SCORM in Open Source LMS : A case study of LEARNSQUARE

Orrawin Mekpiroon[a], Pornchai Tammarattananont[a], Neetiwit Buasroung[a], Narasak Apitiwongmanit[a], Buntita Pravalpruk[a], Thepchai Supnithi[a]
[a]*National Electronics and Computer Technology Center, Thailand*
orrawin.mekpiroon@nectec.or.th

Abstract: Open source Learning Management System (LMS) explores the opportunity for varieties of learning in real world education society. It reduces cost of established an e-learning system. LearnSquare is one of open source LMSs that is developed to widen the use of e-learning system in Thailand educational system. E-learning standard is concerned to increase an effectiveness of the system. SCORM are recognized as one of the specifications that is appropriate features. This paper focuses on the development of SCORM module based on the SCORM specification in LearnSquare. The advantages of the system are to make a community to sharing and exchanging contents.

Keywords: Open source learning management system, SCORM, LMS, e-learning standard

Introduction

E-learning in Thailand becomes widely used as supplementary tool in various educational levels. Unfortunately, a small extent is exploited in the higher educational institutions. Most educational institutions developed e-learning because there are a lot of advantages [1]. One of the important roles is that it maintains resources in a long term which enable learners can learn unlimited learning contents without time constraints from one generation to another generation. Furthermore, it is created to support actions which response to individual learners and also help to reduce problems of distance, time, and place. Since there is lacking of teachers in rural areas in Thailand, this offers a new educational innovation for creating educational opportunities and equality, resulting in educational development in rural areas.

E-learning is divided into two important components; system and content. The system which is called Learning Management System (LMS) composes of various modules such as efficient student tracking, professional management of the contents, and educational media support (web page, document file, and movie clip) [2]. The content composes of learning objectives, learning content, and test. It is necessary to be designed with a good quality. Moreover, it has to follow e-learning content standard in order to reduce the redundancy on creating courseware and gain the reusability on courseware usage.

Normally, the cost of e-learning is quite expensive. Using open source software helps school in rural areas have a chance to set up their own e-learning system with a limited budget. Nowadays, there are a lot of open source LMS are provided in Thailand. However, most of them are very difficult to apply in real schools, because teachers are not familiar to using an e-learning which need to take an effort to implement script or

programming. We have developed open source learning management system called LearnSquare, which is more user-friendly and enable novice people to apply it. One of obstructions of using an open source LMS in Thailand is the difficulty of software development. The user satisfaction survey of LearnSquare showed that its simplicity in open source developing is a major key success factor [3]. This is due to the fact that most users in the educational system (teachers and students) are not professional developers who lack programming knowledge. Moreover, we intend to motivate a community to sharing and exchanging contents to reduce the expense paid by organization on e-learning system, and will eventually improve Thailand educational society. We modify Learnsquare to support based on SCORM specification both in system and content aspects.

This paper proposed SCORM function on LearnSquare that are organized as follow:

1. LearnSquare

1.1 LearnSquare Advantages

LearnSquare is a Thai open source Learning Management System (LMS) which is supported by National Electronics and Computer Technology Center (NECTEC), Thailand. LearnSquare provides a lot of educational opportunities in Thailand, especially, schools in rural areas. Most of them have poor teaching quality, and local teachers are not well-educated due to the lack of good infrastructure to reach knowledge resources. Therefore LearnSquare is aimed to help improving the quality of education in rural areas to reach the similar standard level as that in urban areas.

1.2 LearnSquare Features

LearnSquare are divided into three main features; content management, system management and user management.

1.2.1 Content Management

Content management relates to courseware manipulation, study media creation and reusable content. Content creation for LearnSquare can be done in two ways. The first method is to create content from HTML editor which is plugged in the system. It will give a result as HTML file. Another method is to import the externally created content to the system. Instructor can create study media from any applications or authoring tools. In this case, it requires a standard form to collaborate among different systems. LearnSquare supports the content package following SCORM version 1.2.

1.2.2 System Management

System management is a system that controls the flow of e-learning. It consists of module control, user interface control, and site control. LearnSquare supports users to developed and plug the specific modules which are capable of supporting various functions based on specific purposes. User interface control is designed based on “block” concept that enables users to easily manage their own style web-based interface. In addition, LearnSquare has a

backup function that prevents the loss of data and conveniently transfers server to a new location.

