

# A REMOTE COURSEWARE MANAGEMENT SYSTEM THROUGH THE APPLICATION OF WEB BASED ASP.NET

Hye-Young Kim, Young-Jin Kim and Heung-Kook Choi

## ABSTRACT

In this monograph, we developed a Remote Courseware Management System so we can more easily cultivate a courseware with various multimedia applications through an easy interface with the internet. In the view of Developer of view, we could develop RCMS rapidly using the application of ASP.NET and have tried to adapt ourself to the future environment using it. ASP.NET provides much richer event programming model than ASP and event processor which are executed on Server. In the view of User, they can used the Internet service with equipment that they want at any place and any time. To control any kinds of courseware for Administrator and Users, we offered a variety of Multimedia applications and an easy interface and built a new style of web courseware.

**Key words:** ASP.NET, ADO.NET, C#, Remote Control Management System.

## 1. INTRODUCTION

Now that begin of 21st century, schools educational circumstance which use internet escaping from the teaching type face to face between a teacher and students in a class is constructed for using the unlimited information by the age of information. The teaching method based on using a computer through Internet for learners, which is issued recently at this society, is a remote education. Using this education system provides several benefits but it also causes some problems.

First of all, RCMS provides lots of benefits like below.

First, students can learn without any limitation of time and place. Second, RCMS makes students to study by themselves. Third, it enables to not only improve an effect of education but also reduce

a cost of education. Fourth, it can provide opening study circumstances. That is, lots of materials or information can be exchanged by the way of using the vast information through internet. It use Hypertext concept above RCMS that is prepared.

This RCMS has a lot of benefits. But it also contains many problems.

1) A sudden RCMS brings a big inconvenience case to both students and teachers with insufficient computer facilities so we have to take steps to prepare the counter measure it is urgent to make an infra which is not constructed yet.

2) A construction of network system has to proceed and it should be enough to use many students at the same time. And also it doesn't have any problems to access whenever, wherever and whoever.

3) The Lack of multi-media contents created the technology for RCMS. That is, an ample budget and cost is needed and learners can't use it easily because of the need of creating a professional technology.

4) It also doesn't have a method to manage a web-based textbook. Most of the web-based textbooks can be used now, are only in condition of connection nothing but web sites pre-searched

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centered text. The courseware which consists of the various multi-media materials and various interactions by learner using web materials is short.

5) Comparing with the existed classroom based-study, a student management is difficult in aspect of a professor or between a teacher and students or among students.

6) The Estimation of study is not easy.

Therefore an education system mixed merits of both an education in a classroom and an education. It also used a computer through Internet is being developed actually[1,2].

This system is aimed for the presentation that is a new development courseware model in the future. It is constructed Super high-speed communication network and learners don't have to care wherever they are including houses or schools and whenever they are throughout using internet at a class it is worked as an epoch-making tool maximized an educational function[2,3]. In order to accomplish the goal of RCMS study, we used ASP.NET and ADO.NET. So we have tried to adapt ourselves to the future environment.

## 2. REMOTE EDUCATION SYSTEM

Talking briefly about remote education system, which let learners participate in an education by themselves through the various multimedia for example multi-media materials and animated materials(Fig. 2.1).

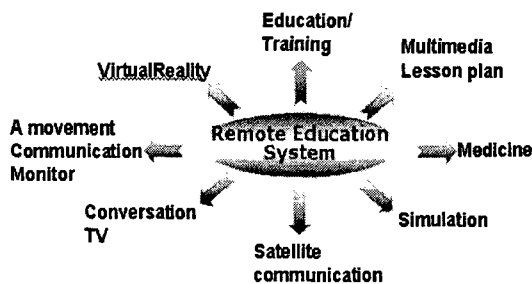


Fig. 2.1. Remote Education System

### 2.1 An Existed Non-Cyber Education and a Cyber Education

A remote educational platform has to be constructed by the capability to accept many kinds of educational methods, which have different characters in the view of time-limited character, space-limited character and interacted character.

The Cyber education works on not physical space but cyber space, it is not an analogy type but a digital multimedia contents. In the view of educational contents, it is not a supplier's education but the learner's education not a supplier's education through an education paradigm. Just like this, the point is that is important to secure the number of students and teachers in the existed education, but it is more important to secure the education of a teacher, management of contents and an active usage of information service.

Fig. 2.2 Shows Cyber education system now. When the Client request specific ASP page, the web server executes the page to be desired. We bring the data by using ADO in the saved DBMS. We produced the html with this data and sent it to client according to the determined method.

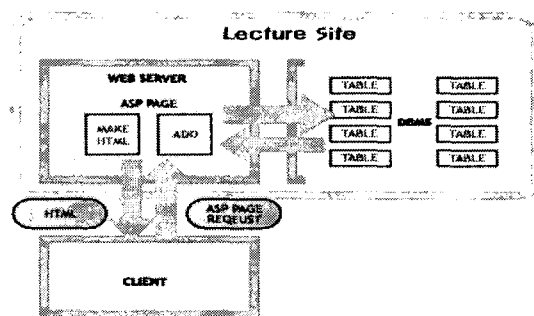


Fig. 2.2. Existing Cyber Education System

### 2.2 A Paper About Study-SystemBased on Web

The education based on web in a middle school and a high school has a meaning as an education used with various types of a computer network including Internet.

### 2.2.1 The Examples of Foreign Country

There are several example of another country. First, An adopting ELSS (Electronic Learning Support System) based on PC structure used a multimedia at an educational revolution in the United States of America. Second, the Galaxy classroom which could work to interact by using a communication, a satellite, a television and a fax in order to give an interesting educational experience for children who are from infancy biogenesis to elementary school students in a 5th grade. It was happened when George W. Bush was the president of the United States of America. The last, Global Lab science study place that students and scientist could communicate and send a message each other all over the world through a teleconference that is called EcoNet[4].

### 2.2.2 The Situation of Domestic Remote Education

To pave the way of a new education paradigm which provides the opened education through the information of education is considered as one of the major strategy in Korea, furthermore we have invested to make an infra for an era of the information education by the way of connecting all of the schools. The situation of the domestic remote education is shown as a united education service system. It is called Endued model school (<http://www.edunet4u.net>) managed by the government, moreover "Endued School" and "On-line School" are the service which goes well the cyber school[4-7]. Most cases of the domestic cyber universities use this system as a sub-material to improve a circumstance of teaching-learning course in a university or use this system as a goal of inter-certified certificate exchanging grades among universities, which joined the participated in a cyber university model management. But there is another case that foreign country manages it for the reeducation demanders who are already presented[8].

### 2.3 An Effective Teaching Method of a Remote Education

For the effective education at a remote education, the maximized courseware using development and management is essential. First, it is good to use various media. Second, it works a suitable feedback. At last, it has to maximize the use of merits each other[4].

## 3. COURSEWARE MANAGEMENT SYSTEM AND RELATED INFORMATION TECHNOLOGY

This program is constructed a remote education that learners connect a remote CAI (Computer Assisted Instruction) courseware and navigate an interactive courseware. A courseware management system is made by using ASP.NET which is presenting as a beta version now. It is below that .NET's core technique factors are used to work a program.

### 3.1 ASP.NET

The target of .NET can be different equipment, which is called Post PC (PDA, Handheld PC, IMT2000)that also will emerge in the near future. We develop the s/w to use and store information at any time and anywhere in the circumstance, which is possible to access the Internet, that is the environment of NET.

The most different thing between this version and ASP is that it could be hid because of the separation of a web design from a work part code; moreover it could adapt and design a form of web on the tool (VisualStudio.Net). The usage of Web server is so easy that the speed of development can be up. And it could make a clear code by supporting many kinds of client including a common function in the developing web site. Although the speed is so fast cause of the offered compiled machine code, there is an error after .Net Web Application works on the visual studio.net.

The cause wouldn't be found out, therefore we opened .Net Web Form made by general Edit. As a result, it was normalized. Thus the real task is worked on where combines a design part with a code part without separating. As the way of programming before, it is easy to edit in the development of the script type[9].

Table 1. ExamObj.aspx

```

<%@ Page Language = "C#" Debug = "true" %>
<%@ Import Namespace = " System.Data " %>
<%@ Import Namespace="System. Data.SqlClient" %>
<script language = "C#" runat = "server">
protected void Page_Load(Object Sender, EventArgs E)
{SqlConnection DbCon = new
SqlConnection("server=localhost;database=webdb
uid=sa;pwd=");
string sqlCom = "select
* from ExamOBJ order by Div";
SqlDataAdapter Adapter = new
SqlDataAdapter (sqlCom,DbCon)
DataSet Ds = new DataSet();
Adapter.Fill (Ds,"ExamOBJ");
DbGrid1.DataSource=Ds;
DbGrid1.DataMember="ExamOBJ";
DbGrid1.DataBind();}
    
```

3.2 Working ASP.NET Through C#

C# is not only a core language of .NET circumstance but also a new language intended for an object to develop a solution worked at VisualStudio.NET. The following advantages of C# are : First, DateTime objects can be worked through the web application and normal application as the same way, since an object and sources are shared in the Microsoft.Net circumstance. Second, we can make C# component which provided framework in all language in all platform web service through the Internet because .Net Frame Component can be shared through any language (Fig. 3.1). So window media player could be played at a normal application and the web application. Third, it raises the productivity of the programmer and reduces programming errors that can be caused a main increase of the develop-cost while

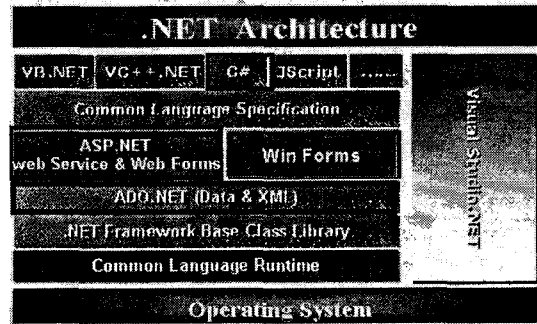


Fig. 3.1 Configuration of .NET

the attribute of an object is shown on the screen makes it possible to work through VisualStudio. Net.

3.3 ADO.NET

ADO.NET is called as a unit of class that can manage data effectively from a various data source. It used a Dataset which is similar to the concept of Recordset used an existing ASP. And it also expressed all data as a XML when ADO.NET is consisted and transferred XML type to another application(Fig. 3.2). Here we see configuration of the XML processing, generally the XSL is applied to XMLdata by XSLT Processor of DOM.(Table 1) is Database connection and example using DB Grid.

The XML is a key point of .NET and the data format, which will be used in all a hereafter MS goods.

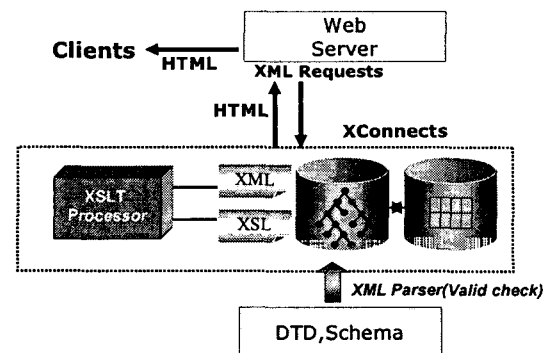


Fig. 3.2. General XML processing configuration

### 4. RCMS DESIGN

RCMS (Remote Courseware Management System) is a system that can plan and develop the remote courseware. The courseware is linked to database without a teacher's using of a hard program such as HTML, JavaScript, Perl(Fig. 4.1) [10]. This system is used IIS 5.0 Web server and MS-SQL 7.0 server. In addition to, ASP.NET is used for the improvement of working speed of searching information and ADO.NET is used for the connection with web database(Fig. 4.2)[14,15].

It is very important to provide the learners with the circumstance that could be confirmed a context of study and do a study alone without as administrator's aid. The system has to be used to provide the lecture, which offered a plan of multimedia, or each student could use a courseware for check out.

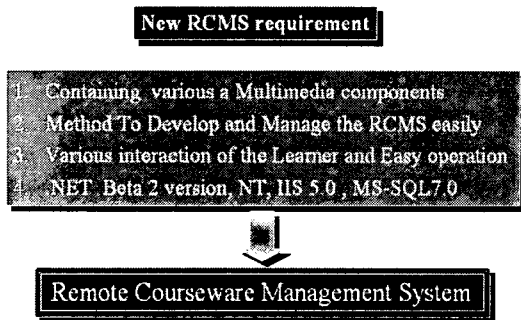


Fig. 4.1. RCMS Environment Requirement

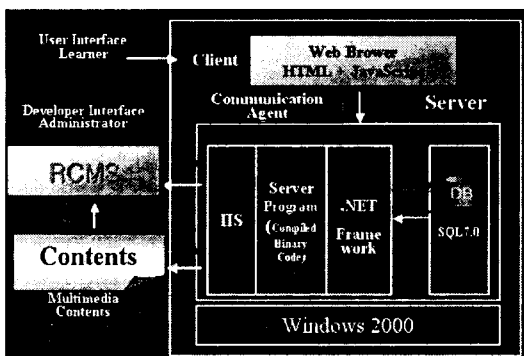


Fig. 4.2. Operating circumstance

Let's see the technical aspects with a divided an administrator's interface and a user's interface. A diagram of structure algorithm between an administrator and a learner is like (Fig. 4.3).

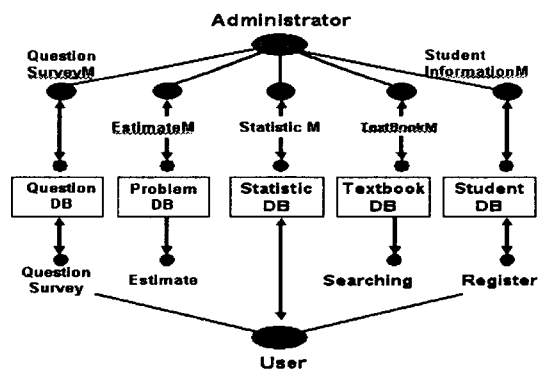


Fig. 4.3. A structure algorithm between an administrator and a learner

#### 4.1 Administrator and User Interface Design

The parts of an Interface have not too much complicated or difficult communicate way. The user of this system is divided an administrator who manages materials and general user. The administrator makes interface for user in order to transfer not only a text education but also an image, an animation, an audio etc.

Knowing about the type of education between an administrator and a user, the important factor of a plan is the interface of a program user. As the users want to look for the more convenient program.

1) The whole picture of structure of RCMS is below(Fig. 4.4).

2) The next treats the interface about the lecture method and let's find out. The Learner can choose the method to study and take lessons(Fig 4.5). It is the way of study that contents can be searched as a word or a sentence among all contents of the lecture.

3) (Fig. 4.6) show the Lecture management that contains a new material : a multimedia contents

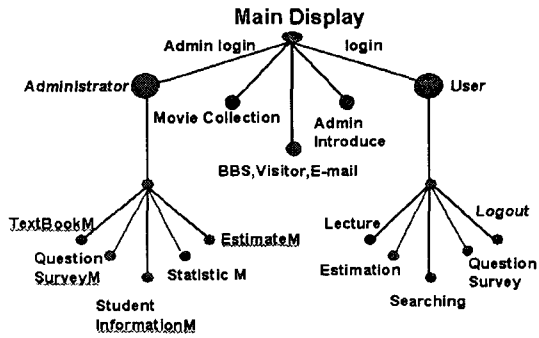


Fig. 4.4. Whole structure diagram of RCMS

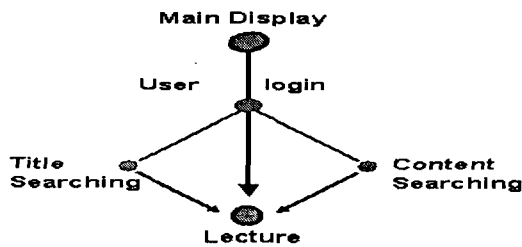


Fig. 4.5. User Interface diagram

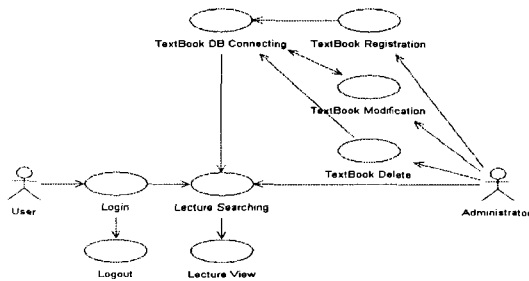


Fig. 4.6. Lecture UseCase Diagram

consisting of a various images, audios, animations etc. is made. When a survey respondent response a question, result of answer are stored at database with ASP.NET(Fig. 4.7). The biggest problem of a question survey system is that it has differences the numbers of questions and examples, it solves the problem, which remakes a program without using re-program. Moreover, the management became connect and database is available newly to use a stick form of subjective and objective problems in order to make a question paper[9]. (Fig. 4.8) provides easiness in setting problems and sorting problems by making a problem bank. It is

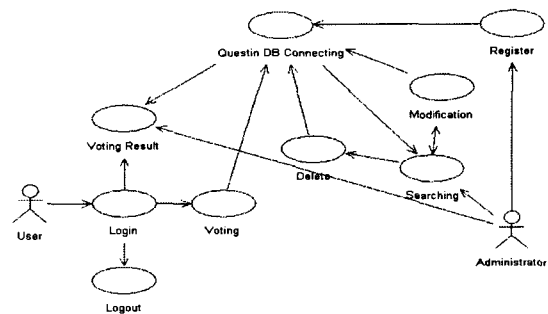


Fig. 4.7. Question Survey UseCase Diagram

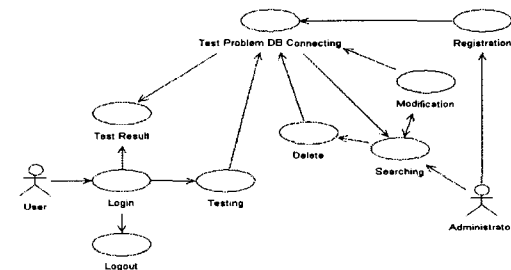


Fig. 4.8. Test Problem UseCase Diagram

easy to check all the student's grades out with using the confirmation of the each student's grade confirm[11]. (Fig. 4.9) (Fig. 4.10) show statistic management algorithm and the admin lecture sequence diagram of this system.

4) An Administrator to lead the active attendance of lecture if there is a student who is not attending continuously. In addition, a modification and an addition of a lecture have to be accomplished based on statistics or question regarding the matter of an education of students now on and on.

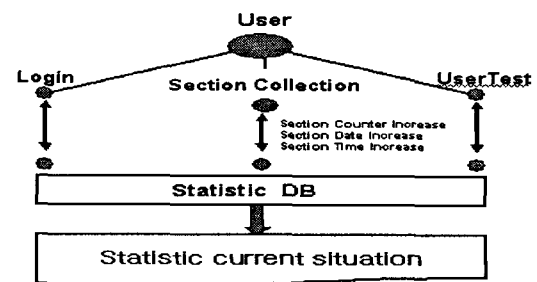


Fig. 4.9. Statistic management algorithm

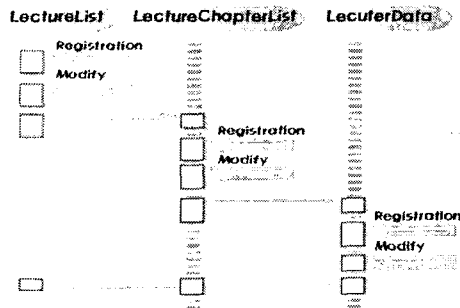


Fig. 4.10. Admin Lecture Sequence Diagram

#### 4.2 Structure of Database

SQL 7.0, which is selected through DBMS for acting database and DB is created as a (Fig. 4.11) by a database that used for a management of materials. Database is contained 43 tables. A table is management and store in a question bank, which is set problems. Plus, a table stores information of user and schema of administrator and learner. A linkage process of a structured database is like (Fig. 4.12). (Fig. 4.13) shows activity diagram of this system[12,13].

##### 4.2.1 Student's Information Table

User's information is stored at database and used when it provides feedback from a teacher to learners.

##### 4.2.2 A Subjective Problem Type

A manager controls an enrollment, an amendment and a delete of problems that selected the

✓ ADMIN Schema				
BOOK	COUNT	EXAM	BBS	GUEST
ID LONG(4)	ID NO	ID DIV	Table_ID	ID WRITER
TREE TEXT(4)	TITLE	Question1	Title	EMAIL
ASSORT TEXT(50)	TC_0	Question2	Contain	URL
SUBJECT TEXT(50)	TC_1	Question3	Author	CONTENT
MOVIE TEXT(50)	.....	Question4	Mail	UPDATE
CONTENT TEXT(16)	TC_22	Question5	Reply	PASS
SOUND1 TEXT(30)	TC_23	Answer	Order_id	SEE
TIME1 LONG(4)	.....	Explain	Depth	DOCTYPE
URL VARCHAR(30)			Cur_date	

Two Schema 43 Table

Fig. 4.11. Database Design

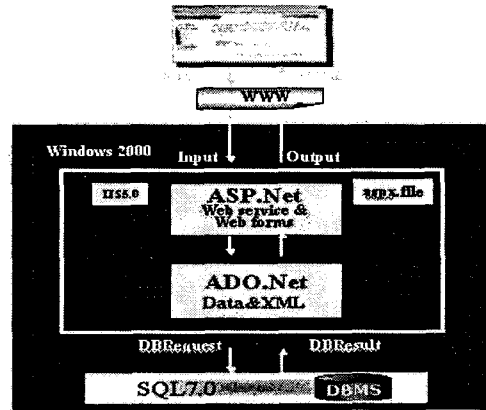


Fig. 4.12. Database Linkage Process

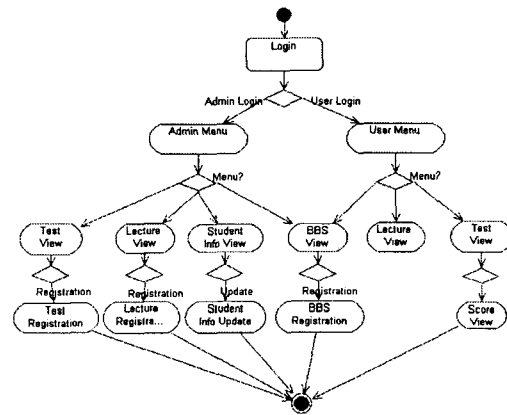


Fig. 4.13. Activity Diagram of this System

subject of test and for students; it is a database to inquire and to solve problems. It is a system that avoiding the duplicated question by using the stored database. It was already set a problem made avoids making duplicate questions through searching and making it easy to make problems on web.

##### 4.2.3 An Objective Question Type

It is a table that a manager input an objective question through selecting a test subject and a test chapter (Table 4.1).

## 5. IMPLEMENTATION OF RCMS

It is very important to provide the learners with the circumstance which could be confirmed a

Table. 4.1 a Object problem type

Num	Field	Explain	Type	Null	ID	etc
1	ID	Int(4)	ID		✓	
2	Div	VC(20)	division	✓		
3	Question	VC(500)	question	✓		
4	Answer1	Int(4)	answer1	✓		
5	Answer2	Int(4)	answer2	✓		
6	Answer3	Int(4)	answer3	✓		
7	Answer4	Int(4)	answer4	✓		
8	Answer5	Int(4)	answer5	✓		
9	Conn	Int(4)	contact count	✓		
10	Explain	VC(500)	explain	✓		

context of study and do a study alone without as administrator's aid. The system has to be used to providethe lecture which offered a plan of multimedia or each student could use a courseware for check out. Let's see the technical aspects with a divided an administrator's interface and a user's interface. First of all, a diagram of structure algorithm between an administrator and a learner is like (Fig. 4.3).

### 5.1 A System Function of an Administrator

It makes it possible to confirm and change ID and password of a manager in a login of a manager menu which is created. It works a page that an enrollment of a manager and another manager, delete enrollment of a manager.

A manager module makes text management, a test problem management, a paper survey management, and statistics management on, and make it possible to input, amendment, read etc.

#### 5.1.1 A Lecture book Management

This is the position which contains a new material: a multimedia contents consisting of a various images, audios, animations etc. is made. lecture book number and title are printed automatically a restored contents on a database and

RCMS is supposed to work when a person clicks an image[10]. (Fig. 5.1) shows are a schema modeling for Lecture[12].

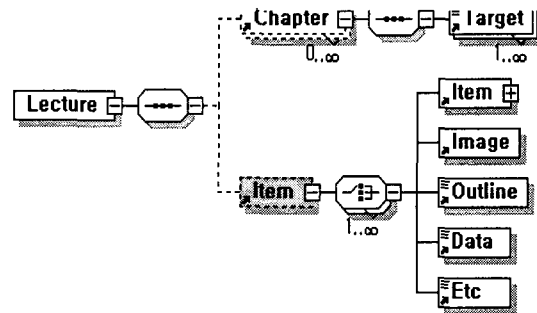


Fig. 5.1. Lecture Schema Modeling example

### 5.1.2 A Problem Management

In the case of working a test problem which is made by an auto-creator on line, it can treat the result of the pointed test list and a list to estimate. It doesn't make duplicated problems through searching the stored problems already existed in a problem bank, and also it makes it available to use existed problems. When it used to create test problems on two menus between an objective problem and a subjective problem and a simple creator help to make a question and sort problems. Then it provides easiness in setting problems and sorting problems by making a problem bank. It is easy to check all the student's grades out with using the confirmation of the each student's grade confirm[11].

### 5.1.3 Question Survey Management

Internet question survey is a method which is opened to all people who use Internet all over the country in that an old research paper is located on a cyber space in a Hypertext type. When a survey respondent response a question, result of answer are stored at database with ASP.NET. At that time, a section time and IP address are made by question maker is stored.

The biggest problem of a question survey system is that it has differences the numbers of



questions and examples, it solves the problem which remakes a program without using re-program. Moreover, the management became connect and database is available newly to use a stick form of subjective and objective problems in order to make a question paper[9].

And then it could be confirmed as making a survey question let us know what the care and hopes of student etc. It also manages RCMS effectively. The contents of survey question is made easily by a simple creating helper(Fig. 4.7).

#### 5.1.4 Statistic Management

This is designed that learners can figure out various kinds of statistic materials: by a textbook, by chapter, by data, by time zone and by IP accessed this system (Fig. 4.9).

#### 5.1.5 Student Information Management

When students become members by the admission, a teacher read their information and then could make them to revise or to delete wrong facts and could check out their grades.

### 5.2 System Function for Learners

#### 5.2.1 Start Screen

When students access to this courseware through Internet, login screen is applied contents for identification of system will show like (Fig. 5.2).



Fig. 5.2 Start screen of system

#### 5.2.2. Lecture book Screen Structure

This courseware structure contains an essential

contents of the study in subjects according to the motive ,controlling the learner ,communication and the plans of an administrator. And this courseware makes plenty of contents in order to accomplish the goal of study. Following is the typical lecture, it makes it possible user to concentrate on study by letting a help function, a usefulness of usage, a spread of response and a coherence of screen. The type of courseware text is designed basis on "frame unit". When animation materials are existed, the player who can play the animation is transmitted through streaming technique.

