Role of standards in development of e-learning system at Trnava's University

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Abstract

The article refers about the role of standards defined in the e-learning area at Trnava's University in Trnava. It explains the importance of most used standards and the reasons why Trnava's University is going to follow them. The article describes specific solution, which requires using of standards and brings closer problems arisen during the operation. At the Faculty of Education of Trnava's University electronic educational system, which important part the LMS system EKP is, has been building for several years. The article indicates experience gained by LMS management.

Keywords: on-line system, on-line education, LMS, EKP, LMS management, EKP management

Introduction

On-line educational system at the Faculty of Education of Trnava's University in Trnava has been built since year 2000. Development of this system has been supported by several grants as VEGA, KEGA, Development grants of Ministry of Education of Slovak Republic, and OSF. This on-line educational system covers not only technology, but courseware and organisational units, as well.

The important feature in each development area is creation and support of specifications (standards). That means that course declared as compliant with some specification should be accepted by any LMS compliant with that same standard. Therefore the selection of LMS is significant part of on-line system building. Trnava's University in Trnava decided to use standards to keep certain kind of independence because the standards guarantee wider application of solutions in praxis. Consequently the final price is reduced. That is the reason why the University exacts standard support from LMS and courseware vendors.

In December 2002 the server for e-learning was bought and later in 2003 LMS EKP™ with basic courses was added. The complete installation of EKP™ finished in January 2004 because it was depending on presence of DBS Oracle 9i, which were bought in December 2003. That was the last step in building process of the Virtual University at Trnava's University in Trnava. On-line courses for obtaining the basic ICT skills were supplemented in December 2003 first at the Faculty of Education. These activities administratively supply Continuing Education Centre (CEC) that currently keeps four employers except of head. For more information about development of the system refer to [7].

Best-known e-learning specifications

There are four best-known e-learning specifications that sow up wide-spread response:

– Institute of Electrical and Electronics Engineers, Inc. (IEEE),

– IMS Global Learning Consortium, Inc. (IMS),

- Aviation Industry CBT Committee (AICC),
- The Sharable Content Object Reference Model (SCORM).

The name of most mentioned standards is also the name of their developing association. Relevant information about these associations and their standards are published at web pages [1], [2], [3], and [4]. Here are short extracts from these web-pages:

"The IEEE (Eye-triple-E) is a non-profit, technical professional association of more than 360,000 individual members in approximately 175 countries. The full name is the Institute of Electrical and Electronics Engineers, Inc., although the organization is most popularly known and referred to by the letters I-E-E-E. Besides its activities IEEE also produces standards for e-learning."

"The IMS Global Learning Consortium is a worldwide non-profit organization that includes more than 50 members. IMS develops and promotes the adoption of open technical specifications for interoperable learning technology. Several IMS specifications have become worldwide de facto standards for delivering learning products and services."

"The Aviation Industry CBT Committee (AICC) is an international association of technology-based training professionals. The AICC develops guidelines for aviation industry in the development, delivery, and evaluation of CBT and related training technologies."

"The Sharable Content Object Reference Model (SCORM) helps define the technical foundations of a Web-based learning environment. SCORM describes a "Content Aggregation Model (CAM)" and "Run-Time Environment (RTE)" for learning objects to support adaptive presentation of content based on criteria such as learner objectives, preferences and performance. " CAP simplifies import process of the course and RTE is useful by communication of the courses with LMS.

Enterprise Knowledge Platform (EKP)

The Enterprise Knowledge Platform (EKP) is Java-based learning management system (LMS) that lets deliver, track and administer learning initiatives for students of the faculty. EKP includes all the tools needed to manage the learning process. It handles enrolment, course descriptions and catalogue management, test authoring and delivery, security and overall network interaction. EKP instance is accessible from the Internet but the entrance is restricted. For more information refer to [6].

Management Tools

EKP has united user interface. All management tools are assorted to several categories by purpose. Each category contains relevant functions. These categories are called "manager". For example: "User Manager" (handles user accounts and user access roles), "Catalogue Manager" (handles catalogues containing education units) etc. All "managers" are groped under main menu item "Manage".