1.2.3 User Management

User management is a system that includes functions to support performance of users. In LearnSquare, it is designed to assist user management, tracking, and checking processes. LearnSquare records class attending statistic at page level, and calculate studying time on either all or individual lessons. Scores on quiz and assignment can be collected as well. The tracked data will be used by instructors to evaluate students.

LearnSquare user group can be divided into 3 major categories; student, instructor, and administrator. The roles of users in student and instructor groups imitate the behaviors of those in the real classroom. The users in administrator group have additional authority to manage the system and other users. They are able to create the courseware as instructors to assist novice teachers.

2. The necessity of SCORM

It is very difficult to transfer learning content from one LMS to another which are not support each other. There is an obviously known about necessity of a common data exchange format for learning content. In the current environment, significantly waste investments in developing e-learning content are recognized, if it is developed specifically for supporting delivery on a specific LMS. A large amount of e-learning content will be lost when learning management systems are changed. Moreover, reconstruct a course to support a new system can be more costly than making the same course in the new system [4].

Because of these problems, the standard is necessary to share contents. This research is developed SCORM standard supported system function which is able to solve the problems. Since SCORM is a well-known international e-learning specification, it is feasible to develop the system based on this specification. The development of either an old or later LMS on SCORM makes it possible to exchange contents, not only in Thailand but also all over the world.

SCORM is a criterion for e-Learning created by Advanced Distributed Learning initiative(ADL) that can increase e-Learning capacity by making the content to have reusability, interoperability, accessibility, durability and affordability functions [5]. These qualities certainly apply to e-learning standards, allowing organizations that adopt SCORM to create efficiencies, lower costs, reduce risk, and increase overall learning effectiveness [6].

3. LearnSquare and SCORM

We are successful in encouraging organization to use the system. Nowadays, many academies and business companies are using LearnSquare as an intra e-learning system. Some examples are Non-Formal Education Center, CAT Telecom, Border Patrol Police Bureau and etc.

Most organizations usually build their own courseware. Moreover, in the same institute or university, different departments sometimes develop the same courseware, because of some reasons, such as lacking communication, non-reusable courseware. This

leads to a large amount of investments. For example, in the case study of Non-Formal Education Center, there is campus network distributed all over regions (especially in rural areas) in Thailand, but each campus has authority to enroll and manage their students independently. Although the coursewares in all regions are similar, the campuses create their own contents without cooperation. As a result, there are a lot of repetition and less quality of contents. Nowadays, campuses in Non-Formal Educations apply LearnSquare as an LMS. LearnSquare supports teachers in each campus to conveniently create their own coursewares and share them based on SCORM specification.

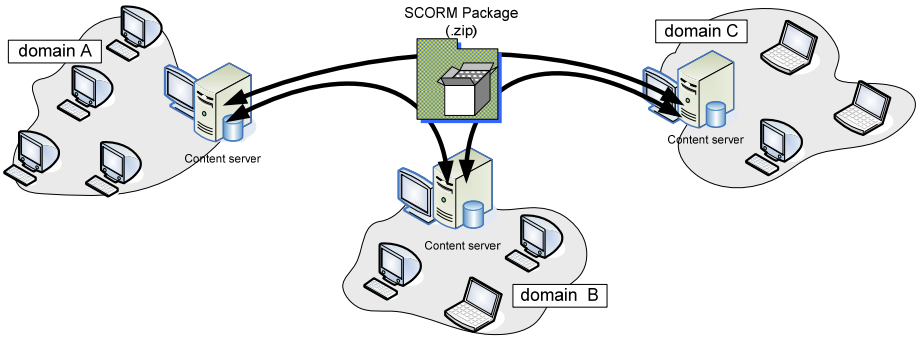

Figure 1 A system architecture of SCORM functionality.

Figure 1 shows an example of system architecture of using LearnSquare as explained in Non-Formal Education case. It is possible to explore into general cases. SCORM function in LearnSquare increases a content quality in rural area. Teachers in those regions mostly have insufficient skill in electronic content creation. The good contents from government center are delivered to them. Another advantage of SCORM function is the backup courseware. It protects contents in case of system failure or server maintenance.

