"Cloud Computing & Its Role in Education"

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Abstract: **In today's world effectively utilization of resources is necessary. Traditional style of teaching in education system in colleges/schools has its own challenges with growing demands and interaction levels of students. With growing recent advancements can help the students find better job opportunities in the future. Cloud Computing gives one common platform to manage/monitor/setup/scale any business whether it is education or any other area. Educational institutions whether it's school or college, they have already adapted this technique and made use of its great potential for innovation. On demand resources (teaching lectures, attendance, and other college data) can be obtained in no time as this bring education to range of options. All this really helps in saving time, saves cost and most importantly, it paves way for 24/7 availability of all resources. This paper covers the introduction of cloud computing, its components and its relation and scope in education system.**

I. INTRODUCTION

Cloud computing is a type of Internet-based service that gives shared access to services, assets, gadgets etc as whenever required. It's simply a mode of communication enabling an on demand access to a huge network of services & assets like PC systems, servers, applications which can be easily upgraded or configured with ease as and whenever required with very less downtime. For a layman we can say that cloud computing means storing and accessing data and programs over the Internet instead of your computer's hard drive.

This type of computing is currently being used extensively in education sector. Many cloud-based services have been developed that can be used daily by students & teachers to help them in interactive learning sessions & social interaction. One of the biggest examples of cloud computing services are Google Drive, Amazon Cloud Drive, Apple I-Cloud, Microsoft's Sky-Drive.

There are 3 different models to Cloud Computing by which the cloud service providers offer their services to their clients:

A. *SAAS (Software as a service):* Cloud-based applications run on computers which are located at very distant places termed as "in the cloud". There distant computers are owned and operated by cloud service providers Users can connect to these computers via the internet usually using a web browser or mobile app.

i)   *Benefits of SaaS:* You can sign up and rapidly start using innovative business applications.
● With SaaS, you don't have to worry about purchasing, installing, updating and maintaining any kind of software.
● As data is in the cloud. You can use any computer at any location to access applications and data. Moreover, no data is lost if your computer breaks.
● Cost-effective to manage.
● We can easily scale up the working environment if needed without worrying about the downtime as it's very less.

B. *PAAS – (Platform as a service):* It's a special type of development environment having everything required to support the complete lifecycle of building and delivering web-based (cloud) applications. It doesn't involve high costs and complexity of buying and managing the underlying hardware, software, provisioning, and hosting.
i)   *Benefits of PaaS:*
● Develop applications in the cloud with ease.
● Can concentrate on delivering applications rather than on the underlying infrastructure.
● It enables programmer to create enterprise-scale systems which can integrate with other Web services and databases
● Reach the customers in the market faster as development in the cloud takes less time.

C. *IaaS-Infrastructure as a service:* provides companies with computing resources including servers, networking, storage, and data center space on a pay-per-use basis.
i)*Benefits of IaaS:*
● We don't need to invest in your own hardware
● We can easily scale on demand to support a growing business.


Source: www.microsoft.com/educloud

IV.   COMPONENTS OF CLOUD

COMPUTING

A. Client: A client is a device or software that user can use as an interface to access the services related to clouds.

B. Cloud Network: It is a network connection between the client and the cloud service providers. The network connection for accessing the services of cloud is so much important. Each and every services of cloud are accessed with a constant network connection.

C. Cloud Application Programming Interface (APIs): The cloud API includes the set of instructions that abstract the implementation of the cloud service from the users. API helps the programmer to connecting the various cloud services.
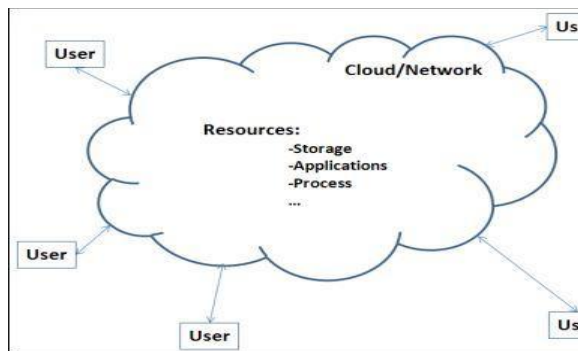
Source:Google images

III .BENEFITS & USES OF CLOUD COMPUTING

A. Big data analytics

One of the viewpoints offered by adopting cloud computing is the capacity to take advantage of tremendous amount of both organized and unstructured information to halter the advantage of removing business esteem.

