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Smart farming based on IoT monitoring system

Maheswari.D[1], Godhandaraman.B[2], Abinaya.M[3], Aswini.C[4]

Assistant Professor, Dept. of ECE, Agni College of Technology Chennai, Tamilnadu, India[1]

UG Student, Dept. of ECE, Agni College of Technology Chennai, Tamilnadu,India[2,3,4]

Abstract: Agriculture plays a vital role in the development of our country .Issues concerning agriculture have always hindering the development of the country. This project aims at monitoring system is helpful of watering the plants and to find the moisture in the soil with the help of moisture sensor and also finds the humidity Measurement of the factors using these sensors in agriculture can be reffered to as smart agriculture. A wireless solution for intelligent field irrigation system and surveillance the entire agriculture field with the help of cameras , its saves the farmers time to monitor the system , based on IOT technology was proposed in this paper.

Keywords: IoT, Smart agriculture, Monitoring, Time management.

INTRODUCTION:

The project is consist of monitoring the agriculture field with the help of the cameras and the necessary sensors like temperature, humidity and moisture sensors. It improves the yield of crops of all kinds it can reducing the time management and operational cost. Optimizing water usage and ensuring better land management and crop rotation.

The technology which plays a key role in the Internet of Things and the cameras are interface with the internet. It can helps to monitor the crop if we anywhere in the place through internet. Traditional agriculture is transforming into smart agriculture due to the penetration of the Internet of Things in the agriculture sector. The IoT network are reducing the human labour requirement of monitoring system. The sensor keep on eye on the monitoring the field and the motor drive and motor pump are connected to the microcontroller which is help to control the motor to turn “ON” and turn “OFF”. The motor depending upon the moisture and water level in the field. In This technology we can monitor the live field condition and to take corrective action.

II. REVIEW OF LITERATURE:

2.1 K.N., Mahadevaswamy H.S., Jasmine H.J,.”IoT based Smart System for Enhanced Irrigation Agriculture”, IEEE, 2020:

Internet of Things (IoT) is an interconnection of devices that can transfer information over the internet and to control operations without human interference. Agriculture provides a rich source of parameters for data analysis which helps in better yielding of crops. The usage of IoT devices in agriculture helps in the modernizing of information and communication in smart farming. The key parameters that can be considered for better growth of crops are soil types, soil moisture), mineral nutrients, temperature, light, oxygen and so on. Various sensors have been used to sense these parameters and communicate the same to the cloud. This paper considers a few of these parameters for data analysis that helps in proposing the users to take better agricultural decisions using IoT. The proposed system performed better and is implemented at Thing Speak IoT cloud platform.

2.2 , A.K. Saini, Himanshu Nigam,“An IoT Instrument Smart Agricultural Monitoring and Irrigation System”, IEEE, 2020:

These days, in the agriculture sector farmers are facing major problems regarding irrigation. Due to over- irrigation and under-irrigation, the crops can be damaged. This work development of an IoT instrumented smart agricultural monitoring and irrigation system. In this paper, an IoT platform based on Thing Speak and Node MCU is demonstrated, which will help the farmer to control the irrigation by using a PC or smart phone from anywhere and anytime, to monitoring the moisture and temperature parameter and reduce his efforts and also to optimize the use of water. Sensors value is sent to the IoT platform and if a value is below the threshold a notification will be sent to the user through E-mail to take suitable action.

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3.1 PROPOSED SYSTEM :

we are building a IoT based Irrigation System using IOT Module and surveillance the entire field with the help of cameras and Sensor. It will automatically irrigate the water based on the moisture level in the soil but also send the Data to Webpage Server to keep track of the land condition. Section 2 consist of an python programming language, which is used to defining the layout of the web page ,this web page is used to monitoring the Humidity value and moisture level . Section 3 the cameras are used to monitor the field . It is used to save the farmer time to monitoring the field.

