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Implementation of Cloud Computing in Education System

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Abstract
In past time India gurukul were the places where the students received knowledge and get educated. The time passes and these gurukul were replaced by schools. The sole purpose of starting schools was to make education available to each and every person in the country without the difference of religion, cast or any type of financial issues. But till now hundreds of years have been passed but still there are places in India where getting proper education is just a dream. There are isolated areas situated not only at villages but also outside the major cities where schools are not present, if schools are there then no good teachers available. At several places they have only middle schools and no high school. Various surveys conducted by government put ahead the result that present system of education is not worth and has many loop holes associated with it. Cloud computing is the knowledge which has built by years of study in Distributed systems, grid computing etc and thus by using this technology we can make available the answers to all the short comes and promise to provide quality education to each and every citizen of India.

Keywords: cloud computing, e-learning, cloud based learning

1. Introduction

Government of India is promoting the education and encouraging students to join schools, motivating parents to send their ward to schools and thus ensuring that education will helps a person to achieve heights in his carrier and life. Various catchy slogans are given by government and various good schemes like “education to everyone” are started by the government. But all these goes in vain when government not able to provide best facilities to the students. The various schemes makes students reaches to the schools but lack of facility es, good teachers, lack of latest books and labs facilities seriously causes affects on their results and thus discourages them to continue their education. Thus all the thousands of crores of budgets which the government approves every year for education goes
in vain and hinders the process of growth of that student and also of the country in a very large extent as all these processes are interrelated. Thus by implementing cloud computing technology we have the hope that we can overcome all these short comes and maintained a proper centralized system where all the

authorities can check the education system from each and every aspects and continue monitor and guide the system [1]. They not only check the needs of the institutions but also ensure that quality education ids provide to every student and also his attendance, class performances etc can be effectively maintained.

Cloud Computing Cloud computing technology is the result that has been generated with years of hard work in grid computing, parallel computing and virtualization [2]. Cloud computing as a new model of IT promise stipulation of computational resources on demand and abstraction of technical details by the clients. The various types of services provides by the cloud are:

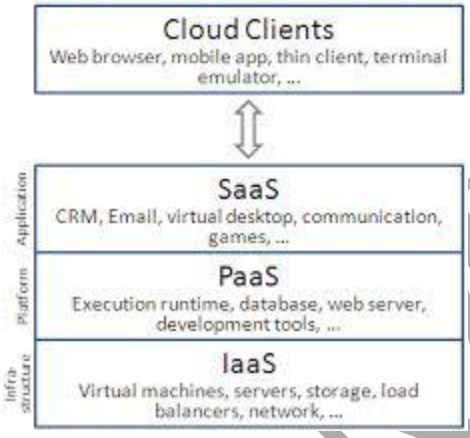

Fig 1. Cloud services

1. Infrastructure as a service (IaaS): Hardware belongings (like storage) and computing preeminence are presented as services to clients.
2. Software as a service (SaaS Software as a service (SaaS): software application as services are presented on The Internet rather than as software packages to be buy by any client[5]. Examples are Google web-based office applications (word processors, Spreadsheets, etc.),
3. Platform as a service (PaaS): This refers to providing amenities to sustain the whole significance growth lifecycle including drawing, debugging, testing, Exploitation, operation and support of rich Web application and services on the Internet.

2. Deployment Models Of Cloud Computing

There are four types of cloud model are explained below:

I. **Private cloud**-the cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers (e.g., business units)[9]. It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises.
II. **Community cloud**-the cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations)[11]. It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.
III. **Public cloud**-the cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider [8].
IV. **Hybrid cloud**-the cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or

proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds)[14].

