

AN IOT BASED SMART AGRICULTURE SYSTEM

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Abstract: Internet of Things (IoT) performs a key position in smart agriculture. Smart farming is an rising concept, because IOT sensors able to supplying statistics approximately their agriculture fields. The project aims making use of evolving technology i.e. IOT and smart agriculture using automation. The proposed framework causes Farmer to enhance quality and amount of their farm yield by detecting surrounding temperature and moistness esteems, soil dampness esteem and water level of the tank from the field with no human intercession. By utilizing the idea of IOT framework can be more effective. On the other hand we will use a smart system which close and open green paper according to changes in temperature to protect plants from high temperature.

Keywords: *IoT, WIFI Module, Irrigation, Farm Monitoring.*

I INTRODUCTION

Internet of Things (IoT) performs a key position in smart agriculture. Smart farming is an emerging concept, because IOT sensors capable of providing information about their agriculture fields . The project aims making use of evolving technology i.e. IOT and smart agriculture using automation. Monitoring environmental elements is the important factor to improve the yield of the efficient crops. The feature of this project includes monitoring temperature and humidity in agricultural field through sensors using CC3200 single chip. Camera is interfaced with CC3200 to capture images and send that pictures through MMS to farmers mobile using Wi-Fi [1]. Agriculture adds to a noteworthy segment of Indias Gross domestic product. Considering and foreseeing natural conditions, cultivate efficiency can be expanded. Product quality depends on information gathered from field, for example, soil dampness, surrounding temperature and stickiness and so on.

Smart Agriculture is produced utilizing an NodeMCU microcontroller. The Farmer can monitor the controlling actions taken at the farm via android app on farmer's mobile phone and details of soil tastings are also available in it. The consumer can

monitor the controlling moves taken at the farm in addition to manage the irrigation via android app on farmer's mobile telephone. The project aims making use of evolving technology i.e. IOT and smart agriculture using automation. Monitoring environmental elements is the major factor to improve the yield of the efficient crop.

II LITERATURE REVIEW

IOT Based Monitoring System in Smart Agriculture, 'Internet of Things' is far and wide castoff in relating devices and gathering statistics. This agriculture monitoring system serves as a dependable and efficient gadget and corrective motion can be taken. Wireless monitoring of area reduces the human electricity and it additionally allows consumer to peer correct adjustments in crop yield. It is cheaper in cost and consumes less power. The smart agriculture device has been designed and synthesized. The advanced device is greater efficient and useful for farmers. It offers the records about the temperature, humidity of the air in agricultural area thru MMS to the farmer, if it fallout from top of the line variety. The software of such device inside the discipline can truly assist to improve the harvest of the crops and international production. In destiny this machine may

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be advanced with the aid of adding numerous current strategies like irrigation method, sun strength supply usage [1].

An Overview of Internet of Things (IoT) and Data Analytics in Agriculture: Benefits and Challenges,

An overview of IoT and data analytics in agriculture has been presented in this article. Several areas related to the deployment of IoT in agriculture have been discussed in detail. The survey of literature shows that there are lots of work ongoing in development of IoT technology that can be used to increase operational efficiency and productivity of plant and livestock. The benefits of IoT and data analytics, and open challenges have been identified and discussed in this paper. IoT is expected to offer several benefits to the agriculture sector. However, there are still a number of issues to be addressed to make it affordable for small and medium scale farmers. The key issues are security and cost. It is expected that as competition increases in the agriculture sector and favorable policies are being implemented the adoption rate of IoT in agriculture will increase accordingly. One major area that is likely to draw lot of research attention is the deployment of low power wide area communication technology for agriculture purposes. The NB-IoT is expected to stand out among the LPWA technologies. This is because of the 3GPP open standard and adoption by the Telco companies [2].

IOT Based Smart Agriculture System, IOT based smart agriculture system can prove to be very helpful for farmers since over as well as less irrigation is not good for agriculture. Threshold values for climatic situations like humidity, temperature, moisture can be fixed primarily based at the environmental conditions of that particular region. The system also senses the invasion of animals which is a primary reason for reduction in crops. This system generates irrigation schedule based on the sensed real time data from field and data from the weather repository. This can suggest farmer whether or not, is there a want for irrigation. Continuous internet connectivity is required. This can be overcome by extending the system to send suggestion via SMS to the farmer directly on his mobile using GSM module instead of mobile app [3].

