

IOT BASED SMART AGRICULTURAL MONITORING SYSTEM

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Abstract - In India, Now a day Agriculture plays the most important role for human to survive in this world. From the beginning agriculture has suffered, lots of changes to improve productivity of foods and crops. Agriculture has been affected by weather conditions such as extreme temperature and humidity. The next step is to develop the agricultural by proposing the technology called Internet of things. The solution for this problem is solved by smart agriculture monitoring system using IOT. IOT technology is the complete solution to increase the productivity of crops in agriculture. The main advantage of this project is to implement the IOT technology will optimize the usage of fertilizer, will helps to identify the weather conditions of the field by using sensors, we can also easily identify the moisture content of the soil, will assist to provide the ripening stages of the vegetables and also helps to know the movement of the animals while entering into the field. GSM modem is used to send SMS notification which displays the current status of the agricultural fields to indicate the farmers.

Key Words: Arduino Uno, IOT, GSM, color sensor, temperature and humidity sensor, soil moisture sensor, water level indicator, motor.

1. INTRODUCTION

As the world is developing into new technologies and implementation agriculture has also to be trend up. IOT plays a very important role in smart agriculture. Monitoring the environmental factors is not the complete solution for crop productivity. There are number of other factors that decrease the productivity to the greater IOT helps in assembling of information such as climate humidity, temperature, animal intrusion, fruit maturity stage. To provide solutions to all such problems develop an integrated system which monitor all factors affecting the productivity in every stage. But complete automation is not possible due to various reasons. To monitor all these above Parameters we have used some of the smart devices like sensors and internet, through internet all devices are connected and controlled. Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination

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1.1 OBJECTIVE

The aim of our project is, to sense the condition of the field and indicate the ripening stage of the vegetable by using colour sensor, using GSM an SMS notifications are send to the farmer mobile, in case of any discrepancy. By using IOT technology, the farmers can easily monitor the growth of the crops. The other goal is to increase the crops productivity and the farmers can also avoid their health issues.

2. LITERATURE SURVEY

1] In this, This research paper deals with an IOT based application for sustained farm practice by sensing the soil moisture from the soil using the soil moisture sensor module, communicating over internet. **2]** An IOT based advanced solution for monitoring the soil conditions and atmosphere for efficient crop growth is presented. **3]** This system set the irrigation time depending on the temperature and humidity reading from sensors and type of Crop and can automatically irrigate the field. The information is exchanged via SMS on GSM network, **4]** . This research paper deals with an IOT based application for sustained farm practice by sensing the soil moisture from the soil using the soil moisture sensor module, communicating over internet

3. PROPOSED METHODOLOGY

The system will be plays as most vital role among our farmers. Because we have use effective components to improve our crops yield and productivity. The components are Temperature and Humidity sensor used to sense the temperature as well as air level, Soil moisture sensor used to detect the moisture level in soil, Animal crossing and it's movement will be detect by PIR sensor, a motor is used when soil moisture's level will become dry and then it will be activated by water in the pump, a water level indicator is fitted with the pump, another motor is also used to spray the fertilizer's water by a week. Finally, a colour sensor is used to detect the stages of a fruit (white: flower, light green:

before mature, thick green: mature, red: ripened fruit). And the alert are displays in 16x2 LCD display by connecting Wi-Fi module. So all these circuits are connected to a adaptor for power supply. By using this method we can save Time ,No harm for the human ,can spray normal water instead of fertilizers during summer, IOT based smart system.

