Systems Requirements Specifications Documents

Project Number : 24
Team Number : 45
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Brief Problem Statement

Building a cloud based learning management System (LMS) exclusively for AR/VR courses with user authentication, Custom UI, certificate generation and students to know their performance.

System Requirements

- Client needs a full scale, cloud deployed LMS to create, publish and host courses, and issue certifications to students.
- Certification issuance implies the LMS must also have an exams and grading module.
- The LMS should be able to host documents (assignments / books / paper / reading material)
- The LMS should be able to stream VoD (as course content will be largely in video mode), and render in multiple qualities and playback speeds
    - This involves all principles of HLS or DASH streaming protocols and caching to improve serving performance.
- Students should be able to see their progress in the courses they have enrolled.
- OpenEdx's Tutor distribution was configured to suit client's requirements
- Tutor has been deployed on an AWS EC2 instance.
- DNS: Porkbun
- Video serving Platform: Vimeo.
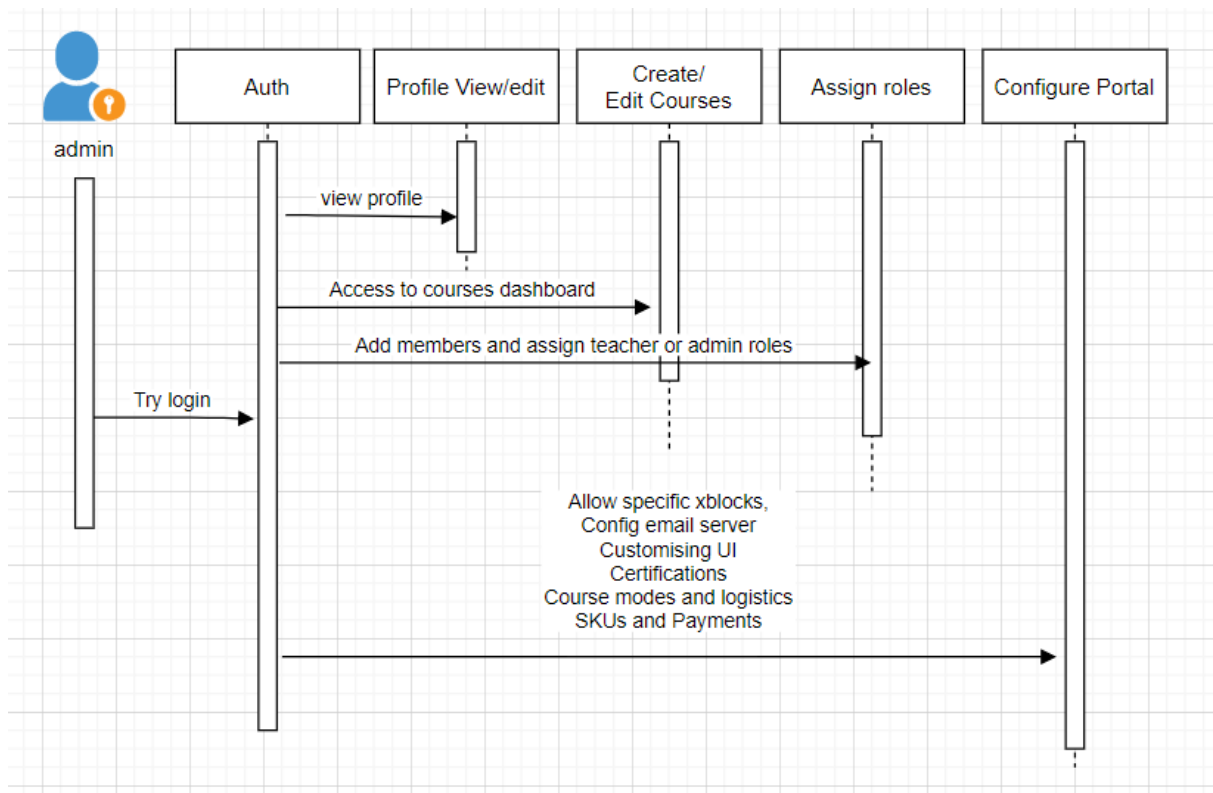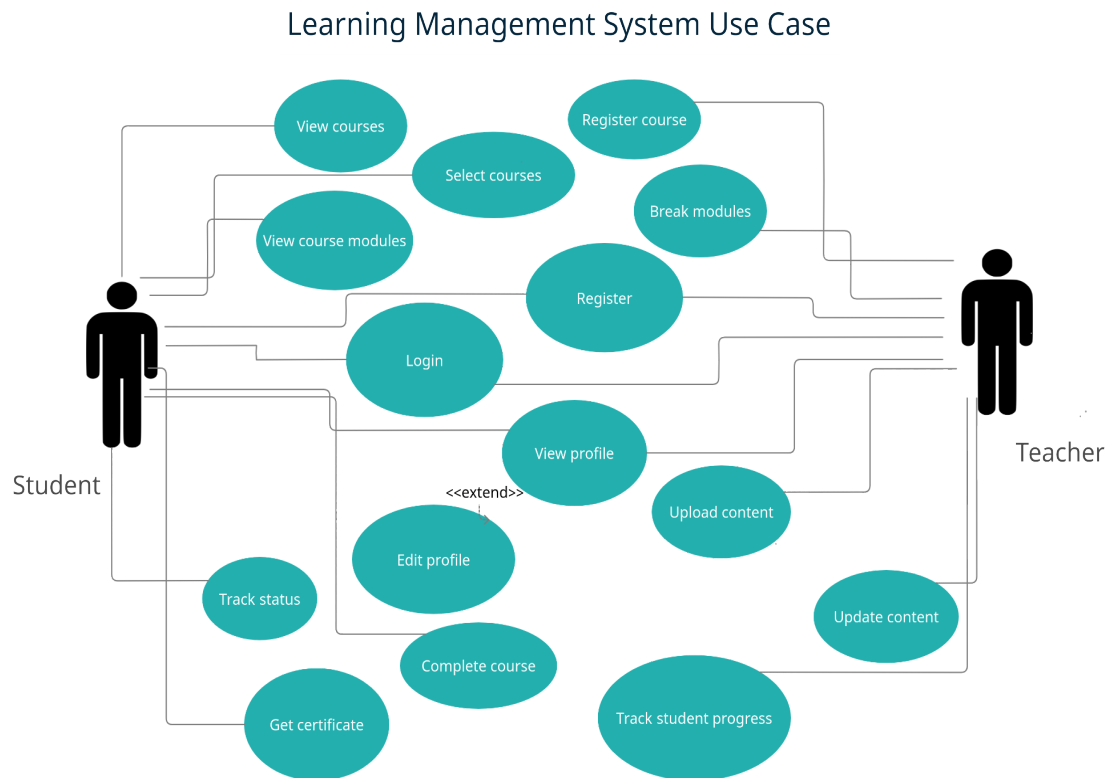
Users Profile:

