

Next Generation Commercial and Open Source Cloud based E learning Systems

¹Atul .U.Patil ,²R.U.Patil, ³A.P Pande, ⁴ Ghugare R.R

¹Asst.Prof, PVPIT, Budhgaon.

²Asst.Prof, Bharthi Vidhyepeth COE, Kolhapur.

³Asst.Prof, PVPIT, Budhgaon.

⁴Asst.Prof, Bharthi Vidhyepeth COE, Kolhapur.

ABSTRACT: Teaching, learning and training processes are intensely affected by the challenges of this epoch of digital environment. They give prospects for the professionals in their higher and further education for training and developing their practical skills as the today smart user must need in this fast-moving and opulently diverse field. The gaining popularity of erudition on the internet, the edifice of perfect cloud-based learning environment has become one of the hottest points on researching remote education. Now a day, cloud computing and Cloud based E learning is rising speedily and plays a vital and powerful role in the field of education and learning. It supports the next generation users to perform their tasks remotely with paying less cost by utilizing the cloud-based applications offered by the cloud service providers and also the same cloud based solutions they can configure on basis of open source cloud solutions at free of cost. These technologies are aimed at running applications such as word processing, spreadsheets, access database, remote computing, online compilers and debuggers and online courses and many more provided by the internet service provider in the virtual environment while on the move by a flexible infrastructure as all the data and information is stored in the cloud ambiance. This paper focuses on how Cloud based E learning benefits the e-learners by using cloud computing services and presents Cloud based E learning approaches by using cloud computing.

Keywords: Cloud based Cloud based E learning, Open source cloud solutions, SaaS, PaaS, IaaS, Internet Enabled Learning.

1. INTRODUCTION

In recent years, the fast development of digital technologies is creating not only new opportunities for our digital world but challenges to it as well. Our digital world is now being sharpened by rapid advances by technologies in the field of education web based e learning and, science technology and many more. Today, Cloud based E learning and cloud computing is emerging as the new paradigm of modern education with reduced upfront investment for teachers and the apprentices. Cloud based E learning is an Internet based learning process, using Internet technology to design, implement, select, manage, support and extend learning, which will not replace traditional educational methods, but will greatly improve the efficiency of higher education [1]. The E learner system motivates the e-learner user in their learning process anytime and anywhere at his/her own pace while on the move with the help of electronic gadgets like smart phones, PDA, tablets etc. and with powerful strategy of cloud computing. The cloud

computing is a collection observer delivering resources that can be accessed remotely via the Internet in real-time. It is also a place for the users to create, store and access personal information by much. Several trends are opening up the era of Cloud Computing, which is an Internet based development and use of computer technology. The ever cheaper and more powerful processors, together with the "software as a service" (SaaS) computing architecture, are transforming data centers into pools of computing service on a huge scale. Meanwhile, the increasing network bandwidth and reliable yet flexible network connections make it even possible that clients can now subscribe high quality services from data and software that reside solely on remote data centers. More efficient way of computing technology [2]. The development of these technologies is directly related to the increasing access to the communication technology, as well as its decreasing cost provided by the mobile service providers. The learners choose to learn over distance or in person at a traditional campus; the power of E learner and virtual collaboration is growing fast in education and in the worldwide economy. This power is best realized with a well-planned cloud computing and E-learner strategy. Learners can use the enormous interactivity of innovative media and develop their skills, knowledge, and awareness of the future domain. The benefits of these computing can support education institutions to resolve common challenges such as cost reduction, rapid and effective communication, security, privacy, flexibility and accessibility. The Educational institutes, businesses and many other industries are adopting the services of cloud computing because of the following reasons:

