

CLOUD COMPUTING IN LIBRARIES: NEW PARADIGM IN LIBRARY & INFORMATION SERVICES

Vinayak Savatagi

GAL, Prof. S. S. Basavanal Library,
Karnatak University, Dharwad – 580003.Karnataka State.
Email:-vinayakslis@gmail.com

Abstract:-Information and communication technologies are developing very fast and providing us opportunities due to their benefits such as reduced cost, anytime, anywhere availability, as well as its elasticity and flexibility. Cloud computing is one of the newly emerged models for technology that provide us the facility of central remote of services to maintain data, software and application through the use of the Internet. Nowadays, cloud computing widely applicable in many areas such as libraries, information centers, in-house applications and digital library services. This paper provides an overview of cloud computing technology, initiatives, and also discusses application of cloud computing in LICs and how it could be beneficial to LICs.

Keywords : Cloud Computing, Cloud Library Framework,

1.0 Introduction

Today the age of Information and communication Technology world and the Information and Communication play a main role in the libraries and information centers. There is emergence of the various technologies in the libraries. Cloud computing is the new technologies in the stage of Information Communication Technology. With the use of cloud computing, anyone can gain access at any time through any device, via the Internet, to data and file which you have uploaded, or to software applications which you need to use for personal or professional use. The new concept of cloud and libraries has generated a new model called cloud libraries. Using of cloud computing may vary with the libraries nature, services and information needs and using of cloud computing with in libraries can be development of digital libraries, acquisition, corporate cataloguing, storage and sharing the resources on virtual environment on the web.

2.0 Methods of Cloud Computing

Through, there are various service models originated on the web but three models widely used for delivering the different cloud based services that described as below.

2.1 Platform as a Service: With PaaS, a computing platform is provided which supplies tools and development environment to help companies to build, test and deploy web-based applications without investment in the required infrastructure but can rent use of platforms such as Windows Azure, Google AppEngine, Force.com etc. Its applications libraries are Paas provides a platform for various applications with pre-built components libraries can utilize this for providing specific services to its users by using specific applications designed according to our service need with minimum investment. Even various libraries together can use these applications to work in a collaborated manner as it provides a platform for feeds, profiles, conversations, updates and file sharing. This will be very helpful to provide value added services of libraries like SDI, CAS and Bulletin Board Service and So on.

2.2 Software as a Service (SaaS):It is popularly known as software on demand. In this, applications or software id delivered as a service to the end user, who can access the program online using a web browser or any other suitable client. Example: Google Apps, Hotmail, Skype and many 2.0 applications etc. There is a little customization on control available with these applications. It offers the ability to libraries to use online software to handle a task video chat through either Gmail video chat or through Skype with a little customization or control available with these applications.

2.3 Infrastructure as a Service (IaaS):It also referasHaas (Hardware as a Service). It offers both storage and computing power services. It delivers computer infrastructure i.e a platform virtualization environment as a

service along with block storage and networking. By using IaaS, a library can purchase server space and computing power, needn't to purchase a server but costs the same to purchase and maintain as what resources it actually used. Some common examples are GoGrid, 3Tera, Amazon EC2, Azure Services Platform, DynDNS etc.

Therefore, by moving towards the cloudy environment, a library can gain the ability to both try out new software without having to buy the hardware as well as being able to scale the computing power to meet the demand of users. In this way the library will save money and staff resources.

3.0 Cloud Computing in Libraries

There is an intellectual contestation of varied interpretation of cloud computing in the libraries. The widespread adoption of web search engines and other Internet tools and services and the emergence of players such as Google Scholar and Windows Live Academic in the scholarly information-retrieval arena have reduced users dependence on library support to fulfill their information needs. The web has also expanded the scope of services provided by librarians. Cloud computing and web collaboration are two major concept that underlie new and innovative developments in library automation. Cloud services allow for more optimal resource utilization, easier access and more effective cost feeds needs to be studied and redesign the library services. The Cloud-based new generation of ILS allows many libraries to share useful data. For instance, sharing of full-text journal titles from electronic databases. Many libraries subscribe to the same database. Historically, libraries have turned to huge capital investment on IT infrastructure for various online as well as subscription based services. With these success libraries are motivated for using subscription based IT infrastructure in the Cloud. In the field of library automation there are several commercial suppliers already offering various adaption of their products which make the use of the cloud possible to a lesser or greater extent. Cloud computing is important in the context of LIS for two reasons: "First the embrace of Cloud computing by many organizations, including OCLC, OhioLink, SirsiDynix and the Library of Congress suggest that this mode of computing will have a significant impact on the configuration, the economics and perhaps the personal requirements of library computing in years to come.

