

# The Study of Cloud Computing Challenges in Agriculture with Special Reference to Sangli District (MS)

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## ABSTRACT

In the present paper concepts and Cloud Computing challenges in agriculture are highlighted. Cloud Computing is delivery of computing services rather than the product. Where by shared resources, software and information are provided to computers and other devices as a utility over a network. Cloud computing will gives us great facility to store our data remotely and use that data on demand. Cloud computing technology is nothing but on-demand resource sharing technology. As we all know that agriculture is the main part of Indian Economy, in different manner like food supply, main source of employment as well as earning of foreign exchange through export of agricultural commodities like grapes, sugar, turmeric, other food grains, etc. so there is need to improve the productivity of such products along with the quality. This will help us to improve the economic status of Sangli district people and that's why one need's to use cloud computing technology for better results. The lack of knowledge regarding the ICT and its use in the development is necessary. Some of the challenges such as availability, connectivity, literacy, ICT awareness and power availability are in Sangli district (MS) for use the cloud computing in agriculture.

## Keywords

Cloud Computing, Krushi Mitra Cloud, Challenges in cloud computing.

## 1. INTRODUCTION

### Overview of cloud computing

Cloud computing, often referred to as simply "the cloud," is the delivery of on-demand computing resources, everything from applications to data centers over the internet on a pay-for-use basis. Cloud computing is not application oriented but service oriented. It offers on-demand basic cloud computing. Environment virtualized resources as measurable and billable utilities.

The main idea behind cloud computing is to provide the information to the used as and when required. John McCarthy [1] has already discussed regarding the facility in the computing field. This facility provides the information to the public. The cloud computing facility is provided [4] by the service provider depending on the certain condition and the requirement for the betterment of the user. Government is providing many agricultural and development facilities using the cloud. The cloud facility is prepared using the various geographical, economical, metrological bases. Bohem and et.al. Stated different types of clouds [2]. The treats in the cloud computing are given by Ashktorab and Taghizadeh [3]. For the deployment of the information many strategies are used. A cloud can be deployed using any of the below mentioned strategies. The private, public, community and hybrid clouds are various

formations of the services provided to the used. Public cloud can be accessed by any user with an internet connection and access to the cloud space for its use in the public interest [6]. For specific group the private cloud is used for getting the information and its access is just limited to the group having similar characteristics.

For more than one organizations the information is passed using the community cloud. In this the community as a whole is benefited. The combination of two or more types of cloud for the information is also desired in such cases the hybrid cloud plays important role. This helps to link the two or more types of cloud formation strategies for the access of the information to the user.

There are three types of cloud providers that user can subscribe to:

- Software Service
- Platform Service
- Infrastructure Service [6]

### 1. Software Service

Software service is a set of software that user does not own but pay for the same element of utilization by user or some other kind of consumption basis, here you do not have to do development or programming but you may need to come in and configure the software you don't have to purchase any software. The development and management is done by the service provider. The software is developed as per the specification of the user and may be modified as per the requirements and various conditions of the data.[6]

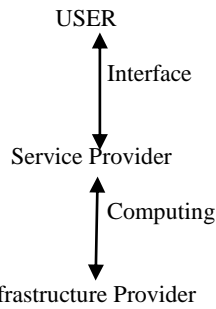
### 2. Platform Service

This provides the hardware and the software together for some application with certain services for common function. [6]

### 3. Infrastructure Service

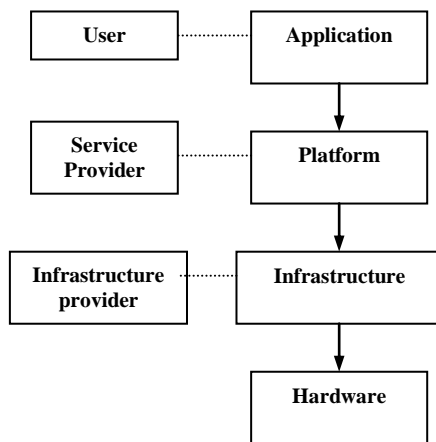
Infrastructure service is a delivery of hardware i.e. server, storage network and associated software operating systems, virtualization technology, file system as a service. [6]

The business model of cloud computing [5] is depicted by Fig. 1. According to the layered architecture of cloud computing, it is entirely possible that a platform service provider runs its cloud on top of an IaaS provider's cloud. However, in the current practice, Infrastructure service and platform service providers are often parts of the same organization. This is why platform service and Infrastructure providers are often called the infrastructure providers or cloud providers.



**Fig. 1 business model of cloud computing**

Depending on the type of provided capability clouds are used for various models such as service, business or agricultural model. The Fig 2 shows the four basic layers in which resources are managed.



**Fig. 2 Management layers**

The four layer resource management has some specific function applicability. The application layer is at the top which is related to the end user having the software as the main functional part. Below that the platform layer which contains the software framework storage as platform service layer. The infrastructure layer has computation and storage block. And at the bottom the data containers consists of CU, memory, disks and the bandwidth for the service. The four layers works together to form the resource management layer.

### Characteristics of Cloud Computing

The characteristics of the cloud computing are import from the cloud point of view. The various characteristics are given -

- On-demand self-service.
- Independency
- Elasticity of workload
- Disaster Recovery
- Security.

