DISTANCE EDUCATION DELIVERY USING THE LOTUS LEARNING MANAGEMENT SYSTEM

Jelena Stankevič, Irma Šileikienė

Vilnius Gediminas Technical University
Sauletekio st. 11-L604, LT-10223 Vilnius, Lithuania

Abstract. A learning management system plays a key role in the e-Learning environment. Its primary function is to manage learner information, administration and access to courses. This paper presents the IBM Lotus Learning Management System that provides total management of an organization's training process from content creation to course delivery.

Keywords: learning management system, distance learning, virtual university, blended learning, student progress tracking, reporting.

1. Indroduction

Studies do not encompass only organising separate informal courses. Since the 2003/2004 school years the joint master studies "The Information Technologies of Open and Distance Learning" by the KTU and VGTU has been offered. This is a step towards creating virtual universities. In a virtual university like in a real one thousands of students study, tens of courses are offered, hundreds of lectors and instructors teach, and the university administration is also present. Therefore, the need arises to manage not only separate courses. Information technologies are needed that provides the ability not only to present educational material, but also to effectively manage the learning process, resources and the educational institution itself in a centralised manner. A system of distance learning must be an integral part of the organisational information system.

A learning management system (LMS) is a major part of system of distance learning. It is most often referred to as the "learning portal" that links users with the various learning activities [10]. In some cases, it is used to manage the course catalog and to link different types of e-Learning activities together in order to deliver a blended solution. The primary objective of a learning management system is to manage learners, keeping track of their progress and performance across all types of training activities. By contrast, a learning content management system manages content or learning objects that are served up to the right learner at the right time [7].

A LMS often delivers the following functionality [8]:

- Learner enrollment
- Learner administration
- Tracking management and information scoring
- Reporting
- Curriculum management
- Competency management
- Skill gap analysis
- Classroom-based training management
- Live virtual classroom management
- Sessions and learning activities scheduler
- Learning resource management
- Course catalog, including advanced search capabilities
- Common course authoring management

We use Lotus Learning Management System v.1. How does the LMS different from currently used learning environments? A short comparison is presented in Table 1.

The LMS has powerful administration tools. It can manage the entire learning process plus all forms of learning.

2. Lotus Learning Management System

Lotus LMS is made up of several software components, dividing functionality among multiple applications and even incorporating products from other software companies. These varied components work together (Figure 1) to provide a comprehensive solution to the problem of learning management. At the root of the LMS's flexibility is the ability to

configure the system instead of customizing it. By dividing features among multiple components and incorporating various third-party applications, the LMS enables a customer to configure the system in many different ways [0]. The Learning Management System framework can include some or all of the following components [0]:

- Learning Management Module (LMM),
- Delivery Server,
- WebSphere. Application Server,
- Relational database management system,
- Authoring tools,
- Domino servers,
- LDAP,
- IBM® Lotus® Virtual Classroom (LVC).

Table 1. Differences between LearningSpace, WebCT and Lotus LMS

	LearningSpace Forum	**WebCT**	**Lotus LMS**
Course management	Yes	Yes	Yes
Live virtual classroom management	No	No	Yes
Physical classroom management	No	No	Yes
Curriculum management	No	No	Yes
Certificates management	No	No	Yes
Content servers management	No	No	Yes
Scalability	No	No	Yes
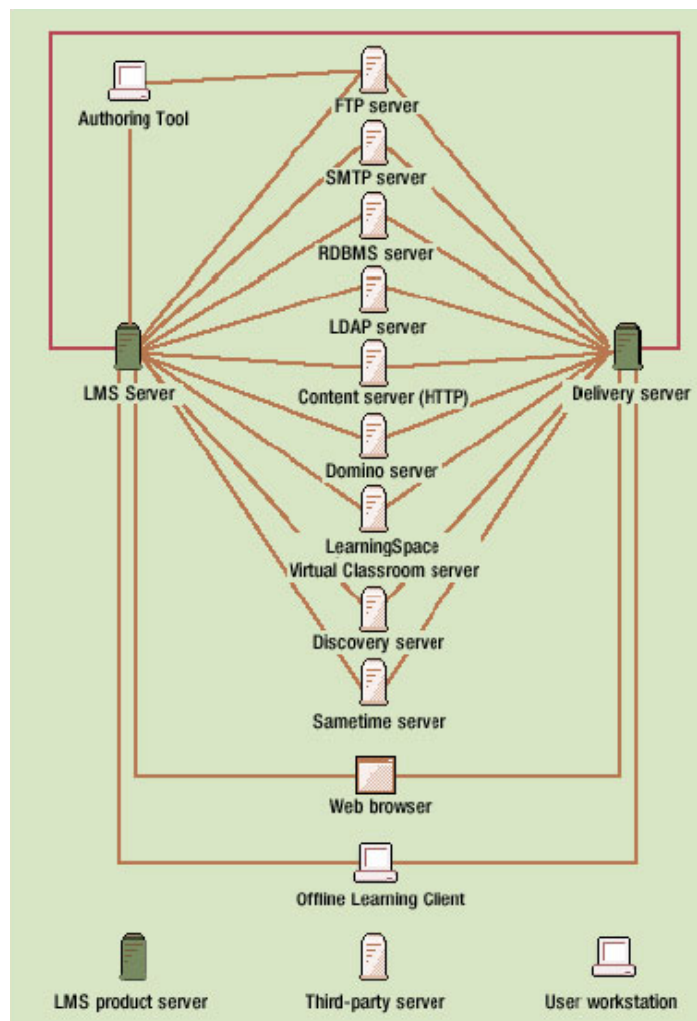
Figure 1. Configuration example

