Internet-of-Things (IoT) based Smart Farming: Towards Making the Precision Farming in Agriculture

Bagam Laxmaiah, Banoth Ramji, Kotha Mahesh

Abstract: Internet of Things (IoT) technology, has been changed every area of human life by making everything. Well-Developed and bright IOT communicates that a network of things or people which make a self-building network. Smart farming food excellently and supportable for the public. High quality farming-based is one of the most important arena systems of increasing food excellently and supportable for the public. High quality farming is one of the well-known applications of IoT in the agriculture are and plentiful establishments are taking advantage of this procedure around the world. One more type of IoT invention in farming and one more element of high-quality farming is harvest management devices. And weather positions, they should be placed in the field to collect data designed only for happening and only with in crop farming, from temperature and rainfall to leaf water and complete crop health. The use of farming-based drones in smart farming. Also called as UAVs (unmanned air vehicles), drones are drones are well prepared than airplanes and satellites to collect farming-based data. With the increasing approval of the Internet of Things (IoT), connected devise have got into every trait of our life from health, home automation, self-pushed and planning required to move people and supplies to where they're needed, smart cities and industrial IoT.

Keywords: Drones, Internet of Things, Precision Agriculture.

I. INTRODUCTION

Background:

Internet of Things started from 2009 and it aims in combining all gadgets and devices to the web.The Internet of Thing" is changing every second. IoT improves our lives in terms of business; medical-health and by adapting products which are Internet of things based making our life easier. Farming in India is done using traditional farming. The information that most of our farmers lack of proper unplanned, illiterates and they are not having much more Knowle makes it even more undependable. A large of or amount of farming and farming-based activities are based on the predictions, which at times fail. Farmers have to tolerate huge victims and at times they end up committing suicide.

Since we tell apart the helps of proper soil moisture and its excellence, air respect and crop-watering or rinsing with water, in the development of crops, such limits or guidelines cannot be ignored. The huge population of world depends on farming for living day to day life.

Dr. Bagam Laxmaiah, Received Master of Technology in Computer Science and Web Technologies from JNTU Hyderabad,

Banothu Ramji, working Associate Professor in the department of Computer Science and Engineering, CMR Technical Campus, Hyderabad.

Kotha Mahesh, Associate Professor in the department of Computer Science and Engineering, in CMR Technical Campus, Hyderabad.
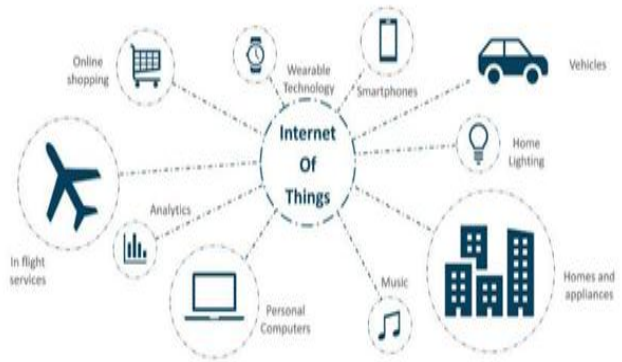

Figure 1 Internet of Things

Most of the farming cannot be showing the ability to create interesting new things only by physical activities, so have to be moved by advanced technologies. We use IoT invention of new things to talk intelligently to the dangerous part of farming. The past method of combining different things together so we treated it as they work as one unit deep water supply system with smart idea. Here, we fully use for profit IoT ideas to address certain very important which deals with critical parts of calming.

II. SMART FARMING

Farmers aim at good enough, healthy food to feed the always the total of something over time population worldwide. We have turn up with an invention of new things of crop watching or supervising and smart farming using IoT. The most examined closely so the truth can be found are of IoT is farming. Because it is really very important area to certify the food security as worldwide population is growing quickly. Farming harvests need applications like soil moisture watching or supervising, conservational condition watching or supervising for temperature, moisture, stream and self-control or control device management. In IoT-based smart farming, a system is built for watching or supervising the crop performing area with the benefit of sensors and automating the crop-watering or rinsing with water system. The agriculture farmers can monitor everything like analyzing weather condition, soil, they can monitor the field conditions from anywhere. IoT-based smart farming is very effective when related with the conservative approach. By using IoT sensors to gather conservational and machine learning that measure things, farmers can make full of knowledge results.

