

IMPLEMENTATION OF CLOUD COMPUTING INTO EDUCATION SECTOR

Pranav Paithankar

Student, NCRD's Sterling
Institute of Management
Studies, Nerul, Navi Mumbai

Ubaid Khan

Student, NCRD's Sterling
Institute of Management
Studies, Nerul, Navi Mumbai

Dr. Murlidhar Dhanawade

Professor & HOD (MCA),
NCRD's Sterling Institute of
Management Studies, Nerul

ABSTRACT:

Cloud computing and education sounds having more than one possible on the face of it. Naturally, it's because, only a few individuals, publishers and users alike come from the education sector. In most cases, cloud computing is merely related to businesses and the way they will leverage their efficiencies. Just to introduce how the cloud deserves an area in our current education institution, it's important to reiterate the education philosophy. Its essence is knowledge. It's this data which brings advancement, achievement and success. However, there are several things which make these parameters not able to be reached. In blunt language, this is failure. Small classrooms, lack of resources. One way or the opposite, cloud computing are often utilized to enhance education standards and activities. The end result are going to be to curb the above problems and instead, boost performance. The solutions provided by the cloud technology ensure that the research and development, as well as the teaching is more sustainable and efficient, thus positively influencing the quality of learning and teaching within educational institutions. This has led to various learning institutions adopting cloud technology as a solution to various technological challenges they face on a daily routine.

Keywords:

Cloud Computing, Web service, Virtualization, Grid Computing, Virtual Computing Lab, Higher education institutions, Remote areas.

INTRODUCTION

Cloud computing has taken major thick piece of attention from various communities in society like researches, student, business, consumer and government organization. Because the human needs cropped and paved way for digitization of data a replacement buzzword GIG data evolved. Big data is that the main source for coming of cloud computing within the

show, everyday many data within the size of PETA bytes are uploaded within the digital world which required many storage and computing resources. Cloud Computing, also referred to as utility computing, delivering the service as software, platform and infrastructure as a service in pay-as-you-go model to consumers. It's just get anything for the pay model. Industry surveys says on this services as "Cloud computing, the long held dream of computing as a utility, has the potential to rework an outsized a part of the IT industry, making software even more attractive and effective.

From the instance above, the economic cloud computing solution for the tutorial institution gave an estimated savings from about \$9,774,000 per annum to \$2,500,000 per annum within the ROI for "businesses version" or to zero cost of licensing and equipment within the "educational version". From the last two examples, we will see that both approaches, industrial (or commercial) and non-commercial cloud computing solutions are often successfully employed within educational institutions and another example, IBM launched IBM Cloud Academy that's provide a worldwide forum for educators, researchers and IT professionals from education industry to pursue cloud computing initiatives, develop skill and share best practices for reducing operating costs while improving quality. during this way users don't got to buy a server, only got to purchase related "services" can create an efficient network teaching platform. Using of cloud computing in academicians in universities aren't conscious of benefits and characteristic of minimizing the value of cloud computing. From an IT-management view, it radically reduces resource management costs—including electrical power , cooling and system force , while driving up the use of servers and software licenses, which successively reduces purchasing requirements.

REVIEW OF LITERATURE:

According to International journal of research cloud computing can help the student keep up with their academics and helps them to coup up with the project and daily work virtually. It also has proven to be the cost cutter as the paid softwares can be also made available to the students who are under priviledged.

Contrary to popular opinion that cloud computing is a new concept, companies known as Application Service Providers (ASP) since 1990s have been providing business services via the internet. However due to the cost of bandwidth, the utility nature did not take off (Carr, 2009). This was followed by XML Web services that represented a model of software

delivery based on the notion that pieces of software applications can be developed and then published to a registry where they can be used by other client applications over different transport protocols irrespective of the language used to develop those applications or the platforms on which they are implemented. The ability to automate the process of discovery, binding, and invocation of Web services on the Internet without human intervention (Manes, 2004; Nakhimovsky & Myers, 2004) received a great deal of hype.

