A Mini Project Report

On

Learning Management System

Submitted in partial fulfilment of the requirement of

University of Mumbai

For the Degree of

Bachelor of Engineering (SE)

in

COMPUTER ENGINEERING

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2022-2023

APPROVAL SHEET

This is to certify that the Mini project entitled

“Learning Management System”

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Declaration

We declare that this written submission for S.E. Mini Project entitled" L**earning Management System"** represent our ideas in our own words and where others' ideas or words have been included. We have adequately cited and referenced the original sources. We also declared that we have adhere to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any ideas / data / fact / source in our submission. We understand that any violation of the above will cause for disciplinary action by institute and also evoke penal action from the sources which have thus not been properly cited or from whom paper permission have not been taken when needed.

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Abstract

Education fulfils the enquiring minds for the knowledge and E-learning has been the backbone in fulfilling it from the past couple of years. LMS can provide rapid access to specific knowledge and information. The project delivers online educational content that can be accessed anywhere, anytime through a wide range of E-learning solutions when compared to the traditional learning system. LMS is a learning platform that can cater to the needs of the students as the platform aims to create a holistic environment where teachers can add, update, and perform various tasks that will assist the students in learning a particular topic through an engaging manner. This system also caters to match every student's imagination so that it becomes more and more interactive and helps to play a pivotal role in making education much more student-friendly.

The LMS provides: Personalized track and progress of a student, Provides different access to different party members and Ability to monitor user progress and Performance. LMS integrates educational goals with the technological features. Many students found difficulty in extracting scattered notes from different learning platforms. To tackle the aforementioned problem, the LMS provides its users with notes in a more systematic and in an organized manner.

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Chapter 1

Introduction

1.1 Background

Even at the peak of its prevalence, the outreached of rote learning was limited to a scant audience. It was then around the early 90s' where Sidney Pressey invented the first teaching machine. It resembled the typewriter to the certain extent, which platonically speaking, was a white text on black background. It was this concept that embarked the start of LMS.

The world's first interactive LMS was built by soft arc in the late 90s. So, we've been saying "LMS! LMS!" and many of you might be wondering what an LMS actually is?!

LMS or learning management system is a web-based software application that streamlines, automates and transforms the delivery of learning content given to students. LMS platforms give organizations the tools and technology to efficiently deploy and manage online learning. [1][3]

1.2 Motivation

Imagine if a pandemic had occurred in the early 19 & 18s a place and time where technology was to no avail the results would have been catastrophic for the entire education system. As experienced before in the beginning of pandemic, people began to fear about their education. It is then the LMS came as a savior for both teachers and students. Hence, we have selected this project which aims to create a LMS that can provide more features, necessary tools and user-friendly system from the best of our knowledge and experience so far. [1][2]

Presently, our college also has a LMS portal but due to technical reasons it has been dormant and closed to students. Many of our peers also found out that our notes and other reference material where being sent through unofficial channels that has rather become a boon than a blessing. Keeping in this our mines, our LMS intends to channelize the content in an organized manner that expedites faster learning. Key features of our LMS include: -1. Live chatbot

2. Personalized track and progress 3. Live calendar such systems are developed using various technology from the domains of Web development, database management

1.3 Aim and Objective

The basic aim in building the LMS is to provide a helping hand to student's education in an interactive manner. Furthermore, who wouldn't like to have recorded lectures and notes along with it?!

Well, if a student falls ill or due to some other reason, he/she is absent then the features of LMS such as recorded lectures, notes, quizzes will help him/her out in such scenario. The system so designed would help students in many more ways possible that we too, as a team of builders, would like to wait and watch for it and surely keep on updating the system wherever there are bug fixes.

1.4 Report Outline

Chapter 1: Introduction: Background Information: Explains the problem and motivation for the project

Chapter 2: Study of the system: Existing system: Alike system which already exists and the drawbacks about it

Chapter 3: Propose system: Explaining what is new in our project other than existing system, that includes problem statement: Scope and Software requirements.

Chapter 4: Design of the system: Defining elements of the system like architecture, Components and their interfaces and data for a system based on the specified requirements

Chapter 5: Conclusion and future Scope

Chapter 2

Study of the System

2.1 Literature Survey

2.1.1 Innovation for better teaching and learning: Adopting the Learning Management System

Even though there is evidence of a slight resistance towards the innovation, it is interesting to note that the concerns among the participants with regard to the use of the Learning Net system centres on the human issues such as its benefits to the students.

Though there is an indication that the group is very concerned over the impact of the innovation on their professional duties, responsibilities, and day-to-day activities, the results show an open mindedness among the participants when dealing with the new technology.

They are also looking for collaboration and working with other faculty members. Hence, there is a positive attitude and a high likelihood that the Learning Net System will be adopted by the participants. **[1]**

Technology/tool used: - Bootstrap 3.3.5, HTML5, CSS.

2.1.2 Review of Literature on E-Learning Systems in Higher Studies

This paper critically reviewed the literature related to e-learning systems and identified some of the most influential factors used in the field of information systems research. More specifically, this paper had an insight on the origins, characteristics as well as the limitations, weaknesses and strengths of web-based learning systems. Understanding the variables like behaviors and attitudes, cultural backgrounds and other demographic characteristics is now helpful for instructors to design meaningful educational activities to promote student knowledge construction and make learning more effective and appealing. This can help the management achieve the most effective deployment of such system and also helps them improve their strategic decision making about technology in the future. **[1]**

Technology/tool used Thinktag Smart, a new Web 2.0 platform

2.1.3 Choosing the right Learning Management System (LMS) for the Higher Education Institute Context

This concept paper discusses a number of potential Learning Management Systems (LMS) that can be utilized for teaching and learning processes in the context of Higher Education Institutions, for example Moodle, A Tutor, Blackboard and Success Factors. The comparison is made based on a literature review of the characteristics of the selected LMS providers. The characteristics considered are flexibility, ease of use, accessibility and user friendliness. This paper also provides some conclusions on the selection of the platform to be used. **[1][4]**

Technology/tool used: Moodle, i-Folio, Caroline, MyGuru2, Learning Care, iLearn System, Learning Cube, Blackboard, PutraLMS and MyLMS.

