IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 8.102 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 12, Issue 4, April 2023

DOI: 10.17148/IJARCCE.2023.124159

Learning Management System using Web Application

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Abstract: A learning management system (LMS) is a software application that is designed to manage, deliver, and track educational courses and training programs. The primary purpose of an LMS is to facilitate learning by providing a platform for students to access course materials, communicate with instructors and peers, and complete assignments and assessments. The key features of an LMS typically include content creation and management tools, learner management and tracking tools, and communication and collaboration tools. . This paper aims to provide an overview of the design and implementation of a learning management system that is tailored to the needs of educational institutions. The LMS includes features such as course management, student tracking, assessment and grading, and communication tools. The system is scalable and can be customized to meet the needs of individual institutions, making it a valuable asset for both small and large organizations . The design of the LMS was informed by an analysis of existing systems, as well as input from educators and administrators. The implementation of the system was carried out using industry-standard technologies and best practices, with a focus on usability, security, and performance. The system was tested and evaluated by a group of educators and students, and feedback was incorporated to improve its functionality and user experience .In conclusion, the learning management system presented in this paper provides a comprehensive solution for managing educational courses and training programs. The system's features and design make it a valuable asset for educational institutions looking to improve their online learning capabilities.

Keywords: Learning Management System (LMS),Educational technology, Online Learning ,Course Management, Student Tracking.

I INTRODUCTION

A learning Mangement System (LMS) is a software application that enables the creation,delivery, and management of learning of learning content and resources.It is a web-based platform that provides a virtual environment for education activities. LMS offer a wide range of features and functionalites, including course creation and management,content sharing and distubtion, tracking and reporting of learner progress and achievement, communication and collaboration, tools and assessment and evaluation tools.In recent years, the use of technology in education has grown more widespread in recent years. One of the most popular technological innovations in education is the learning management system (LMS). A learning management system is a software application that is designed to manage, deliver, and track educational courses and training programs. The primary goal of an LMS is to facilitate learning by providing a platform for students to access course materials, communicate with instructors and peers, and complete assignments and assessments.The use of learning management systems has become particularly important in the current educational landscape, which has seen a rapid shift towards online and hybrid learning models. With the rise of e-learning and distance learning, educational institutions have had to adapt their teaching methods to accommodate the needs of students who cannot attend traditional classroom settings. Learning management systems provide a solution to this challenge by enabling institutions to deliver courses and training programs online, while still maintaining the same level of quality and interactivity as traditional classroom-based learning.Higher education institutions (HEIs) were compelled to abide by their individual governments' preventative social distancing measures and to improve their hygiene procedures in order to slow the spread of the disease.of the pandemic. Several HEIs articulated contingency plans, disseminated information about the virus, trained their employees to work remotely, and organized virtual sessions with students or course participant.

II RELATED WORKS

Learning Management using web based Technology is a popular research area with a lot of existing literacture.Here are some releated works for our reference: “A review of Learning Managemnt system is a framework for evaluating and selecting the lms for your Organization”by J.Holley,D.Lee and C.Norris (2015):learning Management Syatem(LMs) is a major tool used in most universities and institutions for online/distance educcatin purpose.Seversal LMS are beign used in different universities and institutes,and these LMS are uploading their versions and patches to stay versions and patches

