IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 12, December 2021

DOI: 10.17148/IARJSET.2021.81265

Cloud Computing in Agriculture

Santhosh Pawar

Assistant Professor (Computer Science), UAS Raichur, Raichur, India

Abstract: Cloud computing provides computing services such as servers, storage, databases, networking, software, analytics, and intelligence over the Internet providing faster innovation, flexible resources. in agriculture an effective implementation of cloud computing is needed. Cloud Computing is emerging as important technology , as a commercial infrastructure that eliminates the need for maintaining expensive computing hardware, software, Information technology, staff, infrastructure, recourses and their maintenance.

In the modern age of cloud technology, it is very useful to organize all agricultural data banks (related to land, climate, research, crops, farmers, agricultural trade, fertilizers, pesticide information, soil etc) and machinery black. This paper also discusses cloud computing types, characteristics, cloud service types, cloud benefits, and cloud challenges in the agricultural sector.

Keywords: Cloud Computing in Agriculture, IaaS, PaaS, SaaS.

I. INTRODUCTION

Instead of having their own computer software and databases, companies can borrow everything from applications to storage from cloud service providers. One of the benefits of using cloud computing services is the future cost and complexity of owning and maintaining their own IT equipment when a company uses it, instead of paying for what it uses. Is to be able to avoid. Similarly, cloud computing providers can benefit from a large number of statistics by providing the same service to multiple customers. Cloud computing is the provision of computers or IT software on the Internet. It provides software, applications and services online to meet customer needs through minimal effort or collaboration with a service provider. India is one of the major producers of food, grain and other commodities, but agriculture and its production system are uncontrolled, farmers follow poor and old-fashioned methods, and farmers. This creates a clear gap between supply chain and demand for agricultural products.

Fig1: Cloud Computing in Agriculture

II. CLOUD COMPUTING

Cloud computing is a collective concept for everything, including services stored over the Internet. These services fall into three main categories or types of cloud computing. Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

The cloud can be private or public. The public cloud sells services to anyone on the Internet. A private cloud is a unique network or data center that provides a service to a limited number of people with specific access and permission settings. Whether private or public, cloud computing is designed to provide easy and scalable access to computing resources and IT services.

Cloud computing infrastructure includes the hardware and software required to implement a successful cloud model. Cloud computing can be thought of as a useful computer or a required assembly, it is also on demand computing or utility computing.

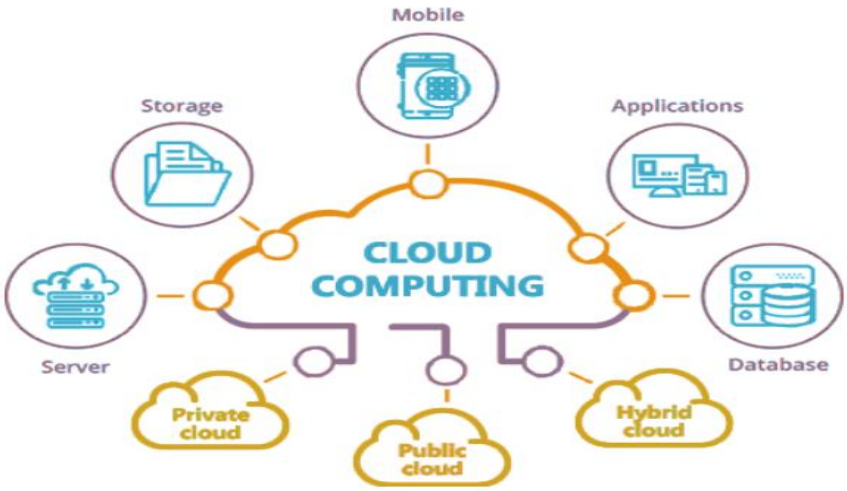
IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 12, December 2021

DOI: 10.17148/IARJSET.2021.81265



Infrastructure As A Service (IaaS):

- This is the most flexible type of cloud service that allows you to rent hardware and use cloud and IT building blocks.
- Full control over the hardware running the application (servers, VMs, storage, networks, and operating systems).
- This is a fast-computing tool provided and managed on the Internet.
- IaaS provides the latest level of flexibility and best-in-class content management tools for IT infrastructure.
- It seems that the infrastructure is dominated by the IT of many IT departments and well-known developers.
- IaaS example: VM or EC2 (via AWS), storage or networking

Platform As A Service (PaaS)

- PaaS is a type of cloud service that provides a ready-to-use platform that allows developers to create customized applications for writing and executing advanced code.
- Enables you to create applications quickly without having to manage the software below. For example, if you are using PaaS to download web applications, you do not need to install the operating system, web server, or even system updates. However, you can extend the service to add new functions.
- This type of cloud services streamline production and deployment, making them cheaper than IaaS, and cheaper than SaaS.
- This improves performance by eliminating the need to worry about non-specific services related to hardware purchases, configuration rights, software maintenance, patching, or applications. running.
- PaaS examples: Elastic Beanstalk or Lambda on AWS, WebApps, Services or Azure SQL DB on Azure, Cloud SQL DB on Google Cloud, or Oracle Database Cloud Service on Oracle Cloud.

