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SMART AGRICULTURE USING IoT

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ABSTRACT

This project presents a forward-thinking strategy for modernizing agricultural techniquesby integrating diverse IoT elements and implementing Arduino-based control systems. This initiative utilizes various sensors, including the Light Dependent Resistor (LDR), soil moisture sensor, Passive Infrared (PIR) sensor, and DHT11, to oversee and regulate various agriculturalparameters.The operation of the system is as follows: When the LDR sensor detects insufficient lightconditions, it initiates the activation of lights through a relay. This ensures that crops receive adequate illumination, even during periods of low light, which promotes optimal growth.Furthermore, in situations where the soil moisture sensor detects inadequate moisture levels, an automatic water pumping motor is triggered using another relay, ensuring the crops receive thenecessary irrigation.To protect crops from potential animal threats, the system employs a PIR sensor. Upon activation, a voice module is triggered, emitting bee-like sounds to discourage animals from entering the agricultural area. Concurrently, an electric fence is activated through a separate relay, providing an extra layer of protection. The DHT11 sensor gathers environmental data, encompassing temperature and humidity, and subsequently displays this information on an LCDscreen.Additionally, the system integrates a GSM module to transmit this data to a web server, enabling farmers to remotely monitor conditions. Besides remote monitoring, the GS*M* module also enables SMS notifications, alerting farmers to significant environmental changes.

Keywords: Transmit the data, web Server cloud, Encompasing Temperature and Humidity, DHT11, Voice Module.

INTRODUCTION

This project proposes an innovative approach by utilizing IoT and Arduino-based automation to get beyond the drawbacks of traditional agricultural approaches. To monitor and regulate important components of agricultural activities, we have integrated a variety of sensors and control elements into this system. A relay is used to turn on lights when the LDR sensor senses a lack of light, ensuring constant crop illumination during the night. The device starts a

water pumping motor through a differentrelay in times of low soil moisture, ensuring timely watering. A speech module also uses honey bee noises to scare away animals when a PIR sensor detects their intrusion, and another relay is used to activate an electric fence at the same time.

Data on temperature and humidity are gathered by the DHT11 sensor and shown on an LCD screen for on-site monitoring. Additionally, this data is uploaded to a web server using a GSM module, allowing farmers to monitor their crops remotely. For farmers to be informed of crucial changesin the environment, SMS warnings are also provided. By addressing the shortcomings of existing practices, this proposed solution improves agricultural output, optimizes resource utilization, and offers real-time monitoring and control. Giving farmers the knowledge and resources they need to preserve their crops, make wise decisions, and ultimately support more productive and sustainable agricultural practices.

LITERATURE SURVEY

[1] **Abhishek Srivastava** and **Ravi kumar** in have designed a working model of **Monitoring of Soil Parameters**

and Controlling of Soil Moisture through IoT Based Agriculture(2020) successfully. In these process SmartAgriculture system using IoT to monitor soil parameters and control soil moisture.

[2]**Yang Yang** in have designed a working model of **Design and Application of Intelligent Agriculture Service**

System With LoRa-based on Wireless Sensor Network.(2020) successfully.In these project an IntelligentAgriculture Service System utilizing LoRa-based Wireless Sensor Networks (WSNs).

[3] **Mohamed Rawidean and Mohad kassim** in have designed a working model of **IoT Applications in Smart Agriculture: Issues and Challenges(2020)** successfully.The project focuses on addressing challenges and issuesrelated to IoT applications in smart agriculture.

[4] **Limin Yu and Sha Tao** in have designed a working model of **Eco-climate Intelligent Monitoring System of an Agricultural Science- And-Technology Park Based on Internet of Things.(2021)** successfully.The project proposes an Eco-climate Intelligent Monitoring System for an Agricultural Science and Technology Park utilizingIoT technology.

