Cloud in Education

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ABSTRACT

Education today is becoming completely associated with the Information Technology on the content delivery, communication and collaboration. The need for servers, storage and software are highly demanded in the universities, colleges and schools. Cloud Computing is an Internet based computing, whereby shared resources, software and information, are provided to computers and devices on-demand, like the electricity grid. Currently, IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (Software as a Service) are used as a business model for Cloud Computing. The paper also introduces the cloud computing infrastructure provided by Microsoft, Google and Amazon Web Service. In this paper, we will review the features the educational institutions can use from the cloud computing providers to increase the benefits of students and teachers.

Keyword: - *Cloud Computing, IaaS, PaaS, SaaS, Amazon, Microsoft Live@edu, Google Apps, MyskoolApp.*

1. Introduction

The concept of cloud computing has its various interpretations and applications, but it primarily refers to technology that delivers powerful computing resources via the web. The benefits of introducing these systems are most frequently discussed in relation to business, but its impact on the education sector is no less significant. Educational institutions are moving towards adopting new developing technology for providing the students new and faster means of resources through which they can adopt the higher level knowledge. Cloud computing might be an area of the educational institution to provide faster and much chipper resources for student with globalization. This paper proposed an idea to develop various clouds for educational sectors which help different students and faculty to research on the various subjects globally. These clouds can help users from different region to share their knowledge in the most appropriate manner. As these clouds can be accessed using the Internet it works in more flexible and reliable manner. The clouds develop for education can provide the three important services which are PaaS , IaaS, and SaaS.[1] These services can change the way student interact with the computing resources and help them to understand more and more about a su0bject. Student can access to the resources in a faster manner with time, place flexibility with the new cloud architecture. These architectures are more reliable with very huge data storage.

2. Definitions of Cloud Computing

Cloud computing is a model for enabling convenient, On demand network access to a shared pool of configurable computing resources like (networks, servers, Storage, Applications and various services) which can be rapidly provisioned and released with minimal management efforts or service provider interactions.
When we discuss the cloud computing technology applications there are three categories of it which are important to mention and those are, [3]

Software as Service:-which basically refers to software that is managed remotely and delivered via the web. [2]
Platform as Service:-platform as a service refers to the infrastructure of a set of applications as a service, such as platform and operating system, which can be rented from the venders. [2]
Infrastructure as service: - another service model of cloud computing for outsourcing the compute resources on demand. [2]

3. Cloud in Education

Cloud computing is an option which is cheaper and more convenient in terms to improve the students' performance. It could also be used for research work for various platforms. Almost all the educational institutions need computing now days for various purposes, these can be solved by implementing various software which serves through which they can interact and perform various tasks. Educational institutions consist of a large IT infrastructure and to manage all this it requires many efforts, time as well as the manpower and money too, still students are not able to avail the benefits of the large infrastructure they have been provided. The software's which students uses are simulation software's, which are used for experiments, perform and manipulate of statically data and those are high end software's and it requires skilled and experienced people to work with, so rather these software's can be installed in the virtual environment on cloud data centers. Which can be provided by the internet and it is the medium to provide access to this software's with high end and reliability in which the technology called virtualization helps in creating multiple client nodes for students, which can be easy to the internet. And there are companies which are providing cloud computing applications as service, Microsoft introduced 365office from which the documents can be access on the web itself without installing the required software to view the document, Google also came up with Google doc by which user can use feature of this office application online without installing them on to the local system, but directly in the web browser, as such application providing flexibility for working, the only need to gain access to these services is to have respective user account.

