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Emerging Trends in Library Information Services

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Abstract

Today we are living in the age of information technology. Information technology play very vital role in library and information services. Cloud computing is a new technology model for IT services which many businesses and organizations are adopting. It allows them to avoid locally hosting multiple servers and equipment and constantly dealing with hardware failure, software installs, upgrades and compatibility issues. For many organizations, cloud computing can simplify processes and save time and money. This article defines cloud computing and shows how it is different from other types of computing. It also discusses how cloud computing solutions could be beneficial to library services. In this paper, an attempt has been made to give an overview of this technology, applications, benefits and the areas in which libraries can deploy this technology for providing services.

Keywords: Cloud Computing, Deployment Models, Cloud Services, Dura Cloud, OCLC's Webscale.

Introduction

Cloud computing can transform the way systems are built and services delivered, providing libraries with an opportunity to extend their impact Cloud computing has become a major topic of discussion and debate for any business or organization which relies on technology. Anyone connected to the Internet is probably using some type of cloud computing on a regular basis. Whether they are using Google's Gmail, organizing photos on Flickr or searching the Web with Bing they are engaged in cloud computing. As Geoffrey Moore points out, the interesting thing about cloud computing is it did not start as a technology for the business enterprise, but was driven by the public with services like Facebook and Flickr. I Over the last few years businesses have started to see the value of cloud computing causing it to become a major technology solution for businesses and organizations around the world. Looking across the information and broader technology landscape, it is not difficult to find success stories of switching to cloud computing, disaster stories, and a great deal of debate about what cloud computing is, or isn't.Information technology play very vital role in library science. For collection, Storage, organization, processing, analysis of information. Library filed facing many challenges in the profession due to applications of information technology. New concepts are being added to ease the practices in the libraries is also accepting many new technologies in the profession as they suit the present information handling and they satisfy 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 are towards virtual International Journal of Digital Library Services libraries. This article defines cloud computing and shows how it is different from other types of computing. It also discusses how cloud computing solutions could be beneficial to library services.

Cloud computing system can be divided it into two sections: the front end and the back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the "cloud" section of the system. On the back end there are various computers, servers and data storage systems that create the "cloud" of computing services. A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols Servers and remote computers do most of the work and store the data.

Cloud computing is a growing trend and new phase and platform of library services and resource sharing in digital environment. The rapid growth of information technology has led to development of network based

services like cloud computing. Cloud computing is working just like an electricity grid. Cloud computing is helpful of storing, accessing, sharing data, applications and computing power in web space. Thus, it is the web based service where the software system designed to support interoperable machine-to-machine interaction over a network. It makes services much easier as one need not be physically present within the one campus. It is a model of service delivery and access where scalable and virtualized resources are provided as a service over the internet.

Aim of the Study

Aim of this article is that Cloud computing is a growing trend and new phase and platform of library services and resource sharing in digital environment. The rapid growth of information technology has led to development of network based services like cloud computing. Cloud computing is working just like an electricity grid. Cloud computing is helpful of storing, accessing, sharing data, applications and computing power in web space.

Deployment Models Of Cloud Computing:

A cloud deployment model (Dustin Amrhein et al., 2010, CSA, 2009) represents a specific type of cloud environment and it is classified on the basis of ownership and size. There are so many models of cloud but the common models of clouds are:-

Public Cloud

In this deployment the cloud infrastructure is accessible to general public and shared in a "pay as you go" model of payment. The cloud resources are accessible via the internet and the provider is responsible for ensuring the economies of scale and the management of the shared infrastructure. It is highly scalable and automated provisioning of commodity computer resource. of Public Cloud.

In this type of cloud, the organization does not access or use the public cloud which is accessible to the general public.

Private Cloud

In this model, the cloud resources are not shared by unknown third parties. The cloud resources in this model may be located within the client organisation premises or offsite. In this model the clients' security and compliance requirements are not affected though this offering does not bring the benefits associated with reduced capital expenditure in IT infrastructure investments. In this type of cloud neither the general public have an access to the private cloud nor the organisation use the public cloud.

Hybrid Cloud

Hybrid cloud as its name implies, is a model of deployment which combines different clouds; for example the private and public clouds. In this model the combined clouds retains their identities but, are bound together "by standardised or proprietary technology."

In this type of cloud the general public does not have access to the cloud, but the organisation uses infrastructure in both the public and private cloud.

Community Cloud

Community Cloud is the fourth deployment model that can be used to deliver cloud computing services. In this model the cloud infrastructure is shared by multiple organisations or institutions that have a shared concern or interest such as compliance considerations, security requirements. This type of cloud may be managed by the organisation or by a third party and may be located on-premises or off-premises.

