

CLOUD COMPUTING & IT'S APPLICATIONS IN LIBRARY SYSTEMS

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Abstract

Cloud computing is the buzzword in today's businesses and organizations. It gives the benefit of hosting your files on a network that could be accessed anywhere anytime rather than hosting on a local server which has limitations of availability and connectivity. It thus, is a memory and time saving process. Our paper defines what makes cloud computing so different and how its solution benefits the library system. This study also reveals the opportunities it brings for the library system by connecting services with cloud. It can help to re-invent the library services in a more effective, compatible and user-centric way.

Keywords: Cloud Computing, Digital Library, Cloud Models, Services, Applications in Library Systems

1. INTRODUCTION

Cloud computing is the technology which by the concept of ubiquitous computing helps in accessing the data in a more efficient way. It requires an internet connection. Basic requirements like cost of purchasing & repairing of hardware, software's etc could be eliminated through this technology. It rather gives a platform to directly use the resources in terms of cloud i.e. a paradigm shift of information technology and computing where all the services are available in virtualized form to the clients. Important point is "pay as use" users will only pay when they use that service, hence making it more cost effective. This concept accessing resources in a virtualized form is implemented by these service models—IaaS (Infrastructure as a Service), PaaS (Platform as a service) & SaaS (Software as a Service). Today many organizations and businesses are moving towards this trend of using cloud services. [1]

2. CLOUD MODELS USED FOR DEPLOYMENT

Cloud Computing can be deployed based on different models as per requirement.

2.1 Public Cloud

Cloud service on a public network providing local or public support i.e. the virtualized resources & data centre is transparent to the end user. Public access of shared resources is provided in this deployment.

2.2 Private Cloud

In this public cloud services are made dedicated to certain users only making it private to them. Using this model, organizations being the sole owner of particular section can more efficiently manage their corporate data. The data is considered to be more secure this way as the information is on a private cloud accessed by the dedicated user only.

2.3 Community Cloud

Requirements specific to a particular set of users is gathered and deployed on a common cloud making a community. It could be considered as a public cloud service designed for researchers working on a joint venture.

2.4 Hybrid Cloud

It combines the different deployment models to form a dynamic and more efficient way of sharing resources. This approach is generally considered by organizations during outsourcing data.

3. SERVICES PROVIDED BY CLOUD COMPUTING

3.1 Infrastructure as a Service (IaaS)

This model provides the entire necessary infrastructure like computers, hard-disks, networks-storage, computing resources etc. to a company in the virtualized form. User can access the resources; run software's & performs deployment without bothering about the management of Infrastructure. The service provider is solely responsible for the maintenance and management of equipments on-service.

3.2 Platform as a Service (PaaS)

This model provides a platform to run different applications. It could be considered as the most important model of cloud computing as it is intermediate between the IaaS & SaaS.

3.3 Software as a Service (SaaS)

This Model enables the use of different software applications by the end user over the internet. All the management & cost factors related to software like licensing, updates etc are handled by the service provider only.

4. CLOUD SERVICES IN LIBRARY SYSTEM

Library is the collection of different resources. The way new additions are made in the library, it is very difficult to manage everything with traditional management system. New technologies are available to manage & distribute the resources. Cloud computing uses the concept of centralising the data on the internet further making it available to user, anytime anywhere. Virtualized shared resources allow multiple users to access the resources simultaneously. It reduces the dependency of installation, maintenance, failure of ICT infrastructure etc. Web repositories like E-journals & digital libraries etc are created so that users can access the global resources, helping the researchers/ educational professionals.

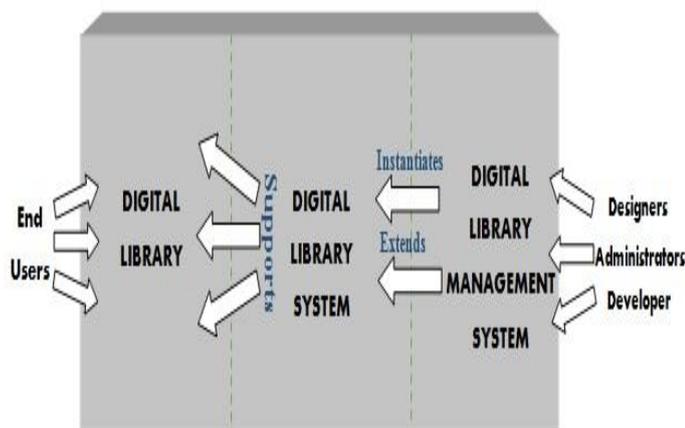


Fig -1: Source [2] Architecture of a Digital Library System

4.1 Application of Cloud Computing in Libraries

The library system along with cloud computing helps in saving time and money while amplifying its power on the web. The services of cloud computing may be applied on the following areas:

4.1.1 Building Digital Library

An efficient way to manage resources, information and library related services is to maintain a digital library. The user may be facilitated access via network. Many open source software are providing a platform to digital libraries by hosting them locally. Duraspace uses digital library services using SaaS approach eliminates the need of maintaining a separate server, taking backups and software updates for the same.