1. Cost Saving: One of the most appealing reasons to switch to the cloud is the cost savings feature. With the cloud, the user will pay for applications only when needed and many applications are included free of charge as an open source applications.
2. Scalability: One of the major reasons for using cloud computing is its scalability. Cloud computing allows Universities, colleges and IT industries to easily upscale or downscale IT requirements as and when required.
3. User friendly: Quite simply, cloud computing is easy to get up and running. Instead of having to download And/or install software yourself, in the cloud it is all done for you.
4. Time Saving: This allows for on-demand analysis of study material instantly.
5. Courseware Resource and wiki pages: It includes web pages design and methods for courseware like video examples of study material, review of academic papers, text book extended resources and the use of wiki pages for teaching assistant and student interactive sharing and collaboration.
6. Fault Tolerant: Cloud providers can afford to have multiple data centers and multiple Internet connections at each data center to adore fault tolerance. As they offer levels of data protection forth e-learner user's simple nightly backups, such as continuous data

protection, generators to handle power outages, and high-end servers that can keep running even one component fails. Apart from the above mentioned reasons, the Learners, Consumers and businesses utilize the cloud on a daily basis even if they're not aware of it. For instance, when we arousing e-mail, or go to a social network and post photos, access online document software, or use company's hardware/software we probably use the cloud services.

2. CLOUD COMPUTING

An Outsourcing Frame to the cloud the term cloud is related to internet. Cloud computing is an internet based computing where virtual shared servers deliver software, infrastructure, platform, devices and additional resources that are hosting to clients with comparable quality of service on demand but at a much lower cost. Essential Characteristics that cloud computing should have:

- On-demand self-service.
- Broad network access.
- Virtualization.
- Resource pooling.
- Security and Maintenance.

3. CLOUD BASED E LEARNING

A new Paradigm Out-of-classroom and in-classroom educational experiences Cloud based E learning is the computer and with the aid of network enabled transfer of skills and knowledge. Cloud based E learning applications and processes offer Web-based learning, computer-based learning, virtual education prospects and digital collaboration to their e-users. Popular Cloud based E learning technologies include:

- Content is delivered via the Internet.
- Voice-centered technology, such as Webcasts, Webinars
- Video technology, such as instructional videos, DVDs, and interactive videoconferencing.
- Computer-centered technology delivered over the Internet Bare Metal servers, Virtual servers.

4. APPROACHES TO CLOUD BASED E LEARNING FACILITIES

Cloud based E learning is broadly used nowadays in different educational stages i.e. continuous education, academic courses, development in higher education, education via satellite and on line problem solving and discussion through video conferencing. There are various Cloud based E learning facilities from open source to commercial for the educators and apprentices that are discussed below:

Multimedia: A combination of text, graphics, animation, audio and video to enhance the online learning process that helps the e -

learner users to grasp the pedagogy and concept maps associated with technical concepts of the educational materials.

Interactivity Skills: An instructional strategy that helps a learner practice what they have learned and implement them in their behavioral interaction.

Bookmarking: With the advancement of technology, Cloud based E learning can be beneficial to the users in the comfort of their home and the willingness to start and commence the course according to their timeline with preference to the job at their disposal.

Search: The technology helps the e- learner user to search the particular information required to complete task while on the move.

Notes and Study Martial: The smart users mark and save their own interesting topics of a course that contain the most important information on the web for the longer use. This facility is available on all the gadgets like tablets, smart phones PDA'S and many more.

Domain Experts: While accessing the internet, the E-learner user can easily access to subject experts through chat or online discussion on a particular topic of their interest.

Infrastructure as a service: Computer- based training provides delivery of training or education through electronic media such as internet, through providing manually configured Infrastructure bare metal machines and also virtual machines and many more. It also provides learning management system through software such as web courses that helps educators and smart users in their knowledge base.

5. CLOUD COMPUTING PLATFORM: ARCHITECTURE AND ITS LAYERS

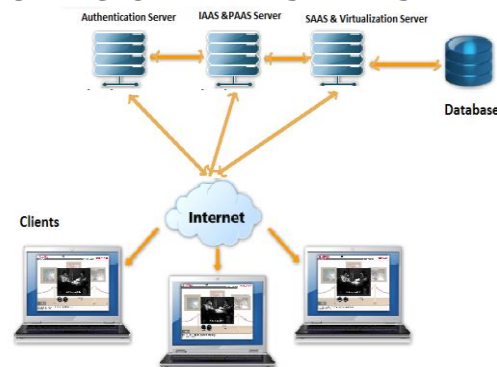


Fig1 Architecture of Cloud Based E-Learning System.

