

Chapter 13

Building Integrated E-Learning Environment Using Cloud Services and Social Networking Sites

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ABSTRACT

Cloud computing technologies, although in their early stages, have managed to change the way applications are going to be developed and accessed. These technologies are aimed at running applications as services over the internet on a flexible infrastructure. Microsoft Office applications, such as Word processing, Excel spreadsheet, Access database and many more can be accessed through the Internet, even though the files and applications are housed in the cloud. Cloud computing provides a low cost solution to academic institutions for their researchers, faculty, and students. This setup provides an additional benefit because all these browser-based applications can also be accessed through mobile devices in addition to being available to a variety of laptop and desktop computers, provided Internet access is available. At the same time, the massive growth of social networking sites (SNS) among today's college students is increasing the number of higher education instructors that are combining distance education delivery with SNS. To take advantage of cloud computing and social networking sites, this chapter presents an integrated solution that provides learners with a comprehensive and feature rich environment for building and utilizing applications and can be used for building a virtual environment both for teaching and learning. The authors present an interactive tool that can be used for science education; they combined various technologies to achieve this goal. The environment and the design proposed can also be used as a platform for exploring and sharing new ideas as well as for designing, modifying, and monitoring educational or course contents. In this design under the same environment the authors also allow integration of different pedagogical approaches to both learning and teaching.

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INTRODUCTION

To demonstrate the effectiveness of their approach, the authors have developed two applications that use MySpace as development platform, composed of several services available on a cloud computing infrastructure. The first application allows users to query and access learning materials (docs and videos), while the second one generates quizzes. The system has a service oriented architecture that simplifies the management and increase the effective utilization of the underlying web resources. This chapter is an extension of research work that was reported in an earlier article (Alzoubi, Elseoud & Wyne, 2010).

The increased use of technology for improved teaching and enhanced learning is going to be the future of education at all levels. Most of the colleges and universities, because of low enrollment in their onsite classes, now offer courses and in some cases the entire degree program through distance education or in online format as well as use various other teaching and learning models. Most of these online offerings currently are at undergraduate level but there is a growing trend of using similar models for graduate and post baccalaureate professional education. There are many different terminologies and technologies used in the online teaching and learning arena, as well as for dissemination of knowledge. This new frontier of education is generally known as e-Learning (Sone, 2001), (Luchini, Oehler, Quintana, & Soloway, 2001), (Heinrich, Jesshope, & Walker, 2001).

Carchiolo in (Carchiolo, Longheu, Malgeri, & Mangioni, 2003) propose an e-learning model related to this new frontier of education, in an attempt to significantly improve the whole learning process for learners. The model provides to both students as well as teachers an open and modular learning environment. In this approach, courses are personalized according to the needs and capabilities of each individual student. Teacher guidelines are also taken into account in this process. To ac-

complish personalization, courses or lessons and precedence or succession relationships are shown as graph nodes and arcs respectively. The lessons, for individual students, are extracted through the creation of personalized sub graphs (Learning paths) using a course generation engine. The lessons that are known to student are eliminated and rest is arranged into a tree with all possible paths right from the knowledge that the students possess to knowledge that is desired by the student.

With rapid advances in technology and extensive use of computers in academic institutes, businesses and homes, there is now an excellent opportunity to create and support a new culture of learning. In (Sing, Sivaswamy, & Naidu, 2007) an approach is presented to create a Multi-Component Distributed System (MuDiS) that can be used in science education primarily at the school level, though it is also usable in tertiary education. Multi User Virtual Environments (MUVES) introduces innovative and new opportunities for academicians to improvise and design new ways of addressing the specific needs of 'online student' learning styles. Today's online students have very different thinking styles and ways of processing information from their predecessors. (Prensky, 2001) provides a rich, multimedia environment where interaction and collaboration between students can take place (Chandler, King, Duke-Williams, & Crellin, 2007). New and innovative opportunities for teaching and learning are offered by MUVES (Hetherington, Bonar-Law, Fleet, & Parkinson, 2008). MUVES are primarily a synchronous 3D social platform, built on gaming technologies but operating without goals and objectives. However all contents are created and owned by the user. These environments are increasingly being used as a new and more advanced platform for 3/4D data visualization and e-learning by educators all around the globe.

Jacobson *et al.* in (Jacobson, Miao, Kim, Shen, & Chavez, 2008) has outlined the rationale and described major development and research components of an ongoing international research

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