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E-learning management web-app with video conferencing.

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ABSTRACT: This article describes architecture of online learning web application which provides students and teachers a platform to interact with each other in a systematic way. This app is basically designed for institutions who wants to conduct their own way of learning and engaging students virtually besides physical classroom. The idea behind this app is to have all at one place, to let teachers convey their teachings to students in efficient way through content management where students can access the study material easily without having to go through the trouble of gathering study material from different platform. It provides access to new technologies for assessing their student's performance through variety of assessment tools. Example engaging students through quizzes and having discussion through video conferencing. In this document we have considered existing applications that focuses on distant learning and have analyzed their main features and requirements and the areas which needs further improvements in our application.

Keywords: E-learning, web-app, Computer Applications, Technology, tools, Education, distant-learning, virtual classroom, study material, video conferencing, assessment tools.

I. INTRODUCTION

The development of information technology (IT) in education has led to the expansion of new teaching and learning methods at universities[1].Stonebreaker and Hazeltine (2004) describes Virtual learning as the delivery of learning through electronic mediation that reduces the gap when the instructor and the learner are separated in either time or place. E-learning is the form of distant learning. The virtual classrooms have evolved with advancement technologies to grab the attention of students and ease of accessibility. Many organizations have deviated their applications from old technologies towards new ones considering users needs. Web based applications have emerged into more complex, interactive and present real time data. That needs lot of complex coding and toolsets.

Nowadays Open-Source tools have gain popularity due to the large community groups and people supporting and assisting each other. There are various open-source web frameworks like Django and JavaScript frameworks which are popular due to their enhance productivity and code-reuse.

Online learning system are often complex due to the features like video conferencing ,content management, course updates ,chat and social media embedded. To design such complex applications, toolsets such as frameworks and API are most preferred. There are many video conferencing platforms such as Zoom, Google-meet emerged during the lockdown period and highly used by education, medical, business and It industry. Scope of digital learning and video conferencing have enhanced and people are more open to it. This paper approaches a way to design an application that combine both the toolsets video conferencing and content management with more secure environment which is more important aspect considering data security. Due to the new trends in development of educational systems and the necessity of developing applications that can be accessed remotely, the security management of e-learning systems and the access control have attracted more and more the attention of researchers and web application developer[3].This research focuses on designing web application including the key feature that is changing the quality of the video call that is lacked by most applications for this we chose to use a video conferencing tool Jitsi-meet, which is an open source ,customizable ,can be locally installed and integrated into local systems thus providing ease of accessibility with secure environment.

II. PROBLEM STATEMENT

Universities and Schools have been trying to manage and schedule their classes online through video conferencing platforms like Google Meet ,

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Goggle Classroom and Zoom. Submission to gathering study notes maintaining them has been a quiet hassle for students. The problem involves in having to use different platforms for different needs which cannot be customize and used as per our needs. That results in unordered distribution of study content to students. Also increasing risk of security.

III. BENEFITS OF USING E-LEARNING WEBAPP

Why web-app?

Web applications saves lot of time of a user rather than installing an app that uses more space and time. You can access them anytime anywhere. Nowadays web-based applications have been enhanced with advanced technologies like frameworks and libraries. Which make them reliable and flexible.

A. User friendly

This app UI design saves user the time of going through the trouble of learning the app itself. It is responsive approach, makes it cross-platform and device friendly(that means can be open on any device).

B. All at one place

Teachers contact with their students through different platform for keeping them updated and share study content. Most of the time the study material gets deleted or missed which then teacher or student have to invest their time to find other content, gathering and sharing, instead of focusing on the work. Our web-application avoid such hassle. Keeping all content at one place.

C. Improved felxibily

Web application are easy to access through browsers at any time and saves lot of time of user having to install the app.

D. Security

Authenticating users(2step-verification)and managing passwords using good password manager which generates random key for the passwords that are stored in the database. Most important getting data backup regularly is essential.

IV. REQUIREMENTS

The web application is based on two components: The video conferencing part and study content management. The architecture of the web-app is built on HTML(for structure), CSS(for styling), JavaScript(for event handling), JQUERY(JavaScript library), Bootstrap5(html, css and js framework). These technologies form the front-end design of the application.

It is supported by "Django" the MVT(Model View Template) framework in the backend. It is most popular framework which consist of variety of plugins uses Python as language. Frameworks are basically a structure that provides a developer a foundation to build application on. It makes code-reuse which saves lot of time of developers and focus on development.

The database is an essential part of a web-based application where the user's data get stored. The database used is PostgreSQL. It is open-source with wide community. The database supports various indexing techniques and replication methods. It has high capacity for fault tolerance and runs on all operating system. Django makes use of ORM(Object-Relational-Mapping) which lets developers write all table definition in python and it translates the python code to chosen query language.

The other requirement of the application is the video conferencing tool "Jitsi" which is open-source platform composed of set of other projects. It is customizable, flexible and user-friendly too with many features like screen sharing, recording, direct YouTube streaming and able to see the connectivity of other participants. Adding password to the room and changing the quality of the video call are some key features of jitsi-meet. It has wide community support and can be locally setup on the computer or on cloud servers. Making the virtual classroom environment more secure and flexible.

A. Features

Users like the applications which are featured rich with user friendly environment. Specially when the user is getting the desired content. Our architecture defines such an application which have following features listed below:

1. Create/Join meeting and setting passwords to room(Jisti).
2. Screen sharing and whiteboard.
3. Screen Recording using any other tool on your computer and uploading it directly or using Jitsi recording feature and saving to dropbox providing link to it.
4. Managing the video call quality and able to see the connectivity rate of participants.
5. Upload/view/edit and delete documents(notes, assignments, presentations and video lectures).
6. Post/view important updates and get email.

