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IOT BASED SMART AGRICULTURE SYSTEM

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ABSTRACT

Smart Husbandry is an arising generality, because IOT detectors are suitable of furnishing information about husbandry fields and also act upon rested on the stoner input. In this Paper, it's proposed to develop a Smart husbandry System that uses advantages of cutting edge technologies similar as Arduino, IOT and Wireless Sensor Network. The paper target at making use of evolving technology i.e. IOT and smart husbandry using robotization. Monitoring environmental conditions is the major factor to ameliorate yield of the effective crops. The point of this paper includes development of a system which can cover temperature, moisture, humidity and indeed the movement of beasties which may destroy the crops in agrarian field through detectors using Arduino board and in case of any distinction shoot a SMS announcement as well as a announcement on the operation developed for the same to the planter's smartphone using Wi- Fi/ 3G/ 4G. The system has a duplex communication link rested on a cellular Internet interface that allows for data examination and irrigation scheduling to be programmed through an android operation. Because of its energy autonomy and low cost, the system has the implicit to be useful in water limited geographically insulated areas.

Keywords: Arduino, Soil Moisture Sensor, ESP-01, Etc.

I. INTRODUCTION

India has husbandry as its primary occupation. According to IBEF (India Brand Equity Foundation), 58 of the people living in pastoral areas in India are dependent on husbandry. As per the Central Statistics Office 2nd advised estimate, the donation of husbandry to the Gross Value Addition India) is estimated to be roughly around 8 which is veritably significant donation. Under such a script, the operation of water especially the fresh water resource by husbandry will be enormous and according to the current request checks it is estimated that husbandry uses 85 of available brackish coffers worldwide, and this chance will continue to be dominant because of population growth and increased food demand. This calls for planning and strategies to use water sensibly by exercising the advancements in wisdom and technology. There are numerous systems to achieve water savings in colorful crops, from introductory bones to more technologically advanced bones . One of the being systems use thermal imaging to cover the factory water status and irrigation scheduling. robotization of irrigation systems is also possible by measuring the water position in the soil and control selectors to wash as and when demanded rather of predefining the irrigation schedule, therefore saving and hence exercising the water in a more sensible manner. An irrigation regulator is used to open a solenoid stopcock and apply watering to coverlet shops(enthusiasm, petunia, salvia, and vinca rosea) when the volumetric water content of the substrate drops below a setpoint. The arising global water extremity In addition to managing failure and conflict between water druggies, the available fresh water is farther defiled by the mortal and carnal population and the pollution situations have increased at an intimidating rate. This if continues, will be leading to limitation of food product which in turn will affect the mortal productivity and therefore the entire ecosystem will be affected in the times to come. The primary and the most important reason for this problem is the tremendous increase in the population which has increased at a rate which is faster than the food product rate. This population growth especially in water short countries will directly have an impact on its growth on the world chart. The food product needs to be increased by at least 50 for the projected population growth. Agriculture accounts for 85 of brackish consumption encyclopedically. This leads to the water vacuity problem and therefore calls for a sincere trouble in sustainable water operation. For a variety of reasons, doable expansion of irrigated husbandry will be suitable to accommodate only a portion of this increased demand, and the rest must come from an increase in the productivity of rain fed husbandry.