Moreover, libraries are in a unique position to experiment with Cloud computing given their service oriented mission and need to find appropriate solutions using limited resources. Some observe that the goals of the organization have an impact on their use of Cloud solutions. There are many reasons for why Cloud computing is being in common. Technologically we use Cloud computing because we can and its convenient. Economically, it is cost effective and pocket friendly and finally it makes interactivity easier to achieve with the target audiences.

Cloud computing is also going to change the practice of traditional reprographic services offered in the libraries. With the development of cloud computing and the digitization of human knowledge., translation has begun to see major breakthroughs by moving from rule to statistical based translation algorithms. Any individual, application or device is now enabled to translate content in endless languages, facilitating communication and breaking a major barrier – language. There is a tremendous amount of enthusiasm around Cloud-based solution and services (filtering, sorting, categorization and analytics to help users manage the vast repositories of both structured and unstructured information) as well as the cost-saving and flexibility that they can provide.

4.0 Potential Areas of Cloud Computing Application in Libraries

The various ranges of services that can be offered via the Cloud computing enabled libraries are enlisted below:

4.1 Automation: Till day, automation in libraries are being undertaken on locally hosted servers using different types of commercial and open source integrated library management software and managed by either internal IT or library staff. Now many of the software vendors and third party services offering of this service on the cloud to save libraries for investing on hardware. Also the library will free from undertaking maintenance such as software updates, back up etc. For Example: Wx-libris.

4.2 Building Digital Library/Repositories: In the present situation, every libray needs a digital library to make their resources, information and services at an efficient level to ensure access via the network. Therefore, every library is having a digital library that developed by using any digital library software. Using of locally hosted open source software such as DSpace, E-prints, Fedora to provide free access to scholarly resources. Not only adding resources but also in server maintenance, undertaking back up and regular updates and a lot of

pressure on library or IT staff when new version of the software get released. Now many vendors are offering digital library services on the cloud using SaaS approach to relieve the libraries from such pressure. Example: Duraspace cloud, OSS Lab.

4.3 Website Hosting: A very common arrangement involves simply hosting a website. Simple web-hosting arrangements allow the provider to aggregate a number of customer sites onto server hardware. Web hosting allows an organization to avoid server management and internet connectivity issues and to focus on the content of the site. Technically complex websites that involve scripting with PHP or Perl, content management systems, and other plug-in many require other arrangements beyond simple web-hosting services.

4.4 File Storage: To access any files on the internet, cloud computing present number of services such as Flickr, Dropbox, Jungle Disk, Google Doc, Sky Drive and so on. These services virtually share the files on the web and provide access to anywhere and anytime without any special software and hardware. Therefore, libraries can get advantages of such cloud services for various purposes.

4.5 Dedicated Hosting Services: Similar to co-location, a library can opt for hosting services through its data center or a commercial provider. Most hosting services involve leasing equipment from the provider. This saves the library the cost of acquisition in exchange for monthly or annual subscription costs. When starting up a hosting arrangement, the library will detail the specifications of the server required, including processor type, amount of memory, disk storage, and the desired operating system. The provider will then allocate a server that meets these specifications and turn it over to the library to install the software.

4.6 Software as a Service: Software as a service, or SaaS, has emerged as a major model for the deployment of business and consumer software. Many library automation vendors favour this approach and market it aggressively. This model delivers access to a software application independently of hardware considerations. The SaaS provider many take advantage of virtualizations. The SaaS provider many take advantage of virtualization, server clustering and other efficiencies in order to deliver an instance of its software in the most efficient way, yet it can deliver the software in a way that functions as if the library operated it locally. In a SaaS arrangement, the user can configure the software as needed but cannot customize it at the level of changing functionality. SaaS usually involves the provider taking responsibility for the implementation of all software updates and the myriad other behind-the-scenes technical details. While SaaS work especially well with entirely web-based applications, it also support applications that involved desktop clients.

