#### A Project Report on

### **Student-Teacher Interaction Portal (ITA)**

Undergone at

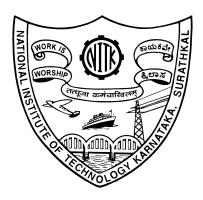
### National Institute of Technology Karnataka

Under the guidance of Dr.Saumya Hegde And Chidananda sir

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in partial fulfilment of the requirements for the award of the degree of

Bachelor of Technology
In
Computer Science & Engineering



Department of Computer Science and Engineering

National Institute of Technology Karnataka

May-July,2020

#### TO WHOM IT MAY CONCERN

This is to certify that Hardik rana, Harshal shinde and Khanak sharma have worked on the project title 'Student-Teacher Interaction Portal', Under my guidance at the computer science and engineering department, National Institute of technology Karnataka as a part of their course project.

Signature (Dr.Saumya Hegde)

#### DECLARATION

We certify that the report on 'Student-Teacher Interaction Portal' which is being submitted as record of our ITA course project is a bonafide report of the work carried out by us. The material contained in this report has not been submitted to any university or Institution for the award of any degree.

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# **ABSTRACT**

The student-teacher interactive portal facilitates easier communication between students and teachers. It allows the student to clarify his/her doubts on the forum, it allows the student to regularly check his/her attendance, it allows the student to view any study material posted by the teacher and it also allows the student to do course registration, and upload assignments.

It helps the teacher in circulating any assignments which he/she wanted to assign to the students, it helps the teacher maintain a dynamic record of the students attendance, clarify the students doubts on the forum and ensure that all the students have understood the concept well enough.

The admin which can add faculty, remove faculty, add students, remove students and he can also view feedback of students

The student is required to create an unique account for himself and then he can access the websites content and services. The teacher can only be added by the admin while the admin can remove both the student and the teacher account.

The interface of our website is very user friendly and it is very easy to navigate the site. The user shall face no difficulty in accessing the services of the website. The website is protected using some very good security measures to ensure only authenticated users can access the website and we have also restricted access to sections of the website based on the category the user falls in.

The application is developed using HTML, CSS and JavaScript along with Bootstrap implementation in its front-end part. The backend part of the website is developed using PHP and the database is stored in a MySQL server.

# **CONTENTS**

- 1. Introduction
  - 1.1 Purpose
  - 1.2 Objective
- 2. Requirement specifications
  - 2.1 Hardware specifications
  - 2.2 Software specifications
- 3. Database Design
  - 3.1 ER Diagram
  - 3.2 Relational Database Design
  - 3.3 Constraints in Relation Schema
- 4. Project Components
  - 4.1 Front End Design
  - 4.2 Security Measures
- 5. Results & Discussions
- 6. Conclusion

### 1.INTRODUCTION

### 1.1 Purpose:

The aim of this project is to design and develop a student-teacher interaction portal. The various functionalities of the web application and necessary details regarding its development process are listed below. In this Project, we will also develop an orderly and user-friendly interface that would follow a hierarchical approach such that the students and the teachers using the portal for their interaction with each other can do it smoothly without facing any inconvenience or discomfort. The software application will be a web-based product.

The website serves the following purposes:-

- The web application will be used by the students to connect with their teachers.
- They can ask their doubts regarding the course.
- They can check assignments [if any]
- The web application will provide a medium for teachers to answer student's queries,
- The Teachers can upload assignment and to view the submissions of students assignments.
- Students can upload and download important materials like assignments and presentations.
- Students can discuss with each other and collectively come to a solution.
- · Faculty can also add any assignments and subject related content.
- Faculty can also post notices.
- The front-end part of the web application will provide the user interface to access the web application.
- The backend part of it will be used to handle the http requests and to manage the database from where data will be stored or retrieved.

### 1.2 Objective:

Our goal is to create a dynamic student portal that acts as a gateway for quick dispersal of information to all students. The portal will address the student need for relevant and effective information sharing and allow students to contribute and learn from each other.

To ensure effective communication with students, the university needs to consistently operate where students interact, and increasingly, that is on digital platforms. We know that students are inundated with information. Therefore, it is critical that we have an effective, valuable and common place to share important information to support student life in and out of the classroom. A single sign-in portal will be a powerful and important tool for the success of the students. The Web Application Software should be able to check authentication of the user. The Web Application Software should be able to fetch the required information from the database and to store it as well. The web application will need an active internet for any user to use.

There are two types of users that interact with the web application: student and teacher. Each of these two types of users has different use of the system so each of them has their own requirements. The sign up feature is only for students and the faculty is be added only by admin. Our web application will allow the student to login into the system with their registered email-id and password. After login, we will provide students a forum where they can ask their doubts regarding specific course and they can answer any question on forum. We will also provide students a fee-payment gateway through which student can pay his/her college fee through online only. We will also allow a student to give feedback to teachers anonymously. The web-application will also provide a functionality for students to maintain their profile.

Teachers can also use our web application by providing their registered email-id and password. Our web-application will allow teachers to answer the student's queries, to upload assignment [if any] regarding to their course and to put general notices. All users can interact with the system only through the web portal. As all the data is stored in a remote server all user data needs to be secured. Hence there will be a requirement to login, to ensure that it's an authorised user. The

web interface should help in quick broadcast of notice and information. The website should allow students to ask questions and discuss them with each other as well as the teacher.

# 2.REQUIREMENT ANALYSIS AND SPECIFICATION

The aim of this project was to build a website which would help improve the interaction between student and teacher by allowing them to interact with each other remotely and at any point of time.

## 2.1 Software requirements

Package: We made use of the LAMP and XAMPP stack in the development of this project.