Cloud computing is everywhere. It reduces the time from sketching out application architecture to actual deployment and incorporates virtualization, on-demand deployment, Internet delivery of services, and open source software for its users. Cloud computing architecture consist of two components, the front end-that comprises the client device i.e. Cloud Software, Virtualization Software or maybe Management Software. The back end- that is the cloud itself that includes techniques of data storage system, managing of high end servers and the computer apparatuses. Cluster of these clouds make a whole cloud computing system [4]. Cloud service providers tend to offer amenities that can be assembled into three clusters: software as a service, platform as a service, and infrastructure as a service. These categories group together

The various layers.

Software as a service (SaaS): Software as a service provides business solutions available on pay-per-use basis. A complete application offered as a service on demand. By removing complexity of the IT environment and provide smart business solutions to their smart users.

Platform as a Service (PaaS): Platform as a Service offers base environment ready for organizing applications on cloud without hassles of managing the cloud infrastructure. Commercial examples of PaaS include the Google Apps engine

Infrastructure as a Service (IaaS): Infrastructure as a Service delivers basic components such as Servers, Network and Storage on-demand, Self-service, and Pay per use basis that are pooled and made available to handle workloads that range from application components to high performance computing applications [5].

Desktop as a service (Daas): Desktop as a service provided through cloud computing in which the Service provider can provide the various desktop platforms to the end user of choice of various configurations and various operating environments. It is basically available in commercial and also in open source platforms.

6. CLOUD COMPUTING BASED CLOUD BASED E LEARNING SOLUTIONS

The Cloud based E learning cannot entirely replace educators; it is merely an updating for technology, concepts, tools and ideas that gives new content in the field of education. The educators and students are playing prominent roles and contribute in developing and making use of Cloud based E learning cloud. This unified learning approach is improving the educational act. Cloud based E learning cloud is a new journey of cloud computing technology in the field of Cloud based E learning, which is future Cloud based E learning infrastructure that includes all the needed hardware and software computing resources engaging in learning[6]. In cloud based Cloud based E learning systems, the organizations are responsible for content creation, management and delivery while the cloud service providers responsible for system building, advancement, management and maintenance. The organizations are charged according to the usage that directly depends on the number of students. There is numerous Clouds based E learning solutions from open source to commercial and at least two entities involved in cloud based E learning system: the students and the instructors.

Benefits for the Students:

1. Pay per view based subscription.
2. Online course recommendation.
3. For Discussion blogs and Technical forums.
4. Allow students to work from multiple places i.e. from home, work, library etc.
5. Cloud based Labs to test environment.

Benefits for the Instructors:

1. Provide e-content material to the e-learner users.
2. Prepare on-line tests and Quizzes
3. Assess in case of Troubleshooting.
4. (24x7) availability of Technical Experts
5. Communicate with Participants with the help of Remote desktop.

7. OPEN SOURCE AND COMMERCIAL CLOUD BASED E LEARNING SOLUTIONS

7.1 Administrate

Administrate is an online software solution that helps training providers save time and money. Designed to streamline your operations, our core Training Management System optionally incorporates an award winning Learning Management System and website integration that includes online course booking and payment. Perfect for commercial training providers or internal training departments, Administrate is used around the world by Fortune 500 and small businesses alike.

7.2 TalentLMS

A super-easy, cloud-based learning platform to train your people and customers. TalentLMS offers a free plan for up to 5 users, 10 courses and 20MB per file upload limit.