4.7 Scholarly Content Searching : Cloud computing technology offers great opportunities for libraries to build network among the library and information science professionals as well as other interested people information seekers by using social networking tools. The most famous social networking services viz. Twitter and Facebook which play a key role in building community power. This cooperative effort of libraries will create time saving, efficiencies and wider recognition, cooperative intelligence for better decision-making and provides the platform for innovation and sharing the intellectual conversations, ideas and knowledge.

4.8 Virtualization: Today's advanced computer hardware far outpaces the needs of many software applications. A dedicated server running a typical applications load many operate at less than 10% of processing capacity and memory. Virtualization, a technique that less than 10% of processing capacity and memory. Virtualization, a technique that has gained extremely wide acceptance, involves allowing multiple instance of operating systems to share a single physical server. These may be multiple instances of the same operating system or of different ones. This approach allows end users to simultaneously run multiple desktop systems such as Microsoft Windows, Linux and Mac OS X. In the data center, virtualization allows each physical server to operate near its capacity reducing the number of devices needed overall as well as the devices, physical footprint, energy consumption and technical management. Since each instance of a virtual services functions independently as if it were on dedicated hardware, each can serve different clients and their complement of applications. Unfortunately, not all applications run well in a virtualized environment. The technical programming of some applications may monopolize resources in way that disrupt virtual environments. Organizations need to test their critical applications in a virtual machine prior to production deployment. Virtualization can be implemented in locally managed, co-located, or remote-hosting scenarios. It requires careful administration to ensure a reasonable balance of virtual machines per physical devices and to monitor the resource use of each instance.

5.0 Conclusion

No technology is permanent in this world today, and no solution is perfect for any software or services but still efforts are made to make them fit in order to enhance the benefits and reduce the demerits. In nutshell, Cloud library paradigm is all about virtualized web based services, providing a painless and economic computing to users and the librarians. Identical to atmospheric Clouds, “Clouds” of computing power comprising inexpensive applications is being offered on Internet through the Cloud provider. The libraries have been automated, networked and now moving towards paper less or virtual libraries. The latest technology trend in the field of library is, the use of cloud computing for various purposes and for achieving economy in library functions. 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.

6.0 References

1. Fox, R. (2009). Library in the clouds. *OCLC Systems & Services: International Digital Library Perspectives*, 25(3), 156-161.
2. Johnson, P. E., & Johnson, P. E. (2013). Cloud computing for libraries. *Journal of Access Services*, 10(1), 71-73.
3. Kaur, K. (2014). Moving libraries to the cloud. *International Journal of Information Dissemination and Technology*, 4(1)
4. Kaushik, A., PhD. (2013). Libraries perception towards cloud computing: A survey. *World Digital Libraries*, 6(1), 13-24. Retrieved from
5. Kaushik, A., & Kumar, A. (2013). Application of cloud computing in libraries. *International Journal of Information Dissemination and Technology*, 3(4), 270-273. Retrieved from
6. Khan, S., Khan, S., & Galibeen, S. (2011). Cloud computing an emerging technology: Changing ways of libraries collaboration. *International Research : Journal of Library and Information Science*, 1(2) Retrieved from
7. Khot, N. (2014). Cloud computing: Tyres, services and application in academic libraries. *International Journal of Information Dissemination and Technology*, 4(3), 240-243.
8. Singh, S. P., & Veralakshmi, R. (2012). Cloud computing: A promising economic model for library and information centers. *DESIDOC Journal of Library & Information Technology*, 32(6)
9. Waugh, M., & Waugh, M. (2012). Cloud computing for libraries. *Catholic Library World*, 83(2), 144.
10. Yeates, R., & Yeates, R. (2013). Cloud computing for libraries. *Program: Electronic Library and Information Systems*, 47(2), 207-209. Retrieved from
11. Yuvaraj, M. (2015). Cloud computing software and solutions for libraries: A comparative study. *Journal of Electronic Resources in Medical Libraries*, 12(1), 25-41.
12. Yuvaraj, M. (2015). Inherent conceptions of cloud computing among library and information science professionals. *Library Philosophy and Practice*, , 1-31. Retrieved from
13. Yuvaraj, M. (2016). Perception of cloud computing in developing countries. *Library Review*, 65(1), 33-51. Retrieved from