Front end development: HTML, CSS, Bootstrap and Javascript was used in the front end development.

Back end development: PHP were used in the backend development.

DBMS: We made use of MySQL for our database requirements.

Web-server: The web application is hosted at

https://workpurpose.000webhostapp.com/

Anybody can access the web Application by visiting the mentioned site.

### 2.2 Hardware requirements:

Web server: We need a reliable web server for our system that is able to handle and maintain such a vast and diverse information at a certain point of time. The machine must be fast and must show high performance in all situations. The server must have capabilities like high transaction processing and optimum concurrency control.

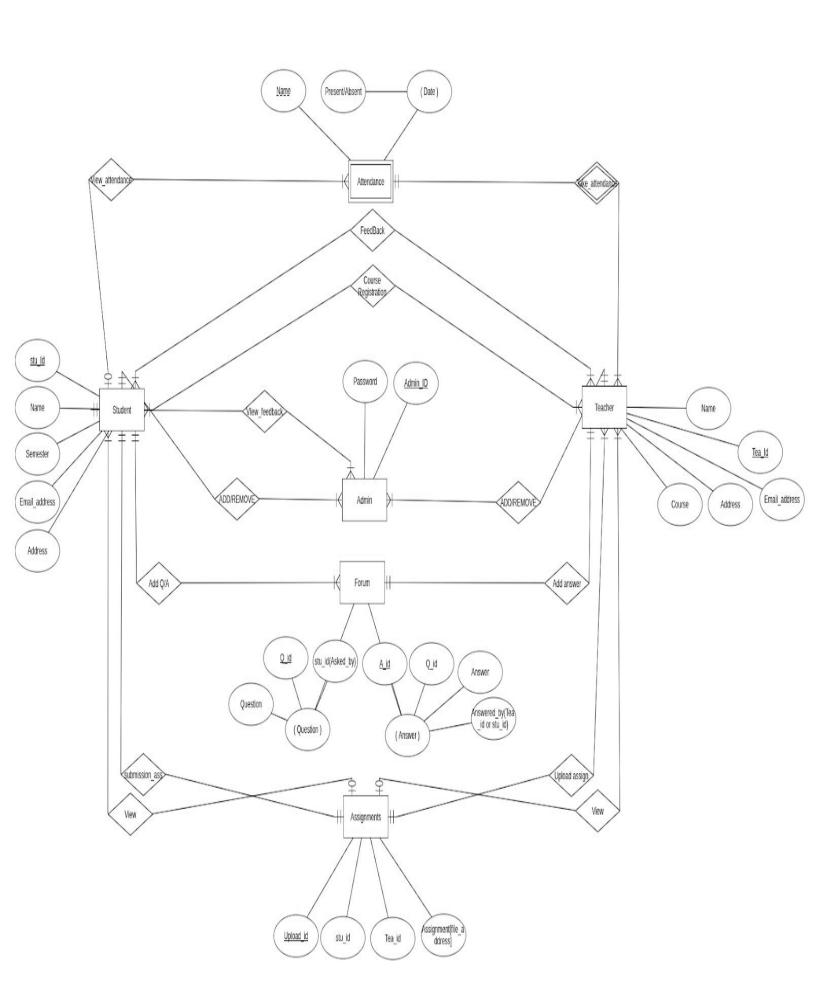
Database server: Since our system requires huge amount of data to be stored we will need an apart machine that will serve as database. As the data in our system is dynamic in behavior, which means it keeps changing and updating regularly, we need a database server that is able to handle such frequent changes in the tuples of the database.

## **3.DATABASE DESIGN**

### 3.1 ER Diagram:

This ER diagram represents the model of Student –Teacher interaction portal application's entities. The entity-relationship diagram of Student –Teacher interaction portal application, shows all the visual instruments of database tables and relationship between the admin, the teachers, the students, the forum, the assignments/ study material etc. The main entities of Student –Teacher interaction portal application are: Teacher, Student, Admin, Forum, Assignment.

Student – Teacher interaction portal application, entities and attributes:



# • Teacher Entity

Attribute Name	Meaning	Value
Tea_ld	It is the unique identification number which will be assigned to each Teacher on registration	It is an integer value starting from 1
Name	It will store the name of the Teacher	It is a string of maximum 50 characters
Email Id	It will store the email-id of the Teacher	It is a string of maximum 50 characters
Address	It will store the address of each teacher	It is a string of maximum 100 characters
Course	It stores the course which a particular teacher will be handling in that term.	It is a string of maximum 50 characters only

# • Student Entity

Attribute Name	Meaning	Value
Stu_ld	It is the unique identification number which will be assigned to each Student on registration	It is an integer value starting from 1
Name	It will store the name of the Teacher	It is a string of maximum 50 characters

Email Id	It will store the email-id of the Teacher	It is a string of maximum 50 characters
Address	It will store the address of each teacher	It is a string of maximum 100 characters
Semester	It stores the semester, in which a particular student is studying in that term.	It is an integer value.

# Assignment Entity

Attribute Name	Meaning	Value
Stu_ld	It is the unique identification number which will be assigned to each Student on registration	It is an integer value starting from 1
Tea_ld	It is the unique identification number which will be assigned to each Teacher on registration	It is an integer value starting from 1
Upload_Id	It is the unique identification number, which will be assigned to each assignment uploaded onto the website.	It is an integer value starting from 1
Assignment (file_address )	Stores the address of the pointer to the assignment file uploaded	It is a pointer address value.

