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WEB-BASED DYNAMIC TEACHER STUDENTS INTERACTION SYSTEM IN ACADEMICS

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ABSTRACT

Web application using node.js backend to support dynamic interaction between teacher students and Admin of the academics is developed. Scholarcad application includes specialized web server, virtual private server, node mailer, and dynamic database. Unlike http protocol express module handles all communication of application. Admin has responsibilities to handles all important data wisely. Students have access to check their personal data like personal info, score tables in their account section. They can download the provided material and can communicate with the staff. Teachers can upload the documents like notes, test papers, assignments, etc. that will be visible in dashboard section of application. Two way feedback is added in this application which will provide a new and better way to take feedbacks. Admin, Teacher and any external person can take feedback. Staff can send the personal notification to every students in academics using node mailer email service. Scholarcad web application demonstrate the helpful tool for improving the communication between students and staff in academics.

Keywords: Web Technologies, Classroom Teaching, Teacher-Student Interaction, Node.Js Application, Web Browser, Server, Teacher-Student Interactions.

I. INTRODUCTION

In today's world web technologies are wisely using in order to upgrade and improve the academics work. In college academics students have lots of burden of studies and extra curriculum activities in such a way most of students are not getting sufficient time for management of work hence web technologies can be useful for making work more effective availability of standalone application will be good idea for students and teachers staff also using the single for media for communication will be reduce the use of social media which will beneficial for students. Email service for academics is discuss in the paper. In this present time there are many resources we free of cost only we need to study that properly for implementation purpose. Various resources and their uses are discuss in this paper. Academic students having their personal secure account on which students can get their scores and the attendance, events information required documents and personalize notification will be beneficial for them. According to us in this paper we mainly focus on effective use of web technologies in academics. The process of learning is enhanced by constant update for available information. Admin in college will handle all the external work of academics like managing the events sending the feedback notification, poll submission etc., and Responsive web application helps to increase the user experience of the students. We have made this application with full of user-friendly graphics and easy to used. Uploading and downloading material is very simple through this application, this application has some access authentication such as teacher will be allowed to upload the required documents like notes, test papers etc. and student will allowed to download and watched it. Using another cool technologies like canvas js, send grid, pusher js, and socket.io. The application will get more enhancement.

Node.js programming provide us to render the pages using more than one collection of the database it has many packages free to use which will very beneficial for development purpose. And last but not least node.js is works on non-blocking API so the rendering the application will not be slow down. Node.js script is easy to understand and development can make faster than any other backend languages. Express generator provide us readymade application sample skeleton which will used for programing our application.

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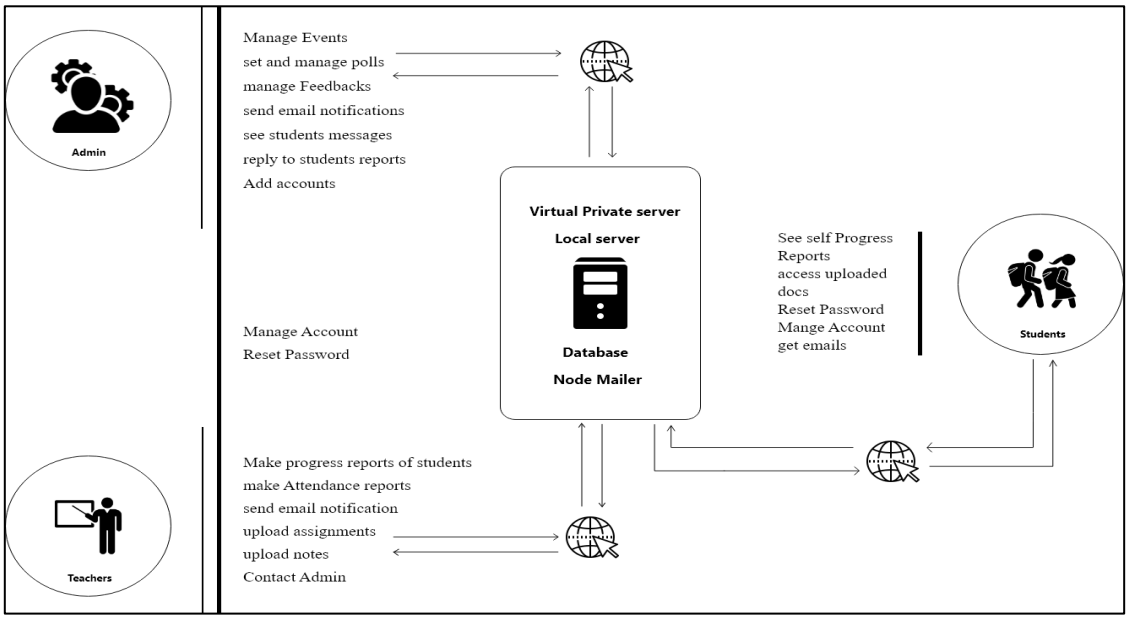