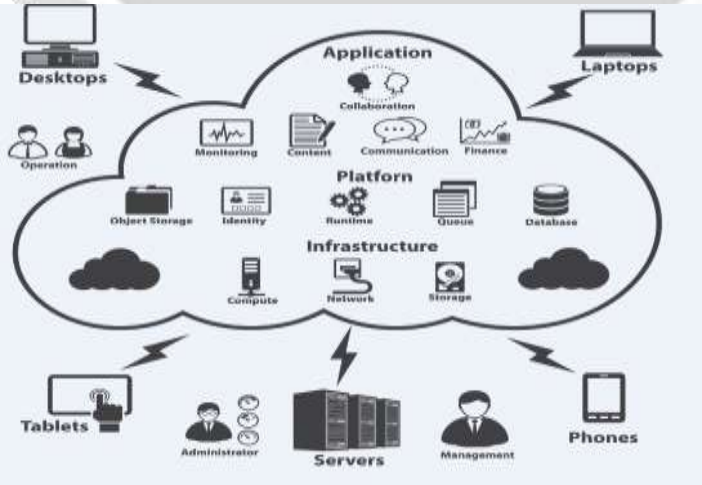

Fig [1].Cloud Architecture

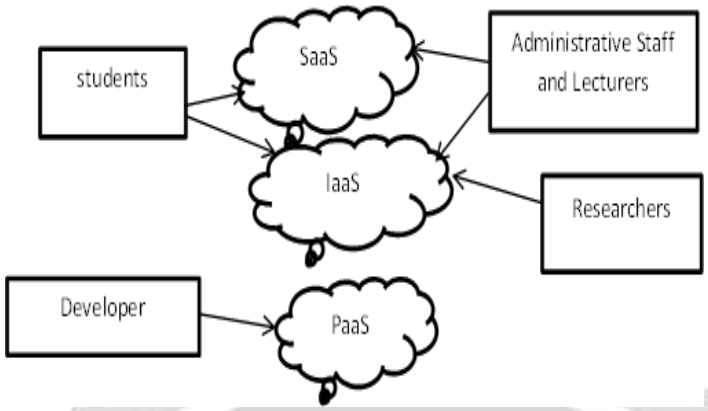

Fig.1. university using the services of cloud computing [4]

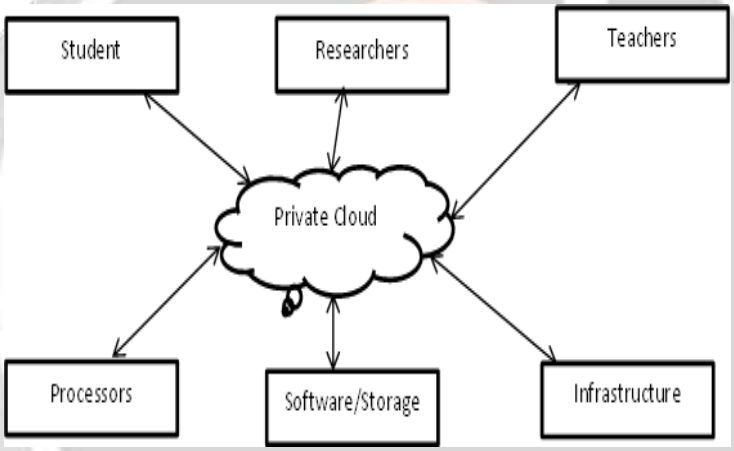

Fig. 2. (a) Private cloud architecture for education

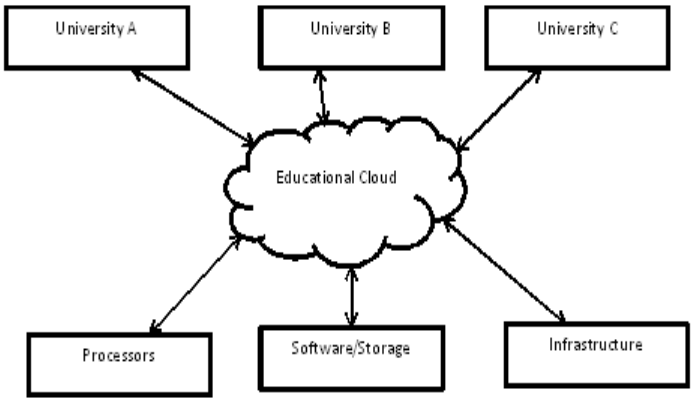

Fig. 2. (b) Educational cloud architecture

4. Services Available to Educational Institutions

Leading cloud providers have recognized the importance of adjusting their computing services Specifically to the needs of educational Institutions. These include customized software packages at low prices And free as well so that more institutions can afford. Some of the most widely used educational platforms are listed below.