Retailers and providers are presently removing data got from buyers purchasing examples to focus on their advertise and showcasing efforts to a specific portion of the occupants. Person to person communication stages are presently giving the premise to investigation on behavioral examples that associations are utilizing to infer important data.

B. Cloud Network

It is a system association between the customer and the cloud specialist organizations. The system association for getting to the administrations of cloud is so much imperative. Every single administrations of cloud are gotten to with a consistent system association. Cloud Application Programming Interface (APIs): The cloud API incorporates the arrangement of guidelines that conceptual the usage of the cloud benefit from the clients. Programming interface helps the software engineer to associating the different cloud administrations.

C. File storage

Cloud can offer you the service of storing your files and accessing, storing and retrieving them from any web-enabled interface. The web services interfaces are usually simple. At any time and place you have high availability, speed, scalability and security for your data. In this scenario, organizations are only paying for the amount of storage they are actually consuming, and do so without the worries of managing the day by day maintenance of the storage infrastructure. There is also the possibility to store the data either on or off premises depending on the administrative consistence necessities. Data is put away in virtualized pools of capacity facilitated by a third party based on the customer specification requirements.

D. Backup

Backing up data has always been a complex and time-consuming process. This includes maintaining a set of tapes or drives, manually collecting them and dispatching them to a backup facility with all the unchallengeable issues that may occur in the middle of the starting and the reinforcement. This way of ensuring a backup is performed is not immune to problems such as running out of backup media , and there is also time to load the backup devices for a restore operation, which takes time and is prone to malfunctions and human errors.

IV. ROLE IN EDUCATION

All these benefits of cloud computing has been extensively used in **Education sector.**

Education nowadays is much more inclined towards interactive elements that can really help in understanding and memorizing any concept. We already know that practical knowledge & reflective thinking with some practice is required to remain in competition. But the biggest challenge that is faced by institutions is to impart best possible practical knowledge.

For this, Institutes have to build latest highly configured Laboratory/tools which results in higher cost in hardware configuration. Education institution are among various organisations that find cloud computing frameworks valuable for rearranging affirmation and organization forms, and also enhancing general staff correspondence. It can profit as far as both cost diminishment and effectiveness.

As detailed by a large portion of the associations as of now utilizing the cloud, the essential advantage of this stage is its cost-proficiency. The cloud speaks to a perfect place for vast associations to store, prepare and investigate information since it requires least equipment speculation. According to the CDW's 2013 State of the Cloud report, 43% of higher education institutions surveyed have implemented or are maintaining cloud computing.
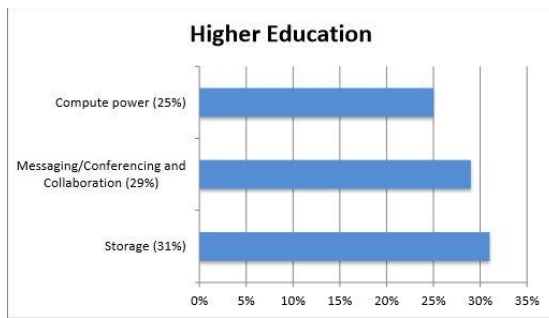
Source: Cloud Computing in Education

This is where Cloud Computing services help us to overcome this issue. Institutes can subscribe a service from any cloud service provider and the best part is that we pay only for what we are using.

Apart from this major challenge, cloud computing has really helped in various other areas like:

- The attendances of students can be made online. (A blessing for teachers, a nightmare for students)
- Students can access study material for any place, anywhere, any device. A big advantage for students as they can study anytime, anyplace, any location.
- Practical/live sessions can be conducted / attended by teachers/students. Many cloud tools help in organizing live sessions between students & teachers.
- Reduced cost to update infrastructure. Easy scalability for growing business is the key to success for any organization.
- This advanced technology can also be seen in emerging online academics and open education platforms that enable students to opt for specific courses as per their interests. Various platforms such as edX and Coursera are commonly referred to as

MOOCs (Massive Online Open Courses) have created a set of new possibilities for students to continue education at no cost.

V. CONCLUSION

Cloud computing has the potential for improving the efficiency, cost and convenience for the universities and educational sectors. Modernizing learning forms and presenting the most recent innovations in classrooms urge understudies to create abilities and information fundamental for accomplishing their scholarly and expert objectives. Together with different types of innovation execution, the cloud can significantly expand learning open doors for understudies everywhere throughout the world, and in the long run add to outfitting future eras with abilities and capabilities important for worldwide professional successes.The more we adopt for Cloud computing, the more easy/comfortable our life will become.

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