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Cloud Computing in Libraries

Abstract ::

Cloud computing is a new technology model for IT services. This technology is mainly used by many businesses and organizations. It facilitates its users to avoid locally hosting multiple servers, devices, equipments and constantly dealing with hardware failure, software installs, upgrades and compatibility issues. For many organizations, cloud computing can simplify processes and save time and costs and workflows they have. This article defines Cloud computing, its characteristics, service models and deployment of cloud services, its advantages in libraries and the potential areas mainly technology, data and community for improvement.

INTRODUCTION ::

Pertaining to the 5th law of library science, library is a growing organism. Today we are living in the age of information and with modern technology. A well equipped library is the heart of any higher education and also helpful for the growth of national economy by providing information on time. Internet is one of the greatest technologies of this millennium; it revolves around advancements in ICT applications in all the area of our routine work. Library is place where information is gathered, stored and retrieved by the patrons. Now-a-days information is available only on online and in digital format and the need of information is high. So the librarian should use the modern technology to store the digital information in a wide number which can be retrieving by various users. Such technologies are Web 2.0, server virtualization, cloud computing etc... And this technology can be used to store more information at libraries as content creation, storage, e-learning, archives etc... Data storage is the basic task of any library; hence this paper gives the clear picture of impact of cloud computing at libraries.

What is Cloud Computing ?

Cloud computing can be understood as a way to use off-site computer processing power to replace content creation and servers that were traditionally hosted onsite. In layman's terms this means "using Web services for our computing needs". Cloud computer allows content creation to be made "when data and software applications reside on and are drawn from the network rather than locally on any one workstation". By utilizing online applications, users can create and save their files online, share content (often for free!), work collaboratively with others or create entire services that can all be accessed online without need of having the programs on their own computer. These online services can reduce the need for expensive software, hardware, and even advanced technical knowledge from library staff since cloud computing services are often streamlined to be very user-friendly. As well, "the focus shifts away from which devices effectively store data and able to run applications to which devices can provide the easiest access to data and applications – which are stored at various places on the Internet".



Figure 1 - Cloud Computing

Types of cloud computing ::

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the use of a cloud-shaped

symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation.

There are many types of public cloud computing:

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)
- Storage as a service (STaaS)
- Security as a service (SECaaS)
- Data as a service (DaaS)
- Database as a service (DBaaS)
- Test environment as a service (TEaaS)
- Desktop virtualization
- API as a service (APIaaS)
- Backend as a service (BaaS)

Principles of cloud computing ::

Cloud Computing is a completely new IT technology and it is known as the third revolution after PC and Internet in IT. To be more specific, Cloud Computing is the improvement of Distributed Computing, Parallel Computing, Grid Computing and Distributed Databases. And the basic principle of Cloud Computing is making tasks distributed in large numbers of distributed computers but not in local computers or remote servers. In other words, by collecting large quantities of information and resources stored in personal computers, mobile phones and other equipment, Cloud Computing is capable of integrating them and putting them on the public cloud for serving users. Let us explain how this above technology used in our digital library.

Cloud computing at Library ::

Cloud computing is a new breed of service offered over the internet, which has completely changed the way one can use the power of computers irrespective of geographic location. It has brought in new avenues for organizations and businesses to offer services using hardware or software or platform of third party sources, thus saving on cost and maintenance. Internet is one of the best example for Cloud computing. In library as the information were exploded in recent age and the usages are been increased, cloud is a platform to store the information in a one place ie in a common server and distribute the same to all the users whenever required via web based systems. Example for cloud computing in library is follows: Library automation with multi user (client), Federated search via Web OPAC, ILS –LMS (Integrated library system), Web hosting, Universal OPAC, Online resources sharing, Digital library and Inter library loan etc...

This new generation of products—more appropriately called something like library services platforms rather than integrated library systems—addresses the fundamental changes that libraries have experienced over the course of the last decade or so toward more engagement with electronic and digital content. In their own distinctive ways, these recently announced or delivered systems aim to break free of the models of automation centered mostly on print materials deeply embodied by the incumbent line of integrated library systems. To make up for functionality absent in their core integrated library systems, many libraries implemented a cluster of ancillary products, such as link resolvers, electronic resource management systems, digital asset management systems, and other repository platforms to manage all their different types of materials.

