



Role of Cloud Computing in Education System

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Abstract— Education plays an important role in maintaining the economic growth of a country. Now a days the classroom teaching is changing and students are attracted more towards technology. Therefore in this changing environment, it's important that we think about the latest technologies which will help the society with better teaching and learning process. One of such trending technology is Cloud Computing. The need for education in this time has become a constantly growing and developing and improving e-learning important solutions, so we need the e-learning systems to keep the pace with the technology. The new direction is to use cloud computing, Cloud computing is highly scalable and creates virtualized resources that can be made available to users will have a significant impact on the educational environment in the future. It primarily refers to technology that delivers powerful computing resources via the web. Actually, the word 'cloud' is used to refer to internet which has currently eased and revolutionized education. The term cloud-based technologies refers to the act of storing and accessing information and various programs over the internet. This paper focuses on the importance of cloud computing in education system.

Keywords— *Cloud Computing, Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS), Education System.*

I. INTRODUCTION

The nature of the Internet was constantly changing from a place used to read web pages to an environment that allows end-users to run software applications. The need for education is increasing constantly and the development and the improvement of the e-learning solutions is necessary. Also, the E-learning systems need to keep the pace with the technology, so the new direction is to use cloud computing. Cloud computing is becoming an attractive technology because of its dynamic scalability and effective usage of the resources; it can be utilized under circumstances where the availability of resources is limited. The need for education is increasing constantly and the development and the improvement of the e-learning solutions is necessary. cloud-based applications reduce infrastructure and IT costs, increase accessibility, enable collaboration, and allow organizations more flexibility in customizing their products both for their brand and for their audience. The benefits of cloud computing are being recognized in almost all kinds of institutions across the board, with 90 percent of organizations currently using some kind of cloud-based application. First, let us understand what exactly cloud computing is and what services it provides.

II. What is CLOUD COMPUTING ?

Cloud computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services), which can be rapidly provisioned and released with minimal management effort. Cloud computing and storage solutions provide users and enterprises with various capabilities to store and process their data in either privately owned, or third-party data centers that may be located far from the user—ranging in distance from across a city to across the world. Cloud computing relies on sharing of resources to achieve coherence and economy of scale, similar to a utility (like the electricity grid) over an electricity network. In other words, Cloud Computing is a process of delivering/enabling scalable, expandable and almost perfectly elastic software services using internet technologies. It is a method of delivering Software as a Service (SaaS), delivered in a pay-per-use basis. It provides self service capabilities to users with scalable features to increase usage on requirement.

III. VARIOUS TYPES OF SERVICES PROVIDED BY CLOUD

A. SaaS (Anytime Anywhere apps)

It stands for Software as a Service. It describes any cloud service where consumers are able to access software applications over the internet. The applications are hosted in—the cloud and can be used for a wide range of tasks for both individuals and organizations. Google, Twitter, Facebook and Flickr are all examples of SaaS, with users able to access the services via any internet enabled device. SaaS is beneficial to organizations in many ways like no additional hardware costs, no initial setup costs, usage is scalable, updates are automated, accessible from any location etc. This cloud service allows educational institutions to subscribe to online software hosted by a cloud provider. If proprietary software is used, educational institutions need to pay for the usage of the software. SaaS removes the need for organizations to install and run applications on their own computers or in their own data centers. This eliminates the expense of hardware acquisition, provisioning and maintenance, as well as software licensing, installation and support.

B. PaaS (the operating environment in which applications run)

It stands for Platform as a Service. It is a category of cloud computing that provides a platform and environment to 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 (ex: Google App Engines etc.).Platform as a Service allows users to create software applications using tools supplied by the provider. Services are constantly updated, with existing features upgraded and additional features added. It supplies an operating environment for developing applications. Some of the benefits of PaaS are: they don't have to invest in physical infrastructure, flexibility, adaptability, teams in various locations can work together, security etc. IT courses that require hands-on practice on a client-server structure, such as database systems or application development courses, PaaS is the one to use. PaaS does not typically replace a business' entire infrastructure. Instead, a business relies on PaaS providers for key services, such as Java development or application hosting.

C. IaaS (the on-demand data centres)

It Stands for Infrastructure as a Service. It provides access to computing resource in a virtualized environment, —the Cloud, across a public connection, usually the internet. In the case of IaaS the computing resource provided is specifically that of virtualized hardware, in other words, computing infrastructure. The definition includes such offerings as virtual server space, network connections, bandwidth, IP addresses and load balancers. Some benefits of IaaS are: scalability, no investment in hardware, utility style costing, location independence, physical security of data centre locations etc. Microsoft Windows Azure and Amazon Web Service (AWS) provide IaaS. This service can mainly be used to satisfy the infrastructure needs of the students, faculties or researcher globally or locally with some specific hardware configuration for a specific task. IaaS platforms offer highly scalable resources that can be adjusted on-demand. This makes IaaS well-suited for workloads that are temporary, experimental or change unexpectedly.

