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CLOUD BASED SMART AGRICULTURE

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Abstract: Use of Cloud computing technology in agricultural areas has larger probability within the overall development of Asian nation. Encouraging in agriculture sector is an effective implementation of cloud computing. Cloud Computing is emerging these days as a billboard infrastructure that eliminates the necessity for maintaining costly computing hardware, software, info technology, staff, infrastructure, recourses and their maintenance. Cloud computing could be a network-based surroundings that focuses on sharing computations, Cloud computing networks access to a shared pool of configurable networks, servers, storage, service, applications & alternative vital computing resources. In era of cloud computing technology terribly useful for centralized the allagricultural connected knowledge bank (Soil-related, weather, Research, Crop, Farmers, Agriculture promoting, fertilizers and chemical information) within the cloud. during this paper, conjointly discuss Computing model, characteristics, deployment model, cloud service model, cloud edges and challenge of cloud computing in agriculture field.

Keywords: : Cloud computing, Community model, Hybrid model, Public model, personal model, Agriculture, IaaS.

I. INTRODUCTION

Cloud computing is that the provision of pc or IT infrastructure through the web. that's the provisioning of shared resources, software, applications and services over the web to fulfill the elastic demand of the customer with minimum effort or interaction with the service supplier. Asian nation is one among the most important producers of foods, grains and alternative merchandise, however still agriculture and its production method area unit localised, unsophisticated and superannuated strategies being followed by the farmers, beside many constraints of the farmers and modernization is incredibly slow. This leads to a lucid gap between the availability and demand chains of the agricultural merchandise. this may have a negative impact on the farmer's economic conditions similarly the national income of the country. This bottleneck are often eliminated with the implementation of Cloud Computing facility in agricultural field. The centralized location must be established to store all the relevant knowledge. It will embrace various, Separate databases Soil-related, weather-related, Research, Crop and Farmers-related knowledge will all be stored at one location, and knowledge accessibility are often achieved. This knowledge are often accessed by the end-users such as farmers, experts, consultants, researchers etc simply any time from any location through the devices that area unit connected to the cloud system.

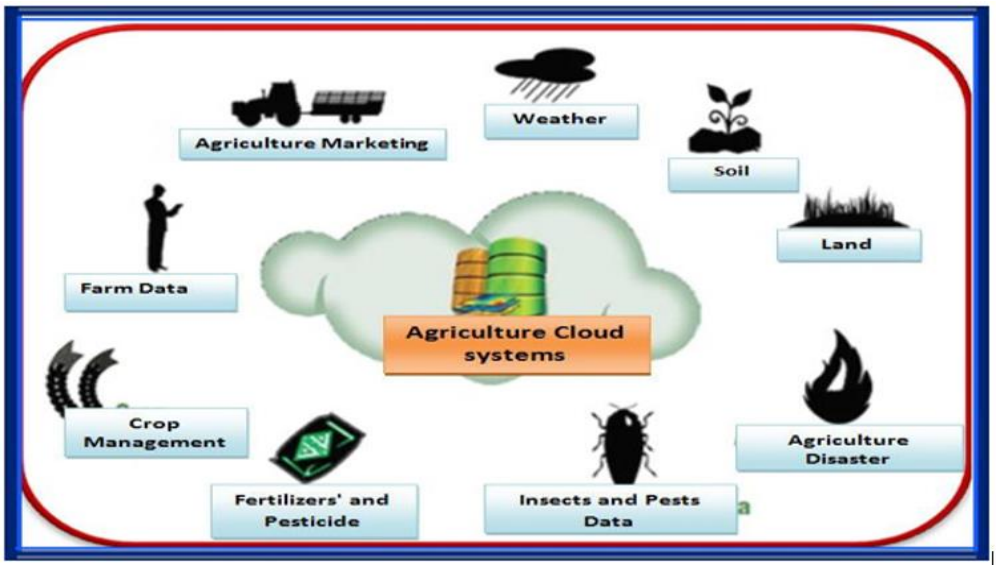

Fig.1 Agriculture cloud system

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II. COMPUTING MODELS

A. Desktop Computing

This type of computing utilized in single computer Computing. This varieties of computing facility applicable for private, professional (Engineer, artist, authors, doctors, programmers) workplace and business firm.

Fig.2 Desktop computing

B. Consumer Server Computing

Client server computing could be a system that performs each the functions of consumer and server to push the sharing of information between them. A consumer is any method that requests specific services from the server method. A Server could be a method that has requested services for the consumer. it permits several users to possess access to the same information at a similar time, and therefore the information can store abundant info. varied varieties of server utilized in Client service computing like mail server, digital computer, fax server, information server, web server. Example of client server System, File transfer: this is often the transmission of files between the consumer and server. It conjointly permits storing of files on the server. Files like movies, images, music are often stored.

