E-Learning platform

by

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Dr. Pinku Ranjan and Dr. Somesh Kumar

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Abstract

Up until outbreak of Covid-19, the teaching-learning process had remained same for a very long time. Even though online learning was present, it was not prioritized. The imposition of lockdown forced a change in this system[3]. With no other way left, both teachers and students were forced to adopt to a new procedure of teaching and learning and this created a huge demand in the market for E-learning platform[2].

Alot of Research and development needs to be done in this new emerging market is it will have significant impact on the future of education system, this project is aimed towards the same. The notion of this project is to develop a product that fulfills all the academic requirements of teacher and student, by using simple tools and tech such as MERN Stack[7].

Acknowledgments

This project for me was a great experience and a huge opportunity to learn so many new things. I would like to take this opportunity to thank Dr. Pinku Ranjan sir and Dr. Somesh Kumar sir for guiding me through the project, thanks to their motivation and valuable suggestions I was able to work on such a wonderful project and have an amazing experience of learning along the way.

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(Sanket Kumar Dawar)

Contents

Chapter 1

Introduction

In this chapter we introduce the project, we discuss about context, the problems which the project aims to solve and what motivated to choose this topic and novelty. In final part we conclude this chapter with objectives of the project.

1.1 Context

Due to the pandemic situation last year, schools and colleges were forced to shut down, which opened new doors for the teaching and learning[3]. Online classes now were the only way to continue the academics.

This project is focused towards enhancing online teaching-learning by providing one single web application for all academic needs of both student and teachers.

How is this project different from others? As for now we need to have multiple apps and website in order to coup up with online system. For eg. for assignments, we need to have class-room, for live classes we need to use Google meet/Cisco/Microsoft Teams according to preference of the teacher, to get in touch with the teacher we use whatsapp or e-mail but with this project the intention is to bring all the features in to one single web app, so that we can focus more on teaching/learning than managing so many web/apps.

1.2 Problem/Motivation

With this sudden shift from offline to online teaching, the huge issue is that there is no proper application to manage all the academics related activities. teachers and students need to have multiple applications for different purposes. e.g.- one application for taking online class, another for exam and another for attendance alone. This often leads to confusion and frustration.

With present system there are no feature to record the class by default we need to record manually or use third party app which is not convenient, so if a student misses a class there is no proper way to access that class.

There is no proper way of communication between student and teacher, To clear any doubt student have to either email or wait for the next online class, which may take too much time and the process becomes too frustrating for both student and teacher.

1.3 Objectives

The notion is to try and develop a product that fulfills all the requirements of a student and teacher for a smooth academic workflow. The objective of this project is to build one single web-based platform for both teachers and students, to manage all the day-to-day academic related activities. such as Online Class, Notes, Assignments etc. to ensure better efficiency in the process of teaching and learning and remove dependency on different apps for different functionality.

Here are some objectives of this projects and how and what is aims to change in present system -

(1) Video-Conference-classes. An integrated video conferencing system which allows better quality and performance as it is integrated into the project and allows you to record classes.

(2) To simplify Online Education by bringing all the needs of teachers and students in one single web app. So that we can spend more time learning and teaching than managing the web/apps.

(3) Better way to share notes to student

(4) Reduce gaps between student and teacher, the only ways student can contact teacher or vice versa, is to whatsapp, e-mail or to wait for the next live class. By providing an inbuilt discussion feature the project aims to ease the communication.

Chapter 2

Literature review

First of all lets understand what is online teaching-learning. Online teaching-learning refers place Online teaching-learning refers to the education which takes places over a long distance. Its also referred as web-based education, is currently the latest, most popular form of distance education[1]. with the recent outbreak of pandemic, online teaching learning became main source of education throughout the world[9]. With this new market emerged and started growing rapidly[2]. While it have brought alot of advantages[5], it also has some some drawbacks, there is no integration of notes writing, there is no option to record classes we have to use third party applications etc. Google have taken most advantages of this situation as there are no actual competition, it have successfully promoted its all other apps such as Gmail, Google Forms Calendars, G-Drive, Google Hangouts, Google Jam board and Drawings along side of its google classroom.

There are alot of distractions while learning online, with present products in the market the lack of single product makes it difficult for student to concentrate on one thing, for eg- when a student after class leaves the video class app and looks for other app to take notes, just looking at the social media apps may create alot of distraction. There are alot of distractions while learning online, so there are alot of distractions and obstacles in online education[8].

