Use of Cloud Computing in Agricultural Sector, a Myth Or Reality

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Abstract

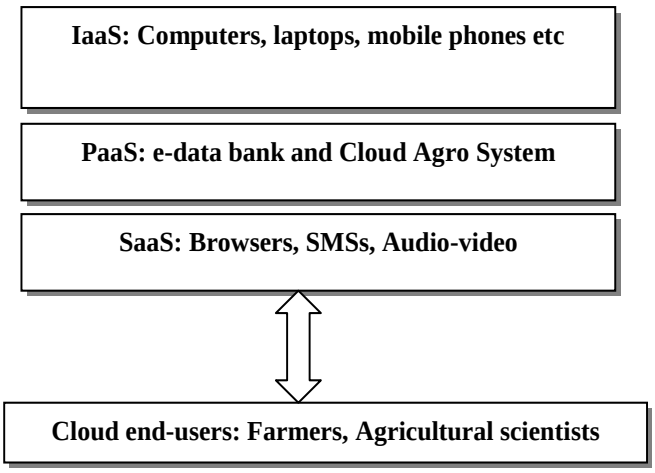
In recent years, Information Technology is being implemented in every sector of the developing nations like India, China whose primary source of income is Agriculture. Use of Cloud computing technology in agricultural sector has greater opportunity in the over all development of India. In this paper we discuss possibilities of cloud computing technology in agricultural activities of the state of Andhra Pradesh. In agricultural sector, the suggested one can be considered as a pilot project. An effective implementation of this will encourage other sectors also, which will lead to optimal benefit of shifting towards better advancement in the agricultural sector.
Key words- *cloud computing, Andhra Pradesh, agriculture, pilot project*

1. Objective

The objective of the study is how much we can introduce cloud computing technology in day to day agricultural activities of the farmers of state of Andhra Pradesh (India). What are advantages and disadvantages of this and what extent we may succeed in our attempt and what are the necessity infrastructural activities we needed and also future scope of use of cloud computing in agricultural activities**.**

2. Cloud computing parameters

Cloud computing is a general term for anything that involves delivering hosted services over the Internet. The name cloud computing was inspired by the cloud symbol that's often used to represent the Internet in flowcharts and diagrams. These services are broadly divided into three categories: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). **IaaS** delivers computer infrastructure as a utility service, typically in a virtualized environment and provides enormous potential for extensibility and scale. **PaaS** delivers a platform or solution stack on a cloud infrastructure. Sits on a top of the IaaS architecture and integrates with development and middleware capabilities as well as database, messaging and queuing functions. **SaaS** delivers the application over the Internet or Intranet via a cloud Infrastructure which was built on underlying IaaS and PaaS Layer.



3. Agricultural scenario of state of Andhra Pradesh

Agriculture is the bedrock of the State's economy in India. In state of Andhra Pradesh out of the total population, over 72.7% live in rural areas seeking their

livelihood from Agriculture and allied sectors. Andhra Pradesh is called "the rice bowl of India". It is the largest and the most populous state. Agriculture is the major source of income to the State's economy. Two important rivers of India, the Godavari, and Krishna, flow through the State providing irrigation. Andhra Pradesh is agrarian in character, and it is considered as the most progressive state w.r.t. agricultural development, maintaining high levels of crop production compared to other states. Around 16.4% contribution of advance estimates at constant prices of the state GDP is from Agriculture during 10-11 and 15.4% during 11-12.Agriculture in AP provides employment to 65% of the population. Agriculture in Andhra Pradesh is mostly dependent on rainfall. Agricultural production depends upon the seasonal distribution of rainfall. In the State, South-West and North-East Monsoons are the two important periodic winds, which are the important sources of the rain. South-West Monsoon (66%) is spread over the period from June to September and North-East Monsoon (24%) from October to December. The normal annual rainfall of the State is 940 m.m. Major portion (66%) of rainfall is contributed by South-West Monsoon (June-Sept) followed by (24%) North-East Monsoon (Oct-Dec). The rest10% of the rainfall is received during the winter and summer months. The Normal rainfall distribution in the three regions of the State differs with the season and Monsoon. The influence of South-West Monsoon is predominant in Telangana region (716m.m) followed by Coastal Andhra (620 m.m) and Rayalaseema (407 m.m),whereas the North-East Monsoon provides high amount of rainfall in Coastal Andhra area (324 m.m) followed by Rayalaseema (238m.m) and Telangana (129 m.m). There are no significant differences in Normal distribution of rainfall during winter and hot weather periods among three regions. The State receives major portion of its rainfall from South-West Monsoon.