# • Forum Entity

Attribute	Meaning	Value
Name		

Q_ld	It is the unique identification number which will be assigned to each Question asked on the Forum	It is an integer value starting from 1
A_ld	It is the unique identification number, which is assigned to each Answer given to the respective Question.	It is an integer value starting from 1
Question	It is the Question asked by the student.	It is a string of maximum 100 characters
Answer	It is the Answer to the respective Question.	It is a string of maximum 100 characters
Stu_ld	It is the unique identification number which will be assigned to each Student on registration	It is an integer value starting from 1
Tea_ld	It is the unique identification number which will be assigned to each Teacher on registration	It is an integer value starting from 1

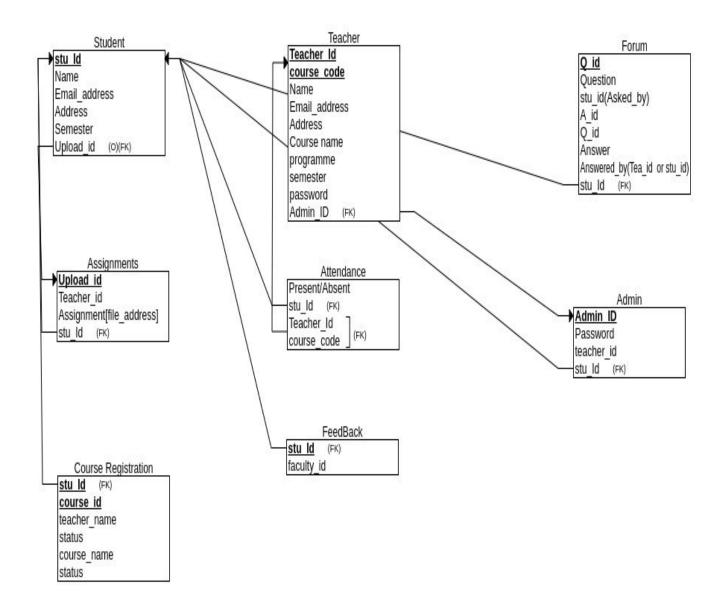
# • Admin Entity

Attribute Name	Meaning	Value
Admin_ld	It is the unique identification number which will be assigned to each Admin that can add/remove a Teacher on registration	It is an integer value starting from 1
Passwor d	Password It will store the password in the encrypted form	The password must be of minimum 8 characters.

# • Attendance Entity

Attribute Name	Meaning	Value
Name	It will store the name of the Student for the Attendance.	It is a string of maximum 50 characters
Date	Stores the date for the attendance	It is a string of maximum 8 characters
Present/Absent	Stores the value if the student is present or absent	It is a binary value.

### 3.2 Relational Schema



The above Relational Schema represents the logical model of our student teacher interactive portal. The given relational schema represents our database of student teacher interactive portal in a logical manner. The relational schema is a representation of how our database is structured. We have the student entity,

teacher entity, admin entity, forum entity, assignment, course registration, attendance, feedback entity. The entities from ER diagram here are stored in form of Relations or tables with attributes or columns. Each of these entities are mapped to one another, which represents their relationship with each other in the database. They are linked by key constraints. That is foreign key and primary key. The Relational schema is an illustration that depicts how the data related to our Railway Reservation System is stored in the server database. This is the first step to designing a database structure. That is because based on these relations the subsequent queries to fetch data will be generated. In addition, this relational schema has to be refined and optimized in order to generate efficient, quick and optimum queries that fetch data quickly. A relational Schema also contains its own constraints based on which the stored data is structured and manipulated.

#### 3.3 Constraints in Relational Schema-

There are mainly the following constraints implemented in our database relational schema. Their use and their location is explained in detail below They are:

### Key Constraints

Every entity has a unique Key constraint also known as its primary key that uniquely identifies each tuple in the given relation. The primary key of student relation is student\_id, of teacher is teacher\_id, of admin is admin\_id, of assignments is upload\_id, of course\_registration is student\_id and course\_id, of forum is q\_id.

### • Cardinality Ratio and Participation constraints.

The Relations N – 1 Cardinality ratio, and their Participation Constraints are:

1.Teacher-course\_registration with full participation by both

The Relations N - N Cardinality ratio and their Participation Constraints are:

- 1. Student-teacher with full participation from both
- 2. Student-assignment with partial participation from student
- 3. Student-attendance with full participation
- 4. Student-forum with partial participation

#### Structural constraint

The main database is divided into seven relations that interact with each other to generate useful data that is manipulated or accessed by the user. For this, we have certain Foreign keys present in every relations. Some of them are a primary key of some other relation.

#### They are:

- 1. Upload\_id is a foreign key from assignments relation to the student table
- Student\_id is a foreign key from student relation to the assignments table, course\_registration, feedback and forum table.
- 3. Teacher\_id is a foreign key from teacher to attendance and assignments table

### 4. PROJECT COMPONENTS

# 4.1 Front End Design

In our project we have 3 modules which are user[student], admin and the faculty. The web-portal is developed using HTML, BOOTSTRAP, JAVASCRIPT at front-end and PHP with MySQL database at Back-end. As we already described the requirements of our project. User can go to any module by logging in to the system.Following is the brief details of each module.[All images are attached in the results section]

**Student Module** - If a new student wants to use the web-portal he/she must first register into the system by providing his/her basic details like email-id,name etc.. Once student is registered into the system,he/she can use the system by login into the system by proving his/her email-id with password. After login into the system a student will be redirected to his/her dashboard, where he/she can do following things:

- Can view/edit profile
- Can do course registration
- Can view study material uploaded by faculty's.
- Can view assignment's of different courses.
- Can upload assignment submission of his courses.
- Can give feedback to the faculty's in his/her semester.
- Can view his/her attendance.

