

Establishment of a Learning Management System

K. W. Han, Y. T. Kim, E. J. Lee, B. J. Min

Nuclear Training Center,

Korea Atomic Energy Research Institute

1. Introduction

A web-based learning management system (LMS) has been established to address the need of customized education and training of Nuclear Training Center (NTC) of KAERI. The LMS is designed to deal with various learning types (e.g. on-line, off-line and blended) and a practically comprehensive learning activity cycle (e.g. course preparation, registration, learning, and post-learning) as well as to be user-friendly. A test with an example course scenario on the established system has shown its satisfactory performance.

This paper discusses details of the established web-based learning management system in terms of development approach and functions of the LMS.

2. Development Approach

General and specific requirements for the establishment of the LMS are identified primarily. Then the on-going practice of training management process in NTC and additionally desired functions have been analyzed. Based on this, the LMS is designed taking account of the requirements, and constructed through coding and testing.

3. Analysis of Learning Process

A course begins with establishment and announcement of the course on the homepage of Nuclear Training Center of KAERI by the course manager. Learners are expected to review "course announcement" before registering a course(s) of interest. This is followed by approval by the course manager. Then the learners implement their learning which could be on-line, off line, and blended in learning delivery type. The learning process includes scheduling, contents play, homework, survey, and test. While, the lecturers operate "lecturing room" by dealing with the lecture management functions, which correspond to the learner's learning functions. At the completion of the learning for a course, the lecturers involved evaluate grade of each learner, and the course manager integrates the evaluation at the course level. Course certificate can be issued as needed. At the post-learning stage, learners can check their learning results and have their grade reports and certificates re-issued. The information

produced from the above mentioned processes are kept in the database system so that they can be used for reviewing the status of learning process as well as statistics of the overall learning management.

4. Design and Construction of LMS

The LMS is developed under "Linux version 2.6.9" operating system and "AOLServer 4.0.10, Tomcat 4" web server, and supported by "PostgreSQL 7.4.8" Database system. Programming language is "JAVA JDK – 1.5.0). The hardware environment is IBM Zeon server with a capacity of 1 CPU(3Ghz) and 1 RAM(1GB).

As explained in Fig. 1, the aforementioned processes are categorized into learner mode, lecturer mode, and course manager mode, in order to provide each user group with a systematic and user-friendly operation system. The design includes establishment of detailed workflow, sequence diagrams, input/output tables, database diagrams, and user interface diagrams of the LMS.

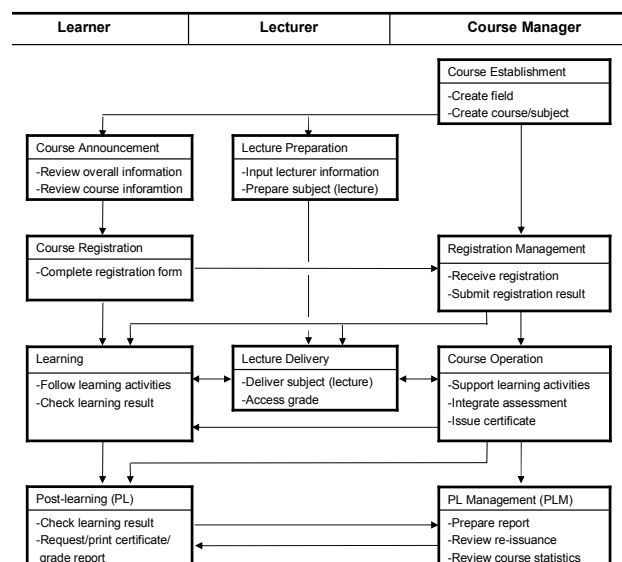


Fig. 1 The Designed Learning Management Process

Specifically, the learning functions have been realized by providing relevant forms, boards, contents publisher, contents player, and a set of lists. The lists include field list, course list, subject list, registration list, learner management list, learning result list, and post-learning management list.

As shown in Fig. 2, user menu items are arranged on the screen along with the functions of the learning management process.

The learning management system has been tested. For this, a set of example course simulating blended learning case with different types of learning materials, e.g. VOD, HTML text, etc. was prepared. With this the whole learning process has been exercised. Since the performance of the LMS has been confirmed, the system is in operation offering diverse courses including cyber learning lectures.

satisfactory performance. The system is expected to make an important contribution to the provision of customized courses by the Nuclear Training Center of KAERI.

References

- [1] K. W. Han, Nuclear Manpower Training, KAERI, KAERI/RR-2479, 2004
- [2] B. J. Min, Nuclear Manpower Training, KAERI, KAERI/RR-2632, 2005
- [3] Jino Tech., Report of KNTC Homepage Upgrade, 2005
- [4] <http://www.eoppiminen.tut.fi/koulutus/pawlowski.pdf>
- [5] <http://jtc1sc36.org/doc/N1201-N1250.html>
- [6] <http://frameworks.jtc1sc36.org/>
- [7] <http://www.projectreference.com>
- [8] <http://satc.gsfc.nasa.gov/assure>
- [9] <http://www.softwareqatest.com/>
- [10] http://cio.doe.gov/ITReform/sqse/download/qa_plan1.doc

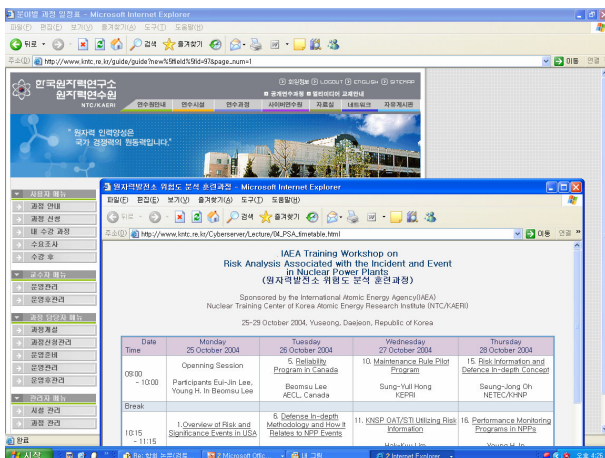


Fig. 2 Screen of the Learning Management System

4. Conclusion

A web-based learning management system has been established through, identification of requirements, development of learning management processes, design, coding and testing. The established learning management system features a practically comprehensive processes of the learning management cycle, i.e. course establishment, announcement, registration, learning, lecturing, course completion and post-learning including data and statistics management. Also the learning management system is designed to deal with various learning types, e.g. on-line, off-line and blended learning. A set of tests with a simulated blended learning course has shown its