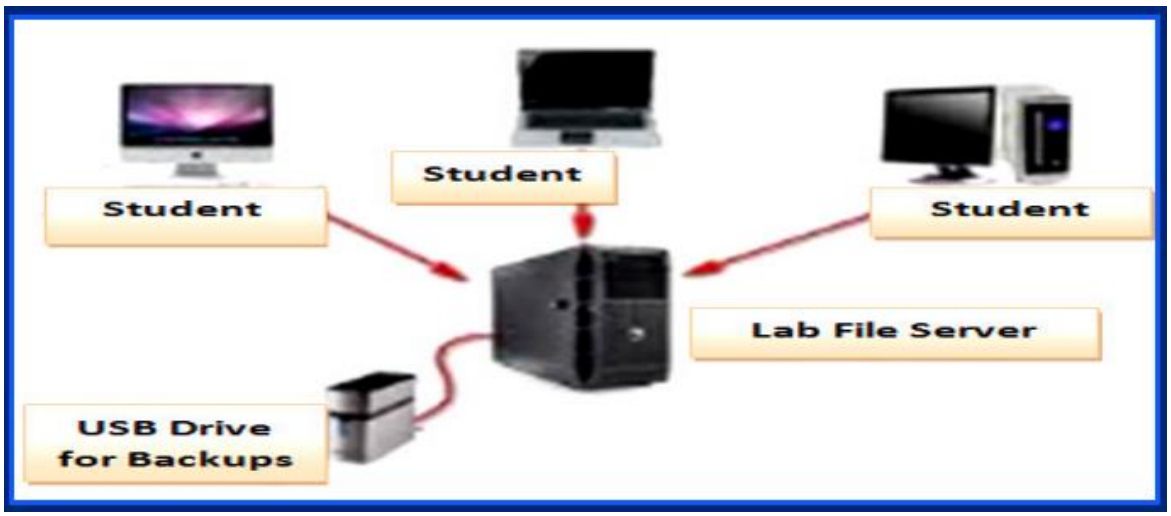

Fig.3 Clint server Computing

C. Cluster Computing

In cluster computing, a gaggle of comparable work outrs is connected regionally to work as one compute. This facility utilised for load balance of servers. Main blessings of this technology is distributed the load of server among the every servers of pc.

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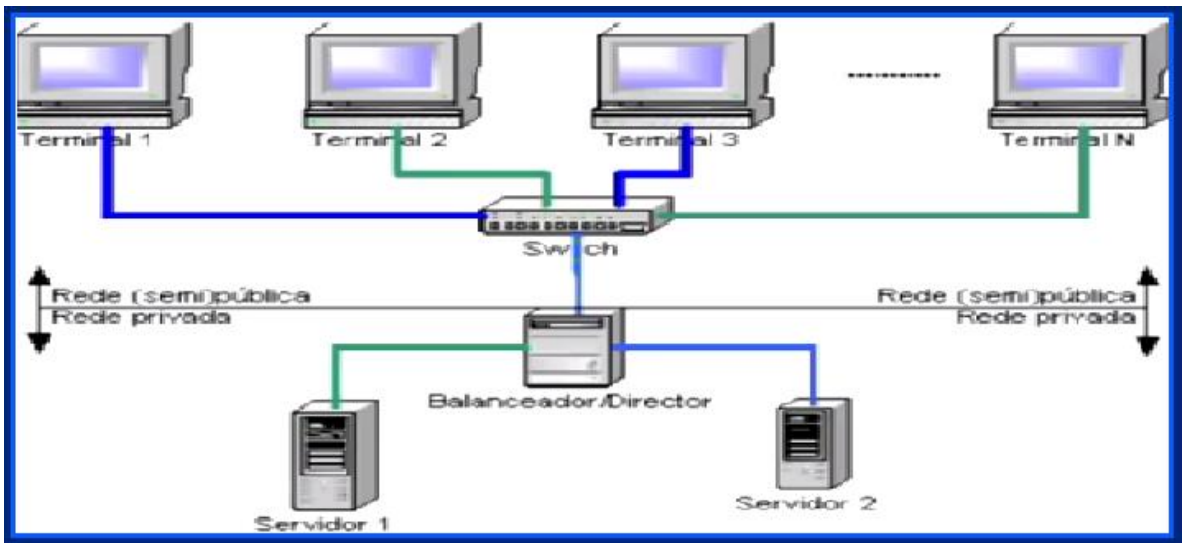