2.1.4 Literature review about usability evaluation methods

This review is a synthesis of research project about Information Ergonomics and embraces three dimensions, namely the methods, models and frameworks that have been applied to evaluate LMS. The issue of usability of interfaces been the subject of researches that propose a multidisciplinary approach on the same points in question. These are: (I) the manner in which the systems interface has contributed to their educational objectives; (ii) the system usability as a possible obstacle to users that seek to develop knowledge and fail their goals. To answer these questions from the viewpoint of Ergonomics we can observe researches of usability evaluation have been discussed together with other fields and sub-fields such as Participatory Design (PD), User-centered Design (UCD), Interaction Design (ID) and analysis of

the User Experience (UX) problems identified in E learning: -Interface problems, browsing problems, content problems – data is presented in a confusing manner, interaction problems, usability problems (related to the iteration possibilities among participants), irregularities in updating **[1][3]**

Technology/tool used: Moodle, blackboard

2.2 Existing System

2.2.1 Duolingo

Duolingo's Learning Management System has played a pivotal role in catering customers in learning a new language all that is required is a device and a good network connection. Over the years, Duolingo has been mainly focusing on over usage of Gamification. Applying a rubric toward evaluating educational games could help ensure a good balance between helping students learn and just helping them have fun which Duolingo have failed to do so. **[5]**

2.2.2 Google Classroom

Google Classroom is a free blended learning platform developed by Google for educational institutions that aims to simplify creating, distributing, and grading assignments. It has been noted that in Google Classroom, if you need to get in touch with a guardian to ask them a question, Google Classroom's Dashboard won't really be able to help. However, you can send group bulletins to all guardians and share reporting (like a missed assignment). You'll have to handle one-on-one messaging another way. **[5]**

2.2.3 Mastery Connect

Mastery Connect is a management platform that assists teachers in identifying student performance by providing mastery standards for any performance-based assessment. A good education app should frequently – or even constantly – remind

the learner of his/her progress toward the eventual learning goal. Too many learning apps feel more like mere references, where the learner has no sense of which concepts or skills have been "mastered," or where s/he needs to focus more energies. **[5]**

SR.NO	TITLE	AUTHOR	DESCRIPTION	TOOLS
1.	Innovation for Better Teaching and Learning: Adopting the Learning Management System	Nor Aziah Alias & Ahmad Marzuki Zainuddin	This paper on LMS has received mixed reviews from students who got the access of it where some believed in slate and chalk system while some believed in the technological innovation.	Bootstrap HTML CSS.
2.	A Review of Literature on E-Learning Systems in Higher Education	Tagreed Kattoua, Prof. Musa Al-Lozi & Dr. Ala'aldin Alrowwad	This paper describes the LMS as an effective system keeping an eye for adaption of technology in educational field in the upcoming future. Here, LMS has received positive reviews by stating LMS making education more effective and appealing.	Thinktag Smart, a new Web 2.0 platform, blackboard.
3.	Choosing the Right Learning Management System (LMS) for the Higher Education Institution Context.	N. N. M. Kasim F. Khalid	This paper demonstrates the fact that LMS is a user-friendly, ease-of-use and accessibility of eduction to a student from nook and corner of the world. This again shows the positive remark on LMS.	Claroline, MyGuru2, Learning Care, iLearn System, Learning Cube, PutraLMS and MyLMS.
4.	Literature review about usability evaluation methods	Freire, Luciana Lopesa,, Arezes, Pedro Miguelb and Campos, José Creissacc	This review is a synthesis of research project about Information Ergonomics and embraces three dimensions, namely the methods, models and frameworks that have been applied to evaluate LMS.	Moodle, Blackboard.
5.	Learning Management and ICTon the Learning Effectivenes	Maya Sova, Maryadi Tirtana Siregar, Iskandar Ahmaddien,Christiyanti Aprinastuti, Kristia	LMS specifically is intended to develop students' abilities in using learning tools, provide conditions that enable students to learn, and help students to obtain the expected results	Moodle, i-Folio , iLearn System, Blackboard.

Table 2.1: Existing system comparison

Chapter 3

Proposed System

3.1 Problem Statement

Over the period of time where students and teachers have started to adapt to the Learning Management System, it was quite noticeable that all the notes that were provided to the students are being received by them in more congregated manner unlike the manual teaching system where the class handwritten notes written on the respective subject notebook were the sole source of notes that a student can receive. Learning Management System that connects the technology and education also takes up the responsibility of pinging notifications on the device which is using the LMS that provides students as well as teachers the flexibility in making any required changes in timings of the lecture or notes or any other important updates that must be informed to the students.

3.2 Scope

i. Why LMS
ii. Uniqueness Of the Project
iii. Outline Of the Project
iv. Major Deliverables
v. Key Milestones
vi. Scope Exclusion

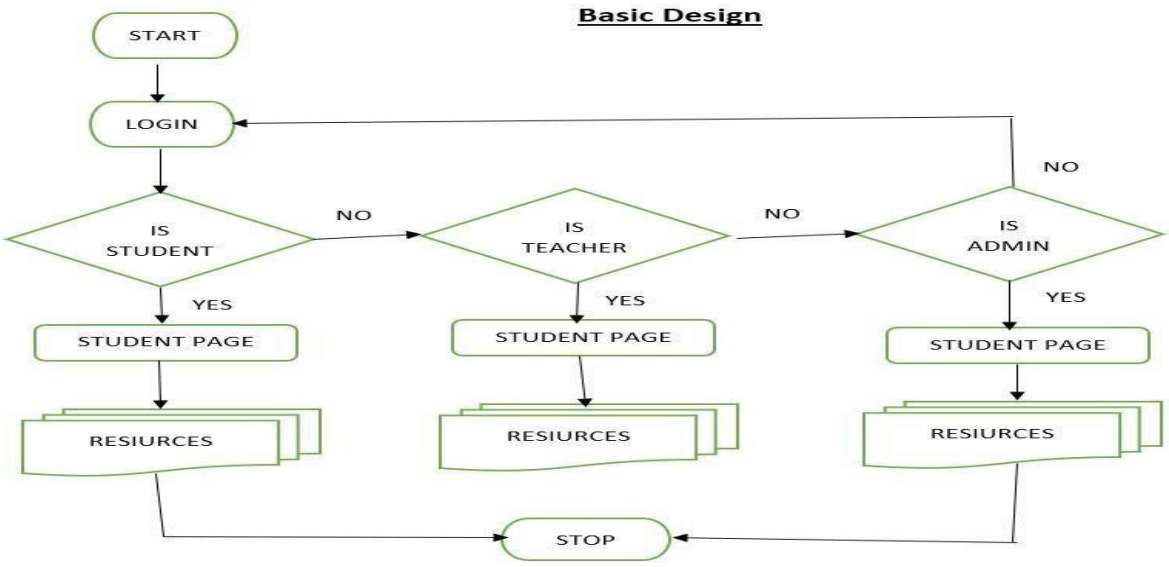
3.3 Software Requirements [1]

HTML5, CSS, JavaScript, Bootstrap4.6.2 & MySQL, Nodejs.

Chapter 4

Design of the System

Fig: 4.1



Once the user uses his id and password to login the system will identify whether the user is a student, teacher or admin.

