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A Profile Based Model for Agriculture Management

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ABSTRACT: In the recent years, the huge volume of real time data in the agricultural sector and its need for an efficient and effective processing, stimulate the use of novel technologies and platform to collect, store, analyse large data sets for future predictions and decision making is needed. BigData can be used efficiently in precision agriculture field to address the needs of different stake holders.

KEYWORDS: Big data, Decision Making, Precision Agriculture.

I. INTRODUCTION

Big Data is an evolving term given to a wide area of data-intensive technologies in which the datasets are extremely large that dealing with them becomes more challenging than how it was before. Due to the critical challenges facing the agriculture sector, farmers feel more forced to adopt intensive farming practices and sustainable agricultural ones, in order to increase both economic and environmental costs. Being able to know where and when to apply fertilizers ,meeting demand for food while maintaining soil fertility, predicting future climatic conditions, controlling pests and diseases that are affecting crops and livestock, monitoring plants growth and productivity, applying efficient and sustainable techniques to crop production, all of these represent great challenges to be overcome in the near future .In this context, varieties of terminologies and technique shave been done to make agricultural practices more efficient ,having as purpose to increase yields and productivity while optimizing the use of natural resources and reducing the negative impacts of intensive farming on the environment.

Among these techniques we mention Precision Farming (PF), Smart Agriculture, Global Positioning System (GPS) ,and Geographic Information System (GIS) etc., but the underlyingconcept in all of them is the same. The main goal of this paper is to provide an elastic and variable Big data architecture based on a profiling system, which aims at providing to agricultural actors a dynamic Big data service composition and an accurate analytical method to help them retrieving meaningful information, in order to enhance decision making Our approach responds to the situation where many users withdifferent interest shall work in a centralized platform such as CloudComputing.By using a dynamic and accurate selection of Big Data services, the agricultural actors can exploit data in real time and with appropriate tools.

II. RELATED WORK

Precision farming (PF) is simply the information technology applied to agriculture. It aims to optimize yields and investments by automatic and real-time monitoring of site specific environmental and soil conditions (e.g. soil type, fertility levels, etc.) using four technologies: remote sensing (RS), geographic information systems (GIS), positioning systems (GPS) and process control.

Precision farming technique was sufficient for small-scale farms, it deals with a set of data coming from sensors, GPS, GIS limited to a few hundred meters for a specific crop land area. WSN architecture was particularly well adapted to meet the needs of precision farming. This kind of network is composed of a large number of spatially distributed sensor nodes, able to cooperate with each other using wireless communication. Regarding sensing, computing, processing and communication capabilities, we can continuously sense and transmit agricultural data to a base station where data can be stored, analyzed and observed in real time.

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However, the implementation of these technologies has highlighted some limitations for precision farming. The emergence of new needs such as real-time processing and analysis of collected data, predicting weather and climate changes at the right time, integrating logistics requirements in the agricultural data process since the acquisition phase until the production one, has open new track of research. Hence the need to go for the new trend of information technology such as big data and cloud computing is a very prominent case study to consider. Responding to this need, we propose a novel approach which mixes and matches between Big Data technologies, cloud computing and a new profiling system, within the same architecture in order to boost agricultural production sustainably and yields in the years ahead.

III. PROPOSED WORK

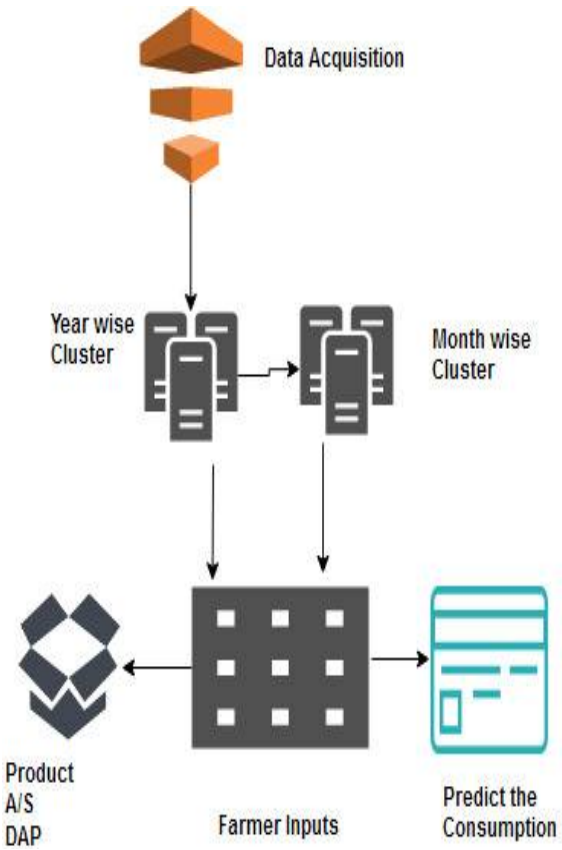

FIG. 1:A PROFILE BASED ARCHITECTURE FOR AGRICULTURE MANAGEMENT

The System Architecture Provides the Frame Work and Basic Functionalities of Novel Consolidated Algorithm.
In the System Architecture there are three important components:Data Acquisition,Clusters, and Inputs.Data Acquisition allows to import data which is stored in the file system.Clusters will be formed according to year cluster and later month cluster with respect to that particular year. Whenever the user enters the product as an input, if the entered data matches with the data present in the cluster then information requested by the user for that particular product will be displayed.

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IV. CONCLUSION

In the present paper, we proposed a profile based approach to manage agricultural data. Our approach will guide the big data providers and the various agricultural actors to identify and select the best services adapted to their specific needs.

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