Software Architecture Project

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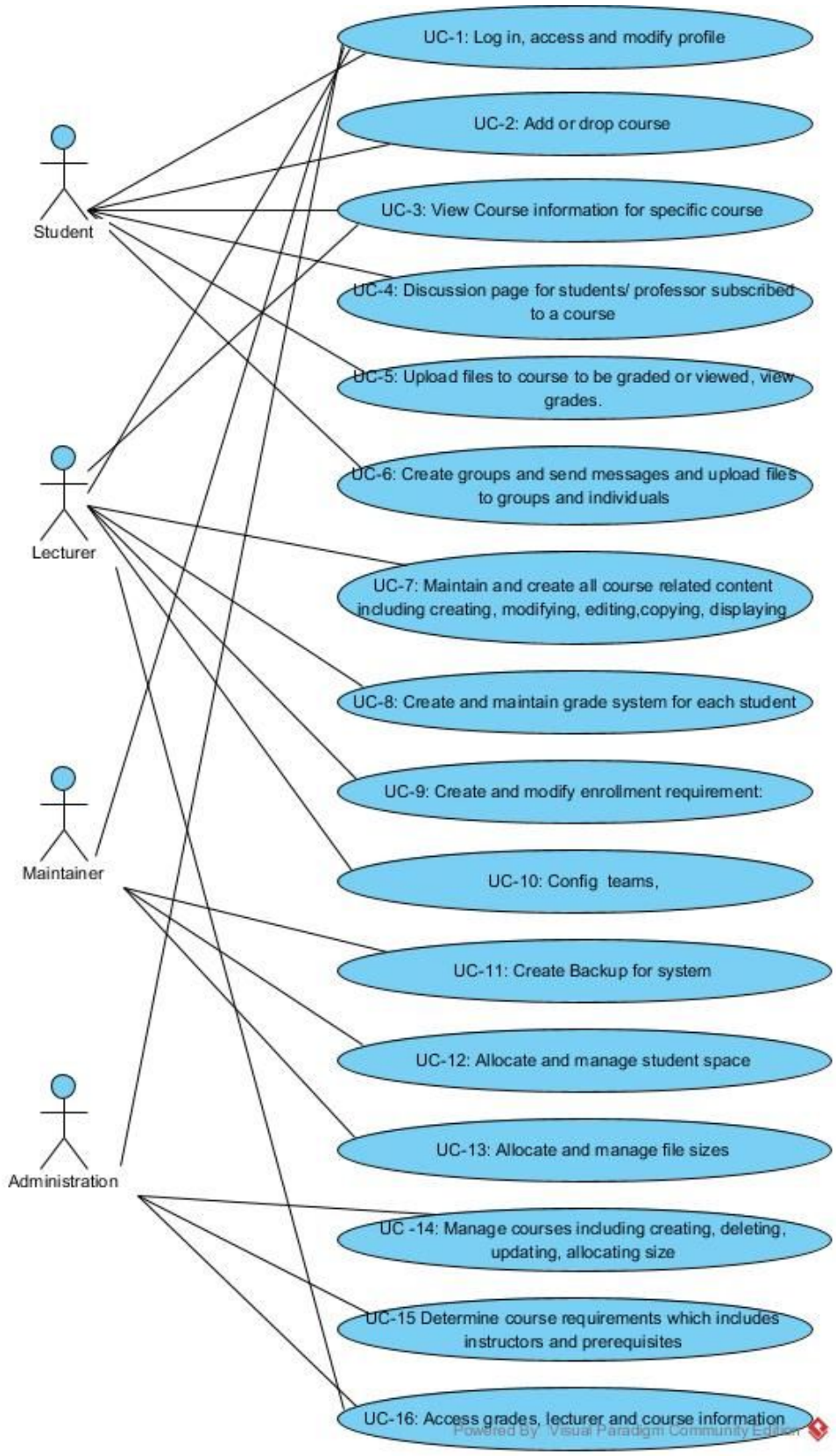
Business Case

The use of course management systems is becoming increasingly popular for large teaching institutions. There are a variety of off the shelf applications available but most are lacking in certain areas and have some main issues. The development of this course management system will aim to create an entirely new application that deals with most of those issues from previous off the shelf softwares. The users satisfaction is of utmost importance and this software will be designed to be simple with an easy to navigate UI, as well as secure, maintained, while providing all the necessary and important features that a system of this importance should have. This system is aimed towards many institutions as it is highly scalable and efficient. With the use of cloud application servers and layered database architecture it can provide powerful computation as well as simple application.

