International Research Journal of Computer Science (IRJCS)
Issue 06, Volume 6 (June 2019)
SPECIAL ISSUE - 5th International Conference - "ACCE – 2019"
ISSN: 2393-9842
www.irjcs.com

A PROFILE BASED DATA ARCHITECTURE FOR AGRICULTURAL CONTEXT

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Manuscript History
Number: IRJCS/RS/Vol.06/Issue06/JNCS10134
Received: 29, May 2019
Final Correction: 30, May 2019
Final Accepted: 02, June 2019
Published: June 2019
doi://10.26562/IRJCS.2019.JNCS10134
Editor: Dr.A.Arul L.S, Chief Editor, IRJCS, AM Publications, India

Abstract—Bringing data mining technologies into agriculture presents a significant challenge. At the same time, this technology contributes effectively in many countries' economic and social development. It includes environmental data provided by precision agriculture information technologies, which represents a crucial source of data in need of being wisely managed and analyzed with appropriate methods and tools in order to extract the meaningful information. Main purpose is to provide an effective data architecture based on profiling system which can assist producers, consulting companies, public bodies and research laboratories to make better decisions by providing them real time data processing, and a dynamic big data service composition method, to enhance and monitor the agricultural productivity. Thus, improve traditional decision making process, and allow better management of the natural resources.
Keywords —Precision agriculture, profiling system, decision making.

I. INTRODUCTION

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 acquire, store, process, analyze and visualize large data sets for future predictions and decision making. 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 become 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

II. PROBLEMSTATEMENT

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. Formers predicting manually the demand of grains and vegetable so its effect to formers economically to overcome this problem proposed system considers machine learning auto demand and yield prediction process.

LITERATURE SURVEY

The first and continuing challenge facing world agriculture is to produce enough food to feed the growing world population. World population could reach eight billion people by 2025. Nearly all of the increase of two billion people in the next 25 years will be in developing countries. The urban population in developing countries will rise by a like number. The implications of urbanization are significant for the food system. It is estimated that people living in rural areas depend on their own production for more than 60 percent of their food supply (only 40 percent is purchased in the market). People living in urban areas, however, depend on the market for close to 90 percent of their food supply. So every time one person moves from a rural to an urban setting, needed market supplies must increase by a factor of two.

Despite the rapid urbanization projected to occur in the coming decades, it will be 2015 before as many people live in urban areas as in rural areas. As of today, some 70 percent of the poor are still rural dwellers, the majority of whom draw some or all of their income from agricultural activities. Literally billions of small and generally poor farmers live in poverty or near the poverty line. Therefore the second challenge facing global agriculture is to develop technologies, policies and institutions that contribute to unleashing agriculture's full potential as an engine of growth. Meeting this challenge will require farmers to have access to both domestic and international markets.

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.

III. EXISTING SYSTEM

Farmers feel more forced to adopt intensive farming practices and sustainable agricultural ones, in order to increase both economic and environmental costs. Disadvantages of existing system: Farmers prediction of crops manually leads to decrease in crops production. Food supply for whole world decreases Due to traditional farming they may produce more crops than the requirement.

IV. PROPOSED SYSTEM

Propose an effective data mining techniques based on profiling(PHANI) improve their traditional decision-making process using Linear Regression algorithm and suggesting the what type grains and vegetable former has to cultivate to get more profit. Advantages include. In this context, varieties of terminologies and techniques have been done to make agricultural practices more efficient. Using these advanced technologies to facilitate crop management, minimize losses and maximize yields.

V. OBJECTIVE

Objective of the system is precision agriculture information technologies, by giving suggestion to the farmer using demand and yield dataset. It is done by applying Machine Learning techniques with external characteristics of the previous year datasets. The algorithm that is used to implement machine learning is Linear Regression Algorithm. The proposed system considers the attributes of the datasets like pani, Aadhar, survey no, vegetable, grains and number of acres. This project increases the efficiency and productivity of the crops.

Algorithm: Linear regression algorithm.

Step1: Let double[]year_data={2008,2009,2010,2011,2012,2013,2014,2015,2016,2017};
double[]demand_data = {18,24,32,40,58,72,80,93,102,118};
Step2: SumX= year_data
SumX2= SQRT(year_data);
SumY= ∑ demand_data
Step3: double xbar = sumx / n; double ybar = sumy / n; Where n=no of the year.
Step4: xxbar += (year_data [i] - xbar) * (year_data [i] - xbar); yybar += (demand_data [i] - ybar) * (demand_data [i] - ybar); xybar += (year_data [i] - xbar) * (demand_data [i] - ybar); double beta1 = xybar / xxbar; double beta0 = ybar - beta1 * xbar; final predicted_value=(beta1*(present_year))+beta0