Fig 4.1 Basic Design of the LMS website

Fig 4.1.2

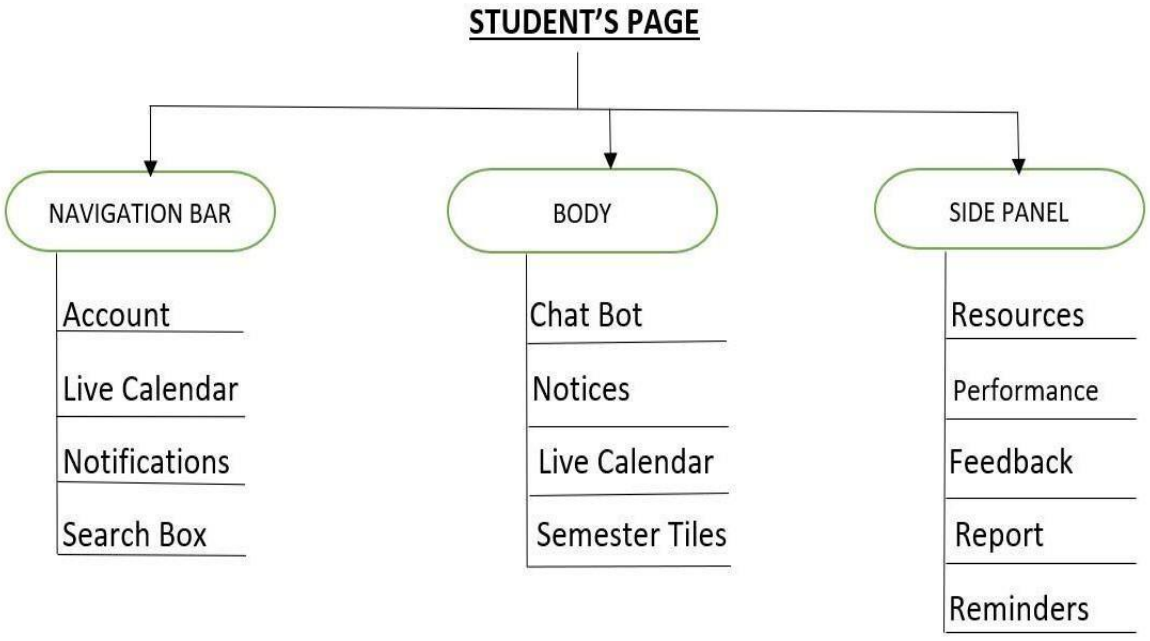


Fig 4.1.2 Student's Page Flowchart

The above diagram shows the features that the student page consists of in the navigation bar, body and in the side panel of page.

Fig 4.1.3

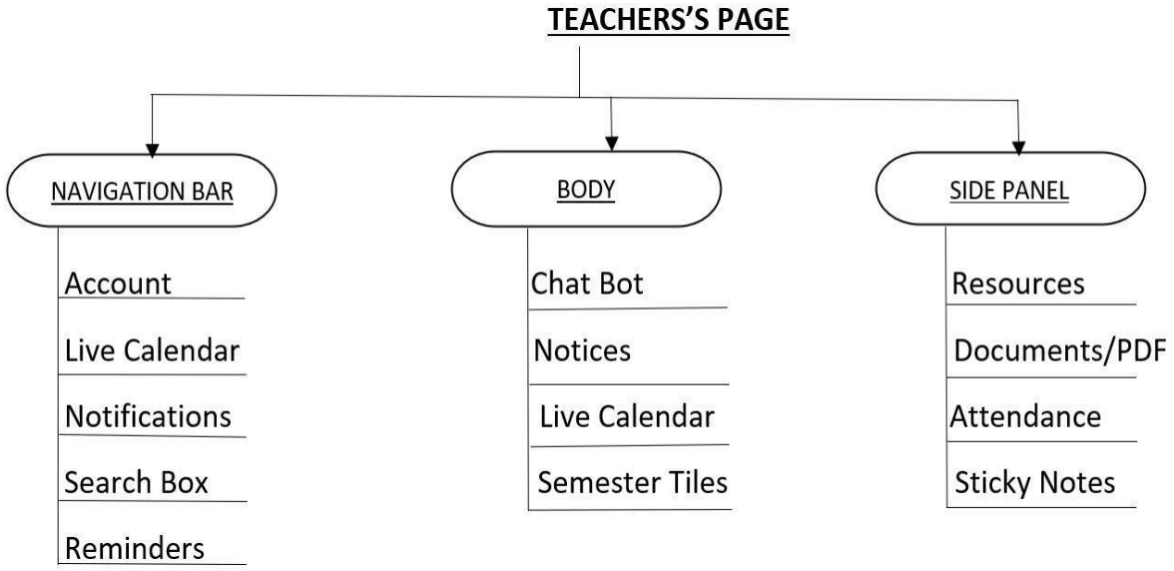


Fig 4.1.3 Teacher's Page Flowchart

The above diagram shows the features that the student page consists of in the navigation bar, body and in the side panel of page.

Fig 4.1.4

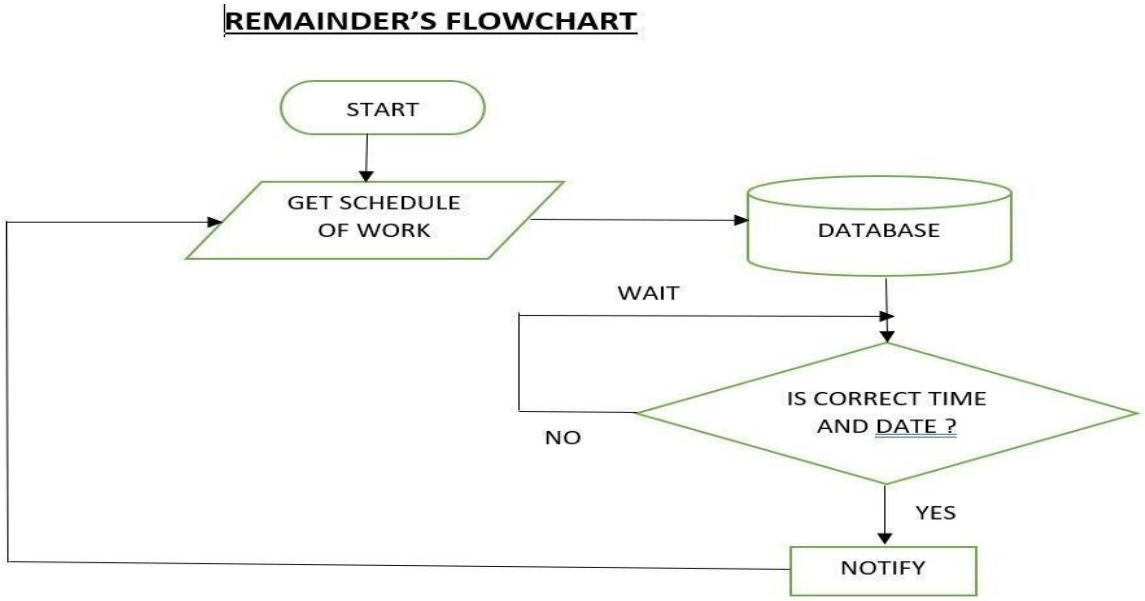


Fig 4.1.4 Remainder's Flowchart

Above flowchart show the flow of the process how the system works. The system will take the input as what and when the reminder has to be given and according to that it will give the reminder.

