Chapter 6
A Study on the Use of IoT in Agriculture to Implement Smart Farming

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ABSTRACT

Presently there is a massive enhancement in technologies, and a lot of things, appliances, and techniques are accessible in the agriculture sector. One of the famous techniques is known as IoT. Several applications of IoT are evident in the field of agriculture for the benefit of the farmers and in turn for the successful development of the nation. IoT is used in agriculture to improve productivity, efficiency, and the global market. It also helps farmers to reduce manpower, cost, and time. In this chapter, the authors are discussing IoT with the cloud for enhancing smart farming. Smart farming is a concept that is focused on providing the agricultural industry with the infrastructure to leverage advanced technology including big data, the cloud, and the internet of things (IoT) for tracking, monitoring, automating, and analyzing operations. IoT with the cloud is used in various fields of agriculture to improve time efficiency, water management, crop monitoring, and land management. It protects the crops from pests and is also used to control pesticides in agriculture.

INTRODUCTION

The current and future era of smart computing rely enormously on the application Internet of Things (IoT) in various areas. In current scenario, IoT is playing a vital role to transform Traditional Technology from normal life to official life everywhere you will find computer. IoT is getting importance in research across the world however it is popular for wireless communications. Basically IoT is a term, which is use for finding uniquely identical objects, things and their respective virtual representations in the internet. Kevin Ashton is known as father of IoT. Initially IoT was used for chain management, after 2008, it scope has enhanced and its development being used in various products such as smart living, education, medical, organization etc. In current era, it is being used for business (like smart education, agriculture, health care), manufacturing, smart devices and machines.

One of the head areas where IoT research is ongoing and lots of products have lunched, various new products will be lunched to make the activities process smarter, easiest and effective towards for better production is "Agriculture". Agriculture (Ali Hasnain, 2021) sector is one of the sectors that is ensure food and food security for livings. If taking Indian Farmer, who are facing lots of trouble due to farm size, transportation issues, shortage of technology, trade, climate, pest etc. No doubt, ICT work on lots of problem for providing its solution to farmers (Chettri & Bera, 2020), infect ICT based techniques have resolved some problems however that are not enough for efficient production. Now ICT has migrated with IoT, and this migration is known as "Ubiquitous Computing". Agriculture production based on lots of different activities such as soil and plants monitoring, water management mentoring, moisture and temperature monitoring, transportation supply management, infrastructure management, animal and pest control monitoring.

IoT based agriculture is a convergence technology, which is used to create high volume in terms of production quantity, and quality, simultaneously it reduced production cost and manpower. Applying IoT in agriculture field data is collected with the help of GPS and sensors (Dinh et al., 2017, García et al., 2020) (smart sensors), and it is processed by the integration techniques of smart farming along with Big data. With the help of smart farming (Islam et al., 2021) Farmers are capable to improve crop yields as well as make it effective (Anjali et al., 2018). As par the current scenario of agriculture that is surrounded by lots of issues, it must be resolved by IoT based smart farming. To build smart farming in real world, requirement is to develop time to time IoT based products on very fast face.

IoT have being use in different domain of agriculture to enhance smart farming. It improves time efficiency, water management, crop monitoring, and soil management. It is also used to control in agriculture. Using IoT, human efforts get reduced mostly work gets done by smart machines. In bygone days farmers used to level the ripeness

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