A Review on IOT Based Irrigation System by Using AES Algorithm

Miss. Dipali Kaluse, Prof. Jayant Rohankar, Prof. Mukul Pande
Wireless communication and computing
Tulsiramji Gaikwad- Patil College of Engineering and Technology,
Nagpur, India.
dipeekakaluse2492@gmail.com, jsrohankar@gmail.com, mukulpande@tgpcet.com

Abstract- **India is mainly an agriculture country. Agriculture is the most important occupation for the most of the Indian families. This system have sensors for soil moisture, temperature sensor and humidity sensor, rain sensor, day night sensor, microcontroller, Wi-Fi controller, motor, rechargeable battery, and AC adaptor. The microcontroller of the control unit is programmed with threshold values of the temperature and moisture content. This sensor senses the various parameters of soil moisture and gets automatically ON/OFF the motor according to these parameters. These sensed parameter and status of the motor will be shown on mobile phone, and laptop.**

Keywords- **AC adaptor, Day night sensor, Humidity sensor, sensor, Node mcu1.0, Rain sensor, Rechargeable battery, Soil sensor, Temperature sensor, Wi-Fi controller ESP8266.**

I. INTRODUCTION

Agriculture is one of the most relevant factors of our community. Producer produced a food from it every day. That's why we need to progressive irrigation system, so we can develop our country. Here project has sensors for senses the parameter of soil, assuming that the soil moisture parameter is below later system activates the motor ON, and assuming that the soil moisture parameters is huge later system is OFF the motor automatically.

These projects also have the IOT; IOT is one that is mostly related to devices. IOT system is different from rest with system and is more adjustable since it empower many automate features and value. IOT relate devices such as Node MCU 1.0 with this sensors and operating task such as taking the parameter and study the parameters from the arduino software and making judgment.

II. METHODOLOGY

On this subject we need sensors which include temperature and humidity sensor, soil moisture sensor and rainy sensor, day night sensor, microcontroller, rechargeable battery, AC adaptor, Wi-Fi module etc.

So here we already set the limit of water level for the soil. Soil moisture sensors are settled under the ground of field.

At the starting point the water level parameters is taken and judgments according to it. The temperature sensor is settled at the center of the field, for taking the parameter of temperature and soil sensor. Parameter is taken in degree. There are five sensors are used, and it fixed into the ground of field and linked to the microcontroller where we get the parameters.

1. Materials: Hardware Materials

1.1 Microcontroller Node MCU 1.0: Node MCU 1.0 is an open source format for which open source prototyping board patterns are available. It is a 32 bit microcontroller. Microcontroller controls the parameters of sensors which are linked to microcontroller. All sensors send its parameters to the microcontroller for performing related operations. According to those parameters the microcontroller controls the motor operation that is ON/OFF.

1.2 Wi-Fi controller-ESP8266: It is a Wi-Fi module with TCP/IP protocol, which allows any microcontroller to approach Wi-Fi network. In this subject, it is used for approaching the Wi-Fi network through mobile and laptop which is wirelessly linked to the system.

1.3 Soil Moisture Sensor: Soil moisture sensor is senses value of soil, according to that parameters microcontroller conclude that there is soil in dry condition or in wet condition.

1.4 Temperature Sensor: Temperature sensor senses the temperature of the soil according to the temperature the motor gets ON/OFF.

1.5 Day Night Sensor: Day Night sensor senses sunlight. When the light is not present it will conclude darkness, and when light is present it will conclude no darkness.

1.6 Humidity Sensor: Humidity sensor senses the moisture in the air. So it is used for removing the moisture in the air.

1.7 Rainy Sensor: Rainy sensor senses water drops of rain. if there is lots of raining it will conclude high. If

there is medium raining, it will conclude medium. If there is slow raining, it will conclude low.

1.8 Smartphone's/Laptops: In this subject Smartphone's /Laptops are used for supervision and execution the system. All data will be displayed on the screen of Smartphone's and laptops.

1.9 Rechargeable Battery: Rechargeable battery is backup storage of electricity. When the electricity is not present then the rechargeable battery can be used.

1.10 External AC adaptor: AC adaptor is used for power supply.

2. Software Materials:

2.1 Ardunio IDE: It is open source Ardunio software. This software is used for compose code and uploads it on board. This software can be used with any board. The board contains set of digital and analog input/output pins, which may be join with various boards or breadboards. This provides an Integrated Development Environment (IDE).

2.2 Operating System Windows 10: Window 10 is a series of operating system introduced by Microsoft. It has NT family. Operating system supports different operations simultaneously, with having accuracy and speed.

2.3 Sublime Text: Sublime Text is a refined text editor for code.

3. Technological Materials:

3.1 Embedded c: Embedded c is a set of language extension for c programming language. Embedded c uses a syntax of c. e.g. main () function, variable definition, conditional statements (if, switch case), data type declaration, loops (while, for), functions, arrays, and strings, structures, union, bit operations, Macros etc.

3.2 XML: XML is a markup language. It is used to cryptographs document in a format that human-readable and machine readable. This language is generally used for the representation of arbitrary data structures and web services.

3.3 HTML: HTML is a Hyper Text Markup Language. This is used to design documents and displayed in a web browser. It supports CSS and scripting languages JavaScript, python, etc. Html has the building blocks of Html page. Html contains the heading, lists, paragraphs, links, quotes and other items. The scripting language use style and content of web pages.

3.4 CSS: CSS stand for cascading style sheet. It is a style sheet language. This is used for describing the presentation of documents written in html. It has layouts, colors, fonts for designing a web page. It has a .CSS extension. CSS has also rules for alternate formatting if the content is accessed on mobile devices.

3.5 Bootstrap: Bootstrap is a free and open source framework. It contains CSS and JavaScript based

design templates for forms, buttons, navigation, and alternative interface component.