24

The system satisfies several integration requirements [0]:

- The installations of the LMS and the other resources are independent of each other. In principle, they should be usable separately.
- From a learner's point of view, all components appear as an integrated whole. For example, a single sign-on service allows external authentication.
- For course administrators, deployment is easy. The LMS includes an authoring tool that course administrators can use to create or modify course content and evaluations and import them into the LMS. The authoring tool saves the content as a SCORM 1.2 package, which is the required standard to use the courses in the LMS. The authoring tool can also convert the course to the SCORM 1.2 standard to import from other sources into the LMS [0].

Lotus LMS relies upon a standard HTTP server for delivery and uses a relational database system for its data storage. The LMS requires that user information is stored in an LDAP directory. The directory contains general user information that may be accessed by more than one application; it does not have to be specific to the LMS.

Course structures are stored within the LMS, while content files are stored on one or more content servers. To access a course, a student launches it from the Student Catalog, viewed on the LMS Server. The LMS Server then redirects the student to a Delivery Server, where the course outline is displayed, allowing the student to navigate within the outline and imposing a predefined sequence on course activities. When the student launches a particular course activity, the Delivery Server accesses the corresponding content files from the appropriate Content server and displays them in the LMS interface. As the student works through a course, progress data are captured on the Delivery Server and transmitted back to the LMS Server for processing.

The LMS can be extended with other IBM Lotus products to add collaborative features (Table 2) [0].

Table 2. Collaborative features

Collaboration feature	IBM Lotus product	Description
Discussions	Domino R5 and later	Uses Notes databases that allow students and instructors to read and post documents discussing course-related topics.
Instant chats	Sametime 3	Uses Sametime instant messaging to allow a student to chat with one or more other students participating in the same course offering.
Live sessions	IBM Lotus Virtual Classroom 1.1	Provides a virtual classroom where instructors lead a class session in real-time. During the session, the instructor can display various types of files, mark up a whiteboard, lead students to one or more Web sites, and run additional applications that students can view from their own workstations.
Knowledge search	Discovery Server	Provides a portlet enabling a student to link to a Discovery Server and to search for information related to a specific topic under discussion in the course.

Lotus LMS lets generate summaries of student, course and resource (vendors, instructors, rooms) information in report form. These reports provide detail on the following:

- Course Catalog information
- Student and course enrollment
- Course progress
- Available resources
- Miscellaneous system information

System administrators, students, course instructors, course administrators, managers and user administrators can all run reports (Table 3) for different reasons [0].

In the e-Learning environment instructors do not have a physical interaction with the students and thus cannot observe them and supervise their learning. For example, LearningSpace provides tools for tracking the progress of students. But the instructors do not know whether the students have studied the appropriate learning resources, practiced the on-line exercises or read the announcements for a course. In LMS instructors can create reports to do such things as track student progress, view a class roster, view the teaching schedule, and view how far a student has progressed in a specific curriculum.