Figure 1: Admin, Teachers and student interfaces to the TSI system.

After analysing communication between students, teacher and admin in the academics we come to creating the application which can helps to organize such a communication in simple way. In this paper we present a scholarcad node.js application which contains specialise virtual private server (VPS) and ordinary web server like apache tomcat and mail service provider Sendgrid. Sendgrid provide the free mailing service which is faster and easy to manage. Structure of Admin privileges teacher students privileges interface has been created for designing scholarcad application as this is web application can be accessible through any devices like phone, tablet, computer etc. we design this application in such a way that the experience we get by using this application in any device is same i.e. no features are hidden for small devices. As this is web application any web browser is necessary to access it.

II. INTERACTION INTERFACE

2.1. Admin View

In this application Admin will get several authentication for managing the resources in academics. While another parties like student and teachers will have different authentication. Events managements, poll management and section of feedback portal will be handover by admin. If suppose students have to set their events add on this application so there is no need to physically meet with the admin there is option of contact Admin that is provided in this application for contacting the admin. Using this everyone in academics can send their queries like about events management or if they have certain problems the can report to the admin on this application. Sometimes there is possibility of having more than one option while taking the seminars or any session so if teachers want to ask to any batch of the students then teacher can go with opinion poll option in this application. Just teacher have to send the required message to admin and admin will initiate the poll if it is fine. We have design the unique poll system in this application. Whatever result will be generated every user of this application can see it. In feedback portal if any teacher of third person wants to take feedback from the students then they can take it by using simple steps. At first they have to contact Admin then admin will initialize the process. At first Admin has to fill one form on application in which several inputs like person's name his/her roll, username for that person, and password for that person. This input will be required as this feedback is two way feedback process after filling the form the mail will sent to email address which admin has filled in the form. On that email temporary username and password for feed portal will be provided. Then admin will send the notification link to whole class in single click so that everyone can open that link can start asking the doubts to that person who is taking the feedback. After getting all doubts clear they can move to feedback process and can provide five star ratings and some suggestion or complaint then they can leave the portal.

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2.2. Teacher View

Teacher has different authentication like making the progress reports of students and also make their attendance reports. Teacher just have to fill the data of the students like their roll no. and marks for progress reports and attendance for attendance reports then according to roll no that whole reports will be available on student account section. For example if teacher fill the info of student 'A like his roll no. and marks and attendance then it will be visible only in the 'A's account section. Likewise very students can see their mark in their personal accounts. Another authentication is about uploading the docs like question papers, assignments notes etc. and it will be accessible to every students in academics.

2.3 Student View

Student in academics can access the uploaded documents and whatever reports submitted by the teachers for them that will also available in their account section. If they wants to organize the some events then just they have to contact the admin through this application and then admin will make live advertisement of their events, while contacting the admin just they have to choose for what purpose they are contacting like for managing the events and may be they wants to take Option form students in academics. Submitted events poster by the students will live on home page of this application which make this application looks unique and dynamic. As we have design responsive application so it will be very easy for admin to work on mobile devices also.

III. IMPLEMENTATION

3.1 Choice of programming languages

Scholarcad web based application has been implemented in java languages. Our choice of programming languages is related to such a planning that it is platform independent language html CSS, JavaScript is very useful to build good-looking responsive web application. Choosing node.js backend i.e. server side platform helps to build the application in less amount of time. It is easy to understand and also easy to manage. By assigning a virtual private server (VPS) will be enough to serve our application throughout the academic. Rendering the webpages with multiple collection becomes very easy by using just few reference. Pug view engine is a combination of html and JavaScript using this one project become easier to understand there are many view engines are available in market but reason of choosing this one is it has better structure than others. And also line of code doesn't look like garbage. Another technologies that we have used is that, canvas js for rendering the charts, pusher for real time chart generation for polling system. Node mailer with sendgrid for sending email notification.

