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IOT in Agriculture

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Abstract: ***This is the age of digitalization. So, digitalization is also needed in agriculture. Cloud-based IoT(Internet of Things) services have gotten well-liked. During this paper we tend to area unit implementing IoT based mostly services for the agricultural trade. The most aim of this paper is to gather information from multiple locations in a very farm. This information are going to be out there to the farmers via the cloud service. This information will be accessed through a mobile application. Not solely providing information diagrammatically, the mobile app also will give varied services useful for the farmers. This paper focuses on remote watching system for agricultural trade combined with some farmer friendly applications. The most aim is to gather the readings from multiple nodes and facilitate the farmers handle numerous operations wirelessly providing good sensible wise} agricultural field for smart farmers.***

Keywords: Internet of Things, Agriculture, Farmers.

I. INTRODUCTION

As the world is trending into new technologies and implementations it's a necessary goal to trend up in agriculture additionally. Several researches square measure drained the sector of agriculture. Most comes signify the utilization of wireless device network collect knowledge from totally different sensors deployed at numerous nodes and send it through the wireless protocol. The collected knowledge offers the knowledge concerning the varied environmental factors. Observance the environmental factors aren't the entire resolution to extend the yield of crops. There square measure range of alternative factors that decrease the productivity to a bigger extent. Thence automation should be enforced in agriculture to beat these issues. So, so as to supply resolution to any or all such issues, it's necessary to develop AN integrated system which can pay attention of all factors moving the productivity in each stage. However complete automation in agriculture isn't achieved thanks to numerous problems. Although it's enforced within the analysis level it's not given to the farmers as a product to urge benefitted from the resources. Thence this paper deals concerning developing sensible agriculture exploitation IoT and given to the farmers.

II. LITERATURE REVIEW

The new situation of decreasing water, desiccation of rivers and tanks, unpredictable surroundings, gift associate pressing want of correct utilization of water. To cope up with this use of temperature and wet, sensors are placed at appropriate locations for observation the crops. When analysis within the agricultural field, researchers found that the yield of agriculture is decreasing day by day. However, use of technology within the field of agriculture plays a crucial role in increasing the production as well as in reducing the man power. a number of the analysis makes an attempt are in deep trouble betterment of farmers that give systems that use technologies useful for increasing the agricultural yield. The cloud computing devices produce an entire computer system processing system from sensors to tools that observe data from agricultural field and accurately feed the information into the repositories .This idea proposes a completely unique methodology for good farming by linking {a good sensible wise} sensing system and smart irrigation system through wireless communication technology. It proposes a low price and economical wireless detector network technique to amass the soil wet ,Humidity , temperature from varied locations of field and as per the want of crop water motor is enabled .It proposes a concept regarding however automatic irrigation system was developed to optimize water use for agricultural functions. Agriculture is that the major supply of financial gain for the most important population in several countries and is major contributor to the country's economy. But technological involvement and its usability still have to be compelled to be fully grown and cultivated for agro sector in Republic of India. Some initiatives have conjointly been taken by the several Governments by providing on-line and mobile electronic communication services to farmer associated with agricultural queries, agro seller data to farmers; it provides static knowledge associated with soil quality at every region. The system has not been enforced which might utilizes real time knowledge of soil quality supported its current properties. Soil properties verify the standard of soil. Conjointly health of soil will be maintained by applying solely needed quantity of fertilizers with the assistance of real time observation. Soil wet analysis helps to provide the water whenever necessary avoiding wastage of water. Conjointly environmental conditions like temperature and wet conjointly have an effect on the crop production and crop diseases. During this respect we want a dynamic model that collects such real time knowledge. To increase the assembly and ease the distribution of agricultural merchandise all agriculture entities ought to be connected to own deciding system from farmers to promoting agencies and from vendors to farmers. Such system will be answerable for dominant alternative parameters like agro product rates.

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A. Challenges in Agriculture Industry

1) Deficient production information.
2) less knowledge about the weather forecast.
3) Not enough sales distribution information.
4) Poor ICT(Information and Communication Technology) infrastructure and ICT illiteracy.
5) Lack of awareness among farmers about the benefits of ICT in agriculture.
6) Marketing research skills and research Centre.
7) Drastic changes in the climatic conditions
8) Lack of interest in agriculture profession among young and educated professionals.
9) High cost machineries for work.
10) More manual work.
11) Keeping a track of record manually.

III. PROPOSED SYSTEM

The planned system is applying the idea of IOT within the agriculture field by victimization sensible sensors to create agriculture field a wiser one. the essential aim of the project is to gather knowledge from multiple nodes and to method this knowledge. The farmers are going to be able to management the operations remotely through a mobile application moreover as access the readings through a cloud.

The purpose of the system is to develop centralize observation and management for the agriculture land. this will be managed and functioned from any location wirelessly employing a mobile device. the applying user will management basic operations of assortment of environmental, soil, fertilization, and irrigation knowledge; mechanically correlate such knowledge and filter -out invalid data from the angle of assessing crop performance; and reckon crop forecasts and personalized crop recommendations for any explicit farm victimization the applying.

