Based on Educational Sector Using of Cloud Computing

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Abstract— **Education is highly important in today's society. It helps to motivate the minds and shape it into intellectuals. Many Academic Institutes are exploring new technologies for effective teaching and learning Methodology. One of the emerging technologies Cloud Computing can be very useful in teaching learning process. As Cloud provides a variety of services, an institute can offer quality education by providing latest infrastructure in terms of hardware and software. This paper focuses on basic introduction of cloud Computing and how cloud computing can be introduced in the education to improve teaching and learning methodology which can bring a revolution in the field of education.**

Keywords— *Cloud, Education, Information, Infrastructure, Services.component; formatting; style; styling; insert (key words)*

I. INTRODUCTION

During the last two decades the evolution of distributed computing has changed the working of scientific and commercial applications. This progress has evolved several newer applications. The latest evolution of distributed computing is Cloud computing . In Simple form Cloud computing means storing and accessing data and programs over the Internet instead of computer's hard drive . In other words cloud computing provides shared resources, software and information through Internet as a PAYGO (Pay-as-you-go) basis.

Cloud computing can be a welcomed optioned in the universities and educational institutes for studies. It gives a better choice and flexibility to the IT departments by building multipurpose computational infrastructure once and then uses it for several purposes for several times. Teaching is now not just restricted to classroom with students. Today Education is heavily dependent on Information technology. The rate of IT technology is changing and which puts more extra financial burden on institute. Continuous upgrading hardware and software is difficult and also it leads high cost to maintain them.

Cloud Computing provides the solution for this problem. With the help of cloud computing the user uses the platform and application on-campus or off-campus or combination of both depending on the institutions need. It offers services at the least cost to users like student, staff who can acquire it anywhere any time.

Fig :1 Cloud computing the User

II. CLOUD COMPUTING

Cloud computing means that instead of all the computer hardware and software you're using sitting on your desktop, or somewhere inside your company's network, it's provided for you as a service by another company and accessed over the Internet, usually in a completely seamless way. Exactly where the hardware and software is located and how it all works doesn't matter to you, the user—it's just somewhere up in the nebulous "cloud" that the Internet represents.

Cloud computing is a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications.

Cloud computing is Internet-based computing in which shared resources, software and information are delivered as a service that computers or mobile devices can access on demand. Cloud computing is already used extensively in education. Free or low-cost cloud-based services are used daily by learners and educators to support learning, social interaction, content creation, publishing and collaboration.

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Some major examples of cloud computing services includes Google Drive, Amazon Cloud Drive, Apple iCloud, Microsoft's SkyDrive, Humyo, ZumoDrive. Cloud computing services are categorized into three different levels.

Software as a Service (SaaS):

These types of application are generally designed for end-users, delivered over the web. SaaS works so much better for students because it provides access to applications anytime, anywhere, for any type of devices like laptop, smart phone, tablet, or other web-enabled device. Adding more users or scaling the software to more classrooms or campuses is becomes very easy task with Cloud Computing in Education Sector.

Fig :2 Cloud Services

Platform as a Service (PaaS):

PaaS is the collection of development tools and services which is used for coding and deploying the applications quick and efficient. With PaaS, Students, teachers or other academicians can develop new applications or services in the cloud which is platform independent, and also make them widely available to users through the Internet. It also provides services for testing, deploying, collaborating on, hosting, and maintaining applications.

Infrastructure as a Service (IaaS):

IaaS is the combination of hardware and software that powers it all – servers, storage, networks, operating systems. These are also known as On demand data centers which provide compute power, memory, and storage, typically priced per hour according to resource consumption. It can be used to satisfy the infrastructure needs of students, staff or any other academia's.

Characteristics

The characteristics of cloud computing include on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service. On-demand self-service means that customers (usually organizations) can request and manage their own computing resources. Broad network access allows services to be offered over the Internet or private networks. Pooled resources means that customers draw from a pool of computing resources, usually in remote data centres. Services can be scaled larger or smaller; and use of a service is measured and customers are billed

accordingly.

Service models

The cloud computing service models are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). In a Software as a Service model, a pre-made application, along with any required software, operating system, hardware, and network are provided. In PaaS, an operating system, hardware, and network are provided, and the customer installs or develops its own software and applications. The IaaS model provides just the hardware and network; the customer installs or develops its own operating systems, software and applications.

Deployment of cloud services

Cloud services are typically made available via a private cloud, community cloud, public cloud or hybrid cloud.Generally speaking, services provided by a public cloud are offered over theInternet and are owned and operated by a cloud provider. Some examples include services aimed at the general public, such as online photo storage services, e-mail services, or social networking sites. However, services for enterprises can also be offered in a public cloud. In a private cloud, the cloud infrastructure is operated solely for a specific organization, and is managed by the organization or a third party. In a community cloud, the service is shared by several organizations and made available only to those groups. The infrastructure may be owned and operated by the organizations or by a cloud service provider. A hybrid cloud is a combination of different methods of resource pooling (for example, combining public and community clouds).

