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Chapter 1

Introduction

1.1 Context

As last year we saw a breakout of a serious pandemic, which a#ected 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 di#erent
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.

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1.2 Problem/Motivation

With this sudden shift from o#ine 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 mul-
tiple applications for di#erent 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 platfrom 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 e#ciency 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.

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(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 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 di#cult 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

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]
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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 re-
sources makes it alot easier.
Fig2: Growth Of Education market in India 2020-2024 [2]

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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, Mon-
goDB is used as database.
Apart from these, Cloudinary is used as

le storage system and Jitsi server is used for au-
dio/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
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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.
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Following are some steps to explain the basics {
(1) Authentication
- Through a signUP and Login system, user will be veri

ed 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 up-
load 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 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 noti

ed 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.
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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
exibility 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.