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A GOVT. AIDED UGC AUTONOMOUS INSTITUTE , AFFILIATED TO R.G.P.V. BHOPAL (M.P.) INDIA

NAAC ACCREDITED WITH A++ GRADE

MITS DRIVE: TRANSFORMING LEARNING WITH SECURE AND INTUITIVE DOCUMENT MANAGEMENT

MINOR PROJECT

A SCHOLARLY DISSERTATION

Presented to full fill the criteria for the attainment of the degree of

BACHELOR OF TECHNOLOGY

In

ENGINEERING MATHEMATICS & COMPUTING

Submitted by

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Under the Mentorship of

Dr. Santosh Kumar Bharadwaj

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We hereby declare that the work presented in this project entitled **"MITS DRIVE"** submitted to the Department of Engineering Mathematics and Computing, Madhav Institute of Technology and Science Gwalior, for the partial fulfilment of the requirements of the Bachelor of Technology degree in Engineering Mathematics and Computing. We further declare that this work has not been the basis for the award of any other degree, diploma or any other title elsewhere.

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Place: **Date:**

Certificate

This to certify that dissertation entitled "***MITS DRIVE***" which is being submitted by **Abhikar Neekhra** (0901MC211001), **Abhishek Kumar** (0901MC211003), **Anuj Rathor** (0901MC211013), **Poornika Sharma** (0901MC211045), **Shivam Singh** (0901MC211059) for the award of degree of **Bachelor of Technology** degree in Engineering Mathematics and Computing, MITS Gwalior is a record of benefited work carried out by them under my supervision. This dissertation has reached the standard fulfilling the requirements of the regulations relating to the degree.

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MITS DRIVE

Abstract : The "MITS Drive" project is a significant initiative aimed at revolutionizing document management and communication within the educational ecosystem. Developed as part of the Bachelor of Technology degree in Engineering Mathematics and Computing, this platform addresses the existing challenges in traditional document management systems prevalent in educational institutions.

The purpose of the project is to create a comprehensive digital platform tailored to the specific needs of the college community, encompassing three main sections: Admin, Faculty, and Users (Students). The platform is designed to enhance communication, collaboration, and document management, providing a secure and efficient way for faculty and students to interact.

The research focuses on identifying gaps in conventional systems and proposes innovative features to bridge these gaps. Leveraging modern technologies, the full-stack web application approach ensures scalability, flexibility, and a robust user interface.

The system design includes an Admin section for efficient management of faculty and departments, a Faculty section enabling secure document upload and sharing, and a Users section allowing students to access shared study materials. The project also emphasizes selective sharing, ensuring that information reaches the intended audience.

Methodologically, the project employs React for frontend development, Node.js for backend, and PostgreSQL for database management. Comprehensive testing, including unit testing, integration testing, and user acceptance testing, ensures the reliability and security of the MITS Drive platform.

The results indicate a positive impact on document management, fostering improved collaboration and communication among faculty and students. The project effectively addresses variations in document management practices, leading to a more organized and streamlined process.

As a future scope, the MITS Drive project aims for continuous improvement and expansion, with potential enhancements including advanced collaboration tools, enhanced security features, and compatibility with emerging technologies.

In conclusion, the MITS Drive project successfully combines technological innovation with practical applications to enhance the overall learning experience within an educational setting.

Backend Technologies: Node.js, Express.js, Bcrypt, Cookie-parser, CORS, EJS, Express-session, HTTP-errors, Multer, Nodemailer, Nodemon, PostgreSQL, PM2, UUID

Frontend Technologies: React, Vite, SWC, Material-UI (MUI), @mui/icons-material, @mui/lab, @mui/material, @mui/system, @mui/utils, Framer Motion, Apexcharts, Axios, Formik, Material-UI Popup State, @tabler/icons, React Apexcharts, React Device Detect, React DOM, React Perfect Scrollbar, React Player, React Redux, React Router DOM, React-scripts, React-toastify, Redux, SCSS, Yup

Additional Keywords: Full-stack web application, Document management, Collaboration, Communication, Secure document upload, Selective sharing, Educational technology, Digital platform, Scalability, Flexibility, User interface, Modern technologies, Research gaps, Continuous improvement, Emerging technologies, Integration of advanced collaboration tools, Enhanced security features

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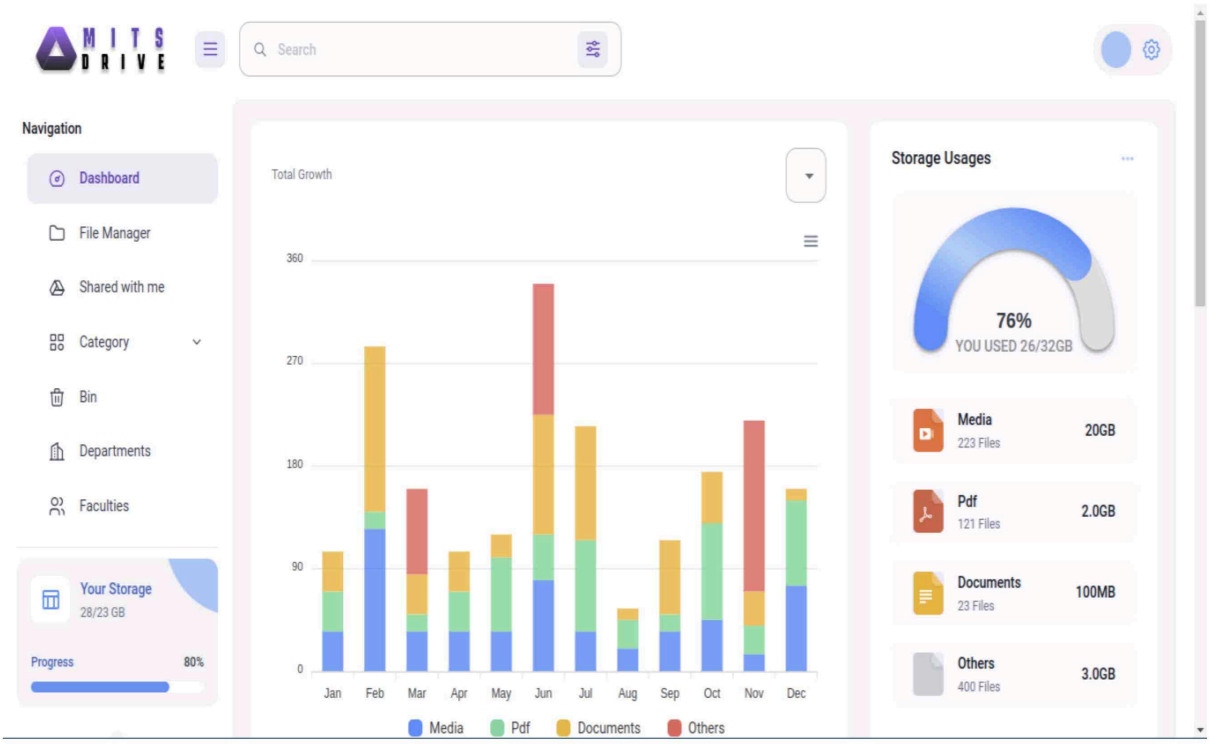
1. Introduction

The "MITS Drive" project represents a pioneering effort in the realm of educational technology, aiming to redefine the landscape of document management and communication within the college community. Developed as part of the requirements for the Bachelor of Technology degree in Engineering Mathematics and Computing at Madhav Institute of Technology and Science, Gwalior, this project is a testament to the fusion of modern technologies and innovative solutions.



1.1 Purpose

At its core, the purpose of the MITS Drive project is to address the inherent challenges present in traditional document management systems within educational institutions. The project seeks to create a comprehensive digital platform that caters specifically to the needs of our college community, enhancing communication, collaboration, and the overall learning experience.

