Summer 7-29-2019

Cloud computing and Libraries: A best choice for effective service: a Review Note.

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Abstract

Libraries are always in transition mode and the libraries incapable of doing or adopting new technologies to the libraries. The present global publishing trends are making things easy for libraries to adopt or apply new technology to boost up their services. The current scenario of world library service is changed from traditional to technological trends. These trends sometimes called cloud computing that is making library users connected in the virtual environment. Cloud computing is the new technology to the library where its end-user can access the library without any problem at remote locations. However using or application of this technology library will face too many problems like security, the privacy of data. This paper has highlighted features, models, benefits, and challenges of cloud computing. It is sure that the libraries get resolved those issues and implement this cloud technology for better use of library data or resources.

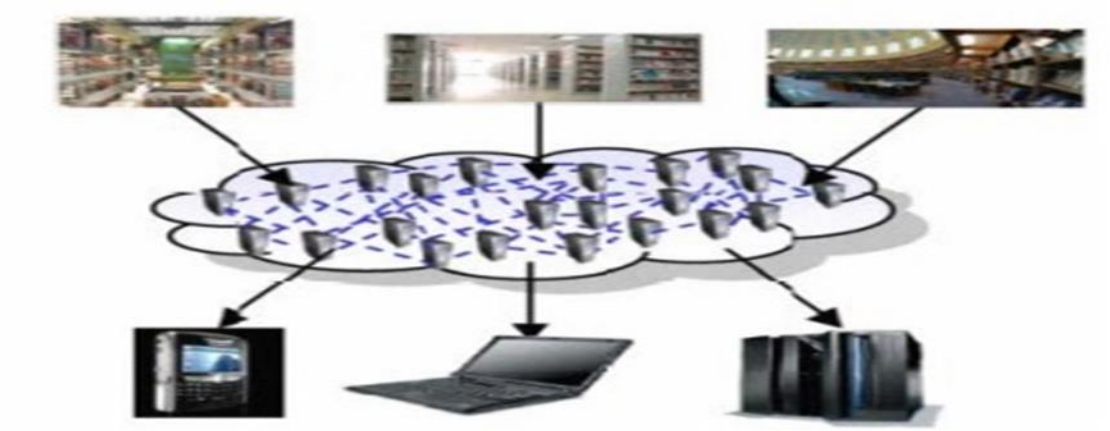
Keywords: Cloud computing, IaaS, PaaS, SaaS, ICTs, Libraries,

Introduction:

ICTs have changed the world drastically and dramatically. The influence of ICTs and its related tools has shown into the era of globalization where the world has changed into a global village. Moreover, in the age of globalization, every individual has their interest and passion to adopt certain tools and techniques to interact with other people via using the internet. ICTs have changed the world's appearance one too many ways in front of the people on to their desktop.

For decades or more the number of media helping the people to interact with other people via access internet (www).cloud computing is the new emerging technology where an individual makes their appearance to use the cloud to get their information using ICTs and related tools. Cloud computing is the source where all types of data and resources are available for consuming (Suman and Singh, 2016). Khan, Khan, and Galibeen (2011a)addressed Cloud computing provides the opportunity to make or create a platform where every individual can get their relevant information after the consultation of cloud service providers. Furthermore, cloud computing newly born technology which can be suitable for those libraries who have fully equipped with ICTs and its related tools.

Cloud computing is a technology where a library can possible to adopt this technology to fulfill the need of its clients in a good way. Cloud computing is a combination of new technologies and new features like web.2.0, grid computing and so on. Presently many libraries are adopting this technology to create an environment suitable for their clients and users to use library resources more effectively and efficiently. Abidi and Abidi (2012a) explained that can be new technology that breaks the communication obstacles from digital libraries and IT. Moreover, cloud computing help libraries to promote its resources and services effectively for long-lasting. Cloud computing helps the libraries to organize their resources and make possible to access their clients easily without any interruption. So, far there were several research papers have been published but this will be the first review paper that has highlighted some of the key areas of cloud computing that are applicable in the libraries for better approaches in the future.



Source from: (Sanchati and Kulkarni, 2011).

Review of Related works

Laxmanrao and Milind (2014) addressed cloud computing and academic libraries. They pointed out the importance of cloud computing in libraries. They find that cloud computing pushing hard to giving library users high-quality services and security as well. This cloud computing is making easy for libraries to appear on the web from local to universal.