One technology analyst and author (David Chappell) in 2003 even doubted if there was a business case for Web services (Chappell, 2003). However, Web services are nowhere near achieving the full potential that was hoped for. Nevertheless, the technology is being implemented successfully (and commercially) by many of the big players such as eBay, Amazon and Google (Iskold, 2006). Furthermore, the technology has also created the foundation for a new Enterprise Application Integration (EAI) paradigm known as Service-Oriented Architecture (SOA). The extensible XML-based nature of SOAP has enabled many organizations to expose some of their legacy and disparate systems as Web services in order to achieve total integration of their systems (Clark, 2007; Flinders, 2007; Mohamed, 2007). Most importantly, SOAP-based Web services are now being used in the delivery of some aspects of a new computing paradigm (namely cloud computing) which not only promises to deliver software remotely but also other computing-related functionality thanks also to other relatively new technologies such as Virtualization and grid computing.

PROBLEM DEFINITION:

India is over populated country as well as due to high rate of poverty, the underprivileged student face a lot of issues with respect to the working with the paid softwares. Due to the current pandemic situation the students as well as the teachers are not able to keep up with the academics and lectures. Students fail to keep up with the project. Teachers are finding it difficult to provide students with the softwares with which students can built their projects. Apart from this viva(oral examination) and examination has also been affected badly as there is no adequate measures to preventing students from any malpractise.

OBJECTIVE/SCOPE:

Students' learning is not any longer confined within the classroom within the era of e-learning 2.0. The environment of IT education might be improved to let student access learning resources anywhere. IGNOU (Indira Gandhi national Open University) is that the

exemplar of e-learning. The free software are often adopted for constructing the cloud computing service for the environment of IT like OpenOffice.org like data processing , spreadsheets, and presentations. Only a browser is required for college kids to attach to the cloud computing service for learning.

For Example

1. ENGINEERING INSTITUTE-Computer Lab.
2. AICTE – Microsoft Cloud Adoption Project..

RESEARCH METHODOLOGY:

Cloud Service Models

It is important to understand the different service types offered by cloud computing in a bid to understand cloud computing as a new approach to IT. Discussed below are the various service types offered through cloud computing.

1) Infrastructure as a Service (IaaS)

IaaS is responsible for various aspects including running the application and operating systems, housing, maintaining and operating the various equipment on behalf of the client.

However, IaaS

cannot manage the underling cloud infrastructure. Payment by consumers is based on utility computing basis. Some of the characteristics associated with IaaS include dynamic scaling, internet connectivity, administrative tasks that are automated, platform virtualization, as well as lower total ownership costs leading to lower3 capital. Some of the IaaS offered by dealers include Rackspace Cloud Servers, Google, Amazon EC2, as well as IBM.

2) Software as a Service (SaaS)

SaaS ensures that clients are able to utilize the various providers applications that run on the cloud infrastructure, but are not in a position to control its hardware, network infrastructure or the operating system. It ensures access to applications that are functional in nature including CRM, web conferencing, the ERP, as well as the email among other applications. SaaS is associated with various benefits including security, rapid scalability, software compatibility, global accessibility, as well as reliability. It is also responsible for different

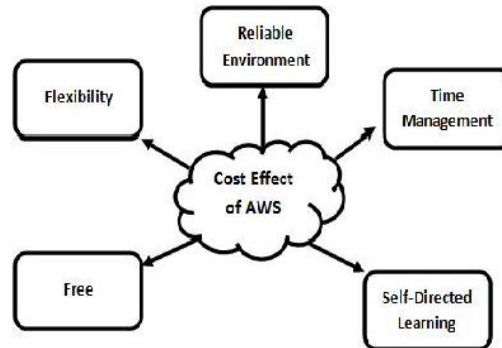
business operation tasks including human resource management, content management, accounting, as well as computerized billing among others. Some of the providers that offer SaaS include NetSuite, Google, Citrix and Salesforce.com among others.

3) Platform as a Service (PaaS)

PaaS enables the customer to hire virtual servers, as well as other services required to operate the applications that exist. Further, it ensures that the client design, develop, test, deploy and host applications. Clients can deploy and control applications e.g. the configurations of the hosting environment, but they are not in a position to control the hardware, operating system, as well as the network infrastructure. Some of its characteristics include lack of software upgrades, reduced risk, and simplified deployment. The providers of PaaS include Google App Engine Salesforce.com, Microsoft Azure, as well as Rackspace Cloud Sites.