B. Challenges:

During the lockdown period many universities/schools and every other department faced the issue not able to continue their work and suddenly changing their work flow to digital platform. Nobody

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expected it and was new to every one at starting people struggled but now it is the new normal in people lives. The scope of digital learning increased the challenges for developers and organizations how to make the platforms secure and user friendly for users. Question arises how will the student feel the classroom environment virtually? But now there are lots of companies coming up with the solution for this problem. The main focus is to develop an active learning environment not just a teaching environment involving use of lot of IT tools/Api/resources for engaging the student as well as teachers having active participation and enhancing the quality of education[4].

C. Modules

- The application is module based that is broken into pieces into different modules. The first module is the Landing-page when the user types the domain name. This page consist of introduction of web-app and some buttons for register/login as teacher or student.
- User Registration module is where the user will provide details like username, email-id , password to be set. And fields like branch and Semester.
- User Login module is where user is asked to login through registered username and password.
- Homepage is the page user is promoted to when they login. Showing the user profile, subjects of the particular branch they selected.
- There are other modules such as notes, assignment and video lectures and syllabus etc.

D. User authentication

When user register's as a teacher they will be directed to Homepage. After registration they will get account verification message. User can also login through google. After successful verification the user will be able to login and directed to the Homepage. Admin will have the authority to verify, remove or add teacher or student.

E. User Role

According to the user roles and permission set by the admin the user's data get stored into two groups teacher and student. Every time when the user's login they will get the requested page of the branch and semester they chose during registration. When teacher login they will be able to access extra features and have higher privileges than student. When student login they will be able to access few features. Other features will be restricted in their case.

F. Design and Analysis

Architecture of the application uses Django framework which makes it easy to breakdown the whole system into small modules or components. These modules are later integrated with the templates (written in html). Other files like images , css and js files are stored in static folder. Everything is created in an environment. Then a folder is created which holds project and apps. Thus, moving an environment is like moving an image file. New technologies like "Docker" makes transporting application from development to production level easy. Bootstrap templates are more productive way to build beautiful responsive layouts. The UI/UX design help to win the consumers' confidence and make them use your application or website providing what they are looking for[7].

The Fig.1 shows The Landing page is the example demo of the app which consist of login/register buttons and displaying introductory info.

Figure 1. example Landing page.

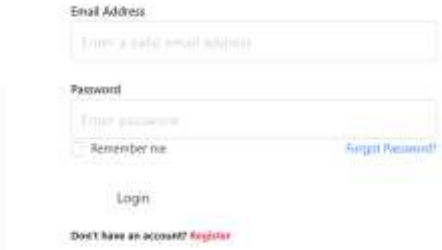

Figure 2. Demo login page.

Fig.2:demonstrates login form consisting of username and password field. This fields are validated through the authentication code and on successful validation user is redirected to Homepage.

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Figure 3. Demo Registration page.

Above Fig.3:Is the Registration form. This module includes various user fields which user must fill up for the successful registration. So that login credentials can be validated.

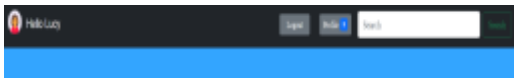

Figure 4.Navbar after login

The above fig.4 displays the navigation bar when a user login into the system, the name of the user will be displayed on the navbar. The logout button will be showed with other features.

Fig.6: Course section of homepage.

The figure 6. Displays the subjects related to the branch and semester selected by the student at the time of registration.

CONCLUSION

We surveyed and researched about variety of tools which can be used for better interaction and efficiency of developing a web-app. Analyzed different learning management system(moodle,google-classroom,canvas) and another video conferencing tool such as zoom and google-meet used them and came up on certain conclusion. Doing so, we realized the open-sourcing power that is enhanced over the years due to wide community support. Using Jitsi and integrating it with learning management system making a feature rich application. Through this report designing web-application combining video conferencing using a powerful tool like Jitsi with content management system will make it easier for university/school students to avoid the hassle mentioned in the above problem statement in the report. Both the areas provides more flexibility in distant e-learning system To achieve a more polished functionality there is more to be done and thanks to the open-source community there are chances for growth of such web application.

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DECLARATION OF INTEREST

The authors declare that they have no competing interest with other authors.

REFERENCES

[1] Shahmoradi,Leila, “The challenges of E_learning system: Higher educational institutions perspective.”Journal of education and halth promotion vol.7, 116, Sep 14 2018.

[2] Zongkai Yang, Qingtang Liu, “Research and development of web-based virtual online classroom”,Computers & Education,Vol 48, Feb 2007,Pages 171-184.doi.org/10.1016/j.compedu.2004.12.007.

[3] Defta Costinela Luminita, “Information security in E-learning Platforms”,Procedia - Social and Behavioral Sciences,Vol.15,2011,Pages:2689-2693. doi.org/10.1016/j.sbspro.2011.04.171.

[4] Rashmi Chari in Edutrends India,Lifestyle,Tech,TOI,Challenges of quality in online learning”,May 6, 2020, India.

[5] Ferrer, M.M. ; Jimenez, A.G.: Pastor, F.J.F,; Chamizo, J.M.G.; Gomez, M.L.R. Specification, Design and Development of a Pyramidal Learning Platform. Proceeding 2019,13.

[6] Turoff, M.(1995).Designing a virtual clssroom. International journal of educational

telecommunications,1(2), 245-262. Charlottesvile,VA: Association for the Advancement of Computing in Education(AACE).Retrived February 1, 2021.

[7] Dharti D.; "Importance of ui/ux design" article,14July2019.(https://www.igexsolutions.com/blog/the-importance-of-ui-ux-design).

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