Khan khan and Galibeen (2011b) addressed cloud computing as an emerging technology that creates a flexible and complex environment for libraries. They pointed out some of the benefits like cost-effective, easily access and everyone can access with flexible way.

Abidi and Abidi (2012b) they mentioned cloud libraries and novel application of cloud computing. They identified that with the help of cloud computing abridged is going to be made between digital libraries and IT.

Konganurmath & Shekar (2014). examined whether cloud-based services and information systems would make or create a possible way to maintained data or records in the cloud computing location. They also discussed the two major layers PaaS and SaaS of cloud computing.

Kaur (2014) studies that cloud computing is a new technology that is getting popularity in the libraries. Cloud computing is making possible to delivery services in the connection of the internet and IT.

Dastagiri and Kumar (2017) addressed the impact of cloud computing in academic libraries and library services. They agreed that cloud computing is the technology that has brought a massive change in ICTs and cloud computing made things easy that everyone can access the library services at anywhere and anytime. Cloud computing also helps in the reduction of cost.

Bandsode and Pujar (2012) investigated that cloud computing has made things easy for every organization as well as libraries where they can use hardware, software or platform of the third party.

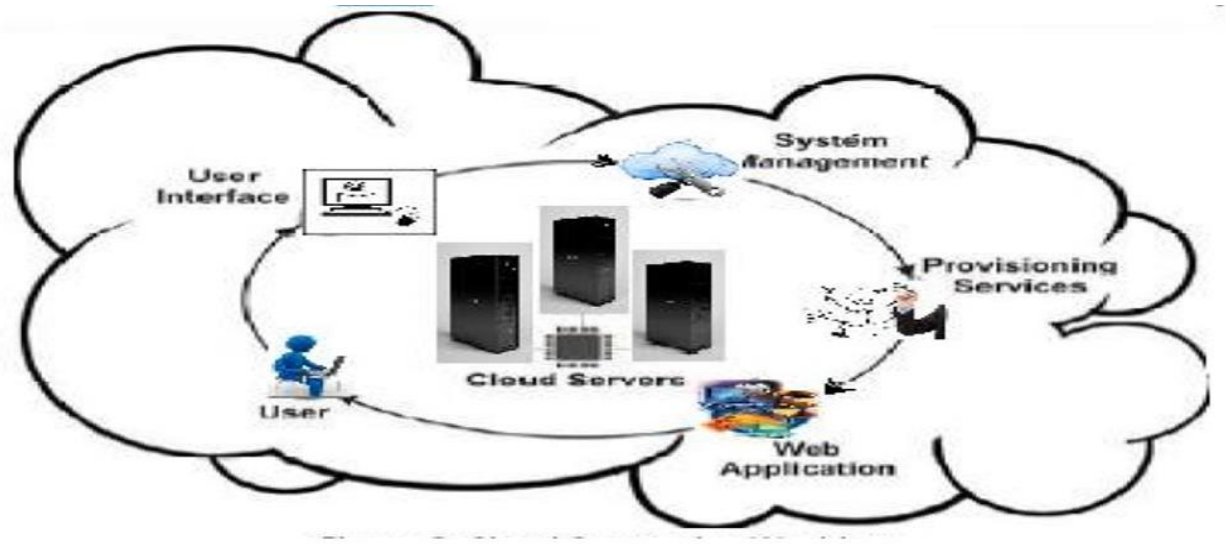
Kaushik and Kumar (2013) addressed that the new technology cloud computing is helping libraries to make a platform of their services with clouds.

Definition of cloud computing

According to Technopedia (2019) "cloud computing is the use of various services, such as software development platform, servers, storage, and software, over the internet often referred to as the cloud".

According to PCMAG (2019) "Cloud computing means storing and accessing data and programs over the internet instead of computer hard drive".

According to the online dictionary (2019) "cloud computing the practice of using a network of a remote server hosted on the internet to store, manage and process data rather than a local server or a personal computer".



Sources from: (Handa, 2013a)

Characteristics of cloud computing

- The back end of the application is completely managed by a cloud vendor.
- A user only pays for service used (memory, processing time and bandwidth).
- Services are mountable.
- This technology never uses for the long term in computing infrastructure.
- Cloud computing just everyone can use without giving any charges.
- It is always flexible to use.
- This technology will help to reduce overburden from the end-user.
- Everyone can access and search with interruption of the global boundary.
- This technology will help to make the environment green.