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to stay in competition [1]. Exploring the impact of learning Management System on student engagement engagement in higher education" by J.Henning,M.Dudley,and K.Johnson(2017):the existing LMS research and the engagement level of an LMS environment, this research also offers supplementary information on the learning analytic methods hence, prompting the possibility of a better learning analytics research.[2]. Learning Management Systems in Higher Education: A Systematic Review of the Literature" S.Naidu (2016): The study of different Learning Management System (LMS) he databases that are used in conducting this research are searched in Google Scholar, EBSCO and JSTOR. Moodle, Sakai, SumTotal, Blackboard, and ATutor are the five LMSs that were selected for the systematic review. this five LMS share one common feature which is easy to use [3]. According to M.Ebner M. Holzinger's (2007) "A Comprehensive Analysis of Learning Management System Effectiveness in Higher Education," a sample of 45 Moodle-using instructors was studied. academic courses served as the basis for the study. In terms of student enrollments, Blackboard also showed the highest market share (35.99%, 6,987,086 student users). Canvas (29.46%, 5,718,857 student users) was followed by Moodle (2.454,441 users, 12.64%), D2L (2,317,030 users, 11.93%), Sakai (666,356 users, 3.43%), Pearson (86,298 users, 0.44%), and ANGEL. were in that order (3,222 student users, 0.02%) (Edutechnica, 2018) [4]. A comparative analysis of learning management systems" by D. R. Dron According to G. Anderson's (2014) research, this study recommends the best tool based on aspects like user experience, memory, and intelligence. According to the survey's basic findings, more than 80% of respondents were unaware of online LMS tools. However, the remaining 20% knew just about one or two well-known LMS programmes, and they were concerned people of IT field including students and as well as teachers [5]. S.E.Ross and J.Morrison's 2010 article, "A review of research on learning management systems," provides an example. The purpose of this study is to get knowledge of the various usability, implementation, and adaptability frequencies as well as the barriers and enablers in the LMS area. Since learning management systems continue to be adopted and used in novel ways, this field of research offers several options for study and learning. [6]. M. S. Breslow and colleagues' study, "The Impact of Learning Management Systems on Student Achievement in Higher Education," According to Pritchard (2013), the goal of this study was to investigate the relationships between university students' success in an English preparatory programme and the of LMS in language learning [7]. According to J. C. Smith's "A Comparative Study of Learning Management Systems: Blackboard, Moodle, and Canvas," by J. C. Richards, the concept of eLearning and online education is still the subject of many scholarly discussions (2018) [8]. "A survey of the literature on "Designing learning management systems for successful learning" was conducted by C. P. Tsai and According to H. T. Chai (2012), most teaching activities use LMS in order to take full advantage of all of the benefits it offers in the various institutions where they are used. It is through this that effective teaching can be enhanced via LMS [9]. Course instructors can use remote learning technologies to upload their digital learning resources, including presentations, notes, quizzes, videos, and assessments for their students' guidance. As a result, students can access interactive materials using various digital media, including mobile devices like computers, cellphones, and tablets, at their convenience and from the comfort of their home. These remote learning technologies offer asynchronous as well as synchronous learning opportunities [10].

III EXISTING SYSTEM

Define the Requirements: First, you need to define the requirements for the LMS system. Determine the purpose of the system, the target audience, and the features required.Design the Architecture: Based on the requirements, design the architecture of the LMS system. Create a detailed diagram of the system showing the various components, their interactions, and the data flow.Develop the Front-End: Develop the front-end of the LMS system using HTML, CSS, and JavaScript. Ensure that the design is user-friendly, responsive, and accessible.Develop the Back-End: Develop the back-end of the LMS system using a server-side programming language like Python, Ruby, or PHP. Use a database like MySQL or PostgreSQL to store user data and course content.

IV PROPOSED SYSTEM

User Authentication: The first component of the LMS is user authentication, which allows users to create and access their accounts on the platform. The system should provide secure user authentication mechanisms, such as email verification and password hashing, to ensure the safety of users' data.Course Creation: Once logged in, instructors can create courses by adding course details, such as the course name, description, objectives, and syllabus. They can also upload course materials, such as videos, presentations, quizzes, and assignments, and set up the course schedule.

Enrollments: Students can browse available courses, view their details, and enroll in them. The system should allow instructors to set enrollment limits for each course and monitor enrollments to ensure that the course does not exceed its limit.Learning Management: The LMS should have a dashboard that displays course progress, grades, and feedback for each student. It should allow students to access course materials, complete assignments, take quizzes, and communicate with instructors.Communication: The LMS should provide various communication channels between students and instructors, such as discussion forums, chat rooms, and email. This feature ensures that students can easily reach out to their instructors to ask questions

