A Review on Effective Contribution of Cloud Computing in Education Sector

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Abstract— Education plays a vital role towards the well economic growth of a country. Now a days students are becoming more technology oriented and more advanced than before, the classroom teaching is changing day by day. So in keeping with this changing environment, it is very essential that the latest technologies should be incorporate in the teaching process .While thinking about the advanced teaching or learning process.

Key words: Cloud computing, higher education, cloud types, cloud services, entities

I. INTRODUCTION

In India, government is encouraging the parents to send their children to join schools and colleges by providing various schemes to promote education which makes the students to reach schools and colleges but lack of amenities, good trainers ,lack of books and labs facilities which is seriously affecting their results which discourages them to continue their education. The biggest challenges the government faces in providing education is the lack of infrastructure and if infrastructure available then there is lack of maintenance of that infrastructure.

Cloud computing can be helpful in providing those solutions. It is a model of delivering services, infrastructure, and application software on-demand using the internet.

System of education has been gradually expanded, Thus by implementing cloud computing technology we can overcome all these pitfalls. Education has changed from teacher centric to learner centric .Blooms taxonomy [1] .Now the teaching approaches like chalk, black board, and physical interaction took a new changeover to online and is growing faster than ever and maintaining a centralized system where all the consultants can check the education system from each and every aspects and can continue monitoring and guiding the system. They not only check the necessities of the institutions but also ensure that better quality education is provide to every student and also his attendance, performances, dedication etc. can be effectively maintained without worrying about the infrastructure issue.

This technology ensures that students, trainers, and staff have an access to any information using any device from anywhere. Both public and private institutions can use the cloud computing technology to provide better services, even if they are having few resources.

II. CLOUD COMPUTING

The word cloud refers to internet or network or it represents remote location. Cloud Computing is manipulating, configuring, and accessing applications online. It offers online data storage, framework and application and accessibility. It is the process of taking the services and tasks performed by us in our computers and bringing them to the internet .Users of cloud computing need not have knowledge of, expertise in the technology infrastructure in the "cloud" that supports them. It represents how we store information and run applications. Here using this technology applications and data are not hosted on an individual PC, everything is hosted in the "cloud"—a collection of computers and servers accessed via the Internet. Examples of cloud-based services include Google Apps, YouTube, and Twitter, Facebook, flicker etc.

III. SERVICES PROVIDED BY CLOUD COMPUTING

A. Software as a Service (SaaS):

Anytime Anywhere application. SaaS is often referred to as software-on-demand and utilizing it is similar to hiring/renting software rather than buying it. Not only is the data stored in the cloud but the application too. The best known examples are Google Apps for Education. Google, Twitter, Facebook and Flickr are all examples of SaaS

B. Platform as a Service (PaaS):

PaaS provides a platform and environment which allow developers to build applications and services over the internet. PaaS services are hosted in the cloud and accessed by users simply via their web browser With PaaS, one can develop new applications or services in the cloud that do not depend on a specific platform to run, and can make them widely available to users through the Internet. Examples of PaaS include Microsoft's Azure Services Platform (Microsoft, 2012), Salesforce's Force.com development platform, Google Apps Engine, Amazon's Relational Database Services.

C. Infrastructure as a Service (IaaS):

The on-demand data centers This type of cloud computing provides the "raw materials" users usually only pay for the resources they consume, including CPU cores, RAM, hard disk or storage space.. You pay for only what you use, and the service provides all the capacity you need, but you're responsible for monitoring, managing, and fixing your on-demand infrastructure. One big advantage of IaaS is that it offers a cloud-based data center without requiring you to install new components or to wait for the hardware obtaining process. This means one can get IT resources at his school, college, or university that otherwise might not be available. For example Amazon's Elastic Compute Cloud; organizations can use this infrastructure to run Linux servers on virtual machines and can use as per the requirement.

