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SMART AGRICULTURE MONITORING SYSTEM USING ATMEGA328P

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ABSTRACT

Internet of Thing (IOT) plays a important role in smart agriculture system. Smart agriculture helps to reduce the farmer work it works automatically or farmer can operate it from anywhere. Smart agriculture monitoring system used wireless sensor network that collect all live information from different sensors and send that data through wireless protocol. Sensors that are used in system provides information about agriculture field. This project is developed to monitor crop-field using sensors (Soil Moisture Sensor, Rain Sensor, Temperature and Humidity Sensor). The notification sent to farmer mobile periodically.

Keywords: Measuring Soil Moisture, Humidity And Temperature Of The Field Also Rain Alert System, SMS Alert.

I. INTRODUCTION

Most of the peoples in India are depends on farming and farming is main source for those peoples. We saw from previous 10 years the food prices are constantly growing because quality of crop has dropped due to which crop is getting less and price is growing. Number of factors are affect on the crop that causes due to soil fertility most of the time, fertilizer misuse, climate changed or diseases and water little etc. This all overcome by using smart agriculture monitoring system it gives sufficient water time to time when field needs water this is done by using soil moisture sensor also in rainy season it used to alert farmer using rain sensor. Temperature and Humidity sensor is used to measure the climate changes. Float sensor is used to measure the water level in well and other water sources level float sensor indicate the water level and using that measure water level pump will start when soil needed water. If well has no water then using other IOT module this system shows alert to farmer mobile by calling to farmer or by SMS. In this system we are using ATmega328p microcontroller. All sensors are connected with ATmega328p and it take output values from sensors and it sends to farmer by using GSM module and our IOT server through WIFI module (ESP8266).by using IOT we send the collected data directly to central server in real time. Means we have automatic data collection data processing is done using computers.

A. Agricultural Sensors

1) Soil Moisture Sensor:

The soil moisture sensor is used to measure water content in soil the sensor has both digital and analog outputs the electrodes of soil moisture sensor are inserted in soil. the moisture in the soil is indirectly by the conductivity of soil. The soil moisture sensor produce an output voltage according to resistance by measuring resistance we can determine soil moisture level. if the soil is more conductive means resistance is low then more water in the soil and it have better conductivity. If the soil is less conductive means resistance is high means it has low conductive. The operating temperature of sensor is in ranges from -40degree Celsius to +60 degree Celsius and operating current is 14mA.

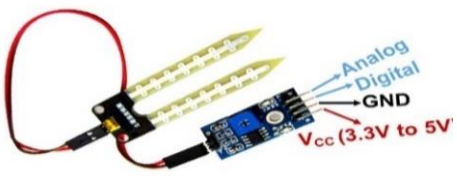

Fig 1: Soil Moisture Sensor

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2) DHT22 Sensor

The DHT22 sensor is a basic and low cost sensor the output of the sensor is in digital form. It uses a thermistor for temperature and a capacitive humidity to measure the surrounding air and split out a digital signal no analog pin is needed. It provide temperature and humidity readings it is most widely used sensor in DHTxx series the DHT22 sensor measure temperature from -40° C to +125°C with accuracy of ±0.5°C. DHT22 sensor measure humidity from 0 to 100% with an accuracy of 2-5%. The operating voltage of sensor is ranges from 3 to 5V.

Fig 2: DHT22 Sensor

3) Rain Sensor:

The rain sensor is used to rain detection. Its resistance inversely proportional to amount of water. If more water on the surface of rain sensor then it has lower resistance and when less water on surface of rain sensor its result into a higher resistance which means sensor produce output voltage according to resistance. A typical rain sensor has two component sensing pad and electronic module according to the resistance output voltage produce by module.

Fig 3: Rain Sensor

II. MODELING AND ANALYSIS

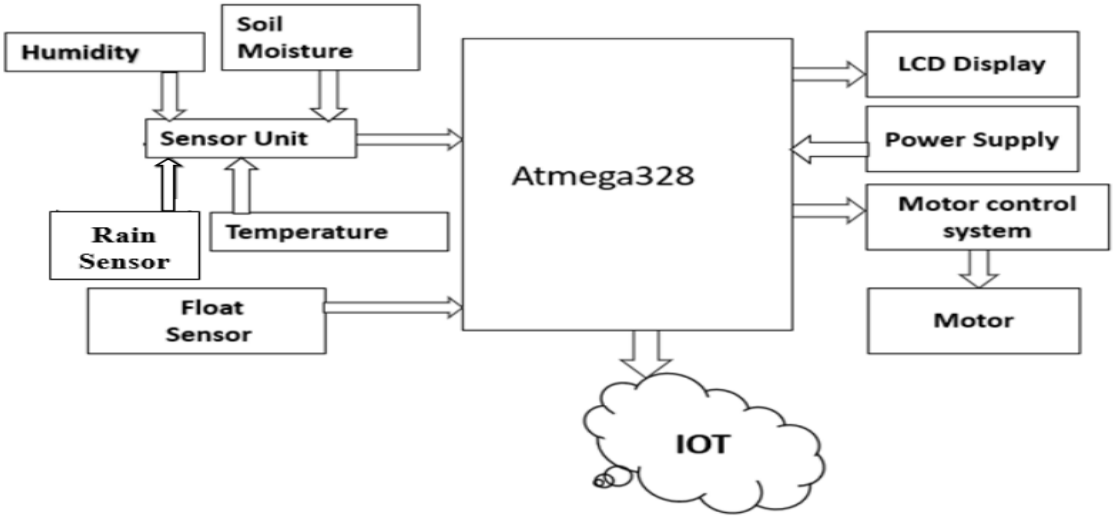

Fig 4: Block Diagram of Smart Agriculture Monitoring System

1. **Collection of Sensory Data:** All data from sensors is collected and given to ATmega328P microcontroller.
2. **Wireless Data Transfer:** Data obtained from the sensors is transferred to a web using WIFI module.
3. **Decision Making:** The pump will automatically turn on when moisture level in soil falls below the threshold.
4. **Web Application:** Web design is used to monitor the field from anywhere with internet.
5. **Mobile Application:** The mobile app is used to controlled the system from anywhere.

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III. RESULTS AND DISCUSSION

In this chapter, we will discuss the actual result of system. This System Work automatically by measuring the surrounding atmosphere conditions and when the pump is start or stop system gives alert to farmer. This technology is used to save water.

IV. CONCLUSION

All This paper is used to brief the Smart Agriculture Monitoring System Using IOT. This technique will explain the used of IOT in the real world problem solving. It collect all data from sensors and send the data to the users via cloud. This system increase the productivity and also increase the quality. It reduce the farmer working time.

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V. REFERENCES

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