4.2 Technology Stack

4.2.1 Tools Required

Front End:

HTML: HTML also known as Hyper Text Markup Language is a markup language used for content used to show in a web browser. It is often accompanied by technologies like Cascading Style Sheet (CSS) and scripting languages such as Java Script.

CSS: Cascading Style Sheet (CSS) is a style sheet language used to present the document on the web browser which is written with the help of a markup language. CSS has been the base technology for building the world wide web along with HTML and JavaScript.

JS: JS or JavaScript is a programming language which was used for making the world wide web alongside HTML and CSS. It allows you to implement complex features on your webpage.

Bootstrap: Bootstrap is a free, open source front-end development framework for the creation of websites and web apps. Designed to enable responsive development of mobile-first websites, Bootstrap provides a collection of syntax for template designs

Back End:

MySQL: MySQL is a relational database management system. Databases are the essential data repository for all software applications. For example, whenever someone conducts a web search, logs in to an account, or completes a transaction, a database system is storing the information so it can be accessed in the future.

Node: Node is a Java Script run time environment that is used for server side scripting

Chapter 5

Result and Discussion

5.1 Observation

5.1.2 Frontend Observation

The Hyper Text Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser whereas cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML and at last JavaScript, often abbreviated as JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS.

As the site involves multiple pages hence different HTML, CSS and JavaScript pages has been created to view different pages based upon the action performed by the user. The CSS file and the JavaScript file are linked using the link tag and script tag respectively to the HTML page to have the effect. The link tag is specified in the beginning whereas the script tag is linked at the end because the browser needs to load those files, which means the client downloads them. While this does happen very quickly, we would prefer that the client looks at some page rather than a white screen.

5.1.2 Backend Observation

The given code is a Node.js application that utilizes the Express framework to create a web server. The server listens on port 3000 and connects to a MySQL database hosted on an Amazon RDS instance. It also includes modules for handling HTTP requests and responses, parsing request bodies, serving static files, enabling cross-origin resource sharing (CORS), and working with file paths. The application has GET routes for serving HTML pages. It also has a POST route for handling form submissions from the login page. When a user submits their username and password, the application checks if the username is of length 7 or 4, and depending on that, it queries either the "Login" table or the "Teacher" table in the database to authenticate the user. If the user is authenticated, the application sends a response to the appropriate HTML page. The code also includes a function named "connectDB" that establishes a connection to the database when the application starts. However, this function is used, and the database connection is established directly using the "mysql. Create.Connection" method. One potential issue with the code is that it is vulnerable to SQL injection attacks as it concatenates user input directly into SQL queries. To prevent this, the code should use parameterized queries or a query builder that escapes user input. In summary, the given code is a simple Node.js web application that uses the Express framework to serve HTML pages and authenticate users by querying a MySQL database. It demonstrates how to

handle HTTP requests, parse request bodies, serve static files, enable CORS, and work with databases in Node.js.However, it could benefit from better security practices to prevent SQL injection attacks.

5.2 Step by step working

Fig 5.2.1.1 Shows the login page that will be visible to user. In the above we login using student credentials which will be their Roll number and date of birth as password

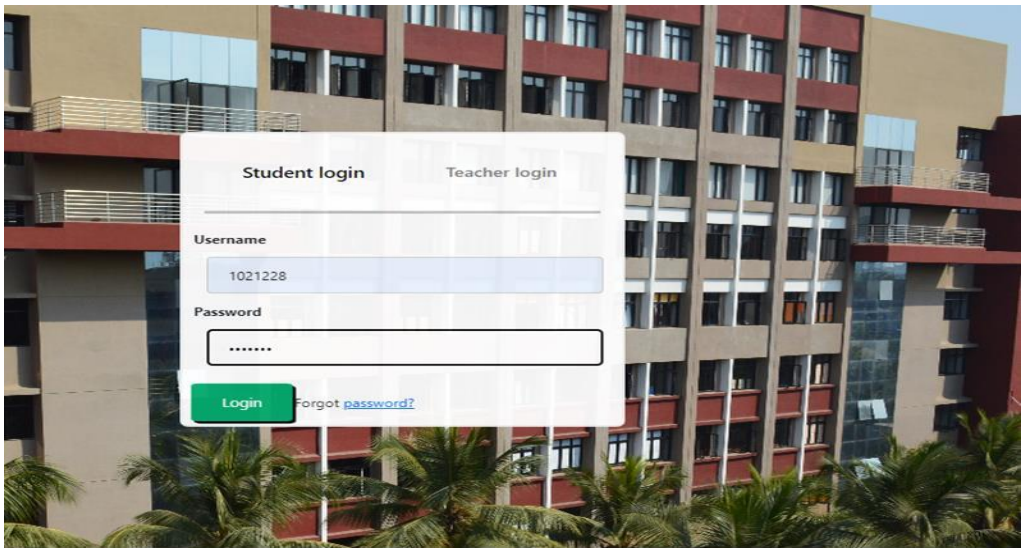
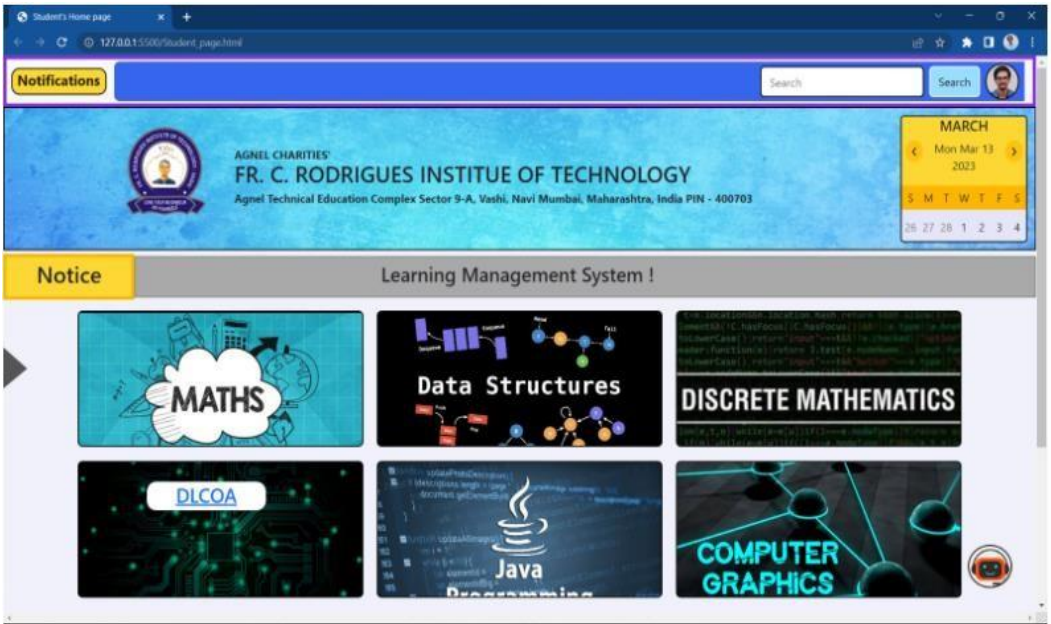


