DEVELOPMENT OF HYBRID SYSTEM FOR SMART AGRICULTURE USING INTERNET OF THINGS

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Abstract:

The research device is intended to develop an Automatic Irrigation System that switches the ON/OFF pump motor to detect the soil's moisture content. The use of proper irrigation methods is significant in the field of agriculture. The benefit of using this technique is to decrease human interference and yet guarantee adequate irrigation. The unit uses a microcontroller of the raspberry pi series which is programmed via the sensing system to obtain the input signal of the soil's varying moisture state. Once this signal is received by the controller, it generates an output which drives a relay for the water pump to operate. To show the status of the soil and water pump, a display is connected to the controller.

Keywords: ***Raspberry pi, soil, temperature, humidity, pir sensor, ultra sonic sensor, turbidity, motor, gprs.***

I. INTRODUCTION:

Internet of Things The term Internet of Things (IOT) is a general definition for network devices' ability to sense and gather data from around us from around the world and then exchange that data over the Internet where it can be processed and used for various interesting purposes. The IOT consists of Interacting and interacting with other devices, artefacts, environments and infrastructures through smart machines. Development of technologies to improve agricultural production. Water saving is the most important challenge on dry land. It is also an essential factor in the survival of plants. Therefore, to prevent the plant from wilting, the humidity of the soil that determines the amount of water in the soil must be tested periodically, or it could die in the worst case. A system that tracks soil humidity and air temperature will be a part of the government's initiative to give the agricultural sector a new spirit. Established so that it can be used by end users such as farmers, gardeners, etc. to decide the exact time to sprinkle their plant to increase the efficiency of water usage in irrigation systems.

II. LITERATURE REVIEW:

Tomo Popovic.et.al (2017) [1] IoT sensor nodes including Arduino, Raspberry Pi, and Libelium Plug and Sense The stage has already been used for development of smart spraying and irrigation, valuation of the marine environment and fish/mussel farm monitoring

V. M. Abdul Hakkim et.al (2016) [2] GPS, GIS, Sensor Technology Comprises three phases including exploration, analysis and execution. Precision agriculture address both financial and environmental issues that edge production agriculture

Alessandro Massaro et.al (201) [3] ZigBee protocol, GSM / GPRS, DSS algorithm A cloud to a web platform for monitoring and activating electro valves of the irrigation network

Ibrahim khider Eltahir et.al (2018) [4] Sensors Solar Supply, Soil Humidity analysis is done. The prediction helps to supply the right quantity of irrigation to the crops.

III. EXISTING METHOD

In existing system an irrigation system mostly done by manuval operations only.In that system there is no sensing and sending information are thair in existing system, if the formaer is out side then very diffcult to pumping the water on the agri field.to overcome the drawbacks of existing system we are praposing iot based agricultural field monitoring and control system.

IV. PROPOSED METHOD:

In this praposed system we are using raspberry pi, temperature sensor, soil sensor, water lelve indicators and gprs modem. Here the raspberry collects the all the sensors information and updates the data on the gprs web page by using GPRS modem, ald also checks the field soil content and it is dry then after it will checks the water level of the well, if the well water level is high then the raspberry pi switch on the irrigation motor and when ever the field goes to wet then automatically the raspberry pi switch off the water pump and also update the water motor status on the gprs web page.

V. BLOCK DIAGRAM:

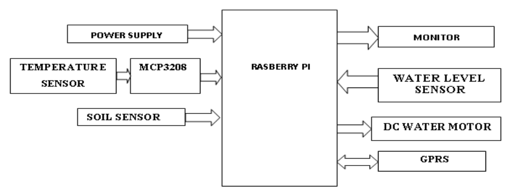


Fig 6.1: System block diagram

VI. SYSTEM OVERVIEW:

MICROCONTROLLER:

The Microcontroller forms the heart of this application because it controls the devices being interfaced and communicates with the devices according to the program being written. Here we are using raspberry pi to implementing this application

TEMPERATURE SENSOR:

Fig 7.1: Temperature Sensor

Thermistor is using to sensing the Environmental temperature.In this application thermistor is used to measuring the Agriculture field temperature.

SOIL SENSOR:

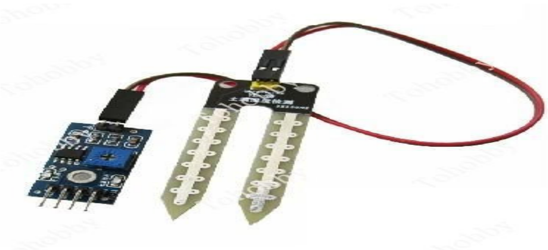


Fig 7.2: soil moisture sensor

Soil sensor is mainly used to checking the soil content in the particular field.

