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Class Z - A Virtual Classroom Designed Effectively using MERN Technology

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ABSTRACT: Class Z - A virtual environment is a Learning Management System (LMS) that provides all of your courses, materials and gives you access to your teachers. It is the inexorable trend of the application of modern information technology in education. It is one of the major learning methods in the era of information that allows students and lecturers to go online and continue their normal school activities. The traditional method of teaching and learning has some shortfalls. Some of these includes: noise making in the lecture hall, poor ventilation, extreme temperature and inconveniency for both lecturers and students that leave far from the school environment all of which contribute to the poor performance of students in their academic life. The proposed system is equipped with features that will minimize if not totally eradicate the aforementioned problems.

KEYWORDS: Computer Vision, Artificial Intelligence, Computing Methodology, MongoDB, hypertext markup, web-app, classroom.

I. INTRODUCTION

The virtual classroom is a digital learning environment that allows teachers and students to connect to the internet in real time. Virtual Classes use video conferencing, white online boards and screen sharing to allow teachers to hold live lectures, working office hours, and conversations with students in a collaborative environment. Virtual classes are designed for repetition that takes place in physical classes, with additional benefits of file sharing, quick feedback and communication and are ideal for grade learning situations. Here the Introduction describes the experience and consequences of using Computer Mediated Communications designed to create Virtual Classroom (VC). Emphasis is placed on the guidelines for the effective use of technology by including "collaborative learning" activities.

With the growth of electronic communication in higher education, the rise of visible classes. Virtual classes exist because of technologies such as electronic mail, list servers, chat rooms, and Comprehensive Web pages. This quality study examined one graduation course offered entirely on the Internet. Data from list servers and email messages, student magazines and time logs, chat time notes, and group chat were collected and analyzed.

The analysis revealed four major themes related to student ideas and performance: peer support, student-to-student interactions, student-student interactions, and study time requirements. A clear student community emerged despite the student distance and face-to-face contact. Students were able to build relationships and give each other support and were able to develop and maintain communication that might not have been possible in a normal classroom environment. The intellectual relationship with the student also manifests itself differently. Although the teacher remained the "head of the class" during the interactive discussion, during the interpersonal communication the coach became a non-information person and everyone in the class became part of the student community. Although students felt that these courses required more time because of the format, the analysis of time logs revealed that more time was spent "working" on the Internet and that the idea was a work of visual time in front of a computer. From the



analysis of student performance and ideas in this particular class, it is clear that even if the actual classes grow more and more, the student classroom community can continue to prosper.

II. HISTORY

Over the past decade, teachers and librarians have prioritized the importance of transforming students' knowledge into knowledge skills. The final report of the Presidential Literacy Committee published by the American Library Association (ALA) (1989) emphasized the importance of this issue as follows: Within the American knowledge community, there is also the potential to address many long-standing social and economic inequalities. To reap such benefits, people - both as individuals and as a nation - must have the knowledge to learn. In order to be able to read information, one must be able to see where the information is needed and be able to find, evaluate, and make good use of the information that is needed.

Over the years, participating groups have created great websites - each a perfect example of how the Internet can connect people - to be proud of their communities at all times.

Most importantly, GVC teams, without the competition result, benefit the most from the learning process. "The AT&T Virtual Classroom project has changed my whole life," said one student of VC Contest 98. "First of all, I've learned never to give up." A Contest 97 teacher, when asked what is the most important thing in a VC program, replied, "Seeing the kids progress. The kids I worked with are mature in 3 months of the program like you can't believe it!"

The success of the VC Competition inspired AT&T to expand its online education offerings in 1998 and 1999, culminating in four different programs under the old AT&T Virtual Classroom umbrella.

III. TECHNOLOGY USED

The web-app "ClassZ – A Virtual Environment" is a full stack website created using MERN technology. MERN stands for MongoDB, Express, React, Node, after the four key technologies that make up the stack.