3.1 SCORM Content Package

A SCORM content package is a self-contained ZIP file containing certain contents defined by the SCORM standard. If a course is going to be shared between LMS, then the organization and learning assets in the course need to be included with the course. In SCORM, this description must be included with the course and placed in an XML file with the name *imsmanifest.xml* [4].

One of the most important issues to be considered when we create content is to design a content structure. The physical files can be incorporated to generate the SCORM package by using various current tools. In this research, an open source software called Reload Editor program (see details in http://www.reload.ac.uk/editor.html) is used to generate the SCORM content package. Content package generated from Reload Editor is readily compatible with LearnSquare.

3.2 Designing of SCORM function on LearnSquare

The latest version of LearnSquare supports SCORM 1.2. The most important process is the designing of import and export SCORM content package modules that follows the SCORM specification.

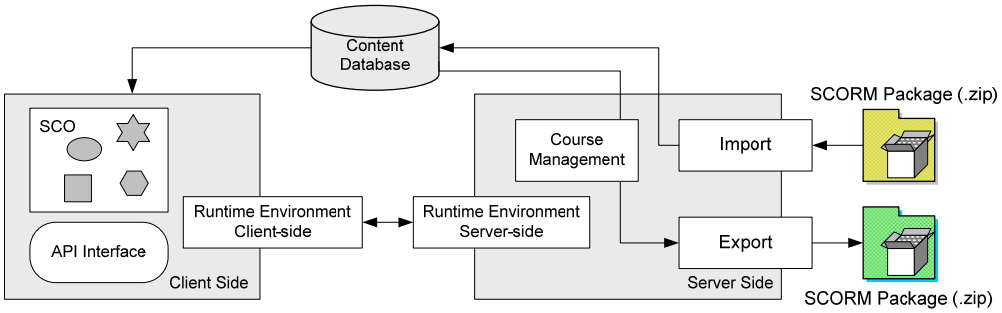

Figure 2 The overall processes of SCORM module in LearnSquare.

Figure 2 shows the overall processes of SCORM function in LearnSquare. SCORM content package is extracted to database by using an import function. When a learner accesses to the content, SCOs which correspond to conditions of schema are retrieved and shown.

In addition, an export SCORM package module is readily prepared where the data are processed in Course Management module and generated into the zip file.

4. Conclusion and Future work

Using an open source Learning Management System can reduce organization cost. Especially, while the system is developed based on e-learning standard called SCORM. We promoted LearnSquare to be an open source LMS playing a major role in e-learning system in our country. LearnSquare is a practical case study that proofs the usage in countries that have different gap of knowledge between rural and urban area. It is useful in rural areas where mostly have the poor quality teaching problem. Our SCORM compatible LearnSquare also reduced cost of courseware and presented the sharing of content among organizations. It also reduced the gap between knowledge by transferring good content from urban to rural.

In the future work, we plan to apply LearnSquare for support SCORM 2004. The sequencing and navigation of that version is useful to improve the system.

References

[1] Pumipuntu, S. (2006). Guidelines for Developing e-Learning for Higher Education Institutions in Thailand.

[2] Mekpiroon, O. (2008). Multimedia Courseware with Open Source LMS : LEARNSQUARE. In I. R. Pravalpruk, B. Buasroung, N. Apitiwongmanit, N. & Tummarattananont, P., *Proceedings of ED-MEDIA 2008* (pp. 92-). AACE, USA.

[3] Mekpiroon, O. (2008). LearnSquare: Thai Open-Source Learning Management System. In I. R. Pravalpruk, B. Buasroung, N. Apitiwongmanit, N. & Tummarattananont, P., *2008 5th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology*.

[4] Edward, R. J. (2002). Implications of SCORM and Emerging E-learning Standards On Engineering Education. *Proceedings of the 2002 ASSEE Gulf-Southwest Annual Conference.* American Society for Engineering Education.

[5] Advance Distributed Learning (2006). *Sharable Content Object Reference Model (SCORM®) 2004 3rd Edition Overview*. ADL Co-Laboratory, USA.

[6] DigitalThink (2003). *SCORM:The E-Learning Standard*. San Francisco, CA.

[7] Won, H., & Jinhoon, J. (2008). CourseBuilder 2004: Development of Visualized SCORM Packaging & Simulation Tool. *Proceedings of ED-MEDIA 2008* (pp. 4595-4599). AACE, USA.