The Necessity Of Using Cloud Computing In Educational System

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Abstract

Cloud computing is a dynamically scalable system that provides internet-based services, often virtually. With emergence of electronic systems and removal of paper, virtual technologies and electronics are becoming important. This paper discusses the importance of online training and emphasizes on its qualitative and quantitative development for some organizations or technical science and engineering students. This paper mainly concentrates on utilizing online education based on cloud computing environments. We discuss the necessity of cloud-based educational systems for organizations and countries. Based on experience of other universities, companies, and other organizations, the challenges and issues of deploying an online education has been considered to avoid of pitfalls.

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1. Introduction

E-learning is a concept that integrates information technology in teaching and learning. The concept of teaching and learning is important to the educational institutions to expand learning and teaching methodologies. In general, e-learning is no teaching and learning through electronic networks to content, interaction, and facilitation. E-Learning refers to the use of technology in learning, including the use of digital tools, virtual classroom, web learning and the use of computers. Internet, intranet, satellite, audio and video tape, interactive TV and CD-ROM is part of the electronic media used to practice e-learning (Lynch & McVay, 2002). The amazing speed of information technology growth has created a scheme that organizations should have required capabilities to encounter it so that
keep on in the route of growth and development (Bouyer, Jalali, Arasteh, & Moloudi, 2013). This situation has some requisites that we should possess them. We should act in a manner that could have a dynamic organization in the world competitions and use properly the capabilities. One of these capabilities is virtual education and localizing it in organization. Virtual education (VE) means utilizing electronic systems such as computer, internet, multimedia disks, electronic books, journals and virtual newsletters, etc (Kurbel, 2001). The aim of VE is to reduce comings and goings and to save time and cost and to learn easily for trainers and learners/ students.

Meanwhile, the cloud computing is a use of Internet-based information technology. It is a system by which computer-resource dynamically scalable and often virtual provide - in the same way that any Internet service provided. User does not need to have knowledge, general or technical or exercise control over the technology infrastructure in the "cloud" that supports these resources. Throughout 2009 cloud computing has continued to catch eyes and efforts both in industry and academic organizations. Cloud solutions seemed to state master keys for the IT enterprises who suffer for budget concerns and economic woes (Teng & Magoules, 2010). I. Foster, defines the ambiguous cloud as “A large-scale of distributed computing paradigm that is driven by economies of scale, in which a pool of abstracted virtualized, dynamically-scalable, managed computing power, storage, platforms, and services are delivered on demand to external customers over the Internet” (Foster, Yong, Raicu, & Lu, 2008).

In fact, the basic infrastructure of our virtual education and virtualization system is cloud computing environment. Applying cloud computing in higher education institutions improves the efficiency of existing resources usage, as well as the reliability and scalability of software tools and applications for e-education. When the system becomes busy and overloaded, the problem of scalability could be solved by adding new physical resources (Vulic, Barac, & Bogdanovic, 2011). Because with a complete and real virtualization that is possible in this environment (Longji, Jing, Yajing, & Liang-Jie, 2010), we can offer a good training and students don’t need to be online in a common or specific time. According to previous studies, the organizations and firms that have used this kind of facilities which offered in the form of virtual services or machines, have had improvements in fields like improvement of learning and training quality and effectiveness and reduction of training costs. In general, cloud computing presents three basic approaches: Full outsourcing of infrastructure, cloud in private, and combination of two previous approaches (Marcos Dias de, Alexandre di, & Rajkumar, 2009).

2. The necessity of move toward virtual education

The development of e-learning in Iran is delayed when compared to the western European and east Asia countries. In Iran, it is directed to the distance learning; and virtual education are mostly offered in universities. There are some efforts to introduce e-learning into the education system in Iran include:

• Smart School Project. In addition to the Smart School, teachers are provided with a laptop and LCD projector to teach selected subjects, ie, Mathematics, Science and English using the standalone computer at the school.
• The creation of virtual university: Shiraz University in 2000.
• The creation of the Tehran University in 1999 to support the MSC projects.
• The creation Azarbaijan Shahid Madani virtual university: a part of Azarbaijan Shahid Madani University.
• The use of e-learning in distance learning programs offered by some universities in Iran.