MongoDB - document database

Express(.js) - Node.js web framework

React(.js) - a client-side JavaScript framework

Node(.js) - the premier JavaScript web server

MERN is one of several variations of the MEAN stack (MongoDB Express Angular Node), where the traditional Angular.js frontend framework is replaced with React.js. Other variants include MEVN (MongoDB, Express, Vue, Node), and really any frontend JavaScript framework can work. Express and Node make up the middle (application) tier. Express.js is a server-side web framework, and Node.js the popular and powerful JavaScript server platform. Regardless of which variant you choose, ME(RVA)N is the ideal approach to working with JavaScript and JSON, all the way through.

Fig. 1 shows the working of MERN stack and the MERN architecture allows you to easily construct a 3-tier architecture (frontend, backend, database) entirely using JavaScript and JSON

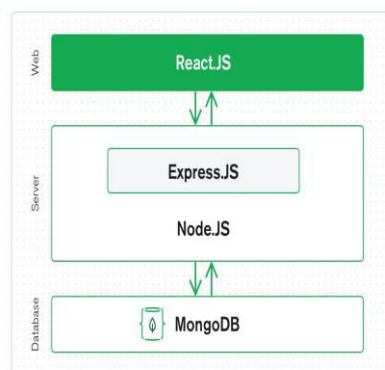


Fig. 1 Working of MERN stack



React.js Front End

The top tier of the MERN stack is React.js, the declarative JavaScript framework for creating dynamic client-side applications in HTML. React lets you build up complex interfaces through simple Components, connect them to data on your backend server, and render them as HTML. React's strong suit is handling stateful, data-driven interfaces with minimal code and minimal pain, and it has all the bells and whistles you'd expect from a modern web framework: great support for forms, error handling, events, lists, and more.

Express.js and Node.js Server Tier

The next level down is the Express.js server-side framework, running inside a Node.js server. Express.js bills itself as a "fast, unopinionated, minimalist web framework for Node.js," and that is indeed exactly what it is. Express.js has powerful models for URL routing (matching an incoming URL with a server function), and handling HTTP requests and responses. By making XMLHttpRequests (XHRs) or GETs or POSTs from your React.js front-end, you can connect to Express.js functions that power your application. Those functions in turn use MongoDB's Node.js drivers, either via callbacks for using Promises, to access and update data in your MongoDB database.

MongoDB Database Tier

If your application stores any data (user profiles, content, comments, uploads, events, etc.), then you're going to want a database that's just as easy to work with as React, Express, and Node. That's where MongoDB comes in: JSON documents created in your React.js front end can be sent to the Express.js server, where they can be processed and (assuming they're valid) stored directly in MongoDB for later retrieval.

IV. WORKING

Virtual classroom is an online teaching and learning environment where participants can interact, communicate and discuss in real time. It simulates a real life classroom but the only difference is that physical presence is not required. Students can attend classes and get involved in discussions from a remote location.

- Student: To access the system (virtual classroom), students can request access into the system through a login portal. After logging in, they will be able to access, live video lectures, get involved in discussion and access course materials. They can also update their personal information in the database.
- Faculty: Faculty can also access the system through a login portal. Once logged in, they can hold live lectures and participate in discussions. They can also update the course materials, grades of students in database.
- Administrator: Administrator ensures smooth functioning of the system. This involves managing the classroom (eg: setting the time table) and addressing complaints received. They also manage student information database. The two main types of data stored in the database are:

Student information: This includes personal information of each student and grades of each course. Students can edit personal information and view grades. Faculty can update grades of students. Administrator can access student information database.

Course materials: Course material for each course is stored in the database which can be edited by the faculty and viewed by the students.

Fig. 2 shows use case diagram of the application. The main participants of the system are student, faculty and administrator.

