid battery, a low value smoothing capacitor is used in the circuit. In the circuit, LED act as the Charger on status a 12V AC adapter can also be considered as a component in the circuit for external power supply for the circuit which enabled the circuit to be

switched ‘ON’ in case if the battery power is very low for use. The adapter can directly act as an AC/DC convertor to provide pure DC current externally to the circuit.

Literature Survey

Agriculture is essential to India's economy and people's survival The method is intended to help farmers increase their agricultural output. A pH sensor, a temperature sensor, and a humidity sensor are among the tools used to examine the soil. Based on the findings, farmers may plant the best crop for the land. The sensor data is sent to the field manager through Wi-Fi, and the crop advice is created with the help of the mobile app. When the soil temperature is high, an automatic watering system is used. The crop image is gathered and forwarded to the field manager for pesticide advice.

Development of an effective loT-based smart irrigation system is also a crucial demand for farmers in the field of agriculture. This research develops a low-cost, weather-based smart watering system. In real time, these field weather variables are stored in a remote database. Finally, based on the present weather conditions, a weather prediction algorithm is employed to manage water distribution. Farmers would be able to irrigate their crops more efficiently with the proposed smart irrigation system.

Smart agriculture is a novel concept since IoT sensors can offer information about agricultural regions and then act on it based on user input. The purpose of this study is to develop a smart agricultural system that utilizes cutting-edge technologies such as Arduino, Internet of Things, and wireless sensor networks. Through automation, the research tries to take use of emerging technologies such as the Internet of Things (IoT) and smart agriculture. The capacity to monitor environmental factors is a critical component in increasing crop efficiency. The purpose of this study is to develop a system that can monitor temperature, humidity, wetness, and even the movement of animals that might damage crops in agricultural areas using sensors, and then send an

SMS notification as well as a notification on the app developed for the same to the farmer's smartphone via Wi-Fi/3G/4G if there is a discrepancy.

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