In this type of cloud both the public and the organizations forming the community cloud have access to the cloud services offered by the community cloud.

Cloud Service/ Delivery Model

All web-based applications or service offered via cloud computing is called a cloud service. Almost all large computing companies today, from Google to Amazon to Microsoft, are developing various types of cloud services. Cloud computing is an umbrella term used to refer to internet based development and services. A cloud client consists of computer hardware and or computer software that relies on cloud computing for application delivery.

Cloud computing services can be broadly classified into three *ass, i.e three layers of cloud stack also known as cloud service models:

Software as a Service (SaaS)

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g. web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

Platform as a Service (PaaS)

The capability provided to the consumer is to deploy on the cloud infrastructure consumer-created or acquired applications, created using programming languages, library services and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations. Google App Engine, Microsoft Azure Services, Amazon SimpleDB, CloudFoundry are well known Platform as a Servic.

Infrastructure as a Service (IaaS)

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems; storage, deployed applications, and possibly limited control of select networking components. EducationERP.net, Microsoft Flexiscale, Amazon S3, Cloudstatus, GoGrid, and Oracle Coherence are offering IaaS

Use Cloud computing in Information 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 in Information Science

Cloud computing is a completely new in technology and it is known as 3rd revolution after PC and Internet. Cloud computing is an enhancement of distributed computing, parallel computing, grid computing and distributed databases. Among these, grid and utility computing are known as predecessors of cloud computing.Cloud computing has large potential for libraries.

Libraries may put more and more content into the loud. 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 comprehensive, easily searchable database and would be accessible to any researcher. Many libraries already have online catalogues and share bibliographic data with OCLC. More frequent online catalogues are linked to consortium that share resources.International Journal of Digital Library Services, Data storage cloud be a 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 professionals.

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 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

Service Providers of Cloud Computing in Information Centre

Dura Cloud

Dura cloud is associated with the Duraspace those exist after merging of Fedora ad Dspace. Fedora is a good digital repository or just like a digital library with the high class software and hardware solution. Dura cloud is especially for digital library services. Dura cloud provides open source code and the code needs to be installed on your machine and its cost is nominal.

Ex Libris

It is a very famous service provider in USA. Ex Libris is providing cloud solution in the field of library with all the software and hardware support needed to provide services to the users. It is built on various standard and contains number of features like compatibility with Unicode font, flexibility, migration of data, customization etc.

Polaris Library System

It is the cloud based library automation system available in the open market. Company also provides standard acquisition and processing system. Due to Polaries ILS client License, the library can integrate various PC and print management systems at not another cost. The systems uses number of well know standards like MARC-21, XML, Z39.50 for information retrieval, Unicode etc.

OCLC's Webscale

OCLC has set an example for making use of cloud computing for libraries. OCLC has been functioning as a cloud computing vendor because they provide cataloguing tools over the internet and allow member institutions to draw on their centralised data store. Now, OCLC has geared to implement the plan of library management systems on the cloud in which OCLC has web-scale delivery and circulation, print and electronic acquisitions, cataloguing and license management components. Its world-share management services (WMS) allows libraries to manage entire collection management life cycle in a cloud-based application. The overall purpose of web-scale sharing resources, data, and innovation is supported by a variety of features that work together to save money, promote community development and drive better services for library users.

In other words, one can say OCLC provide cost benefits for libraries and efficiencies not possible when utilizing disparate, specialised systems. The service promises to include privacy, security, scalability and technical support.

Advantages of Cloud computing in libraries

1. Cost saving
2. Flexibility and innovation
3. User centric
4. Openness
5. Transparency
6. Interoperability
7. Representation
8. Availability anytime anywhere
9. Connect and Converse
10. Create and collaborate

Disadvantages of Cloud computing in libraries

1. Risk or data loss
2. Failure in compliance
3. Constant connectivity required
4. Dependency
5. Quality problems with cloud service provider
6. Time and Budget Constraints
7. Since all the development and deployment have been done by Cloud service provider, it is very difficult to get good grip on overall system.

Beyond Library Discovery Services

It is here that libraries can look to gain new efficiencies both internally and among theentire library community. When library software suppliers create the user personas thatwill use their software the focus is generally on external personas but there are also many internal personas that need to take advantage of new technologies and Web capabilities.One such

example has been given with reference librarians now able to both better assisttheir patrons online but also to build a large network of librarians globally who can answerspecific questions and be available 24/7. What other personas in the library can benefitfrom cloud solutions?