4. Security Materials:

4.1 AES Algorithm: AES is secure because its building blocks and design principles that is fully described. AES can be carrying out in software and hardware to encode sensitive data. It is beneficially to government computer security, cyber security and electronic data protection. It's give free encryption services for public and private, commercial or noncommercial programs.

4.2 AES features: Security: AES having a more resist attack than the other submitted cipher. It has a more security strength, and it is important factor in the competition.

4.3 Cost: cost is not expensive.

4.4 Implementation: AES has a flexibility, suitability, and simplicity for hardware and software.

III. MODELING AND ANALYSIS
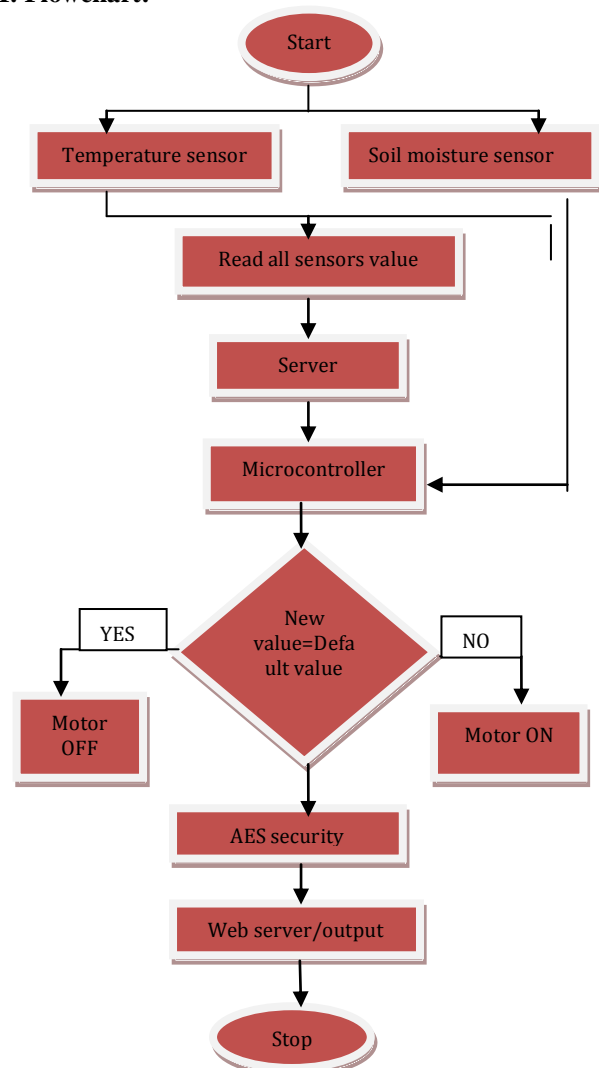
1. Flowchart:

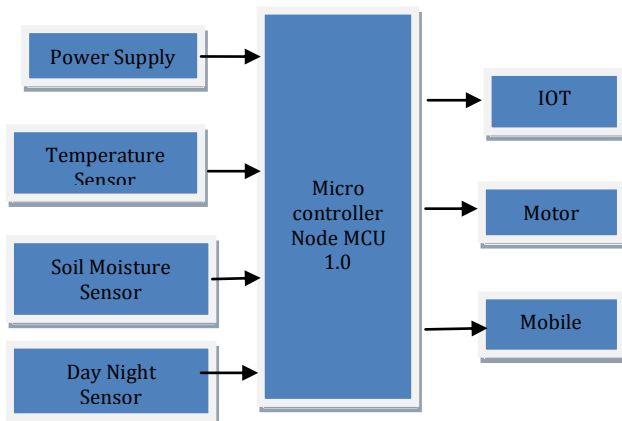Fig 1. Flow Chart.

2. Block Diagram.
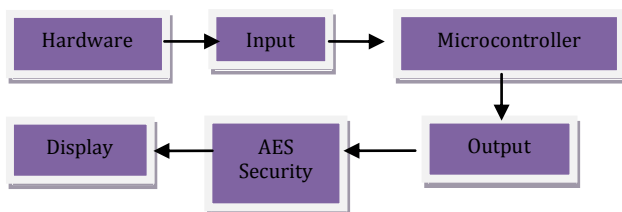

Fig 2. Block diagram of hardware part.

Fig 3. Block diagram of software process.

IV. CONCLUSION

This IOT based irrigation system was tested on garden plants. The plant water demand is 500-700mm per day and temperature requirements of the soil is 40-100 degree Celsius. So this system proves that it is cost effective, and water maintain and reducing its wastage.
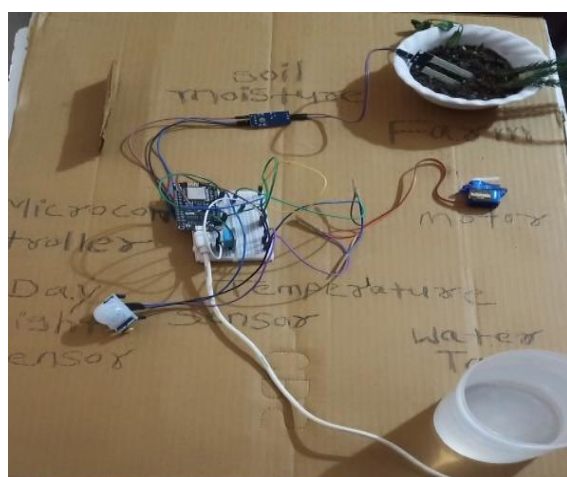

Fig 4. Screenshots.

Thus IOT based irrigation system in agricultural fields will be a powerful and will be helpful in usages of water resources are finite. It is mean for proper improvement of agriculture field.

V. ACKNOWLEDGMENT

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