Advanced Cloud Computing Technology for Accelerating Innovations in E-Learning

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Abstract: Cloud computing refers to the use and access of multiple server-based computational resources via a digital network (WAN, Internet connection using the World Wide Web, etc.). Cloud users may access the server resources using a computer, notebook, pad computer, smart phone, or other device. In cloud computing, applications are provided and managed by the cloud server and data is also stored remotely in the cloud configuration. At present, most of conventional education forms are becoming not being suitable for requirements of social progress and educational development and not being able to catch up with the changes of learning demand in time, thus computer networks have brought opportunities for it. However, in traditional web-based e-learning mode, system construction and maintenance are located in interior of educational institutions or enterprises, which results in a lot of problems existed, such as a lot of investment needed, but without capital gains to return, without development potential and staying power.

Key words: Cloud computing · Pseudonym Manager · Verifier-Local Revocation · Nimble Manager · Network Time Protocol

INTRODUCTION

In traditional web-based e-learning mode, system construction and maintenance are located in interior of educational institutions or enterprises, there left a lot of problems such as significant investment needed but without capital gains for them, which leads lack of development potential. In contrast, cloud-based e-learning model introduces scale efficiency mechanism, i.e. construction of e-learning system is entrusted to cloud computing suppliers, which can make providers and users to achieve a win-win situation: on the one hand, the supply companies can use their own technological advantages to build an e-learning system with more stable performance, more comprehensive functions and more secure features. Meanwhile, suppliers profit to return funds [1].

On the other hand, users can be free from the building and maintenance of e-learning system and specifically focus on the application of e-learning system in order to improve teaching quality and management level [2].

In this model, the construction of cloud computing systems is separated from their usage and through economic leverage there are sufficient back-up and maintenance funds to build and feed an e-learning system, which can make e-learning system development into a virtuous circle. Thus, emergence of cloud computing opens a new idea to further development for e-learning [3-7].

Literature Review

Origin and Definition of Cloud Computing: In recent years, cloud computing as a new kind of advanced technology accelerates the innovation for the computer industry. Cloud computing is a computing model based on networks, especially based on the Internet, whose task is to ensure that users can simply use the computing resources on demand and pay money according to their usage by a metering pattern similar to water and electricity consumption [8]. Therefore, it brings a new business model, where the services it provides are becoming computing resources. At present, as cloud computing has become a research hotspot among modern technologies, scholars pay more attentions to its applications. As concerned as cloud computing applied in the field of education, a lot of problems had been studied, such as the technology and morphology of loud computing for future
distance education cloud, teaching information system, the integration of teaching resources, teaching systems development [9].

**E-Learning Framework:** The e-Learning Framework is a service-oriented factoring of the core services required to support e-Learning applications, portals and other user agents. Each service defined by the Framework is envisaged as being provided as a networked service within an organization, typically using either Web Services or a REST-style HTTP protocol.

The ultimate aim of the Framework is, for each identified service, to be able to reference an open specification or standard that can be used to implement the service and also to be able to provide open-source implementation toolkits such as Java and C# code libraries to assist developers.

The intention is not to provide a blueprint for an open-source solution, but rather to facilitate the integration of commercial, home-grown and open source components and applications within institutions and regional federations, by agreeing common service definitions, data models and protocols.

The Framework began life within JISC as a way of making sense of its funded development activities within the learning and teaching space and to focus future efforts.

**E-learning in Cloud Computing**

**Core Concepts:** 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 education methods, but will greatly improve the efficiency of education.

As e-learning has a lot of advantages like flexibility, diversity, measurement, opening and so on, it will become a primary way for learning in the new century.

In this paper, we introduced cloud computing to e-learning, built an e-learning cloud and made an active research and exploration for it from the following aspects: its work mode, architecture, construction method, external interface with the business model, challenges and solutions etc.

Our results suggest that the introduction of cloud computing into e-learning is feasible and it can greatly improve the efficiency of investment and the power of management, which can make e-learning system development into a virtuous circle and achieve a win-win situation for suppliers and customers [10].

**Content Creation (Forms and Methods):** Multilingual content creation refers to the creation of content, such as, multilingual secondary/primary database, specialized Indian language calendar, portal or vortal, electronic publishing, news letter, news papers, manuals, brochures, online documents etc, by the author or generator of thought. Language technology and tools can be used for creating computerized qualitative content. These tools can be also used for multilingual e-mail application, chatting etc.

It gives traditional educational forms and methods. But e-learning cannot completely replace teachers, it is only a updating for technology, concepts and tools, giving new content, concepts and methods for education, so the roles of teachers cannot be replaced. The solution is teachers play leading roles and participate in developing and making use of e-learning cloud.

Cloud computing has the course content that have converted to eLearning, such as instructor-led material or a PowerPoint presentation. University staff can take this material and convert it into eLearning content with graphics, interactive assessments and simulations.
Fig. 3: Cloud Computing for E-learning

**Content Management:** To implementing the difference between school education and e-learning cloud education, the introduction of e-learning cloud computing will bring a lot of new problems. To solve these problems, we establish a comprehensive management rules for e-learning mode based on cloud, including teaching content management, course management, examination management, performance management, student management, teacher workload management and so on.

Interaction between learners and the system in their own languages through the following:

- E-classes
- E-survey
- E-Chats
- E-Discussion
- List forums

Interactive nature of the content not just means having an input from the learner but for us it means involving the learner throughout the module and ensuring his or her attention in the complete e-learning, which results in knowledge creation and not just a mandatory learning. Similarly when it comes to accomplishing the learning objectives we ensure that not just the aim of the learning is fulfilled but also a value addition is achieved both for the learner and the organization in totality. Furthermore while creating an interactive content and achieving the learning objectives, we do not undermine the quality of content. The content appropriateness and suitability is one of the most important aspects which are adhered to by us [11].

**CONCLUSION**

E-learning is an Internet-based learning process, using Internet technology to design, implement, select, manage, support and extend learning. Cloud computing is a recently developed advanced Internet-based computing model. By combination of cloud computing and e-learning, building cloud-based e-learning system opens up new ideas for the further development of e-learning [12].

In this paper, we introduced cloud computing to e-learning, built an e-learning cloud and made an active research and exploration for it from the following aspects: its work mode, architecture, construction method, external interface with the business model, challenges and solutions etc. Our results suggest that the introduction of cloud computing into e-learning is feasible and it can greatly improve the efficiency of investment and the power of management, which can make e-learning system development into a virtuous circle and achieve a win-win situation for suppliers and customers.

E-learning and content management system products make the delivery, management and tracking of online learning across your organization easier and more affordable than ever [13].

**Future Enhancements:** This paper comprises of the E-learning services in cloud computing. In future some more services can be provided for universities. By combination of cloud computing and e-learning, building cloud-based e-learning system opens up new ideas for the further development of e-learning [14-18].

**REFERENCES**