WATER LEVEL ELECTRODES:

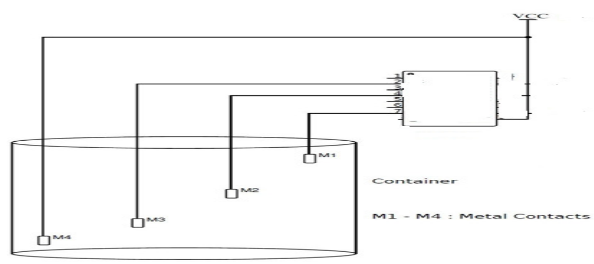


Fig 7.3: Water level Electrodes

The water level electrodes are mainly used to checking the water levels in the well or tank.

DC WATER MOTOR:

Fig 7.4: Dc Water Motor

The dc water motor is used to implementing to pumping the water to agriculture field.

GSM /GPRS Module:

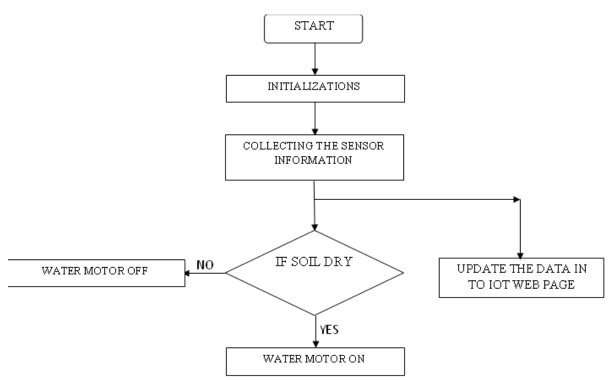
Fig 7.5: SIM 800 L GSM MODEM

GSM 800L module we are using to implement the IOT. This module is allows to perform different operations, this module is GPRS enabled GSM modem, and this modem operates with

VII. CONCLUSION

In this work, we are successfully developing a device that, by measuring the soil moisture level, can assist in an automatic irrigation system. The grounded sensors will provide warning of the need for water all over the farming land and it will be supplied accordingly. At the same time, we have configured an automatic solution to fill the water tanker when it is empty. In Our Future

IX. FLOW CHART:



X. RESULTS:

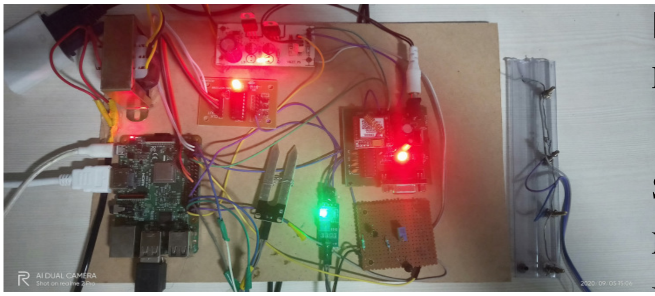


Fig 10.1: The above figure is showing the complete hardware setup of the project

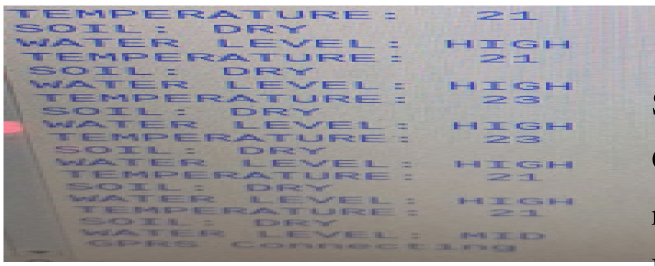


Fig 10.2: the figure is showing the output values on the GUI

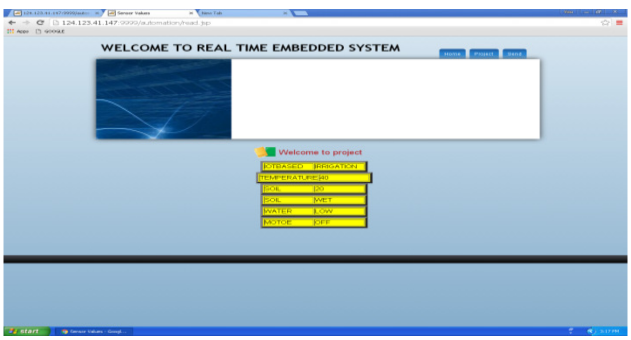


Fig 10.3: Updated Results on IOT Web Page

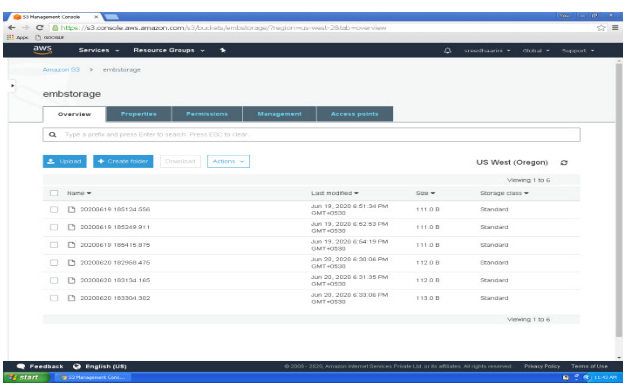


Fig 10.4: The figure is showing the data is stored on the Amazon cloud services

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