



CLOUD COMPUTING AND ACADEMIC LIBRARIES

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Abstract:

Cloud Computing refers to group of technologies that provides on demand storage data or computing power through the Internet. It's a new technique of information communication technology because of its potential benefits such as reduced cost, accessible anywhere, anytime as well as its elasticity and flexibility. Its a new term and growing very fast. Cloud based information services in libraries play an active role in knowledge delivery. The diversity of library user's requirement and changing scenario of library resources need a drastic change over to fulfillments the gap of demand and supply of users end and timely instant library services. Present paper describe the meaning ,characteristics and role of Cloud Computing in libraries with its advantages and drawbacks.

Keywords:

Cloud Computing, Characteristics, Role of Cloud Computing in libraries, Cloud base library services.

Introduction:

Cloud Computing provides people the way to share distributed resources and services that belong to different organizations or sites. It share distributed resources via the network in the open environment. It is a virtual pool of computing resources through internet. Cloud Computing is broken down into three segments: 1) Application 2) Storage 3) Connectivity.

Libraries are using computers for running services such as Integrated Library Management Software, Website or portal, digital library or institutional repository, etc. Now cloud computing has become a new buzzword in the field of libraries, which is blessing in disguise to run different ICT services without much of a problem as third-party services will manage servers and undertake upgrades and take backup of data. Cloud Computing contains features of different technologies including utility computing, grid computing ,unified computing , web 2.0, service oriented architecture etc. Cloud Computing technology is offering great advantages for libraries to connect their services not only promptly but also in new formats with the flexibilities such as pay as you use model, access anywhere any time and so on.

Definition:

According to Wikipedia, Cloud Computing refers to the delivery of computing as a service rather than a product, where by shared resources, software, and information are provided to computers and other devices as a metered service over a network, typically the internet. OR

A model for enabling ubiquitous, convenient, on-demand network access to shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services)that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Characteristics of Cloud Computing:

AS per definition of cloud computing by the national institute of Standards and Technology (NIST) there are five characteristics of Cloud Computing.

- 1) **On demand self –service:** Cloud services such as email, applications, database, storage, computing, network or server service can be provided without requiring human interaction with each service provider. E.g. Amazon web service, Microsoft, Google, IBM etc.
- 2) **Broad Network Access:** Cloud deliverables are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms such as smart phones, tablets, laptops and desktop PCs.
- 3) **Resource Pooling :** The provider’s computing resources are pooled together to serve multiple clients using multiple tenant model, with different physical and virtual resources dynamically assigned and reassigned according to client demand. These sources include, among others, storage, processing, memory, network bandwidth, virtual machines, etc. This characteristic also gives a degree of location independence in wherein the client generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at higher level of abstraction.
- 4) **Rapid Elasticity:** Usage of resources in cloud services can be rapidly and elastically provisioned, which can be also done automatically, to quickly scale out and rapidly released to quickly scale in. The capabilities available for provisioning often appear to be unlimited to the consumer and can be purchased in any quantity at any time.
- 5) **Measured Service:** Cloud Computing resource usage can be measured controlled, and reported providing transparency for both the provider and consumer of the utilized service. Cloud Computing services use a metering capability which enables to control and optimize resource use.

Library and Cloud Computing:

Today we are living in the age of information. Information technology plays a very vital role in handling library resources ranging from collection, storage, organization, processing and analysis of information dissemination. Library field facing many challenges in the profession due to application of information technology. New concepts and technologies are being added to ease the practices in the libraries and satisfy the needs of the knowledge society. With the advent of information technology libraries have become automated which is the basic need towards advancement followed by networks and more effort is towards virtual library. The emergence of digital library, internet usage, web tools application for libraries, consortium practices leads to the advancement in library profession. Cloud Computing is a completely new IT technology and it is known as the third revolution after PC and Internet in IT. The later technology trend in library science is use of Cloud Computing for various purposes and also the application of Cloud Computing in library science. Cloud Computing offers many interesting possibilities for libraries that may help to reduce technology cost and increase capacity reliability and performance for some type of automation activities. Cloud Computing has made strong inroads into other commercial sectors and is now beginning to find more application in library science. The Cloud Computing pushes hardware to more abstract levels. Most of us are acquainted with fast computing power being delivered from systems that we can see and touch.

Role of Cloud Computing;

Cloud Computing has large potential for libraries. Libraries may put more and more content into the cloud. Using Cloud Computing user would be able to browse a physical shelf of books, CDs or DVDs or choose to take out an item or scan a bar code into his mobile device. All historical and rare documents would be scanned into a compressed, easily searchable database and would be accessible to any researcher. Many libraries already have online catalogues and share bibliographic data with OCLC. Data storage could be main function of libraries, particularly those with digital collections storing large digital files can stress local server infrastructures. The files need to be backed up, maintained and reproduced for patrons. ; this can strain the data integrity as well as hog bandwidth. Moving data to the cloud may be a leap of faith for some library professions. It’s a new technology and on the surface it is believed that library would have some control over this data or collections. However, with faster retrieval times for patron’s requests and local server space it could

improve storage solutions for libraries. Cloud Computing or IT infrastructure that exists remotely, often gives users increased capacity and less need for updates and maintenance, and has gained wider acceptance among librarians.