242

III. PRECISION AGRICULTURE

The Precision Agriculture putting into use of access to high-quickness internet, mobile to success plans or ways of reaching goals and consistent, low cost satellites by the producer are a few key technologies describing the high-quality farm-related popular things. High quality farming is main goal and agriculture farming is one of the most well-known computer programs of IoT in the farming-based area and most of the organizations are taking advantage of this way of doing things about the world. High quality farming is the mechanical device which controls the land working well and getting a lot done and uses and reduces the impression on surrounding conditions by organizing and assigning procedures to the complete farming processes.

The soil moisture technology delivers complete and entire details in-season local provision and references to improve water use smart ability. The virtual improve PRO combines technologies like weather condition, soil moisture and for water management into one most in control and most common, cloud-based, and powerful position meant for advisors and things that help plants grow to take advantage of the aids in high quality crop watering or rinsing with water via a simplified connection.

Figure 2 Smart Agriculture using IoT
IV. Methods

A. Monitoring of climate conditions

The most common smart farming gadgets are weather station s, combining many smart farming sensors. Located across th e performing area, they collect many data from the health of the Earth and the surrounding conditions, choose the good crops, and take the required measures to improve their ability is called precision farming.

B. Crop management

Another helping type of IoT product in farming and different element of highquality farming are crop management device s. Same thing like weather stations,
they should be positioned in the field to gather data for crop farming, from temperature and rainfall to leaf water probable and complete crop health. Therefore, you can monitor your crop development and any suspicious things or mistakes to effectively prevent any sicknesses or badly harms and bothers that can harm your harvest.

Figure 3 Monitoring of Climate conditions

C. Agricultural drones

One of the most promising farming developments or increases over time is the use of farming-based drones in smart farming. Also known as UAVs, drones are well prepared than airplanes and satellites to gather farming-based data. As well as using of UAVs for smart abilitys,
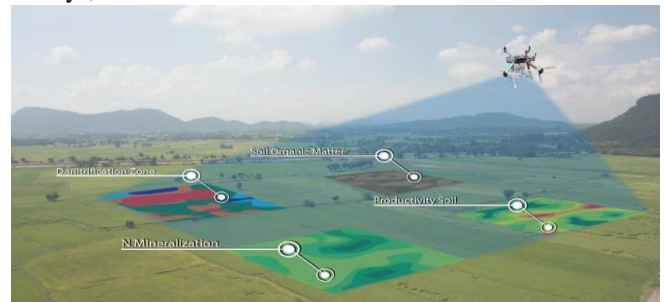

Figure 4 Remote sensing by Drones

drones can also reach a huge number of errands and that before now needed and demanded human labor, planting crops, aggressive pests and diseases that spread farming scattering, crop watching or supervising etc.

V. RESULT

The data has been handled; it is sent to farmers in an underst andable format. The report contains sharp-eyed information, that information is for better farm management decisions.

A. Estimating soil condition

Smart farming is data-driven, give power toing farmers to take fully use based on exact information on soil conditions. The data had earlier involved physical visits to the field and collecting information that measure things physically. And they Prepared with farming like devices, smart sensors, drones can gather and deliver this data.

B. Planting future crops

The soil becomes prepared for planting and a drone shoots o rigin in it, instead of using no longer useful or no longer used planting ways of doing things. By means of drones for seed planting is compared to something else new, until now, some companies are working with this approach.

C. Fighting infections and pests

Farming drones inform farmers on soil conditions using ther mal, multispectral and hyperspectral technology, but also det ect fields caused an inconvenient situation by weeds, contaminations and pests.

Based on this, Farmers can choose the take amount of chemicals needed or demanded to fight on situations where large numbers of harmful or disgusting things exist, and not only aid, decrease expenses, and also decrease using of pests and fertilizers and helping payments to better field health.