- Students -
    - have credentials to access course material, questionnaires
    - will get certificates after completing a course. Students can be either school students or college students, and we expect them to be comfortable with using platforms like this one. Focus will be on making a neat and understandable UI so that the platform is easy to use.
    - Be able to see their performance in the course
- Teachers
    - will add course material
    - Can update course material
    - Attach locally or externally hosted media
    - Refactor Course Modules
    - Initiate discussion posts
    - make questionnaires
- Admin
    - Provide staff permissions
    - Configure portal
    - Create and customise certificate

Feature Requirements

S. No.	Use case name	Description	Release
1.	Authentication	Students, Staff and Admin need to set and enter creds to gain access to the portal	R1
2	View and Edit profiles	Student, Staff and Admin will be able to view his/her profile	R1
3	View course	Have a look which courses are listed	R1
4	Enrol in a course	Student enrols in a course	
5.	Publish a course	Teacher should be able to create and publish a course	R1
6.	Have modules	For a certain course, the teacher should be able to have it into modules	R2
7.	Upload content	Teacher should be able to upload content	R2

		for a particular module in a course	
		Upload and host media files	
		Video serving modules	
8.	Update content	Teacher should be able to upload content for a particular module in a course	R2
9	Refactor Content	Staff can refactor the course content	
10.	Set assessments	Set graded modules/exams for students to complete	R2
11.	View Performance	The student should be able to track his/her status of a particular course like what percentage of the course has been completed till that time	R2
12.	Render certificate	Upon completion of a course, certificate gets generated automatically	R2
13.	Modify perms	Admin can give certain users staff (teacher) permissions. Admin can also give admin permissions to other users if more than 1 admin is required.	R2
14.	Configure portal	Admin has the ability to add/edit course modes i.e. whether the course track is audit, honours, professional etc.	R2
		Set multiple tracks for a course	
		Edit config files for emailing Edit config files for theming Change file upload perms and settings	
15.	Create and customise certificate	Admin can create and edit the certificate for any course, activate/deactivate certifications for a course	R2

Use Case Diagram

Learning Management System Use Case

User Case Description

User case number	UC -1
Use case Name	Authentication
Overview	Student will be asked for some details for registration
Actors	Student / Staff / Admin
Pre-condition	None
Flow	Credentials will be hashed and matched in the backend.
Post Condition	Allows access to the LMS For the admin portal, allows access only to the Admin to configure the LMS For the Studio Portal, allows access only to Staff and Admin to configure individual courses

User case number	UC - 2
Use case Name	View and edit profile
Overview	To view and modify profile
Actors	Student / Staff / Admin
Pre-condition	Authenticated
Flow	Profile details are fetched from the backend and served to the user. Then are overwritten.
Post Condition	Details populated and/or overwritten.

User case number	UC - 3
Use case Name	Enrol in a course

Overview	Enrolling in a course.
Actors	Students
Pre-condition	Authentication. If not authenticated, Portal will ask the user to sign in or sign up.
Flow	Course should be published and accepting enrolments
Post Condition	None

User case number	UC - 4
Use case Name	View Course(s)
Overview	Anyone can view what courses are floated on the website.
Actors	Anyone, even non logged in users
Pre-condition	none
Flow	Listed courses be served from the database.
Post Condition	Listed courses be displayed

User case number	UC -5
Use case Name	Publish a Course
Overview	Publishing a course makes its live version visible to course participants.
Actors	Staff
Pre-condition	Staff be authenticated. Publish option is available only after creating a course.
Flow	The students see the live version of the course.
Post Condition	Students can view content/grading exams.

