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SMART AGRICULTURE USING IOT

Swajita Kamble¹, Pranav Chippalkatti²

PG Student, Dept. E&TC, G. H. Raisoni College of Engg. & Management, Pune¹

Assistant Professor, Dept. E&TC, G. H. Raisoni College of Engg. & Management, Pune²

swajitakamble@gmail.com¹, pranav.chippalkatti@raisoni.net²

Abstract: Recent researches hypothetically showed the potential of Internet of Things (IOT) to change major industries for a better world, which includes its impact towards the agriculture industry. Proposed framework is architected and intended to improve the effectiveness of agribusiness, fabricate a very much associated cultivating system and make an information sharing stage for farmers. In a more drawn out run, system will address two key issues tormenting farming in India – reaping water and groundwater, and foreseeing compelling usage of the equivalent. Primary point of this work to trim advancement at low amount water utilization, In request to concentrate on water accessible to the plants at the required time, for that reason the majority of the farmers squander parcel time in the fields. A proficient administration of water ought to be created and the framework circuit multifaceted nature to be diminished. The proposed framework created on the data sent from the sensors and gauge the amount of water required. In this paper, the hardware and software of the IOT for smart farming will be presented besides sharing the successful results.

Keywords: IOT, WIFI Module, NodeMCU, Irrigation, Farm Monitoring, Android App.

I INTRODUCTION

Consequently the proposed strategy goes for making farming shrewd utilizing computerization and IOT innovations. IOT empowers different applications crop development checking and choice, water system choice help, and so forth. The significant favorable position the framework is executing of Precision Agriculture with cloud figuring, that will upgrade the utilization of water composts while augmenting the yield of the harvests and furthermore will help in dissecting the climate states of the field. In this Paper, it is proposed to build up a Smart Agriculture System that utilizes focal points of forefront innovations, for example, NodeMCU, IOT and Wireless Sensor Network. The paper goes for making utilization of advancing innovation for example IOT and keen farming utilizing robotization. Checking natural conditions is the major factor to improve yield of the effective harvests.

II LITERATURE SURVEY

Ibrahim Mat, et al. [1] ongoing investigates speculatively appeared the capability of IOT to change real ventures for a superior world, which incorporates its effect towards the farming business. Cultivating industry

must handle IOT to sustain 9.6 billion of worldwide populace by 2050. Difficulties, for example, outrageous climate conditions and rising atmosphere change will be defeated to satisfy the interest for sustenance. Savvy cultivating dependent on IOT advances will empower cultivators and farmers to diminish squander and improve efficiency going from the amount of manure used to the quantity of adventures the ranch vehicles have made. It is the utilization of present day ICT (Information and Communication Technologies) into horticulture. In this paper, the equipment and programming of the IOT for savvy cultivating will be displayed other than sharing the victories.

M. K. Gayatri et al. [2] describe the field of Cloud figuring is helping by a wide margin to ad lib our deep rooted business - Agriculture. Handy applications can be worked from the monetary utilization of distributed computing gadgets that can make an entire figuring biological community, from sensors to devices that watch information from agrarian field pictures and from human on-screen characters on the ground and precisely feed the information into storehouses alongside their area as GPS co-ordinates. As a general rule, sensors are presently ready to recognize the situation of water

sources in a subject that is being explored. Issues identified with farmers are continually hampering the course of our development. One of the responses to these sorts of issues is to help the farmers utilizing modernization systems. This paper proposes a methodology joining the upsides of the significant attributes of developing advances, for example, Internet of Things (IOT) and Web Services so as to build an effective way to deal with handle the huge information engaged with agrarian yield. The methodology utilizes the blend of IOT and distributed computing that advances the quick improvement of horticultural modernization and acknowledges keen answer for agribusiness and productively unravel the issues identified with farmers.

Mahammad Shareef Mekala et al. [3] describe IOT is a progressive innovation that speaks to the eventual fate of registering and correspondences. The vast majority of the individuals over all universes rely upon agribusiness. As a result of this reason shrewd IT advancements are expected to move with conventional horticulture strategies. Utilizing present day advances can control the cost, support and checking execution. Satellite and elevated symbolism play an essential job in present day farming. Accuracy agribusiness sensor checking system is utilized incredibly to gauge Agri related data like temperature, moistness, soil PH, soil sustenance levels, water level and so on in this way, with IOT farmers can remotely screen their harvest and hardware by telephones what's more, PCs. In this paper, we overviewed some normal uses of Agriculture IOT Sensor Monitoring System advances utilizing Cloud registering as the spine. This review is utilized to comprehend the extraordinary advances and to construct supportable brilliant farming. Straightforward IOT agribusiness show is tended to with a remote organize.