3. LMS scalability

The IBM Lotus Learning Management System is supported on a specific set of hardware and software components.
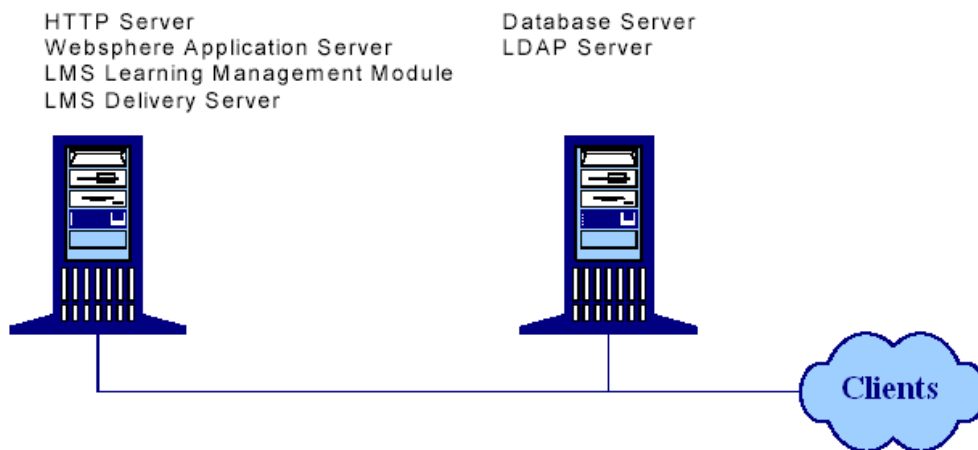
Lotus LMS easily scales from small through departmental to university or enterprise-wide needs. Smaller organizations may choose to set up a simple configuration with one or two Delivery Servers to cover their online training needs. In Figure 2 a typical small deployment is shown. It has a few hundred con-

current users. Larger corporations can expand the configuration at will (up to 10000 concurrent students), adding in additional Delivery Servers, and optionally plugging in one or more collaborative products [0].

Table 3. Reports

User	Tasks
Student	View progress about their learning activities
Course instructor	Review students
	Track student progress
	View class roster
	View teaching schedule
Course administrator	View surveys
	Views course resources
	View schedules
User administrator	Run certification reports
	Run student progress reports
	Run profile progress reports
System administrator	Run any available report
	Create customized reports for other users
	Modify existing, pre-defined reports

HTTP Server
Websphere Application Server
LMS Learning Management Module
LMS Delivery Server

Database Server
LDAP Server

Clients

Figure 2. Smallest LMS deployment

4. Conclusions

Lotus Learning Management System is a scalable, flexible platform for managing both classroom-based and e-learning activities, resources, curriculum, and courseware catalogs across the organization.

Lotus LMS targeted at educational institutions and company training. It supports the extension and optimisation of the different learning offerings within a company and combines different learning components in blended learning solutions. This helps company to get more effect out of what is invested in learning.

Lotus LMS has been installed in VGTU Information technologies department. Now we are going to import courses from LearningSpace into the LMS and planning to delivery courses using this system.

References

[1] Advanced Distributed Learning Initiative. Sharable Content Object Reference Model (SCORM^{TM}) Version 1.2, 2002, 49.

[2] **P. Avgeriou, A. Papasalouros, S. Retalis, M. Skordalakis.** Towards a Pattern Language for Learning Management Systems. *Educational Technology & Society, Vol*.6, *No*.2, 2003, 11-24.

[3] **K. Friesen, N. Mazloumi.** Integration of learning management systems and web applications using web services. *Advanced Technology for Learning, Vol*.1, *No*.1, 2004, 16-24.

[4] IBM Lotus Learning Management System Handbook. *IBM Corporation,* 2003, 461.

[5] Learning Management System R1. *Administrator's Guide. IBM Corporation*, 2003, 116.

[6] Learning Management System R1. *Installation Guide. IBM Corporation*, 2003, 102.

[7] Learning Management Systems and Learning Content Management Systems Demystified. *http://www. brandonhall.com/public/resources/lms_lcms/*

[8] I. Šileikienė, R. Kulvietienė, J. Stankevič. Learning Management System for blended e-learning delivery. *International Improving University Teaching Conference. Bern, Switzerland*, 2004, CD-ROM, 6.

[9] I. Šileikienė, R. Kulvietienė, L. Jarmuškaitė. Comparison of asynchronous and synchronous learning models. *EDEN Second Research Workshop "Research and Policy in Open and Distance Learning". Germany*, 2002, 33-37.

[10] Using IBM Lotus LearningSpace – Virtual Classroom. *IBM Redbooks*, 2002, 280.