1.2 Overview

MITS Drive is structured into three main sections: Admin, Faculty, and Users (Students). Each section is meticulously designed to fulfill distinct roles in the document management process. The platform provides a secure and efficient means for faculty and students to interact, share study materials, and engage in seamless communication.

1.3 Background and Motivation

The motivation behind MITS Drive arises from the need to embrace modern technologies to overcome the limitations of conventional document management systems. By leveraging a full-stack web application approach and incorporating technologies such as React, Node.js, and PostgreSQL, the project aims to create a dynamic and responsive platform that aligns with the evolving needs of a dynamic educational environment.

1.4 Research Gaps

Critical to the MITS Drive project is the identification and resolution of gaps existing in current document management practices. This initiative stands out by introducing innovative features and a forward-thinking approach that bridges the chasm between conventional methodologies and the dynamic requirements of the academic setting. Through this, the project aims not only to address existing challenges but to anticipate and prepare for the future needs of educational technology.

1.5 Significance of the Project

Beyond its immediate goals, MITS Drive holds the promise of fostering a transformative impact on the academic landscape. By facilitating more efficient collaboration, transparent communication, and secure document sharing, the project seeks to elevate the overall academic experience for both faculty and students.

2. System Design and Formulation

2.1 System Requirements

2.1.1 Technology Stack

The backbone of MITS Drive is its robust technology stack, carefully chosen to ensure optimal performance and scalability:

- **Frontend:**
  - React: Utilized for building a dynamic and responsive user interface.
  - Vite: Enhances the development experience by providing fast and efficient builds.
  - SWC: A JavaScript/TypeScript compiler for faster code execution.
  - Material-UI (MUI): Integrates a cohesive design system for a consistent user experience.

- **Backend:**
  - Node.js: Empowers server-side development for handling requests and business logic.
  - Express.js: A fast and minimalist web framework for Node.js, facilitating backend development.
  - PostgreSQL: Serves as the relational database management system for data storage.

- **Additional Libraries:**
  - Bcrypt: Ensures secure password hashing.
  - Cors: Enables cross-origin resource sharing.
  - Nodemailer: Facilitates email communication.
  - Multer: Manages file uploads.
  - UUID: Generates unique identifiers.

2.1.2 Scalability Considerations

The MITS Drive project anticipates future growth and scalability challenges. By adopting technologies known for their scalability, such as Node.js and PostgreSQL, the system is poised to handle increased loads and expanding user bases.