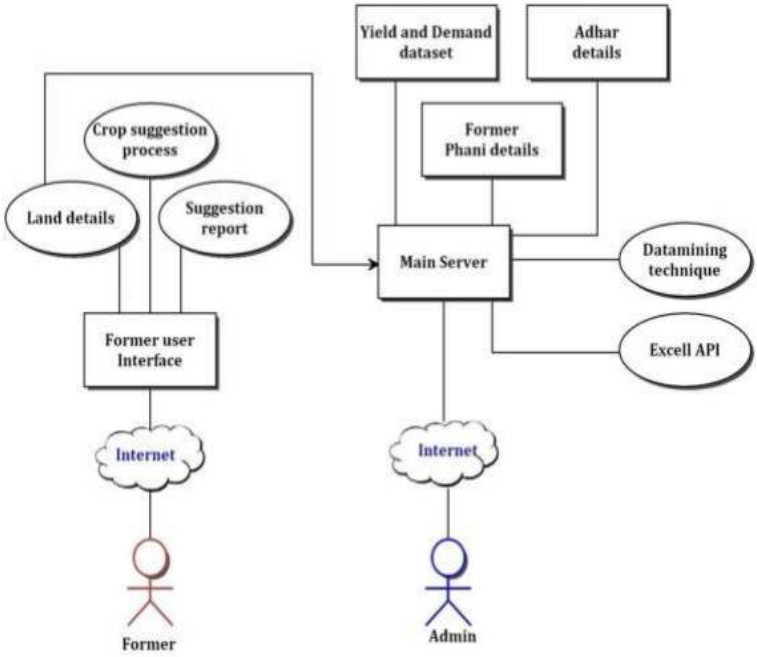

Fig 1:Flow chart for Admin and Farmer Interface

A dataset is a collection of data, which is presented in tabular form. Each column represents a particular variable and each row corresponds to a given member of the dataset. Several characteristics define a dataset's structure and properties. These include the number and types of the attributes or variables, and various statistical measures applicable to them. The dataset consists of a single column of values, often represented as a list. The values may be numbers, such as real numbers or integers; it may also be nominal data. In this module admin can add the former land information details like Aadhar No and survey no of the land and No of Acers Land. In this module admin will upload the previous 10 year dataset like vegetable demand, crops demand, vegetable yield dataset monthly wise, vegetable demand dataset monthly wise, District wise crops data season wise(Karif, Summer, Winter).

Demand calculation includes:

New demand calculation process In this module predicting the Yield From Yield Dataset Using the Linear Regression Technique Let NYLD and No acres former going to cultivate NACR and calculate the ne demand. NewDemand1=NYLD*NACR

Demand Prediction Process: In this module predicting the demand From Demand Dataset Using the Linear Recreation Technique Let NewDemand2. Land Suggestion Process: Comparing the NewDemand1 and NewDemand2 if NewDemand2 is greater than NewDemand1 admin will give permission to cultivate.

VI. RESULTS

Main result of the system is giving suggestions to the farmers using regression techniques. In this work, we will study environmental data provided by precision agriculture information technologies, which represents a crucial source of data in need of being wisely managed and analyzed with appropriate methods and tools in order to extract the meaningful information.

VII.CONCLUSION

The proposed system will be able to predict the crops according to demand and supply chain. Result of the system is giving the suggestion to the farmers using Regression Technique. In this work, we will study environmental data provided by precision agriculture information technologies, which represents a crucial source of data in need of being wisely managed and analyzed with appropriate methods and tools in order to extract the meaningful information. It also suggests what type grains and vegetable former has to cultivate to get more profit. In this context, varieties of terminologies and techniques have been done to make agricultural practices more efficient. Using these advanced technologies to facilitate crop management, minimize losses and maximize yields.

VIII. FUTURE ENHANCEMENT

In future work, this approach will be extended by developing an application to automate the processes of selection and composition of big data services.

REFERENCES

1. A. F. McCalla, Challenges to world agriculture in the 21st Century, Update Agric. Resour. Econ. Univ. Calif. Davis, vol. 4, no. 3, 2001.
2. R. D. Grisso, M. M. Alley, and G. E. Groover, Precision Farming Tools. GPS Navigation, 2009.
3. R. D. Grisso, M. M. Alley, P. McClellan, D. E. Brann, and S. J. Donohue, Precision Farming. A Comprehensive Approach, 2009.
4. R. D. Ludena, A. Ahrary et al., Big Data approach in an ICT Agriculture project, in Awareness Science and Technology and Ubi-Media Computing (iCAST-UMEDIA), 2013 International Joint Conference on, 2013, pp. 261–265.
5. N. Alexandratos, J. Bruinsma, et al., World agriculture towards 2030/2050: the 2012 revision, ESA Work Pap, vol. 3, 2012.
6. Y. Hayami and V. W. Ruttan, Agricultural development: an international perspective, 1st ed. Baltimore, London: The Johns Hopkins Press, 1971.
7. S. Ray, "Essentials of Machine Learning Algorithms (with Python and R Codes),"in Analytics Vidhya, 2015. [Online]. Available:https://www.analyticsvidhya.com/blog/2015/08/commonmachine-learningalgorithms/. Accessed: Nov. 29, 2016.
8. P. Vinciya, Dr. A. Valarmathi, "Agriculture Analysis for Next Generation High Tech Farming in Data Mining," International Journal of Advanced Research in Computer Science and Software Engineering (ijarcsse), vol. 6, issue. 5, pp. 481-488, May.2016.
9. S. Veenadhari, D. Bharat Mishra, and D. C. Singh, "Soybean Productivity Modelling Using Decision Tree Algorithms," International Journal of Computer Applications, vol. 27, no. 7, pp.11–15, Aug. 2011.
10. N. KUMAR, G. P. O. REDDY, S. CHATTERJI, and D. SARKAR, "An application of ID3 Decision Tree Algorithm in land capability classification," Nagpur 440033, India, 2012, pp. 35–42.
11. A. Kumar and S. Bhattachrya, "Crop yield prediction using Agro Algorithm in Hadoop," International Journal of Computer Science and Information Technology & Security (IJCSITS), vol. 5, no. 2, pp. 271-274, April.2015.