3. FROM E-LEARNING TO CLOUD E-LEARNING

E-learning is an Internet-based learning process, by which we can read, write and extend the any topic on internet and upload so that it might be helpful for others .It cannot replace the traditional methods but will increase the efficiency, performance of education methods. E –learning provides lot of advantages such as flexibility, time management, availability, it will become a primary way for learning in the new century as in Mendez [19] illustrates that in traditional web-based learning mode, system construction and maintenance are located inside the educational institutions, which led to a lot of problems, such as significant investment needed but without profit. In contrast, cloud-based e-learning model very less investment needed compare to traditional e-learning it enable providers and users win-win situation.

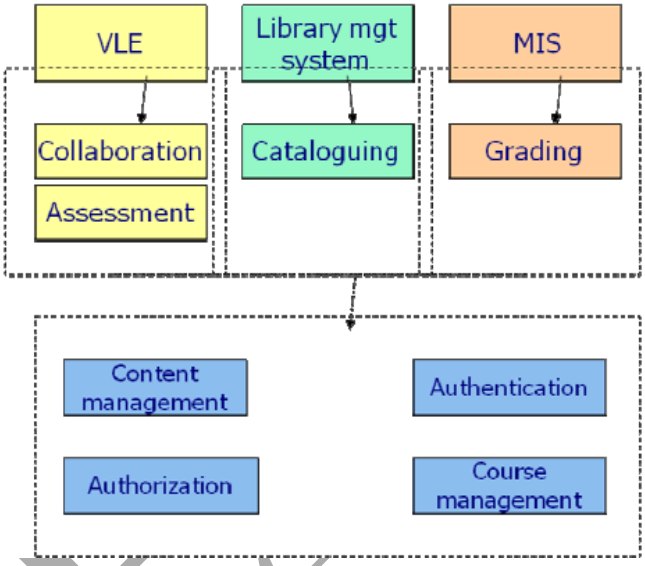

Fig. 2 Architecture of a traditional Learning System

The cloud-based environment supports the creation of new generation of e-learning systems, able to run on a wide range of hardware devices, while storing data inside the cloud. Ouf [20] has presented an innovative e-learning ecosystem based on cloud computing and Web 2.0 technologies. The article analyses the cloud services, advantages of deployment (E-learning2.0) provided by by public cloud computing environments such as Amazon Elastic Compute Cloud (EC2) or Windows Azure. The authors also identified the benefits of cloud-based E-Learning 2.0 applications and enhancements regarding the cost and risk management. Chandral [21] focused on current e-learning architecture model and on issues in current e-learning applications. The article presents the Hybrid Instructional Model as the blend of the traditional classroom and online education and its customization for e-learning applications running on the cloud computing infrastructure. The authors underline the e-learning issues such as scalability, availability, development cost. The existing e-learning systems are not dynamically scalable, extendable, integrations with other learning system increase the overall cost. The article proposed the hybrid cloud delivery model that can help in fixing these problems.

In this article a new paradigm is highlighted in educational area by introducing the cloud computing in order to increase the scalability, flexibility and availability of e-learning systems. The authors have evaluated the traditional e-learning networking model, with its advances and issues, and the possibility to

move the e-learning system out of schools or enterprises, inside a cloud computing infrastructure. The separation of entity roles and cost effectiveness can be considered important advantages.

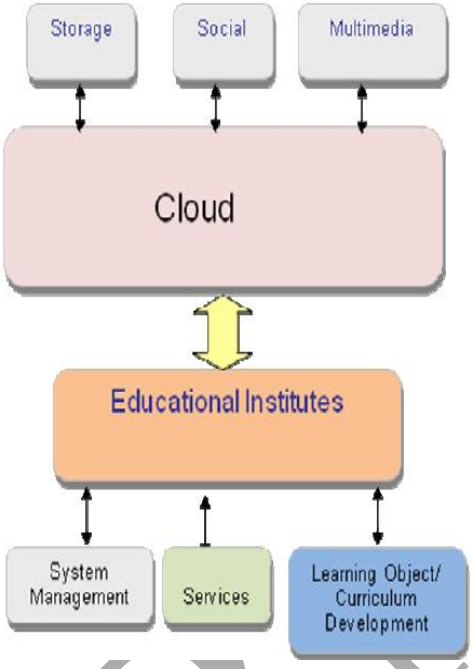

Fig 3. Architecture of modified E-learning system

The institutions will be responsible for the education process, content management and delivery, and the vendor takes care of system construction, maintenance, development and management. The e-learning system can be scaled, both horizontally and vertically, and the educational organization is charged according to the number of used servers that depends on the number of students as in figure 2.

