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# IOT BASED IRRIGATION MONITORING USING NODE MCU ESP8266

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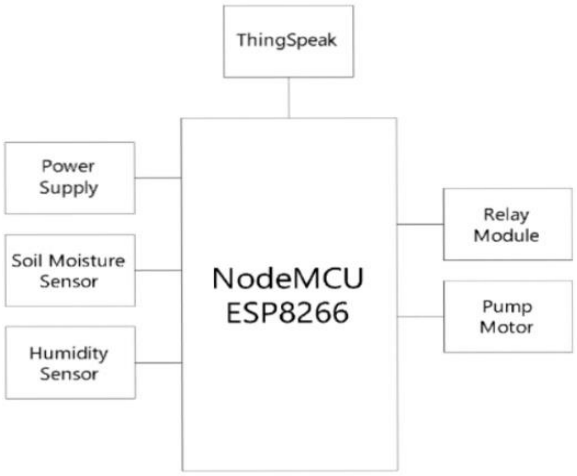
**Abstract -**Automation of farm actions can convert farming area as of presence labor-intensive and still to smart and lively principal to developed production with lesser human regulation. This paper proposes an automated irrigation system which maintains and monitors the chosen soil moisture content through automatic watering. Node mcu is used as controller unit. The format uses soil moisture sensors which measure the exact moisture level in soil. This value allows the system to use suitable amount of water which sidesteps over/under irrigation. IOT is used to keep the farmers updated about the grade of motor. Information from the soil moisture sensor, dht11 sensor is frequently updated on the Thing speak page through which a farmer can check whether the water motor is ON/OFF at any given time. Also, the sensor readings are transmitted to a Thing speak channel to generate graphs for analysis.

**Key Words-**IOT, Smart Agriculture [Irrigation], Humidity, Temperature, Soil Moisture

## 1.Introduction-

Irrigation is making use of water to the land artificially. water is one of the precious useful resource and important factor for farming. general troubles in farming is underneath watering or over watering the problems are nice explained with the aid of answering the easy query that when the water cycle began and the way long watered..?? underwatering is starting the water cycle too late and running it for no longer enough period due to this the crop may be damaged and it impacts the manufacturing. overwatering is beginning the water cycle too early and going for walks it for longer length than what it is essential by using doing this exercise the crop can be broken and manufacturing reduces. if human intervention is greater then this under and over watering takes vicinity due to small human errors. the primary object of this paper is to reduce human intervention and growth the irrigation performance by automating the irrigation system the use of sensors (moisture and dht11) and tracking via thing speak net web page. India owns agrarian economy with 70% of population depending upon agriculture immediately or in – at once [1]. in this sort of developing us a wherein digitization is given high precedence, technology is showing its optimization in diverse fields while it nonetheless calls for footprints into irrigation so present day smart move inside the discipline is significantly advocated.

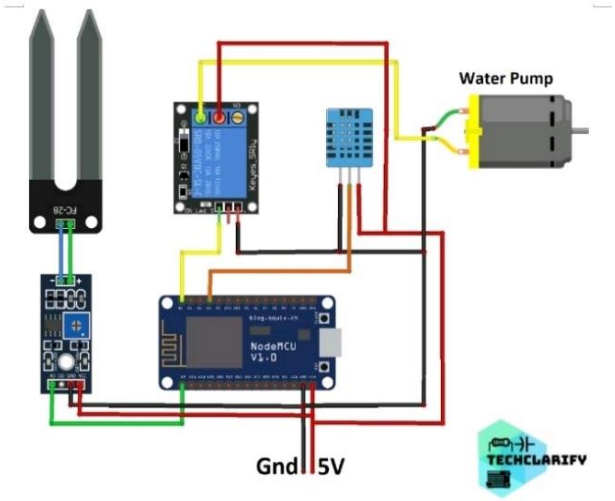
## 2. Block Diagram-




## 3.Working-

IOT based totally clever irrigation gadget which is capable of automating the irrigation procedure by way of analysing the moisture of soil and the weather circumstance. additionally the facts of sensors could be displayed in graphical form on thing speak cloud page.