**Admin Module** - In our web-portal we have only one admin[HOD].He/she can directly login into the system with the unique email-id and password provided to him.After login he/she will be redirected to the dashboard page where he/she can do following things:

• Can view total students/faculty's registered in the system.

- Can add/remove faculty's.
- Can view/remove students.
- Can view feedbacks given by students to the faculty.

**Faculty Module** - After admin add faculty in the system, faculty can use the web-portal by using that unique email-id and password provided to him. After login he/she will be redirected to the dashboard page where he/she can do following things:

- Can view/edit profile
- Can upload study material/assignments
- Can view assignment submissions
- Can approve/reject courses.
- Can view feedbacks given to him/her by students of his/her course.
- Can give daily attendance to students of his/her course
- Can also view attendance of students.

## 4.2 Security Measures:

Some of the security measures that our project can face and how these vulnerabilities were handled are mentioned in this section.

# 1.SQL INJECTIONS:

The SQL injection is a type of code injection, where attackers make full use of the vulnerabilities in the website security measures to send special SQL queries to the database which can modify it and tables within it or delete the whole database.

To prevent it we are doing following:

• We are validating and also verifying each and every data entered by user [student] while registration, while login and while giving feedback.

- We are also validating and verifying each data of faculty.
- We are also securing the confidential information of user.
   For example we are encrypting each user's password using md5 in php.
- We are also using mysqli\_real\_escape\_string() which will avoid all the special character and we have also used htmlentities() to avoid html entities.
- We are avoiding using words such as 'insert', 'update', 'drop', and 'union' from being added to the database, as these all being words can alter tables and databases.
- We are also limiting the permissions granted on the database, because fewer permissions will result in fewer chances of hacking attack.

#### 2.BROKEN AUTHENTICATION & SESSION MANAGEMENT:

Broken authentication and session management encompass several security issues, all of them having to do with maintaining the identity of a user. If authentication credentials and session identifiers are not protected at all times an attacker can hijack an active session and assume the identity of a user.

To prevent it we are doing following:

- Password Change Controls: We are using a single password change mechanism where users are allowed to change a password, regardless of the situation. Users should always be required to provide both their old and new password when changing their password.
- Password Storage: All the passwords in our system are stored in either hashed

form to protect them from exposure, regardless of where they are stored. Hashed form is preferred since it is not reversible. We are also ensuring that passwords should never be hardcoded in any source code.

Session ID Protection:

We are doing session ID protection as following:

- 1.We start session when student/faculty/admin login to website and store their ID in global session array.
- 2. If any user want to access any webpage, and if given webpage should be

- access by specific user type then according to ID set in session array. If user is allowed to access the page then we show them the page, else we redirect user to their home page.
- 3. If user logout the website then we destroy all session variable so if they try to access previous webpage they can't access.

#### 3.INSECURE DIRECT OBJECT REFERENCES:

Insecure Direct Object References occur when an application provides direct access to objects based on user-supplied input. As a result of this vulnerability attackers can bypass authorization and access resources in the system directly, for example database records or files. Insecure Direct Object References allow attackers to bypass authorization and access resources directly by modifying the value of a parameter used to directly point to an object. Such resources can be database entries belonging to other users, files in the system, and more. This is caused by the fact that the application takes user supplied input and uses it to retrieve an object without performing sufficient authorization checks.

To prevent it we are doing following:

- Before giving access of any server resource, we are checking whether user is authorized or not.
- We are not taking the id from any parameter and directly identify the user based
  - on session object over the server. We are creating a session variable over the server and storing user specific information in it[email-id] and checking it in each request.
- Accessing each page of the website which requires authenticated user we are making sure that the user is logged in to the system by checking with session Variable.

## **5. RESULTS AND ANALYSIS**

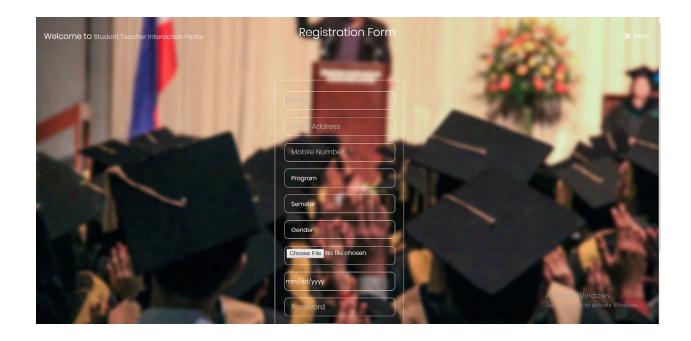
### Home Page



### STUDENT MODULE

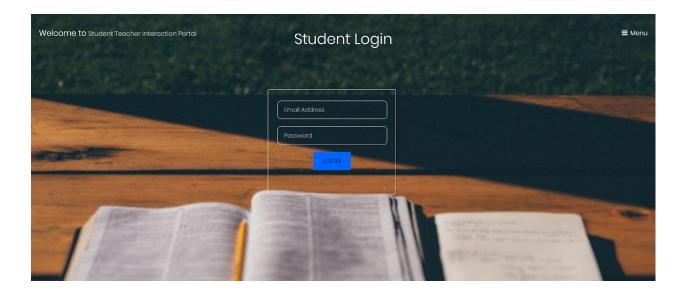
# Registration Page

Any new student who wants to use this web-portal must first register himself. Without registration he/she can not use this web-portal. Student can register into the web-portal by providing his/her basic details like name, email-id, semester, program etc..