4. Strategy Implementation of proposed system

As it is earlier explained above architecture of cloud based learning system. The proposed e-learning cloud architecture is divided in to following four layers. Each of them is explained below

a) Infrastructure layer:-It is composed of information infrastructure and teaching resources. Information infrastructure contains Internet/Intranet, system software, information management system and some common software and hardware; teaching resources is accumulated mainly in traditional teaching model and distributed in different departments and domain.

b) Resource layer: - It is composed by operating system and middleware. Through middleware technology, a variety of software resources are integrated to provide a unified interface for software developers, so they can easily develop a lot of applications based on software resources.

c) Service layer: - It has three levels of services namely, SaaS (Software as a service), Paas (Platform as a service), IaaS (Infrastructure as a service) . In SaaS, cloud computing service is provided to customers.

d) Application layer: - It is the specific applications of integration the teaching resources in the cloud computing model, including interactive courses and sharing the teaching resources. The interactive programs are mainly for the teachers, according to the learners and teaching needs, taken full advantage of the underlying information resources

Once any of the computer system connected with internet gets started then it will directed the student, teacher or in better words a whole institute to the cloud. In cloud both the students and teachers have to login with their separate id and from here the first best feature that is to monitor attendance of teacher and student is possible, secondly Live and recorded both type of the lectures can be seen by the student. The best part of this facility is that a student studying at any school and another student studying at any big name school both are attending the same tutorial from a highly skilled faculty at the same time. Thirdly entire examination process is changed and now the exams will be conducted on cloud and the results of each and every exam that is even a class test is reported directly to the concerned authority. With this new system parents can be able to monitor their ward attendance and his growth in the session.

5. Advantages

1. Better services

a) Elasticity of service: In a single moment many students and teachers can store data, and the best part is that there is no limitation of space and thus user's capacity to store data increase to a larger extent.
b) Quality of service: Service quality is the most important feature and in maximum cases where exact necessities have to be fulfilled by the outsourced resources and outsourced services.
c) Availability: Availability of the services is the most important and desired by the user using the education cloud.24/7/365 is the availability that is needed by this system without failure

2. Economic and technical Benefits

a) Reduction of cost - Cloud system that we are proposing is friendly to our pockets and it will reduce the cost by allowing us the facility of Pay per use. That is we have to pay only for the resources which we are using and thus it does not put any financial burden on any of the institute, government or student.
b) Focus on education only – Schools and governments are now free to focus on there goals that is making more research facilities available to the students and making the environment global in spite wasting time on worrying about the buildings, labs, teachers etc.
c) Going Green- Education cloud will surely reduced the carbon footprint.
d)User friendly – This new facility is user friendly and no need to worry about the complexity. It is easy to understand and easy to operate.
e) Free from foundation of locations: From anywhere a teacher can login and take the lecture. Also from other layers are also important and there use is shown in the diagram 2. any where a student can login the check his grades, submit assignments etc.
f) Management of data – A large amount of data is generated by each school and thus to maintain them effectively and to use it appropriately when needed is the best feature of the education cloud.

6. Conclusion

With this proposed system all problems can be easily solved. The rise of cloud computing is rapidly changing landscape of Information technology and ultimately turning to the long-held promise of utility computing into a reality. Cloud computing can help communities and nations, can transform education. An entire world of knowledge can now be made available to teachers and students through cloud based services that can be accessed anytime, anywhere, from any device. The best part of this system is that the boards' difference which arises due to standard of different boards (different state boards and central

governed boards) will come to an end. Thus this new system will spread the quality education to each and every part of India.

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