## 4.CIRCUIT DIAGRAM-

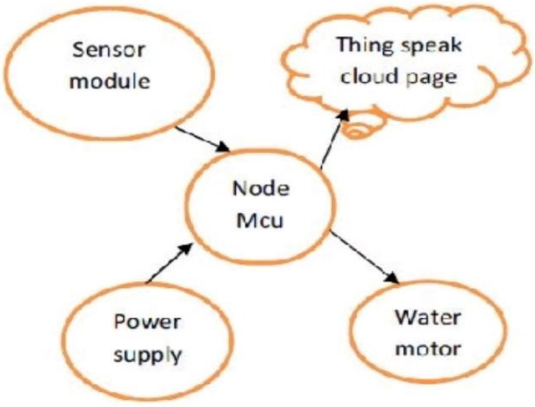



## 5.Components With Specifications-

### a. Node MCU ESP826

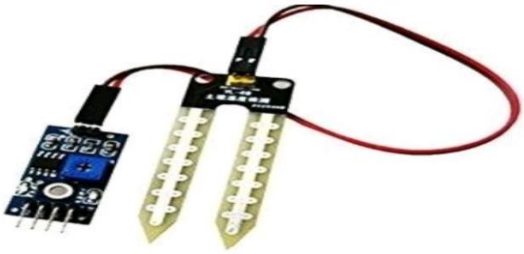
***Microcontroller:*** Tensilica 32-bit RISC CPU Xtensa LX106,***Operating Voltage***: 3.3V,***Input Voltage***: 7-12V,***Digital I/O Pins (DIO)***: 16,***Analog Input Pins***

***(ADC):*** 1,***UARTs***: 1,***SPIs***: 1,***I2Cs***: 1,***Flash Memory*:** 4 MB,***SRAM***: 64 KB,***Clock Speed*:** 80 MHz,USB-TTL based on CP2102 is included onboard, Enabling Plug n Play,PCB Antenna.



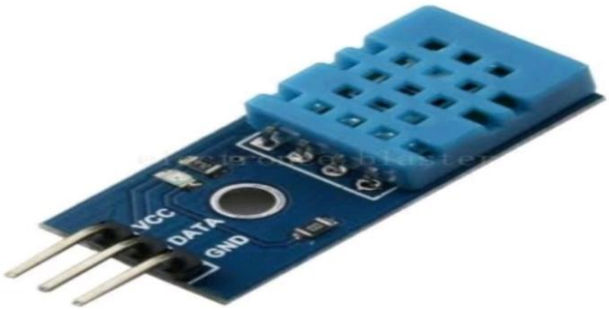

### b. Soil Moisture Sensor

***Operating Voltage:*** 3.3 to 5V,2 State Binary Output,Adjustable Sensitivity.



### c. Humidity Sensor – DHT11

***Adjustable Sensitivity Operating Voltage***: 3.5V to 5.5V,***Operating current***: 0.3mA (measuring) 60uA(standby),***Output***:Serial data,***Temperature Range:*** 0°C to 50°C,***Humidity Range***: 20% to 90%,***Resolution***: Temperature and Humidity both are 16-bit,***Accuracy***: ±1°C and ±1%




### d.Relay Module 1 Channel

***Trigger Voltage (Voltage across coil):*** 5V DC,***Trigger Current (Nominal current):*** 70mA,***Maximum AC load current:*** 10A @ 250/125V AC,***Maximum DC load current:*** 10A @ 30/28V DC,***Compact:***5-pin configuration with plastic moulding,***Operating time***: 10msec Release time: 5msec,***Maximum switching:*** 300 operating/minute (mechanically).


## e..Power Supply Module – LM2596

***Adjustable Output Voltage Range:*** 1.23 V – 37 V,***Guaranteed:*** 3.0 A Output Load Current,***Wide Input Voltage Range*** up to 40 V,150 kHz Fixed Frequency Internal Oscillator,TTL Shutdown Capability,Low Power Standby Mode, typ 80 A,Thermal Shutdown and Current Limit Protection,InternalLoop Compensation,Moisture Sensitivity Level (MSL) Equals 1,Pb−Free Packages are Available.

### f. Pump Motor

Immersible,***Operating Voltage***: 9-12V

## 6. CONCLUSIONS-

The online version of the volume will be available in LNCS Online. Members of institutes subscribing to the Lecture Notes in Computer Science series have access to all the pdfs of all the online publications. Non-subscribers can only read as far as the abstracts. If they try to go beyond this point, they are automatically asked, whether they would like to order the pdf, and are given instructions as to how to do so.

## 7.FUTURE WORK-

Large ability of our Indian agriculture is but untapped and we still have miles to tour in this arena of studies as we've specific soil textures in different areas of our kingdom. farmers may be benefitted through the real implementation of this projected software. real demanding situations that had been faced and which can be but to be triumph over in fact are the inter-networking of the nodes in an agricultural area and in designing a user pleasant software this is without difficulty comprehensible for the farmers.

## 8.ACKNOWLEDGEMENT-

I would like to express my special thanks of gratitude to my project guide MRS. PRACHI GODBOLE , as well as our principal DR. ALAM SHAIKH who gave us this golden opportunity to do this wonderful project on the topic IOT BASED IRRIGATION SYSTEM USING NODE MCU, which also helped us in doing a lot of research and I came to know about so many new things and I am really thankful to them.Secondly, I would like to thank my project members PRERNA MISTRY, JANHAVI BHATKAR, VRUSHABH DHADVE AND RUSHIKESH JAGDALE, who helped me a lot in finishing this project within the limited time. We are making this project not only for marks to also increase my knowledge. THANKS AGAIN TO ALL WHO HELPED ME.

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