Benefits of cloud computing to the users and IT/service Providers

Cloud computing provides many benefits to their clients, users and as well as service providers. The following benefits are purely related to two major categories that have discussed above.

Benefits to Users

- The users are to right access the data anywhere 24/7 /365 but with the facilitation of internet connection.
- Users can secure, organize and fully reliable with their data security.
- Users can access remote locations with the help of advertising software.
- The software updated easily.

Benefits to IT/service Providers

- Service providers get into lower costs.
- Services providers shared costs with others like (real state and electricity).
- It helps service provider for proper organization of data in a meaningful order
- It helps service providers to make the server more effective to use.
- It gives them an idea of the maintenance of our sourcing infrastructure.
- It provides /helps service providers to create separate code from its physical resources.

Models of cloud computing

Infrastructure as a service (IaaS) this is one of the cloud models that would help to create a virtual platform, sometime this platform will be developed on demand of concern organizations like Amazon, HP, IBM, and Google-based. This model also provides serverless computing and cybernetic machines.

Platform as a service (PaaS) it is the cloud computing model that provides a virtual place that is confined in a specific programming language, tools, and applications.it can be understood easily that on this model every organization can create a platform where they can run software on the internet without managing the software and hardware.

Software as service (SaaS) software as service mean the way services offered as per the demand of users. This is the best type of cloud where a user can use without any trouble.

Infrastructure types of cloud computing models

Some Cloud computing models are following with detail discussion.

- **Public Cloud:** such type of cloud computing where the number of different organization have to create external services provider link. This type of cloud makes people lower costs and without any trouble. It provides an extension on timely bases.

- **Private cloud:** this type of cloud computing based on an individual organization's needs and build within the organization to full fill the need and requirements of that particular.

- **Hybrid cloud:** such a type of cloud computing model where private and public clouds make a joint venture on a single cloud to create more power cloud.

- **Personal Cloud**: such a cloud computing model where an individual can store their data into the cloud and access anywhere with the help of the internet. Sometimes it is called the mobile cloud. Through the mobile cloud, everyone can share the data from multiple devices such as tablet computers, etc.

Some of the cloud types and model has been mentioned by Ambhore (2016a) are as follow.

1. Storage as a service (STaaS)

2. Security as a service (SECaaS)

3. Data as a service (DaaS)

4. Database as a service (DaaS)

5. Test environment as a service (TEaaS)

6. Desktop virtualization

7. API as a service (APIaaS)

8. Backend as a service (BaaS)

There are several areas where libraries are willing to adopt or apply cloud computing in their respective libraries to introduced new technologies to reach their users.

Ambhore (2016b) mentioned.

1. OCLC

2. Library of Congress (LC)

3. Exlibris

4. Polaris

5. Scribd

6. Discovery Service

7. Google Docs / Google Scholar

8. WorldCat

9. Encore

Challenges using cloud computing

The application of this technology to the libraries is not possible due to some issues and challenges.so it will be tough for libraries to adopt while facing problems.

- Security is the main concern of the library using new technology because of the reliability of their data. Besides that this technology needs more money but data consistency is much more crucial than money.

- It was seen that the vendor makes sure the security, safety, and privacy of the data. This technology will be implemented with the help of the vendor but still, the organization cannot be sure about the overall working situation.

- The librarians are not fully aware of this new cloud computing technology as well as the majority of stakeholders not aware of this technology.

Role of could computing in libraries

Cloud computing is playing its part to revolutionize the library services and its integrated parts. Cloud computing is the 3rd uprising changed after the PC and the Internet. Ambhore (2016c) states that cloud computing is associated with parallel computing, grid computing, distributed databases as well. The library users can browse the same as a physical search on bookshelves. Handa (2013b) mentioned that cloud computing helping the libraries to convert the print version into the digital version to access the library users at remote locations. Joshi (2015) cloud computing will help to reduce the time of the client to meet their search requirements. Cloud computing also enables library staff to focus on client-facing services.

