

Online teaching-learning platform

by

Sanket Kumar Dawar

2019BCS-054

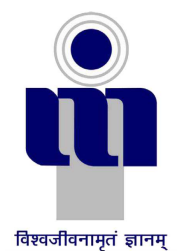
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ATAL BIHARI VAJPAYEE-

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY AND MANAGEMENT

GWALIOR - 474015, MADHYA PRADESH, INDIA

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Abstract

For a very long time, the teaching-learning process has remained the same. Even though online learning was present, it was not prioritized, but with the recent outbreak of the covid19, lockdown was imposed and every one was forced to stay at home, which led to change in the entire teaching and learning[3]. Initially both teachers and students struggled with the process, no proper way to teach students, or to take assignments. Which created a huge demand for a product which could ease online learning[6].

It is important to explore this market and constant research and development needs to be done because this is going to have a huge impact in the future education system. The aim of the project is to build one single platform for all the academic requirements. In this Project I use simple technology such as MERN Stack[7] is used to build a web-based application.

This paper discusses the introduction and working of the project.

Acknowledgments

I would like to take this opportunity to thank Dr. Pinku Ranjan sir and Dr. Somesh Kumar sir, not only for their mentorship but also for the guidance and motivation they provided throughout this project. Thanks to their Suggestions and feedback, I was able to do such a great project.

This project for me was a great experience and a huge opportunity to learn so many new things. I would also like to thank the institute for a giving me this opportunity.

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(Sanket Kumar Dawar)

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Chapter 1

Introduction

1.1 Context

As last year we saw a breakout of a serious pandemic, which affected us in many ways, Education system also took a major hit. Soon online classes became the main source of teaching-learning[3]. As this was just the beginning there were very few resources were available to continue schools and colleges online.

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 other? well we need to have multiple products we need to have multiple apps and website we need to use for eg. for assignments, we need to have classroom, 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 objective of this project is to build one single 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.

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

- (1) Recorded class. If a student misses any class for any reasons, He should be able to access the classes, the project ensures that by recording the class and storing it.

- (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) Notes making is most important while learning, so objective is to provide students an easier way to take notes and for teachers to provide notes.
- (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 let's understand what is online teaching-learning. Online teaching-learning refers to the education which takes place over a long distance. It is also referred to 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 the main source of education throughout the world[9]. With this new market emerged and started growing rapidly[2]. While it has brought a lot of advantages[5], it also has 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 has taken most advantages of this situation as there is no actual competition, it has 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 a lot of distractions while learning online, with present products in the market the lack of single product makes it difficult for a 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 a lot of distraction. There are a lot of distractions while learning online, so there are a lot of distractions and obstacles in online education[8].

Chapter 3

Methodology

The objective of this project is to create one single web application for all the academic activities. 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].