Software As A Service (SaaS):

- SaaS provides a running product and is managed by your service provider.
- This software will be supported online and will be available for purchase with a subscription or using this type of cloud service.
- With SaaS offerings, you don't have to worry about how to manage your services or how to manage your infrastructure below. It helps if you believe in how to use the application.
- SaaS Example: Microsoft Office 365, Oracle ERP / HCM Cloud, SalesForce, Gmail, or Dropbox.

Characteristics Of Cloud Computing

- Multi-tenant: multi-tenant is an example of a software application company that assists many customers. Each client is called a landlord.
- Private Services: cloud computing is a private cloud service where customers provide security and deploy applications without an external cloud service provider. Through the Private Services Cloud, users access the website portal to request or configure a server and launch an application.
- Elastic (scale-up). This saves hardware and software as a whole
- Web-based: means that resources can be accessed through web-based applications.
- Automation: Most things in the cloud are automated, with less human intervention.
- Pay-as-you-go model: You only have to pay when using cloud resources.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 12, December 2021

DOI: 10.17148/IARJSET.2021.81265

➢ Modern web-based integration: You can configure multiple application programs to share data in the cloud. In networks that incorporate cloud integration, a variety of applications communicate directly or through third-party software.

➢ Security: Cloud services make copies of the data they store to prevent any form of data loss. In the unlikely event that one server loses data, the copy version will be restored from the other server.

Cloud Computing In Agriculture:

➢ Agricultural information databank (crop, weather, soil, growth progress, farmer data, expert consultation)

➢ Store all agricultural information in a centralized cloud. This makes it available to all users anytime, anywhere.

➢ Manage all land, location and area related data. Soil and land characteristics with a centralized decision support system

➢ Advanced integration and sharing of agricultural information

➢ Remove farmers' restrictions on technical knowledge and resources

➢ Providing agricultural technology services and science

➢ Improved agricultural marketing

➢ Efficient use of agricultural resources

➢ Promote the distribution of agricultural products and services at a broader level.

III. BENEFITS OF CLOUD COMPUTING IN AGRICULTURE

- Data Readiness any time & any where
- Local and global communication
- Improve economic condition of the Nation
- Enhanced the GDP of the nation
- Ensure food security level
- Motivation of farmers and researchers
- Reduction of technical issue
- Rural-Urban movement
- Data availability at any time and at any location without delay
- Improve market price of Food, seeds, other product

CHALLENGE OF CLOUD COMPUTING IN AGRICULTURE

Third-party maintenance and monitoring reduces the security of your data

➢ Indirect administrator accountability

➢ Farmers are uncertain about cloud computing technology

➢ Less physical control

➢ Attractiveness to hackers

➢ Necessity of network connection

➢ Always need internet connection

➢ Farmers do not have easy access to platform facilities

➢ Farmer training required for this technique

➢ Does not work well on slow connections

➢ There is a security risk

IV. CONCLUSION

Cloud computing is a new technology development that has the potential to make a huge impact on agriculture these days. There are many benefits to offer to users and businesses. This outstanding technology has the potential to provide not only agricultural-based knowledge, but also the management and knowledge of natural resources directly to consumers in larger areas as well as in smaller areas such as non-stop marketing and shops. It's hidden. This will change the entire supply chain, which is now primarily for large enterprises, but could change to a more direct and shorter chain between producers and consumers. Cloud computing technology applicable to agricultural growth, food, grain, products, improving economic conditions, food safety, ensuring national GDP, distribution of agricultural information, etc

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 12, December 2021

DOI: 10.17148/IARJSET.2021.81265

REFERENCES

[1]. Hori, M., Kawashima, E. and Yamazaki, T., (2010) "Application of cloud computing to agriculture and prospects in other fields", Fujitsu Science and Technology Journal, Vol.46, No.4, pp.446–454.

[2]. Kamath, S. and Chetan, A.A. (2011) Affordable, interactive crowd sourcing platform for sustainable agriculture: Enabling public private partnerships. Cloud Computing Journal, April, 2011.

[3]. Quan Chen, and Qianni Deng (2009) "Cloud Computing and Its Key Technologies", Journal of Computer

[4]. Rani, S. & Gangal, A. (2012) "Security issues of banking adopting the application of cloud computing", International Journal of Information Technology and Knowledge Management, Volume 5, No. 2, pp. 243- 246.