7.3 WiZDOM LMS by G-Cube

G-Cube's proprietary LMS WiZDOM is a world-class product, with over a million users and 100+ implementations worldwide. The LMS can be deployed on-premise or on Cloud, as per the requirement of our Clients. WiZDOM LMS can be accessed through multiple devices, as per the choice and availability of the user. The User Interface is touch-friendly and web responsive, providing a uniform experience for all – irrespective of the viewing device and its capabilities. With its host of high-end functionalities, WiZDOM LMS prioritizes the users' ease of use to ensure strong and long-lasting effects of learning. The lightweight structure of the product aids viewing because the product is not bandwidth hungry and can perform even at average internet speeds. Native apps for the iOS and Android platforms have been developed to aid users who do not have consistent internet connections. This also gives the users the opportunity to choose between online and offline study, as per their convenience. The LMS has won multiple awards including Brandon Hall Award for Excellence and the LearnX Awards.

7.4 ExpertusONE

Cloud LMS-With ExpertusONE Cloud LMS both learners and managers alike get instant access to every tool, program and resource they need to get answers fast and build skills/knowledge over time. Some of ExpertusONE Cloud LMS features include: simplified, customizable user interface with Web 2.0 features and heuristic design, personalized content based on each individual's role, profile and goals, universal mobile access with native iOS and Android apps and offline sync, and social and collaborative learning tools, including course- or role-based discussion threads, blogs, wikis, chat and expert networks.

7.5 OpenClass LMS

Discover a learning environment that goes beyond the LMS. Open to everyone. Easy to use. Completely free. OpenClass is a cloud-based learning management system (LMS) that educational publisher Pearson has offered for free with a joint venture with Google.

7.6 Joule LMS by MoodleRooms

Joule LMS is a cloud-based Learning Management System, fully supported E-learner solution that combines open-source Moodle with enhancements and services to allow institutions to focus on teaching and learning. MoodleRooms has been acquired by Blackboard.

7.7 VTA Talent Management Suite

The award-winning VTA Talent Management Suite integrates training, assessment and competency management into a single system with robust reporting to support the needs of organizations spanning multiple-sites, languages and currencies. Students can search course offerings, review training assignments, enroll in classes, and launch E-learner while supervisors monitor compliance, assess employees and assign developmental activities through an intuitive web interface. RISC is a technology innovator as a TinCan early adopter and a cloud LMS provider since 1999 supporting hosted sites on six continents in a number of heavily regulated industries.

8. BENEFITS AND CHALLENGES OF USING CLOUD

Corporations are progressively conscious of the business value that cloud computing carries and are taking steps in the direction of evolution to the cloud. This smooth evolution involves a systematic understanding of the benefits as well as challenges involved. Like any new technology, the implementation of cloud computing is not free from issues. Some of the most important benefits and challenges are discussed below.

8.1 Benefits of using Cloud Computing

Convenience and continuous availability: Public clouds offer services that are accessible wherever the end user might be positioned. This type of approach enables easy access to information and accommodates the requirements of users in different time zones and geographic locations.

Cost Efficiency: This is one of the biggest benefits of cloud computing as the cloud is in general available at much cheaper rates. This is achieved by the elimination of the investment in stand-alone software or servers.

Resiliency and Redundancy: A cloud deployment is typically built on a robust architecture thus providing resiliency and redundancy to its users.

Better Storage Capacity: Cloud accommodates much more data on a server compared to a personal computer. It offers boundless storage capacity and eliminates worries of the e- user about running out of storage space and at the same time.

Easy to get the latest and greatest updates: Software updates are also handled by the cloud vendor and occur several times a year at no price to the customer. This helps the user to remain up-to-date with ongoing business demands.

Improved information security: Data confidentiality issues such as data location and segregation, and privileged access control, become greater in the cloud. Threats introduced by cloud computing infrastructures include new types of privilege escalation vulnerabilities from virtual machine to virtual machine.

Organizations are much more concerned about the safety of the user's data and discover new security solutions day by day.

8.2 Challenges of Cloud Computing

Ensuring adequate performance: The intrinsic restrictions of the Internet apply to cloud computing.

These enactment limitations can take in the form of interruptions caused by traffic spikes, strikes caused by Malicious traffic/attacks, haste in the server and many more.