Fig 5.1 Login page with Student credentials

Fig 5.2.1.2 Shows Upon successful login by the student this will be their landing page. Here various Subject tiles makes it easy for the student to navigate between their subjects' resources.



5.2.1.2 Student homepage

Fig 5.2.1.3 shows the full-page view of the site with the side panel, which contains additional student resources such as Academic planner, Performance Analysis etc..

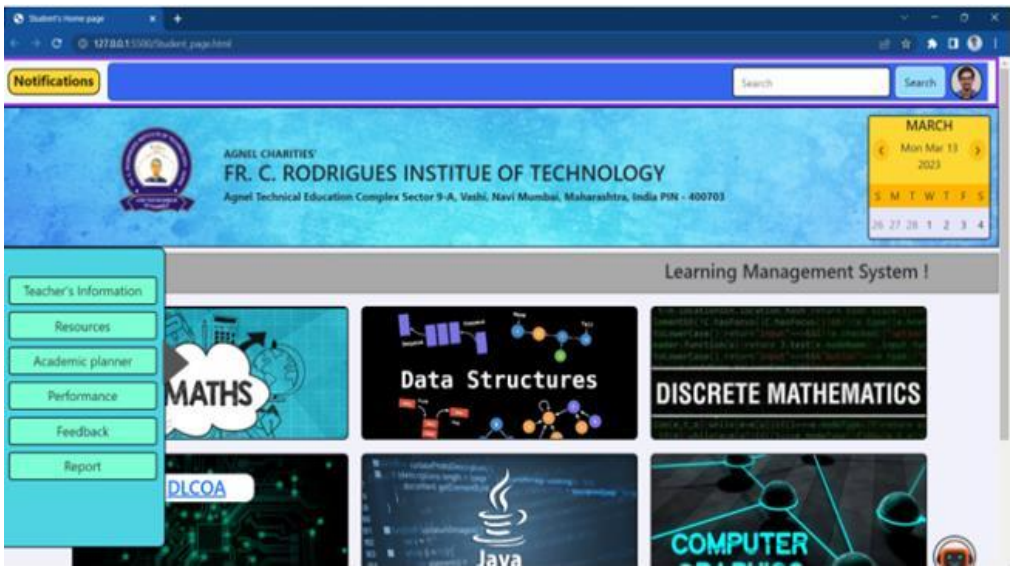
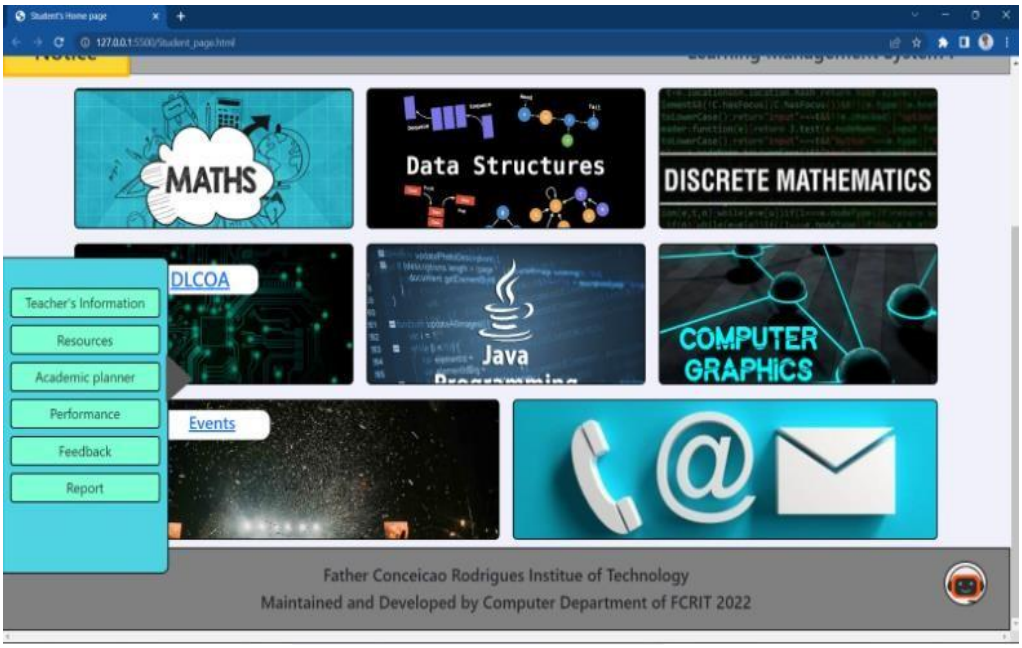


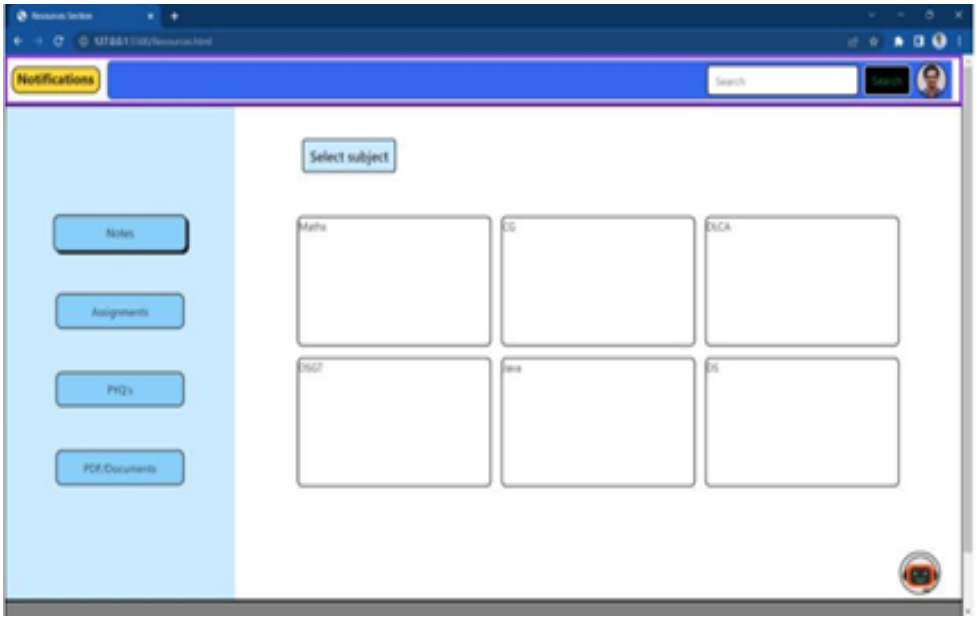
Fig 5.2.1.3 Student homepage with resource section