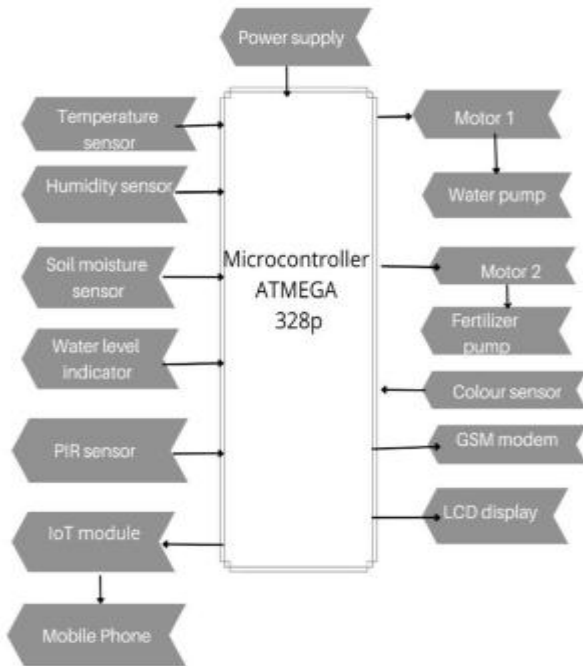


FIG 1-BLOCK DIAGRAM

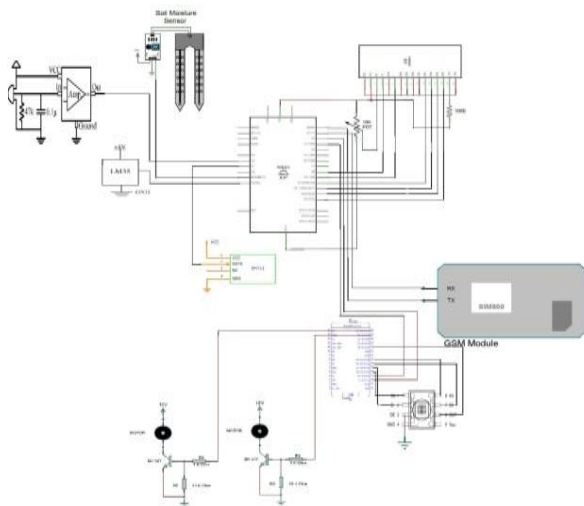


FIG 2-CIRCUIT DIAGRAM

4. TECHNICAL BACKGROUND

4.1 HARDWARE DESCRIPTION

The system structure represents the connection of the individual components

(Arduino, node MCU, color, color sensor, Soil moisture, GSM pair, LM35, Humidity, Water level, pump 2)

Arduino is the main controller unit and it control all components of analog sensor, LM35, Soil moisture. LM35 has three pins +5v, GND, out, Out pin is connected to A5 of Arduino. Soil moisture sensor has three pins of +5v, GND, out, out pin is connected to A4 of Arduino with digital sensor. Humidity sensor has three pins +5v, GND, out, out pin is connected to A3 of the Arduino also humidity has three pins +5v, GND, out, out pin is connected to A2 of Arduino. Water level sensor has 2 pins, these 2 pins are connected to 6th and 7th pins of Arduino. Color sensor is connected to node MCU with S0 to D4, S1 to D5, S3 to D6, S4 to D7, out to D8. Node MCU will get color and date is send to Arduino with serial communication pin. LCD has 6 main pins and 3- GND, 2- 5v and 1 Port with out pin. 6 pins are connected to Arduino of 8 to 13 pins respectively. In this, LCD of 4 bit programming are used. 2 Serial communication module with 1 GSM and 2 node MCU. GSM have 12v grndtxrx; tx to Arduino rx pin and rx to Arduino tx pin. Node MCU is also like controller and have inbuilt wifi connection of 5v to Vin, gnd to gnd. Tx to Arduino 2 pin and rx to Arduino 3 pin. Here, node MCU is connected as software serial of Arduino, it gets all data from Arduino and send all data to server. 12v adaptor will give 12v DC for Arduino, GSM need 12v with 7805 is used for regulat12v to 5v. Finally, 5v to all sensors of LCD and node MCU

4.2 SOFTWARE DESCRIPTION

Proteus

Proteus is used to simulate, design and drawing of electronic circuits. The software proteus has been used to show the working of the devices from the prototype of 'IOT Based Smart Agricultural Monitoring System'. The GPS module helps in finding the location of the person and it's sent to the registered users via short message service with the help of GSM module. LED operates based on the value of LDR. Also, A TCS 3200 sensor is used to indicate the final stage of fruit ripening . All the output of the devices are designed such that they'll appear in the virtual terminal.