Some students and researches are already employing a sort of cloud computing-based application and services. Furthermore, these applications are heavily investing in cloud computing as being the longer term of the tutorial cloud computing. a number of these applications are Microsoft, Google, IBM, HP, Amazon, sales department , Amanda and Zamanda. A. Amazon Education Cloud Computing to help educators in providing cloud computing instruction ,Amazon Web Services (AWS) offer teaching grants supporting free usage of AWS for college kids in eligible courses. The grants will provide educators with free usage for every student en rolled in courses with AWS as a part of the curriculum. Furthermore, AWS provide a highly scalable cloud computing platform for schools and universities which encompasses high availability, dependability, and therefore the flexibility to enable the school , students and researchers to create a good range of applications. With AWS, students et al. can requisition compute power, storage, and other services gaining access toa suite of elastic IT infrastructure services for educational purposes. Moreover, AWS are often characterized as IaaS. this suggests that Amazon provides basic computing capability a virtual machine container, high performance networking reliable and redundant storage, during a remote location. The AWS provides some educational services for the scholars and faculty: a search grants for tutorial researchers using AWS within the ir work_ Access to the available resources²⁷_ Tutorial and project grants for the scholar organizations using AWS for self-directed learning_ Teaching Grants for faculty supported AWS_ Efficiency and cost-effectiveness in the institution's IT Infrastructure As a result, the deployment and reliability for the tutorial infrastructure are basically managed by AWS.

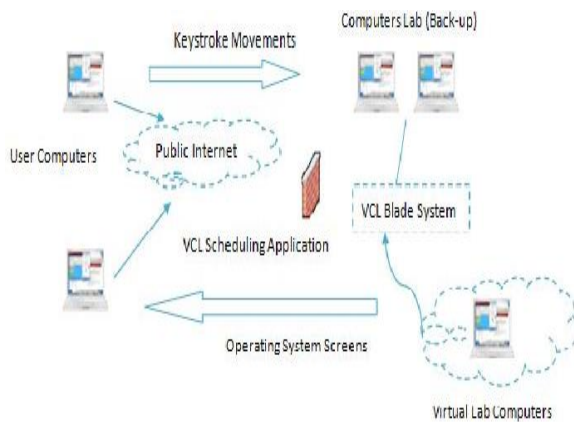
Cloud Service Model



1.0 Fig.google.com/cloudplatform

A) Amazon Cloud Services in Education: Amazon Web

Amazon offers many cloud services, including: Amazon Elastic Compute Cloud (Amazon EC2): an internet service that gives virtual machine and additional CPU cycles for the institutional organization. The services of Amazon EC2 Amazon Simple Storage Service (Amazon S3): Allows the scholars , faculty and researchers to store items with a limited size in Amazon’s Virtual storage_ Amazon Simple Queue Service (SQS): Offers different sorts of messages passing API, in order that educators can ask each other_ Amazon SimpleDB: an internet service for running queries on a structured data set within the cloud in real time_ Amazon Virtual Computing Laboratory (Amazon VCL): A free source implementation of a secure production level on-demand utility computing for accessing a wide-area of computational resources, storage and software.