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2.2 System Design

- **Authentication**

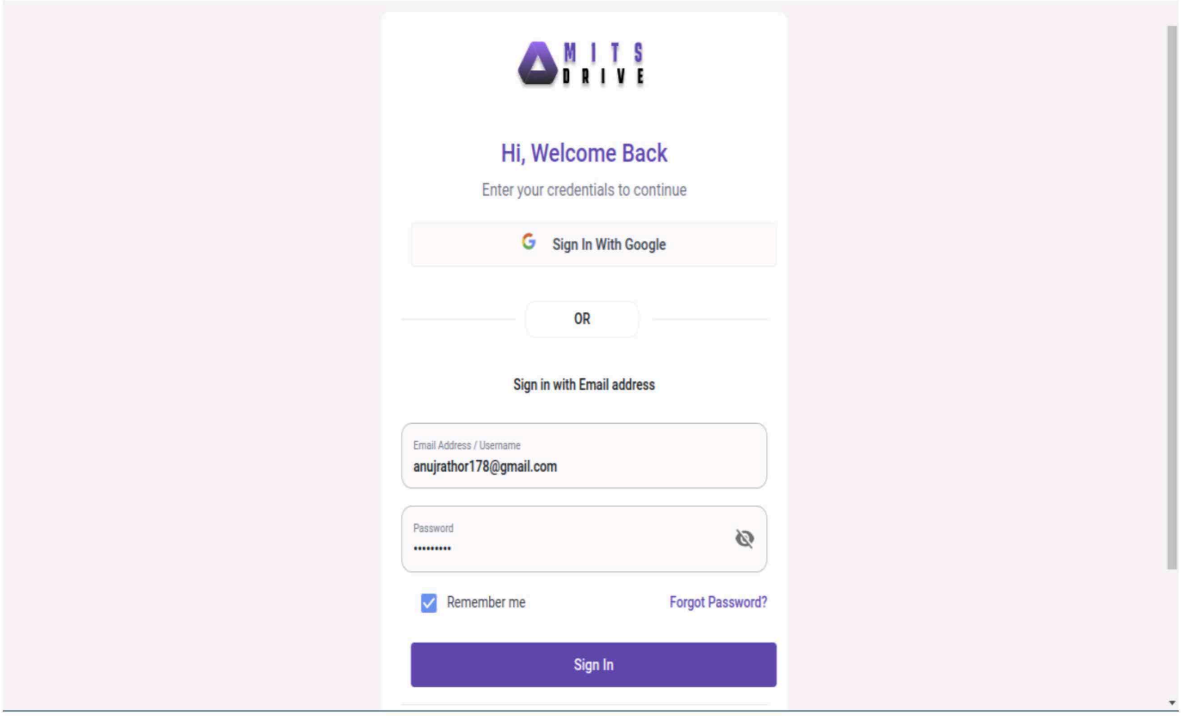

Fig. No. 01

Login page for all type of Users

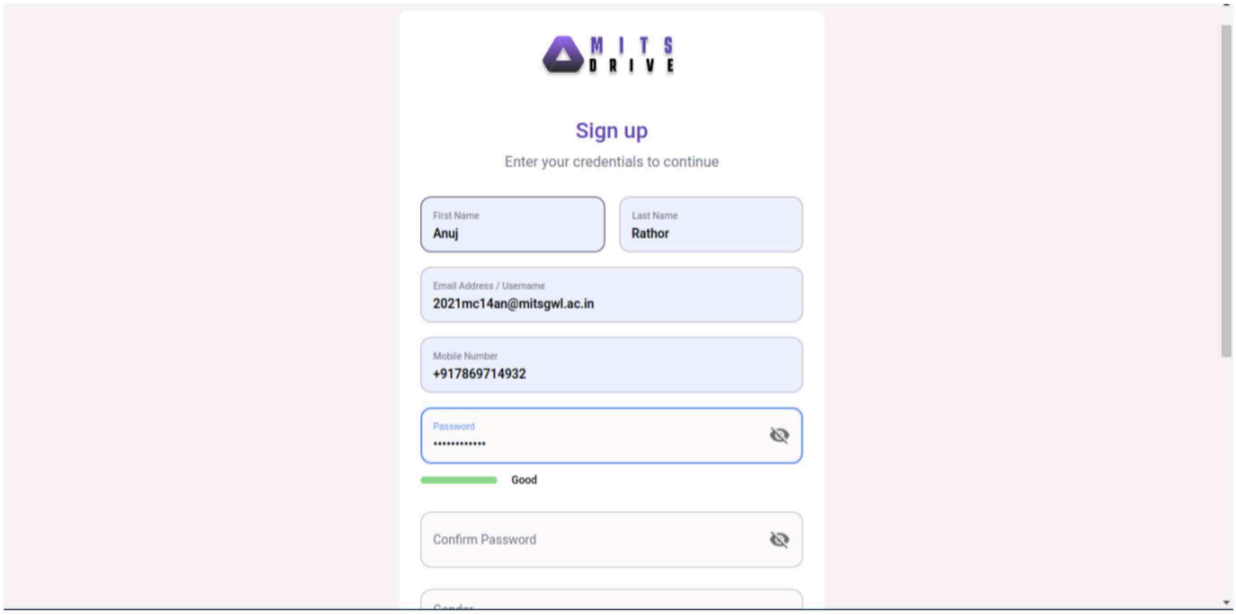

Fig. No. 02

Registration page for all users

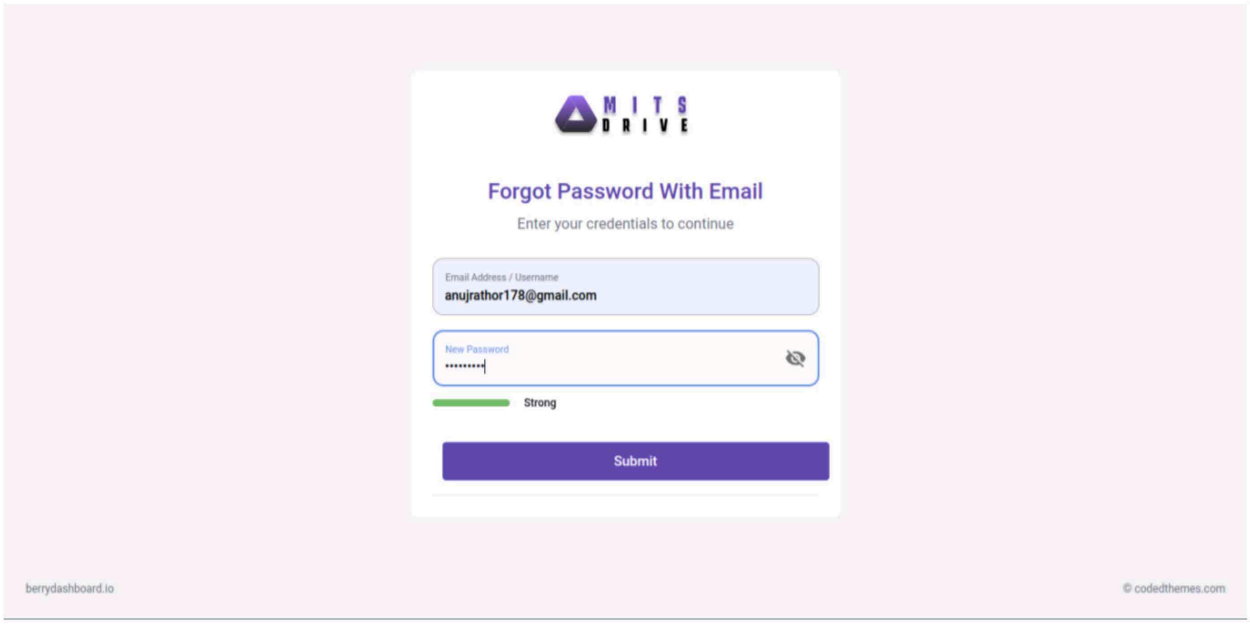

Fig. No. 03

Forgot Password page

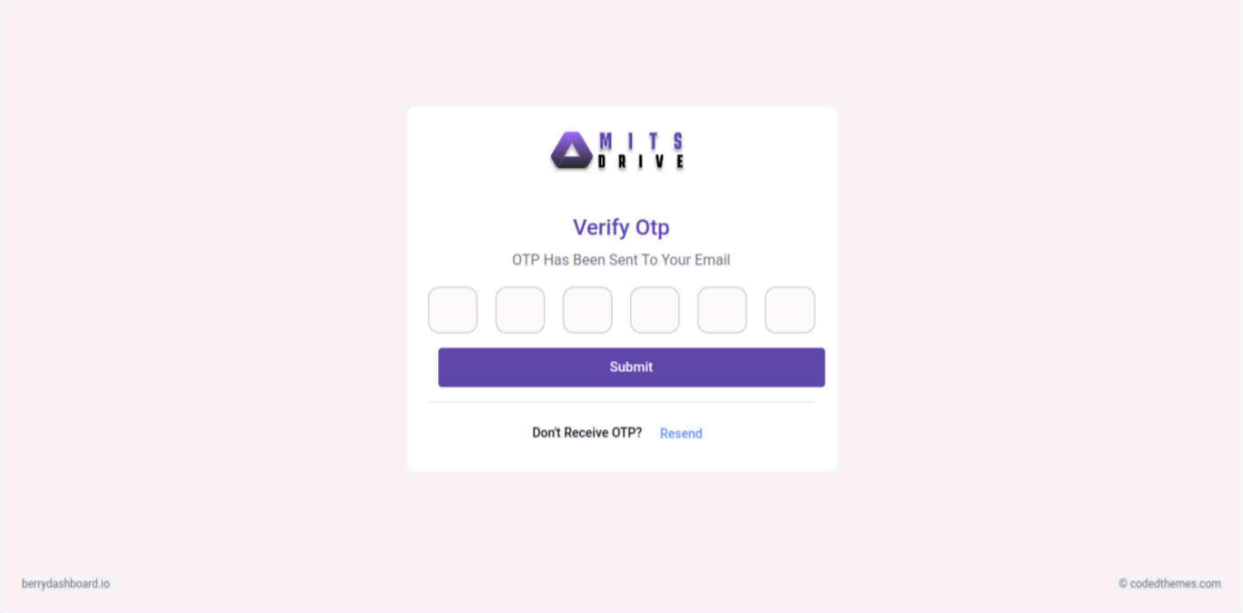

Fig. No. 04

OTP Verification Page

