

LMS for Web based e-Learning on the SCORM

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Abstract—The core purpose of the system proposed in this paper is to help learners pursue proactive and self-oriented education by allowing learners to proactively configure their own content, that is, learners no longer have to be restricted by prescribed sequence of lectures.

Although a variety of standardization and Learning Management System (LMS) were produced to develop and effectively manage web contents in response to active diffusion of internet application, practical changes to assist online learners are not yet to be found.

In this paper, I would like to introduce a LMS that can support self-leading education by providing various types of learners at Virtual University with delicately organized educational contents for maximum efficiency. The system allows a learner to select a lecture or a chapter which has been presorted to meet his educational needs and intellectual ability.

In general, most LMSs cannot meet every individual's educational needs because they structure their programs by letting learners simply choose from a list of available lectures at prescribed level or difficulty. However the Self-Leading LMS eliminates such boundaries by allowing learners to choose contents and difficulty within the limit set by their own educational competence.

Key Words—LMS(Learning Management System), SCORM(Sharable Content Object Reference Model), e-Learning, SCO

I. INTRODUCTION

Responding to the growing popularity and interest that online education has gained, solutions for effective online education system and standardization which allows compatibility of contents among different systems were developed. Among them, the most prominent standardization is proposed by Sharable Content Object Reference Model (SCORM) developed by Advanced Distributed Learning (ADL). Online education systems and contents, when developed based on the SCORM standard, can be

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implemented in other systems without needs for configuration and organization of contents can be easily edited. Content is composed of a SCO and SCO contains chapters which constitute contents. Based on the standardization of SCORM, maintenance of contents can be easily done and SCORM can be configured and customized by learners to meet their specific educational needs[1,2,3,4]

However, although contents are delicately divided, it is the administrators or contents producers who have the control over the organization of contents. In reality, learners have to follow prescribed steps regardless of their knowledge or level of educational competence. When it comes to a virtual college where levels of educational competence among learners greatly vary, it is very tough for instructors to offer contents that can meet individual educational needs. For instance, those with sufficient knowledge in a specific subject would not want to learn basic or introduction portion of the subject. Unlike offline education which requires face to face interaction, virtual university can give a variety of people an opportunity to take advantage of self-leading education by selecting contents that meet their specific educational needs. By selecting contents of their needs, learners can heighten their self-satisfaction and enjoy academic achievements at the same time[5,6,7,8]. This paper addresses the problem stated beforehand and presents relevant research and implementation of solutions that can allow learners to set their own difficulty of the contents they select.

II. SYSTEM REQUIREMENTS

As I have presented, the needs for standardization of online education has become increasingly important and SCORM has been positioning itself as the standard of online education. As of now, using search and category functions, reorganization and maintenance of contents became easy, however, service provider organizes contents for his learners to search and register a lecture of their choice. In this paper, I would like to present a solution that can allow learners to choose lecture contents for each subject [9,10].

The purpose of this paper is to build a system that can allow learners to choose contents of their educational level, learn to achieve educational goals, and move onto the next level. The system offers detailed information, such as completed courses and prerequisites of lectures that a learner has to know before registering a lecture. Once he selects a subject, the system illustrates subject contents that are categorized by chapter and difficulty.

With the given information of the subject, he can confidently select his own contents to be studied. Organization of the proposed system is as follows:

- 1) DB server which contains SCO information
- 2) Module which allows administrators and instructors to input detailed contents
- 3) Webpage module that can illustrate detailed information of each subject and its contents for learners to choose.
- 4) Module that can organize educational process for each subject according to the specific requirements and needs that a learner requests.
- 5) Module that can operate in conjunction with LMS and contents for learners to use.

III. SYSTEM ORGANIZATION

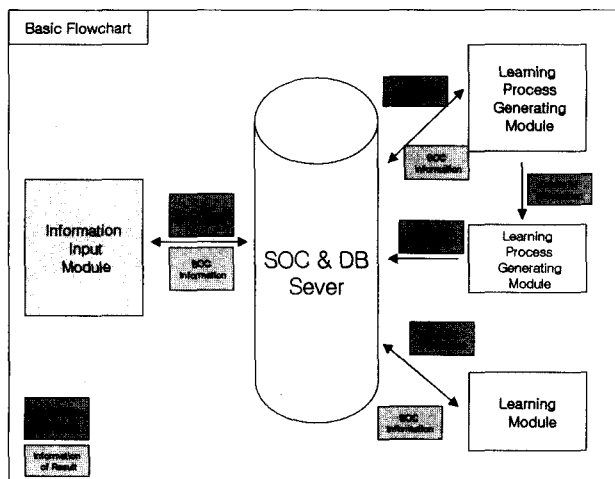


Fig. 1 System Basic Flowchart

As shown in the figure 1, contents information is uploaded using the information input module. Based on the information of the learner in DB server, he can choose contents that the system allows. "Information Input Module" inputs and edits detailed information of contents in DB server. "Learner Request Module", based on the learner information, shows a list of available subjects to the learner. Then the learner can compose his own contents according to the difficulty level that he chose. "Learning Process Generating Module" generates a learning process for the contents selected by the learner and stores the result in DB server. Lastly, "Learning Module" optimally services the selected contents to the learner. [11,12]

A. SCO Information Input Module for Administrators and Instructors

This module registers contents of lectures established by LMS administrators or instructors and inputs the registered contents. Detail contents information would possess the following information: learner's year in school, completed subjects, open lectures, available level, and grades after completion.

