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Role of IoT in Agriculture

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ABSTRACT

Cultivation is the main livelihood in our country. Cultivating assumes an essential part in our nation's economy. A rustic individual relies upon agribusiness as their wellspring of work; because of movement of individuals from provincial to urban there is trouble in cultivating. To give stagnant agricultural growth a boost, a shift must be made from concentrating on the country's food security to focusing on the farmers' income security. So to beat this issue we go for brilliant farming methods by using IoT technique. Utilization of wireless sensor network gathering information from various sensors sent at different hubs and send it through the wireless protocol. The gathered information give the data about the different natural components.

Key Words: IoT, WSN, Sensors, RFID, WMS, SOS.

I. INTRODUCTION

The stark observation made in the Economic Survey of 2015-16 that "Indian agriculture, is in a way, a victim of its own past success – especially the green revolution", demonstrates the dark reality of the cultivation segment at exhibit and the ruin that has been wreaked by the green revolution.

The Internet of Things (IoT) is changing the agriculture business and empowering ranchers to compete with the massive difficulties they confront. The business must beat expanding water deficiencies, restricted accessibility of grounds, hard to oversee costs, while meeting the expanding utilization needs of a worldwide populace that is relied upon to develop by 70% by 2050.

Hence mechanization must be implemented in farming to conquer these issues. So, in order to provide solution to all such problems, it is important to build up a coordinated framework which will deal with all components influencing the efficiency in each stage. New inventive IoT applications are tending to these issues and expanding the quality, amount, maintainability and cost viability of agrarian creation[1].

II. BACKGROUND OF IoT

The Internet of Things definition: **"**Sensors and actuators embedded in physical objects are linked through wired and wireless networks". There are a number of like thoughts but Internet of Things is by a wide margin the most popular term to describe this phenomenon. The term IoT **(**Internet of Things**)** was invented in 1999, at first to promote RFID technology. The notoriety of the term IoT did not quicken until 2010/2011 and achieved mass market in mid 2014.

The Internet of Things (IoT) has not been around for very long. However, there have been visions of machines communicating with one another since the early 1800s. Machines have been providing direct communications

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since the telegraph was developed in the 1830s and 1840s. Described as "wireless telegraphy," the first radio voice transmission took place on June 3, 1900, providing another necessary component for developing the Internet of Things. The development of computers began in the 1950s.

The Internet, itself a significant component of the IoT, started out as part of DARPA in 1962, and evolved into ARPANET in 1969. In the 1980's commercial service providers began supporting public use of ARPANET, allowing it to evolve into our modern Internet. GPS became a reality in early 1993, with the Department of Defense providing a stable, highly functional system of 24 satellites. This was quickly followed by privately owned, commercial satellites being placed in orbit. Satellites and landlines provide basic communications for much of the IoT.One additional and important component in developing a functional IoT was IPV6's remarkably intelligent decision to increase address space. Steve Leibson, of the Computer History Museum, states, "The address space expansion means that we could assign an IPV6 address to every atom on the surface of the earth, and still have enough addresses left to do another 100+ earths." Put another way, we are not going to run out of internet addresses anytime soon.

By the year 2013, the Internet of Things had evolved into to a system using multiple technologies, ranging from the Internet to wireless communication and from micro-electromechanical systems (MEMS) to embedded systems. The traditional fields of automation (including the automation of buildings and homes), wireless sensor networks, GPS, control systems, and others, all support the IoT[3,5].

III. ROLE OF IOT IN AGRICULTURE

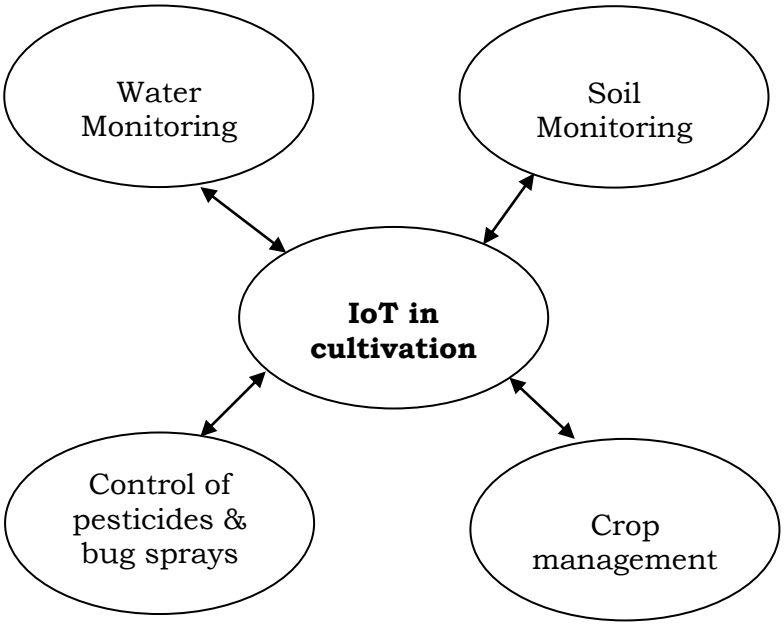

Fig.1 Role of IoT

a. Water management

Purportedly, it can possibly conserve 50 billion gallons of new water in a year. Sufficient water supply is basic for cultivation; yields can be harmed by either water abundance or deficiency. The Agricultural IoT, coordinated with Web Map Service (WMS) and Sensor Observation Service (SOS) gives an answer for overseeing water

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necessities or supply for crop irrigation. It also smartly analyzes crop water requirements and uses water supply resources available to reduce waste.