Ensuring adequate security: Several cloud-based applications contain private data and individual information. So, one of the

crucial barriers cloud providers have had to overwhelm is the perception that

Cloud-based amenities are less secure than desktop based or datacenter-based services.

Performance and Bandwidth Cost: Companies can save money on hardware but they have to spend more for the bandwidth. This can be a low cost for smaller applications but can be significantly high for the data intensive applications. Delivering intensive and complex data over the network requires sufficient bandwidth. Because of this, many businesses are waiting for a reduced cost before switching to the cloud.

Harmful competition: Too many companies are entering in the cloud environment and crowd the stage.

This result is a virtual scrap where some are not afraid of using erroneous procedures to gain the upper hand.

This can include false claims or trying to damage the reputation of a competitor.

Major failures: The major challenge to cloud computing is how it addresses the security and privacy concerns of businesses thinking of accepting it. Issues related to data security need to be taken more seriously by the vendors, particularly the big players that fully trust on the cloud data storage.

Political and Legal Issues: Cloud computing legal issues result from where a cloud provider retains important data of the consumer. The data centers of the cloud service providers (CSP) may be located beyond the boundaries of the client's nation. This arises the political and legal issues as we have to ensure that CPS

Complies with that country's business policies and regulations.

9. FUTURE SCOPE OF RESEARCH

Though the concept of Cloud based learning platforms gaining popularity. However, lot of work is required to be done to make it more popular and adoptable by the all. Collaborative efforts are needed to make Cloud based E-Learning as a main stream mode of education. The future research includes the following prospects:

- i. The huge platform of multilingual e-Contents is required to be evolved to accommodate all the streams of education.
- ii. Open source clouds for E learning must provide Software as a service, Platform as service and also infrastructure as service for E-learning purpose.
- iii. More universities and colleges must support e-Learning and cloud based Architecture.
- iv. Development of online education based policies and regulations.

10. CONCLUSION

Cloud based E learning is an emerging aspect of distance education that provides any-time, anywhere educational approach. Advance apprentices always looking for up-gradation of their knowledge and technical skills and those who want extra skills are going towards it. Many students are adopting this technology. With progression of cloud based Infrastructures, increased budget and open source initiatives the future of E- Learning is gaining popularity day by day. The advent of cloud environment making Cloud based E-learning effective and convenient to access. People of all age groups are connected through the Internet and mobile devices, thus increasing

awareness. In short, we can conclude Open source cloud based E-learning facilitating platform for learning in effective ways.

REFERENCES

[1]. THE UTILITY OF CLOUD COMPUTING AS A NEW PRICING – AND CONSUMPTION - MODEL FOR INFORMATION TECHNOLOGY”, David C. Wyld, Department of Management, Southeastern Louisiana University, Hammond, LA USA, International Journal of Database Management Systems (IJDMS), Vol.1, No.1, November 2009

[2]. Cloud Computing-Future Framework for e-management of NGO's”, 1. Harjit Singh Lamba, 2.Gurdev Singh, International Journal of Advancements in Technology <http://ijict.org/> ISSN 0976-4860, Vol 2, No 3 (July 2011)

[3]. Bora UtpalJyoti, Ahmed Majidul (January 2013): International Journal of Science and Modern Engineering (IJISME), Volume-1, Issue-2.

[4]. Introduction to Cloud Computing architecture (June 2009): Whitepaper 1st Edition.

[5]. Fern´andez. A, Peralta.D, Herrera.F, Ben´itez.J.M, an Overview of E-learnerin Cloud Computing.

[6]. Masud Md. Anwar Hossain, Huang Xiaodi, An Cloud based E learning System Architecture based on Cloud Computing, World Academy of Science, Engineering and Technology 62 2012.

[7] Cloud Computing Benefits for E-learning Solutions”, Paul POCATILU, PhD, Associate Professor, Department of Economic Informatics, Academy of Economic Studies, Bucharest.

[8] An E-learning System Architecture based on Cloud Computing”, Md. Anwar HossainMasud, Xiaodi Huang, World Academy of Science, Engineering and Technology 62 2012