Advantages of Cloud Computing:

Cost reduction – Ability to increase or decrease the consumption of hardware or software resources immediately and in some cases automatically.

Unlimited storage capacity: The cloud offers virtually limitless storage capacity but at any time you can expand your storage capacity with a small additional charge on you monthly fee.

Scalability –“Pay as you go” allowing a more efficient control of expenditures. Only those employees actually using an application need access to that application in the cloud.

Lower Investment & reduced risk – Maintenance costs also will be reduced using Cloud Computing since both hardware and software maintenance for organizations of all sizes will be much less. e.g., fewer servers are necessary in the organization which means that maintenance costs are immediately lowered. As to software maintenance, there is no software on the organization’s computer for the IT staff to maintain.

Support included – Enjoyment of the most advanced security procedures, availability and performance of providers with experience and knowledge in this type of service. There is no point to worry for disk failures or a disaster at your office. All the data is stored in the cloud.

Better performance: Due to the fact that no programs or files are loaded on the local PC, users will not experience delays when switching on/off their computers and also the internal network will be much faster since no internal traffic will occur.

Greater security and accessibility – Access to resources from any geographical point and the ability to test and evaluate resources at no cost. When using Cloud Computing, you can use the Cloud Computing power since you are no longer limited to what a single desktop computer can do.

Latest version availability : One more thing in relation with documents is that when you edit one document at the office and then you go somewhere else and open it, the latest version will displayed since as I already aforementioned all the work is done centrally in the cloud.

Drawbacks of Cloud Computing:

The disadvantages are actually the same as those encountered by institutions that have information hosted outside of the entity. In case of digital data there is still a huge fear of putting our information in the hands of third parties. This fear arises due to issues such as confidentiality, theft, loss etc. Yet people are increasingly more likely to do so now that the use of Web 2.0 and social networks has become so widespread. An institution might take the decision to progressively move towards Cloud Computing by uploading applications which are not very sensitive such as: messaging, the booking of rooms, meeting management, the liquidation of costs and other such management. Following this learning process, more valuable information involving the corpus of the institution, i.e. “Business Intelligence” might be uploaded to the cloud. In case of libraries and information centers, this information would include management funds and network transactions.

Application of Cloud Computing in Libraries:

Libraries are shifting their services with the attachment of cloud and networking with the facilities to access these services anywhere and anytime. In the libraries, the following possible areas were identified where cloud computing services as applications may be applied.

- 1) **Building Digital Library/ Repositories:** In present era, every library needs a digital library to make their resources, information and services at an efficiency level to ensure access via the network. In connection to cloud based digital library software, Duraspace is having two software i.e. Dspace and Fedora Commons but Dspace is widely used for building digital libraries/ repositories relative to Fedora Commons. Dura cloud provides complete solutions for developing digital libraries or repositories with standard interfaces and open source tools for the both software.
- 2) **Searching Library Data:** OCLC is one of the best example for making use of cloud computing for sharing libraries data for years together. OCLC is offering various services pertain to circulation, cataloguing, acquisition and other library related services on the cloud platform through the web share management system.
- 3) **Website hosting** : Website hosting is one of the earliest adoptions of cloud computing as many organizations including libraries preferred to host their websites on third party service providers rather

than hosting and maintain their own servers. Google Sites serve as an example of service for hosting websites outside the library servers and allowing for multiple editors to access the site from varied locations.

- 4) **Library Automation** : For Library Automation purpose, Polaris provides various cloud based services such as acquisitions, cataloguing, process system, digital contents and provision for inclusion of cutting edge technologies used in libraries and also supports various standards such as MARC21, XML, Z39, Unicode and so on which are directly related to library and information science area. Apart from this, nowadays many of the software vendors such as EX-Libraries, OSS Labs are also offering these services on the cloud and third-party services offering hosting of this service on the cloud to save libraries from investing in hardware for this purpose.

Cloud base Library Services:

- ✓ Cloud based storage tools
- ✓ Cloud based presentation
- ✓ Cloud based form
- ✓ Social Media
- ✓ Cloud based blogging
- ✓ Cloud based operating system
- ✓ Library Automation
- ✓ Library Website/ Portal
- ✓ Android application
- ✓ Digital library/ Institutional Repository
- ✓ Web scale Discovery Service
- ✓ Reference Management Tools
- ✓ Data Collection Tool
- ✓ Cloud based Learning Tools

Conclusion:

Libraries are moving towards Cloud Computing technology in present days and taking advantages of Cloud based services especially in digital libraries, social networking and information communication. Therefore this is a better time for libraries to think seriously for services with cloud based technologies and provide reliable and rapid services to their users. The diversity of users expectations regarding academic libraries will be fulfilled by cloud computing.

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