Fig 5.2.1.4 Here we reach the end of the landing page for the student with last two tiles being Events tab and Contacts tab.



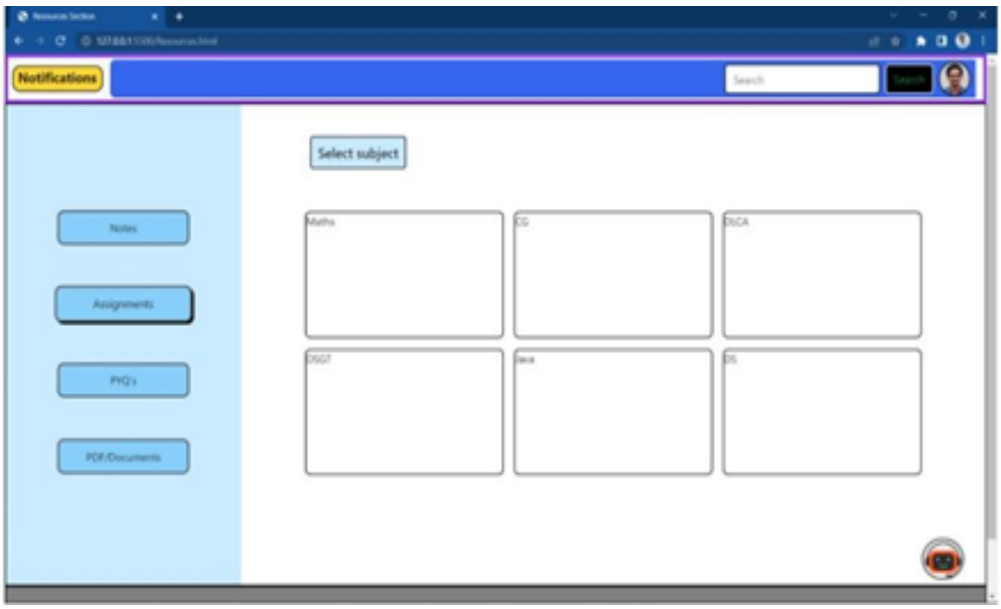
5.2.1.4 Student homepage with resource section 02

Fig 5.2.1.5 shows that upon clicking a particular subject tile the student will be leas to this webpage where he can choose to perform various operations. Here in order to view notes the student has to select the particular subject.



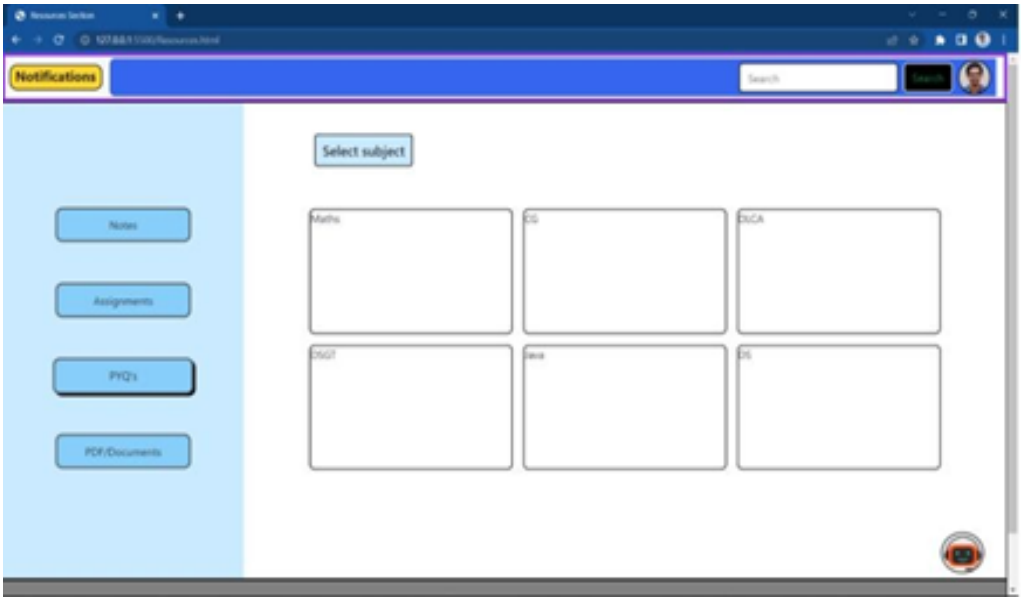
5.2.1.5 Student resource section highlighting Notes section

Fig 5.2.1.6 shows a view of the assignments tab. It has features similar to the notes section in Fig 5.1.2.5



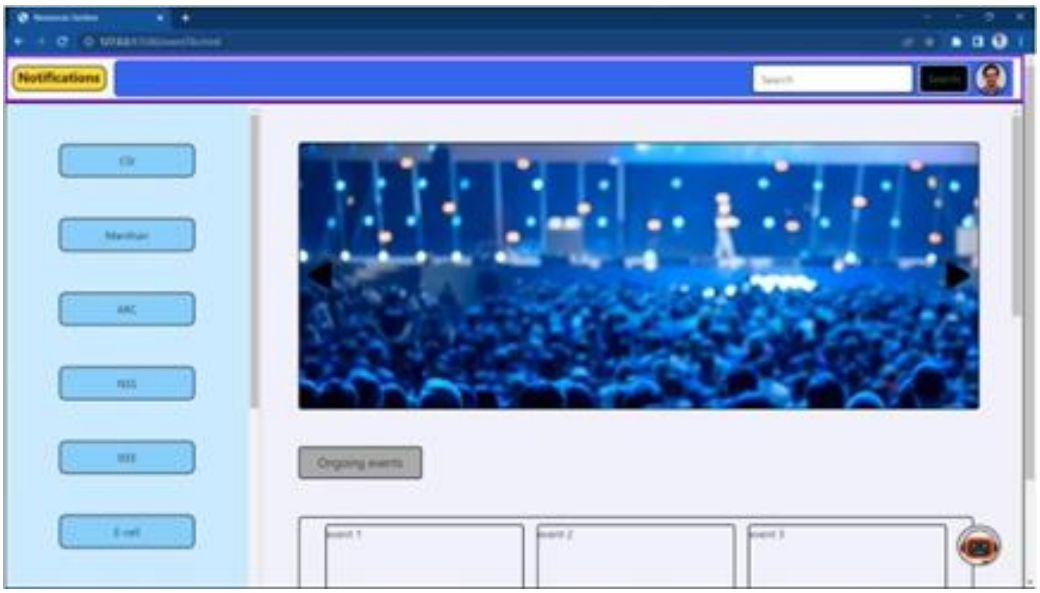
5.2.1.6 Student resource section highlighting Assignments section