Use Case Model


UC-1: Log in, access and modify profile
UC-2: Add or drop course
UC-3: View Course information for specific course
UC-4: Discussion page for students/ professor subscribed to a course
UC-5: Upload files to course to be graded or viewed, view grades.
UC-6: Create groups and send messages and upload files to groups and individuals
UC-7: Maintain and create all course related content including creating, modifying, editing,copying, displaying
UC-8: Create and maintain grade system for each student
UC-9: Create and modify enrollment requirement:
UC-10: Config teams,
UC-11: Create Backup for system
UC-12: Allocate and manage student space
UC-13: Allocate and manage file sizes
UC -14: Manage courses including creating, deleting, updating, allocating size
UC-15 Determine course requirements which includes instructors and prerequisites
UC-16: Access grades, lecturer and course information
Student
Lecturer
Maintainer
Administration
Powered by Visual Paradigm Community Edition

Use Case

Use Case	Description
UC-1	Log in, access and modify profile
UC-2	Add or drop course
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UC-13	Allocate and manage file sizes
UC -14	Manage courses including creating, deleting, updating, allocating size.
UC-15	Determine course requirements which includes instructors and prerequisites
UC-16	Access grades, lecturer and course information

Quality Attribute Scenario

ID	QAS	Scenario	Associated UC
QA-1	Security	When user login into the system, system should determine its user privilege and only allowed pre-determined access and should work 100% of the time	All
QA-2	Availability	The system should work 24/7 without any error. During the expected downtime, maximum 4 hours/month.	All
QA-3	Availability + performance	A message should be send to all users 48 hours prior to downtime and the downtime period should be at off-peak hours	All
QA-4	Useability	The system should have an simple UI to navigate and able to get to any content with maximum three clicks	All
QA-5	Performance	The system should able translate and display two language	All
QA-6	Interoperability	The data from the system can be extracted and printed should work 100% of time	All

QA-7	Interoperability	The system should be able to import roster information into the course router	UC-7
QA-8	Maintainability	The system shall be easily maintained	U-11,U-12
QA-9	Testability	The system shall be easily tested	U12
QA-10	Scalability	The system shall be scalable	U-12, U-13
QA-11	Interoperability	The system shall be interoperable with secondary university system	U-12, UC-14
QA-11	Extensibility	The system shall allow administrator makes exception to enrollment	UC-9

Constraints

ID	Constraint
CON-1	The system must be accessed from a web browser (Chrome, IE, Safari) in various platforms: Windows, IOS, Linux/Unix, Tablet, Phones
CON2	Multiple simultaneous connection is required, size > 300
CON-3	High bandwidth is required to allow fast enough download and upload of files and course materials
CON-4	Server with large capacity is required to store all data since day 1
CON-5	A large relational database is required to maintain student progression and

	enrollment requirement

Architectural Concerns

ID	Concern
CRN-1	Planning architecture of a large relational database with many complexities.
CRN-2	Organizing information without nesting two tables into one.
CRN-3	Strong knowledge of sql to query the views and input into the database, as well as implementation in a variety of languages such as php or asp.net.
CRN-4	Work distribution among all members

ADD Step 1: Review Inputs

We will first review the inputs and determine which requirements will be drivers.

Category	Details
Design Purpose	This system will be used for schools of any size in order for that institution to perform many tasks such as delegate, manage students courses and grades.
Primary Functional Requirements	UC-1 Necessary for all parties in order for the system to work fully. UC-2 Students are the main user of the system and their main goal is to apply to a course. UC-3 View Course information for specific course UC-14 Creates most of the required data for the system.

Quality Attribute Scenario

ScenarioID	Importance to Customer	Difficulty of implementation According to Architecture
QA-1	High	Low
QA-2	High	High
QA-3	High	Low
QA-4	High	High
QA-5	Low	Low
QA-6	High	Medium
QA-7	High	Low
QA-8	Medium	Medium
QA-9	Low	Low
QA-10	Low	High
QA-11	Medium	Low
QA-12	Medium	Low