IV. CLOUD TYPES

A cloud infrastructure comes in four different forms: •

A. Private Cloud

This cloud infrastructure is dedicated to a single organization or company; it is implemented and managed by the organization itself (internal private cloud) or by a third party (external private cloud).

Public cloud: This cloud infrastructure is made accessible to the general public or a large industry group by a service provider who hosts the cloud infrastructure. Generally, public cloud providers are like Amazon, Microsoft and Google and offer access over the Internet. In public clouds customers have no visibility or control over where the infrastructure is located

Hybrid or shared cloud: A model that incorporates and uses the resources of different types of cloud (public, private, etc.), which interact to suit needs (this assumes a certain level of technological harmonization between them)

B. Community Cloud

A cloud infrastructure reserved for a community (i.e. for user organizations with common interests).

V. CLOUD COMPUTING ENTITIES

Various entities of cloud computing are:

A. Cloud Providers

Includes ISP (Internet service providers), and telecommunications companies provide either the Internet connections(media) or hosted data centers(infrastructure) that enable consumers to access cloud services.[2]

B. Service Providers

Include systems integrators that build and support data centers hosting private clouds and they offer different services (e.g., SaaS, PaaS, IaaS, and etc.) to the consumers, the service brokers or resellers.

C. Cloud Service Brokers

Service brokers concentrate on the negotiation of the relationships between consumers and providers without owning or managing the whole Cloud infrastructure. Moreover, they add extra services on top of a Cloud provider's infrastructure to make up the user's Cloud environment.

D. Cloud Resellers

Resellers can become an important factor of the Cloud market when the Cloud providers will expand their business across continents. Cloud providers may choose local IT consultancy firms or resellers of their existing products to act as "resellers" for their Cloud-based products in a particular region.

E. Cloud Consumers

End users belong to the category of Cloud consumers. However, also Cloud service brokers and resellers can belong to this category as soon as they are customers of another Cloud provider, broker or reseller. In the next section, key benefits of and possible threats and risks for Cloud Computing are listed.

VI. IMPLEMENTING CLOUD TECHNOLOGY IN PRESENT EDUCATION SYSTEM

Internet plays very limited role in government schools and colleges in India. Most of the work is done manually from attendance to classroom teaching and also the examination system. But most of the private educational institutions have become highly dependent on information technology to service their requirements. These services are provided using Internet

Technologies to faculty and students and accessed from web browsers. It will be beneficial if majority of educational services will be hosted in the cloud and institutions no longer host their own data centers with expensive hardware, software, staff and computing resources. The main users, basically in higher education cloud include students, faculty, administrative members, examination branch and admission Branch which is shown in Figure below. All the main users of the institution are connected to the cloud .For all the users a Separate login is provided for their respective work. Teachers can upload their class Tutorials, assignments, and test questions on the cloud server which students will be able to access all those data that are provided by the teachers via Internet both at home and college in 24X7. The education system will make it possible for tutor to identify problem areas in which students tend to make mistakes, by analyzing students 'assessment report. By doing such things, it will also allow teachers to improve teaching materials and methods.