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II. WORKING PRINCIPLE

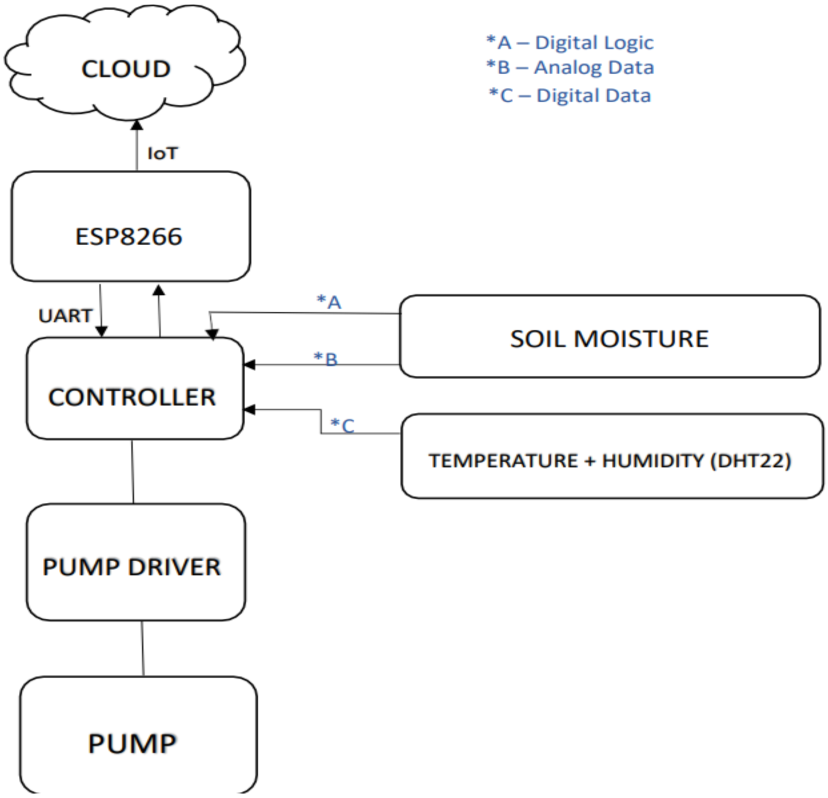

Figure 1: Block Diagram

III. REQUIREMENT ANALYSIS

1) Arduino

Arduino is an open-source hardware and software platform designed for building digital devices and interactive objects. It was created to make electronics more accessible to artists, designers, hobbyists, and anyone interested in creating their own electronic projects. Arduino provides a user-friendly and flexible environment for programming and building with microcontrollers.

Figure 2: Arduino

2) Soil Moisture Sensor

A soil moisture sensor is a device used to measure the moisture content of soil. It is a crucial component in agricultural and gardening applications to monitor soil conditions and optimize irrigation. Soil moisture sensors are commonly used in conjunction with microcontrollers like Arduino to create smart irrigation systems.

Figure 3: Soil Moisture Sensor

3) LCD Display Interface with Arduino

Connecting an LCD (Liquid Crystal Display) to an Arduino allows you to display information, text, or numbers in a user-friendly format. There are various types of LCD displays, but one of the most common types is the 16x2 character LCD, which can display two rows of 16 characters each.

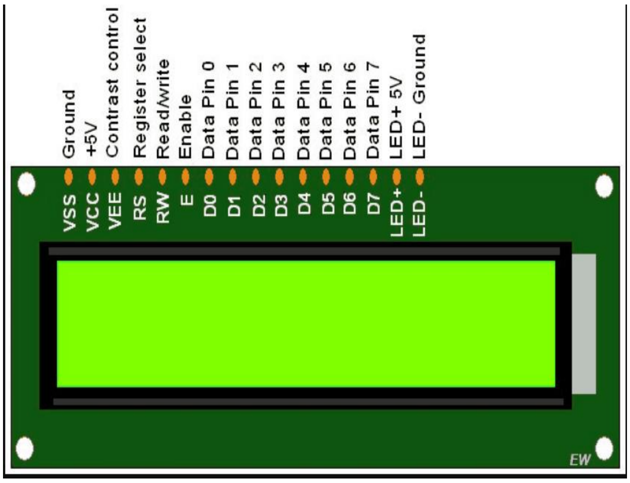

Figure 4: LCD Display

4) ESP-01

The ESP-01 is a compact and cost-effective Wi-Fi module that is widely used for Internet of Things (IoT) and wireless communication projects. It is based on the Espressif ESP8266 microcontroller, which offers Wi-Fi connectivity and can be programmed with Arduino or the ESP-IDF (Espressif IoT Development Framework). Despite its small size, the ESP-01 provides impressive capabilities for IoT applications, with features such as GPIO pins for digital and analog inputs and outputs, support for Wi-Fi networking, and the ability to connect to the internet, making it suitable for various IoT and smart device projects.

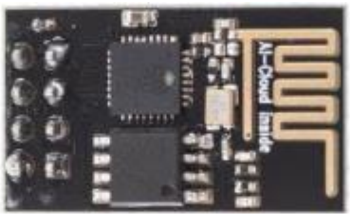

Figure 5: ESP-01

5) DHT22

The DHT22, also known as the AM2302, is a popular and versatile sensor for measuring temperature and humidity. It is frequently used in electronic projects, particularly those related to weather monitoring, home automation, and climate control systems. The DHT22 sensor is known for its accuracy and reliability, offering a wide temperature measurement range and a respectable humidity measurement range. It communicates with microcontrollers like Arduino through a single-wire digital interface, making it relatively easy to integrate into various projects. The sensor provides both temperature and humidity data, which can be read and processed using libraries and code readily available in the Arduino ecosystem and other development platforms.

