Enhancing Library Services With Cloud Computing

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Abstract

The advancement of data innovation has sparked emotional changes across the board. The administrations of libraries and data science benefited from these advances. Libraries have been automated, and they are currently transitioning to being paperless or virtual. Modern ideas are incorporated to acknowledge various contemporary advancements in the calling as well as to encourage the sharpening inside the libraries. In this article, a diagram illustrates how cloud computing operates in library services and the fundamental idea behind it.
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Keywords
Cloud Computing; Enhancing Library Services; Cloud service models; Features of cloud computing

Electronic access
The journal is available at www.jalis.in
DOI: 10.5281/zenodo.7779992

Journal of Advances in Library and Information Science
ISSN: 2277-2219 Vol. 12. No.1. 2023. pp.01-06

INTRODUCTION

Today, library science is being impacted by the era of knowledge and information technology. The library industry has faced many challenges as a result of IT application. Libraries have become automated thanks to the advent of IT, which is a necessary condition for progress. The next area of focus is networks, and virtual libraries are receiving more attention. There are several trends affecting library services, including digital libraries, e-publications, internet use, online tool applications, and consortium practices. The use of cloud computing in library science is a recent development.

MEANING AND DEFINITION OF CLOUD COMPUTING

The term "cloud" refers to a network or the internet. A cloud is something that exists far away. Through WAN, LAN, or VPN connections, cloud computing can provide network services over either public or private networks. The online manipulation, configuration, and access to the application are referred to as "cloud computing." Applications and infrastructure are provided for online data storage. When we use the term "cloud computing," we refer to a departure from having all of your computer hardware and software on your desktop or somewhere else in the network of your company. When we talk about cloud computing, we're talking about all the many services and applications that are available over the internet cloud and how many of the devices used to access them don't require any specialised software.

The National Organized of Guidelines and Innovation provides the most accurate representation of a cloud (NIST). Cloud computing is an approach to providing practical on-demand access to a pool of shared reconfigurable computing resources, including servers, systems, capacity, software, and administrations. It enables quick provisioning and connection of these assets with little administrative labour or benefit provider intervention.

According to Gartner, the term "cloud computing" alludes to a computing show in which a few outside clients can get to enormously scaled IT-related abilities "as a benefit" by means of web innovations. Online record capacity, social organizing

destinations, webmail, and online trade applications are some cases of cloud administrations.



Fig. No. 1

The term "cloud computing" is used frequently yet has varied connotations for various people. In some cases, it refers to some computing service offer via web based or another similar network, other definitions describe it as anything you purchase and use that is located outside your firewall. Those familiar with IT outsourcing may think of it as simply another way of referring to it.

IBM developed a concept called RJE (Remote Job Entry Process) in 1950. The first public cloud from Amazon (Amazon Web Service) was launched in 2006.

CLOUD COMPUTING MODELS

The cloud computing uses two different models.

A. Cloud Deployment Models
B. Cloud Service Models.

A. Cloud Deployment Models:

A kind of access through the cloud, which is referred to as the location of the cloud, is outlined in the deployment models.Any of the four access types are possible for the cloud:

1. Public Cloud Model:

The common citizens are able to easily access systems and services thanks to the public cloud architecture. The third party providers have total control over the entire cloud computing infrastructure. Online cloud services are provided by companies like Google, Amazon, and Microsoft.

2. Private Cloud Model:

The private cloud enables internal access to systems and services for an enterprise. A single company is the only one using the private cloud. However, it might be handled by an outside company or internally. Considering that it is integrated with the internal firewall, this cloud gives additional security.

3. Hybrid Cloud Model:

This cloud combines public and private cloud models. While some vital tasks are completed using the public cloud, others are completed utilising the private cloud. For resource-intensive applications, the business uses both its own cloud and the public cloud services.

4. Community Cloud Model:

By using the cloud, a variety of businesses can access the systems and services. The management of the cloud might be held by a third party or a member organisation provider. Many different organisations share the infrastructure.

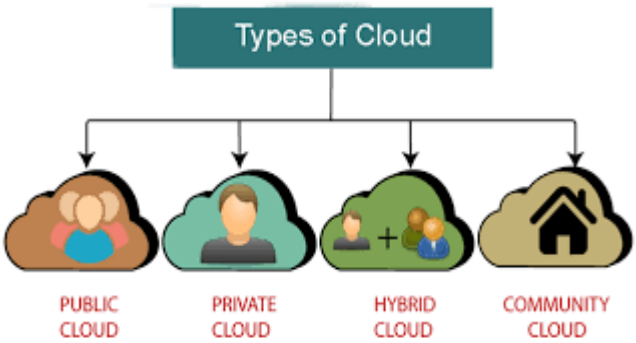


Fig. No. 2

CLOUD SERVICE MODEL

The cloud computing service models are;

1) IaaS- Infrasturcture as a Service
2) PaaS- Platform as A Serices
3) SaaS- Software as a Service

1. IaaS- Infrastructure as a Services:

In this paradigm, physical machines, virtual machines, and virtual storage are available for users to access. Applications, operating systems, and software are installed or made by users. All of the aforementioned resources are accessible to the end user thanks to server virtualization.