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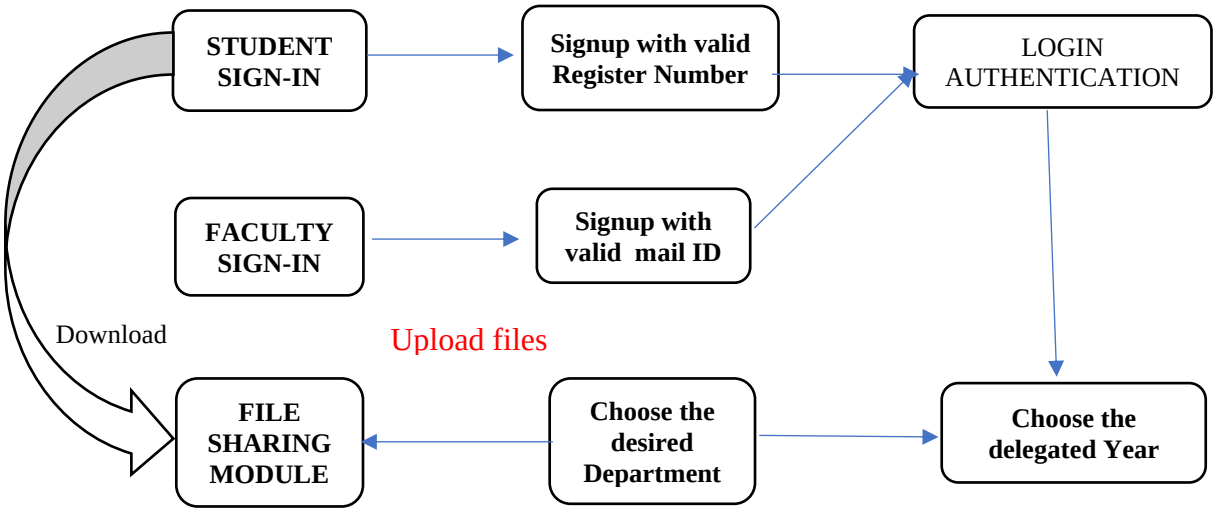

Figure 4.1. Proposed System Diagram

V IMPLEMENTATION AND RESULTS

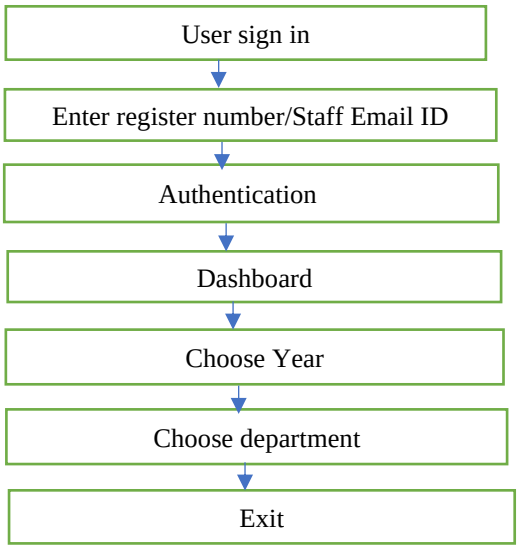

Figure 5.1 Flow Diagram

1.In the following steps, to understand the purpose and scope of the learning Management system before you start learning.

2.Add existing traning materials to the lms,such as videos,and quizzes etc.

3.Roll out the LMS to users, provide training and support as needed, and encourage adoption of the system.

4. Assign courses to learners and track their progress through the LMS. Provide feedback and support as needed

5.The LMS administrator can now create and upload content such as courses, quizzes, and assessments. The content can be created using different formats such as videos, PowerPoint presentations, PDF documents, and SCORM packages.

6. LMS to create and administer assessments, track learner performance, and generate reports on course completion and learner progress.

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7.The LMS administrator can create user accounts and assign user roles such as learners, instructors, and administrators. User profiles can be customized with additional information such asj ob roles, departments, and locations.

8.The LMS provides reporting and analytics features to track user progress and assess the effectiveness of the training program. This include tracking user activity, completion rates, quiz scores, and other metrics.