In zones of drought, the yield water administration capacity of Agricultural IoT can be of incredible esteem, as it brilliantly deals with the limiteded water supply by ascertaining the valve operation timing and building ideal water system technique, bringing about better practices to protect water assets.

The smart sensors in the farmland are additionally capable of notifying in a real time about the moisture level in lands and can prevent spoiling of water. To solve this problem smart irrigation systems powered by latest IoT technology can help conservation of water resources better by monitoring irrigation through remote sensing technologies. This capability can be further aggravated if the real-time sensor data can trigger action in the meter by switching it off or on. The meter can be automatically switched on or off depending on the need of irrigation and level of the water resource[2].

Besides, smart sensors can identify the flaws in the irrigation system framework in an ongoing and can counteract depleting of water without legitimate supervision. For spills in pipelines, such such smart sensors are doubly effective absence of as they are often hidden from view and make detection of leaks really troublesome. The prompt detection of leaks and faults in will enable users addressing the issue quickly and will help saving water.

Many sensors work with sprinklers utilizing is an extraordinary case of the use of IoT in cultivation. To prepare the savvy irrigation system additionally smart sensors can be installed in the farmland soil that can simply measure the level of dampness. The dampness measuring sensors of the farmland can additionally hand-off the data about dampness level to the sprinkler and it can begin sprinkling the right amount of water upon the dirt.

b. Crop monitoring

Web of Things has empowers the cultivation crop monitoring easy and proficient to upgrade the efficiency of the product and henceforth benefits for the rancher. Wireless sensor system and sensors of various sorts are utilized to gather the data of yield conditions and natural changes and these data is transmitted through system to the agriculturist that starts remedial activities. Ranchers are associated and mindful of the states of the agriculture field at whenever and anyplace on the planet[6].

R. Balamurali [26], Narut Soontranon, Panwadee Tangpattanakul, Panu Srestasathiern, Preesan Rakwatin [32], Chen XianYi, Jin Zhi Gang, Yang Xiong [33] have discussed precision agriculture for real-time monitoring of environmental conditions of a farm like temperature, humidity, soil PH etc. The values of monitored parameters are communicated to the remote server in order to take appropriate action, instead an actuator or an automated system can also be used to take appropriate action based on the measured parameters over a period of time.

c. Soil Monitoring

Internet of things (IoT) for an agricultural environment. Monitoring agricultural environment for various factors such as soil humidity, temperature and moisture along with other factors can be of significance. A conventional approach to compute these factors in an farming atmosphere meant farmers physically taking measurements and examine them at various times. These nodes send data wirelessly to a central server, which collects the data, stores it and will allow it to be analyzed then displayed as needed and can also be sent to the client mobile.

- Current soil moisture status, Active root zone depth, Depth of irrigation/fertigation

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- Infiltration rate, Daily water consumption rates, Date/time of irrigations, Irrigation rates and run times, Total water used (per irrigation, week, month, season)

d. Farmers detect crop diseases

Farmers will be able to detect many diseases in the season's crop through mobile phones, because of smart wireless sensors used in field and also using small drones to recognize the dieses of plants by using sensors & WSNs in a drone. Then information will send to ranchers mobiles regarding the information about the disease of a plant. Agricultural experts are able to gauge the crop's susceptibility to disease based on soil and weather (humidity, temperature and rainfall) parameters. anticipate plant stress, weed germination, pest infestations and other factors. You can use less water to flush salts from the soil profile.

The agri-experts gather the information from a wireless sensor network spread across the farms and are able to determine the disease risk. By this they can able to identify the dieses of a plant and they may give instructions to drone to spray the pesticides[4,7].

IV. CONCLUSIONS

The role of IoT in cultivation is very helpful to ranchers by helping them to identifying or monitoring the fields by remote places. They will come to know climatic conditions like humidity, temperature, water level monitoring & moisture can be fixed based on the environmental conditions of that particular region. It also minimizes human efforts, simplifies techniques of farming and helps to gain smart farming. Along with these features smart farming can help to grow the market for farmer with single touch and minimum efforts. Hence this paper explains an overview on Role of IoT in agriculture.

REFERENCES

[1.] Xiaohui Wang and Nannan Liu, "The application of internet of things in agricultural means of production supply chain management", Journal of Chemical and Pharmaceutical Research, 2014, 6(7):2304-2310, ISSN : 0975-7384,2014.

[2.] Vinayak N, Poja K Role of IoT inagriculture", National Conference On "Changing Technology and Rural Development", 2016, e-ISSN: 2278-0661, pp 56-57

[3.] V.C Patil, K.A Al-Gaadi, et.al "Internet Of Things (IoT) and Cloud Computing For Agriculture: An Overview" Proceedings of AIPA 2012, 2012, , pp 292-296

[4.] Meonghun Le, Jeonghwan Hwang, and Hyun Yoe, "Agricultural Production System based on IoT" IEEE 16th International Conference on Computational Science and Engineering, 2013, pp 833-837.

[5.] Jeetendra Shenoy & Yogesh Pingle, " IoT in agriculture" International Conference on Computing for Sustainable Global Development", 2016, pp 1456-1458.

[6.] Dr.N.Suma, Sandra Rhea Samson, et.al "IOT Based Smart Agriculture Monitoring System" International Journal on Recent and Innovation Trends in Computing and Communication, Vol. 4, Issue 2, 2017, pp177-181.

[7.] Nikesh Gondchawar1, Prof. Dr. R. S. Kawitkar, " IoT based Smart Agriculture" International Journal of Advanced Research in Computer and Communication Engineering, Vol. 5, Issue 6, June 2016, pp 838-842.