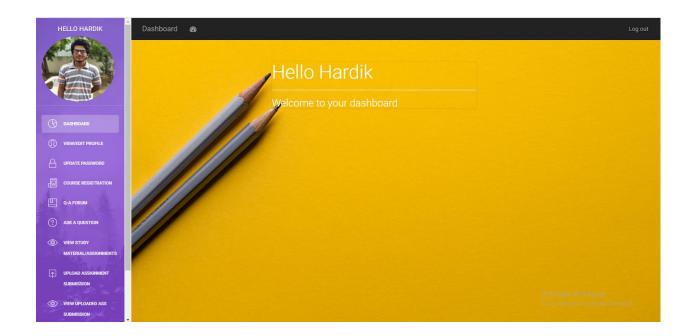
# • Login Page

After successfull registration any student can login into this web-portal by proving his/her email-id and password which he used while registration proocess.



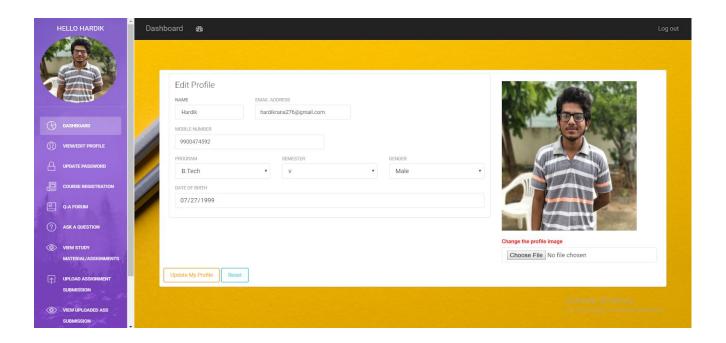
# Dashboard

After successfull login a student will be redirected to his/her dashboard [which will look like this].



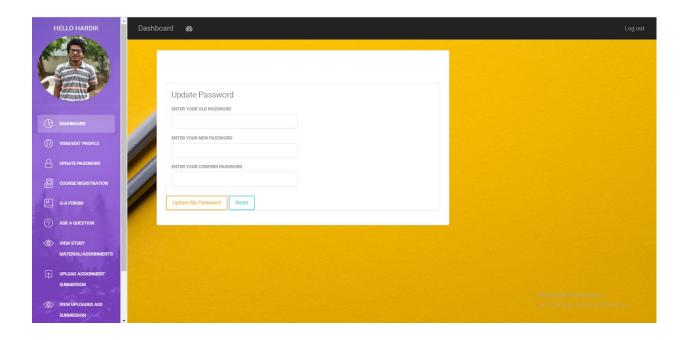
# • View/Edit Profile

In this section a student can view and can also update it's details.



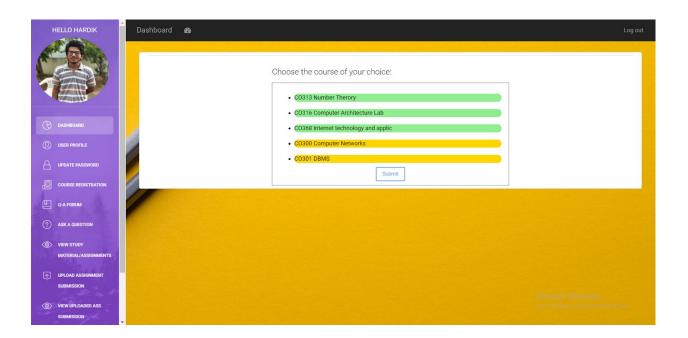
# • Update Password

In this section a student can update his/her password by proving old password.



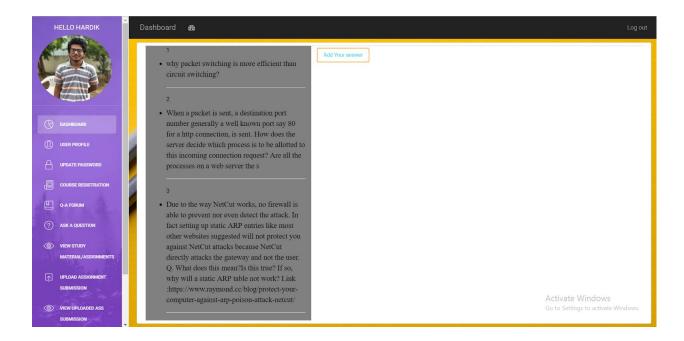
### • Course Registration

In this section a student can do course registration. The courses which will have green background are the courses which are approved from faculty. The courses with the yellow background are the courses which are still pending for the faculty response, and the courses with the red background are the ones which are rejected from the faculty.



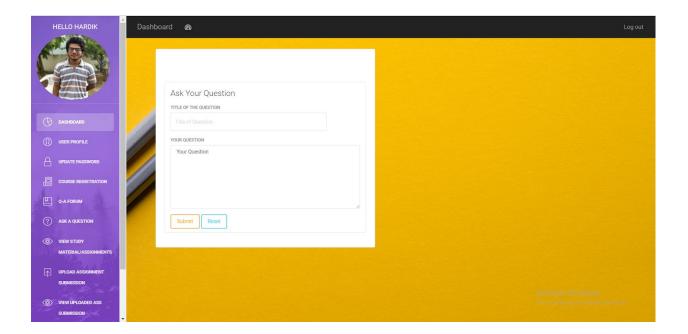
## • Q-A Forum

In this section a student can view all the questions asked by other Student's regarding doubts in courses and respective answers.