2. PaaS- Platform as a Services:

Pass provides the app's run-time environment. The deployment and development tools required to make apps are also provided. It is the collection of tools and services created to speed up and effectively code and deploy those applications.

3. SaaS- Software as a Servces:

Software programmes can be offered to end users as a service thanks to this service model. It alludes to software that is installed on a hosted service and is reachable online. Numerous SaaS applications exist, including:

a. Software for billing and invoicing
b. Managing customer relationships through applications
c. Helpdesk applications
d. Human Resource Management. According to recent reports that forecast continued double-digit growth, the SaaS market is expanding quickly.

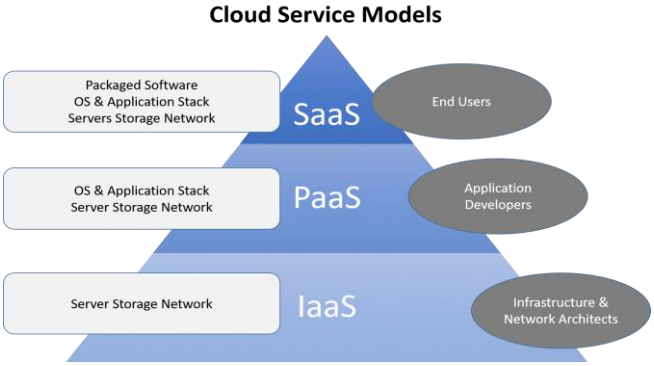


Fig No 3

FEATURES OF CLOUD COMPUTING

1) ***Shared Infrastructure:*** Utilizing a virtualized software approach enables sharing of physical resources such as storage, networking, and services. The objective of cloud infrastructure, regardless of deployment method, is to distribute the usage of the available resources among as many users as feasible.

2) ***Network Access:*** It permits the provision of service over public or private networks.

3) ***Dynamic Provision:*** It enables the delivery of services in accordance with the demands of the moment. Automation automates this process, allowing service capabilities to be expanded and contracted as needed. High levels of security and reliability must be maintained while performing this dynamic scaling.

4) ***Maintenance:*** The vendor is responsible for cloud computing maintenance.

5) ***Performance:*** As a result of intensive monitoring and effective infrastructure usage, the overall performance of the answer will be appreciably greater and extra predictable.

ETHICS OF CLOUD COMPUTING

The ideas underlying cloud computing make it distinct from conventional web services. The following are these guiding principles:

a) Resource Pooling:

By combining their resources, cloud computing enterprises can benefit from large economies of scale. The same configurations, security standards, and other controls are applied to a vast network of hard drives and servers.

b) Virtualization:

Both the physical conditions of the hardware and hardware compatibility are unimportant to users.

c) Elasticity:

A few mouse clicks can be used to instantly add more server bandwidth or hard drive space. It is also possible to duplicate data to a number of data centres around the world using cloud computing's geographic scalability feature.

d) Automatic and Easy Resource Deployment:

The cloud computing company will routinely configure and set up the resources; the person solely desires to pick the kinds and specs of these he requires.

e) Measured Billing:

Users only pay for what they really use. Compared to employing a standard online service provider, cloud computing offers users greater cost savings, automation, and flexibility.

Use of Cloud Computing in Library and InformationScience:

With the addition of networking and the ability to access these services from anywhere at any time, libraries are changing the way they provide their services. For libraries, cloud computing offers a variety of fascinating options that could save technology costs and improve capacity, dependability, and performance for various types of automation tasks. Cloud Libraries can benefit greatly from computing. Libraries might upload more content to the cloud.

There are several potential industries where cloud computing services and programmes could be used, including the ones listed below:

Searching Library Data:

Many libraries currently share bibliographic information with OCLC and have online catalogues. One of the better instances of using cloud computing for library data exchange is OCLC. It offers several services relating to lending, cataloguing, purchasing, and other relevant library services through the cloud platform and share with the management system.

File Storage:

Cloud computing offers a variety of services, like Flickr, Drop Box, Jungle Disk, Google Docs, Sky Drive, and others, to access numerous files online. These services essentially exchange files over the internet and offer access to them at any time and from any location without the need for specialised hardware or software. Because of this, libraries can utilise these cloud-based services for a variety of purposes. The LOCKSS (Lots of copies keeps everything safe), CLOCKSS (Controlled LOCKSS), and portico tools are extensively used by libraries for digital preservation.