Figure 6: DHT 22

IV. PROJECT IMPLEMENTATION

To implement a project using the DHT22 sensor for temperature and humidity measurements, you'll need to follow a series of steps. First, wire the DHT22 sensor to your Arduino board by connecting the VCC pin to 5V, the Data pin to a digital pin (e.g., pin 2), and the GND pin to ground. Next, install the necessary libraries, specifically the "DHT sensor library" and the "Adafruit Unified Sensor" library, in the Arduino IDE. With the libraries in place, you can proceed to write the Arduino code. A basic code example initializes the sensor, reads temperature and humidity data, and displays it through the serial monitor. After uploading the code to your Arduino, you can monitor the real-time data on the serial monitor.

For more advanced applications, you can connect additional components, such as LCD displays, data loggers, or IoT modules, to extend the project's functionality. The DHT22 sensor can be integrated into a variety of projects, including weather stations, environmental monitoring systems, and home automation setups, allowing you to gather and utilize precise temperature and humidity data for decision-making or automation tasks. This project serves as a fundamental introduction, and you can customize and expand it to align with your specific requirements and objectives.

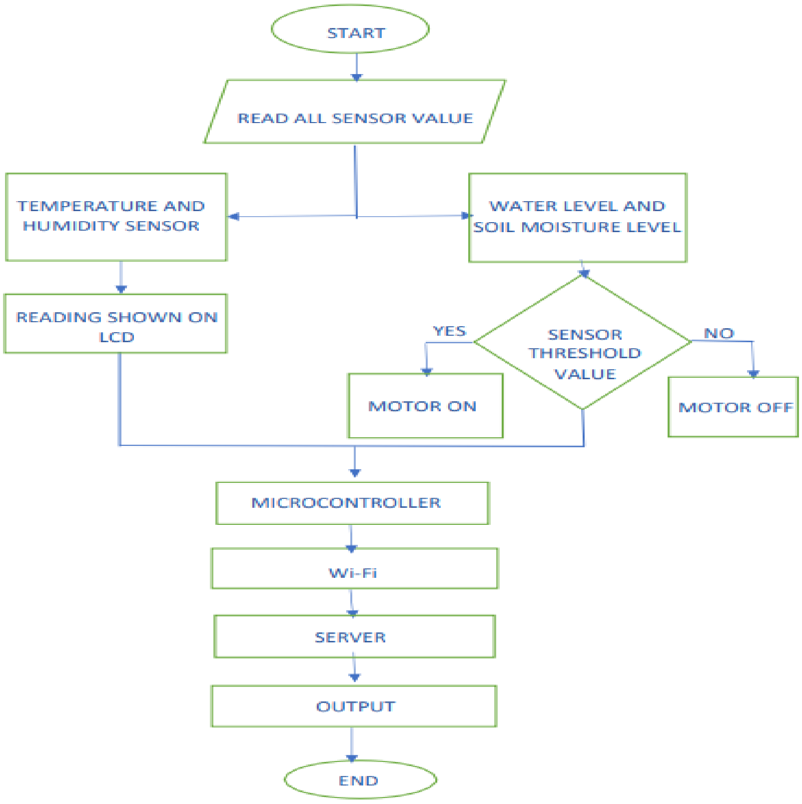

Figure 7: Flowchart

V. RESULTS AND DISCUSSION

The results section presents key findings and data from a project or experiment, while the discussion interprets and contextualizes those results. It examines implications, acknowledges limitations, and suggests future research directions, providing a comprehensive understanding of the research's significance and potential impact.

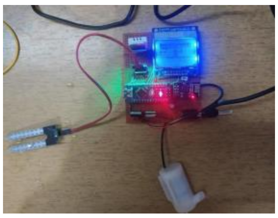

Figure 8: Prototype in on condition

VI. CONCLUSION

The DHT22 sensor, with its ability to measure temperature and humidity, presents an accessible and valuable tool for a range of electronic projects. By following the steps outlined in the implementation process, you can successfully integrate this sensor with an Arduino board. This enables real-time monitoring and data collection, offering valuable insights into environmental conditions. Whether used in weather stations, home automation systems, or environmental monitoring applications, the DHT22 sensor empowers you to make informed decisions, automate processes, and create solutions tailored to your unique needs. The flexibility and versatility of this sensor make it an essential component for a wide array of projects, reflecting the power of DIY electronics in addressing real-world challenges and fostering innovation.

VII. REFERENCES

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