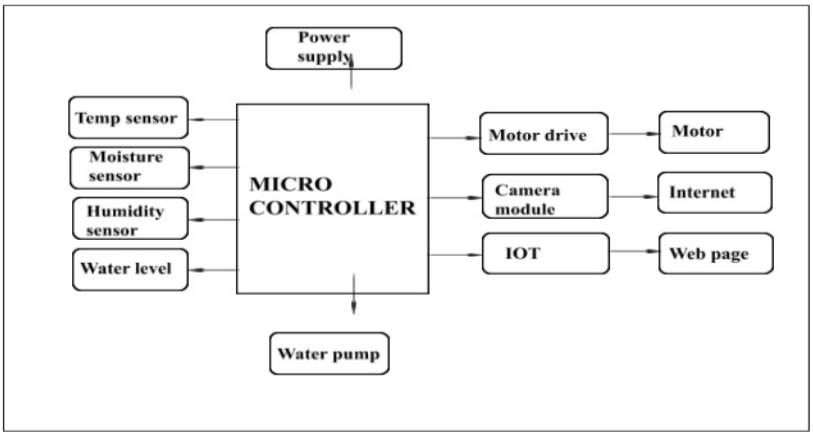

Fig 3.1 BLOCK DIAGRAM

3.2 EXISTING SYSTEM:

In the existing system of agriculture the crops are being monitored with the help of Arduino boards and GSM technology where in arduino boards acts as a micro controller but not as a server.

DESIGNED EMBEDDED SYSTEM:

An embedded system usually contains an embedded processor. Many appliances that have a digital interface microwaves, VCRs, cars utilize embedded systems. Some embedded systems include an operating system. Others are very specialized resulting in the entire logic being implemented as a single program. These systems are embedded into some device for some specific purpose other than to provide general purpose computing.

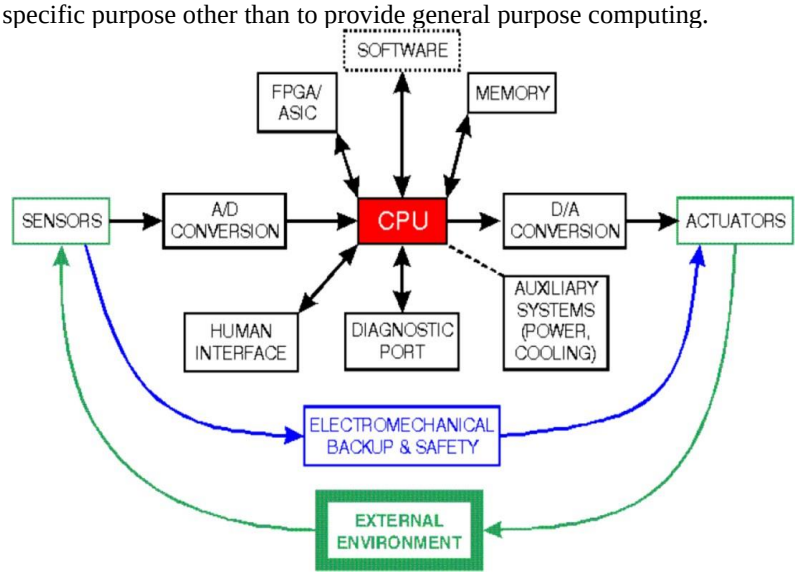

Fig 3.2 BLOCK DIAGRAM OF A TYPICAL EMBEDDED SYSTEM

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From the initial state of the project to the final fabrication the design considerations will be taken like the software consideration and the hardware components, sensor, input and output. The electronics usually uses either a microprocessor or a microcontroller. Some large or old systems use general- purpose mainframe computers or minicomputers.

IV. PROGRAM ANALYSIS FOR IMPLEMENTATION PROGRAM

4.1.1 Raspberrypi

The Raspberry Pi board contains a processor and graphics chip, program memory (RAM) and various interfaces and connectors for external devices (figure 4.2). Some of these devices are essential, others are optional. RPi operates in the same way as a standard PC, requiring a keyboard for command entry, a display unit and a power supply. It also requires 'mass-storage', but a hard disk drive of the type found in a typical PC is not really in keeping with the miniature size of RPi. Instead we will use an SD Flash memory card normally used in digital cameras, configured in such a way to 'look like' a hard drive to RPi's processor. RPi will 'boot' (load the Operating System into RAM) from this card in the same way as a PC 'boots up' into Windows from its hard disk.