System will integrate nearly any IoT device, together with commercially offered sensors, cameras, weather stations, etc. and may kind a cluster of those devices which might build it versatile for one user to hide an outsized space and store their knowledge within the cloud for performance analysis and suggestions. user will get of these details of the sector on sensible phone by associate degree application Smart Agro Services and may management the operations.

The detector network is intended to urge data regarding the climate of the farm like Soil wet, Temperature, Light, and wetness. With the assistance of this, system can decide the operations on the sector. A single farm will have multiple crops divided into fields. Thus every crop can have completely different parameters to be controlled.

This, we want to possess a cluster which will collect knowledge one by one. For this nodes area unit put in on numerous components on the sector relying upon the parameters.

Every Node includes of a chip Raspberry Pi and a sensor connected thereto. Sensors could also be temperature and wetness detector or soil wet sensors. The soil wet detector being associate degree associate degree log detector needs an ADC (Analog to Digital Converter). The info from detector is within the analog kind and want to be reborn to digital kind. Thence the data is equipped to ADC that in turns to digital.

The digital knowledge is within the kind of voltage price and reckoning on voltage price the proportion of wet within the soil is taken. The sensors area unit connected to Raspberry Pi. Raspberry Pi collects the info from the sensors of that node. There are a unit multiple nodes that area unit placed round the field.

Victimization the cluster technology the farmer will build correct choices like within which a part of the sector soil wet has reduced and wherever to divert the irrigation system. As well as once to modify on and off the motor pumps and different devices for the parameters to be maintained.

Data from of these nodes is collected and transferred to a cloud. Here, we have a tendency to area unit victimization the cloud service as storage information. The info sent to the cloud is keep within the cloud information. Farmers will log in their various accounts to look at their history and therefore the current knowledge of every node. The data from the cloud is given to the mobile application. With the assistance of the mobile application the farmers get ease to regulate numerous devices and record the readings from the sensors.

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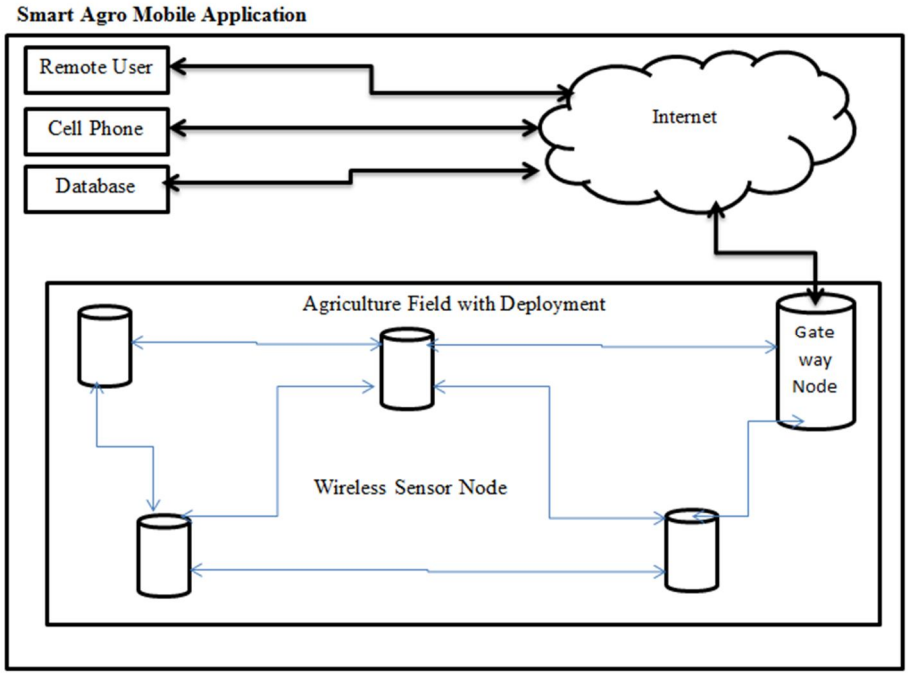


Fig1:architecture Diagram of Proposed System

The farmers are the top users of this application. This application can give full wireless property to the farmers for his or her farm. The processed knowledge from the cloud are accessed by the farmers victimization this mobile application. The farmers can get a graphical illustration of information in addition for higher understanding of the parameters. With the assistance of this knowledge analysis the farmers are conscious of the climate of the farm and consequently can management the devices like light-weight and motor pump. Each farmer can have its own account through that he will login employing a distinctive username and secret. New users will register victimization their email ID and build a replacement account. The farmers can get the direct readings from the sensors for the node they need elite. Supported this they're going to conjointly get associate alert that device ought to be switched on or off. The farmers will therefore check for the readings and wirelessly management the devices for the sector. Apart from this the appliance conjointly provides alternative helpful services for the farmers as follows:

1) *Weather Forecast:* the appliance can give time to time prognosis for the farmers together with the minimum and most temperature for the amount, the wetness, wind pressure and probabilities for precipitation. This can well prepare the farmers for the climate and consequently the crop parameters are controlled.
2) *Agro Calendar:* the applying provides the power for the farmers to store within the events within the agro calendar. Events like the date of seed sowing, harvesting, spraying pesticides, etc is keep by the farmers. The agro calendar in amendment can generate notifications for the maturity of the events to occur.
3) *Notifications:* The farmers can get app notifications for brand spanking new updates concerning the weather changes. Also, notifications from the agro calendar concerning date of harvest, pesticides and fertilizers are generated.
4) *Agro News:* the applying will give the most recent news of agriculture and farming that once more is to stay the farmers updated concerning the news.
5) *Multilingual:* This application is multilingual in order that the native farmers will get total edges of the services provided.