Chapter 3

Methodology

With the recent pandemic situation, the concept of online classes saw an huge increase. As you can see in the given graph, the quires related to online class and online education increased by almost 90percent [3].

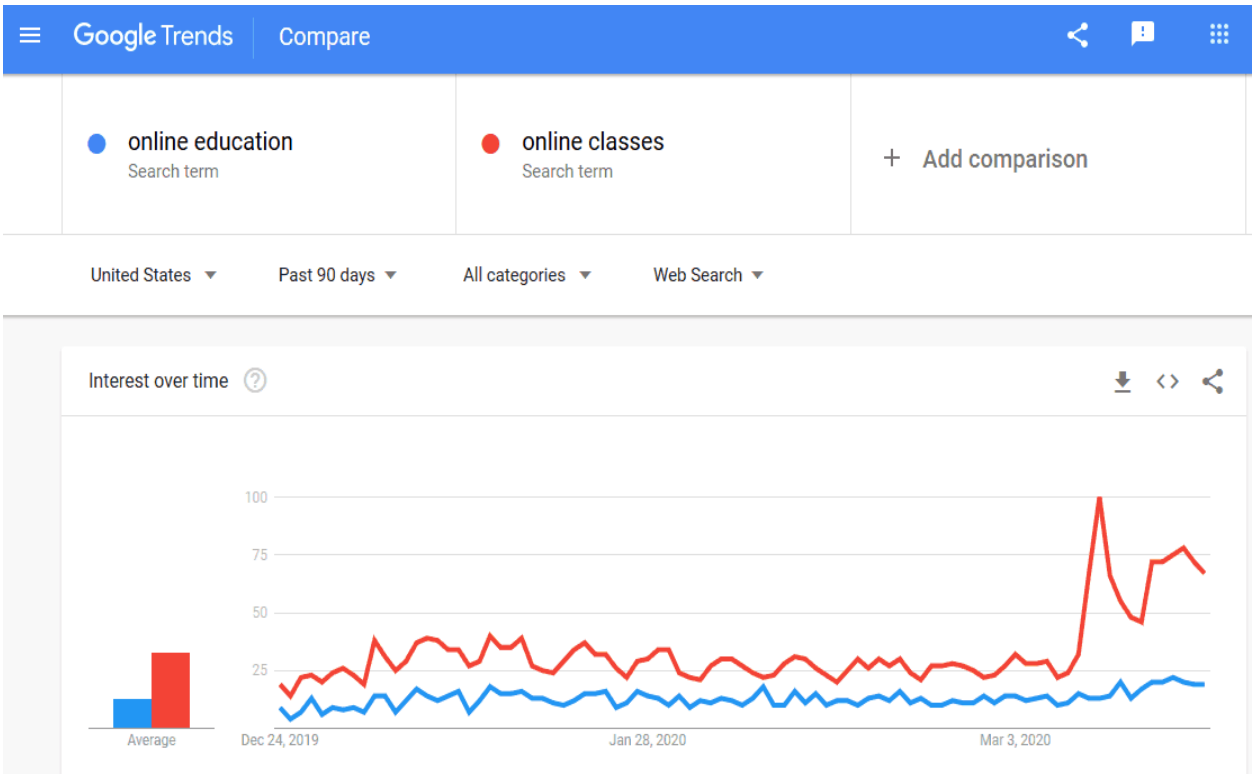

Fig1: Surging Interest in Online Education [3]

With the huge demand in the market there are very few products to address the demand, and the demand will be increasing further on, according to survey by technavio,the growth of online education market in India alone hadgrowth of about 19.6 percent in year 2020 and the market growth will accelerate at a CAGR of 21percent [2].

So there is an opportunity to for a product like this one and the availability of all the resources makes it alot easier.