4. The relationship between Cloud computing and agricultural development

The applications of cloud computing technology in agriculture can solve the bottleneck problem of agricultural modernization and agricultural information, and can also break agricultural producers' limitations in knowledge or technology, reduce duplication, improve utilization of existing resources to make up for dispersed, small-scale, regional differences agricultural production and the strong dependence on the natural climate vulnerability of agricultural production.
Modernizations of agriculture include three aspects:

1) Widely use modern agriculture production equipment, agricultural machinery;
2) Extensively use modern agricultural planting and breeding technology, weather observation and forecasting;
3) Use modern forms of production organization and management methods, etc.

Seen from the development of agriculture, the agricultural mechanization goal has been basically achieved, but there are still many outstanding issues in technology and management, such as fewer agricultural technology service organizations and personnel, less necessary technical guidance, especially in the breeding, pollution-free crop cultivation and livestock breeding, soil testing, fertilizer, irrigation and soil improvement, meteorological observations and weather forecast were not enough technical support, most of farmers are in a state of blind conformity. Organizational form of production in agriculture is relatively simple, backward, and a low degree of specialization of agricultural production areas, it is difficult to achieve Integrating Agriculture. In addition, due to the limitations of the farmers at market forecasting, business decision-making, information gathering and logistics management capacity is more lacking; it often leads to a mismatch between the supply and demand, not only damages the farmers' own interests, have also hindered the healthy development of the market supply and demand .

5. Advantages

• *Data management*: The data will be managed by the service provider, a team of professionals. That guarantees a better and organized management of data.
• *Data readiness*: This provides data from the e-data bank databases to its entire stakeholder at any time and at any location.
• *Local and global Communication*: This makes the communication between different users much faster, easier and cheaper. Also the communication will be secured.
• *Rural-urban migration*: A major problem of Andhra Pradesh is rural-urban migration. It can be reduced as this provides its services all over the state and may also all over country at any time no matter how remote the place is. This will also help in controlling unemployment problem in the state and country.
• *Motivation*: It will motivate the farmers and researchers to get involved more and more into agriculture as any communication will be result oriented. That will result in overall development of this sector in the nation.

• *Security*: It provides an enhanced security as the resources will be stored in cloud and will be maintained centrally by the service providers. Thus, it is not a cause of concern for its users.
• *Reduction of technical issues*: It cuts short the man power, maintenance and infrastructure requirement drastically, as it will be provided by the service providers.
• *Overall economy*: Implementation of cloud computing in agriculture sector will help in uplifting the agricultural sector of the country. That will boost the overall development of the economy. It is due to the mass involvement of different stakeholders, as the system will monitor and deliver progress report whenever and wherever needed.

6. Disadvantages

Although the implementation of the cloud computing in agriculture indicates overall growth of the agricultural sector in India and also Andhra Pradesh, there are few concerns as well. One of the main concerns of cloud computing is the conflict in different country laws. It demands a careful selection of the provider and may also require negotiation in drawing an effective agreement between the service providers and State. Another concern is the security and privacy. The nation may not be willing to hand over sensitive data to a third party. This can be taken care of by careful selection of reliable and reputed cloud service providers. One more important constraint is, cloud computing demands high bandwidth internet connectivity. The current international bandwidth of Andhra Pradesh is 325Mbps, which is just sufficient to cater the basic needs in the state only, for entire India more than 1200Mbps is needed. For optimally use the cloud services India needs much higher bandwidth than the current capacity. One possible solution to this problem could be to incorporate certain services through mobile, especially text related services.

6. Conclusion

The state of Andhra Pradesh will benefit significantly if the idea of implementing cloud computing in agricultural sector properly. This may bridges information gap within and outside the states of India. In agricultural sector, the suggested one can be considered as a pilot project. An effective implementation of this will encourage other sectors also, which will lead to optimal benefit of shifting towards better advancement in the agricultural sector. This will definitely have a positive impact in the overall economic development of the state as well as nation. Above all, cloud computing is a newly introduced concept and most of the developing nations are not readily willing to accept and implement it. Therefore, it needs a mass awareness and promotion among the prime stakeholders to acquire the full potential of it and have a well established information base. This will in return lead to a well-connected world. Finally we can say use of cloud computing in agricultural sector is not a myth it is going to realty.

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