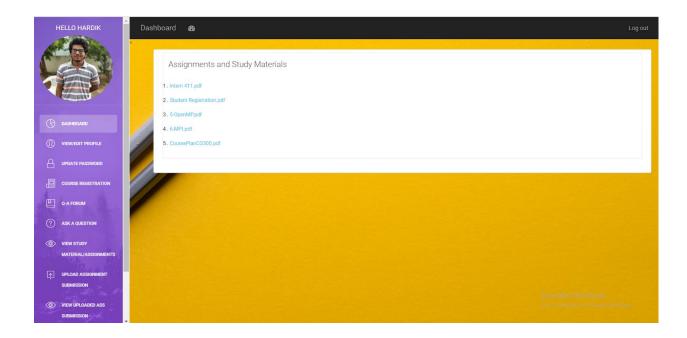
## Ask a question

In this section a student can ask question if she/he has doubt in any course he/she has taken,this question further will be added to the forum,where other students and faculty can view and add answer to it.



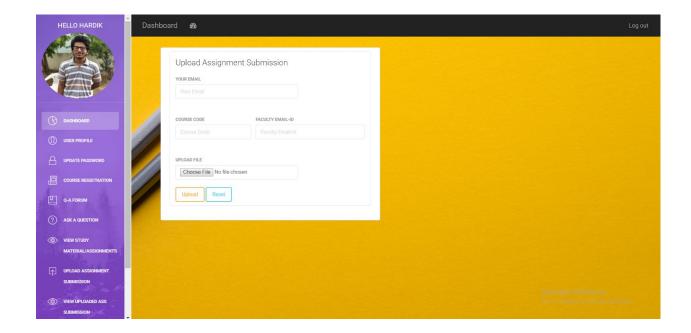
# View study material/Assignments

In this section a student can view and download all the study material and assignment uploaded by the faculty of the courses he/she has taken.



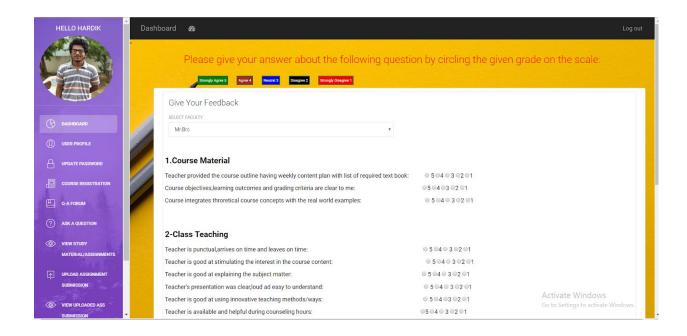
# • Upload assignment submission

In this section a student can upload his/her assignment submissions of particular courses by providing course code and faculty email-address.



### • Give Feedback

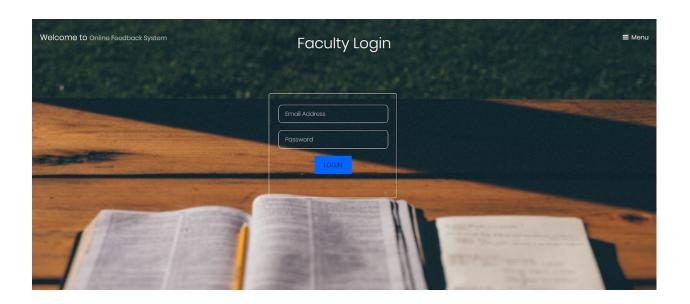
In this section student can give feedback to the faculty he/she has selected. We will show him only the professors which are taking courses in their semesters.



# **FACULTY MODULE**

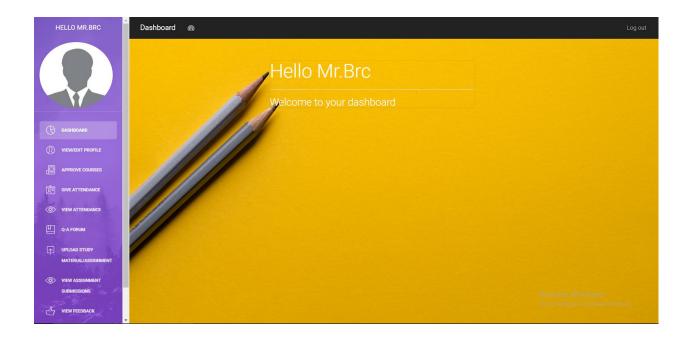
# • Login page

In our system admin will add faculty into the system. After that with that email-id and password a faculty can login into the system.



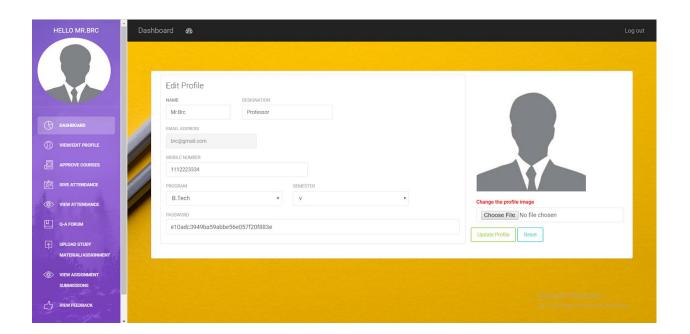
### Dashboard

After successful login a faculty will be redirected to his/her dashboard [which will look like this].



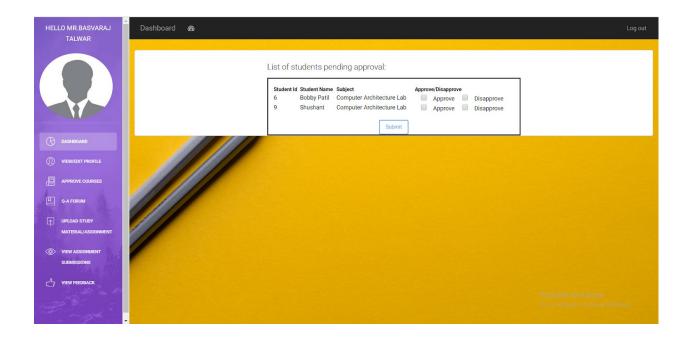
# • View/Edit Profile

In this section a faculty can view and can also update his/her details.