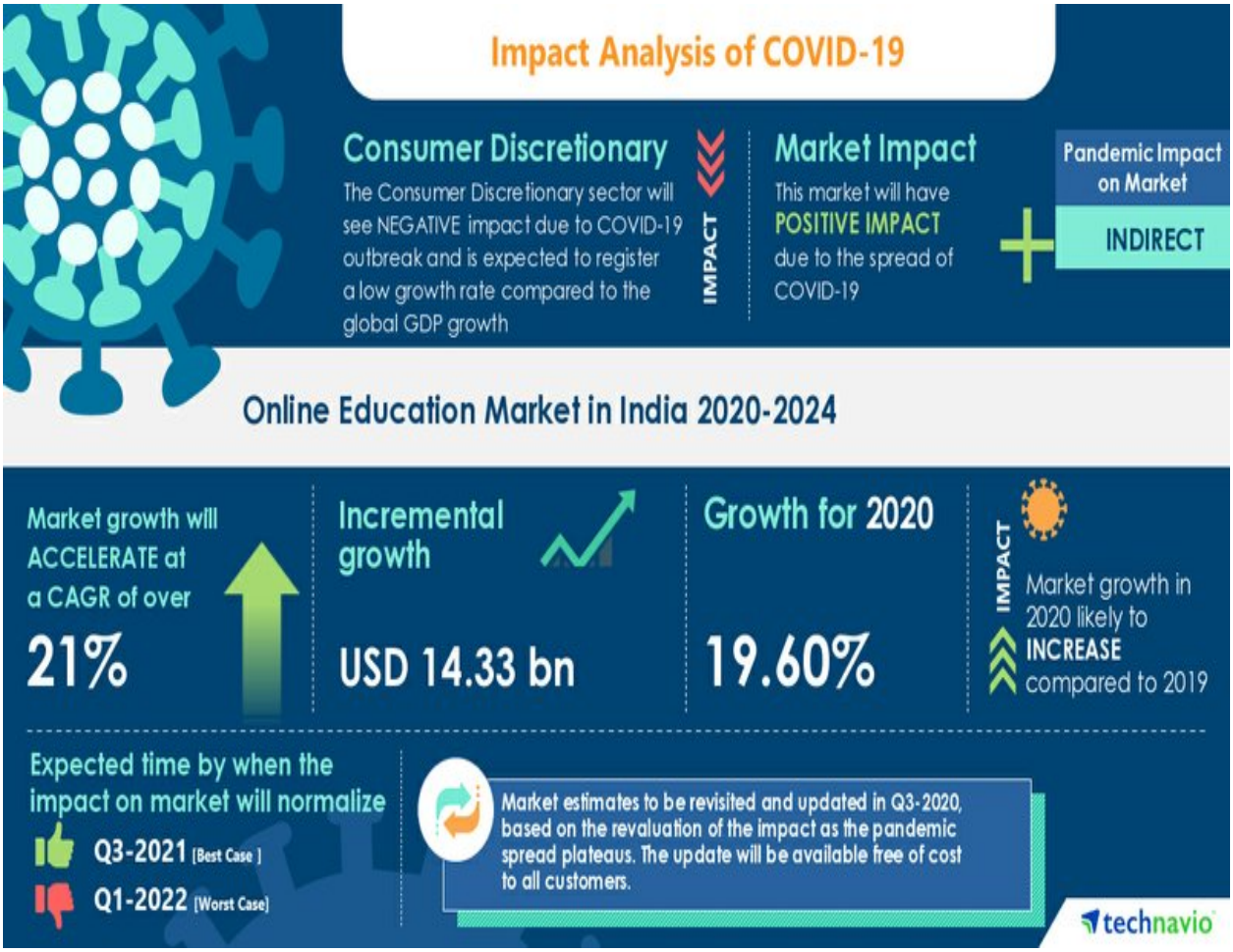

Fig2: Growth Of Education market in India 2020-2024 [2]

3.1 Proposed hypothesis

By using simple technology like MERN Stack, a web-based application can be built for this project.

Frontend is developed using React.js as it allows us to build User Interface in components and features like states, hooks and props make it more eficient to work with.

Backend is developed using Express.s and Nodejs as it can handle multiple client requests and its single threaded nature ensures great scalability and performance.

MongoDB is used as database mainly because of its performance and scalability but also due to its simplicity over other SQL databases .

Apart from these, Cloudinary is used as file storage system and Jitsi server is used for audio/video stream requests.

3.1.1 Software Requirements

As the project is be a web-based application, Following are the Technologies and tools used-

(1) **Node.Js** and **Express.Js** are used for backend .

(2) **React.Js** is used for frontend development.

(3) **MongoDB** is used as database

(4) **Socket.io** for real-time bidirectional communication

(5) **Jitsi-meet** (API integration) for video conferencing server

(6) Some other tools and setups used are -

-**Git** for project management

-**Mongoose**, Nodejs lib for better management of MongoDB

-**BcryptJs** and **JWT** Nodejs libraries for authentication.