IV. IMPLEMENTING CLOUD COMPUTING IN EDUCATION SYSTEM

To implement the Cloud on the education we first build the system to create the cloud and upload the documents, files, images, videos on the cloud. Then we can access it from anywhere. In schools and colleges, teachers, students can prepare their own documents and share it with the others. Also by creating the dynamic changes in the documents or in the presentations we can show animations or perform experiments on the documents.The below figure 1 shows how the School Education System can use the Cloud Computing:

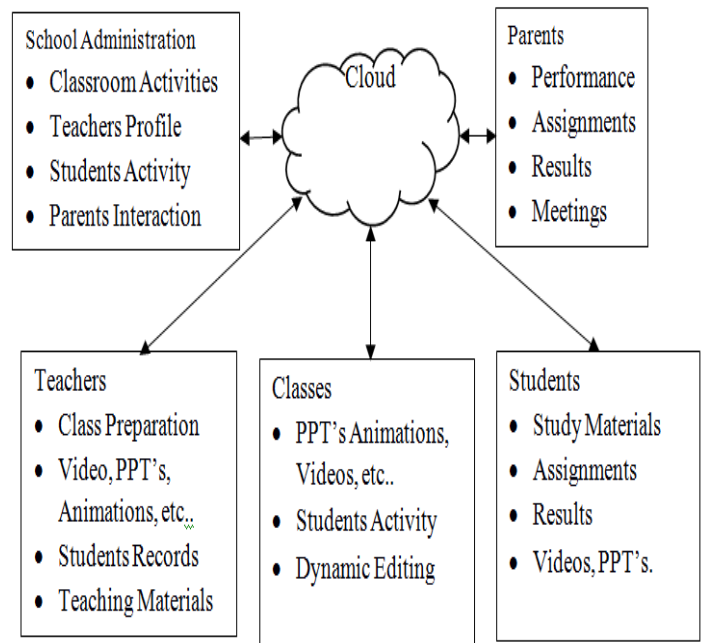


Fig.1 School Education System using Cloud Computing.

For instance, School administration will manage teacher's profiles, creating account, assign the classes to them. Create and manage the timetable. Keep activity of the students in classroom as well as on grounds based on the teachers engaging them. He can submit the results and activity of the students to their parents and also call for Meetings and many more. Teacher will prepare the class and upload the power points and videos for the next class in home using the account created by administration. They can maintain the records of the students for the subject. Teacher can upload the study materials which can be accessed by the students in home as well as in classroom. Teachers can give them the online presentations or change the content of the any image dynamically during teaching, students can submit their assignments online etc. This sounds very tedious but not impossible. Parents will get to know what all things his child in doing in the school. What are the improvements he/she has achieved from the past? Parents will get to know what are the assignments/homework given to them during that day. They can easily see the results and can attend the meetings and many more. Students will login based on their authentication given to them and access Power Points, Study Materials, Results and Assignment assigned to them, Video Lectures (this will be helpful for those students who couldn't attend classes for some reason, for slow learners and also for revision purpose).This will improve interactive learning. The advantage of cloud service is particularly useful for supporting lab activities in the teaching and learning process. In classroom students can even able to do some activity based on the teachers instructions. Hence improving their skills and knowledge.

A. Benefits of Cloud Computing in Education System

- *No more carrying around devices*, such as thumb drives or CDs. You don't need to worry about losing the device, breaking the CD, or not having your information load properly.
- *Easy access!* Lesson plans, labs, grades, notes, PowerPoint slides – just about anything digital that you use in teaching is easily uploaded and accessed anytime.
- *Stability:* cloud computing is now to the point of being a very stable technology that you can rely on.
- *Security:* Your data, content, information, images – anything you store in the cloud usually requires authentication (ID and password, for example) – so it is not easily accessible by anyone. In addition, should something happen to the technology at school, your content will still be available to you and your students if it is stored elsewhere.
- *Shareability:* Working on an instructional assignment with other teachers? You can share some or all of your files that you have stored in the cloud. No more obtaining an extra thumb drive or burning another CD or DVD. You just need to send a link to the file(s) destination.
- *Trackability:* Make changes to a lesson and want to change it back? No problem. Cloud computing will save multiple revisions and versions of a document so that you can chronologically trace back the evolution of an item.

B. Drawbacks of Cloud Computing in Education System

- Cloud computing depends on the availability of high speed internet access and reliability of the cloud. Without it students cannot access their files or applications.
- If proper authentication is not available then anyone will access to files anywhere, anytime, this is the security concern which must be handled.

V. CONCLUSION

Although still quite a vague term for some, cloud computing is definitely one of the major innovations that entered worldwide classrooms in recent years. With the ability to cut IT costs and at the same time create a modern collaborative

environment, educational institutions can see some important benefits from moving to the cloud. Modernizing learning processes and introducing the latest technologies in classrooms encourage students to develop skills and knowledge necessary for achieving their academic and professional goals. From this perspective, it is obvious how valuable a resource the cloud is in the education sector. Together with other forms of technology implementation, the cloud can substantially increase learning opportunities for students all over the world, and eventually contribute to equipping future generations with skills and competences necessary for international career advancements.

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