



WEB BASED CLASSROOM WITH EDUCATION TOOLS USING CLOUD COMPUTING

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Abstract: The COVID-19 pandemic has resulted in schools shutting all across the world. Globally, over 1.2 billion children are out of the classroom. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Research suggests that online learning has been shown to increase retention of information, and take less time, meaning the changes coronavirus has caused might be here to stay. E-Learning is an advanced system and powerful tool which supports teaching and learning by the use of Information and communication technology. It bridges the gap between a teacher and a student in different geographical locations. E-Learning is the use of technology to enable people to learn anytime and anywhere. In this presentation, we are presenting the idea of our web-based E-Learning Classroom platform. This app contains various features that are essential for conducting online learning such as Live Video Lectures, Online IDE, Assessments tool, Assignments Tool, etc. We are also presenting the workflow for the development behind this app, the stakes involved, and the scope of this app in the real world.

Index Terms - E-Learning, Cloud Computing, Web Application Model, WebRTC.

I.INTRODUCTION

An online learning platform is a web application or portal for educational content and resources that offers a student everything they need in one place: lectures, resources, opportunities to meet and chat with other students, and more. It is also an excellent way for the student and the teacher to monitor the progress.

Like any other online platform, one designed for learning represents a web application or portal with educational content and resources. This course content can be divided into different topics or subjects. It is typically uploaded to the platform by the course instructor or teacher, depending on the institution you're signed up with.

Among the things that also received attention was the attitude of individuals in LMS learning. There must be self-discipline to enable lecturers to continue to diversify learning and teaching materials. Lecturers also need to be creative to attract students to continue using the LMS.

Everyone should strive to diversify learning materials and content, and students who need to find other sources of information digitally. This is great for improving students' skills in obtaining the information required from other systems and sources.

The new normal in education is the increased use of online learning tools. The COVID-19 pandemic has triggered new ways of learning. All around the world, educational institutions are looking toward online learning platforms to continue with the process of educating students. The new normal now is a transformed concept of education with online learning at the core of this transformation. Today, digital learning has emerged as a necessary resource for students and schools all over the world. For many educational institutes, this is an entirely new way of education that they have had to adopt. Online learning is now applicable not just to learn academics but it also extends to learning extracurricular activities for students as well. In recent months, the demand for online learning has risen significantly, and it will continue doing so in the future. This model integrates different tools like starting a meeting, recording it, uploading it and yes, coding too. This web-app will save time, scrolling and makes it easy to create class, distribute assignments, code, communicate and stay organized. It's not only for teachers and students but for any organization who is working with big teams.

II. PROPOSE MODEL -

In Our Model, we have tried to put all the actions and interactions between student and instructor into parts called modules. Each module will work in its own entirety. Some of the important modules in this are :

1. Class Module:

This is the module in which classroom data to be shown is present. All the other modules will coincide in this module. Announcements, users, exams, assignments, study material and much more to be provided to students are monitored in this module.

2. User Module

This is the module in which user roles information is present such as classroom he is present in, attendance, assignments will be present in this module.

3. Exam Module

This is the module where instructors will be able to create and publish exams for student's assessment, and students will be able to access those exams as well as the result that will be submitted by instructors after exam submission.

4. Assignment Module

This is the module in which instructors will be able to create assignments as assessment methods and students will be able to submit those assignments which will help them learn and assess easily.

5. Other Characteristics

In addition to those, there are also standard and supported elements available in LMS and LAMS such as modules including discussion forums and doubts and video conferences with live boards.

Usage of the virtual classroom model by each of the participants is summarized below.

Student: Once logged in, students access a particular course in the classroom. They get access to live video lectures and can participate in discussions. They can also access course materials for each of the enrolled courses. They can edit their personal information and view grades.

Faculty: Faculties conduct live video lectures and participate in discussions. They can edit the course materials and edit grades of students.

Administrator: Administrator is responsible for the correct functioning of the virtual classroom. They manage the classroom, for example, they set the time table for the classroom. They also deal with complaints received about the classroom.