- **Admin Section**

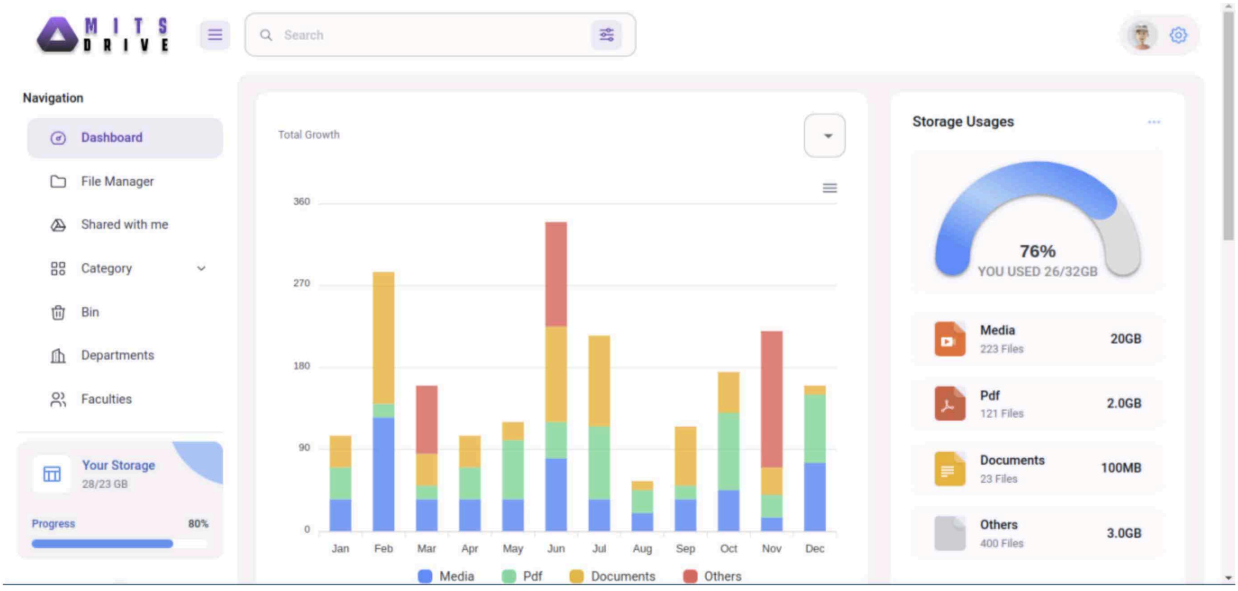

Fig. No. 05

Admin Dashboard Page

- **Faculty/ Department Section**

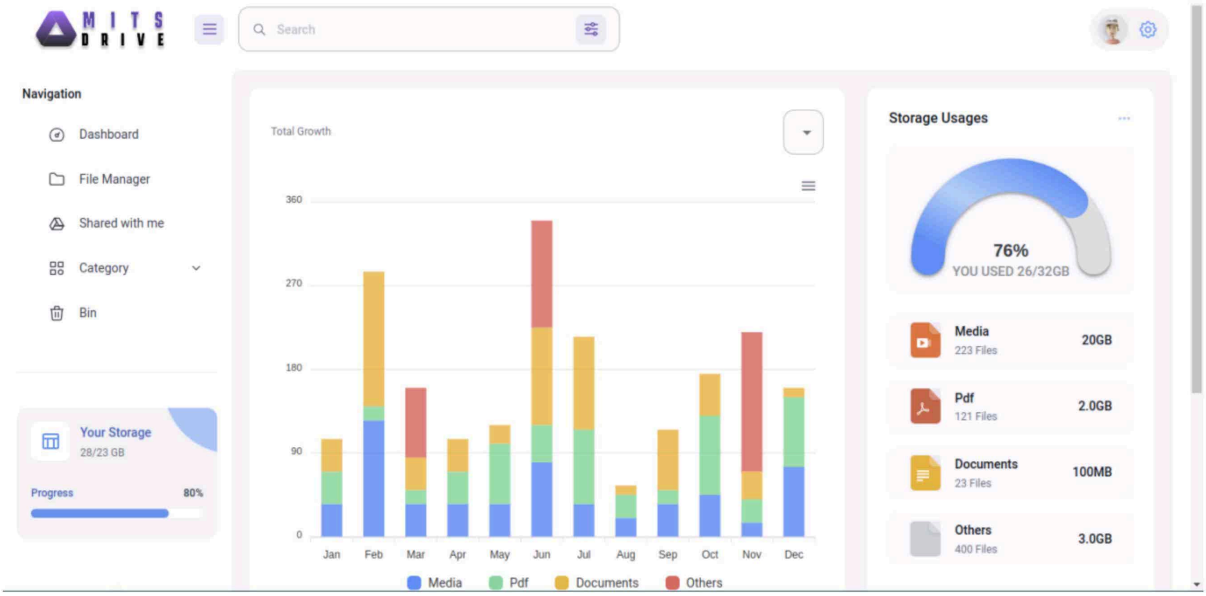

Fig. No. 06

Faculty Dashboard Page

- **User Section**

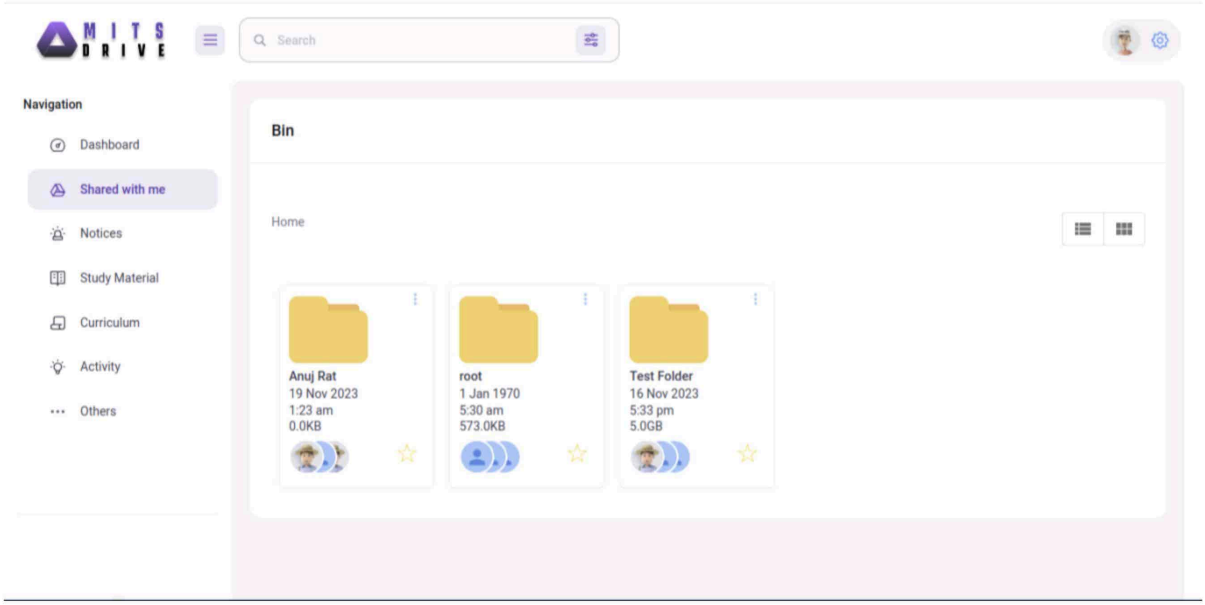

Fig. No. 07

Trash Bin Page

- **Profile Section and Log Out**

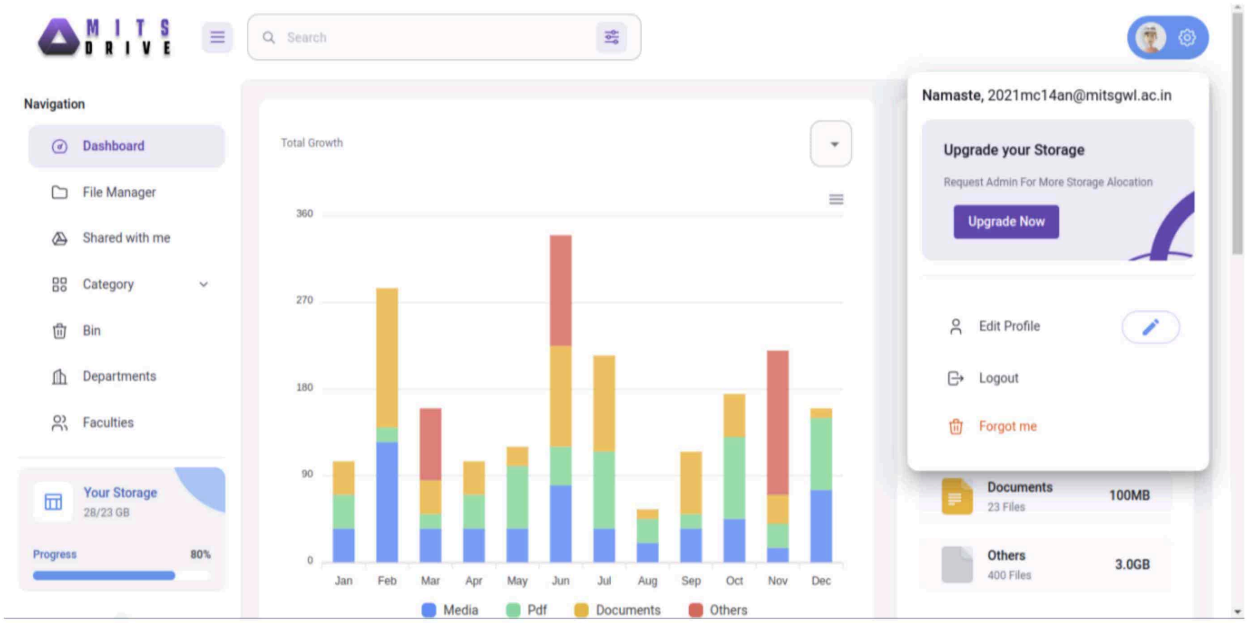

Fig. No. 08

Log Out Page