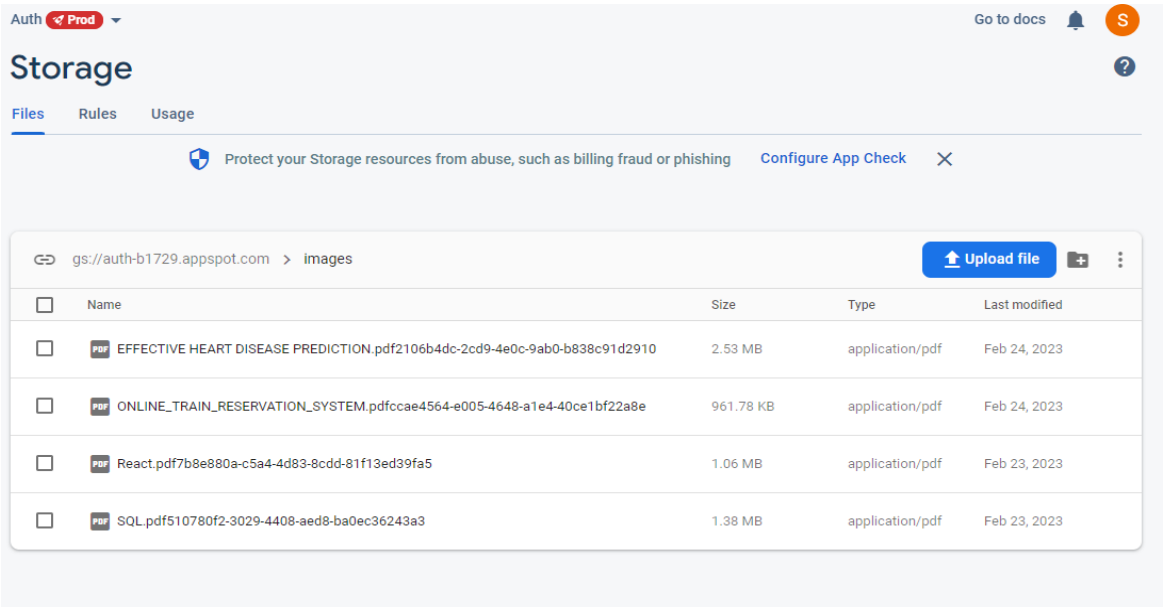

Figure 5.1 Uploading Files

A.Data Access Layer:

The Ajax Engine creates an Xml Http Request object and sends it to the web service without affecting the control flow of the webpage. The web service calls the stored procedure to interact with the database, retrieves the result from the database, converts it to XML, and then returns XML or HTML data by using XSLT to convert the XML into HTML to the Ajax Engine. If the result returned is XML, Ajax Engine processes it and transforms it to HTML, or else just the returned HTML is sent to the client browser. Together with the normal benefits of scalability, availability, and ease of integration, the n-tier architecture also enables independent upgrades and replacements of any one of the n tiers.as requirements or technology change. For instance, switching from SQL Server to Oracle 10g would only affect the data access and storage layers.

B.Database Design

Six tables make up the website's database schema, one of which is utilised to hold BLOBs.. So if the files are stored in the file system, the table could be removed. One major table is used to record the fundamental information about each uploaded file, while another table is used to monitor different iterations of the same file, i.e. versioning control, two tables for group creation and file sharing, and the last table for folder-based file organisation. The tables for managing users, roles, profile properties etc were in-built with NODE membership, role and profile providers. The User Name column present in the table created by membership provider is referenced by all the tables of the schema

C. Functionalities

There was no file size restriction placed on users while uploading or downloading files because the project was done for educational purposes. The main features of the website are:

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1.User AuthenticatioN

New users can register to upload files and create their own file system. The user management was easily integrated into the website with the providers that ship in with Nodejs as Backend .

2.File Sharing

The centre of the project is this section, where users can upload files. Part of this page is Atlas enabled. A wizard control is used to upload files, guiding the user through each stage of the process. A progress bar indicator will be provided to the user when they upload a file to let them know how the upload is progressing. The first stage also allows for the entry of metadata regarding the file upload. The option to input the activation and expiration dates of the uploaded files is available in the second phase.

3.Download Files

The uploaded files can be downloaded by the user either for free or with cost. The downloaded file link can be shared in the form of URL site link which can be shared worldwide. There is no time limit for the link to expire. Once downloaded, the link can be accessed anytime and anywhere.

D.Payment gateway

One more option for downloading files is by paying through Gpay. This is a sort of token of thanks to the user who contributed the file. If the students find the document extremely useful and worthy, they can pay and get the file, which is completely up to the user's choice.