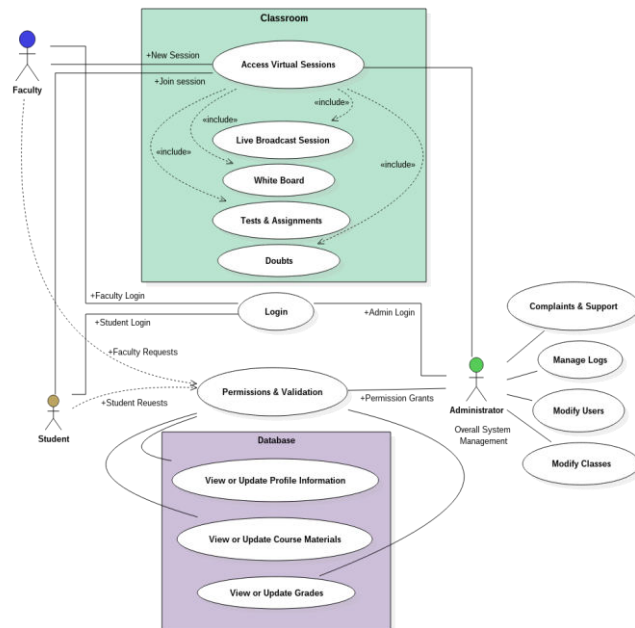


Fig. 2 Use Case diagram

Students, Faculty and Admin have a common login platform from where they are directed to their respective use page. Here, different users have required facilities, i.e., joining classrooms for students, creating new classrooms for faculty, managing operations for admin etc. This includes live broadcast sessions, interactive whiteboard, tests and a doubt forum. Faculty can initiate live study sessions and students can join and interact with the live session. 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. The database keeps track of students and teachers’ history and profile information. This helps in improving the system based on usage history and statistics. Faculty is allowed to offer new courses to the students along with all the relevant information and helpful resources supporting the same. Faculty grades students based on their performances in the chosen courses and can be viewed by the students. 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. 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. Admin will be able to modify user permissions and other information for quick modifications. Admin will be allowed to oversee and update class flow so as to ensure smooth operational flow and to avoid unethical activities and other distractions.

V. ANALYSIS

A student should be able to access the web app by typing a URL in a web browser. Using the URL a student will be able to load the web app in the web browser. Given that the student has access to web application, the student should be able to register as a “student” in the web application. The student must provide name, email address and password to complete registration. The user can choose to provide personal information like age, gender, education, phone number. Given that the student has registered, the student should be able to login using the user-name and password entered during registration. Once logged in, the student can access the classroom. Given that a user has logged into the web application, in the first page, the user should be able to view a list of courses in which he/she is enrolled in. The student must be able to access the course page of the course in which he/she is enrolled in. The course page contains live video stream, discussion forum and course materials. Once the student has entered a course, the student must be able to view live stream of video lecture if the faculty is conducting live video lecture. On the profile page, student can edit personal information which include name, age, gender, education, phone number. A faculty should be able to access the web app by typing a URL in a web browser. Using the URL, a faculty will be able to load the web app in the web browser. Given that the faculty has access to web application, the faculty should be able to register as a “faculty” in the web application. The faculty must provide name, username, email address and



password. The faculty can choose to provide personal information which include age, gender, qualification, phone number, address. Given that the faculty has registered and has been approved by admin, the faculty should be able to login using the username and password entered during registration. Once logged in, the faculty can access the classroom.