VI. DRONES

A. Agriculture spraying

Smart farms also use drones for farm related spraying which helps in the reduction of human interaction with material, that makes plants grow better, bug-killing, chemicals and other destructive and chemicals Drones are also excellent when it comes to spot treatment. They can detect infected areas with sensors and work on them while leaving the healthy part of the field unharmed.

B. Crop surveillance

Farming-based fields live in large areas, and it is impossible to guess the overall state of crops. By using drones for farm-related mapping, farmers can stay updated on the health of plants in a clearly stated or particular area and specify which in large areas, and it is impossible to guess the overall state of crops. By using drones for farm-related mapping, farmers can stay updated on the health of plants in a clearly stated or particular are and specify which field areas required or result in attention. To guess the state of crops, drones examine the field with infrared cameras and control light mental concentration/picking up of a liquid rate. Based on exact, happening or viewable immediately, without any delay inform to farmers can take measures to improve the state of plants in any locations.

Figure 5 Crop Surveillance

6 C. Livestock monitoring

In farm animals, drones can keep an eye on the cows, bulls, and other animals which are grazes on areas of grassyland), decreasing the need for human. Using thermal s ensor technology, drones can find lost farm animals, detect wounded or sick animals, and calculate their exact numbers. Drones are skilled of doing a better cow, bulls, etc.

Figure 6 Livestock Monitoring

VII. CONCLUSION

Smart farming is a resolution in field of farming through whi ch the growing demand of people of the group can be met. It helps in the producing a lot of food and use of technology resulting in the growth of farming and also the process of people making, selling, and buying things as a whole. As it involves the combination of different things together that work as one unit of advanced technologies, it helps in the reduction of time and also the labour needed or demanded making it the best form of farming.

REFERENCES

1. Chris Anderson, (2016) "Agricultural Drones Relatively cheap drones with advanced sensors and imaging capabilities are giving farmers new ways to increase yields and reduce crop damage.".
2. S. R. Nandurkar, and V. R. Thool,, (2014). "Design and Development of Precision Agriculture System Using Wireless Sensor Network", IEEE International Conference on Automation, Control, Energy and Systems (ACES).
3. Y. Kim, R. Evans and W. Iversen, (2008) "Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network", IEEE Transactions on Instrumentation and Measurement, pp. 1379–1387.
4. Yoo, S.; Kim, and Kim, D. A2S, (2007). Automated agriculture system based on WSN. In ISCE 2007. IEEE International Symposium on Consumer Electronics, 2007, Irving,TX, USA.
5. McBratney, A., Whelan, B., Ancev, T., 2005. Future Directions of Precision Agriculture. Precision Agriculture, 6, 7-23.

AUTHORS PROFILE

Dr. Bagam Laxmaiah was received Master of Computer Application from Kakatiya University, 2008 and Received Master of Technology in Computer Science and Web Technologies from JNTU Hyderabad, 2011 and received Doctor of Philosophy in Computer Sceince and Engineering from OPJS University, 2018. He is currently working as an Associate Professor in the department of Computer Science and Engineering, in CMR Technical Campus, Hyderabad. He is a member of International Association of Engineers, A Member of International Association of Engineers and Scientists and a Member of Indian Society for Technical Education. Dr. Bagam Laxmaiah may be reached at E-mail ID : laxmanmtech99@gmail.com Mobile No : 8106467177

Banothu Ramji was received Master of Technology from JNTU University. He has 5 years of Teaching & Industrial experience. He is currently working as an Associate Professor in the department of Computer Science and Engineering, in CMR Technical Campus, Hyderabad. E-Mail Id: ramji.cse@cmrtc.ac.in

Kotha Mahesh was received Master of Technology from JNTU University. He has 10 years of Teaching & Research experience. He is currently working as an Associate Professor in the department of Computer Science and Engineering, in CMR Technical Campus, Hyderabad. E-Mail Id: mahesh.cse@cmrtc.ac.in.