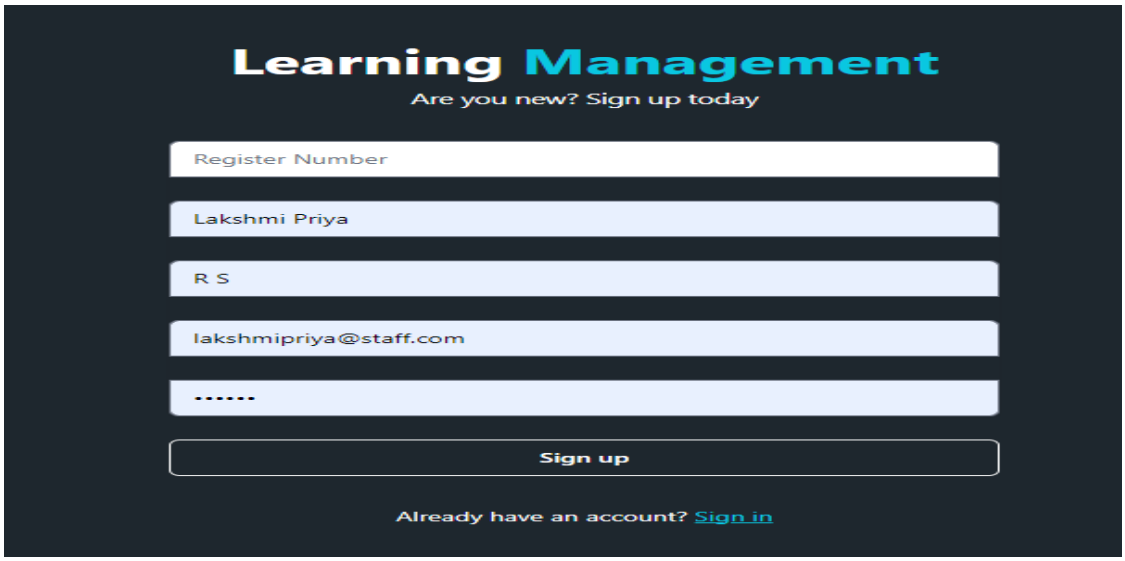

Figure 8.1 SignUp as Staff

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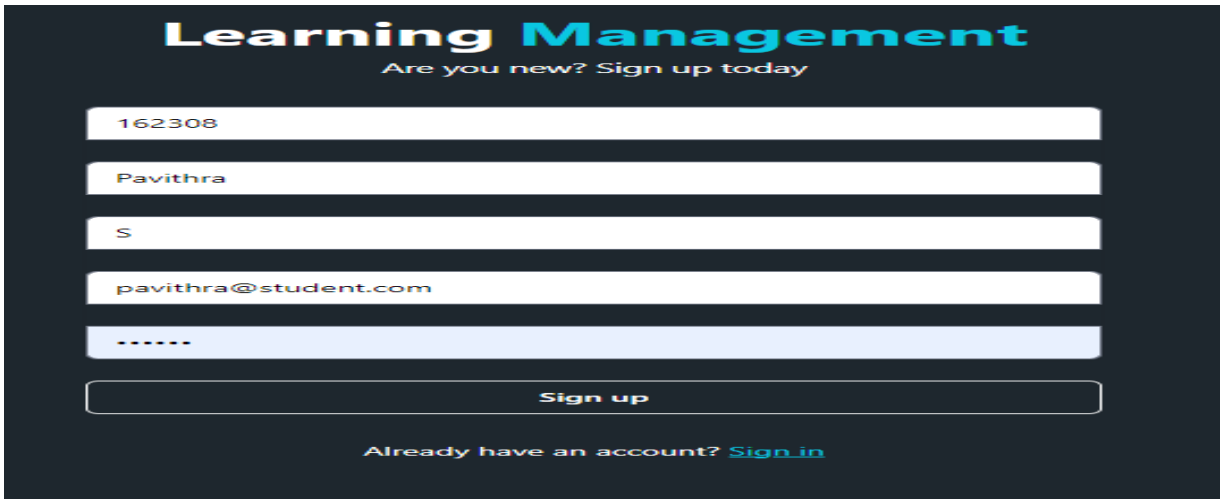