-**Bootstrap** and **CSS** for responsive and better User interface.

- **PostMan** Development tool

3.1.2 System Design

Basic system design

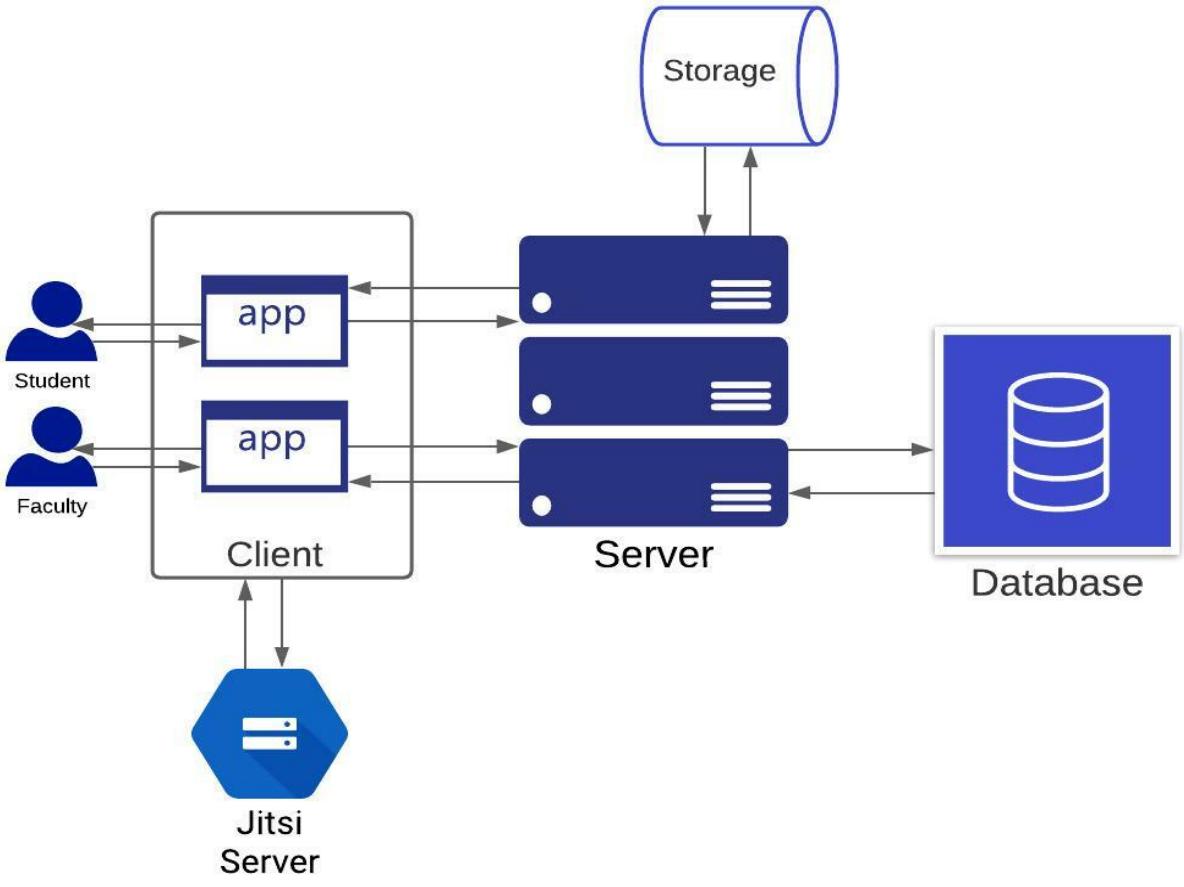

Fig3: Basic system design

3.2 Mechanism/Algorithm

There will be two separate interfaces, one for Teachers and ohter for Students, with some minor changes. Each Student and teacher will be enrolled with some subjects and in those subjects there will be all the functionalities related to that subject.

Following are some steps to explain the basics –

(1) Authentication

- Through a signUP and Login system, user will be verified and and authenticated and once authenticated, user will be redirected to the Homepage.

(2) HomePage

-The homepage consists of all the subjects user are enrolled to, with some info like batch name and Faculty name.