The sequence the module's information input, as illustrated in a flowchart of the figure 2, starts off with the page where a learner's ability is confirmed and

available categories, which can be registered, are displayed. For administrators, all available subjects are displayed and for instructors, categories in progress are displayed. When selecting specified category's subject, administrators and instructors can input or edit detailed information for each chapter. Once the input is completed, information stored in DB is renewed. If there are no errors, the system will direct to the categorical page and if there are errors, the system will direct to the contents registration page.

B. SCO & DB Servers

SCO & DB servers are database servers that contain required information for the proposed LMS. They basically manage information of contents and instructors and learners.

- ① Detailed Contents Information,
- ② Instructors Information,
- ③ Learners Information,
- ④ Information of Available Courses

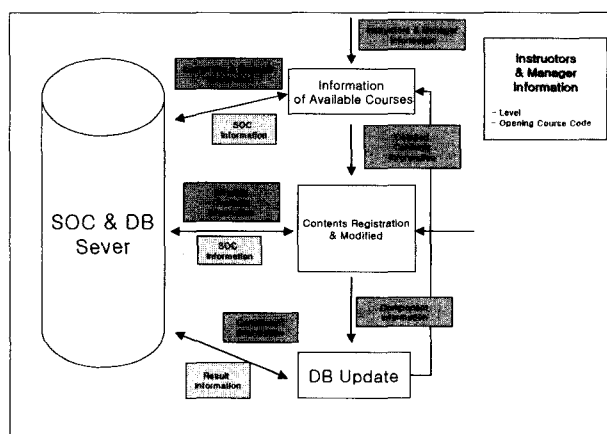


Fig. 2 Input Information Module Basic Flowchart

Detailed contents and information of available courses are shared among instructors because it is not always just one instructor who makes up the entire contents for a course. Thus, learners can easily find out about other courses that are complementary to their selected courses. To determine competence level, points are given discriminately based on learner's occupation, major, depth of knowledge of the selected subject. As a learner completes a course and move on, he will gain points and eventually get to the higher level. Educational competence levels are A, B, C, and D and levels based on occupation are A for professionals, B for students, C and D for others based on their depth of knowledge and job descriptions.

C. Learning Process Request Module

Learning Process Request Module displays available subject for learners. Once a subject is chosen, the module will show detailed information for each chapter of the contents so that learners can choose that fits his level and complete his registration request. For those who do not want to organize the contents, instructors will determine basic organization contents.

Learning Process Request Module is activated once a learner requests course registration. Based on the information submitted to DB server, which includes major, year in school, and competence level, the module displays available courses and their information on the "Available Courses Page" and prerequisites for non-available courses.

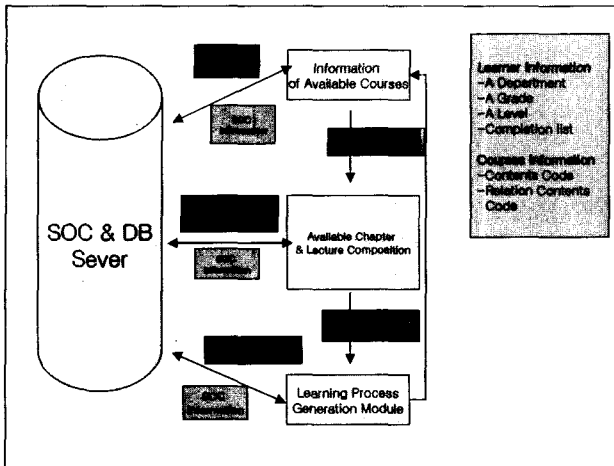


Fig. 3 Learning Process Application Module Basic flowchart

If a course is selected, the learner is taken to the page where available chapters are displayed based on the contents information and his background information. There, only the available courses for his level are displayed for him to choose and organize. Once registered courses are confirmed by the learner, he can call up the subject organization page using information of selected subject and his background information. Based on the detailed contents information received from DB server, Learning Process Request Module generates contents sequence in the order requested by the learner and moves to the "Available Courses Page" after storing the sequence into DB server.

IV. CONCLUSION

Although a variety of standardization and Learning Management System (LMS) were produced to develop and effectively manage web contents in response to active diffusion of internet application, practical changes to assist online learners are not yet to be found.

In this paper, I would like to introduce a LMS that can support self-leading education by providing various types of learners at Virtual University with delicately organized educational contents for maximum efficiency. The system allows a learner to select a lecture or a chapter which has been presorted to meet his educational needs and intellectual ability.

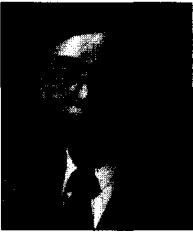
The further research areas include the followings:

- 1) Subdivision of selected educational contents.
- 2) Restriction on selectable chapters in regards to educational achievement.
- 3) Reorganization of remaining contents during learning process.

The features discussed above should assist learners in case they choose difficulty without a full knowledge of their educational ability by allowing them to choose difficulty again according to their ability. Further research on Self-Leading LMS should be done to decide how much subdivision of subject contents should be done to achieve maximum efficiency.

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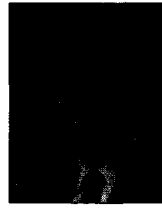
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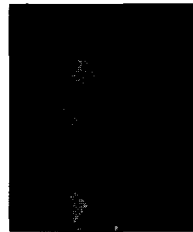
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