Figure 8.2 SignUp as Student

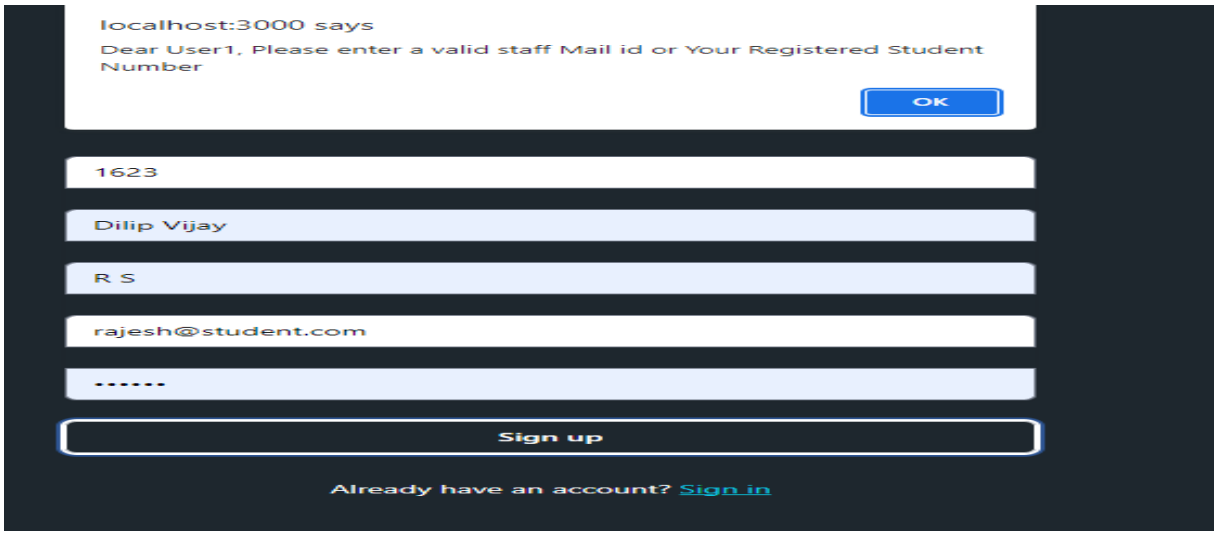

Figure 8.3 SignUp Validation

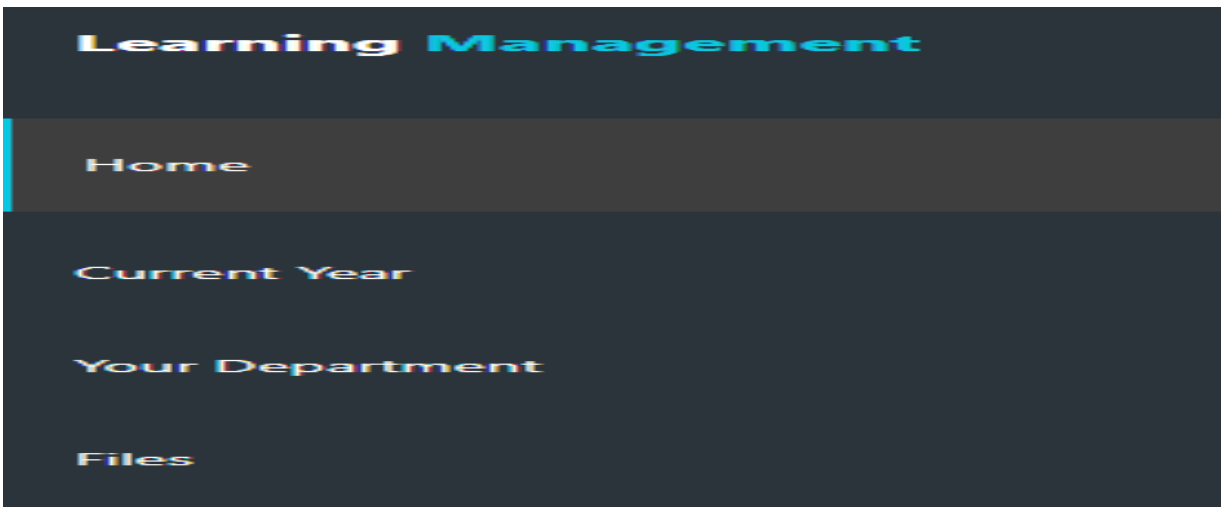