## 2. CHALLENGES OF COMPUTING IN AGRICULTURE.

The agriculture sector accounts for about 18.0% of the GDP and employs 52% of the total workforce. Most of the people's live hood depends on agriculture. The agriculture is the main source of earning of about 70% people in India. The land is limited and it is necessary to feed growing population of 125 cores. Day by day feeding hands are increasing and land usage is decreasing due to industrial usage, housing and wastage due to salinity.

Therefore it is necessary to use the scientific techniques in agriculture to increase the productivity. For this the proper utilization of various agriculture services are necessary. Therefore for such investigation Sangli District in Maharashtra is taken as a research area which is located in southern Maharashtra..

The Indian climate divided in to six major climatic subtypes and Maharashtra state is having tropical monsoon climate. In Maharashtra also variety of climate changes are observed. Such as Konkan, Western plateau and central plains. One part of Sangli district is situated in river basins of Krishna and Warana and another part is famine. Sangli district can be broadly divided into three agro-climatic zones as under

- Western part of Shirala tahasil
- Tahsils of shirala(East), Walwa , Miraj(West), Tasgaon (West) and Palus
- Tahsils of khanapur, Atpadi, Kavthe Mahankal, Jat, Miraj(East) and Tasgaon(East)

Agriculture plays vital role in economic point of view. The agricultural growth is totally depending on different kinds of cycles those are seasonal, climatic, topographic, etc. Many time farmers from Sangli District may have to face with climatic change problem, famine, etc.

In other countries like china, Japan fujitsu has designed the cloud for agricultural development but economical and technological point of view these countries are developed. India is developing country and economical share of Sangli district's in India's economy is considerably higher through agriculture. Sangli district is famous for turmeric, Grapes etc. So to improve the productivity of Sangli district farmers should know all the basic information regarding market conditions, market demands etc.

Considering basic requirement of farmers from Sangli district Krushi Mitra Cloud is designed. That will help the farmer to get better results. This Krushi Mitra Cloud is beneficial to farmers for better productivity and government for economical development.

Cloud Computing is better solution to provide all the facilities to the farmer as Cloud Computing is having various benefits like

- Data and applications are accessible from any connected computer or network.
- No data is lost if your computer fails, as data is in the cloud.
- The service is dynamically scaled to usage needs of organization.
- Location Independent.
- Cost Saving
- Easily accessible.

For all the above benefits of cloud computing, there are some challenges they are given bellow.

The Krushi Mitra Cloud is specially designed for Sangli district according to the climate, soil patterns, etc. In this cloud testing of soil will be done through soil sensors and that will gives results regarding type of soil, total moisture in soil, humidity of soil, rainfall and using this data experts will gives suggestion about which crop will gives more benefits or maximum productivity from that soil. There are some more facilities given

by Krushi Mitra Cloud, instead of these facilities there are some challenges regarding implementation of cloud in agricultural sector in Sangli district.

- Computer availability
- Connectivity
- Computer Literacy
- Internet Awareness and access
- Power availability
- Climatic conditions

#### **1. Computer availability**

Most of the part of Sangli district comes under rural area and the financial condition of these people are very poor. So to buy computer system is not affordable to the respondent. The electricity supply is also not available during 24 hours almost half the day load shedding is applicable. The rain, cyclone and adverse conditions affect the continuous power supply so we can't rely on these services

#### **2. Connectivity**

Due to poor network, internet access is not much available for the villagers. The villagers are not able to by the internet connections due to their economical condition The internet connectivity in the remote area of mountains and vast dry land the connectivity is not provided. Now attempts are made to provide the internet through the mobile services but still it is not enough to reach to the common poor people.

#### **3. Computer Literacy**

As we all know Sangli district is having higher literacy ratio but in rural area in district people are aware of computer due to less number of computers are available. The use of ICT is least used in the district.

#### **4. Internet awareness.**

Most of the people do not know the internet services. The cost of the internet services and speed is also not up the desired level.

These are some challenges which are the main barriers in implementation of Cloud Computing in agriculture sector in Sangli district. To avoid these barriers government has to initiate because Krushi Mitra Cloud provides various facilities to farmers to get profit from his farm, and that is directly proportional to the economical development of India. Then the question is what kind of efforts government of India or Ministry of Agriculture should have to take –

- Government of India should have to provide computer systems in affordable price.
- They have to start training centers to avoid computer illiteracy.
- To implement cloud computing there should be better network coverage and government of India has to provide better connectivity in low price.
- As these people got network connectivity easily then they will automatically aware about use Internet.
- Supply of electricity should be 24 hours.

### **3. CONCLUSION**

This paper contains the various challenges faced while implementation of the cloud application in agriculture sector.

For economic point of view agriculture plays important role in India. Cloud Computing is really great technology which is having various benefits. To implement these types of technology in India is necessary because in case of ICT the respondent should have to invest his money more as compare to Cloud Computing. From the investment point of view the respondent only invest his money to buy computer system and internet connection. The expectations from the government of India are the basic requirement is 24x7 power supply, strong network connectivity. The government should provide special schemes to access these things easily, like as we access electricity, telephone connection having minimum charges for rural areas. Because the success of this Cloud Computing in Sangli district is totally depends on the rural area. Creating awareness to these people about to adoption of this kind of technology in their daily practices for better results.

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