III. EASE OF USE -

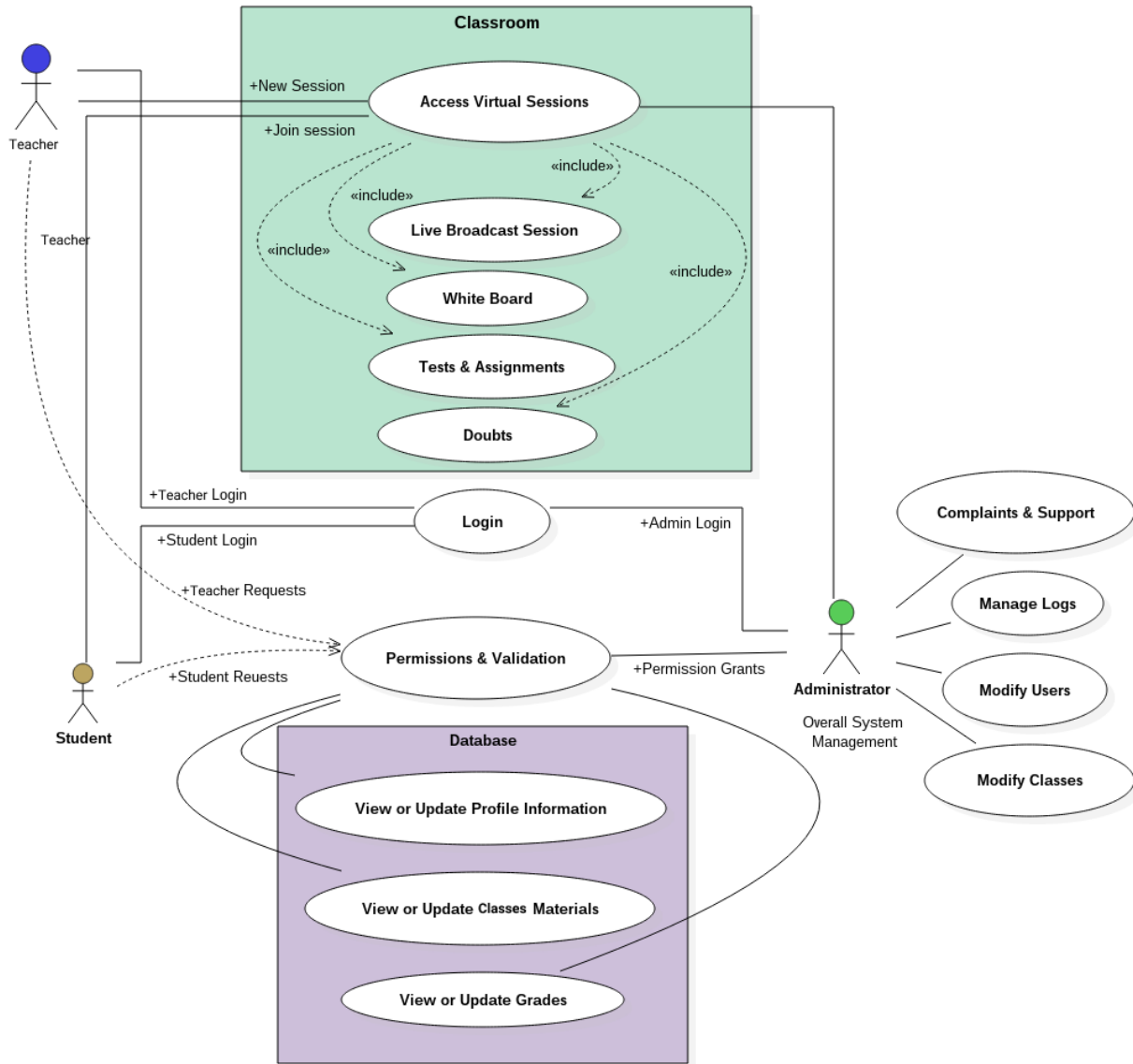
Below is the use case(Table 1) to show some of the common use case in this model :

Table 1 - Use Case Table

U.Id	Use case	Description
1.	Login	Students, Faculty and Admin have a common login platform from where they are directed to their respective use page.
2.	Access Virtual Sessions	Here, different users have required facilities, i.e joining classrooms for students, creating new class rooms for faculty, managing operations for admin etc. This includes live broadcast sessions, interactive whiteboard, tests and a doubt form.

3.	Live Broadcast Stream	Faculty can initiate live study sessions and students can join and interact with the live session.
4.	Permissions and validation	Students and Faculties have many dependencies. Admin can allow or block access and specific features for certain users. Based on this, users have different usage rights for database entities.
5.	View or Update Profile Information	The database keeps track of students and teachers history and profile information, this helps in improving the system based on usage history and statistics.
6.	View or Update Course Materials	Faculty is allowed to offer new courses to the students along with all the relevant information and helpful resources supporting the same.
7.	View or Update Grades	Faculty grades students based on their performances in the chosen courses and can be viewed by the students.
8.	Complaints and Supports	The administrator sees to and manages the complaints and suggestions by the users which helps in constant improvement of the system and avoids unexpected crashes.
9.	Manage Logs	All the transcripts and logs for the live sessions, discussions and submissions are to be stored and archived on a periodic basis. This ensures ease in retrieval of data as and when necessary.

This use case in the form of diagram can be resolved as below :



Web Real-Time-Communication (WebRTC) which is a free and open project which provides rich and optimized communication capabilities for live broadcasting/streaming for lectures which uses socket connection. All the other things such as authentication, frontend and backend can be created easily with the help of the latest web technologies very efficiently.

IV. FUTURE SCOPE

As we have divided everything in the form of modules, this makes this system highly scalable and new modules and features can be added time to time to increase interactivity of both instructor and students. Also the use of cloud in this will increase the scalability of this module in terms of storage and also the deployment.

Also the addition of more interactive ways such as virtual reality, gamification, etc. can be easily integrated with help of cloud computing.

V. CONCLUSION

From this project of SVCA (Simple Virtual Classroom Application) we have made the interaction between student and teacher very easy.

We created a platform for teachers which helped them grade students easily, creating class meetings and updating the timetable for classes, sending class meetings to students and a forum where everyone can talk, raise questions about the classes and see the recording of meetings and make notes.

We created a platform for students which helped them see their grades easily, see the meeting recording, details of every class, when it will happen, what is class about and what is the percentage of attendance you have in a specific class and the forum in which students can ask the questions about a class/topic.

While we were creating SVCA (Simple Virtual Classroom Application) we had one major goal in our mind and that was to create the easement which we had while we were in offline mode, the same easement is provided in our app.

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