Figure 8.4. Home Page

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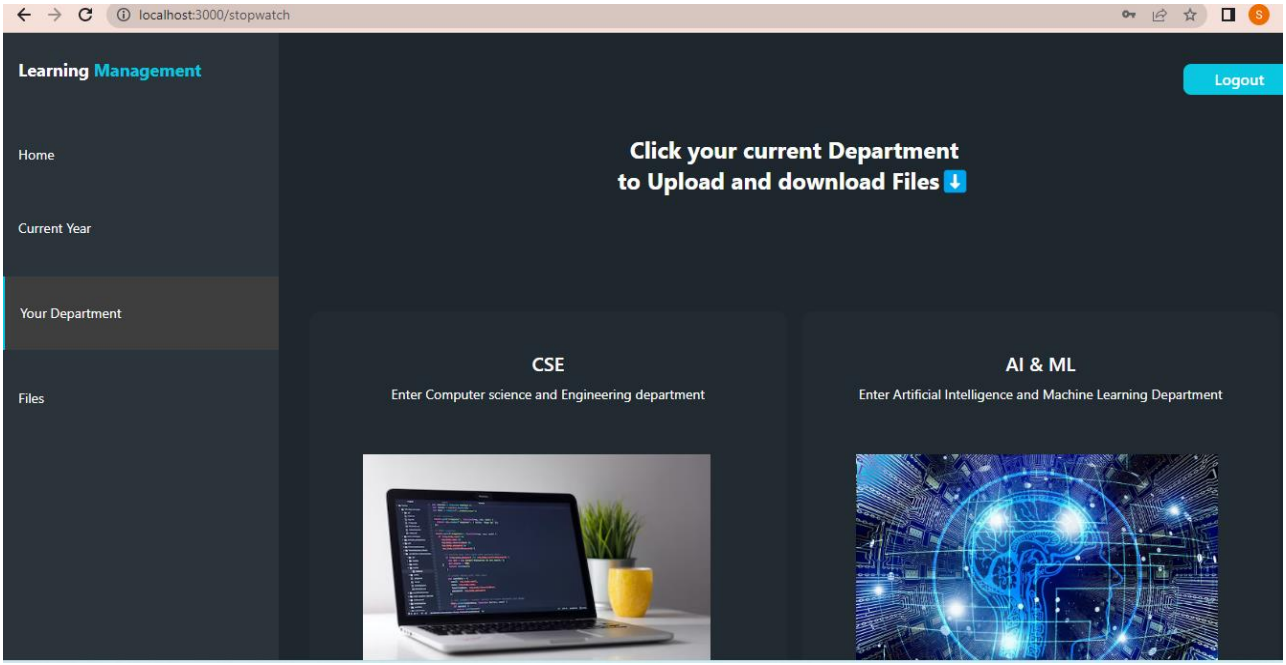