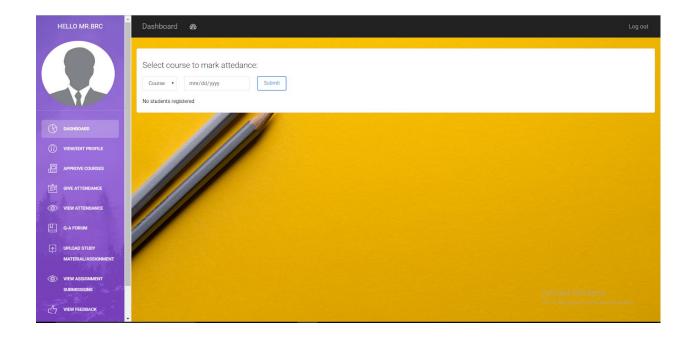
# • Approve/Reject Courses:

In this section a faculty can approve/reject student's request of taking their courses.



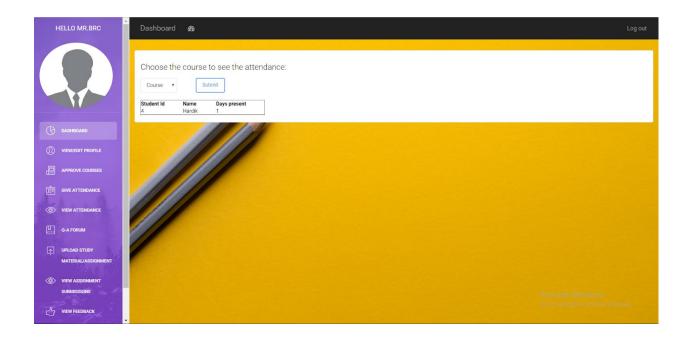
### Give Attendance:

In this section a faculty can give student's of his courses an attendance for particular date.



### • View Attendance:

In this section a faculty can view total attendance of student's of his courses.



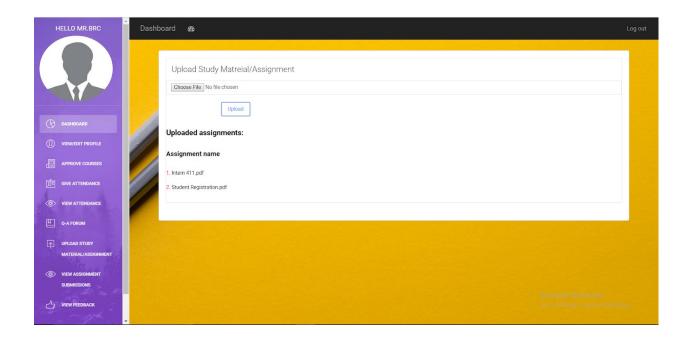
### • Q-A Forum:

In this section a faculty can add answers to the queries of students.



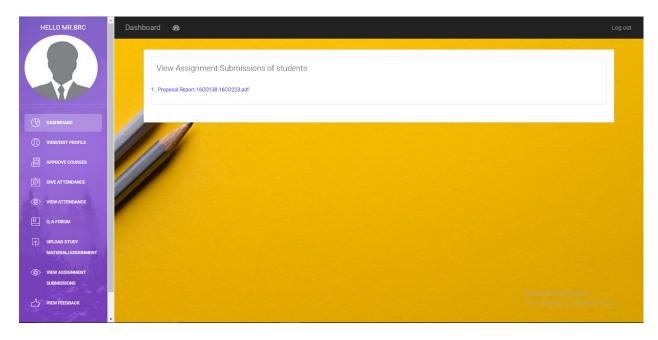
## Upload Study material/assignments

In this section a faculty can upload study material/assignments related to his/her course, which will be shown to the students of his/her courses.



# • View Assignment Submissions:

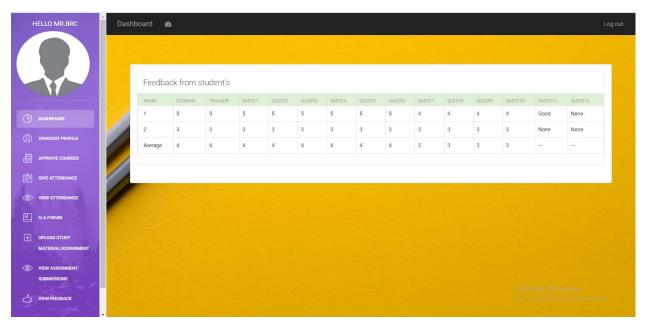
In this section a faculty can view assignment submissions of students of their courses.



#### View Feedback's:

In this section the faculty can see all the feedback of student's given to him and total average feedback.

We will not show him/her the name of the students. So it will be completely Anonymously.



# **ADMIN MODULE [HOD]**

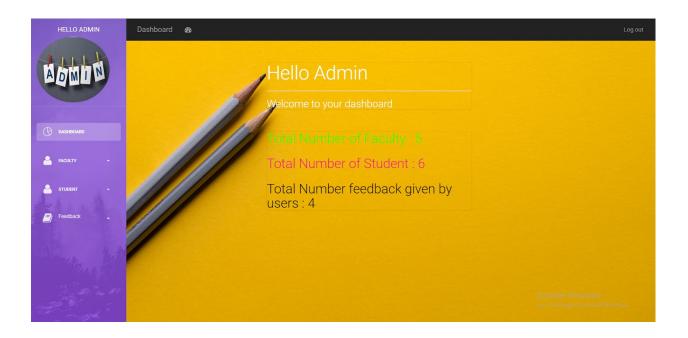
# • Login Page:

We will have only one admin in our system. Admin can login into the system by entering the unique email-id and password provided to him.