4.1.2 Searching Library Data

This could be provided with the help of collaborative platform to help connect more easily. It may include a repository, Innovation as well as a discussion platform where resources, ideas and problems may be shared for better decision making.

4.1.3 Library Automation

This helps in saving the cost of maintenance and investment on hardware and software resources. Libraries don't have to worry about software updates backup etc. This all may be taken care by a centralised cloud service like SaaS.

4.1.4 Search Services

Many open source solutions are providing services in this regard. They use context-sensitive links to jump from citation in an abstract or indexed database to complete text. 'OpenURL providers' is such a key service on the cloud.

4.1.5 Website Hosting

In spite of maintaining their own server many library including organizations consider to host their websites outside library server so that editors from varied geography may access the site.

4.1.6 Searching Scholarly Content

Researchers may take great benefit from this service as sharing of knowledge with peers along with discussions is made easy by this. A widespread range of articles, journals, e-books, patents and scholarly content may be accessed with ease.

4.1.7 File Storage

The virtual sharing and accessing of files makes the real life easy. Cloud computing makes possible the uploading and downloading of information from anywhere anytime by offering no maintenance, no-cost storage space. This further helps in easy sync of documents across multiple devices and elaborated work over the web in a collaborative way more effective.

4.1.8 Building Community Power

This benefits not only the library related individuals but also provides a medium to connect the information seekers on a global level. More intellectual conversations along with innovative ideas may be shared and implemented in a powerful approach. The community cooperation further helps in decision making, recognition, and providing timely and efficient solutions for dynamic knowledge. [3], [4]

4.2 A Few Areas where Libraries are Implemented using Cloud Computing

4.2.1 Online Computer Library Centre

OCLC is one of the cloud computing vendors, providing a platform to access information. It's a research organization designed to reduce the cost of accessing information available globally. In this the Centralized data is managed by the cataloguing tools over the Internet. By maintaining a centralized data source of catalog, multiple libraries can access the resources simultaneously, increasing the sharing of resources, hence reducing the time spent in individual

cataloguing of new material. Another example of cloud computing architecture maintaining common catalog is World Cat.

4.2.2 Library Thing

Tim Spalding is the originator of Library Thing designed to combine aspects of Cloud computing & social networking. Here people share interests, contribute information and provide suggestions regarding the books, articles & various resources. It allows the different users to interconnect with each other globally. Libraries can access the database regarding the recommendation of users to provide better facility by paying fee.

4.2.3 Reed Elsevier

Provide scientific information to medical technicians. Technical manuals, article content are hosted for the medical personnel to get assistance. Data & applications are tied to provide better facilities to practitioners.

4.2.4 CYBRARIAN

CYBRARIAN is a web based library used for automation & management solution. It provides a platform where data is stored in much more updated and secured form. Constant backup of data is maintained at regular interval automatically. A centralized database is maintained over a remote server. Users can access & run this software, from a normal PC having a browser, to carry out online transactions, management of catalogues & reports, article indexing etc. Only authorized users can access the library resources.

4.2.5 OPAC

Online Public Access catalog is a general cataloguing service used to maintain data records online. Users can search books & other resources available physically in a library. Other examples are **Amazon, Google, Kindle, Mobile Me services, DuraSpace, Chronopolis Project, TerraPod.** [5]

5. CONCLUSION

Cloud computing is benefitting the organizations in different ways. And it is supporting more innovations because of its existence. Whether it's about software updating, hardware maintenance, space or time limitations, cloud computing has a range of services to support the digital world. Libraries can now pay full attention on gathering library resources rather than paying attention on the technical aspects. Some libraries in India implementing this concept are Digital Library of India (hosted by ERNET, CMU, IIT-H, NSF, MCIT, IISB), and National Library (Ministry of Culture, Government of India). More and more libraries may be connected together to share resources, innovations and feedbacks. It becomes feasible for the user to get a vast pool of knowledge with easy accessibility, cost effectiveness and scalability at the time of growing information. Shared data and integrated, well collaborative services have helped libraries to grow and take new leaps.

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