For library:

- OCLC Web scale
- Ex-Libris Cloud
- Duraspace's DuraCloud – Repository solutions like dspace
- Open source software like koha, dspace, Green stone
- Moodle for LMS

- Drupal for content management

Activities at library with cloud computing:

- Automation of library activities using LMS
- 24*7 access of library with
- Creating Digital library to link the online databases using IP, institutional repositories, free resources, e-learning and training materials, question papers, and archives uploading.
- Library portal for new book request, queries, feedback, newsletter
- Creating group e-mails to the users (via web mail)
- Web OPAC, online renewal, reservations etc...
- Federated searching
- Large number of documents can be stored in a public server using cloud
- Online attendance monitoring, student's records maintenance, fine collections etc...
- PO / PR requesting using internal software
- Creating and uploading news letter, new arrivals and forthcoming events for user community (CAS)
- Creating alerts to the user community based on SDI

Advantage of Computer Clouding in Libraries ::

In computer clouding data is saved in cloud. Whatever we are doing on computer for even on MS word is saved through internet. It is new generation of computers.

It is economical. We pay in installments.

1. Capacity is increased. We can store more data.
2. Information can be retrieved from anywhere through internet
3. We need not to keep our software updated. It saves our time.
4. Third law of library science given by Mr Ranganathan "save the time of user" is satisfied because user time is saved.
5. Users will not experience delays while working on computers.
6. It provided automatic updates.

Disadvantages of Computer Clouding in Libraries ::

Biggest disadvantage of using computer clouding is in the libraries internet connection is must. If internet is down it will become impossible to work without internet. Secondly 1 mbps connection is required it need high speed. Thirdly data you stored on the internet is secured in the cloud. Fourthly data is present on the other server there is no direct control at where your data is actually present. There is danger to privacy.

Examples of Libraries where Computer Clouding is Used ::

If one have already worked with web 2.0 technologies over the past few years (e.g. Gmail, Google, Wikipedia etc. This means one have knowledge about computer clouding. We are living in the era of budget restraints. Cloud computing we will say is economical because now we are in world of information economy, digital libraries and virtual libraries is economical. Many vendors are selling cloud hosted versions to libraries.

Examples of Libraries where Computer Clouding is Used ::

It is a non-profit, membership, computer library service. OCLC offers hands to other venders also and started giving LIS tool that they complement WORLD CAT and First Search. World cat is also one of the best examples is the union catalogue. Libraries started building and managing there on datacenters. Hybrid computer is privately owned.

Library Thing ::

Library thing is one of sites brings together aspects of social networking and cloud computing. It

enriches your library catalogue with the power of web 2.0.library thing is a product .it offers catalogue enhancements packages, book recommendations, tag cloud for books, tag based search. Library things for libraries build worlds largest personnel and social cataloguing site.

Amazon and Google ::

These are also one of leading enter also providing solutions for libraries by having partnership between library automation centre's. We will pay what is used by us. Mobile Me is provided by Apple. Google for years is working from years working for dissemination of information also taking interest in library solutions.IBM developed infrastructure known as "blue cloud". Terrapod is a video Digital library [<http://surferblue.wordpress.com>] We will say cloud computing is a burning topic which is giving new dimensions to computers. It is vital for libraries due to various reasons Important part of cloud computing are known as the front end and back end front par is seen by computer user and back end is cloud itself. Computer clouding is useful in library and information sciences we can access data from anywhere. Its services are available from anywhere. We can order it on the internet. It helps in modernizing data centre's so we can say cloud computing is like revolution in the field of library and information services.

Conclusion:

The Cloud computing offers numerous benefits for different organizations, individuals and in libraries also. There are also privacy and security concerns. If any library consider to provide cloud services, it has to think about its personal information, and that of its' users, can best be protected. Carefully review the terms of services or contracts, and challenges the provider to meet its needs. In today's information society, libraries have the opportunity to improve their services with the help of Cloud computing. It is one path for this move into the future which brings numerous advantages for libraries.

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