So this will not only make it possible for students to access online teaching materials during class but also they will be able to access these materials at home, using them to prepare lessons.
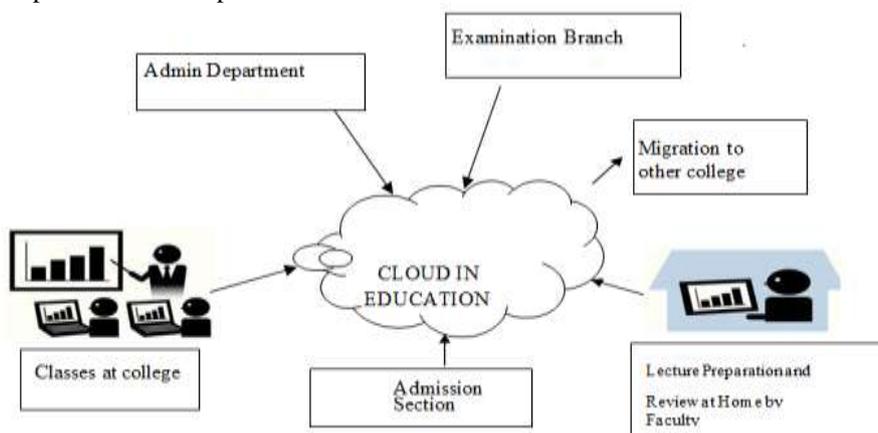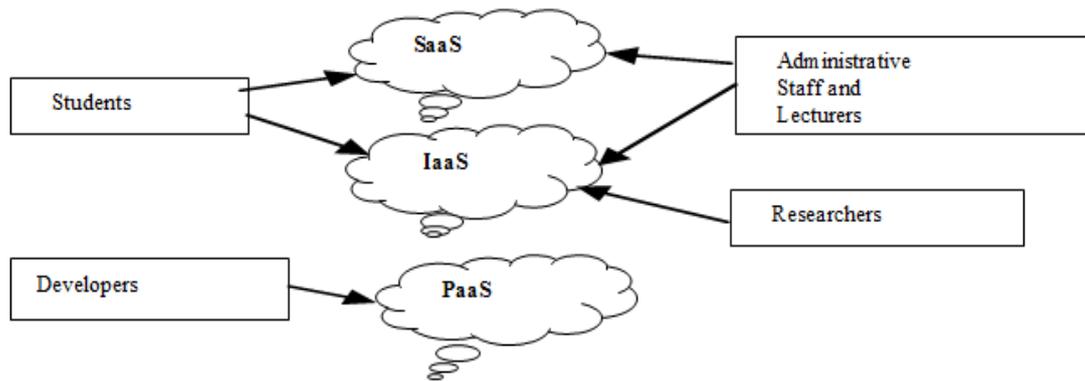

Fig 1: Services Attached to Education Cloud

Following figure shows the university using the services of cloud computing. [3]

VII. BENEFITS OF CLOUD COMPUTING FOR INSTITUTIONS AND STUDENTS

A. *Personalized Learning*

Cloud computing affords opportunities for student's choice in learning. Using an Internet-, students can access various resources and software tools that are suitable for their learning styles.

B. *Low Costs*

Cloud-based services can be helpful for institutes to reduce costs and to adopt new technologies to meet their educational needs. Students can use office applications in free without having to purchase, on their computers. It also provides the facility of Pay per use for some applications.

C. *Accessibility*

Availability of the services is the most important and desired by the user using the education cloud.24 X7 is the availability that is needed by this system without failure. From anywhere one can login and access the information.

D. *No Extra Infrastructure*

Colleges and governments are now free to focus on their goals that are making more research facilities available to the students without wasting time on worrying about the unavailability of buildings, labs, teachers etc.

E. *User Friendly*

No need to worry about the complexity, it is easy to understand and operate.

VIII. SECURITY ISSUES

In cloud computing we are saving our important and crucial data in one place and it will be easy for hack. Protection of data is a major security issue. Educational organizations may consider that their valuable data is more secure if it is hosted within the institution. Transferring data to a third party for hosting in a remote data Centre, not under the control of the institution on and the location of which may not be known presents a risk. Some cloud providers now provide guarantees in their contracts that personal data will only be stored in particular countries. It has been suggested that the provision of cloud services through a single provider is a single point of failure and that it would be better to contract more than one cloud provider in order to minimize risk. Another security issue is unwanted advertising in which cloud providers will target users with spontaneous email or advertising.

IX. CONCLUSION

The cloud allows us to access our data anywhere, anytime and which can be share with anyone .There is no need a particular machine to access a file or an application like a word processor or spreadsheet program. In this paper education through cloud computing is introduced and how it is beneficial for students, lecturers and the educational organizations for providing quality education is also discussed.

In our country technology cannot reaching to remote schools and educational institutes. In order to give them a better quality education through cloud computing, it will be better if they will be provided laptops with low cost.

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