3.2 Scholarcad architecture

In order to maintain flexibility of application we divide it into three part. First is admin side second is teacher side and third one is student side and each part has some common privileges. During this days notification of daily updates like events, polls, and feeds s important hence we decide to use sendgrid free email service in which we can send the email notifications in form of dynamic also is important.

For events we made some interesting slide show on home page and inside the event page details of that events will be visible, also on this page we built some skills appreciation container to show interesting skill to everyone by just filling the form student can share it by contacting admin by sending data to him/her.

For opinion poll we use pusher by which it will look like real-time polling system. In every module of this application we have include mailing system to send notification either for single batches or individual notification. Ajax technologies is used throughout this application it will help to saved/reduced bandwidth of transmission of data. Username and password is created by default by administration for this application and it will be provided to everyone i.e. student and teachers. After getting there authentication user ID/pass they can change pass account to their comfort it will be saved in database in encrypted form by which if suppose anyone even developer also check the database so they will not be able to recognize the actual password hence this is very convenient process. For validation purpose we have used express-validator which is best library of node.js which contains many validations like checking email is correct or not and also there are many options over there that is useful while creating the signup form of the application. Admin will have basically five authentication like creating events, managing the polls, feedback management and sending the emails for feedback and also individual email notification.

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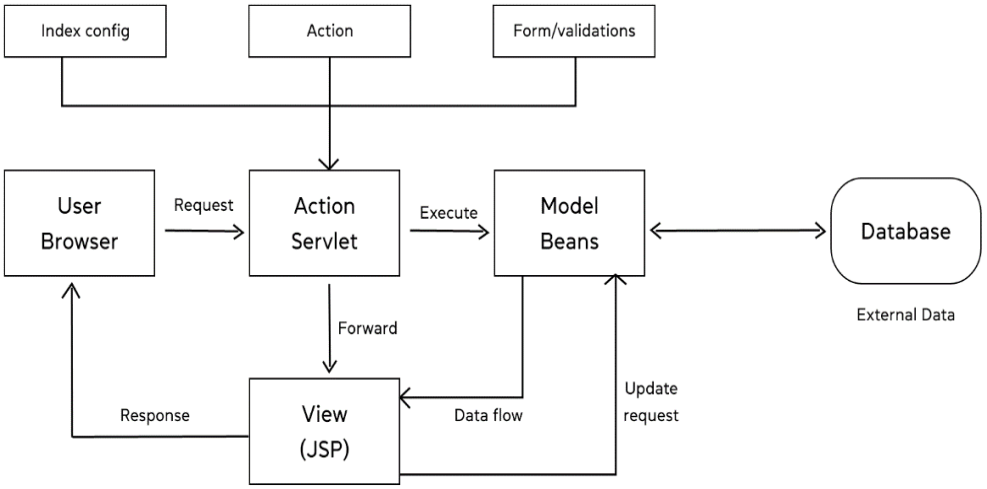


Figure 2: MVC Architecture for scholarcad.

In this application we have included two way feedback system. The working of this system is somehow different from one way feedback system. In this feedback system first of all the admin will set the feedback and he/she will include the first person email, his/her name, their temporary user ID and their role. By submitting form the notification will be send to that first person on the email address that admin have set while filling the form. In that email message the temporary credentials will be provide to that first person who is taking the feedback so that he/she will be able to enter in the feedback portal. This credentials will be active only for three hours. Now admin will send the feedback notification to every students in the batch on one click. By visiting the admin have provided everyone in the batch can enter in portal and they can ask the doubts they have about the session to that person. After doing this they can move toward the feedback. One window is provide on that page. That window consist of five star ratings and message box. By filling this for everyone can exist the feedback session. Ratings provide by students will be calculated in the percentage from database and it will be visible on admin account in form of pie chart and it will show how many students give five start , four star and so on. From this admin can understand that whether the session was understandable or not. The after admin can share this result to any person individually via email.