Smart Farming Using IOT, Even today, different developing countries are also using traditional

methods and backward techniques in agriculture sector. Little or very less technological advancement is found here that has increased the production performance extensively. To boom the productivity, a singular layout approach is supplied in this paper. Smart farming with the help of Internet of Things (IOT) has been designed. A faraway controlled car operates on both automated and guide modes, for various agriculture operations like spraying, slicing, weeding etc. The controller maintains monitoring the temperature, humidity, soil condition and hence resources water to the sphere. Based on the use of the green energy and smart generation the agriculture area will find better productiveness [4].

A Model for Smart Agriculture Using IoT, The paper proposes a wise agricultural model in integration with ICT. ICT have always mattered in Agriculture domain. Village farmers may have planted the “same” crop for centuries, but over period, weather patterns and soil conditions and epidemics of pests and diseases changed. By the usage of the proposed method, acquired up to date information lets in the farmers to deal with or even gain from those modifications. It is sincerely tough undertaking that needs to provide such know-how because of especially localized nature of agriculture facts particularly distinct conditions. The complete real-time and historical environment information is expected to help to achieve efficient management and utilization of resources [5].

III PROBLEM DEFINITION

The land utilized for farming in India is diminishing at a quickening rate. Obsolete water system methods and accessibility of water assets are the essential purposes behind in distinguishable generation. Subsequently, answers for agriculture undertaking computerization are the need of great importance. Specifically, streamlined water system instruments diminishing water wastage are exceptionally basic, which support accuracy in agriculture. Overall farm monitoring with security checking can avoid this problems effectively.

IV PROPOSED SYSTEM

The proposed framework causes Farmer to enhance quality and amount of their farm yield by detecting surrounding temperature and moistness

esteems, soil dampness esteem and water level of the tank from the field with no human intercession.

detail information about crop related query information

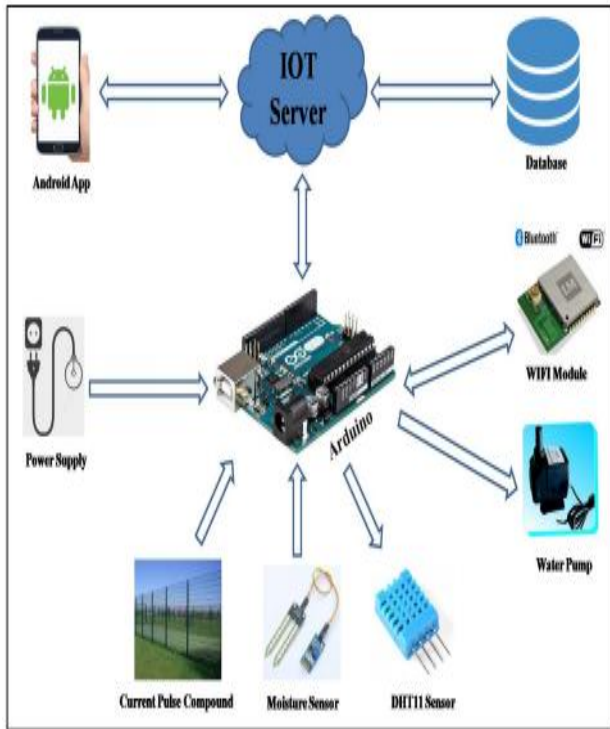


Figure1: Propose System Architecture

V MATHEMATICAL MODEL

Let S be the whole System,

$$S = I, P, O$$

Where,

I is the input to the system.

P is the processes in the system.

O is the output of the system.

$$I = I_0, I_1, I_2$$

Inputs: I₀ : Soil Moisture

I₁ : Temperature/Humidity

I₂ : Soil test queries

Processes: P = P₀, P₁, P₂

P₀ = Check if moisture is greater or lower than threshold

P₁ = Find temperature and humidity at real time

P₂ = Search keyword related queries Output: O = O₀, O₁, O₂

O₀ = Water pump on and off respectively O₁ = Moisture temperature and humidity value O₂ = Show

VI ADVANTAGES

- Reducing the risk of electric shocks, deaths due to poisonous creatures in the fields.
- Visual display using LCD display unit.
- Watering depends on the moisture level present in the field.
- All the farm parameters can view through online in graphical notation.
- Efficient and low cost design.
- Fast response.
- User friendly.