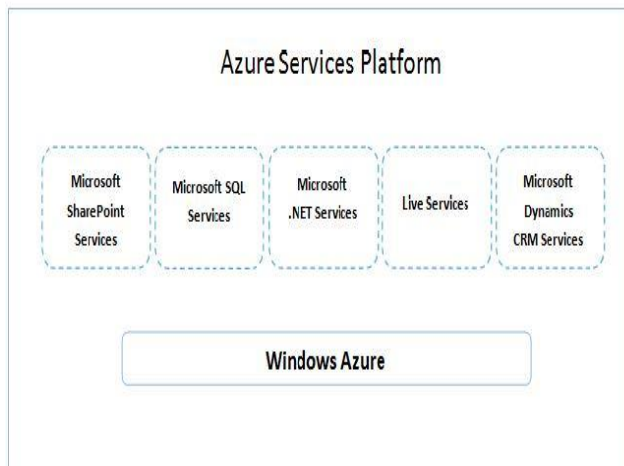


1.1 Fig.google.com/cloudplatform

Cloud Service Model

B. Microsoft Education Cloud Computing

The solution of Microsoft's cloud computing is additionally called Windows Azure, an OS that permits the schools and colleges to run OS applications and stores data by Microsoft server. Furthermore, the Azure Services Platform (ASP), includes services that allow the school ,students and researchers to establish user identities, manage work flows, execute other functions such as Microsoft's online computing platform.



1.3 Fig.google.com/cloudplatform

Azure Services Platform

C. Google Applications for Educational Cloud Computing

1) Google Applications For Educational Cloud Computing: GAE provides a variety of online tools and services that give secure communication and collaboration capabilities to the institutional schools and let the school , researchers and students choose the solutions that suit their needs.

Service Service details

Support Phone support

Application 3rd party applications

Video Google Video

Cost 3 Google Video

Scheduling Resource scheduling

Storage Enough Space Enough Space

Users No limit

Table I: GAE Services

- 2) Google Calendar: Google Calendar is a published, shared, integrated and accessible calendar for scheduling courses. Moreover, the teachers, researchers and students can use the Google calendar to manage and organize their work groups.
- 3) Google Sites: Google Calendar enables the teachers, researchers and students to build, create and publish information with Google tools.
- 4) Google Video: Google Video allows the school,college, researchers and students to share information using secure and personal video tools.
- 5) Google Talk: Google Talk is a moment Messaging (IM) tool of Google. Colleagues can communicate remotely with limited conservation by Talk is a moment Messaging.
- 6) Google Mail: Google Mail uses labels and filters to help students, teachers and researchers organize their email, manage the flow of incoming messages and get mail from other email accounts in their Gmail inbox additionally to sending messages from different addresses.
- 7) Google Docs: it's considered the most task tool of the course, because it allows participants to collaborate synchronously within the same document.



1.4 Fig.google.com/cloudplatform

Cloud Platform

ANALYSIS AND FINDINGS:

Major educational institute across the globe has accepted cloud computing as a great initiative of the better and innovative future of teaching and learning.

1.University of California

The University of California(UC) viewed cloud computing to be appealing to be used in one among its courses which was solely aimed toward deploying and developing applications for SaaS. A donation from Amazon Web Services helped the UC course content move from being locally owned to the clouds, since many servers (needed for the course) might be easily obtained within the shortest time possible.

2.University of Westminster

The University of Westminster (UOW), with a student capacity of greater than 22,000 students within the UK has also embraced cloud computing. An outdated student email platform and a survey whose report showed that institution could also be of a substantial amount despite the cloud services cost being minimal.

3.Florida Atlantic University

Florida Atlantic University, a public university, features a capacity of 29,000 students upwards and 170 degree programs. The university uses HyperV which may be a hypervisor based server virtualization platform that merges workloads onto one server. By virtualizing its data center, university has been ready to decrease IT expenses by

U.S \$600,000 and to deliver new IT services without additional staff. it had been also possible for the university to run Blackboard on Linux within the HyperV setting, to deliver more performance and to simplify administrative work

LIMITATIONS AND SCOPE:

There are clearly some major potential benefits to institutions deploying cloud services however; it challenges computing service personnel who may fear the results of their roles being outsourced. the schools and schools should consider the challenges and risks before transferring to the cloud. samples of these risks are:

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, also as a loss of investment, make the schools and schools to the danger of getting to perform

their own duties and obligations, thus being exposed to contractual or legal liability to their employees, third parties, the scholars or maybe the general public .

2.)Compliance Regulations: thanks to the increasing number of regulations and wish for operational transparency, the tutorial institutions are increasingly adopting consolidated and consistent sets of compliance controls

3.)Data Privacy: The multi-tenancy, reuse of hardware and software profiles, and resiliency thanks to the redundant nature of cloud means a greater risk of incomplete or unlock deletion or denial of service attacks on institutions' confidential data.