Adequate training and a positive attitude towards the use and application of the latest teaching methods and technologies are necessary so that teachers can use the knowledge and learned skills in a new combination with the latest virtual education technologies. Training a solid foundation will determine their desire to continue to improve their knowledge and skills in the field of educational technology is constantly changing. Virtual education has reduced the learning time from 25% to 50% and has shown that active time of information maintenance also has increased significantly. IBM Company, in a survey that had done from participants in virtual courses has reported that learners could learn in less time in comparison to traditional courses (Education, 2007). Of course virtual training needs technology and appropriate ground. Many appropriate and useful grounds have been established on the basis of internet or intranet, but we sometimes witness limitations in access, privacy and expressing needs. However, in recent years, one of the grounds that could adapt flexibly and dynamically with requirements of any organization is using cloud computing environments. The reasons of popularity of these environments are offering services with high quality and low cost in the first stage and using modern or virtualized facilities in the second stage. Microsoft believes that with cloud computing in education, users get powerful software and massive
computing resources where and when they need them. Use cloud services to best combine: (1) On-demand computing and storage, (2) A familiar development experience with on-demand scalability; and (3) Online services for anywhere, anytime access to powerful web-based tools (Microsoft, 2011).

Although e-learning is able to provide an effective return, contributing factors will continue to play an important role. The explosion of technology will be the main focus of human involvement as a benchmark and determining achievement (Rosenberg, Foshay, & Perf. Improv., 2002). Zo raini (Abas, 2005) outlines eight entities and issues in eLearning in higher learning institutions ICT Infrastructure, Rail LMS / LCMS, Pedagogy In and Out of Line, Pattern and Course Development, Faculty, Students, Policy and Standards. In the context of the students, the challenges associated are (a) Preparedness (b) Attitude (c) Comprehension (d) ICT equipment (e) motivation and (f) learning styles.

3. Effect of cloud computing in online learning

Cloud computing is the latest development of client-server. According to the cloud computing definition, applications and files stored in the "cloud" in a virtual and transparent location. Cloud is made up of hundreds or even thousands of computers linked together and can be accessed via the internet. Cloud computing looks very sophisticated, but simple fact. If we are often on the Internet, will have on cloud computing. For example, access the web-based service such as Gmail, Google/sky drive, drop box storage, or office265 services. Cloud computing comes in different forms (Buyya, Yeo, Venugopal, Broberg, & Brandic, 2009; Voas & Zhang, 2009):

- Private cloud. The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise. Private Clouds offer scope for advanced security, high availability or fault tolerant solutions that are not possible in a Public Cloud (Microsoft, 2011).
- Community cloud. The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns.
- Public cloud. The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services. Public Clouds are appealing to many businesses as they reduce complexity and lead times, because the underlying architecture is fixed, there is less scope for customisation for security and performance.
- Hybrid cloud. The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability. Typically a business might run an application primarily on a private cloud, but rely on a public cloud to accommodate spikes in usage. Customised rules and policies govern areas such as security and the underlying infrastructure, with tasks allocated to internal or external clouds as necessary.

With cloud computing we can do many things such as file sharing, service computing, collaboration systems, and online education. In this system, a Virtual class is created for training that are held electronically and between human and computer. For instance, in cloud computing environment, you will be able to use various services. These services include education services, offering software and other standard resources, and creating services or desired virtual machines to meet our needs (Bouyer et al., 2013). Advantages of using virtual environments

- In this environment, user feels more secure.
- In most cases, the cost of design and implementation is less.
- It is flexible and we can change it easily and according to conditions and goals.
- It has real users and significant potentiality so that users can experience a model similar to life or walk in a secure environment and at the same time can control that environment. It may be impossible in reality.