Prof. K. A. Patil, et al. [4] describes atmosphere changes and precipitation has been sporadic over the previous decade. Because of this in ongoing time, atmosphere brilliant techniques called as brilliant agribusiness is embraced by numerous Indian farmers. Keen horticulture is a mechanized and coordinated data innovation executed with the IOT (Internet of Things). IOT is growing quickly and generally connected in all remote conditions. In this paper, sensor innovation and remote systems joining of IOT innovation has been contemplated and surveyed dependent on the real circumstance of horticultural framework. A joined methodology with web and remote correspondences, Remote Monitoring System (RMS) is proposed. Real goal

is to gather constant information of agribusiness generation condition that gives simple access to horticultural offices, for example, alarms through Short Massaging Service (SMS) and advices on climate design, crops and so forth.

Prathibha S. R., et al. describe [5] web of things plays an essential job in keen farming. Brilliant cultivating is a developing idea, on the grounds that IOT sensors able to do giving data about their horticulture fields. The paper points utilizing developing innovation for example IOT and keen horticulture utilizing mechanization. Observing ecological elements is the central point to improve the yield of the proficient harvests. The component of this paper incorporates observing temperature and dampness in horticultural field through sensors utilizing CC3200 single chip. Camera is interfaced with CC3200 to catch pictures and send that photos through MMS to farmers versatile utilizing Wi-Fi.

III PROPOSED SYSTEM

The element of this paper incorporates improvement of a framework which can screen temperature, moistness, dampness and even the development of creatures which may crush the harvests in farming field through sensors utilizing NodeMCU board and if there should be an occurrence of any inconsistency send a SMS warning just as a notice on the application created for the equivalent to the cell phone utilizing Wi-Fi/3G/4G. The framework has a duplex correspondence connect dependent on a cell Internet interface that takes into account information review and water system planning to be modified through an android application. In light of its vitality self-sufficiency and minimal effort, the framework has the potential to be valuable in water restricted topographically separated zones.

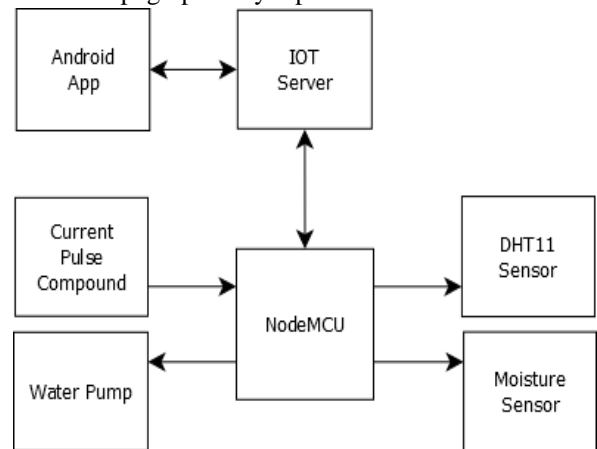


Figure 1: Proposed System Block Diagram

Agriculture water system framework is created with low complex hardware. A two sensors are utilized proficiently those are temperature and moisture of soil in the circuit to get the aligned data to the framework. All perceptions and trial tests demonstrates that proposed is a finished answer for field exercises, water system issues, Implementation of such a framework in the field can improve the field of the harvests and by and large creation. With the assistance of this methodology the water system framework totally mechanized additionally gives constant data about the terrains and harvests that will enable farmers to settle on right choices. Distributed computing is “another style of figuring in which powerfully versatile and regularly virtualized assets are given as an administration over the Internet”.

IV RESULT ANALYSIS

Smart Agriculture using IOT framework is utilized to create choices with respect to water system utilizing constant information. Most importantly, farmer signs in to the framework utilizing username and password from an Android application. Framework is actualized in three stages.

- Detection
- Processing
- Information distribution

The detecting stage includes the detecting parameters which incorporate temperature, humidity, moisture, current pulse and motion. Every one of these sensors is connected to the NodeMCU microcontroller. This microcontroller goes about as the IOT gateway in the created framework as it has the ability to transmit the information to the cloud. This transmission is finished utilizing Wi-Fi ESP8266 module. The handling stage happens in the cloud. The cloud comprises of a Web Server, a database where the detected information is kept up and a decision logic which takes decision dependent on the detected information. In the data distribution stage, the output of the decision logic will be sent to the android application and after that to the IOT gateway.