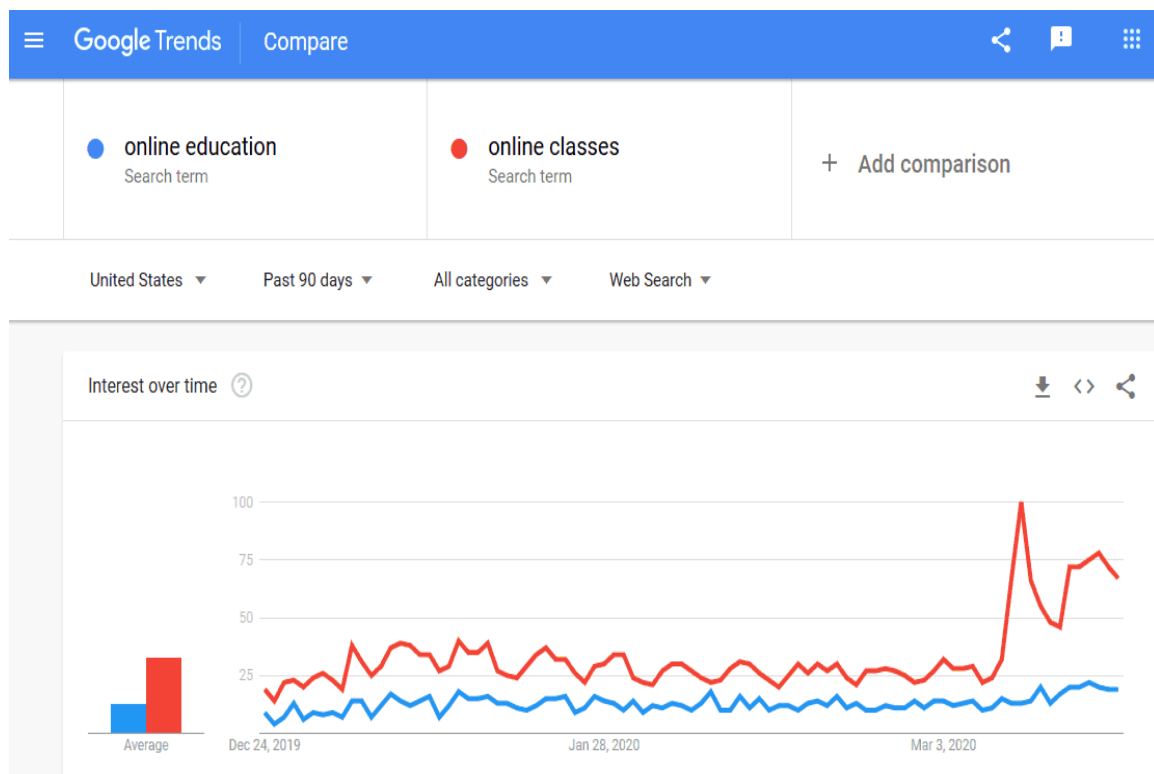


Fig1: Surging Interest in Online Education [3]

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 had growth of about 19.6 percent in year 2020 and the market growth will accelerate at a CAGR of 21 percent [2].

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

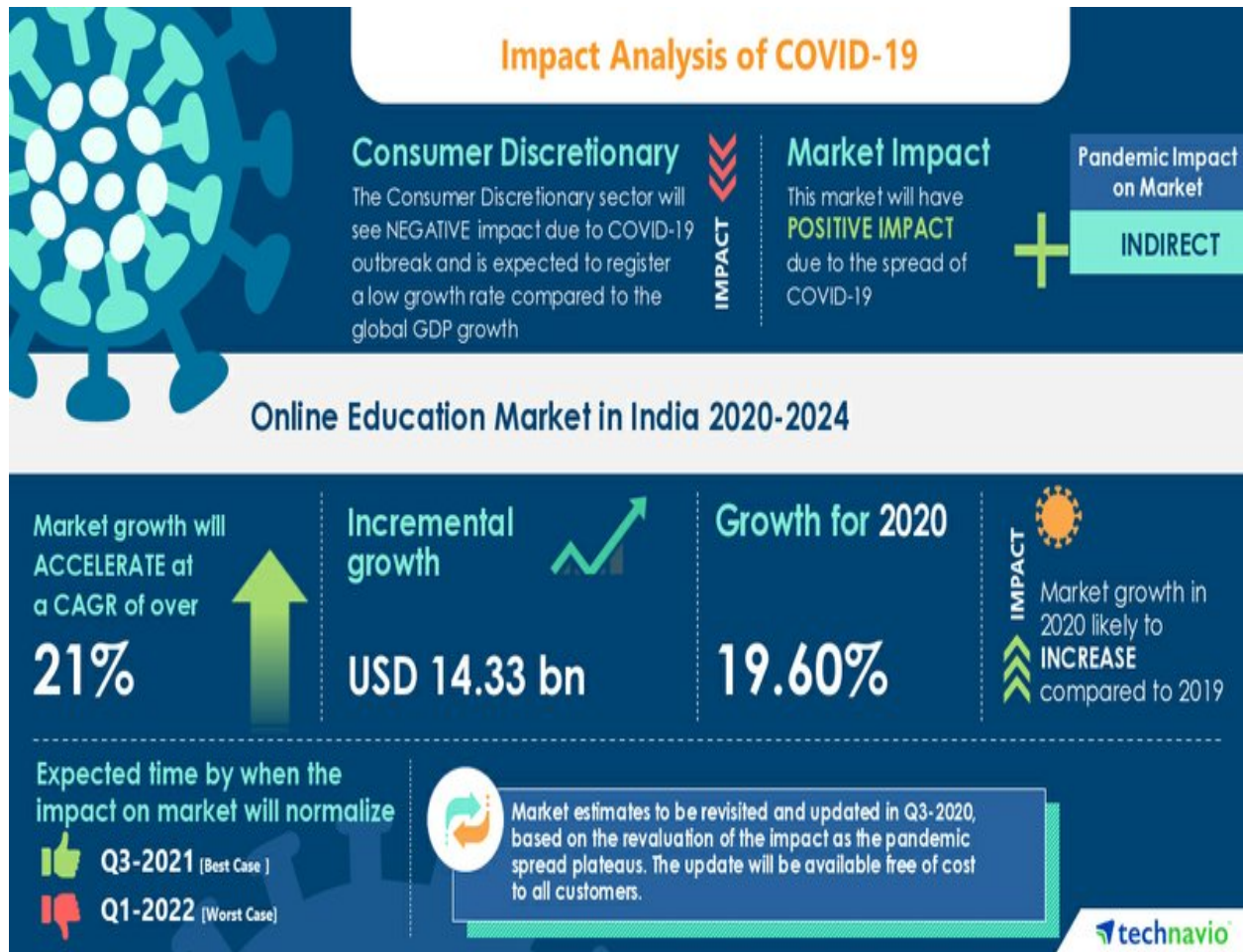


Fig2: Growth Of Education market in India 2020-2024 [2]

3.1 Proposed hypothesis

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

Frontend is developed using React, Backend is developed using nodejs and ExpressJs, MongoDB is used as database.