- **Document Management:**

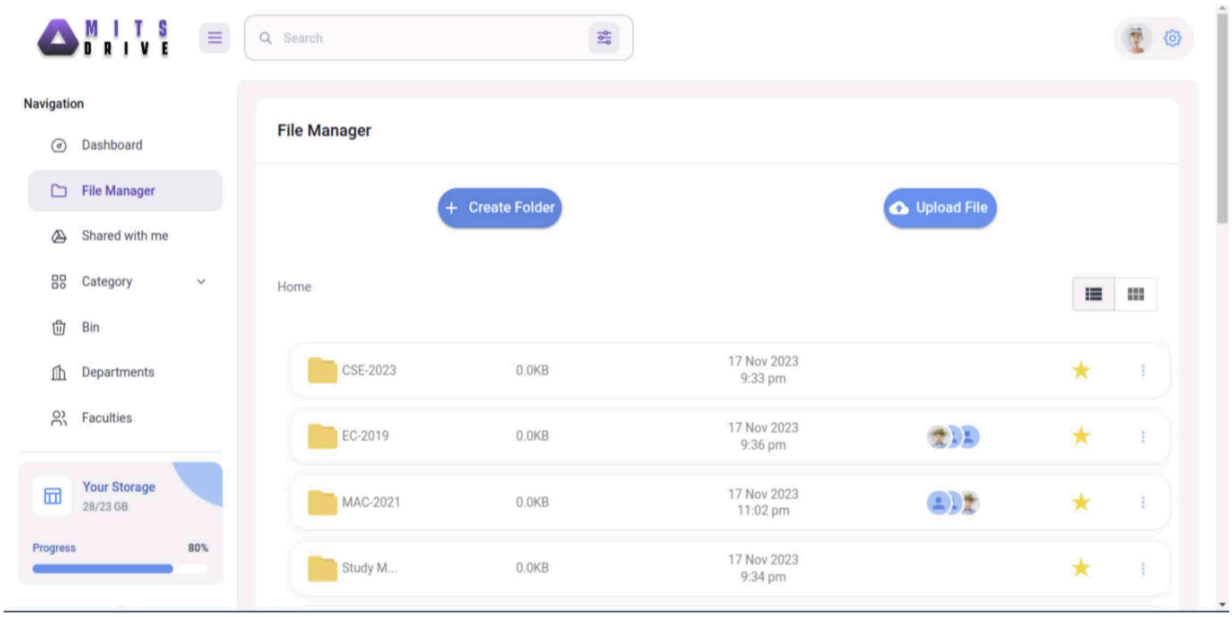

Fig. No. 09

Document Management System Page

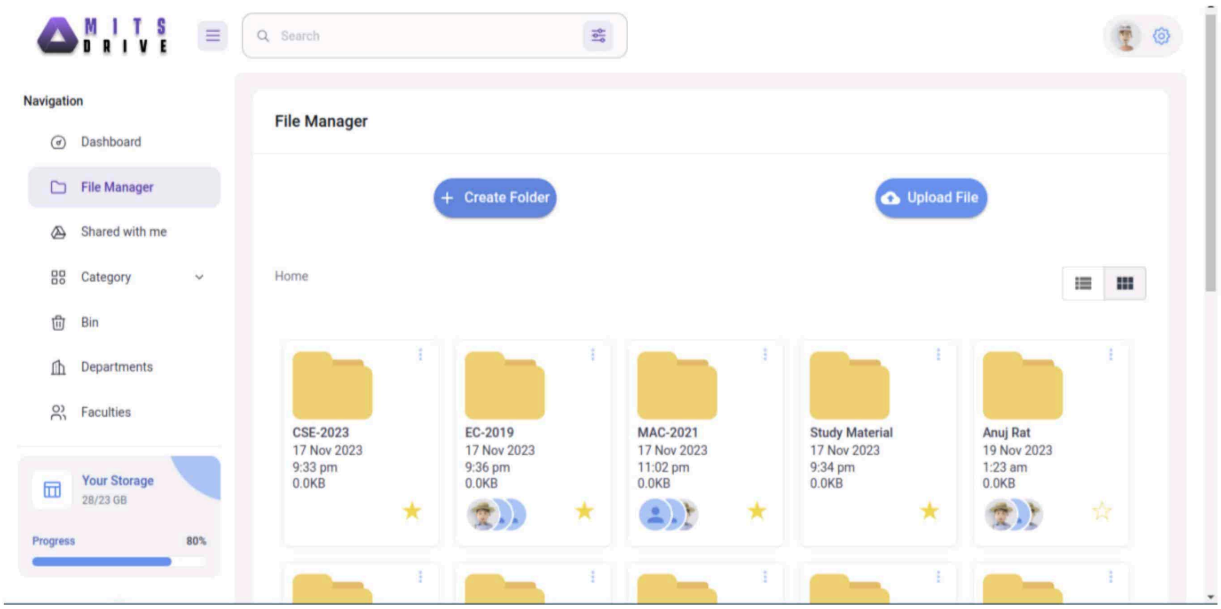

Fig. No. 10

File Manager Page

- Admin can create folder inside its home directory.

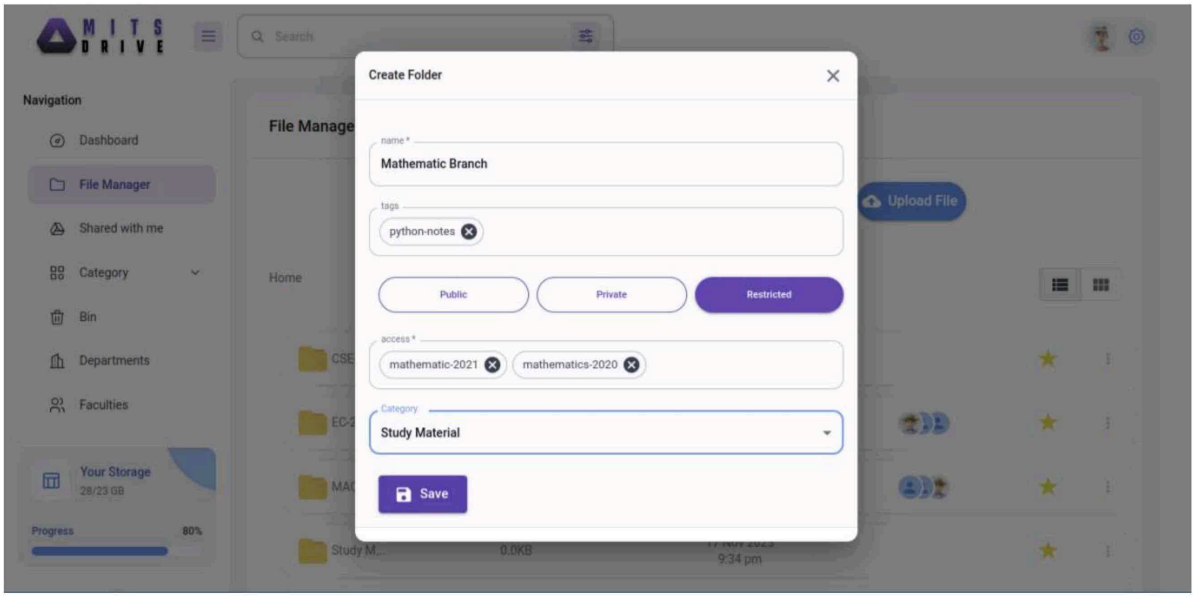

Fig. No. 11

Folder Creation with special access

- Admin can upload study materials, lecture notes, and relevant documents.

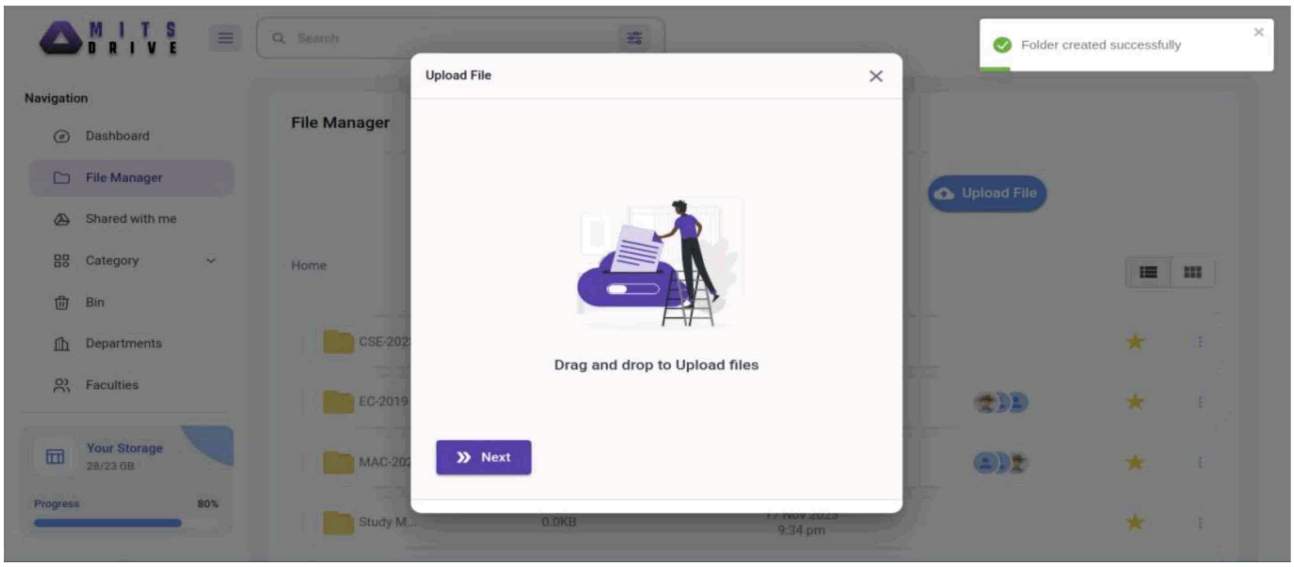

Fig. No. 12

Document Upload Page

- Edit file/folder: Enables Edit files and folder uploaded by admin.

