Volume 10, Issue 2
April 2021

ITEE Journal
Information Technology & Electrical Engineering

ISSN: - 2306-708X

Analysis of Smart Farming using Smart Technologies

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ABSTRACT

In this paper, we dig into the idea of accuracy Agriculture. This paper depicts the requirement for exactness horticulture, related innovations, the methodology towards accomplishing it, the snags looked at simultaneously and conceivable arrangements that can contribute towards acquiring real energy in the field of accuracy horticulture. This paper takes into thought a few exploration papers produced in a decade ago also, sums up an itemized comprehension of the idea and future course requiring further exploration. It gives a beginning point for anybody keen on agreement or investigating exactness farming.

Keywords: Agriculture, Smart farming, AI

1. INTRODUCTION

In the present scenario, agriculture system is facing an enormous compression to meet the demands of the farmers [1]. Due to the increase in population, it is becoming difficult for the agriculture sector to execute its services efficiently to the farmers. It is seen that the conventional farming is being digitized but still the agriculture sector is not completely digitized to be called as smart farming. In agriculture sector, it is important to enhance the infrastructure and implement an advanced technology for smart farming, empowered by essential advanced services to deliver an efficient promise which is required to attain healthier farming attention, involvement and functioning competence. The utilization of technologies is playing an important role in increasing the production in agriculture sector. However, the security remains an important hurdle [2]. The use of Internet of Things (IOT), artificial intelligence (AI) with the combination of processor, play a crucial role in determining the important parameters such as temperature, humidity, watering and so on, which are much related to the smart farming. In existing age correspondence cell are not just utilized as a calling gadget, rather utilization of cell gadgets is expanding exponentially consistently. A typical man utilizes advanced innovations for its day-by-day life needs like, transportation offices, medicinal offices, and correspondence offices which will crucial for agriculture sustainability. Innovation must be valuable to facilitate the life of individuals [3]. Rapid information move systems are the essential prerequisite for innovation upgraded advanced world for development of administrations and henceforth the life of a person. To increase the crop, yield the need of huge measure of information at higher speed for ongoing applications cutting edge correspondence frameworks ought to be created. The remote frameworks can screen significant physiological parameters of the patients continuously, watch wellbeing conditions, surveying them, and generally significant, give input. Sensors are utilized in hardware medicinal and non-therapeutic gear and convert different types of imperative signs into electrical signs [4]. Sensors can be utilized forever supporting inserts, preventive measures, long haul checking of impaired or sick patients. Social insurance associations like insurance agencies need ongoing, dependable, and precise demonstrative outcomes gave by sensor frameworks that can be observed remotely, regardless of whether the patient is in a medical clinic, facility, or at home [5]. The cutting-edge remote systems known as AI must have the option to address the limit limitations and the current difficulties related with current correspondence frameworks, for example, arrange interface unwavering quality, inclusion, dormancy and vitality proficiency [6]. Personal satisfaction in many nations has been expanding much over the few hardly any decades because of huge enhancements in AI and agriculture services. Hence, there is an immense interest for the advancement of remote monitoring checking, which could be anything but difficult to use for older individuals [7]. The remote agriculture services checking incorporates sensors, actuators, propelled correspondence advances and gives the open door for the patient to remain at his/her agreeable home rather in costly social insurance offices. A ton of work has been carried out AI frameworks utilization in remote health smart farming [8]. Be that as it may, useful acknowledgment of the framework requires various execution restricting difficulties to be tended to. It is seen that the new companies have a helpless comprehension of horticultural particulars [9]. For instance, designer's know-how innovation is being applied in one nation and afterward, essentially attempt to move it to another country. Be that as it may, if the creation of, say, a cell phone in the USA and Vietnam can be underlying pretty much a similar way, to gather rice in these two nations, one requirement to go down two diverse mechanical ways. Every country on the planet has its own explicitness of fields, soils, environment, cultivating customs, and so forth, so when growing new Ag-Tech devices, countless components should be considered [10].

