Application of cloud computing at library and information centers

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Abstract: Pertainning 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.

Keywords: Cloud computing, cloud architecture, requirements for cloud computing at library, cloud platform for libraries, cloud and its applications.

Introduction:
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. Being a new and emerging area, Cloud computing has generated much interest in library applications. Predictions are that within five years, all library collections, systems, and services will be driven into the cloud. Cloud Library Management Systems, Cloud OPAC, Cloud Electronic Resource Management Systems, etc. will replace individual and standalone library systems such as LMS, OPAC, and ERMS. In addition, cloud computing will enable libraries to collaborate on the Web. This article defines cloud computing and benefits of clouds at Library automation and activities.

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.

Cloud diagram for digital library in University:

This model would let libraries maintain more control over the applications and data stores that contain sensitive, private information about patrons.
Cloud Computing Initiatives

There are good number of cloud computing initiatives undertaken by Amazon – Amazon web services, Google Apps, Microsoft windows Azure and others offering various types of cloud computing services for the organizations, businesses, and individuals.

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

Advantages
- Cost saving
- Easy on installation and maintenance
- Cloud computing technology is paid incrementally
- Increased storage
- Highly automated
- Flexibility
- Better mobility (24x7) service
- Shared resources
Disadvantages

- Data security and privacy
- Cost involved for software and hardware
- Technical skill required for maintenance

Conclusion:

Cloud computing is a new dimension in the computer systems technology, it increase the usage of internet and web technology. Librarians requires to think on system changing by using cloud computing to provide better service to the users on time. However, this technology has certain advantages, which definitely help organizations such as libraries in managing their services, which will relieve library staff from managing the servers. Library professionals many a times find it difficult to manage the technologies owing to their skill levels, lack of support from IT departments or for not having IT facilities within the organizations. Here, cloud computing may help libraries to undertake modern ICT activities without worrying about technical side of it, except adding content of resources. So cloud computing made a big difference in ICT world.

Reference: