

2008

ACMESOFT Requirement Specification Sheet

Change Management And Quality
Framework For Course Design

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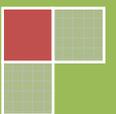


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1 Introduction

1.1 Project Title

Change Management and Quality Framework

1.2 Motivation

In educational institutions, the objectives, plans and materials of courses offered should be predetermined. The preparation of course plans and the control process of the plans according to the standards followed by the educational institutions is a confusing and time consuming problem in education. If the course plans are developed and displayed at online environment, it will significantly ease the job of both instructors and the administrative staff of the schools. A course plan and the related course material is subject to modifications or updates which are necessary for a dynamic course plan system. That is, a course plan and the related materials should be developed or changed according to new improvements in technology or problems resulting from the current plan.

1.3 Project Definition

EDUPLAN is a Change Management and Quality Framework for Course Design and Planning enabling to the educators to show and develop the plan, units and the related materials of various courses from different schools, departments, and courses with similar content from different instructors or schools. The courses and the standards are determined by the institutions, and instructors use the system according to these standards.

1.4 Project Scope

This software system will be Change Management and Quality Framework for Course Design and Planning for educational organizations. We will develop this system in order to maximize the productivity of the teachers by providing modules and tools in automating the course planning process, which would otherwise have to be performed manually. With the help of this framework, educational institutions can meet their needs while remaining easy to use.

1.5 Team Structure

Our team is a controlled decentralised team. We have a project leader, because work experiences of the team members are not equal. However, the communication between the leader and the other members of the team is horizontal, that is there is not an explicit hierarchy in the group. We believe that this will help us learn more during the project.

1.6 Process

Our team is supposed to progress through analysis, initial design, detailed design, release of prototype, implementation, testing and maintenance phases in a determined time as stated in the syllabus. The first goal of our team is to be successful in the release of the prototype. Up to the release of our project prototype, we think that the waterfall model is the most suitable project model for us, since we have strict deadlines and we should develop our design step by step and in a determined way.

We thought that the waterfall model will not be the most suitable one for us after the preparation of the project prototype. Because during the design we may possibly need to turn back to former phases to revise and develop the details of our requirements, but waterfall model is not proper to such changes. That's why we decided to use the spiral model from the prototype to final product of our project.

1.7 Glossary

Term	Definition
Course Objectives	Abstract goals those should be reached
Course Plan	Concrete goals that course cover fully and timeline
Course Material	Any type of materials that should be used in the instruction process of course
Admin	Person who initialize and configure the system.
Organization	An educational institution.
Commission	A person or a group of people who will responsible from entering course objectives and controlling the instructors' course offering.
Teachers	An instructor lecturer or academician of institute.
Software Requirements Specification	A document that completely describes all of the functions of a proposed system and the constraints under which it must operate. For example, this document.
Ranking Module	A module can evaluate course plan rating by taking the average ratings of topics of those courses.
Versioning Module	A module can version the course plans, topics and every dataset.
Theme	An abstract structure to inspire the commission while preparing the course objectives.

1.8 References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirement Specifications.

2 Research

Since Curriculum Mapping is a very abstract subject in this part we are going to clarify the subject by a few researches. In order to understand the topic better, have different points of views and improve knowledge, researches have a vital importance for software engineering projects. These kinds of researches also fix some misunderstandings about the general concepts. In this part we will show what we have done for our project in three parts: articles written about this topic, existing products in market and customer ideas.

2.1 Literature Survey

2.1.1 Why Curriculum Mapping?

In this part, we are going to deal with the question: Why Use Curriculum Mapping? Actually, there are a few answers to the question;

- Mapping curriculum enables teachers to assure that they allocate sufficient time to cover each standard and objective.
- As teachers map out teaching units, cross-curricular connections become more evident and can be intentionally promoted. This enables students to develop real world application for concepts.
- Curriculum maps provide the framework for building teaching units. Some standards and objectives are seasonal and must be taught during the appropriate time of the year. Other standards and objectives are developmental and must be built sequentially throughout the year.
- As teachers stand back and analyze a curriculum map, teaching strategies become clearer. The teacher is more able to create a balance between teacher-directed concepts and student-generated investigations.
- Grade level planning, exploration tubs, learning centers, and creative drama centers can be correlated using curriculum maps. Elementary school, secondary school and high school standards and objectives have common themes, and teachers can benefit from sharing resources, correlating field trips, and building grade level libraries.
- Curriculum mapping can also facilitate assessment planning. Periodic self-assessment and assessment using rubrics promotes awareness of strengths and areas for improvement.

2.1.2 Technology Overview: AJAX

Since Ajax is one of the key concepts in our project based in this part of our report, we will mention what Ajax contributes to our application with some references from the related articles.

When building enterprise web applications, we often need to let the user select one item from a large list of records which is the related items in the curriculum. For instance, on an order entry form, the user must be able to select the title from a large list of titles. For performance reasons, it would be insane just to load a *DropDownList* with 5000 items. The other alternative would be to open another form where the user would be able to search and select the desired title. We've used this approach suggesting the related titles to the users while he/she is writing the title to the textbox.

A very effective uses of Ajax is the dynamic textbox suggestion script. Newegg.com uses this in their search box, as do a growing number of ecommerce websites. This is a great use for Ajax because it is very passive, but extremely effective. Users with JavaScript disabled will see no loss in usability. Users that can use JavaScript have a much more usable search or other textbox function.



The AJAX made it an easy problem to solve. An *AutoSuggest* textbox, where the user would type a part of the desired title and the control would show the matches, would fit perfectly here. We needed an *AutoSuggest* textbox with the following features:

- Built-in validation
- Template-based content
- Ability to bind to all sorts of objects (collection, data tables, etc)
- Ability to work like a *DropDownList*
- Smooth integration
- Ability to show a header
- No need to call web services

2.2 Market Research

As mentioned earlier, curriculum mapping is somehow abstract subject. Therefore, explaining the related and similar applications about curriculum mapping is surely so important. In this part of the report our goal is to give a brief explanation of other curriculum mapping applications which are Curriculum Mapper® and Atlas Curriculum Mapping by Rubicon.

2.2.1 Curriculum Mapper

2.2.1.1 Curriculum Mapper Overview

- It is an original web-based mapping system with the longest track record of success.
- It is a mapping tool created and designed by practicing K-12 educators.
- It has innovative force driving computer-assisted mapping.
- It provides very intuitive mapping interface, allowing users to focus on the process, not the technology.
- It is compatible with all major browsers such as Internet Explorer, Netscape, Safari, Mozilla and Firefox.

With such an intuitive system that can be accessed from anywhere to provide detailed information, Curriculum Mapper simply offers very robust mapping tool and services available.

2.2.1.2 Where is Curriculum Mapper Being Used?

Curriculum Mapper is used in schools and districts in forty-eight states in USA and Canada. As the first web-based mapping system, it has blazed the way with innovation and set the standard for others to attain. The summaries below provide a sampling of how Curriculum Mapper meets the needs of a wide range of schools and districts nation-wide.

Cleveland High School, Cleveland, Alabama

Cleveland High School is a 7-12 building with just over 400 students. It is located in a rural area 38 miles north of Birmingham, Alabama. The school started mapping in August 2005, involving all grade levels and subject areas. Teachers are mapping one subject/prep during the 2005-2006 school years, taking a staggered start approach - teachers take on more subjects and preps when they feel able to do so.

It is interesting to note that mapping was brought to the high school by Stoney Beavers, an English and Spanish teacher at the high school. He brought together a group of teachers who received initial workshops through Professional Learning Associates. That group then worked with the rest of the faculty to build understanding and support.

This fall, Glenn Pucket, a social studies teacher and Kelly Morton from the science department worked with teachers in an adjoining school district as they started mapping. During one of their sessions, Glenn stated that even though they were only in the mapping for a brief period, "It was

possible for us to see visible improvements in our curriculum in just the first three months." One can only wonder what progress they will make within a full school year.

2.2.1.3 Advantages of Curriculum Mapper

- Curriculum Mapper is the oldest web-based curriculum mapping system available. Therefore it is the most experienced and maybe more reliable.
- Curriculum Mapper was designed by classroom teachers and school administrators. In other words it is an experienced real-world application.
- Curriculum Mapper is designed by classroom teachers and features online help on each screen. Their interface is intuitive and allows teachers to map naturally in a very time-efficient manner. Curriculum Mapper is a proven tool, used throughout the United States and Canada.
- Curriculum Mapper incorporated all state academic standards into the system. The teachers need only check off the standards they address as they complete their map -- and indicate whether each was introduced, developed or reinforced. It is powered by Academic Benchmarks' Standards Database, "The Source for Academic Standards."
- It designates any number of maps as "masters" for the community to see and for reference to the other teachers. This extra layer hides the ongoing mapping process from the outside world and lets one public see only what they choose.

2.2.1.4 Disadvantages of Curriculum Mapper

- Curriculum Mapper has an internal structure for USA and Canada education system. It is difficult to apply it for other countries and other documentation methods such as updating help and support documentation of an operating system.
- Since it is the oldest curriculum mapper it begins to lose its simplicity. In other words it requires advanced users not for novices.
- It is neither an open source application nor cheap for a teacher in most countries.
- It is not so user friendly, efficient and easy to use. It redirects the user only before he enters the item, then lets him alone. However an artificial intelligence may make it more easy to use by suggesting dynamic titles and warning the user with duplicates.
- The application does not allow the user to cite his database version. It makes the issue for itself by looking the date. However one may want the older database be the latest version in his work.
- It is monolingual i.e. does not support Turkish.

2.2.2 Atlas Curriculum Mapping

Atlas is a customizable, web-based application designed to electronically encompass the process of curriculum mapping which facilitates collaboration among teachers across subjects, grades and schools. Its extensions go beyond just recording and reporting, to the sharing of curriculum strategies

with administrators, superintendents, boards of trustees and parents. Armed with the most current and enhanced curriculum information, educators and administrators alike are empowered to make complex curriculum decisions in order to advance and improve the learning experience of all students on a continuum. Atlas is a:

- Tool designed for teachers.
- Tool useful for administrators.
- Tool for communicating with students and parents.
- A system for focused conversation.
- An instrument for transparent partnerships.
- The hub of all curriculum initiatives.
- The central nervous system of curricular discussions.
- An electronic town hall.
- A promise that the students won't get lost.
- Implemented properly, it can be transformational.

2.2.2.1 . Benefits of Rubicon's Mapping

Atlas allows educators to look through the macro lens at student's learning experience and build on what students have learned in previous years to prepare them for future classes and achievement.

Using Atlas, curricular information can be assembled and used by curriculum decision makers to:

Determine what is taught, as it actually occurs in the classroom.

Understand how students are being taught.

Make appropriate, immediate modifications to the curriculum.

Determine "why" certain performance results have been achieved.

Atlas can also give parents a larger view of what their children are experiencing in the classroom and the requirements needed to excel. It has the capability to enable community leaders and board members to see how schools are planning students' educational careers and what support is needed to ensure success.

2.3 Customer Survey

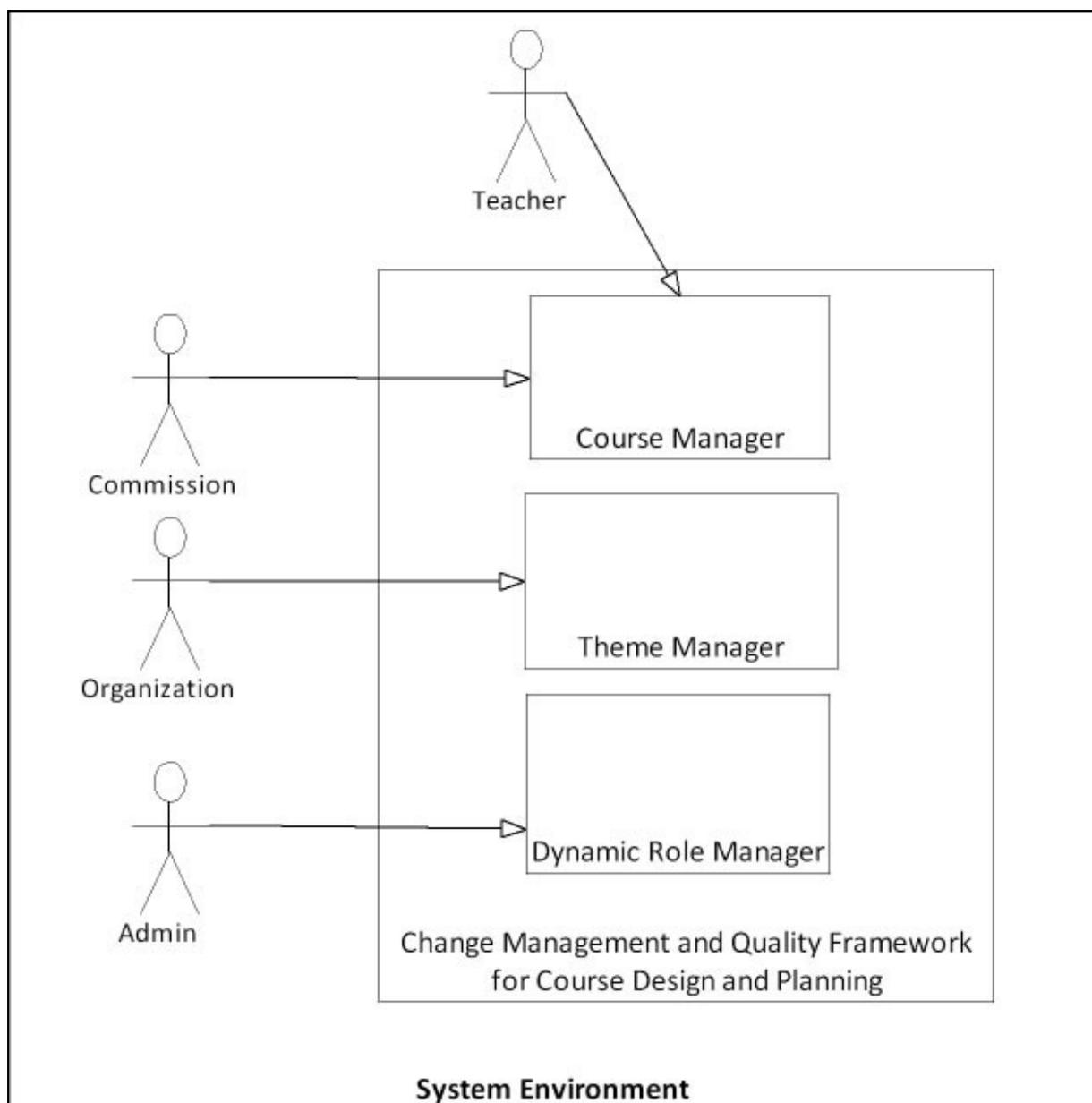
We had a talk with the possible customers in order to get the ideas of them. They told us that such application would be very comfortable for information sharing and optimizing the curriculum to the ideal one. Süleyman Eryıldız, a teacher in Kayseri stated that guiding the teachers when they were creating the curriculum was one of his biggest expectations from MEB.

Another approach for this project is updating the documentation of a new version of an application said Doğa GİRAY, project manager of Net Solutions in METU – Teknokent. They have great difficulty about preparing documentation and manual to an application. They've done this issue by hand, i.e. manually. Therefore it takes a long time. Although there exists similar software, this could be a better way, because of the project scope.

3 Requirement Specification

This section of this document gives an overview and the functionality of the project. We will describe all the informal requirements.

3.1 System Environment



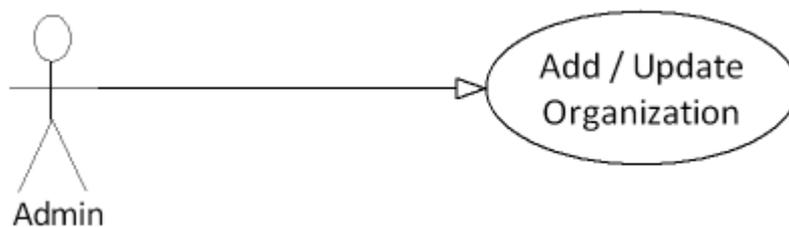
The Change Management and Quality Framework has four active actors and three cooperating systems. The Admin, Organization, Commission, Teacher access the system through the Internet. Those roles will communicate with the system by means of web forms. Three roles except only The Admin role should communicate with each other in a hierarchical point of view, and system entitles them to give warnings to each other at relevant times.

3.2 Functional Requirements Specification

This section outlines the use cases for the system.

3.2.1 Use case: Add/Update Organization

Diagram:



Brief Description

Admin adds organization to the system by entering related information.

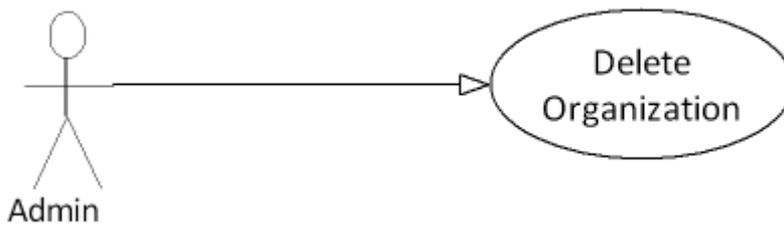
Initial Step-By-Step Description

Before adding organization information, the admin must have an access to the Internet

1. The admin logs in the system.
2. The admin clicks the new Organization.
3. If the admin wants to update the information related to the organization then the admin selects the organization.
4. The admin enters new organization information or changes old data.
5. The admin clicks the save button.
6. The admin see the message related to the organization creation or update.

3.2.2 Use case: Delete Organization

Diagram:



Brief Description

The admin can delete organization.

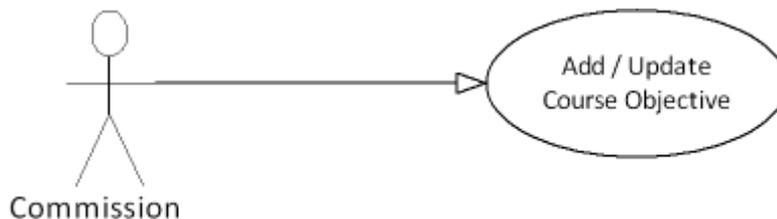
Initial Step-By-Step Description

Before deleting organization, the organization must be ready in the database.

1. The admin logs in and access the system.
2. The system lists all the organization.
3. The admin selects the organization from the gridview.
4. The admin clicks the delete button.
5. The admin see the message "Do you want to delete this organization?".
6. If the admin presses the ok button the organization will be deleted from the system.

3.2.3 Use case: Add/Update Course Objectives

Diagram:



Brief Description

The commission or assigned person by organization enters Course Objectives related to the specific course.

Initial Step-By-Step

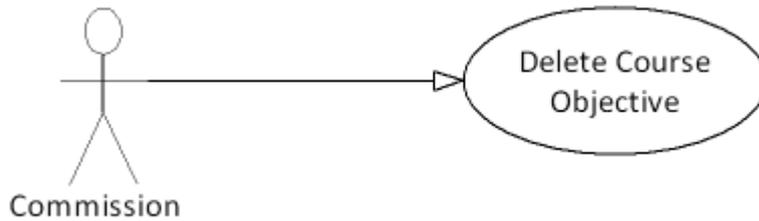
Before Adding course objectives, commission should be ready on the system.

1. The commission head or the assigned person log in the system.
2. The person clicks the New Course Objectives button.
3. If he/she wants to update the data, the person selects the course objectives from the gridview.

4. The person enters the related information or updates it.
5. The person clicks the save button for saving data.

3.2.4 Use case: Delete Course Objectives.

Diagram:



Brief Description

Commission can delete course objectives from the system

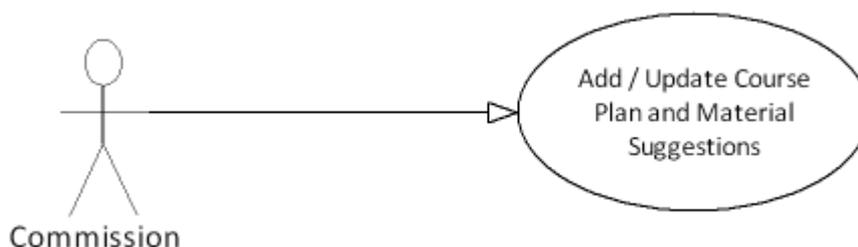
Initial Step-By-Step Description

Before suggestion, the course objectives and course must be entered to the system.

1. The commission logs in the system.
2. The commission selects the related course.
3. The commission clicks the delete button to delete the course.
4. The commission sees the message that “Do you want to delete this course objective?” message
5. If the commission presses the ok button the course objectives will be deleted from the system.

3.2.5 Use case: Add/Update Course Plan and Material Suggestions.

Diagram:



Brief Description

In addition to the adding or updating course objectives, the commission can also suggest course materials and course plans to the teacher as a template.

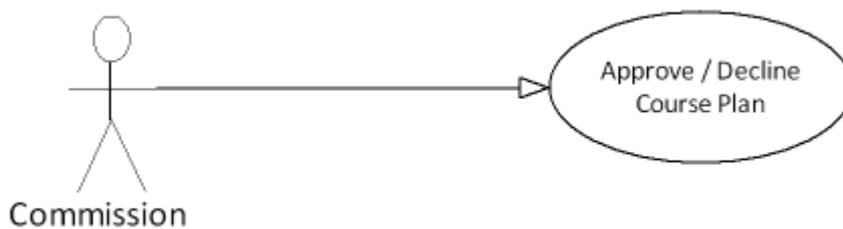
Initial Step-By-Step Description

Before suggestion, the course objectives and course must be entered to the system.

1. The commission logs in to the system.
2. The commission selects the related course.
3. The commission clicks the course plan suggestion button.
4. The commission enters new information or changes old data.
5. The commission clicks the save button.

3.2.6 Use case: Delete Suggested Course Plans and Course Materials.

Diagram:



Brief Description

Commission can delete suggested course materials and plans from the system.

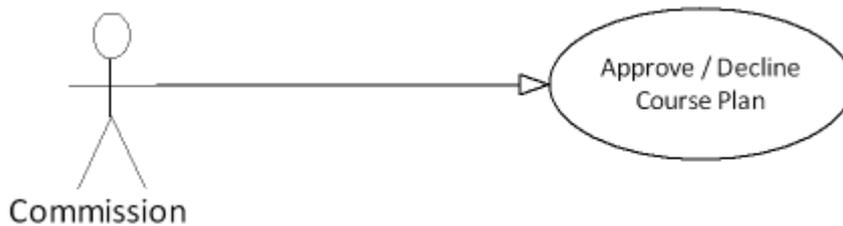
Initial Step-By-Step Description

Before suggestion, the course objectives and course must be entered to the system.

1. The commission logs in the system.
2. The commission selects the related course.
3. The commission selects course plan button from the selected course.
4. The commission selects course plan from the gridview.
5. The commission clicks the delete button.
6. The commission see the message that "Do you want to delete this course objective?".
7. If the commission presses the ok button the course objectives will be deleted from the system.

3.2.7 Use case: Approve or Decline Course Plan.

Diagram:



Brief Description

After the teacher prepares the course plan, it should be sent to the Commission for approving.

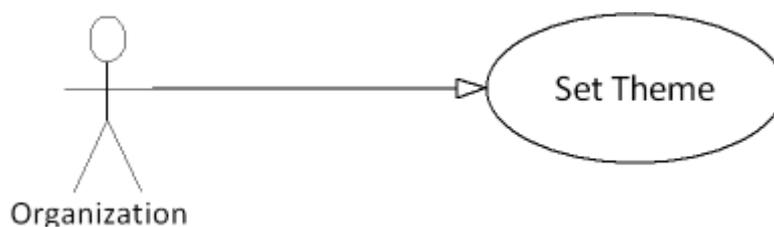
Initial Step-By-Step Description

The course plan prepared by teacher should be sent to the commission.

1. The commission logs in the system.
2. The commission selects the course plan waiting for approval.
3. The commission compares the course plan and course objectives.
4. If course plan does not conform to the objectives, he/she can decline the course plan with explanatory statements and points out the parts which does not satisfy.
5. Otherwise the commission can approve and sent it back to the teacher.

3.2.8 Use case: Set Theme

Diagram:



Brief Description

The Organization accesses the system and arranges a set of a basic theme.

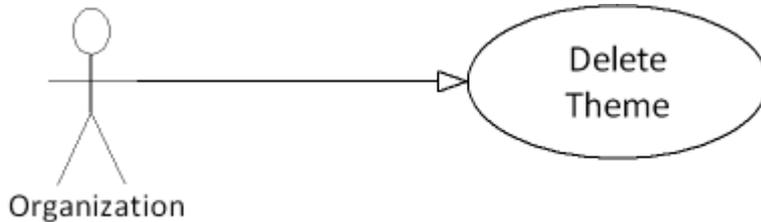
Initial Step-By-Step Description

1. The Organization accessed the system and logged in.
2. The Organization chooses the Themes button.
3. The Organization defines a basic theme.

4. The System invokes the necessary modules and sets the relevant warn flags.

3.2.9 Use case: Add Commission

Diagram:



Brief Description

The Organization accesses the system and deletes a theme.

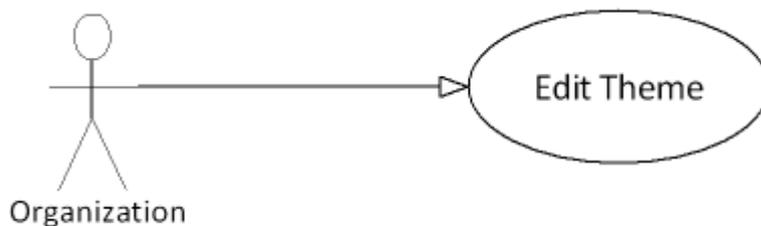
Initial Step-By-Step Description

Before this use case can be initiated, the Organization has already connected to the system. The Organization needs to have already created themes also.

1. The Organization chooses the Themes button.
2. The Organization chooses an existing theme.
3. The Organization chooses the Delete button.
4. The System backups the old theme via versioning module.
5. The System generates and monitors themes as preview.

3.2.10 Use case: Edit Theme

Diagram:



Brief Description

The Organization accesses the system and arranges a set of a basic theme.

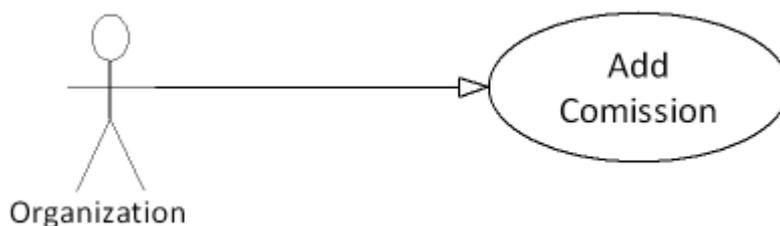
Initial Step-By-Step Description

Before this use case can be initiated, the Organization has already connected to the system. The Organization needs to have already created themes also.

1. The Organization chooses the Themes button.
2. The Organization chooses an existing theme.
3. The Organization chooses the Edit button.
4. The Organization fills in the relevant descriptive entry boxes.
5. The Organization chooses the submit button.
6. The System backups the old course plan via versioning module.
7. The System generates and monitors theme as preview.
8. The System invokes the necessary modules and sets the relevant warn flags.

3.2.11 Use case: Add Commission

Diagram:

**Brief Description**

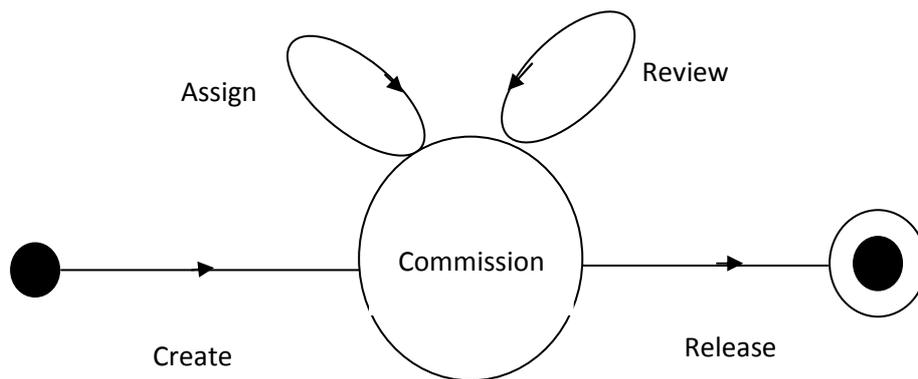
The Organization creates a commission from scratch.

Initial Step-By-Step Description

Before this use case can be initiated, the Organization has already connected to the system.

1. The Organization accessed the system and logged in.
2. The Organization created a commission.
3. The Organization assigned one or many commissioners to created commission.
4. The system invokes the necessary modules and sets the relevant warn flags.

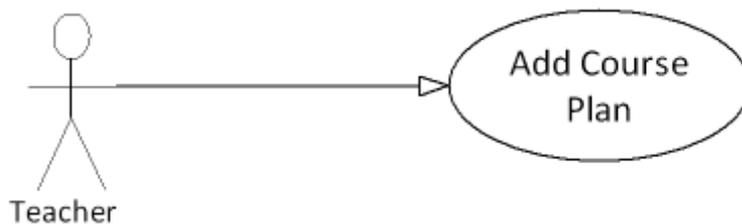
5.



Figure– Commission Generation Process

3.2.12 Use case: Add Course Plan

Diagram:



Brief Description

The Teacher creates a course plan from scratch.

Initial Step-By-Step Description

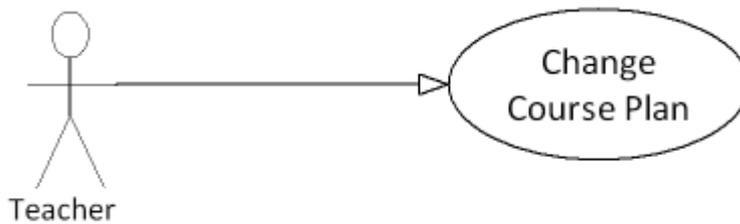
Before this use case can be initiated, the Teacher has already connected to the system.

1. The Teacher chooses the mycurriculum button.
2. The Teacher chooses the mycourseplans button.
3. The Teacher chooses the createcourseplan button.
4. The Teacher fills in the relevant entry boxes.
5. The Teacher chooses the submit button.
6. The System generates and monitors course plan as preview.

3.2.13 Use case: Change Course Plan

Diagram:





Brief Description

The Teacher makes updates on an existing course plan.

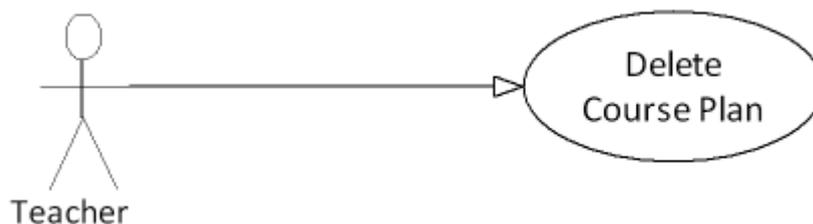
Initial Step-By-Step Description

Before this use case can be initiated, the Teacher has already connected to the system. The Teacher needs to have already created courseplans also.

1. The Teacher chooses the mycurriculum button.
2. The Teacher chooses the mycourseplans button.
3. The Teacher chooses an existing course plan.
4. The Teacher chooses the Edit button.
5. The Teacher makes changes in the relevant entry boxes.
6. The Teacher chooses the submit button.
7. The System backup the old course plan via versioning module.
8. The System generates and monitors course plan as preview.
9. The System invokes the necessary modules and sets the relevant warn flags.

3.2.14 Use case: Delete Course Plan

Diagram:



Brief Description

The Teacher makes delete an existing course plan.

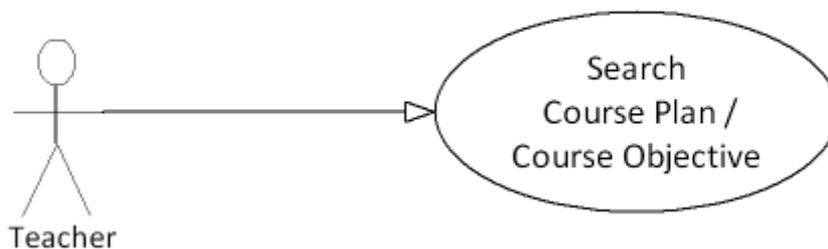
Initial Step-By-Step Description

Before this use case can be initiated, the Teacher has already connected to the system. The Teacher needs to have already created courseplans also.

1. The Teacher chooses the mycurriculum button.
2. The Teacher chooses the mycourseplans button.
3. The System uses the sendto module to bring up the Teacher 's account system.
4. The Teacher chooses an existing course plan.
5. The Teacher chooses the delete button.
6. The Teacher chooses the submit button.
7. The System backup the old course plan via *versioning* module.
8. The System monitors existing course plan list from account.
9. The system invokes the necessary modules and sets the relevant warn flags.

3.2.15 Use case: Search Course Plan / Course Objective

Diagram:



Brief Description

The Teacher accesses the system, searches for a course plan or objective and downloads it to his/her machine.

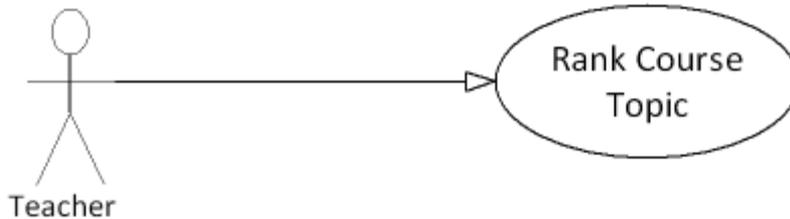
Initial Step-By-Step Description

Before this use case can be initiated, the Teacher has already connected to the system.

1. The Teacher chooses to search by teacher name, course category, or keyword.
2. The system displays the choices to the Teacher.
3. The Teacher selects the course plan, course objective desired.
4. The Teacher chooses to download the data.
5. The system provides the requested course plan, course objective.

3.2.16 Use case: Ranking Course Topic

Diagram:



Brief Description

The Teacher accesses the system, and gives rating to topics over ten.

Initial Step-By-Step Description

Before this use case can be initiated, the Teacher has already connected to the system and made a search for relevant topics.

1. The system displays the choices to the Teacher.
2. The Teacher selects the course topic desired.
3. The Teacher chooses the ratethistopic button.
4. The Teacher enters the appropriate rating value.
5. The Teacher chooses the Rate button
6. The System uses the ratecoursetopic module to evaluate the current rating of topic.
7. The System uses the autoratecourseplan module to evaluate the course plan's current rating that topic belongs to.

3.3 User Characteristics

The admin is expected to initialize the system and makes necessary configurations of the system such as creating organization. In addition, the admin is responsible to maintain the system's stability.

Organization is an educational institution that can create commissions, and make the necessary changes on them. The organization can contain many commissions and many teachers.

Commission is a group of people or one person who is/are responsible from entering the course objectives, course plan templates and suggested course materials assigned by the organization. Moreover, they monitor active course plans and materials whether it should be approved or not.

Teachers are responsible to add new course plan and materials by using related course objectives. Teachers contribute to the ranking of course plans by giving ratings to the topics of the course plan.

3.4 Non Functional Requirements

3.4.1 Usability

Usability is an important issue because the audience of this project is not much familiar with technology. Therefore we make the system interface as user friendly as possible.

3.4.2 Reliability

The system should have stable functionalities working in the way it is designed. In order to achieve a robust and rapid system, all parts of the system should be guaranteed to work cooperatively well. The system records all of the activities that user should benefit via its versioning modules

3.5 Minimal Hardware Requirements

The minimal hardware requirements for our project are

3.5.1 For Development

Processor	Computer with a Pentium III-class processor, 600 MHz Recommended: 1 gigahertz (GHz)
Available Hard Disk Space	Required Basic capacity: 40 MB of available space required on system drive 160 MB of available space required on installation drive
RAM	192 MB Recommended: 256
Operating System	Windows 2000, Windows XP, Windows Server 2003, or Windows Vista
CD-ROM Drive or DVD-ROM Drive	Not Required
Video	800 x 600, 256 colors Recommended: 1024 x 768, High Color 16-bit
Mouse	Microsoft Mouse or compatible pointing device

3.5.2 For User

Active Internet connection and a low level computer can use this system.

3.6 Minimal Software Requirements

3.6.1 For Development

- Visual Studio Professional 2005
- SQL Server 2005 Standart Edition
- Microsoft SharePoint Portal Server 2007

3.6.2 For User

IE 5.5+ or Firefox

4 Project Schedule

Project milestones are simply stated following;

1. Proposal report (A clear statement of the problem)
2. Requirements analysis report (Explaining the problem and solution)
3. Initial Design Report (Explaining how the problem be solved)
4. Detailed Design Report (Specifying the particular software system that will meet the stated requirements)
5. Prototype Demo

4.1 Gant Chart

Gantt Chart is attached to the end of the report.

5 Risk Management

Recognizing the risks of a project is the first and also one of the most important steps in software designing. Then analyzing the risks and classifying them with respect to rank and impact is one of our goals in this part of the report. Finally a plan is developed to manage those risks with high probability and high impact.

5.1 Project Risks

Inter-platform Compatibility: In recent year's technology becomes grooving so fast that it is difficult to keep track of this rapid development. For this reason there may be a risk that after a few years some computers may not have supported system compatibility to our project. For instance we will use some JavaScript's but some browsers such as FireFox 3.x has an add-on to block JavaScript due to security reasons. In the feature these kinds of risks may occur.

Security: The data stored on the web site (web server) are not the only data that must be protected; all entered data must also be protected in order to ensure that all curriculums are carried out in a permissible manner.

System Reliability: Customers demand an easy-to-use and reliable system. While security issues are closely related to reliability, providing a service that is available at all times is a necessity to provide services to the customers. The system must provide a great security meanwhile it must have to be easy-to-use reliable system.

Platform Dependency: Since the project is developed in the .NET platform which needs that the server must also have the same version of .NET framework. Obviously, server must be run by Microsoft operating system (2000 +).

Staff: There are few people in our project group who are not familiar with Visual Studio platform and ASP .NET (C#) language. This lack of knowledge may result in latency in the project timeline.

Inexperienced Users: The final software requires somehow experienced and advanced users, therefore some novice users may be lost in the application or may create unnecessary data. As a result some garbage data may occur.

5.2 Risk Table

Risks	Category	Probability	Impact	RMMM
User database may be damaged	CU	30%	1	R1
Size of user may be greater than expected	PS	30%	3	R2
Less reuse than planned	PS	70%	2	R2
Data may lost during transporting	CU	30%	1	R1
Lack of training on tools	DE	80%	3	R3
Staff inexperienced	ST	30%	2	R4
Lack of communication among staff	ST	60%	2	R4
Unexpected input from user	CU	30%	3	R5
Server may be shut downed while running	SE	5%	1	R1
Irrelevant data entered by user	CU	20%	2	R4
User may leave without logging out	CU	30%	2	R5
Coincided user log in	PS	10%	2	R2
Editing same content by different users at the same time	CU	2%	2	R6

5.3 Overview of Risk Mitigation, Monitoring, Management

To mitigate, monitor and manage these risks stated above, project administration must develop a strategy for reducing such risk. The following steps may be taken:

R1:

- Save the last successfully processed database in another place.
- Do not make any change until the last step of confirmation.
- Send any bug or unexpected input/output to the system administrator.
- While processing one item of the database do not make any change on it in another place.

R2:

- Dynamically implementation of user database
- Do one job of a user after previous task

R3:

- Create training tools for the team
- Make a test application in a local area with arbitrary users

R4:

- Meet the staff regularly in order to solve any problem that they have.
- Increase their communication methods before the task begin
- Assign a backup staff for every critical technologist (optional)
- Conduct peer reviews of all work
- Organize project teams so that information about each development activity is widely dispersed.

R5:

- Check the correctness of inputs
- Put a time out counter to the log in manager
- Prepare a well-prepared documentation

R6:

- Check first that the user editing the content part is different from the other user.
- Check the user's hierarchy and permission; define which one is higher if they are editing the same content part.

- Display the users currently if there are other users editing the same content.