Fig.4 Cluster computing

D. Grid Computing

Grid computing is that the assortment computers resources from multiple locations to succeed in a typical goal. Benefits of grid computing area unit Increase access to knowledge and collaboration, be a part of knowledge and distribute it globally, Support massive multi-disciplinary collaboration, employment balance, knowledge security etc. Main characteristics of grid computing.

listed within the below:

- Grid coordinates Resources that don't seem to be subjected to centralized management.
- Grid use customary, open, general protocols and interfaces.
- Grid deliver top quality of Service

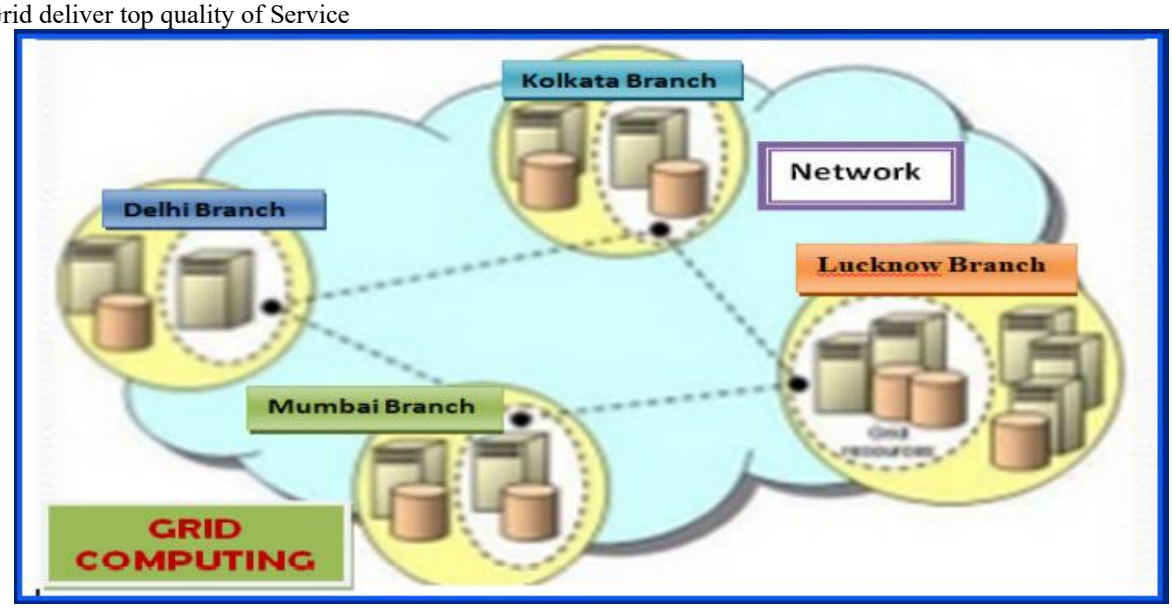

Fig.5 Grid Computing.

E. Cloud Computing

Cloud computing is that the combination of cluster and grid computing. The IT atmosphere evolved from mainframes to consumer servers, the web, virtualization and cloud computing. To configure IT resources a shared pool is provided by the Cloud computing .(e.g. processing, network, software, data and storage) on demand, as a ascendible and elastic service, through a networked infrastructure, on a measured (pay-per-use or subscription) basis, that desires stripped-down management effort, relies on service level agreements between the service supplier and customers, and sometimes utilizes virtualization resources. laptop Engineering and Intelligent Systems web.iiste.org