VII APPLICATION

1. Crop Protection.
2. Farm irrigation.

VIII RESULT

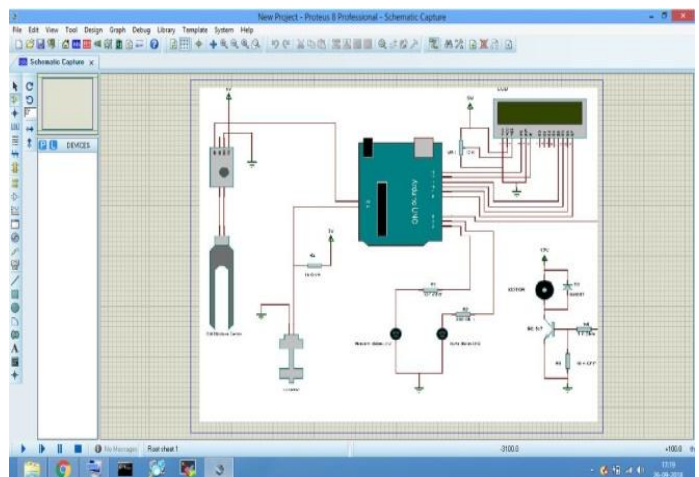


Figure 2: Simulation Result

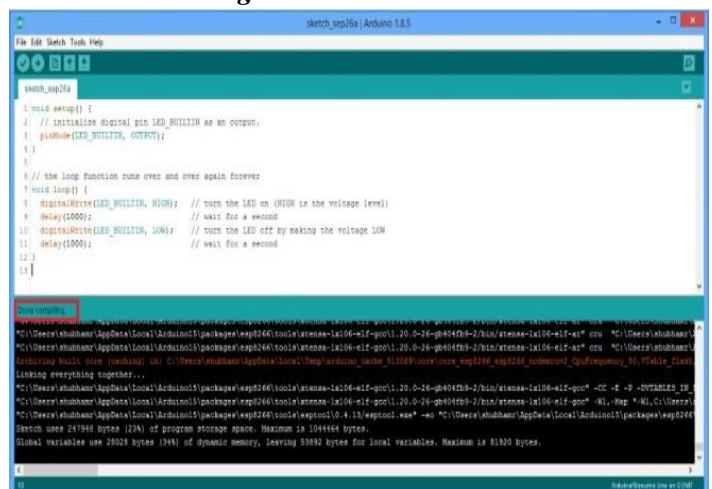


Figure 3: Writing code in IDE and Compiling the code



Figure 4: Test program for sensors like moisture sensor

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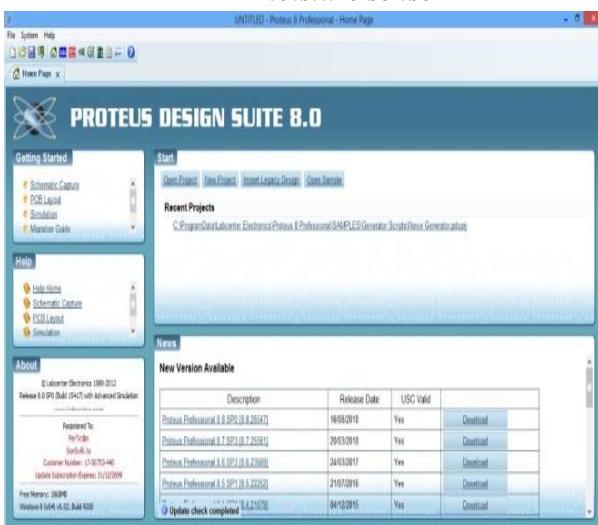


Figure 5: Simulation Software Proteus 8.0 front panel

IX CONCLUSION

System will avoid over irrigation, under irrigation, top soil erosion and reduce the wastage of water. The main advantage is that the system's action will change according to the situation (crops, weather conditions, soil etc.). By implementing this system, agricultural, horticultural lands, parks, gardens, golf courses will be irrigated. Thus, this work is less expensive and efficient when in comparison to different forms of automation devices.

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