According to previous studies in (Bouyer et al., 2013; CISCO, 2012; 2010; Google, 2012; Kalagiakos, 2011; Praveena & Betsy, 2009; Sultan, 2010; Vulic et al., 2011), cloud has several important benefits for education:

- Delivery of various services quickly: Cloud computing enables lecturers/teachers to quickly arrange educational services that enhance learning and enable teachers to individualize learning based on performance data and each student’s unique learning style. Cloud-based administrative applications can standardize processes, provide access to centralized information stores, and increase reporting consistency.
• Minimize costs: Virtualization and other capability of cloud computing systems (e.g. Cisco Cloud Intelligent Network) facilitate service delivery at a lower cost than traditional infrastructures. Cloud computing allows schools to increase efficiency and achieve greater economies of scale. Organizations can reduce or eliminate IT capital expenditures and decrease ongoing operating expenses by paying only for the services they use and potentially by reducing or redeploying IT staff.

• Reduce risk and enhance security: cloud security helps district IT staff reduce risk, which enables consistent security policies and enforcement, up-to-date threat intelligence, high scalability, and improved performance. For example, Cisco cloud security helps remove barriers to cloud computing so that schools can achieve the educational and business benefits of the cloud-computing platform.

• Reshape teaching and expand collaboration: cloud-based educational system offers a portfolio of cloud services that can extend a rich interactive learning environment to anyone, anywhere. These cloud services can also simplify administrative processes and cost-effectively train faculty and staff across geographical boundaries.

Fig. 1. Cisco Networking Academy: Impressive numbers continue to grow

Every school, college or university has its own specific needs and implementation preferences. For that reason, cloud computing systems offer a wide range solutions and services to make it easy to build and deploy educational cloud networks, and offer cloud e-learning services, from partner-hosted cloud networks to Collaboration Cloud. For example, Berlin’s University of Technology (TU) virtualized much of its IT infrastructure using the Cisco Unified Computing System (Cisco UCS). Cost savings have been particularly impressive. For example, TU now requires only eight cables per blade chassis, achieving a 90 percent reduction in cabling-related costs. For designing a collaboration cloud-computing for online education with a best virtualization and acceptable services, we need to consider some cases:
• Choice of partners/providers and cloud-computing solutions
• Arranging an e-learning approach and its goals
• A comprehensive, architectural approach
• A full service and solution offering with robust security
• Measurable benefits such as time-to-learn
• Establishing a Virtual Private Server (VPS) for desired system

VPS is a software technology, which enables resource sharing and service offering in a number of virtual machine (server). Every virtual server has an operating system that runs on a standalone basis. VPS provides a full access to the user (student). Each VPS has a configuration that can be arranged like a full on physical server (dedicated server). One of the challenges of technical science students is simulating and creating three dimensional models from the results of implementing researches and projects. For instance, we can refer to applying various algorithms for three dimensional simulations in the field of mechanical engineering (machine and building design, bridge installation and measuring their resistance) or in the field of computer such as simulation in complex calculations in distributed environments such as grid computing, etc. For modeling, we usually need one or more powerful computer. It is difficult to provide them in reality, but we can define them virtually in cloud. It then saves data about virtual world and directs applied software to control what is happening in virtual world. It also gets information from outside or other information systems to produce and present desired models.
4. Conclusion

Cloud computing is reducing the difference between on campus education and distance education still there are few limitations of E-learning for Lab based education due to computation power. Fortunately cloud computing is the technology which can offer different services in three layers, cloud computing enable students to access the knowledge by sharing distributed E-learning resources in a public, private or hybrid cloud systems. Due to using cloud computing system for deploying a modern educational systems, universities and other organizations must take to account various items such as cost and accelerate delivery of learning service, quickly learning, and privacy issue. Therefore, cloud service providers should especially attended to offering cloud-based learning for improving education status in poor countries in Asia and Africa.

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