IV. WORKING WITH SCHOLARCAD

4.1 Admin Menu

In this application there are various options are provide to admin for manage the resources they are:

1. Event Management
2. Opinion Poll
3. Arrange Feedback
4. Send Notifications
5. Add or Removes Available Entries

For managing the events, its image or well design banner, good name, promoter name, and some information will be required. Admin will have to fill all this information regarding the event and then whatever banner or image has been uploaded, will be visible on home page of this application. For knowing the information regarding the uploaded event everyone need their credentials for entering into event web page. Inside this event web page we have provide one part for sharing the student's skills. Just any student can fill that information which is require on form then this information will sent to admin. Admin will first see all information whether it is valid or not then only admin will upload it on this application. After uploading the image or banner provided by student will be available on middle of the event page. Opinion poll is important part in academics because if someone wants to ask everyone about any suggestion then we think it will be best option to include this part in this application. Admin can set poll in few simple steps. First he will have to check whether there is empty slot is available or not as only three polls can be online at a time so first of all admin will have to any completed poll from the application the he can set another one. He will have to just fill some information like poll question and its options and promoter or the person name who is taking this poll. Then

every students can submit their opinion. This poll panel will be visible on home page for that purpose students must have to logged in, otherwise poll option will not be open. By clicking on opinion poll tab in menu one slider will be open in bottom side where poll and its result will be display. Now the feedback about feedback process everything will be like wise but here few steps are unique for example, while filling the feed form, admin will have to provide the email address of the person who is taking feedback, and his role e.g. teacher or external then after submitting the form that person will get email in which his/her temporary username and password will available. We have design some logical concept in database for this process. The password provided for this person will be auto generated by the system in which we have used auto-generate string library of node.js. Using this credential that person will unable to enter in feedback portal and for students admin will provide the link to everyone on their email by which they can enter in this portal. Credentials for students will be their username and password of this application. Then everyone can ask their doubts if they have, on this portal and after they can give their feedback. One window on same page is provide for five start rating and for suggestions or complaint. There is option on every page which will help admin to remove the unwanted or expired entries so that here will no extra garbage accumulate in database.

4.2 Working with Feedback Module

In this project application we decided to include two way feedback system rather that that old one. For demonstration purpose we have used simple concept of two way communication. At first point Admin will have to arrange the portal by using few simple steps. Initially admin will fill one form for the person who is going to take feedback. Then by adding some more details like his/her role, username for them and the password will generate automatically by the system. We are initializing the process in this way because there is need to make systematic error proof running application module. Then one email will be send by the system to that person which will contain username and auto generated password for him/her. Then he/she can enter into feedback portal. In next step admin will send the email notification to the students in which link for feedback portal will be given. Then everyone can discuss about completed session or say seminar and afterward they can move toward feedback process. On the same page we have provide one feedback window which contains five star rating and a suggestion or complaint box everyone can go through this process and the process will end after submitting feedback. For safety purpose the like of the feedback will be live till 3 Hrs from start. Then link will get closed. Whatever feedback ratings have generated it will be visible in admin panel in form of pie chart. The admin can share this result with anyone via email.

For making this part of the project application the socket.io library has been used. The resone for this is that it allowed us to make real time chatting like application and best part is it if free of cost. This module will require another port on server which will different from main application. Socket.io required one special port so in whole application to port of the server will be in use. While testing this part we feel this process of feedback is lot better than one way communication. In future also this kind of system will be very useful even though it is time-consuming

4.3 Integrated Personal Notification

For sending notification to the students another technology called as sendgrid has been used in this application. “Sendgrid” allow us to send both static and dynamic emails. In this case we choose dynamic way. First of all we have to make the template on sendgrid and after that the templated id of template will be provided in the panel. Then we have to just insert this id into mail code which is basically node mailer in this application. By clicking send email button, at first node mailer will hit the message to sendgrid then sendgrid will throw that template to respected provided email address. Authentication of our account will be based on API provided by the sendgrid for our account. If suppose we have insert some dynamic information into that template then we have to use “{link}”, by passing “link” variable from server it will be replaced by provided string.

4.4 Experience with Scholarcad

Since five month many students and teachers are using this application, they are trying to access all function of this project application. Teachers are making progress reports of the students and they are getting well response from this application, also the time required for completing their work is also getting decrease. Admin personality of the campus is very satisfied with this application as this application help him to save his time and manage all the resources perfectly. For contact purpose the students are using contact admin option frequently.