4.2.1 EXPERIMENT RESULTS:

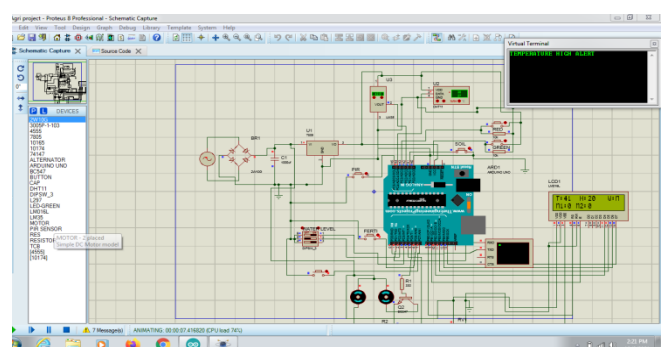


FIG 3-TEMPERATURE SENSOR

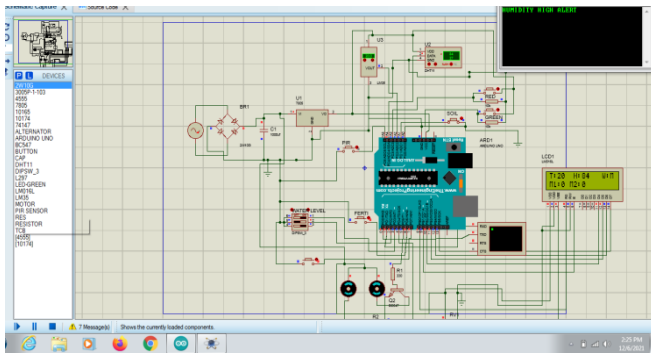


FIG 4-HUMIDITY SENSOR

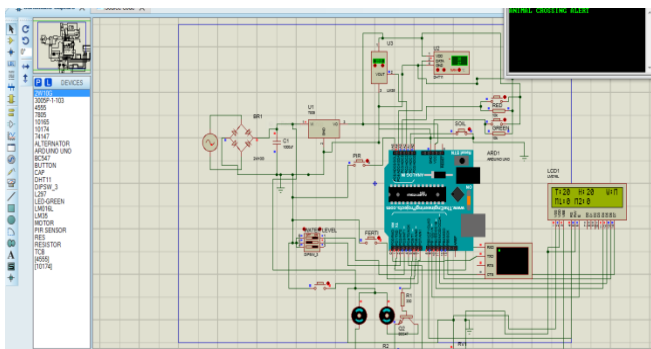


FIG 5-PIR SENSOR

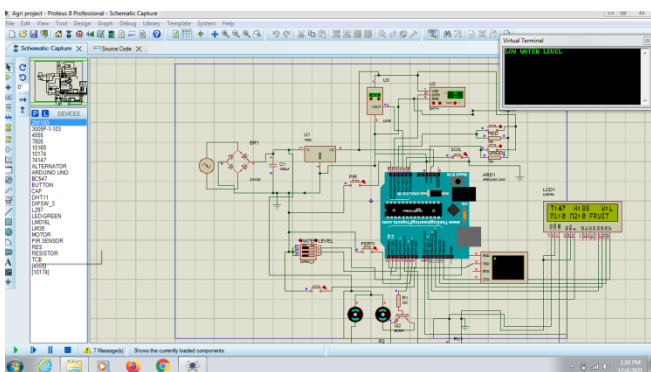


FIG 6-WATER LEVEL INDICATOR

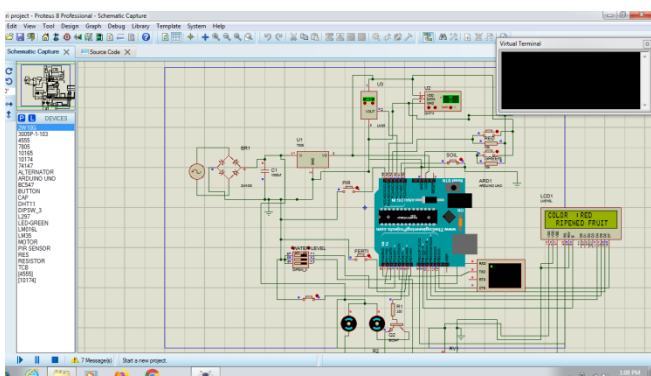


FIG 7-RIPENED FRUIT STAGE

5. BENEFITS

Increase the quality of food protection, improved livestock forming, remote monitoring, reduce environmental foot prints and farmers can easily response to any significant change in soil humidity quality as well as the health of each crop or soil in the field and no harm to human beings

6. CONCLUSION

The smart agricultural system on IOT will be useful to farmers in spraying fertilizers, animal intrusion detection and crop protection products while being controlled by a single person operating from a safe and secure location. All sensors will be maintain properly.

8. FUTURE SCOPE

With adverse climatic conditions, an Indian farmer can't predict and plan farming activities. Therefore there is a dire need for a system that could provide precise and accurate information about crop cultivation needs. Below are the few ways in which IOT will shape the future of agritech industry

9. REFERENCES

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