(3) Subject

-Onclicking a particular subject, user can access the the subject. which consists of four 'tabs' Class-For accessing the Online class and the previously recorded classes, Notes- To upload and access the Notes, Assignments- where teacher can provide assignment, Discussion- A place to clarify doubts.

(4) Class - In class, User can directly join the online live class

(5) Notes- for teachers there is an option for uploading the notes, and a list of all the previously uploaded notes. For sstudents a list of all the notes provided by the teacher.

(6) Assignment - For Teachers, there will be Take assignment option along with due date and marks. On uploading the assignment, student will be notified about the assingment and can access the PDF and has to submit in time.

(7) Discussion - student can ask any doubt directly to the teacher.

3.3 Conclusion

Overall the project is feasible and all the resources are available. However there are some challenges faced too. For video conferencing(taking Online Classes),building from scratch seems is not a viable option, so Jitsi, an openSource Video conferencing plactorm can be directly integrated into the project. Mern Stack was chosen as because of its flexibility and availability of vast libraries. For database, NOSQL database, MongoDB is used. For project management, and version control GIT is used.

Chapter 4

Results

This section discusses the various results of the project.

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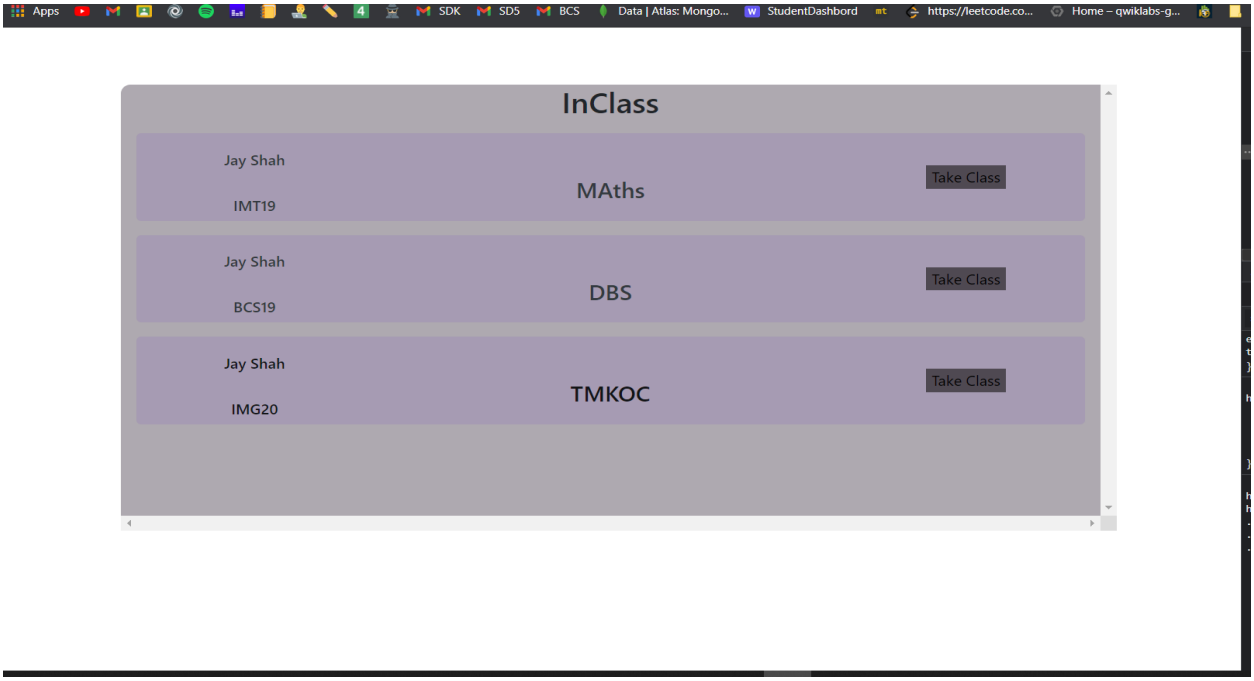

Fig4: Once user is authenticated, user gets the list of the classes he/she is enrolled to