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This option of contact admin is becoming very useful thought the academics. Opinion poll in this application are working properly till this time also there is no lagging or server error occur throughout testing this application. Number of hits we see on pusher that is also updating time to time properly. By showing the attendance and progress reports of the students in their personal account section was the best idea and everyone also appreciate it. Feedback module has been tested by everyone and it is running properly as expected. Students are able to ask the questions more efficiently than previous methods. Admin is able to see the feedback result perfectly. We check whether it is calculating perfect result or not and is was showing perfect results. Everyone liked this two way feedback system in academics. As a responsive web application all can access this application in mobile phone and tablet also which is best part of this project.



Figure 3: Home Page of scholarcad.

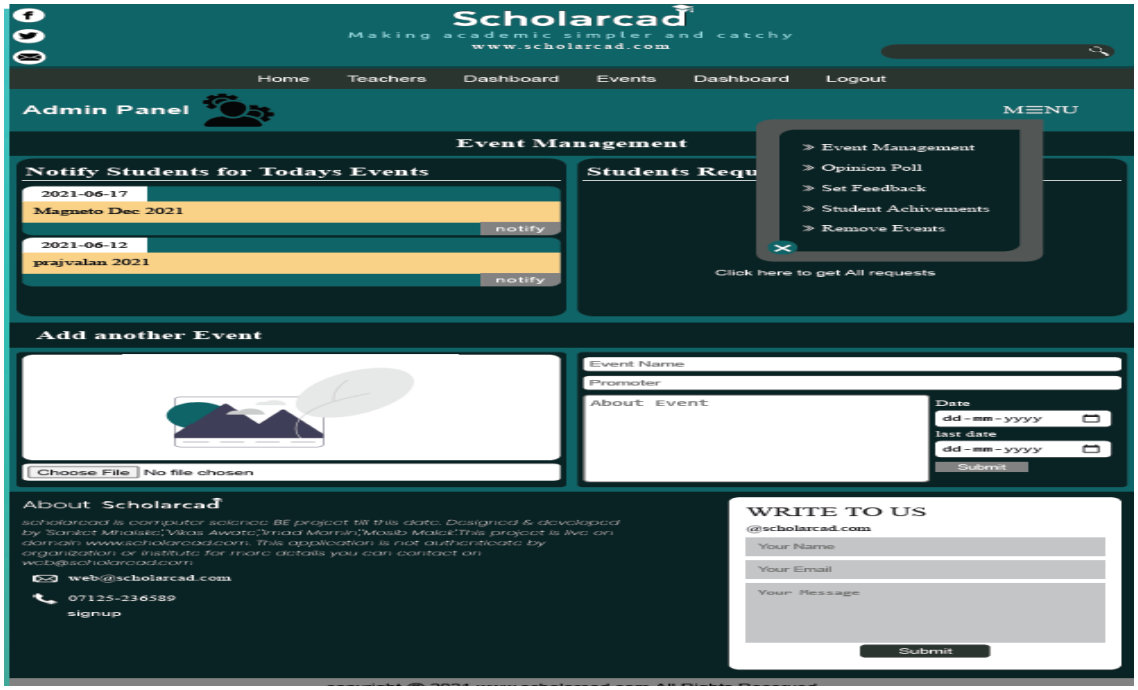


Figure 4: Admin Panel View of scholarcad.

V. CONCLUSION

In daily life of academics this application getting more engagement of the students inside academics. It is important to note that this application provides only academics related content no other part which is outside the campus will be upload on this application. In this project we tried to solve the daily life general problems of the students and teachers which they faced inside the academics. Sometime due to extra work and administration pressure teachers don't get enough time to cover complete lectures for example if there are running events in campus so most of students will be gathering for their promotion of the event and that's why event management is necessary for saving the time and resources. Every part of this application has been tested by the professors of the academics and they got good response from this one. Student in academics are accessing the uploaded content more efficiently. Also it is taking less time for the teachers to make progress an attendance reports. In future there are many modifications will be perform on this application. All charts included in it are working properly and are showing perfect results. You can refer this application on address http://ec2-18-118-195-239.us-east-2.compute.amazonaws.com/ which will five basic idea of this project.

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