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2. TECHNOLOGIES INVOLVED

2.1. Global Positioning System (GPS)

Usage of exactness agribusiness or site-explicit cultivating becomes conceivable utilizing Global Positioning System (GPS) innovation. GPS innovation joined with GPS-server.net global positioning framework empowers the social event of constant information assortment with exact position data, prompting the productive control and examination of gathered information. GPS-server.net administration can be utilized for exactness cultivating, field arranging, yield planning, and work vehicle direction. Such data permits ranchers to accomplish compelling soil/plant treatment methodologies which can improve creation [11].

2.2. Artificial Intelligence (AI)

Factors, for example, environmental change, populace development and food security concerns have pushed the business into looking for more creative ways to deal with ensuring and improving harvest yield. Therefore, AI is consistently arising as a feature of the business' innovative development [12]. In light of our exploration, the most famous uses of AI in agribusiness seem to fall into three significant classes:

Farming Robots:
Companies are creating and programming self-ruling robots to deal with fundamental rural undertakings like gathering crops at a higher volume and quicker speed than human workers.

Yield and Soil Monitoring:

Companies are utilizing PC vision and profound learning calculations to handle information caught by rambles as well as programming-based innovation to screen harvest and soil wellbeing.

Prescient Analytics:
Machine learning models are being created to follow and anticipate different natural effects on harvest yield like climate changes.

2.3. Drones

Flying over the field, the robot takes high-goal pictures with a camera or sensor. In light of a deliberate boundary, these pictures are caught in various groups from obvious (shading), close infrared to infrared range. The gathered pictures are crude information which requires further understanding. Following catching the picture, the pictures are straightforwardly shipped off the cloud/programming where distinctive solution maps are made relying upon the activity the rancher needs to perform on the field. The guides would then be able to be transferred to the particular homestead hardware which will change the quantity of sources of info (seeds, composts, pesticides) that would should be applied to the field in like manner [13].

2.4. Internet of Things

IoT arrangements are centered on assisting ranchers with shutting the stock interest hole, by guaranteeing significant returns, productivity, and security of the climate. The methodology of utilizing IoT innovation to guarantee ideal use of assets to accomplish high harvest yields and lessen operational expenses is called accuracy horticulture. IoT in agribusiness innovations contains specific hardware, remote network, programming, and IT administrations. Brilliant cultivating dependent on IoT advancements empowers cultivators and ranchers to decrease waste and upgrade profitability going from the amount of manure used to the quantity of excursions the homestead vehicles have made and empowering proficient use of assets like water, power, and so on IoT keen cultivating arrangements is a framework that is worked for checking the yield field with the assistance of sensors (light, stickiness, temperature, soil dampness, crop wellbeing, and so forth) and mechanizing the water system framework. The ranchers can screen the field conditions from anyplace. They can likewise choose among manual and robotized alternatives for making vital moves dependent on this information. For instance, if the dirt dampness level declines, the rancher can convey sensors to begin the water system. Savvy cultivating is profoundly productive when contrasted and the ordinary methodology [14].

3. RESULTS

The fig.1 comprises of raspberry pi, pic-microcontroller, sensors which is used for keen cultivating in the farming field. These sensors are associated with pic-microcontroller which is responsible for controlling of these sensors. Fig. 2 indicates the temperature sensor which will be kept in the field to sense the encompassing temperature. In light of the temperature esteem the assurance of yields can fare thee well.

Fig.1 Prototype model

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Fig. 2. Finding of temperature

4. CONCUSION

Almost everybody working on the eventual fate of current horticulture is centered on proficiency. A wide scope of advancements will empower the progress of present-day agribusiness in the field. The utilization of automated checking and the executive's framework are gaining increasing requests with the mechanical headway. In agricultural field loss of yield predominantly happens due to widespread of illness and customary cultivating techniques. Mostly the discovery and recognizable proof of the infection is noticed when the disease advances to severe stage

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