2

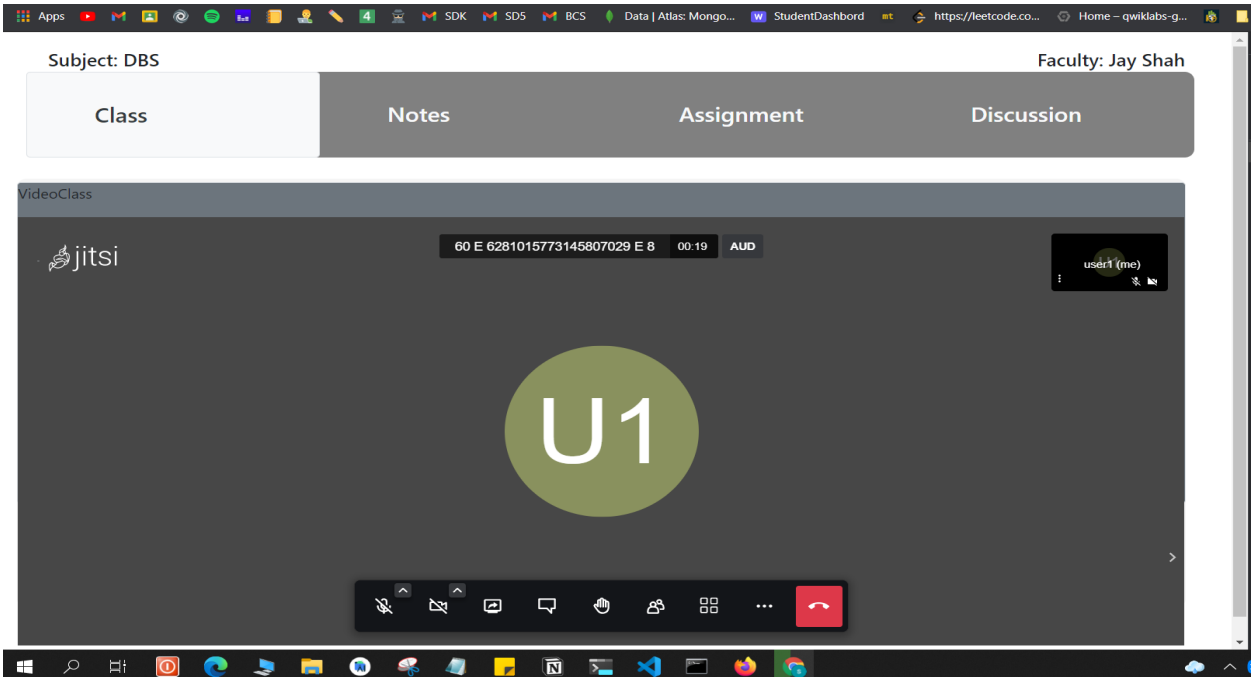

Fig5: On clicking a subject user is taken to page with 4 tabs and first one being live class where user can directly join the live-class of that subject

