

Role of Cloud Computing in Enhancing Education Services

Mamta Joshi

mamtahjoshi29@gmail.com

Assistant professor, Amrapali Institute of Management and Computer Application, Haldwani (Nainital)

Abstract: Using of ICT in education services allows the management of thousands of students through a single instance with high level of accuracy. Design and development of various ICT applications in education system enhances the effectiveness of delivering education in our country. Research paper shows the use of Cloud computing in enhancing education service in India. Various modes of cloud deployment have been discussed with different aspects.

Keywords: ICT, CLOUD COMPUTING, SaaS, PaaS, IaaS

I. INTRODUCTION

ICT (Information Communication and Technology) plays an important role in improving academic standards in education system of India. One needs to implement this concept right from the root i.e. elementary and school education system, in India. This concept provides the new dimensions in education delivery system of India. This also enhances research activities in education system of India.

Using of ICT in education services allows the management of thousands of students through a single instance with high level of accuracy. Design and development of various ICT applications in education system enhances the effectiveness of delivering education in our country.

As due to the emergence of new technology called cloud computing we can encourage the growth of education services through various ICT applications [1]. In this research paper I tried to focus on the working of this technology at school level and its impact on various academic activities.

1) *Cloud computing* [2]: As per NIST (National Institute of Standards and Technology) cloud computing is a “framework for enabling network access in shared pool of computing resources”. In general, cloud computing is an internet enabled technology which provides shared access of data storage, platform and various computational resources on demand basis.

II. DELIVERY MODELS [2,3]

The term delivery model is used to discuss the techniques through which cloud computing services could be delivered. The entire cloud services are divided under the following delivery models as follows:

SaaS (Software as Service)

This layer of cloud computing we could deliver various applications designed for enhancing education services. These services are designed and developed by PaaS users. We could internet to access the SaaS layer i.e. all the applications present at SaaS layer is downloaded through Internet. This layer is independent of other layer i.e. users need not to care about development and installation of actual softwares.

PaaS (Platform as a Service)

This layer of cloud computing is the collection of set of tools which are used by PaaS layer users. In this layer we could create and deploy various services which are used by citizens or end users. Due to the independency users at this layer were not bothered about the hardware issues related with the applications. For example google AppEngine service provided by google inc.

IaaS (Infrastructure as a Service)

This layer of cloud computing is responsible for providing all the hardware requirements for designing and delivering educational applications. This layer fulfills all storage requirements, network requirements servers etc. This layer of cloud computing reduces the task of hardware maintenance, purchasing of software licenses etc.

For example amazon is one of the best IaaS providers.

III. CHALLENGES IN EDUCATION SYSTEM [4]

Lack of ICT (Information Communication and Technology) infrastructure is one of the barriers faced by the government while providing better education services especially in school education system of India. In case infrastructure exists, then maintenance of that infrastructure is another concern while managing effective education services in India [4].

Cloud enabled architecture can be one of the solutions for managing infrastructure issues. This technology is a setup of resources through which anything could be shared from any location. Using of cloud computing in education system guarantees that students, teachers and guardians can access the data relevant to them by using any devices like smart phones, laptops, desktops etc.

IV. BENEFITS OF USING CLOUD COMPUTING IN EDUCATION SERVICES

While going through the various applications of ICT enabled education services I have identified various benefits in using cloud computing based education system in India. Some of them are discussed below:

- **Low Cost:** Cloud computing deals with sharing of resources upto an extent level. Implementation of various education services through cloud computing leads the low cost of development.
- **Easy Accessing of Information:** Due to its shareable architecture, accessing of required information can be made easy in this.
- **Easy Learning:** In Cloud system, one can access the required information from home. This feature is very helpful for remote areas of India. Presently various software tools are available which made the accessing of study material quite easy.

- **Environment Friendly:** Cloud computing system is also helpful reducing the carbon footprints.
- **Security:** While using cloud computing one can use login/password facility or another means like user verification id while data downloading. This may helps in managing proper user identification.