4.1 Microsoft for Education

Office 365 Education is a collection of services that allows you to collaborate and share your schoolwork. It's available for free to teachers who are currently working at an academic institution and to students who are currently attending an academic institution. The service includes Office Online (Word, PowerPoint, Excel, and OneNote), 1TB of OneDrive storage, Yammer, and SharePoint sites.

4.2 Google Apps for Education

Google Apps for Education is a widely used platform for outsourcing free web-based email, calendar and documents for collaborative study. Google has initiated two important campaigns for introducing improvements in the education sector.[5] 50 million users for Google apps for education ,10 million users for Google apps for education,190 countries Reach students or faculty members instantly with email, voice calling, and chat. Choose which services you turn on and off. Customize Gmail to match your school's logo, colors, and domain, e.g., you@yourschool.edu

Gmail:-
Students or faculty members instantly with email, voice calling, and chat. Choose which services you turn on and off. Customize Gmail to match your school's logo, colors, and domain.

Calendar:-
Manage all of life's important events within your online calendar. Plan lessons and book parent/teacher conferences. Overlay multiple calendars to see when people and resources are available

Drive:-
Sync, store, and preview documents, videos, images, and files. Share individual files or whole folders with specific students, other teachers, or the whole school.

Docs:-
Write, edit, and collaborate wherever you are. Add comments to give feedback to students in real time. Plan a lesson together with other teachers. View revision history to see how student writing has evolved

Sheets:-
Teach students the power in data with built-in formulas, pivot tables, and conditional formatting options that simplify common spreadsheet tasks. Have a whole class capture data from a science experiment.

Slides:-
Create lessons that shine with a variety of slide themes and templates. Enhance learning by embedding educational videos—add the animations that grab attention and the transitions that keep it.

Classroom:-
Create and organize assignments quickly, provide feedback efficiently, and communicate with classes.

4.3 Chrome books for Education

One of the most important Google's projects aimed at education innovation. Malaysian Ministry of Education has recently joined the project and introduced 4G high-speed internet access and Samsung Chrome books in 10,000 national schools in 2016.approximately 10 million Malaysian students, teachers, and parents will now use Google Apps for Education which enables to smoothly implement the latest technology solutions into classrooms and make useful apps. [6]

Benefits and Limitation of Cloud Computing [10]

Benefits	**Limitations**
Access to applications from anywhere	Access to applications from anywhere Not all applications run in cloud
Support for teaching and learning	Risks related to data protection and security and accounts management
Software free or pay per use	Organizational support
24 hours access to infrastructure and content	Dissemination politics, intellectual property
Opening to business environment and advanced research	Security and protection of sensitive data
Protection of the environment by using green technologies	Maturity of solutions
Increased openness of students to new technologies	Lack of confidence
Increasing functional capabilities Standards adherence	Offline usage with further synchronization opportunities
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5.Related Works

Internet has changed the present world and there is a drastic change in usage of a computer.
People are addicted with computer from mail to online shopping. But now cloud has changed the complete meaning of internet. This powerful desktop application is available on internet and also in database which is available from anywhere anytime with any device. With this new invention we are getting lucky like E-Learning, Teacher student online projects [7], and many more.