Figure 8.5 Departments Module

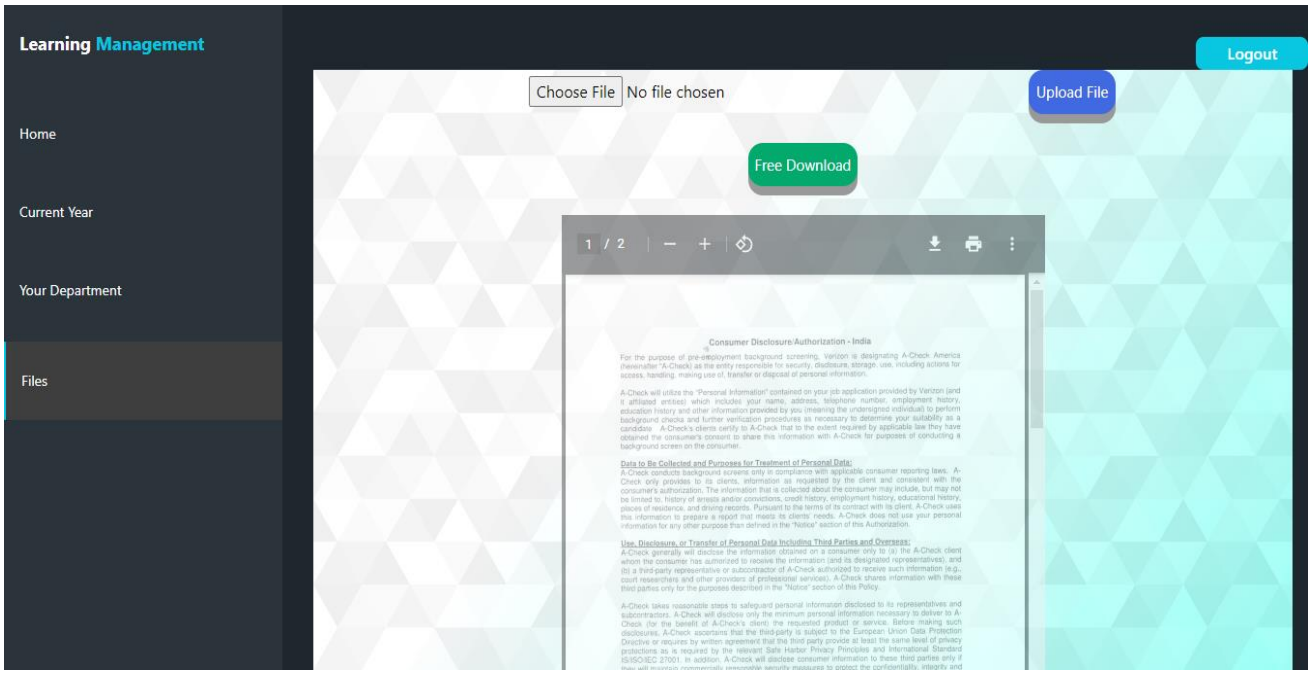

Figure 8.6 File Sharing Module

VI DISCUSSION

When signing in as a staff, there is no need to enter any value in the Register number field. When signing in as a student, the Register Number should be in the range of 162301 to 162320 and the mail id can be given as any. When both staff and student validation fails, alert arises once the user tries to sign in. Staff validation is that the mail should end with the "@staff.com". Student validation is that the register number should fall within the range 162301 to 162320.The site is navigated to the login page as we click the login button. To login, entering the email address and password is sufficient to proceed .The Home page defines the goal of the application. It is designed with a very simple and clean UI. There is a widget designed for students especially to maintain focus while studying. This page is designed to display the years

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available in a college. This allows the user (the students) to choose their designated year. On choosing the year, the site navigates to the departments page.This page is designed using Bootstrap cards. A flexible and expandable content container is a card. A free and open-source CSS framework called Bootstrap is designed for front-end web development that prioritises mobile responsiveness. It includes design templates for typography, forms, buttons, navigation, and other interface elements in HTML, CSS, and (optionally) JavaScript. As modifier classes for cards, similar functionality to that of those components is accessible.This module enables the user to choose among the available departments. On choosing the department, students get navigated to the last module. The File Sharing page enables the students to upload and download files of different formats. This is done using Firebase storage API. For app developers who need to store and serve user-generated material, such as pictures or videos, Cloud Storage for Firebase was created.A robust, user-friendly, and reasonably priced object storage service designed for Google scale is Cloud Storage for Firebase.The Firebase SDKs for Cloud Storage add Google security to file uploads and regardless of network quality, downloads for your Firebase apps.You can use our SDKs to store images, audio, video, or other user-generated content. You can access the same files on the server using Google Cloud Storage APIs.

VII CONCLUSION

LMS, or Learning Management System, is a software application used to deliver, manage, and track educational courses and training programs. It has become an essential tool for educational institutions, businesses, and organizations to provide online learning and training to their learners or employees.In conclusion, LMS provides numerous benefits such as flexibility, scalability, accessibility, personalized learning, and cost-effectiveness. It enables learners to access educational resources from anywhere and anytime, and allows instructors to manage and track learners' progress easily. LMS has revolutionized the way education and training are delivered, and it will continue to evolve and improve in the future.

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