3

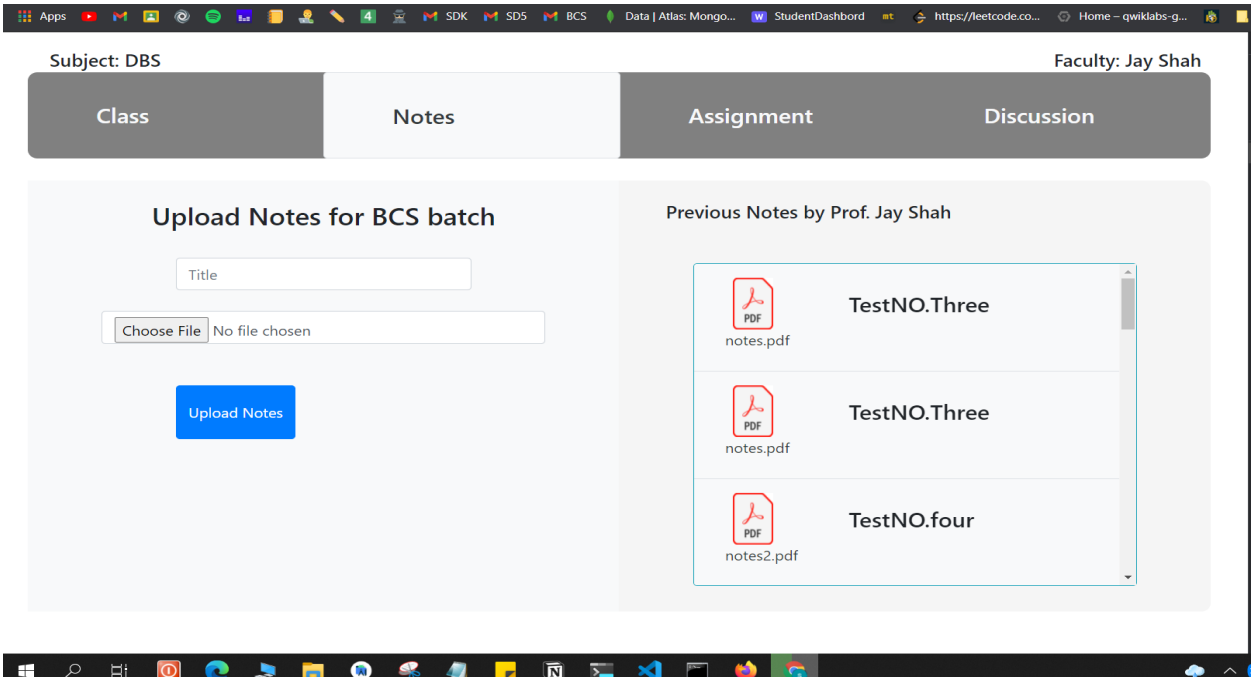

Fig6: In the Notes tab faculty can upload notes and student can receive the same to their end.

4

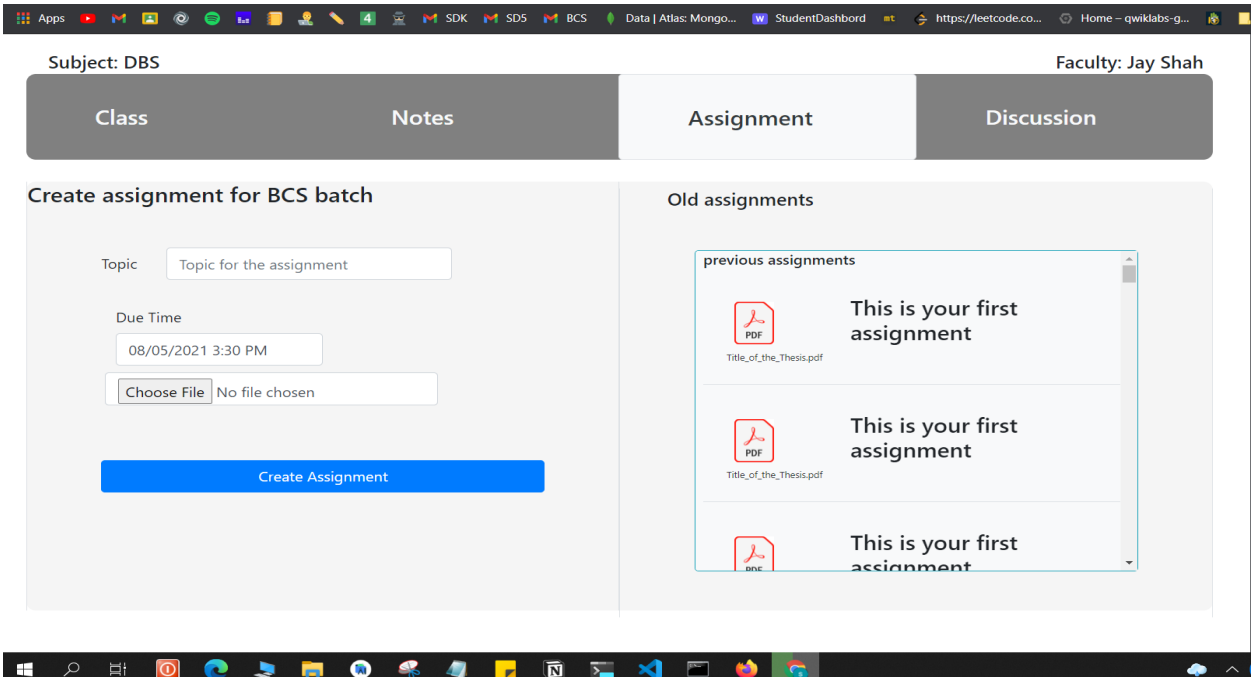

Fig7: In the Assignment tab, faculty can create an assignment which then reflects in students ongoing assignments list. Once completed, faculty can evaluate the submissions by clicking on the assignment on the previous assignment section.