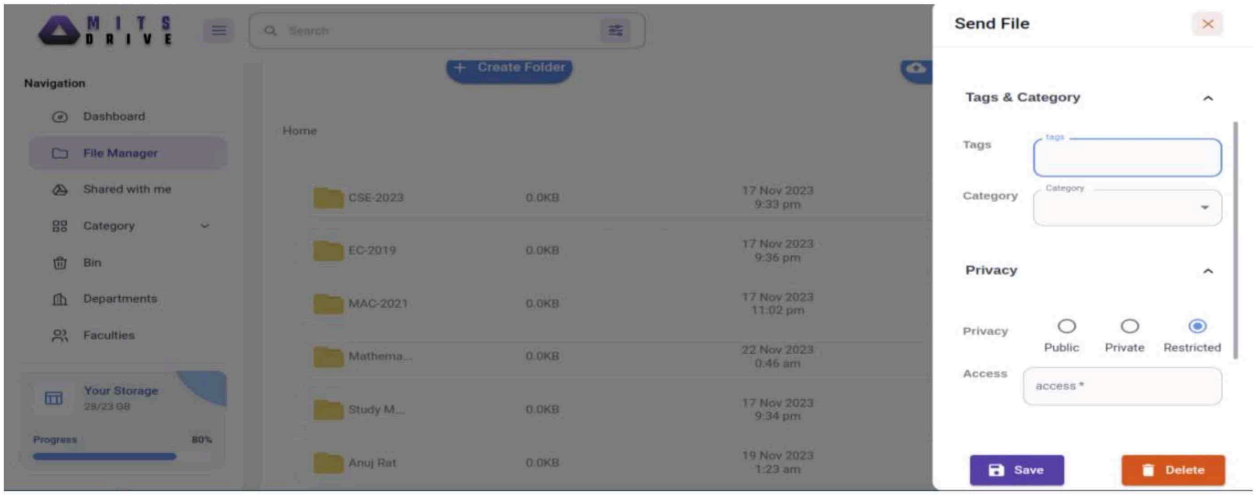

Fig. No. 13

Edit Folder Page

- Individual Sharing: Allows to share document with specific person

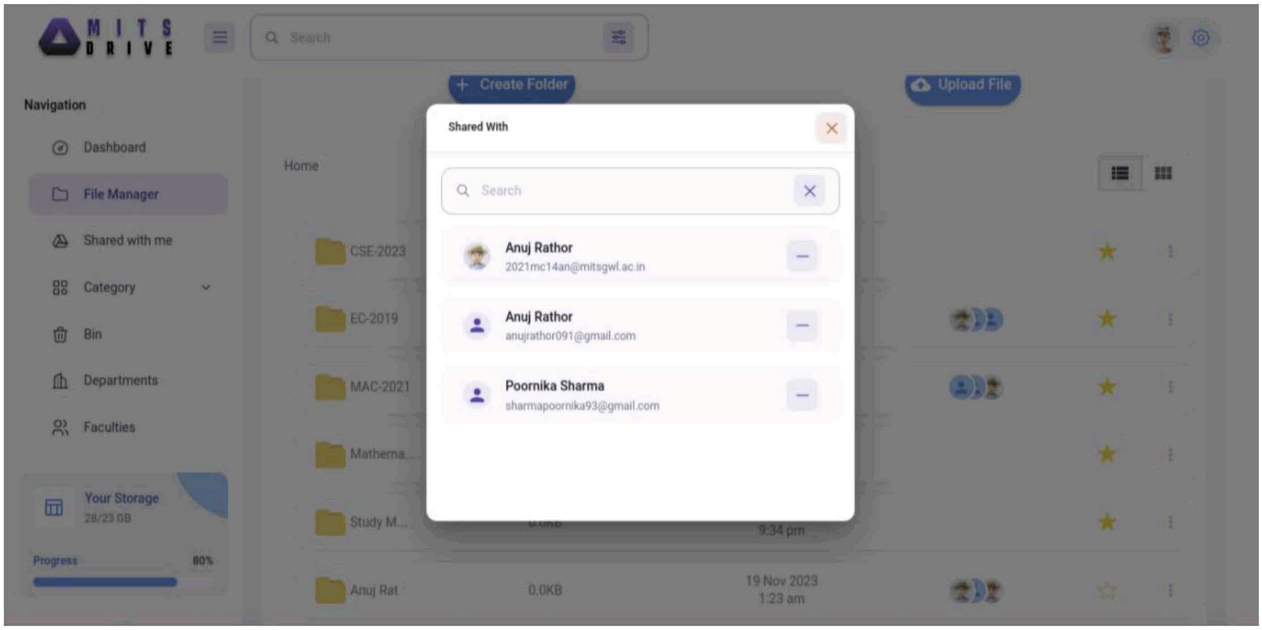

Fig. No. 14

Individual And Group Document Sharing

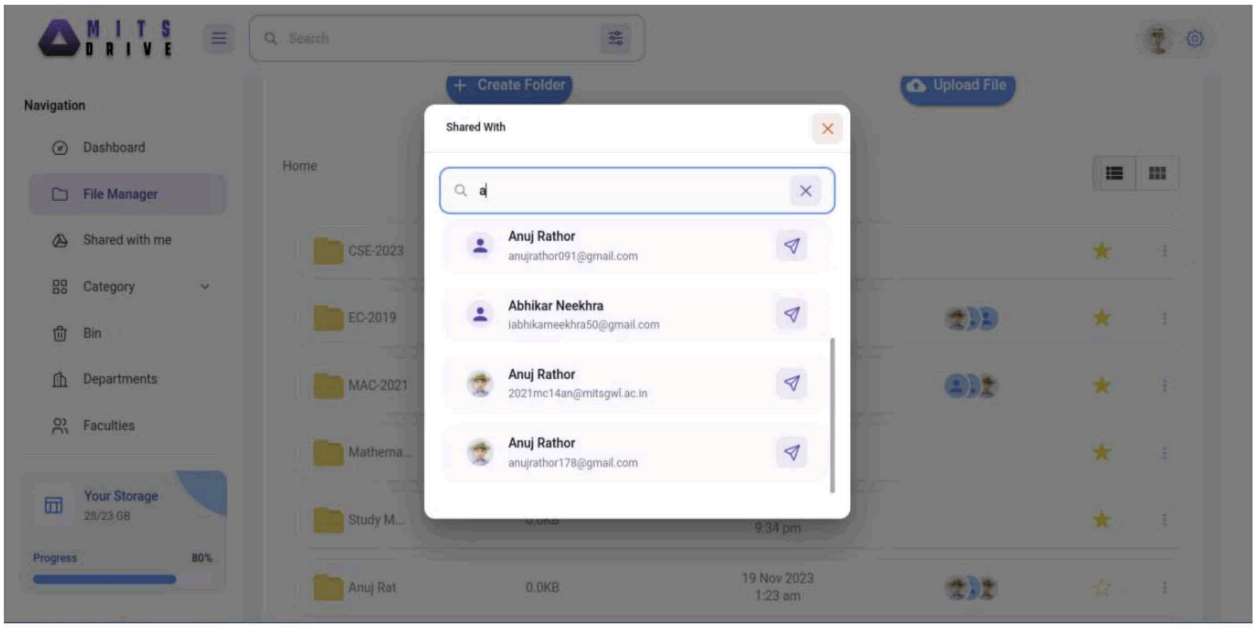

Fig. No. 15

Sharing through Email

- Folder Navigation: Helps to navigate between different folders

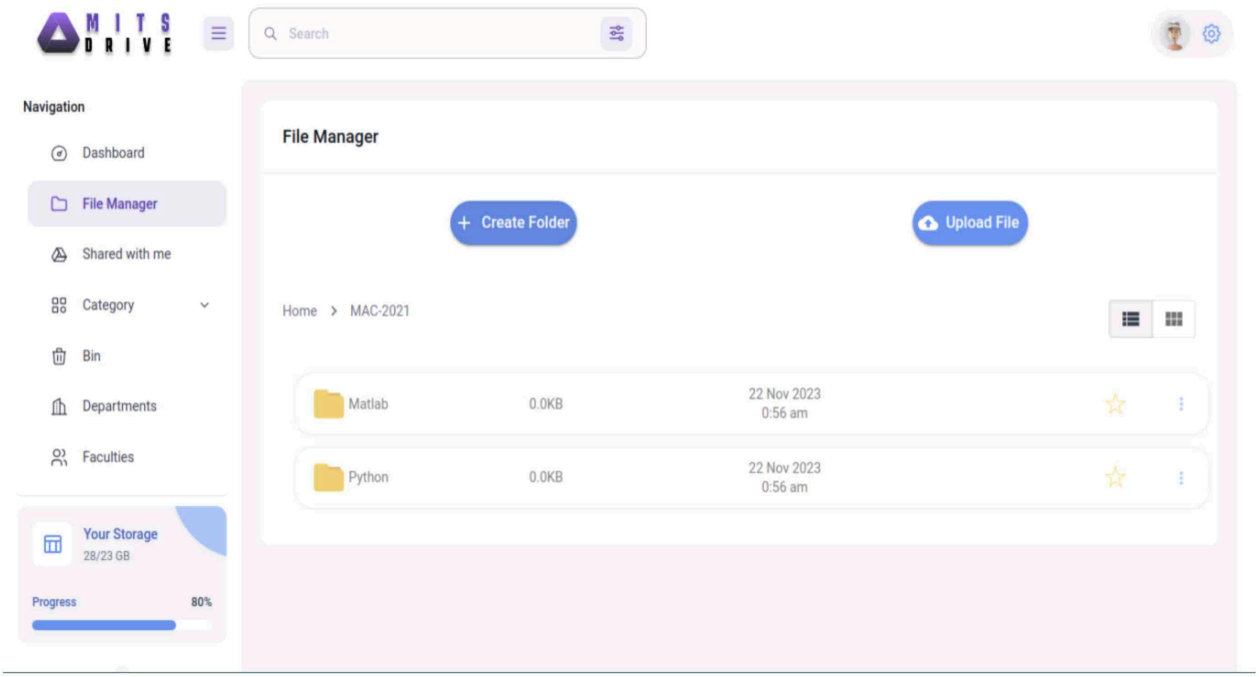

Fig. No. 16

Folder Navigation

- **User Management:**

  - Administrative functionalities include adding faculty members and creating new departments.

