

ROLE OF CLOUD COMPUTING IN SMART AGRICULTURE

Kanahaiya Lal Ambashtha^{*1}, Rajesh Dey^{*2}, Manoranjan Kumar Singh^{*3}

^{*1,2}Associate Professor, Faculty Of Information Technology, GNSU, Sasaram, Bihar, India.

^{*3}Department Of Mathematics, Magadha University, Bodhgaya, Bihar, India.

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ABSTRACT

Cloud computing provides fundamental supports in each and every field and address the challenges with shared computing resources including computing, storage, networking and analytical software; the application of these resources can implement our ideas with all connected people includes farmers. Most of the information technology systems must be used by Indian farmers for filing tax records and traceability records to meet the requirements of non- farmer in the government and distribution industry. We focused on introducing the latest technologies such as sensors, wireless networks and cloud computing to radically revise approaches to agriculture and conduct business feasibility studies for cloud services that make a genuine contribution to agriculture.

Keywords: Cloud Computing, Internet Of Things, Smart Agriculture, Agricultural, Information System.

I. INTRODUCTION

Cloud computing and IOT are two hot concept of ICT, newly emerged since 1960. Nowadays use of internet is also increasing day by day. Today most people used internet based computing called cloud computing. It allows to use software and hardware resources as per as demand. Cloud computing allows the user to share the storage and computing resources. Cloud computing uses distributed network and provide different services and application [1].

In recent years, new ICT is basically focused on country based on agriculture sector. But the main concern for technician is to find a good, efficient, cheaper and user-friendly tool for agriculture field. The new application domain of ICT is cloud computing. It allows users to make use of services as real time computation, data access, and On-line storage. My review article is concerned with the concept of implementing ICT tool based on cloud computing to maintain the survey of tree through updated and secured data base with instantaneous connectivity but with reasonable investment cost [3].

What is cloud computing?

Cloud computing is a tool of ICT able to hide the complexity, share software and hardware information based on use and demand of user [4]. Cloud computing is a better way to run your businesses easily. Cloud computing collects the abstract information from developer as well as from the end users. This information includes details about the implementation of the system. It allows for accessing the application and services at anytime from anywhere [3]. It also reduces the cost of availing those services drastically. At the same time it also offers less men power and maintenance of those services. It also make users free from certain concerns such as buying software, maintain them up to date, maintenance of data, etc. All these issues would be taken care of cloud computing offers various models based on user requirement.

What is agriculture?

Agriculture is a process of farming including cultivation of soil for growing crops and rearing of animals and plants to provide food, fiber, medicinal plant to sustain and enhance life [5]. Agriculture is the major source of income for the largest population in India and is major contributor to Indian economy. However technological involvement and its usability still have to be grown and cultivated for agro sector in India. Although few initiatives have also been taken by the Indian Government for providing online and mobile messaging services to farmers related to agricultural queries, agro vendor's information to farmers, it provides static data related to soil quality at each region. The system which utilizes real time data of soil quality based on its current properties for decision making has not been implemented. Soil properties determine the quality of soil [6].

What is the agriculture position of India in World?

Agriculture plays a vital role in Indian economy. Over 70% of household depends on agriculture. It is an important sector of Indian economy as it contributes about 17% to total GDP and provide employment to over 60% of population. But agriculture productivity is very less compared to world standard due to oblate farming technology and lack of understanding of the need for sustainability. In poor farming community has made things worse [7].

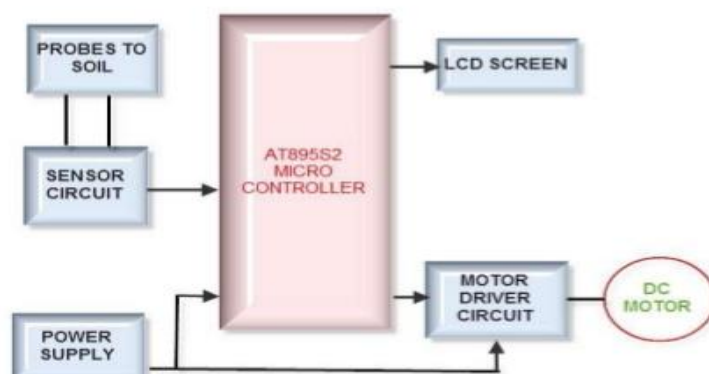
II. SMART AGRICULTURE

While world agriculture is undergoing industrialization, it is important to develop agricultural informationization at the same time. Agricultural informationization has become the trend of development for world agriculture. As far as China’s agricultural development is concerned, agricultural informationization is a major force promoting agricultural development and transformation and a corner stone for maintaining sound and sustaining economic development. In recent years, we have been focusing on agricultural information service and infrastructure development. After years of hard efforts, remarkable results have been seen in agricultural infrastructure development, like “Every Village” project of Ministry of Industry and Information, “Golden Agriculture project” and “Three Dian Project” (computer, TV and telephone network coverage in rural area) of Ministry of Agriculture. These infrastructure provided foundation for agricultural information service. However, problems still exist in China’s agricultural information. For example, we put more emphasis on hardware than software and cannot provide high quality information to meet production needs of farmers. Moreover, information is not sufficiently used by farmers and the effect of information on agriculture, famers and rural area is not that notable. To change this situation and promote fast development of agricultural informationization, it is necessary to use cloud computing and visualization technology to construct “agricultural information cloud combine IOT technology and RFID technology, so as to realize smart agriculture [2].

In smart agriculture deployment of a Cloud of Things (CoT) network, which can include Internet of Things and cyber physical system, can make energy use more efficient and less costly. For example, data analytics collected from the CoT network (e.g., weather situation, land condition, and type of soil) can provide practical information when used in combination with data captured by sensors measuring heat, moisture, chemicals, water stress, pump status, level of water resources, etc. This allows farmers to utilize water, fertilizer, and pesticides in more precise quantities and positions, and with better time scheduling to increase yields. Agriculture is very water and electricity intensive, and both water and electricity are two of the most important input parameters for agriculture. Water and electricity costs can also make or break agricultural commerce. Therefore, smarter water use (e.g., supervising and monitoring water capacity, location, timing, and period of flow based on data analytics) helps to improve irrigation efficiency and leads to lower costs [8].



Block Diagram of Automatic Irrigation System:



Application of agricultural information cloud:

- Cloud computing in planting management by using cloud computing database, information management of specific processes of plant production becomes possible and this allows cloud computing management of relevant records and storing of data related to production performance shown by individual plant and plant groups, analyze and compute, make production plans, etc. This include automatic analysis of key problems occur in specific process of production, like analysis of potential management defects, measurement and analysis of productivity and property based on productivity curve.
- Cloud computing in estimation of productivity effect and management measures Cloud computing estimates productivity effect of plants with production function constructed by using computer simulation and mathematic modeling. For example, scientists use random model and computer simulation technologies to estimate the benefit of various management strategies adopted in different growing processes of key plants.
- Cloud computing in tracing and control of farm produce security By using information technology of computer network, cloud computing is able to build a tracing system for regional farm produce, thus enhances security monitoring of farm produce "from farm to dining table" and realize certification of pollution-free farm produce and place of origin.
- Cloud computing in monitor of plant growing Cloud computing is able to identify the growing of plants by using pattern identification technology and perform dynamic monitor of plant growing with help of other sensing equipment[2].

III. CONCLUSION

In this review article we need to focus on introducing the latest technologies such as sensors, wireless networks and cloud computing to radically revise approaches to agriculture and conduct business feasibility studies for cloud services that make a genuine contribution to agriculture.

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