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4.1.2 Power Supply :

The unit is powered via the microUSB connector (only the power pins are connected, so it will not transfer data over this connection). A standard modern phone charger with a microUSB connector will do, providing it can supply at least 700mA at +5 dc (figure 4.3). Check your power supply's ratings carefully. Suitable mains adaptors will be available from the RPi Shop and are recommended if you are unsure what touse.

4.1.3 Camera

FIG 4.1 LOGITECH CAMARA

Logitech HD Webcam comes fitted with auto focus wide-angles lens that has smaller focal length to capture more of yoursubjects.This type of lens goes well with indoors photography so that you can enjoy amazing images on your notebook or desktop at home or office.Moreover, with its up to 720p HD video-recording capacity (special PC configuration needed), you view high-quality HD picture on your monitor that is clear, sharp and detailed (figure 4.8).Colouralso look vivid and beautiful. Further, Logitech Fluid Crystal Technology enhances the video quality by making your chats' display fluid and flawless. Automatic Light Correction feature rectifies brightness-related errors to give you improved viewing experience.

RESULT OF THE STUDY

5.1 HARDWARE SETUP

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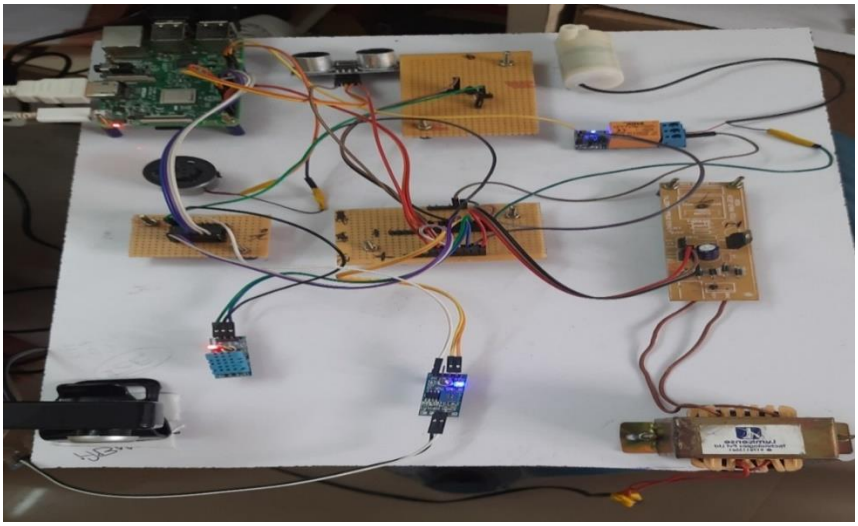

