


Chapter 6

Architecture for Analyzing Agriculture Data Using Data Analytics

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ABSTRACT

The main steps for agricultural practices include preparation of soil, sowing, adding manure, irrigation, harvesting, and storage. For this, one needs to develop modern tools and technologies that can improve production efficiency, product quality, schedule and monitoring the crops, fertilizer spraying, planting, which helps the farmers choose the suitable crop. Efficient techniques are used to analyze huge amount of data which provide real time information about emerging trends. Facilities like fertilizer requirement notifications, predictions on wind directions, satellite-based monitoring are sources of data. Analytics can be used to enable farmers to make decisions based on data. This chapter provides a review of existing work to study the impact of big data on the analysis of agriculture. Analytics creates many chances in the field of agriculture towards smart farming by using hardware, software. The emerging ability to use analytic methods for development promise to transform farming sector to facilitate the poverty reduction which helps to deal with humane crises and conflicts.

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INTRODUCTION

Agriculture is the backbone for most of the countries around the world. But it is facing many problems in the developing countries where farmers cannot afford modern technologies and tools.

In farming sector, there has been a digital revolution. Big Data is playing a vital role in the development where the machines are equipped with various kinds of sensors which measures data in their environment which is used for predicting machines behaviour.

It promises a level of precision, information storage, processing and analyzing which was not possible previously due to limitations in the technology. The use of information sets and latest digital tools for collecting, aggregating and analyzing is done by Big Data. Information is gathered based on agricultural equipments and farmers using data from large datasets and analytics to make farming decisions.

Big Data in agriculture is Electronic Farm Records which contains dampness content information, pH level information, soil temperatures maps and information, electrical conductivity maps and information, online networking posts, protection and yield related data.

Big Data addresses the problems in the society which includes the need of consumers, producers, business analysts, marketing agents and decision making. Generally, analysis is done on large volumes of data and used in decision making process.

At present, agricultural sector is at the initial phase of rendering Big Data services. Farmers must join data systems and share farm data. Various applications and techniques can be used to enhance the farms productivity along with reducing their use of inputs.

Smart Farming is a emerging concept towards farm management using modern technology to increase the quantity and quality of product using the required human labor.

The technologies available for farmers today are:

- Sensors are used to monitor and optimize the soil, water, light, humidity, temperature management
- Cell phones are used by farmers to remotely monitor their equipment, crops, and livestock.
- Data analytics is applied which enable monitoring and supervision of growth rate and nutrient requirements of a plant and can be used to make data-based decisions like which crops to plant for their next .

Figure 1. Why Agriculture needs Big Data?



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