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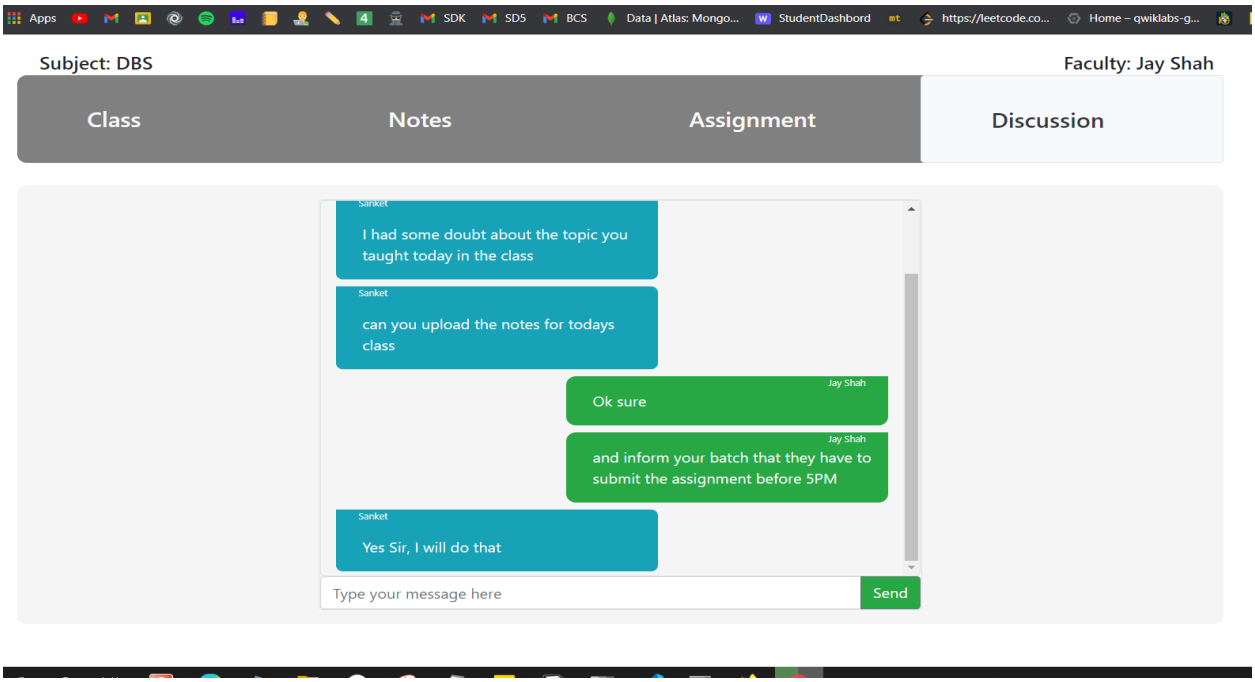

Fig8: Faculty and students can interact and discuss and student can clear their doubts in discussion section.

Chapter 5

Discussions and conclusion

The project as a whole, is an attempt to understand and tackle the challenges faced in this young emerging sector. The primary goal of the project is to enhance the experience of the online teaching-learning process, as the its fairly new to the market it has some challenges and needs to be resolved as it plays major role in future of education sector.

There is a need for proper research and development as there is a room and a potential to change the future of learning.

5.1 Limitations

This project was a great experience for me but also has some limitations. First of all building everything from scratch was not possible, so I had to use external API's for some features which however is considered to be a good practice.

Secondly, as easy it was to avail a resource it was quite a challenge to integrate all the individual things together in one working system.

Bibliography

[1] Matthew N. O.— Sadiku Philip O. Adebo— and Sarhan M. Musa. Online teaching and learning. www.researchgate.net, 2020.

[2] apnews. Online education market in india analysis highlights the impact of covid-19 (2020-2024). apnews.com/press-release/business-wire/0885fb71135e413f82145a919c30eebf, 2020.

[3] classcentral. Surging interest in online education. classcentral.com, 2020.

[4] edexlive. Pandemic effect: 1 in 5 kids in india attended online classes from their beds, finds survey. www.edexlive.com/, 2020.

[5] elearningindustry. advantages-and-disadvantages-of-elearning. elearningindustry.com/, 2020.

[6] Mohammad Mahyoob. Challenges of e-learning during the covid-19 pandemic. files.eric.ed.gov/fulltext/EJ1287713.pdf, 2020.

[7] Medium.com. Mern stack medium article. , 2019.

[8] weforum. coronavirus-education-global-covid19. www.weforum.org/, 2021.