Fig 5.2.1.7 shows a view of PYQ's tab. It has features similar to notes section in Fig 5.1.2.5



5.2.1.7 Student resource section highlighting PYQ's section

Fig 5.2.1.8 Shows the events tab that will contain the list of events being held in the college premises.



5.2.1.8 Student resource section highlighting Ongoing Event section

Fig 5.2.1.9 Shows the continuation of events tab, that segregates events into Past, Ongoing and future events

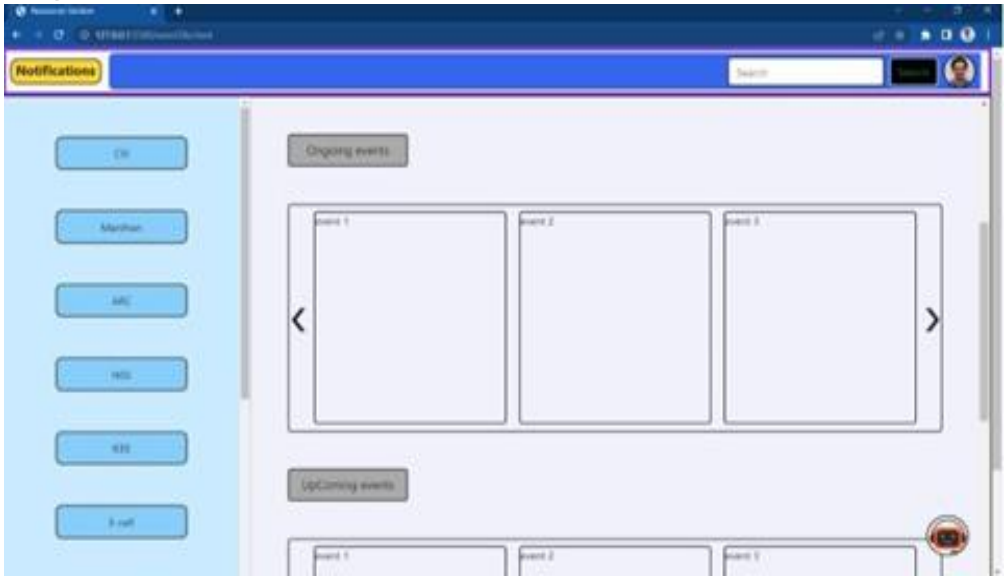


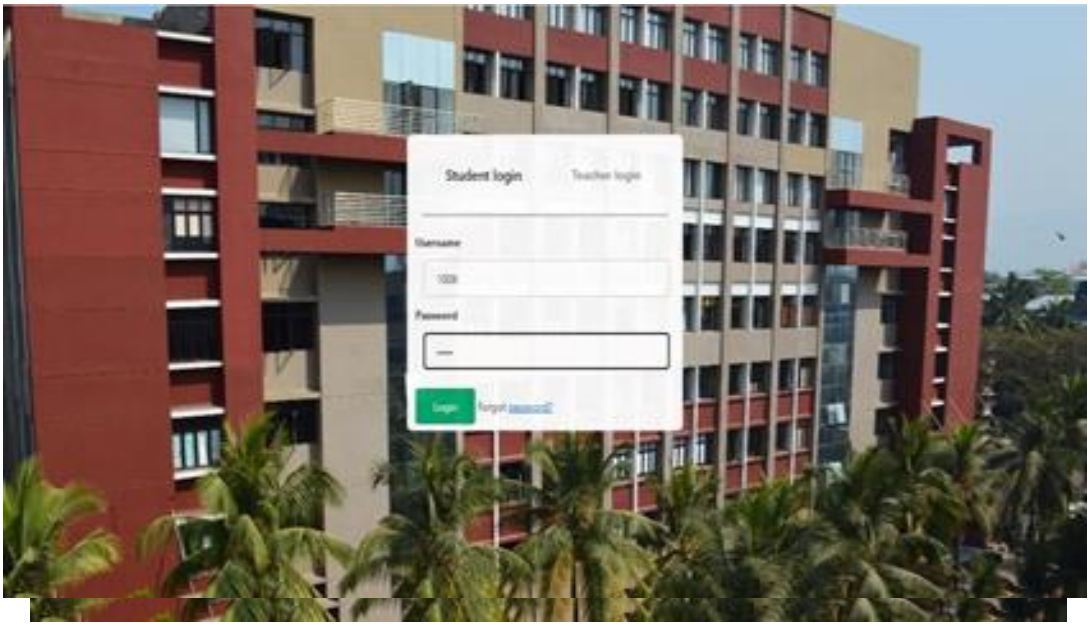
Fig 5.2.1.9 Student resource section highlighting Upcoming Event section

Fig 5.2.1.10 Shows the Contact page, where the student can view the teachers' contact details of various departments.

5.2.1.10 Student resource section highlighting Teacher's information section

5.2.2 Teacher

Fig 5.2.2.1 Shows the is the teacher ‘s login, with dummy teacher credentials



5.2.2.1 Login page with Teacher credentials

Fig 5.2.2.2 Shows that upon successful login, the teacher will be directed to this page where they will their semester tiles. Through which they can perform CRUD operations on resource files.

Fig 5.2.2.2 Teacher Homepage

Fig 5.2.2.3 Shows full-page view of the site with the side panel, which contains additional teacher resources such as attendance, add files etc.

Fig 5.2.2.3 Teacher Homepage highlighting resource section

Fig 5.2.2.4 Shows the use of dynamic calendar makes it easy for the teachers to plan their week in advance.