Conclusion

Cloud computing is the 3rd biggest revolution in the computer world. Besides these facts cloud computing is the new revolution for the libraries to build their relationship strong with library users at any level. Cloud computing is helping libraries to make things easy for library staff. This technology will be helpful to the libraries and make sure while sharing their digital information and stopped the duplication of shared materials means electronic sources. Abidi and Abidi(2012c) libraries always face problems but with the help of cloud computing, these problems will be solved. These problems are budget cut, ICTs infrastructure, Digital data inflexibility and low level of efficiency. Could computing will help to bridge the gap among

these problems to make things easy for libraries. Singh, Sharma, Kumar & Yadav (2016) shared that the application of cloud computing will have to make library resources accessible and make a good image of library services to the library users beyond the thought of library staff. Furthermore, cloud computing will be helpful to solve the problem of sharing of resources and organization of resources. Cloud computing will be focused on access the digital materials from the library users at remote locations. Cloud computing is worthwhile for LIS professionals to create an environment to render the library services to their users in an easy way.

References

1. Abidi, F., Abidi, H. J., & Armani, S. (2012a). Cloud libraries: A novel application of cloud computing. In *International Conference on Education and e-Learning Innovations* (pp. 1-4). IEEE.
2. Abidi, F., Abidi, H. J., & Armani, S. (2012b). Cloud libraries: A novel application of cloud computing. In *International Conference on Education and e-Learning Innovations* (pp. 1-4). IEEE.
3. Abidi, F., Abidi, H. J., & Armani, S. (2012c). Cloud libraries: A novel application of cloud computing. In *International Conference on Education and e-Learning Innovations* (pp. 1-4). IEEE.
4. Ambhore,V.J.(2016a). CLOUD COMPUTING FOR LIBRARY SERVICES. Knowledge Librarian" An International Peer Reviewed Bilingual E-Journal of Library and Information Science.3 (5).92-98.
5. Ambhore,V.J.(2016b). CLOUD COMPUTING FOR LIBRARY SERVICES. Knowledge Librarian" An International Peer Reviewed Bilingual E-Journal of Library and Information Science.3 (5).92-98.
6. Ambhore,V.J.(2016c). CLOUD COMPUTING FOR LIBRARY SERVICES. Knowledge Librarian" An International Peer Reviewed Bilingual E-Journal of Library and Information Science.3 (5).92-98.
7. Bansode, S. Y., & Pujar, S. M. (2012). Cloud computing and libraries. *DESIDOC Journal of Library & Information Technology*, *32*(6).

8. Dastagiri, D., & Kumar, S. P. (2017). Impact of Cloud Computing Applications in Academic Library and Library Services.
9. Handa, T. S.(2013a). Library Services through the Cloud: A New Paradigm.
10. Handa, T. S. (2013b). Library Services through the Cloud: A New Paradigm.
11. https://www.pcmag.com/ retrieved from: 12th June, 2019.
12. https://www.techopedia.com/ retrieved from: 12th June, 2019.
13. https://www.dictionary.com/ retrieved from:12th June, 2019.
14. Joshi, N. (2015). Cloud Computing and Libraries. *International Journal of Applied Research*, *1*(12), 128-130.
15. Khan, S., Khan, S., & Galibeen, S. (2011a). Cloud computing an emerging technology: Changing ways of libraries collaboration. *International Research: Journal of library and Information science*, *1*(2).
16. Khan, S., Khan, S., & Galibeen, S. (2011b). Cloud computing an emerging technology: Changing ways of libraries collaboration. *International Research: Journal of library and Information science*, *1*(2).
17. Kaur, B. (2018). Cloud Computing and Its Use in Libraries. *Journal of Advancements in Library Sciences*, *5*(3), 46-48.
18. Kaushik, A., & Kumar, A. (2013). Application of cloud computing in libraries.
19. Konganurmath, M., & Shekar, H. P. (2014). Cloud computing services in libraries: An overview.
20. Laxmanrao, K. A., & Milind, S. S.(2014). Cloud Computing and Academic Libraries: An Overview. International journal of innovative research and development. 3(12).148-150.
21. Sanchati, R. (2011). Cloud computing in digital and university libraries. *Global Journal of Computer Science and Technology*.
22. Singh, A., Sharma, S., Kumar, S. R., & Yadav, S. A. (2016, February). Overview of PaaS and SaaS and its application in cloud computing. In *2016 International Conference on Innovation and Challenges in Cyber Security (ICICCS-INBUSH)* (pp. 172-176). IEEE.
23. Suman and Singh, P. (2016). CLOUD COMPUTING IN LIBRARIES: AN OVERVIEW. International Journal of Digital Library Services.6 (1).121-127.