V. SERVICES OFFERED BY ICT ENABLED EDUCATION SYSTEM

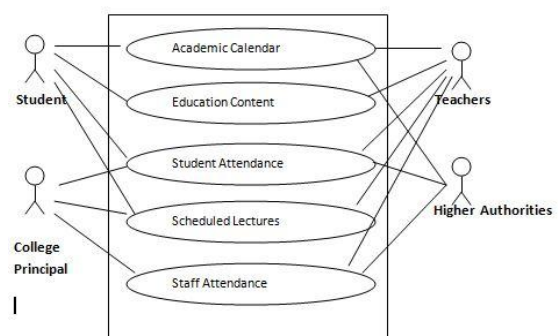


Figure 1: Use Case showing various services

According to Figure 1, I have tried to show the basic services [6] in education system and their accessing by various authorities. In this case we need to upload all the data in cloud enabled framework and its accessing by various authorities/users.

VI. PRESENT STATUS OF EDUCATION SERVICES

In India most of the private schools are using IT enabled services as per their requirements. Generally, Internet is the medium for connecting teachers and students for sharing the information. Offering of various educational services through Internet is one of the cheapest mean of sharing data. This can also lead the availability of data in 24x7 manners.

But due to the increasing requirements of data storage, majority of the educational services are to be hosted on cloud based environment. But as of know most of the schools are not prepared to this implementation [6]. So, here we need to identify the areas in where we can implement cloud enabled services in education system of India.

Whereas in case of government schools the condition is more verse as they are playing very

limited aspects while transforming educational services through cloud computing. In most of the government schools, the day to day activities like attendance, class schedules etc are done manually. So we also need a proper framework for hosting educational services through cloud computing.

VI. IMPLEMENTING VARIOUS CLOUD COMPUTING BASED EDUCATION SERVICES

Services Lectures Student Attend. Staff Attendan. Academic Sch.	SaaS Software as a Service	Users Students. Teachers. Higher Auth.
Services Progrm. Lang. Operating Sys. Database Appl.	PaaS Platform as a Service	Users Programmers. DBA's. Experts of various tools.
Services Multitenant. Scaling. Network Arch.	IaaS Infrastructure as a Service	Users Network Arch. All Hardware Experts.

Figure 2: Service as Per the Cloud Computing Architecture

Cloud computing is one of the solutions for managing present challenges and issues in education system of India. One can use Internet as the best medium for controlling data access in cloud enabled environment.

As shown in Figure 2 above, where users and available services are discussed in cloud enabled environment.

VII. CONCLUSION

Cloud Computing is the emerging technology that can be used to encourage the growth of ICT in education services in India. Using of cloud computing in elementary or school level education is still infancy in comparison to other sectors.

The adoption of cloud technology at school level helps in achieving the goal of improving teaching and learning methodologies by using various applications. Implementation of cloud technology in education sector enhances the performance at reduced costs. The security issues are still challenges while implementation of education services through cloud computing. The proposal of various layers of cloud implementation in terms of education sector has been discussed in this research paper.

VIII. REFERENCES

- [1] S Manro, et al., "Cloud Computing in Education: Make India Better with the Emerging Trends", High Performance Architecture and Grid Computing Communications in Computer and Information Science Volume 169(2011), pp 131-139.
- [2] WIKIPEDIA, "Cloud Computing", http://en.wikipedia.org/wiki/Cloud_computing (accessed in Jul 2013)
- [3] R Giordanelli, and C Mastroianni, "The Cloud Computing Paradigm: Characteristics, Opportunities and Research Issues." (ICAR). Technical Report no.: RT-ICAR-CS-10-01.
- [4] A Singhal, V Tiwari, a report titled "CHALLENGES FACED BY THE EDUCATION SYSTEM IN INDIA" IITA (available at: <https://library.iated.org/view/SINGHAL2012CHA>, accessed on 1.2.2017).
- [5] L. J .Sankpa et al, "Cloud Computing in Education System", International Journal of Advanced Research in Computer and Communication Engineering, Vol 3(2) ISSN (Online): 2278-1021, ISSN (Print) : 2319-5940.
- [6] A report by MHRD (available at: http://mhrd.gov.in/ict_overview, accessed on 1.3.2017).