

Augmenting LMS with Repository System to facilitate Content Sharing

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Abstract: While E-learning has been supported continually, it has not gained much popularity in Thailand. A major problem is the lack of quality, as well as the variety of the learning contents, especially in the rural area where the teachers are less experienced in creating the contents compared to that of the teachers in urban areas. This paper presents a method to distribute contents between two areas that have a different quality of education. Our LMS called LearnSquare is modified to support content sharing by connecting with Fedora repository system. The teachers who use LearnSquare can choose the contents they want from repository. The large amount of contents offers variety of choices for the students to choose from according to their teachers' learning conditions.

Keywords: Fedora Repository, Learning Management System, LMS, Content Sharing

Introduction

In Thailand, the effort to promote online learning has been made over the recent years. Initially, apart from the preparation of the infrastructure, the dissemination and installation of learning management system have also been carried out. However, as time has passed, we realize that one of the major problems of using the online learning system is not because of the lacking essential infrastructure, but the lack of quality as well as variety in the learning contents. This problem is often found in the rural areas where the number of teachers is small, thus creation of online materials was overwhelming. In addition, most of the teachers are not equipped with a tool to produce contents that could hold students attention. Meanwhile, in urban areas where the number of teachers is usually more than that of the rural, the contribution of higher quality and more diverse contents from the teachers are expected. These richer contents are mostly available to the students in the city. To solve the problem, we believe that the contents should be created and shared among people at all places. By doing so, we certainly can help expand the opportunity in learning across the nation [1].

This paper presents a combination model between a learning management system and a digital object repository. Moreover, a navigation technique is proposed to support a condition of learning in each lesson.

1. System Component

This project has 2 main components; Learning Management System (LMS) and repository system. LearnSquare is a Thai open source LMS which provides educational opportunities in Thailand. In the latest version of LearnSquare, we develop the system to connect through the repository. Fedora is an open source digital repository system that manages rich content and delivers rich digital content [2]. It combines variety of data streams that reference content anywhere on the web. Fedora repository runs as a service within a web server. It is accessible through well-defined REST and SOAP interfaces that be easily integrated into a variety of application environments with different user interfaces. This paper represents Fedora as a content center. The contents in Fedora repository system will be shared but cannot be copied to the other site.

2. Navigation Techniques

Adaptive navigation technology is also a developed in this paper. Not only an instructor can use content from digital object repository but also assign conditions in each lesson for navigating a student. The navigation technique consists of direct guidance, sorting, hiding and annotation [3]. We concentrate on hiding (focus on link hiding) and annotation technique. Annotation technique can further inform students about the current state of the annotated links by using some forms of comments.

3. System Process

The system process is shown in Figure 1. The teachers (as shown here as Instructor A,B and C) create or import contents via LearnSquare. In the case that other teacher (as shown here as Instructor D and E) also uses LearnSquare, they could search the Fedora Repository System for those contents and use them to create their own course.

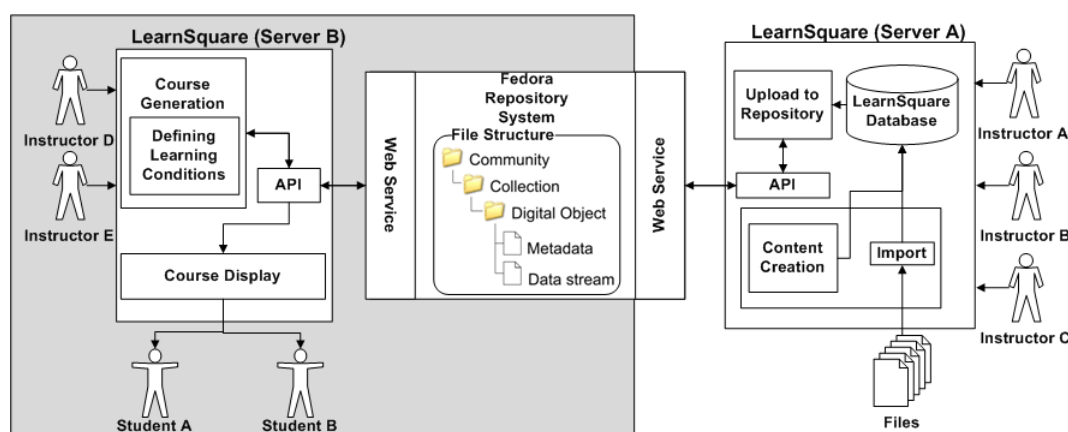


Figure 1. The system process.

3.1 Digital Object Collection

All contents are stored in content based of LearnSquare server. Whenever the instructors want to upload the contents, they have to fill an information will be used as the metadata of the contents. Contents are stored in Digital Object (DO) format. The DO should be a stand alone object since it would be easier to manipulate and retrieve [4]. Fedora Repository file structure is composed of 3 levels show in Figure 1. Community level and Collection level

are used to categorize Digital Objects. Metadata in Digital Object is used for identifying DO while data stream is used for calling real contents.

3.2 Course construction and defining of learning condition

The process of LearnSquare course construction by using contents from Repository is shown in gray area of Figure 1. The example of the course structure is shown on the left in Figure 2. The Course structure consists of various lessons; each lesson is made of sub lessons. Folders sign represent parent lesson in which there are no contents stored inside, but are used to define learning conditions. Papers sign represent child lessons, which are the actual contents selected from repository.

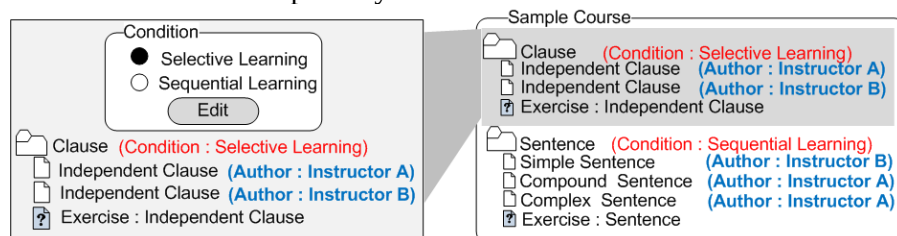


Figure 2. An example of content structure and UI of defining learning condition

Learning condition is separated into 2 parts. Selective learning means students can choose and study at least one child lesson. Sequential learning means students have to study all child lessons. The right side of figure 2 shows an example of user interface in defining learning condition. Lesson “Clause” is defined to “selective learning” so, a student can choose to study lesson “Independent Clause” of “Instructor A” or “Instructor B”. While lesson “Sentence” is defined to “Sequential Learning” so, a student has to study “Simple Sentence”, “Compound Sentence” and “Complex Sentence” respectively.

4. Conclusion and Future work

The main purpose of this project is to make quality contents available to all places including the rural areas where there are fewer teachers than in the city. Those teachers can gather the contents created by teachers in the city and create their own courses. We have modified our LMS so that LearnSquare can be connected to Fedora repository, content center. Furthermore, since contents in the Repository are significantly large, chances of finding duplicated contents are also high. This is considered to be an advantage because the teachers will have enormous choices of contents to choose from.

For future work, we will reinforce the making of high quality contents. Moreover, authoring tool will be developed for supporting content generation.

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