

## Chapter 4.3

# Open Source LMS for Management and E-Business Applications

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### BACKGROUND

Advances in computer technology have led to the increase in the use of information technology in business (Barron, 2002). Computer-mediated communication in the form of the Internet offers unprecedented avenues for the exchange of information and the delivery of instructional materials globally and locally (NHDP, 2003; Robey, Boudreau, & Rose, 2000). Through the Internet and related technologies, people are able to acquire skills and knowledge, adapt learning experiences to their own needs, and assimilate information faster (Azad, Erdem, & Saleem, 1999; NHDP).

An organization that is making use of such e-technologies for the advancement of e-business is the Advance Information Technology Institute's Kofi Annan Center of Excellence for Communica-

tions and Information Technology (AITI-KACE), established in 2003 in Ghana. The center is a collaborative initiative between Ghana and India, and is aimed at bridging the gap between education and industry. This initiative was in response to Ghana's recognition of the social and economic benefits of information and communications technologies. The center is considered part of a national initiative to educate Ghanaians and unleash their creative potential in the use of digital communication technologies for business and education. It is a major skills-development and training institution whose graduates can transition into industry immediately as employees or employers. Ghana's main challenge is that computer education at all levels is inadequate, and businesses are struggling to incorporate computer applications in their operations. Despite the relative advances made in the adoption of e-technologies in businesses

and education, the greatest challenge lies in the fact that a greater part of the adult population does not have adequate knowledge and skills in computer software applications or hardware in order to explore their use in everyday activities or at their workplaces. It is therefore expected that by enrolling in the programs at AITI-KACE, a participant<sup>1</sup> can either be employable or have skills to venture out into self-employment. AITI-KACE targets adults—at least those who have completed high school.

## **DESCRIPTION OF E-BUSINESS APPLICATIONS**

The main technology used by AITI-KACE to deliver instruction and learning materials, and promote e-business solutions is an open-source learning-management systems (LMS). Free and open-source software (F/OSS) is software with an unrestrictive license whose source code is made available for modification, customization, and distribution by others. Martin Dougiamas (n.d.) began the development of the Moodle LMS in the 1990s. However, it was not until August 20, 2002, that version 1.0 was released. Moodle assists in the planning, delivery, and management of e-learning, and is aimed at remedying the fragmented nature of e-learning by creating an integrative system.

LMSs were developed to enable instructors not only to deliver materials in an online environment, but also to track user activities and progress across various learning activities (Barron, 2002). LMSs are characterized by the following customizable elements: a course-development component that enables an instructor to develop a course, a roster component that enables the instructor to enroll users in a course, the assignment-management component that enables the instructor to assign lessons and activities for the users, the courseware-launching component that provides the interface for users to have access to course content and

activities, and the data-collection component that enables the instructor to collect and manage information, as shown in Figure 1.

The F/OSS that have been operational at AITI-KACE are Open USS, Eledge, and Moodle. Open USS is an open-source administration system aimed at institutes of higher learning. Eledge is a learning- and course-management system developed by the University of Utah. AITI-KACE has since discontinued the use of Eledge, but has combined the examination section of Open USS with Moodle as the main system for delivering and managing its online program. The AITI-KACE e-learning-management system is a virtual campus with instructional material on e-technology applications in business such as those required for diplomas in advanced computing (DACs), business computing, Web technologies, and Microsoft .Net technologies; and certificates in C programming, Web programming, and database technologies.

The installation of Moodle requires three other open-source software: Easy PHP, Apache, and MySQL. Easy PHP is a software application written in the dynamic PHP language that combines an Apache Web server and a MySQL database to create flexible Web development tools. Apache is an open-source Web server. Web servers use the hypertext transfer protocol (http) to enable a computer user to connect to the Internet. MySQL is an open-source database that organizes information through tables, and enables interactions between the user and the Web through the creation of dynamic Web pages. The system was implemented by the AITI-KACE management to ensure efficiency and the effective delivery of the services at the center. It was aimed at providing an alternative and flexible approach to the development of ICT skills of the participants enrolled at the center. It also serves as a practical demonstration of the use of ICT in the management and delivery of services in business.

Moodle is a learner-centered application grounded in the social constructionist pedagogy

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