III. CURRENT SCENARIO OF EDUCATION

Education system is always based on the marks, grades and figures. But in real life the practical knowledge, reflective thinking, and some practice is required to remain in competition [6]. Moreover practical knowledge has great significance to be in competition nowadays for this reason to impart the practical knowledge Institute has to build latest configured Laboratory which incurred highest cost in hardware configuration and due to technological obsolescence it will becoming recurring cost for the institute. Hence there is need to find out feasible solution and the solution is Cloud

Computing services. To overcome from such type of problem the Institute can subscribe a service from any cloud service provider on the bases of pay as you go. Another factor is that Institutes are heavily depend upon content management system according to that Institute can also hire a service to store the content on the cloud and any student or staff or any academia's can use that from anywhere and anytime and on any device.
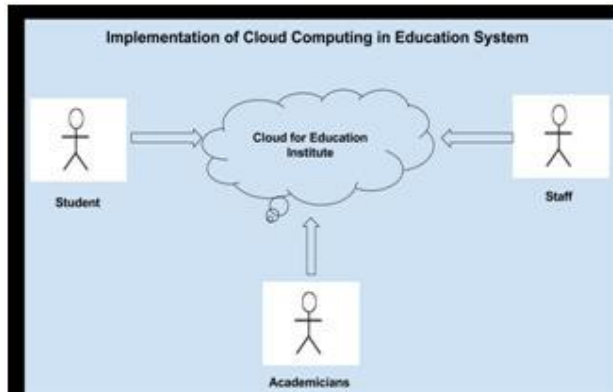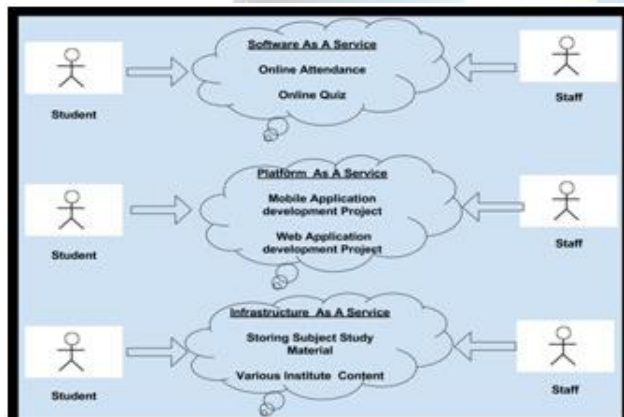

Fig:3 Cloud of Educational System

Fig:4 Cloud Sharing the information to student and staff.

IV. IMPLEMENTATION OF CLOUD COMPUTING IN EDUCATION SECTOR

The potential users of Education cloud are students, staff or academicians. Each user has their own credentials to access the respective cloud services. Adopting SAAS of Education cloud, teaching staff can maintain the attendance, conduct online quiz and many more with the respective software packages .Adopting PAAS Institute can organize practical sessions as and when needed from Education Cloud. For e.g., developing projects like mobile apps, web apps, etc. Adopting IAAS Staff can upload their study materials or any related content on Education cloud and student can access these materials and content 24*7*365.
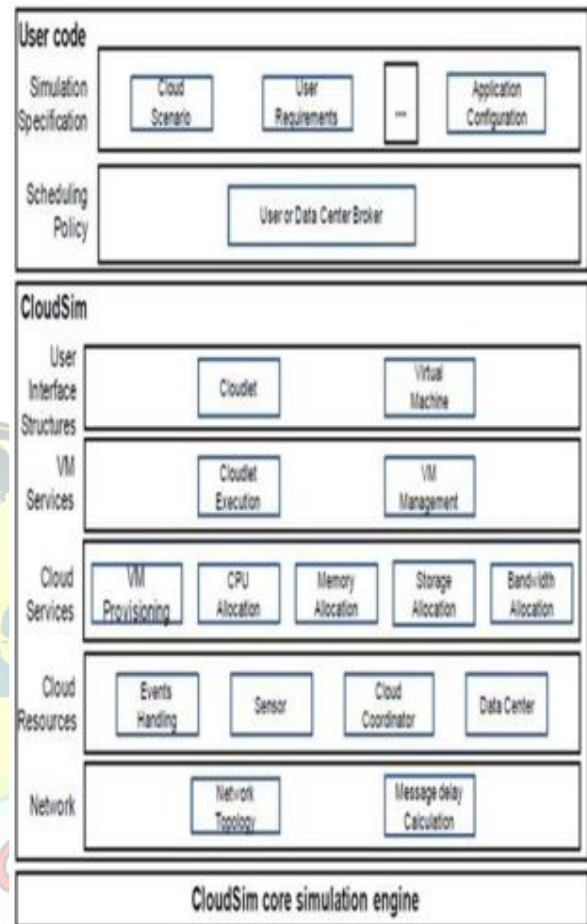