User Management

First step is to create users based on one of default or created user role. It is more effective to use "User Editor" for small groups of students and to create importable CSV database file to import huge amount of user related data. In our situation it was more effective the second possibility, ergo creation of CSV (Comma Separated Value) file. CSV File Template is part of EKP default installation.

CSV file is text file and it can be written by hand if necessary. Better than that is to use some kind of software able to export content as CSV file (for example MS-Excel or Open Office). Output from Open Office is better because the commas contained inside the data are not processed correctly by MS-Excel. In case of using Slovak diacritics the file must be saved as Unicode UTF-8 text (refer to [5]). UTF-8 files contain three-byte header mark which is missing after saving the file in Open Office. This imperfection can be corrected by Notepad for Windows XP.

Test Management

During each education process it is necessary to get some kind of feedback to get information about current level of students' knowledge and skills or to get information whose can help improve next education process. EKP contains integrated environment for creating and using tests and questionnaires. Tests can be attached to education unit and questionnaires to adequate news.

Internal tests are advantageous because they are part of system and the connection between test and system is efficient. The results are processed effectively and they can be displayed lucidly. Students and teachers became detail information about each question (question score and listing with marked correctness). Results can be also printed as reports with help of another integrated EKP module. The tests, like user accounts, can be also created using CSV file. We made use of this possibility.

Courseware management

 "Catalogue Manager" is dedicated to manage catalogues, which can contain miscellaneous units like "On-line Module", "Book", "CD", "Video", "Virtual Classroom" etc. One course can be attached to more than one catalogue and each user can access to different catalogue. "Catalogue Editor" is implemented as user-friendly web application where all units can be configured. But, if it is possible, it is more comfortable to use "Automatic Import" feature. Courses can be imported into EKP as "SCORM CAP" or "AICC Course Structure". SCORM was used mostly at FoD TU. This method seems to be the easiest way of courseware import with corresponding meta-data.

Experimental Operation of On-line System

During the experimental run, several courses, which were made-to-order for Faculty of Education, were deployed and published as off-line and on-line courses. Process of initiation had been split in several basic areas, what included installation and administration of the server EKP™, organisation and systematization of tutoring etc. In experimental run we found out how the system works in practice and the problems may arise during its operation.

There were no problems related with the activity of server EKP™ immediately, during the operation. The system has very comfortable and user-friendly environment. Students and tutors adapted to the system relatively fast what confirm our expectations. Administrator enters in the same environment as other user, except of some extra functionality.

Pilot Operation of On-line System

Currently several courses are loaded into EKP. Some of them were bought from commercial companies; others were made-to-order for and at Trnava's University. All courses communicate with LMS through standards (SCORM or AICC). That was the one of the most important requirements by obtaining the courses. The installation of all courses was, thanks to use

standards, without troubles. The course "Information and Communication Technology in Education 1" (ICTE 1) was taught for the first time through on-line courses with support of EKP in the summer term of academic year 2003/2004. This course is a part of the new curriculum focused to obtain basic ICT knowledge and skills more than was conventional in the last years (refer to [8]). This course was used as a pilot operation of the on-line system to set environment and verifies the performance of the e-learning system. The integrated test environment was used to evaluate the students' results studying on-line. Two on-line tests were prepared. First test was attended to check capabilities of the environment. We miss former experience. We found out some imperfections in way of evaluation of multiple choice questions and decided to search an alternative solution. It was not closed in present time.

Conclusion

The development of the on-line system is not finished. It is never-ending process and in another form it will continue even after this period (pilot run) ends. Almost four-year experience showed propriety of elected philosophy. We succeeded in development and application of system containing components made by several different vendors, which integration has been successful. That was possible thanks to fact that all the components respect standards. That is the reason why we use standards at preparation of our own courses, too. It gives prerequisites for wide application not only at the ground of FOE (after prospective change of LMS) but at another universities, too.

References

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