1. Acquisitions librarians managing increasingly diverse collections
2. Cataloguing librarians seeking to describe an ever increasing body of information andinformation sources the library is managing
3. Serials librarians working to maintain control and access to collections spideredacross the Web
4. Electronic resource librarians managing burgeoning collections, and ever-changinglists of vendors
5. The dramatic change in library collections often blurs the lines between traditional job "Roles in libraries. An acquisitions librarian probably also needs to manage licenses forelectronic materials as well as manage purchasing for multiple formats, often for the sameitem. They need to access information from suppliers, reviewers, local constituency andother staff in a unified manner. This begs for an open system deployed where it can easilybe accessed by external systems and pull in data and services in from those same systems.Cloud computing solutions can create the new workflows needed by librarians because it offers the opportunity for a cooperative platform for libraries to build on. There are fourkey principles of a cooperative platform:
6. Openness, meaning that services and data are made available to support greaterinteroperability, not only within and between cloud services, but also with library developed and third-party applications;
7. Extensibility, meaning that the platform can easily accommodate the addition ofnew services and applications, developed either by the service provider or bymembers of the community;
8. Data richness, meaning that a library can interact with and expose a wide varietyof information about purchased, licensed, and digital content through thisplatform; and
9. Collaboration, meaning that libraries can harness the collective power of thecommunity of libraries to innovate and share solutions.And it is precisely this that the business world and social media have demonstrated can bedone with cloud computing solutions. Through cooperative and community buildinglibraries can have the same possibilities.
10. What can cloud computing solutions do for libraries?

So turning to cloud computing and libraries, are their real problems that can be solved?

The answer is yes. The library community can apply the concept of cloud computing to amplify the power of cooperation and to build a significant, unified presence on the Web. This approach to computing can help libraries save time and money while simplifying workflows.

A brief list of potential areas of improvement could include-

1. Most library computer systems are built on pre-Web technology Systems distributed across the Net using pre-Web technology are harder and more costly to integrate.
2. Libraries store and maintain much of the same data hundreds and thousands of times.
3. With library data scatter across distributed systems the library's Web presence is weakened.
4. With libraries running independent systems collaboration between libraries is made difficult and expensive.
5. Information seekers work in common Web environments and distributed systems make it difficult to get the library into their workflow.
6. Many systems are only used to 10% of their capacity. Combining systems into a cloud environment reduces the carbon footprints, making libraries greener. These improvements can be grouped into three basic areas: technology, data and community. Each offers some general and some unique opportunities for libraries. Looking first at the technology that most current library systems employ several benefits of cloud computing solutions surface.

So turning to cloud computing and libraries, are their real problems that can be solved? The answer is yes. The library community can apply the concept of cloud computing to amplify the power of cooperation and to build a significant, unified presence on the Web. This approach to computing can help libraries save time and money while simplifying workflows.

SWOT Analysis of Cloud Computing with a view to Indian Libraries

Analysis is a strategic planning method usedto evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a projector in any venture. It involves specifying theobjective of the project and identifying the internal and external factors that are favourable andunfavourable to achieve the objective.

Strengths

India has a particularly strong ITindustry that can be an important commercialfactor for the western countries to consider in theirfuture cloud related development. Accordingly, anIndian library does not have the economic strengthto impact on the western countries. The mainstrength and hence advantage of India, however, consists in its consolidated and synergetic efforts to address new technological innovations, trends and governmental issues. As India has strong IT industry now, up-coming Indian companies are offering cloud services for Indian libraries at affordable prices. Moreover in India many institutes are not in condition to purchase high end server and costly software for their library, in this situation the cloud computing will provide grate platform to host their data on cloud to serve their users.

Weakness

However, India is not as fast as US and Europe in the development and considering the

timelines of research to reach market-readiness as opposed to the fast movements in the market itself. The time is a critical resource with respect to positioning India in the global cloud development market. Implementation of cloud in the libraries is not easy task as there are many administrative and financial matters involved. Adopting cloud services means we have to be depending on the service provider. Many Indian libraries does not have even internet connection to connect with the cloud, in this case, it is very difficult to implement cloud based services.

Opportunities

India is an emerging market for IT industry and, Indian government is also providing help to Indian university libraries to get high speed internet connection for research purpose, in view of these libraries/institutions/universities can consider cloud based library services to serve their users. Using cloud computing libraries can offer modern information services in user friendly format. With the use of these advanced technology library staff can also get an opportunity to learn new technological changes occurred in the field. As the cloud is athird party service if, any problem occurs, then the experts will provide the quick solution withoutinterrupting library services.

Threats

These opportunities are obviously counterweighted by some threats that particularly relate to the effort involved in the implementation. The threats namely connectivity problem, hidden cost for add-on services by service provider, compatibility, lock in period etc. The most important is migration of data from one service provider to other is a very difficult task.

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