Searching Scholarly Content:

With the intention of find and recover the academic resources that are related to the UGC INFONET DIGITAL Library consortium, the Information and Library Network (INFLIBNET) centre has integrated the Knimbus online service. so as to search and distribute scholarly content, use the Knimbus cloud-based research platform. It serves as a place for scholars and researchers to collaborate and find new knowledge. Rahul Agarwalla and Tarun Arora, two businessmen, founded Knimbus in 2010 to overcome the difficulties that researchers encounter while attempting to search through and access a variety of information sources. Over 50,000 academics and scholars presently utilise Knimbus at more than 600 academic institutions and R&D labs. Now, Knimbus has put forth a free offer to register in order to give libraries the ability to use dynamic searching as well as a single point search interface, maximise use of the entire e-resources, and perform customised searches across a set of sources that minimise noise and highlight pertinent content and tools to support the entire research lifecycle.

Website Hosting:

Numerous organisations, as well as libraries, chose to put their websites on moderator service contributors before hosting and managing their personal service. One of the first instances of cloud computing in use can be found here. Google Sites is a service that hosts websites on servers other than the library's and allows multiple editors to access the location through the various sites.

Community Power:

Through the use of social networking technologies, cloud computing technology provides libraries with fantastic chances to create networks among those working in the library and information science as well as with interested information seekers. The most well-known social networking sites, including Facebook and Twitter, are crucial for fostering a sense of community. This collaborative effort of libraries will result in time savings, increased productivity, and greater recognition. It will additionally foster cooperative Genius for multiplied

decision-making, supply a platform for creativity, and inspire the trade of thought-provoking thoughts and knowledge.

Library Automation:

Polaris provides a range of cloud-based services, including as digital content integration, workflow systems, acquisitions, cataloguing, and catalogue automation. It also provides digital material and workflow systems. Supports a variety of standards as well, including as MARC 21, XML, Z39.50, UNICODE, and others that have a direct bearing on the discipline of library and information science.

Digital Library and Repository:

In these days all library requires a electronic library to ensure that its materials, knowledge, and services are available over the network at an effective level. As a result, every library has a digital collection that was created using digital library software. For creating digital libraries and repositories, utilise Fedora and Dspace. For creating digital libraries and repositories, Dura Cloud offers comprehensive solutions with standardised user interfaces and open source codes for both types of software.

BENIFITS OF CLOUD COMPUTING

1. **Cost Effectiveness:** As stated in, using, maintaining, and upgrading cloud computing is definitely the most affordable option.

2. **Virtually Infinite Storage:** The cloud provides you with virtually unlimited storage.

3. **Information backup and recovery:** Most cloud service providers frequently have the capacity to handle this. Consequently, the entire backup and recovery process is significantly simplified as compared to different normal techniques of statistics storage.

4. **Essay Information Access:** Users who register in the cloud have get entry to to their facts from any place with an web connection.

5. **Automatic Software Integration:** In the cloud, software program integration generally occurs on its own.

6. **Rapid Deployment:** Rapid deployment is a benefit of cloud computing.

DRAWBACKS OF CLOUD COMPUTING

An expanding technology, cloud computing, have created numerous difficulties in a variety of areas.

- **Security and Privacy:** Privacy and data protection for users is the fundamental issue with cloud computing. It is possible to address security and privacy issues via encryption, security hardware, and security software.

- **Portability:** Moving applications from one cloud provider to another is simple. No vendor should be locked in. Because each cloud provider uses a distinct standard language for their platform, it is currently not possible.
- **Interoperability:** Applications should be able to use services from multiple platforms when running on one platform. Web services enable it to happen.

- **Computing Performance:** High network bandwidths are needed to deliver data-intensive applications in the cloud, which raises the cost. Low bandwidth usage falls short of the necessary compute performance for cloud applications.

- **Reliability and Availability:** Because the majority of organisations are now depending on services offered by third parties, cloud solutions must be trustworthy and durable.

PRESENT SITUATION OF CLOUD COMPUTING IN INDIAN LIBRARIES

Although Indian libraries are working to advance in this field, cloud computing technological know-how has now not but been absolutely adopted Libraries are trying to furnish cloud-based offerings to users, however they are no longer absolutely profitable due to a lack of reliable provider carriers and LIS professionals with the required technical information in the vicinity of managing libraries the usage of latest technology. However, other services, such those that use Web 2.0 technology, digital libraries,

and web documentation, are operating well. Dura Cloud, OCLC services, and Google-based cloud services are excellent examples of effective cloud in libraries are in the development stage.

CONCLUSION

The technology of the cloud is ever-evolving. Libraries are embracing cloud computing technologies at the moment and utilising cloud-based services, particularly when creating digital libraries. It is the responsibility of LIS experts to develop cloud-based services as a trustworthy medium for distributing library services to users in this age of technology.

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