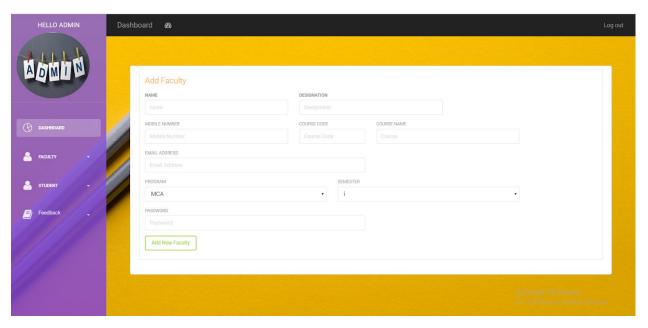
### Dashboard:

After successful login a faculty will be redirected to his/her dashboard, Where we will show total number of students, faculty's registered in the system. [which will look like this].



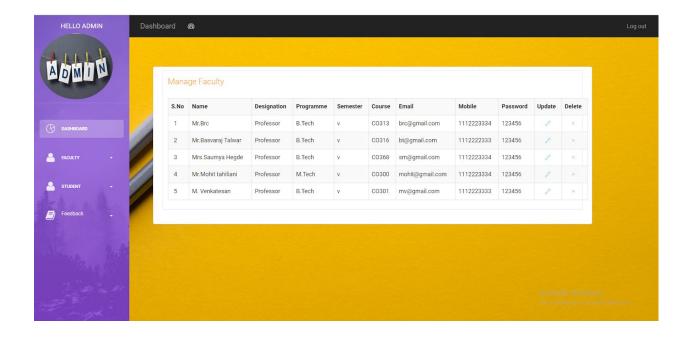
# Add Faculty:

Admin can add new faculty in the system by entering his/her email-id,course-code, course-name.



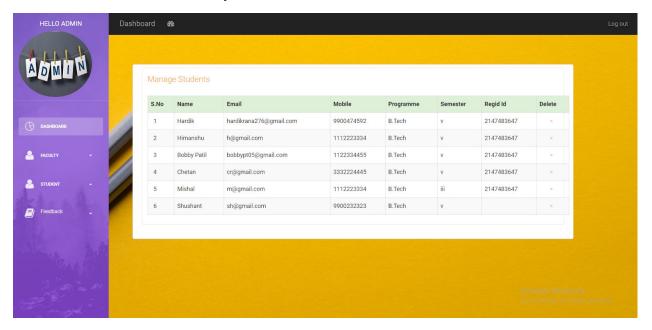
# • Update/Remove Faculty:

Admin can update the details for faculty's in the system and can also remove faculty's from the system.



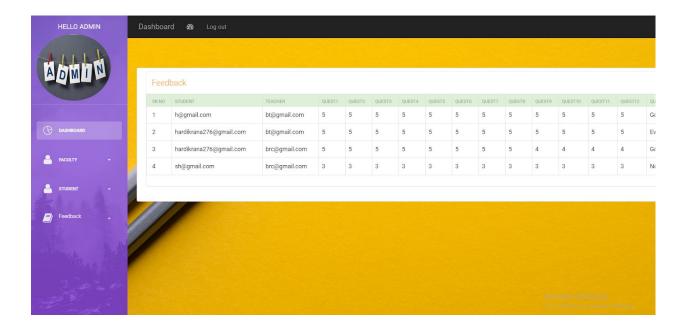
## Manage Students:

Admin can view all the student's registered in the system and can also remove students from the system.



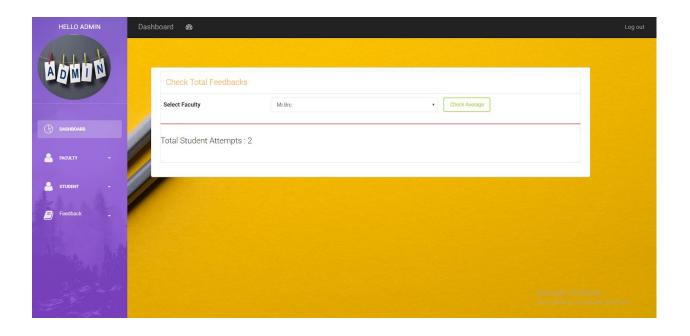
### View Feedback's:

Admin can also view all the feedbacks given to all the faculty's.



### View Total Feedback's:

Admin can also check how many total feedback each particular faculty is having.



### 6. CONCLUSION

To ensure effective communication with students, the university needs to consistently operate where students interact, and increasingly, that is on digital platforms. We know that students are inundated with information. Therefore, it is critical that we have an effective, valuable and common place to share important information to support student life in and out of the classroom. A single sign-in portal will be a powerful and important tool for the success of the students. The Web Application Software should be able to check authentication of the user. The Web Application Software should be able to fetch the required information from the database and to store it as well. The web application will need an active internet for any user to use.

This is not the end but beginning of the versatile, efficient and outsourcing Student- Teacher interaction and communication system. This is the one, which is compatible to all operating system. By making this project, we made a small footstep towards the path of progress of platform independent Digital forum system. After successful implementation of this software, it will help to the management for managing task efficiently. This gives satisfactory outputs as per required by the End User. This system also has extensibility feature that allows the Users to fulfill their additional requirements in the current system. After testing, the system gives same outputs as expected. Student-Teacher interaction and knowledge exchange is made economically, technically sound, and providing Efficiency.