Figure 5.1 Hardware set up

5.2 Result For Switching ON and OFF of Motor.

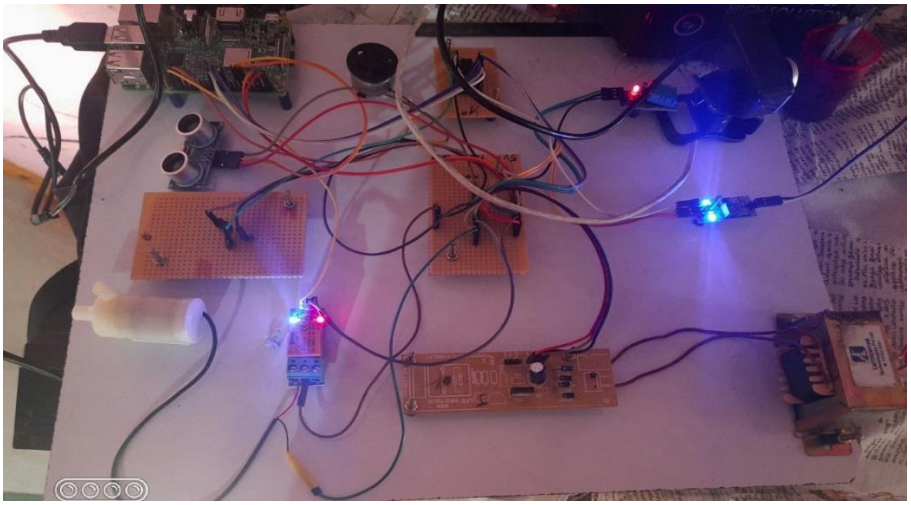

Figure 5.2 Pump Motor ON Output

5.3 Result For Displaying Software Output

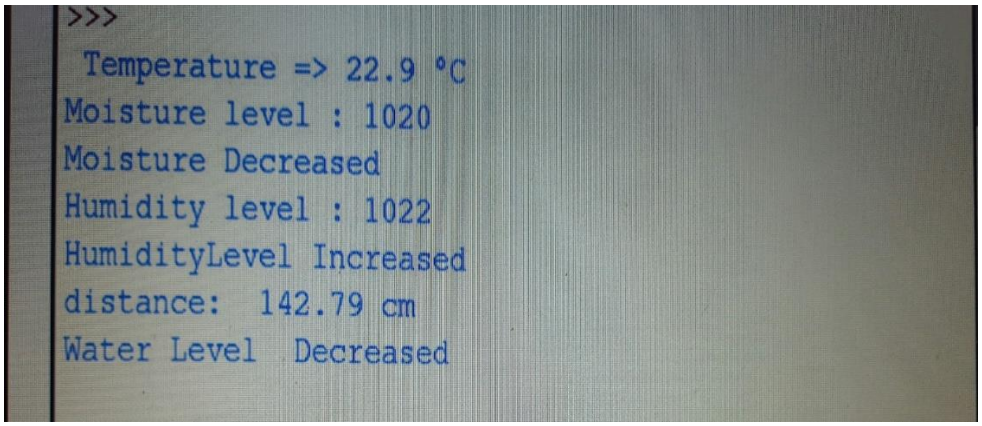

Figure 5.3 Temperature, Moisture, Humidity,Water Level Output.

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5.4 Result ForDisplaying Web Page Output.