The Smart Agriculture Application is created on Android. The highlights that are given in this application are as per the following:

- Determination to turn ON/OFF the water pump
- Determination of a water system (irrigation) profile i.e. the farmer can pick a period on a specific day to begin the water system and an opportunity to stop the water system.

- Identify the parameters which incorporate temperature, humidity, moisture, current pulse and motion.

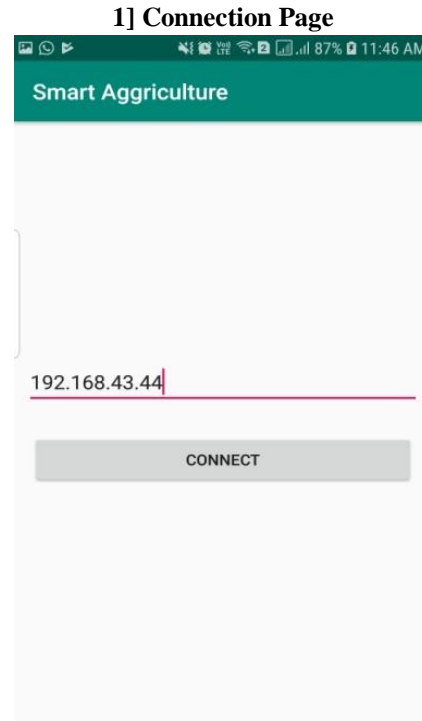


Figure 2: Connection Page

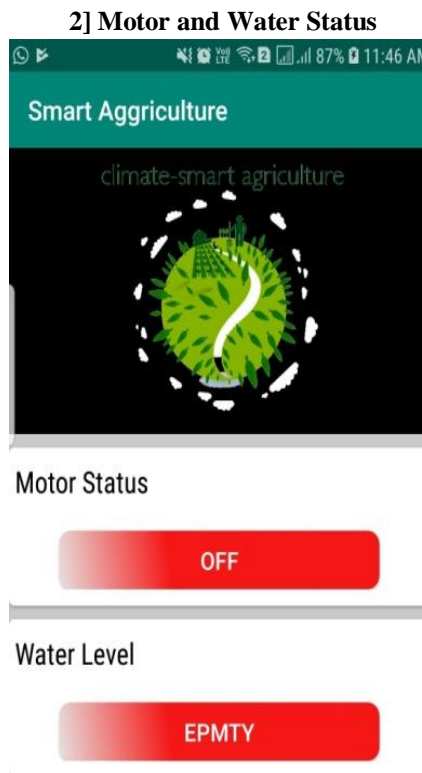


Figure 3: Motor (On/Off) and Water (Full/Empty) Status

3) Humidity, Temperature and Moisture Status

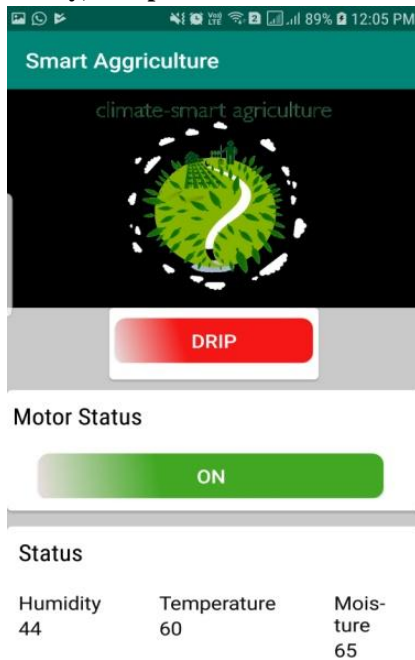


Figure 4: Humidity, Temperature and Moisture Status

V CONCLUSION

IOT based smart agriculture system can end up being exceptionally useful for farmers since over just as less water system isn't useful for farming. Edge esteems for climatic conditions like humidity, temperature, moisture can be fixed dependent on the ecological states of that specific area. The framework likewise faculties the intrusion of creatures which is an essential purpose behind decrease in harvests. This framework produces water system plan dependent on the detected ongoing information from field and information from the climate archive. This framework can suggest farmer whether, is there a requirement for water system. Persistent web network is required. This can be overwhelmed by stretching out the framework to send proposal by means of SMS to the farmer straightforwardly on his portable utilizing GSM module rather than versatile application.

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