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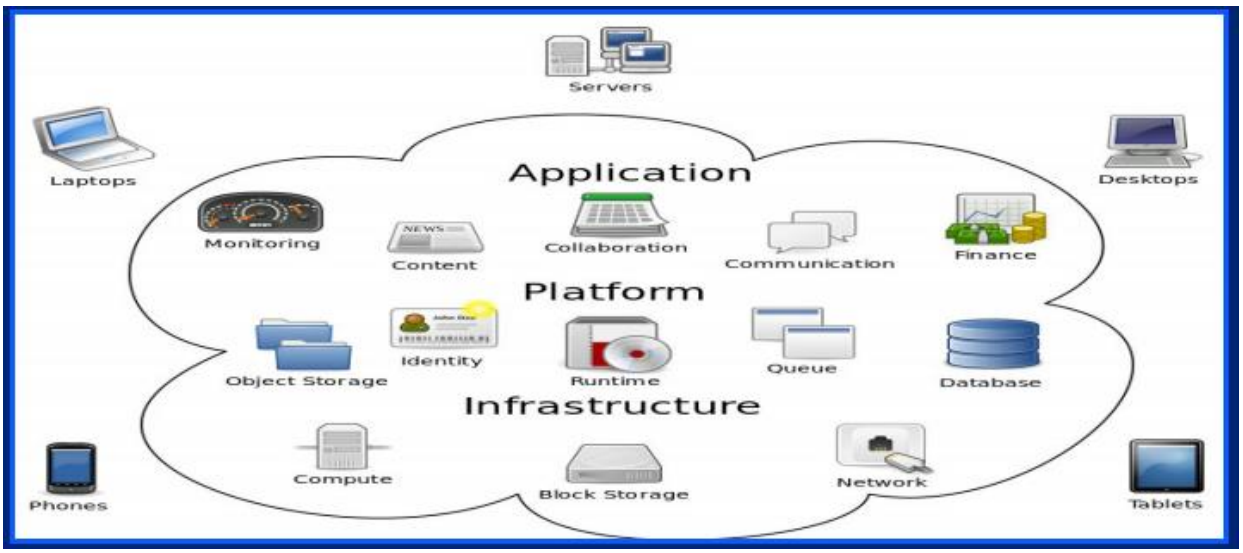

Fig.6 Cloud Computing

III. CHARACTERISTICS OF CLOUD COMPUTING

• On-demand self-service: a consumer can unilaterally provision computing capabilities, like server time and network Storage. .
• Broad network access: Capabilities unit of measurement accessible over the network & accessed through customary mechanisms that promote use by heterogeneous skinny or thick shopper platforms (e.g., mobile phones, tablets, laptops, and workstations).
• speedy elasticity: Cloud services could also be rapidly and elastically provisioned, in some cases mechanically, to quickly
scale out and rapidly absolve to quickly scale in. To the patron, the capabilities accessible for provisioning typically appear
to be unlimited and will be purchased in any quantity at any time.
• Measured service: Pay per use-capabilities is charged using a metered, fee-for-service, or advertising primarily based request
model to push optimization of resource use. Examples live|area unit|unit of measurement|unit} measure the storage, bandwidth, & computing
resources consumed and charging for the number of active user accounts per month.
• Resource pooling: The provider is computing resources unit of measurement pooled to serve multiple customers using a multi-tenant model, with utterly completely different physical and virtual resources dynamically allotted and reassigned in line with shopper demand. there is a manner of location independence during this the shopper usually has no management or knowledge over the precise location of the provided resources but might even be able to specify location at an improved level of virtuality (e.g., country, state, or info center). samples of resources embrace storage, processing, memory, network metric, and virtual machines.

IV. DEPLOYMENT MODEL OF CLOUD COMPUTING

A. Public cloud
The cloud infrastructure applications, storage, and different resources square measure created accessible to the general public for gratis or on pay-per-use model. it's in hand by a corporation commercialism cloud services. Example: Amazon, Google Apps,Windows Azure etc.
Some vital purpose for Public Cloud
• Entirely hosted by External suppliers
• nearly any client will pay for resource on the cloud
• Support is handling by the supplier.

B. Community cloud
The cloud shares infrastructure for specific community with common considerations (security, compliance, jurisdiction etc), whether or not managed internally or by a 3rd party and hosted internally or outwardly.

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C. Hybrid cloud
The cloud infrastructure may be a composition of 2 or additional clouds (private, community, or public) that re-main unique entities however square measure sure along by standardized or proprietary technology that allows information and application movableness. laptop Engineering and Intelligent Systems web.iiste.org

D. non-public cloud
The infrastructure of cloud is operated for one organization. it should be in hand, managed and operated by the organization or a 3rd party, and will exist on-premises or off-premises.

V. MODEL OF CLOUD COMPUTING

A. SaaS (Software as a service) model: Through this service delivery, model finish users use the package application services directly over network in step with on-demand basis. during this sort, service solely needed administrator & cloud consultants. Example salesforce, drop box and Google applications like Email, Google drive, talk etc.

B. PaaS (Platform as a service) model: within the PaaS model, cloud suppliers deliver a computing platform, typically as well as software, artificial language execution atmosphere, database, and internet server.This type service solely package developer needed for readying of package, Example Google application engine, window Azure, force.com etc.

C. Infrastructure as a service (IaaS): In associate degree IaaS model, resources will simply be scaled up, relying upon the demand from the user, services being charged in a very pay-per use model. Network administrator & computer programmer required for Iaas services, Example Amazon internet service, IBM, HP etc.