PROPOSED SYSTEM

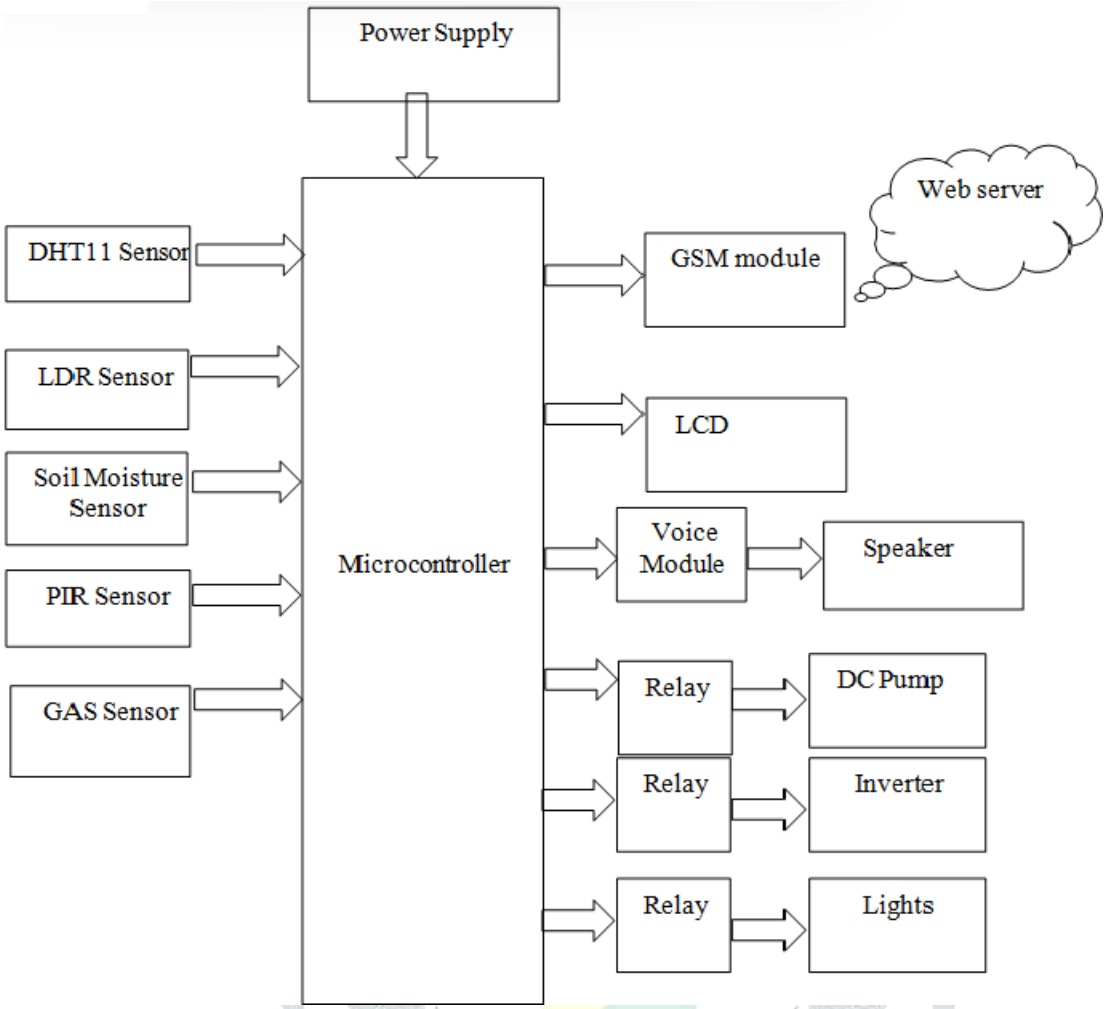

Fig: Block Diagram

It an innovative approach by utilizing IoT and Arduino-based automation to get beyond the drawbacks of traditional agricultural approaches. To monitor and regulate important components of agricultural activities,we have integrated a variety of sensors and control elements into this system.

EXPERIMENTAL RESULTS

- In this project, the integrates sensors, IoT connectivity, and Enhancement of Smart Agriculture using IoTWith Arduino uno as the core component, it enables real- time data collection and analysis.The system empowers users with actionable insights to address monitoring effectively.

FIG:LCD DISPLAYS TEMP VALUE **Fig.b:The LCD display soil moisture value**

Fig.c:The lcd display ldr value

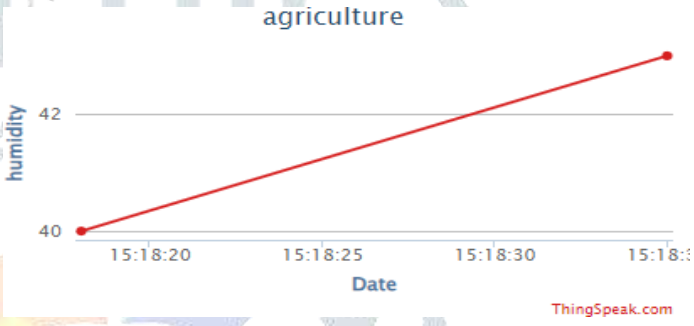

Fig.e:The lcd display moving object detect **Fig.f:Thingspeak values**

The sensor values are uploaded in Thingspeak server (IOT). These are the field values uploadedaccording to the specific sensors and measurements that are used in dustbin monitoring system. Remember to ensure that the data format and types match the requirements of the Thingspeak platform that are using.

CONCLUSION

In conclusion the integration of IoT technologies with components like Arduino, sensors,LEDs, relays, DC pumps, GSM, LCDs, APR9600, and M inverters presents a powerful solution for enhancing agricultural productivity and automation. The synergy of these devices enables real-time monitoring and control of crucial factors such as soil moisture, temperature, light, and security. The use of Arduino as a central hub ensures seamless communication and processing of data from various sensors, leading to informed decision-making. The incorporation of smart components like GSM modules facilitates remote management, while the inclusion of DC pumps and M inverters optimizes resource utilization. This holistic approach not only empowers farmers with actionable insights but also contributesto sustainable and efficient farming practices, showcasing the potential of IoT in revolutionizing modernagriculture.

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