Fig 5.2.2.4 Teacher Homepage highlighting calendar section

5.3 Code Snippets

Fig 5.3.1 Shows data with AWS-RDS with Node JS

```
const mysql = require("mysql");
require('dotenv').config();

const db = mysql.createConnection({
  host: process.env.host,
  port: process.env.port,
  user: process.env.user,
  pass: process.env.pass,
  database: process.env.database
});


db.connect((err) => {
  if (err) {
    console.log(err.message);
    return;
    }
    console.log("Database connected");
});

db.query('select*from Login where ID ≥ 40', (err, result , finish) =>{
  if (err) {
    console.log(err.message);
  }
  return console.log(result);
})
```

Fig 5.3.1 Code Snippet for AWS - RDS

Fig 5.3.2 Shows backend connectivity (Node JS) to S3.

```
// Validate that the credentials were successfully loaded
credentials.get((err) => {
  if (err) {
    console.log('Error getting credentials:', err);
  } else {
    AWS.config.credentials = credentials;

    // Create a new S3 service object
    const s3 = new AWS.S3();
    listObjectsinbucket();            // here i am invoking a function

    function listObjectsinbucket(){   // here i am creating a function

    const params = {
      Bucket: 'my-lms-filesharing'
    };

    //Call the s3 listObject method to list all the files in the s3 bucket
    s3.listObjects(params, function(err, data) {
      if (err) {
        console.log('Error', err);
      } else {
        console.log('Bucket contents:');
        data.Contents.forEach(function(content) {
          console.log(content.Key);
        });
      }
    });
    return new Promise((resolve, reject) => {
      s3.listObjects(params, (err, data) => {
        if (err) {
          reject(err);
        } else {
          resolve(data.Contents);
        }

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  COMMENTS
For more information, check the migration guide at https://a.co/7PzMCcy
$ node testsharing-list.js
(node:15496) NOTE: We are formalizing our plans to enter AWS SDK for JavaScript (v2) into maintenance mode in 2023.

Please migrate your code to use AWS SDK for JavaScript (v3).
For more information, check the migration guide at https://a.co/7PzMCcy
(Use `node --trace-warnings ...` to show where the warning was created)
Bucket contents:
Hello.txt
filesharing-maths/
filesharing-maths/Hello.txt
invoice.pdf
```

Fig 5.3.2 Code Snippet for S3 connection

Chapter 6

Conclusion and Future Scope

6.1 Conclusion

The Learning Management System (LMS) is an educational portal that provides a comprehensive platform for learners and instructors to engage in a seamless online learning experience. The LMS combines various features that are supported by many online classroom portals, resource sharing apps, and reminder cum notification apps, all under one umbrella. The system has a user-friendly interface that makes it easy to navigate, and it addresses all the requirements of learners and instructors. With the LMS, learners can access course materials, interact with other learners, and receive feedback from their instructors. Instructors, on the other hand, can manage course content, monitor progress, and communicate with their learners.

6.2 Future Scope

As technology advances, there are several areas in which the Learning Management System can be further developed. For instance, the system can incorporate more interactive and engaging learning tools such as Chatbot and Track and Progress features which will further give more flexibility and convenience to the users.

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Acknowledgement

Success of a project like this involving high technical expertise, patience and massive support of guides, is possible when team members work to- gather. We take this opportunity to express our gratitude to those who have been instrumental in the successful completion of this project. We would like to appreciate the constant interest and support of our mentor **Mrs.Bhakti Aher** in our project and aiding us in developing a flair for the field of Your Domain. We would always cherish the journey of transforming the idea of our project into reality. We would like to show our appreciation to **Mrs.Bhakti Aher** for his/her tremendous support and help, without whom this project would have reached nowhere. We would also like to thank our project coordinator **Mrs. Dakshayani R** for providing us with regular inputs about documentation and project timeline. A big thanks to our HOD **Dr. Lata Ragha** for all the encouragement given to our team. We would also like to thank our principal, Dr. **S. M. Khot**, and our college, **Fr. C. Rodrigues Institute of Technology, Vashi**, for giving us the opportunity and the environment to learn and grow.

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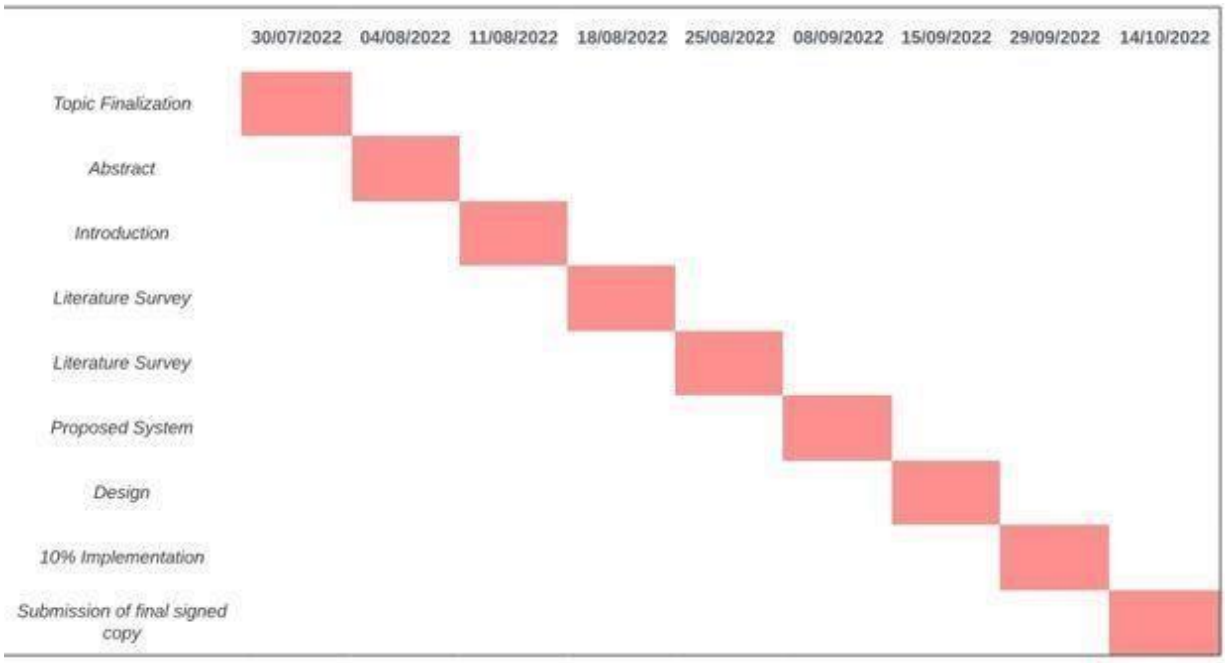
Appendix A : Timeline Chart



Appendix B: Publication Detail

Won first prize in international conference on Nascent technologies used in Engineering (ICNTE) , The event was held in Fcrit Vashi on 20 january to 21 january 2023.