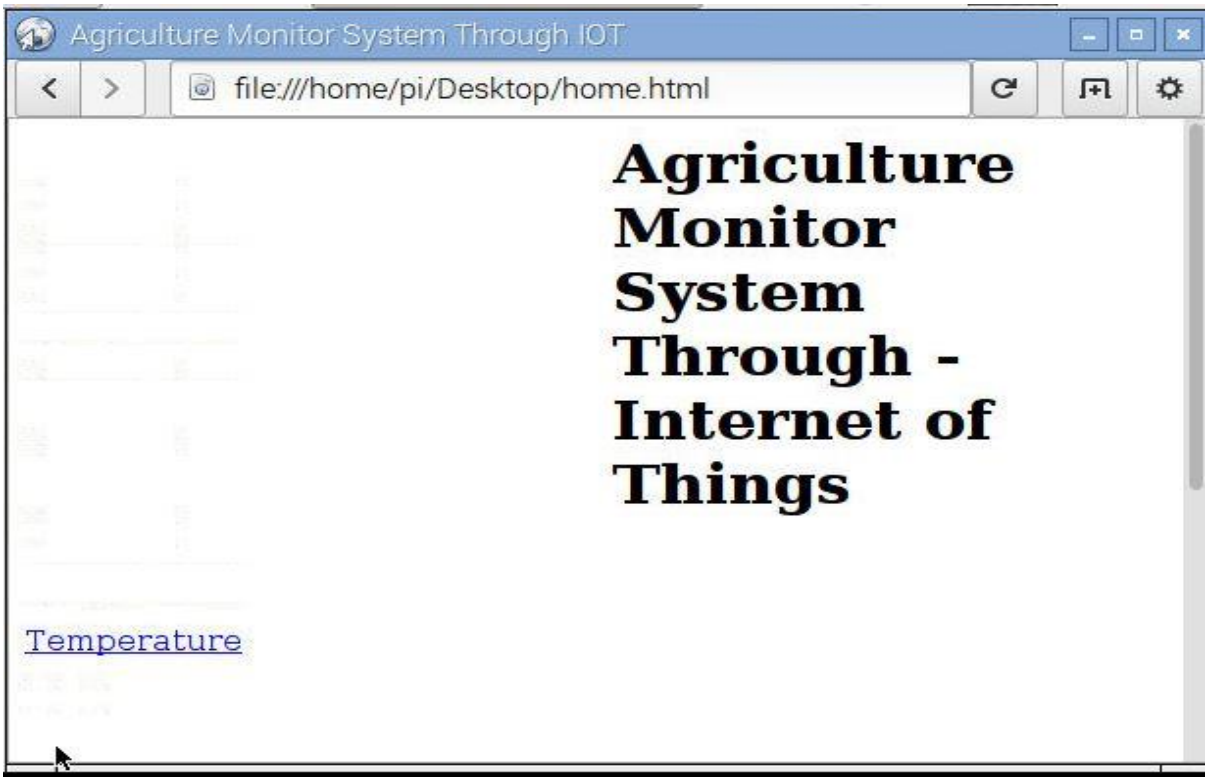

Figure 5.4 web page output

5.5 Result For Displaying Mail Notification Output.

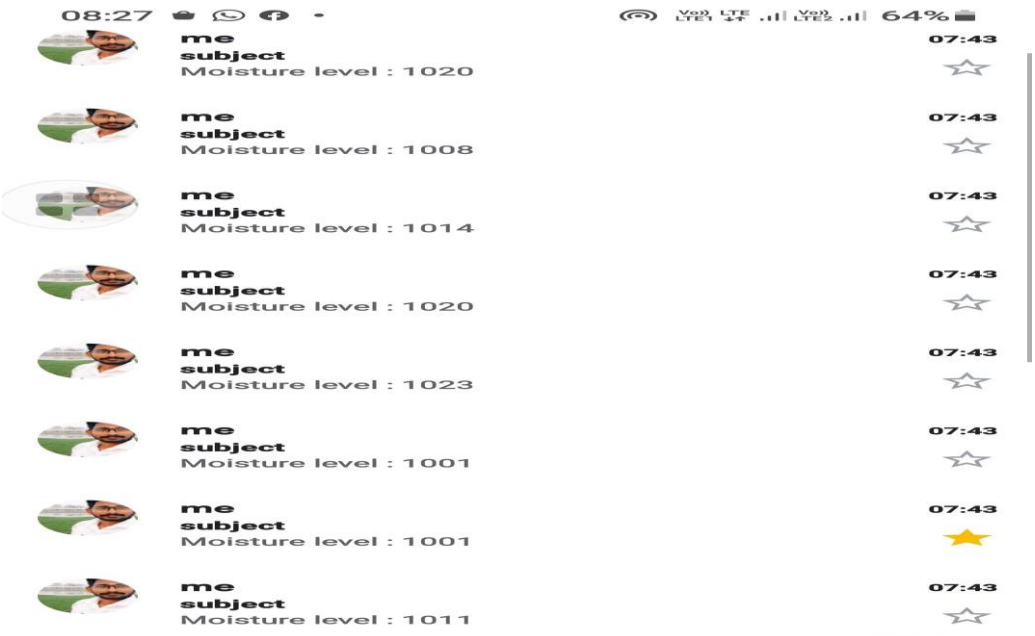

Figure 5.5 Mail Notification Output.

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VI. ADVANTAGES:

The main advantage of the smart agriculture is to reduce the farmers time It increases the crop yield. It reduces the human labour works at any time.Weather predictions and soil moisture sensors allow for wateruse only when and where needed

VII. CONCLUSION:

The smart agriculture project has been completed with the result of NPK value of the agriculture land. The default minerals present in the agriculture field is sodium, phosphorous, and potassium, the value of the minerals is mandatory for the cultivation. In this project the value has been demonstrated and the result has been verified. Including that temperature value and humidity value has been derived.

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