5.1 Improve economies of scale

The main problem we get in the class room is students get feared asking questions or waste time of the lecture which can be solved virtually. Students can use online space and can attend the classes or do their projects by interacting with their guides. Teacher can create attention to all the students not showing interest only to crammed students. With this environment the workload can be reduced and can improve the ability of student .This can leverage on economies of scale outside the classroom

5.2 Improve rapport and ease assignments

Now days all the school have computers and are also following many technologies. Many schools and colleges give assignment works during vacations. With the cloud computing students are able to interact, do the assignments as they are on single computer. This process not only is efficient but also saves time and improves the quality in students.

5.3Easy access to education resources and effective sharing

Introduction of cloud has benefitted the colleges, institutes and schools. The idea behind this is students can share beyond their ideas. The main thing is colleges can spend less on new infrastructure, software, textbooks and improvise the quality of learning by providing all these virtually. This not only helps the management but also enables the students to get more knowledge which leads quality of education, development in academics. All these are great aspects. However the management has to plan for their investment for cloud.

NOTE:-

All we saw educational apps are Free for the students and teachers. But there are some apps those are paid but provide the best services to the students and teachers and security for the sensitive data of the students. Now we can see one such paid app in detail name is **"MySkoolApp".**

6. MySkoolApp

With "mySkoolApp™", educational institutes can share real time updates of activities/happenings/reports emanating in the confines of classroom and school campus with parents, without dissipating efforts on underlying clerical drudgery. Intelligent features of "mySkoolApp™" will reinforce the scale of teacher-parents interaction, with an objective to bring an element of real time information and transparency regarding the student's activities and accomplishments. Naturally, this will infuse more involvement on the part of the parents, in contributing towards the advancement of their child's studies and other non-curricular activities.[13]

6.1 Features

Student Management System	**Staff & HR Management System**
• New Admission • Parents Details • Exams Results • Performance Analysis • Attendance & Homework • Student Category • Fees Alerts	• New Recruitment • Staff Attendance • Staff Category • Salary Management • Messaging Within Staff • Allowances & Deductions • Online/Printable salary Slips

Fee Management	**Transport Management**
• Create Fee Types & Manage Fee Slots • Class & Student Wise Fee setting • Online Printable Fee Receipt • Due/Pending Fee Alert to Parents • Search & Download Various Fee Reports • Online Payment Gateways Options	• Manage Bus Routes & Stops • Set Pickup & Drop Time • GPS Navigation System • Route wise Fee Management • Bus Location on Parent Mobile • Student Pickup & Drop Notification

7. Risks Of Cloud Computing In Education

There are clearly some major potential benefits to institutions deploying cloud services however; it challenges computing service personnel who may fear the consequences of their roles being outsourced. The universities and schools should consider the challenges and risks prior to transferring to the cloud [8][11]. Examples of these risks are:

7.1 Cloud Service Failure:-

Insufficiency of financing and immature markets could guide some cloud providers out of business and any loss or deterioration of service delivery performance, as well as a loss of investment, make the universities and schools to the risk of having to perform their own duties and obligations, thus being exposed to contractual or legal liability to their employees, third parties, the students or even the public.

7.2 Compliance Regulations:-

Due to the increasing number of regulations and need for operational transparency, the educational institutions are increasingly adopting consolidated and consistent sets of compliance controls

7.3 Data Privacy:-

The multi-tenancy, reuse of hardware and software profiles, and resiliency due to the redundant nature of cloud means a greater risk of incomplete or unlock deletion or denial of service attacks on institutions' confidential data. Assurance to Service Provider: This proposes a dependency on a particular cloud service provider for service preparation, especially when data portability is not supported.

8. CONCLUSIONS

By making Use of Cloud services like Infrastructure, platform and software there are lot of benefits which can be availed for the education systems. The student's expectations can be satisfied with rising demand for the latest technologies on the campus. The functionality available through cloud services is sufficient for the needs of most users, who have access to their files and related software any place they have a computer and as internet connection, with cloud services hardware failure becomes less concern. Organizations like Microsoft, Google and Amazon are providing grants and free access for Universities, Colleges, Researcher and students and the educational institutions can use the services with less effort.

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