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) 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

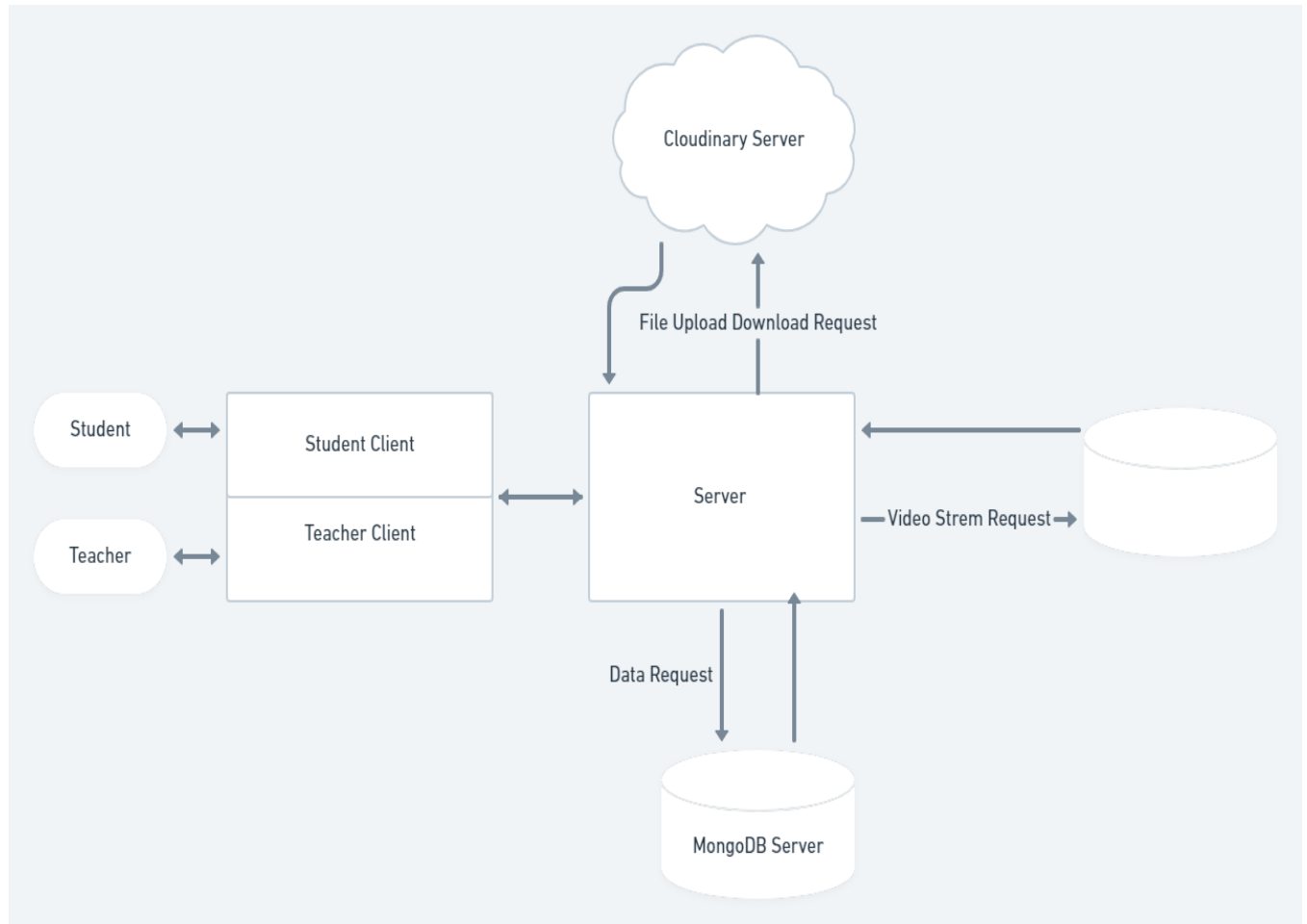


Fig3: Basic system design

3.2 Mechanism/Algorithm

There will be two separate interfaces, one for Teachers and other 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 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

-On clicking a particular subject, user can access 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, There are previously recorded class, and a link for the live online class.

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

Discussions and conclusion

The project as a whole, is an attempt to understand and tackle the challenges faced in this new 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.

4.1 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 thing together in one working system.

Finally the scale of the project was to big for 2 months of time.

4.2 Future scope

As discussed above, this project will explore the ways in which the we can enhance the online teaching system to find a proper way to manage daily academic activities such as online class, notes, assignments, discussion etc.

The project can further explore the ways in which exam cheating/plagiarism can be tackled and the availability of administration to ease the process.

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