Fig :5 Cloud core simulation engine

V. BENEFITS OF CLOUD COMPUTING FOR INSTITUTIONS AND STUDENTS

With the development of educational cloud, new web applications such as Lecture Tools, Slide share etc allows the lecturer to get their work done in their web browsers rather storing and carrying it on the hard drive. Its gives the benefits such as;

- Access the files from anywhere

- Stop worrying about additional software licenses

- Share content more easily

- Get things done without software hassles

- Support for teaching and learning

- Software free or PAYGO

- 24 X 7 access to infrastructure and content

- Protection of environment by using green technologies

- Increased exposure of new IT technologies to students

Simulator	Programming Language	Networking	Availability
CloudSim	Java	Limited	Open Source
GDC	C++/OTCL	Full	Open Source
Cloud Analyst	Java	Limited	Open Source
Network Cloud	Java	Full	Open Source
MDC	C++/Java	Full	Commercial

Fig : 6 Cloud Simulator

MODULES

1)SMS: In this system we are having a feature of intra messaging in which staffs can send a message to a particular student only. Students can even send messages to other students.

2)Create groups: In this, staff can create groups on the basis of their class, practical batches, branches. A new user added should be assigned to some group

3)Assign task: The HOD can assign the daily task to its department staff and manage it. Similarly teachers can assign their project task and subject assignments to students.

4) Group-wise broadcasting: Notes and notifications can be broadcasted only to particular group. For example: class teacher can send a notice only to its class students.

5) Email: Email service can be used by the staffs and students to mail and transfer information. The service is used free of cost.

6) Manage notifications: Staff can send importance notice to all the students with the help of this notification feature.

7) Monitor student group: Staff can monitor the progress of their respective class or group. This will help them to schedule their work and assign tasks.

8) Staff-student communication: Staff-Student communication is the main feature of this system which helps in increasing the bond betweenstudent and teacher by sharing the information between different users. This feature has maximum priority as communication is the base service of this system.

9) Event creation : Information regarding tech-fest in college or other cultural events can be circulated among the students.

10) Easy Map: In this Top View of every floor will be shown with the names of the allotted classrooms which would help students to find out a particular class more easily.

11) Request for group join/leave: Any student or staff can join a particular group. Staffs and students can even leave a particular group.

Education plays an important role in maintaining the economic growth of a country especially growing country like India. Now days students are becoming more technology oriented and more advanced than before, learning and teaching is changing day by day. Information and Communication Technologies (ICT) are powerful enabling tools for educational change and reform introducing new methods of teaching and conducting research as well as provisioning of educational facilities for online learning, teaching and research collaboration. The smart classroom, labs are introduced with automation in maintenance and management of all academic activities. Cloud computing is opening new horizons for various sectors of business as well as education sector also. Cloud computing is changing the ways of the individual's personal learning and interactive learning. In this paper, we discuss the use of cloud computing platforms as solution for educational institutes which is likely to have a significant impact on new teaching and learning environment.

In essence, the top five benefits of cloud are as follows:

1.Achieve economies of scale. Increase volume output or productivity with fewer resources (computing and human).

2.ReduceCapEx by moving to OpEx. The pay as you go model (weekly, quarterly or yearly), based on demand / utility computing, will help reduce capital expenditure on hardware and software licenses.

3.Improve access. Information access can be anytime, anywhere and anyhow through omni channel access.

4.Implement agile development at low cost. Design, development and rollout of new solutions and services using agile methodologies on cloud based shared development operations.

5.Leverage global workforce. Follow-the-sun model for defining, developing and rolling out new solutions and applications.

UNIVERSITY

The result of significant challenges arising from efforts in adopting new and emerging technologies like cloud and IoT, Higher Education system needs to move together in a constant state. However, using traditional methods, Higher Education (HE) systems cannot caters all the new software, updated platform and high technology infrastructure due to lack of financial help and cooperation between the institutions. University level many colleges are affiliated university. The university maintains the cloud server and storage. Each college should maintain their own server to overcome the centralized communication problems. There are different roles(users) in the university Like Student Activities

1. view marks card and download marks cards

2. View attendance status

3. E-learning

- Notes
- Projects
- QPs,
- Circulars
- Online videos
- Interaction with domain experts and other college
- students-By forum
- Knowledge sharing

Faculty Activities

1. Online attendance (No manual) and marks

2. Online/offline academic resources

3. Domain expert interaction

4. View status like experience , feedback, college

5. Research

- Sharing of knowledge between research scholars

CONCLUSION

Cloud computing is an arising technology in the coming years which provides range of advantages to students, staff, and academicians. Despite of these limitations cloud computing offers reliable services to student and staff so that teaching learning methodology become effective and qualitative. Besides this by acquiring cloud services from Education cloud Institute can reduce their expenditure in

maintaining their laboratory. The main aim of the paper is to highlight the implementation of cloud computing in education will shape a 'revolution' in the traditional education system.

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