### 5.3 User Aid Function

Interface user is consisted with the convenience and it makes easy to use it through user-concentrated on study. Learner can be estimated about study by accessing a server on web and the access is possible in condition of a user's enrollment.

#### 5.3.1 Estimation and Searching function

An estimation-menu appeared for the study estimation after studying courseware which was applied this system. Learners can check and choose either a subjective problem or an objective problem in a selected chapter with the aims of the test of proficiency by oneself. Also, if the learners press the confirmation button of the answer, they can check it. In the case that there are a lots of questions it can be shown page by page, also, in the case of getting a right answer, learners can compared with providing answer feedback and in the case of a wrong answer it can provide a wrong answer feedback immediately.

#### 5.3.2 Survey function

To evaluate the system in question, it is made to collect opinions on convenience and interest about the Internet, effects on the education and remote education. On the primary screen, if you click the survey button, the menu pops up. With

answering each questions and clicking the complete button, the accumulative figures will be printed. The survey results include graphs, the number of participants, and percentages and they are open to show all who have access to the site.

### 6. RELATED COURSES AND THE CONTENT DESIGN

Sex education can offered the several teaching method. It shows that if each of the learners can choose the contents and be provided with the chances for the education, it can be a contribution for the activation of their sound sex education. When sex education is preceded in class of middle schools, a new educational tool and a model are needed. The concepts about knowledge and psychology on sex may not be taught in a type of lecture, but it will be possible to use the case by case or using various multi-media technologies. For verification of the sources to utilize the systematic study of sex education and the suitability of remote courseware control system, the contents must be built to apply to the sex education in middle school class (Fig. 6.1).

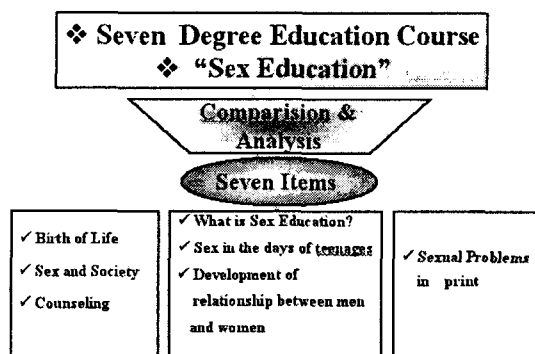


Fig. 6.1. Sex Education Comparison and Analysis

### 7. CONCLUSION AND FUTURE WORKS

The distinctions of the system on the aspects of developers are that the courseware control

system was made in use of ASP.NET. Above all, we have tried to adapt ourself to the future environment using it. In .NET, the environment for operation of C# language was constructed easier than that of C/C++, because it is easy to form a formation code for the convenient operation. But the weak point is that it uses too much internal sources. With the more complex structure than Web program, especially the DB controlling part, cookie, the setting security and user authentication based on the Windows was hard to use. However, the bulletin board using DataGrid was able to cut the speed of development.

As for users, like teachers, textbooks, survey documents, figures, student information and problems were free to be controlled. And questions are presented in web browsers; it is easy to be made. Question amendment and search are easy and with the result of confirming survey, weak points are amended and complemented on the matters of courseware, maximizing the system with constant update.

As for students, it is easy for them to have access to the system with web browsers, confirm the evaluation in the real time, and choose the type of the examinations what they want. Those results of the database can help the future education and pre or post inspection on the result of survey can help to determine the effectiveness of the system. However, there are some problems.

1) It is difficult to use yet because this management of the courseware of system is made in .NET framework is beta version program. Therefore, it is urgent to connect the much more other systems.

2) Related with database construction. It has to prevent unnecessary wastes of resource by managing more effectively the database construction regarding study materials and user.

3) A study needs more materials compare with others because there are not any pre-study about RCMS based on ASP.NET.

It is expected that lots of effect of the expectation could be obtain if this system input some schools with solutions of these problems.

## 8. ACKNOWLEDGMENT

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