4.)Assurance to Service Provider: This proposes a dependency on a specific cloud service provider for service preparation, especially when data portability isn't supported.

CONCLUSION:

The Present problem of our country reaching technology to remote schools and academic institutes in imparting “equal and quality education to all” are often solved with mere small gadgets like ipad's, iphones, tabs thereby saving on purchase of computing infrastructure, licensing and buy of software's and support personnel. within the era of “Big data” cloud computing has immense role in improving quality and massive educational content available for college kids and research scholars. The success and high return on investment (ROI) of cloud infrastructure vests within the hands of larger organizations and therefore the public sector especially . The success of cloud computing in education are often attributed to the acceptance of cloud computing by everyone within the field of education with good chunk of support by government.

This paper presents educational cloud computing and the way the schools and institutions are already taking advantage of it, not only in terms of cost but also efficiency security, reliability and portability. Several general samples of cloud computing in education like Microsoft, Google App, IBM, Amazon et al. were provided and a case study of the applications was presented and explored in additional details.

REFERENCES:

[1]C. Justin, B. Ivan, K. Arvind and A. Tom, Seattle: A Platform for Educational Cloud Computing, SIGCSE09, March 37, 2009, Chattanooga, Tennessee, USA, 2009.

[2]P. Shanthi Bala, INTENSIFICATION OF EDUCATIONAL CLOUD COMPUTING AND CRISIS OF DATA SECURITY IN PUBLIC CLOUDS, (IJCSE) International Journal on Computer Science and Engineering Vol.02, No. 03, 2010, 741-745. 2007.

[3]M. Armbrust, et al, Above the clouds: A Berkeley view of Cloud Computing, UC Berkeley EECS, 2009.

[4]S. Al Noor, G. Mustafa, S. Chowdhury, Z. Hossain, and F. Jaigirdar, A Proposed Architecture of Cloud Computing for Education System in Bangladesh and the Impact on Current Education System, (IJCSNS) International Journal of Computer Science and Network Security, VOL.10 No.10. 2010.

[5]M. Luis, R. Luis, C. Juan and L. Maik, A Break in the Clouds: Towards a Cloud Definition, ACM SIGCOMM Computer Communication Review, Volume 39, Number 1. 2005.

[6]Cloud Computing Articles. Cloud Computing Education, <http://www.code2cloud.com/cloud-computing-education/>

[7]Cloud Computing Articles, SaaS+PaaS+IaaS. Free Cloud Apps for Educational Institutes: Schools, Colleges, Universities, <http://www.technopulse.com/2010/08/free-cloud-apps-educational-institutes.html/>

[8]IBM Academic Initiative. Cloud computing: Delivering Internetbased information and technology services in real time, <https://www.ibm.com/developerworks/university/cloud/>

[9]IBM Sales and Distribution - Solution Brief for Education. IBM Cloud Academy Education for a smarter planet, <ftp://dispsd-40-www3.boulder.ibm.com/>

[10]R. CJB and N. Evans. A PROPOSAL FOR THE ADOPTION AND USE OF CLOUD COMPUTING IN SECONDARY EDUCATION IN SOUTH AFRICA, 11th DIS Annual Conference 2010, 2nd 3rd September, Richardsbay, University of Zululand, South Africa, 2010.

[11]THE ABC'S OF ENGINEERING EDUCATION: ABET, BLOOM'S TAXONOMY, COOPERATIVE LEARNING, AND SO ON

[12]K. Youry and V. Volodymyr. Cloud Computing Infrastructure Prototype for University Education and Research, WCCCE '10, May 78, 2010, Kelowna, Canad, 2010.

[13]M. Grimes, T. Jaeger and J. Lin. Weathering the Storm: The Policy Implications of Cloud Computing, iConference, 2009.

[14]Microsoft Education Cloud Computing. The most comprehensive solutions for the cloud. On earth, <http://www.microsoft.com/en-us/cloud/>

[15]Microsoft in Education — IT solutions. Microsoft Live@edu, <http://www.microsoft.com/education/en-us/solutions/Pages/liveedu.aspx/>