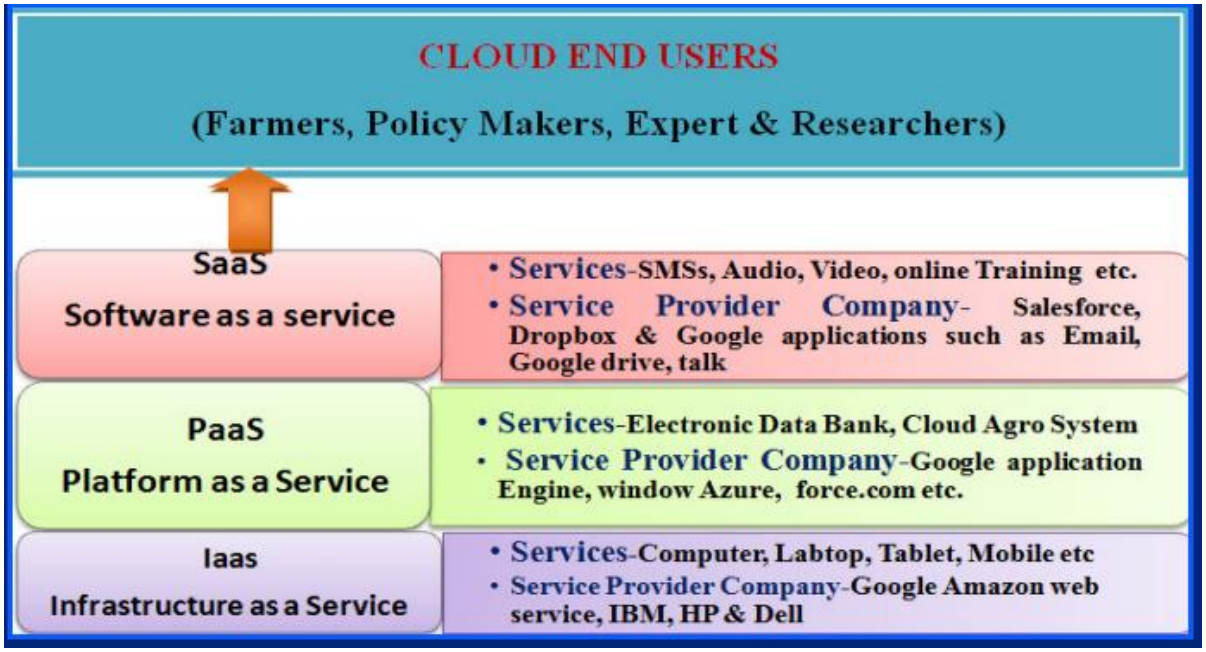

Fig.8 Cloud services model

VI. ROLE OF CLOUD COMPUTING IN AGRICULTURE FIELD (RURAL & HILLS)

• Agriculture info information bank (crop, weather, soil, growth progress, farmer information & skilled consultation) pc Engineering and Intelligent Systems web.iiste.org
• Store all the agriculture connected info during a centralized cloud, which is able to be offered to all or any the users at anytime, anywhere
• Management of all information associated with land, location, area; soil and land characteristics through centralized call support systems
• High integration & sharing of agricultural info
• It is eliminate the farmer's limitations of technical data & resources
• Providing agricultural technology service & science
• Improvement of the agricultural product promoting
• economical use of agricultural resources

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• Promote the circulation of agricultural product and repair in wider level.

VII. ADVANTAGES OF CLOUD COMPUTING IN AGRICULTURE

• information Readiness any time & any wherever
• native and world communication
• Improve status of the state
• increased the value of the state
• guarantee food security level
• Motivation of farmers and researchers
• Reduction of technical issue
• Rural-Urban movement
• information handiness at any time and at any location immediately
• Improve market value of Food, seeds, alternative product

VIII. CHALLENGE OF CLOUD COMPUTING IN AGRICULTURE

• Maintenance & supervising by third party, therefore information security is a smaller amount
• Indirect administrator responsibleness
• For cloud computing technology Farmer is unknown
• Less physical management
• Attraction to hackers
• would like on the network property
• needs a relentless web association
• Platform facility isn't simply offered for farmers
• Farmers coaching necessary for this technology
• doesn't work well with low-speed connections
• it runs the danger of security

IX. CONCLUSION

This distinguished technique could deliver the agriculture-based data along side management of natural resources and data on to the shoppers not solely during a little region like in nonstop promoting or retailers but conjointly during a wider region. this may modification the total offer chain, that is especially within the hand of enormous companies, now, however will modification to a additional direct, shorter chain between producers and shoppers. Cloud computing technology, applicable for the advance of agriculture growth, food, grain, product, economic condition, guarantee food safety, value of the state & flow into info associated with agriculture etc.

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