IV. CONCLUSION

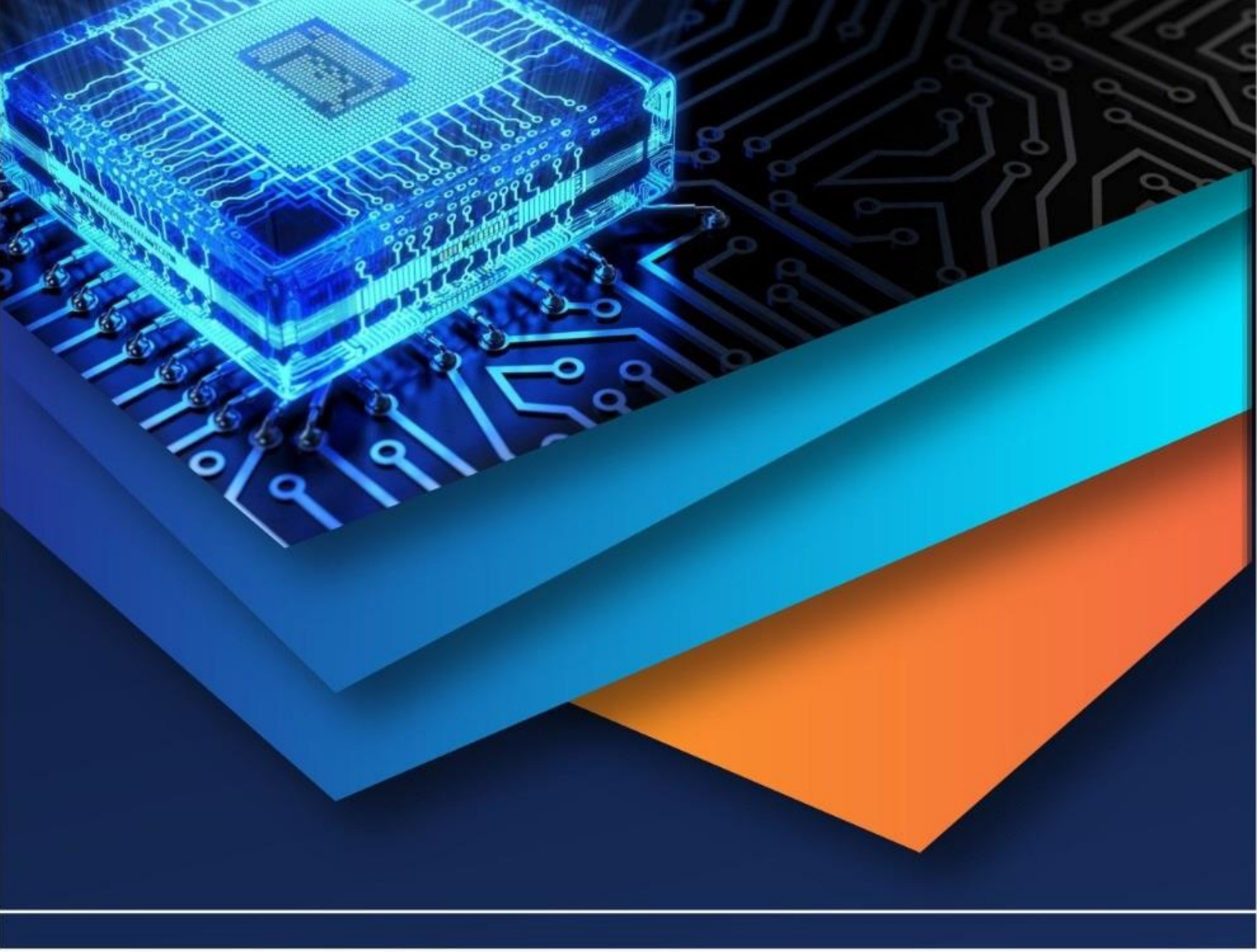
Through this paper we've created an endeavor to reduce the manual work of the farmers and build them a wise farmer. We've enforced a system which will collect knowledge from multiple nodes and victimization this device knowledge the farmers are going to be ready to management the operations on the agricultural field wirelessly and remotely anytime. This system is going to be a service provided to the farmers for digitalizing agriculture. Future doable work on this method might embrace integrative the information and providing services for every crop one by one.

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