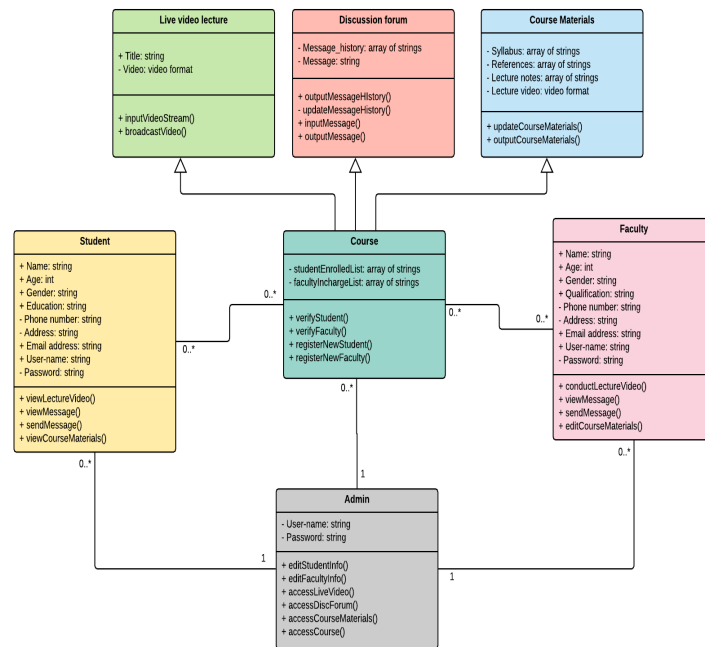


Fig. 3 Class Diagram

VI. PROBLEM

Software to support teaching and learning activities added to the computer network to create a "Virtual Classroom." Objectives include improving access to and performance of college-level courses, especially by facilitating collaborative learning. The process and results were compared with several subject categories taught in the traditional classroom, either online, or in mixed mode. The virtual classroom allows faculty to deliver web-based training to geographically dispersed students, staff. The visual classroom can be used to host a live classroom lesson. Each topic includes a coherent discussion room for students. In addition to being easy to use, a good visual classroom is made up of collaborative tools that involve students in practical learning. For example, the visual classroom has smart videos, and students who are not comfortable asking questions in front of teachers can easily ask their questions.

VII. SOLUTION TO THE PROBLEM

The objectives of visual classes are to improve access to advanced educational experience by allowing students and educators to participate in remote learning communities using their computers; and improving the quality and effectiveness of computer-based education to support a collaborative learning process. The explosion of the information age has changed the context of what is being read and how it is learned - the concept of visual classes is the manifestation of this transformation of knowledge. There are many different classroom programs and forums you can use: everything from Adobe Connect, WebEx, and Citrix Got Training. But more important is the content of the training done and assisted. This is the key to effective information transfer.



VIII. CONCLUSION

Our virtual classroom will be used for conducting web seminars. The classroom has two login modes, one is presenter, and another is participant. A presenter will conduct a session for participants, which they can attend from anywhere in the world. When a session is started, the presenter can - conduct seminars for participants, add new users, create agenda that will give an outline about the session, add various resources (i.e., files or web links) to the session, show PowerPoint presentation to participants, also use white board, answer participant's doubts using chat facility, create different poll questions.

After entering the classroom, the participant can - attend the session, download the resources submitted by presenter, chat with other participants in the classroom, answer the polls, and see the responses submitted by participants to those polls, view the slide transition, access to whiteboard, also do hands up to ask question to the presenter.

REFERENCES

- [1] IBM Software - IBM Lotus Virtual Classroom; www.ibm.com/lotus/virtualclassroom.
- [2] Virtual Classroom—Instructor-led web-based training; <http://www.cadence.com/support/virtual-classroom.aspx>
- [3] Akridge, J., DeMay, L., Braunlich, L., Collura, M., & Sheahan, M. (2002). Retaining adult learners in a high-stress distance education learning environment: The Purdue University executive MBA in agribusiness. *Motivating and Retaining Adult Learners Online: A Journal of Research Articles and Practitioner's Tips*, 62–71.
- [4] Albrecht, B. (2006). Enriching student experience through hybrid learning (Research Bulletin, 2006, no. 12). Washington, DC: Educause Center for Applied Research.
- [5] Allen, I. E., & Seaman, J. (2004). *Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004*. Wellesley, MA: Sloan Consortium.
- [6] Clark, Ruth Colvin, and Ann Kwinn. *The New Virtual Classroom*. San Francisco: Pfeiffer, 2007.
- [7] <https://hyperleap.com/topic/HTML>
- [8] <https://blockchain.works-hub.com/learn/making-friendly-css-with-tailwind-css-66334>
- [9] Wikipedia.org



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