User case number	UC -6
Use case Name	Have modules
Overview	Each course can be divided into subsections i.e. modules.
Actors	Staff
Pre-condition	The course should be created already.
Flow	The teacher can create new modules by filling required details in the Studio portal.
Post Condition	After publishing, new modules are visible to students.

User case number	UC -7
Use case Name	Upload Content

Overview	In a (sub)section, the Staff can
	   - Upload internal/externally hosted media files
	   - Make a module which streams video

Actors	Staff
Pre-condition	Course should be existing
Flow	For uploading media files, they have to be uploaded on the `Files and Uploads` portal, which generates a URL. That URL is embedded in the `LTI - external resources` section of the course module. For Video modules, the video is uploaded to vimeo which gives an embed link. This link is pasted on to an IFrame module, so that Vimeo's video player is rendered and requests video stream from servers.
Post Condition	After publishing, Students can view more content in a course

User case number	UC -8
Use case Name	Update content
Overview	Teacher should be able to update content for a particular module in a course

Actors	Teacher/Tutor
Pre-condition	Course should be existing
Flow	Same as upload content
Post Condition	None

User case number	UC -9
Use case Name	Refactor content and module order
Overview	Course modules can be renamed and their order changed.
Actors	Staff
Pre-condition	Course should be existing with non-zero material uploaded
Flow	Drag and reorder functionality is available.
Post Condition	After publishing, Students can view the new order

User case number	UC -10
Use case Name	View Performance
Overview	The student should be able to track his/her status of a particular course like what percentage of the course has been completed till that time
Actors	Student
Pre-condition	Student should be logged in and enrolled in that course
Flow	The student can see the percentage of course completed by him by getting the number of modules completed from backend and performing some simple calculations in frontend
Post Condition	None

User case number	UC -11
Use case Name	Generating certificate
Overview	Once a student completes a course a certificate must be automatically generated
Actors	Automated
Pre-condition	Student should have completed the course
Flow	Criteria for passing a course is set by Staff and Configurations for the certifications is set by Admin
Post Condition	Certificate contains a Credential ID. Students can get a PDF render of the certificate as well.

User case number	UC -12
Use case Name	Staff permissions
Overview	Admin can give certain users staff (teacher) permissions. Admin can also give admin permissions to other users if more than 1 admin is required.
Actors	Admin/Teacher
Pre-condition	There should be an admin for the LMS and also a user who is to be given staff/admin permissions and also the course for which permission is to be given
Flow	The admin can visit the studio and search for a particular course in which he/she wants to add a staff member. The admin can enter the email id of that user and that user will get staff/admin permissions depending upon the case.
Post Condition	None

User case number	UC -13

Use case Name	Configure the portal
Overview	Admin has the ability to add/edit course modes i.e. whether the course track is audit, honours, professional etc.
	Set multiple tracks for a course
	Edit config files for emailing Edit config files for theming Change file upload perms and settings
Actors	Admin
Pre-condition	There should be an admin for the LMS and the course for which course mode is to be set.
Flow	The admin can visit the admin portal, go to course modes and choose the course for which to add/edit/delete the course mode. The list of course modes is present in the drop down menu. File upload permissions and settings can also be modified in the admin portal. To edit the config files the client will have to do ssh
Post Condition	None

User case number	UC -14
Use case Name	Create and customise certificate
Overview	Admin can create and edit the certificate for any course.
Actors	Admin
Pre-condition	There should be an admin for the LMS and the course for which certificate is to be created/modified
Flow	The admin can visit the studio portal, go to settings and choose certificates and then click on create certificate or modify an existing one.
Post Condition	None

Test Backlog

Use case	Test case
Authentication	Test if Students/Staff/Admin can log in to LMS, Studio (Staff and Admin only) and Admin portal (admin only) successfully
View and Edit profiles	Test if Students and staff are able to edit their profiles.
View Courses	Test if any logged in/non logged in user is able to view the courses up for listing.
Enrol in a course	Test if the is the student is able to enrol in a course
Publish a course	Test if the changes made to course are reflected in students' view after publishing
Have modules	Test if multiple modules are possible for one course.
Upload content	Test if media uploads are working, External resource links are working and the video renderer is actually playing the video.
Update Content	Test if changing the course content reflects as the students view it.
Refactor Content	Test if the dragging and reordering courses functionality affects the order in which students see the course.
Set assessments	Test if tests are visible to students and are being graded, and their scores being considered as per the grading policy.
View performance	Check if students are able to see their progress as they complete course material and exams.
Render Certificates	Test if students who passed a course are being issue certificates
Modify perms	Test if the Admin is able to assign some people certain roles
Configure the portal	Test if the admin can edit course modes, files uploads and settings in the admin portal and is able to ssh to edit config files. Test if the AWS server is up and the admin can ssh into the remote server.
Create and customise	Test if the admin can create and edit the certificate for any

certificate	course.