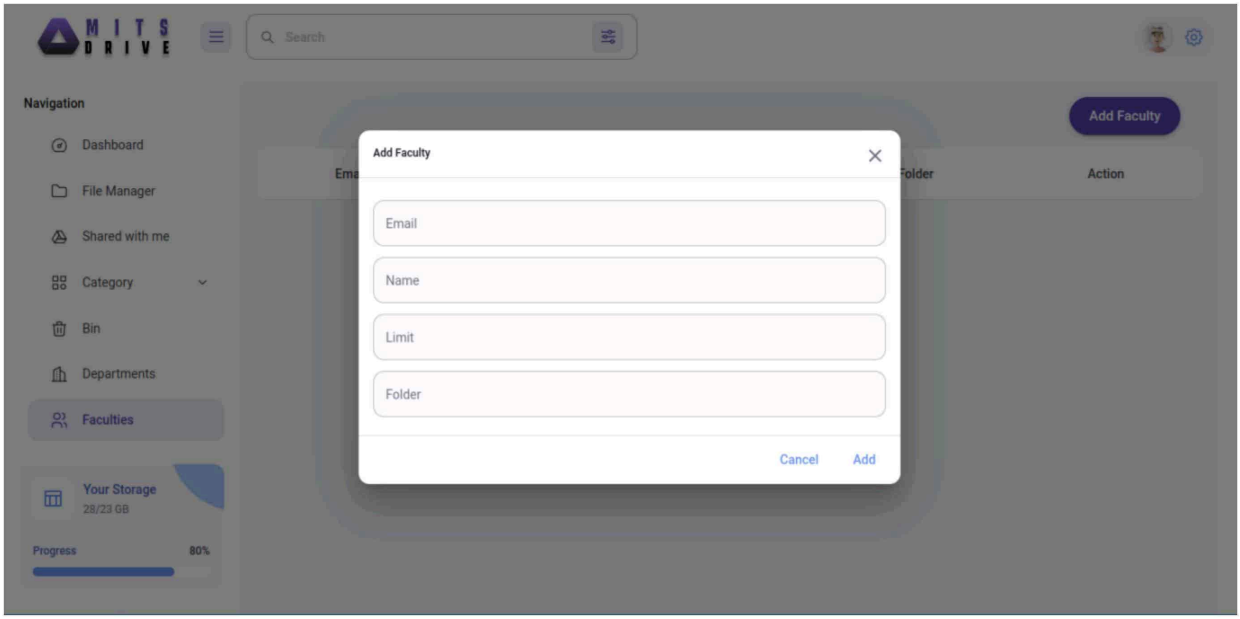

Fig. No. 17

Add Faculty Modal

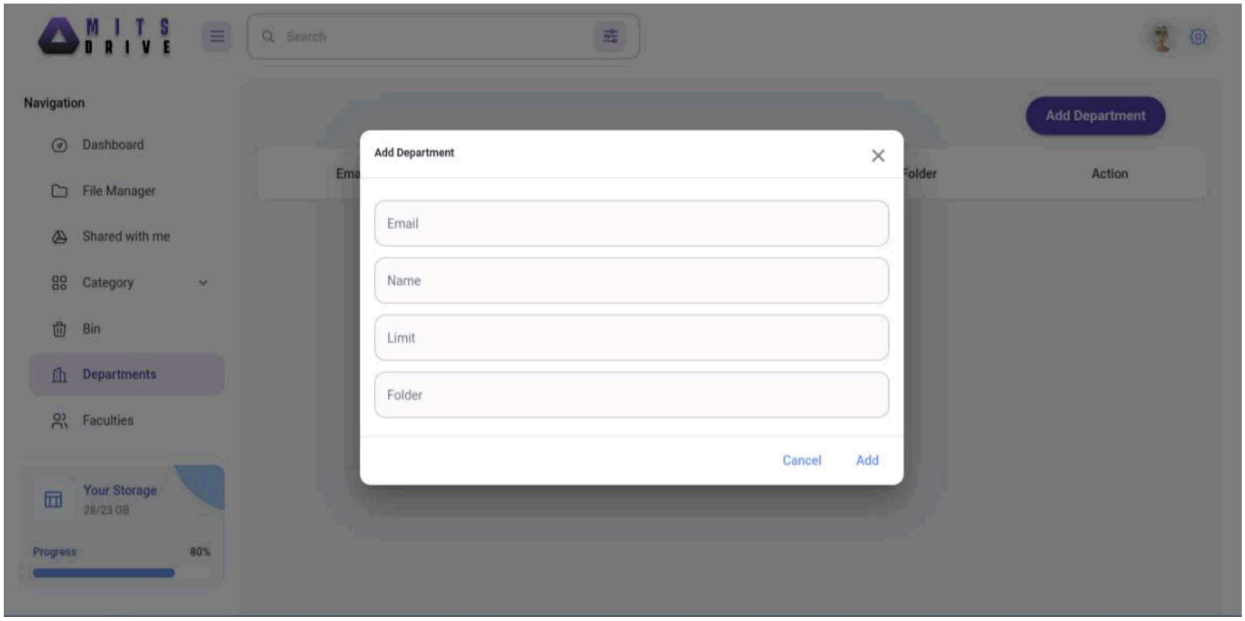

Fig. No. 18

Add Department Modal

- manage faculty and departmental entities.

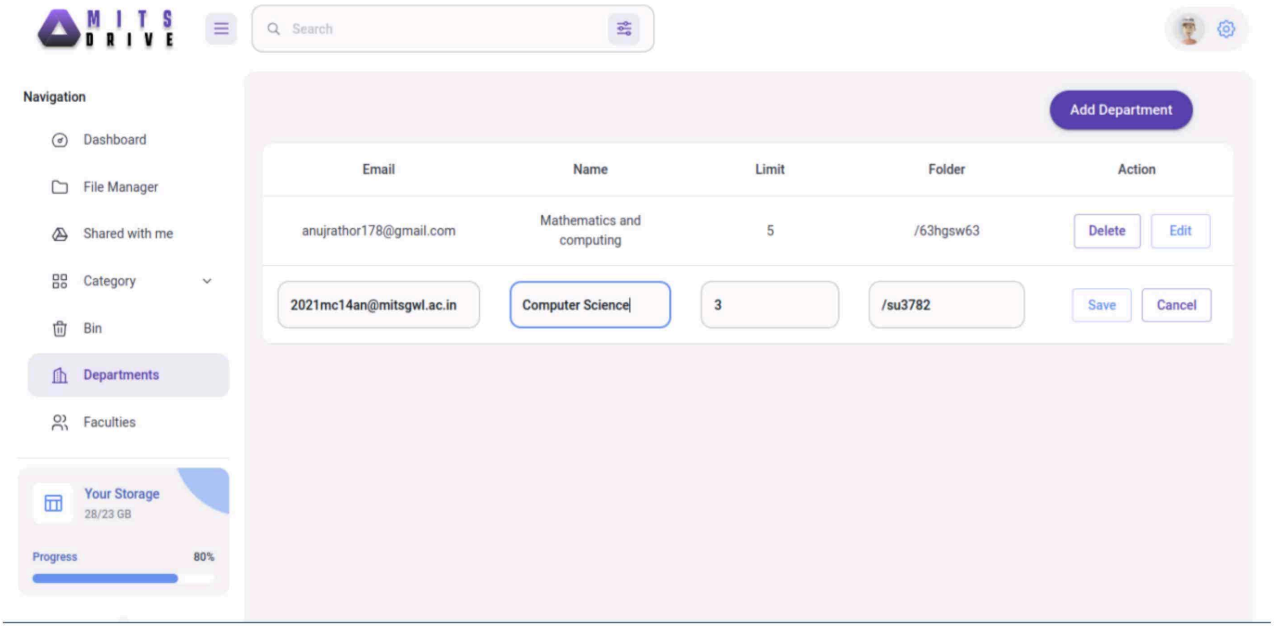

Fig. No. 19

Department Edit Page

- **Resource Access by Category:**

  All Files and folder will be accessed by any users from following pages. There only files and folder will be displayed which shared with user or his group or public.

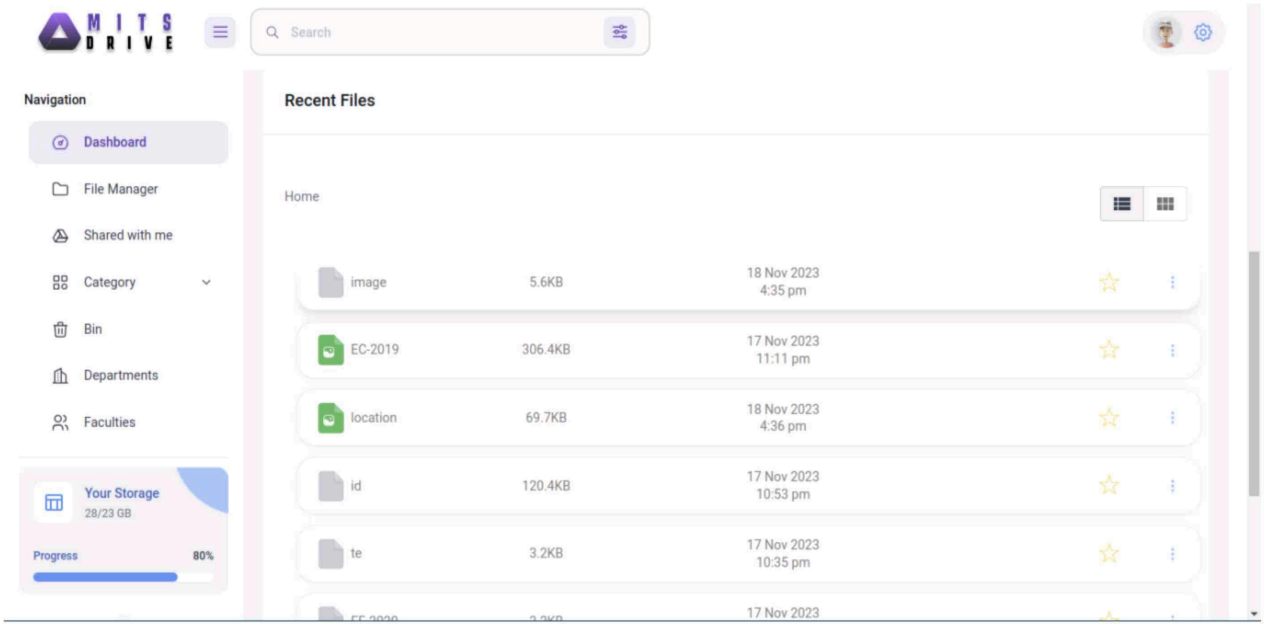

Fig. No. 20

Recent Files Dashboard

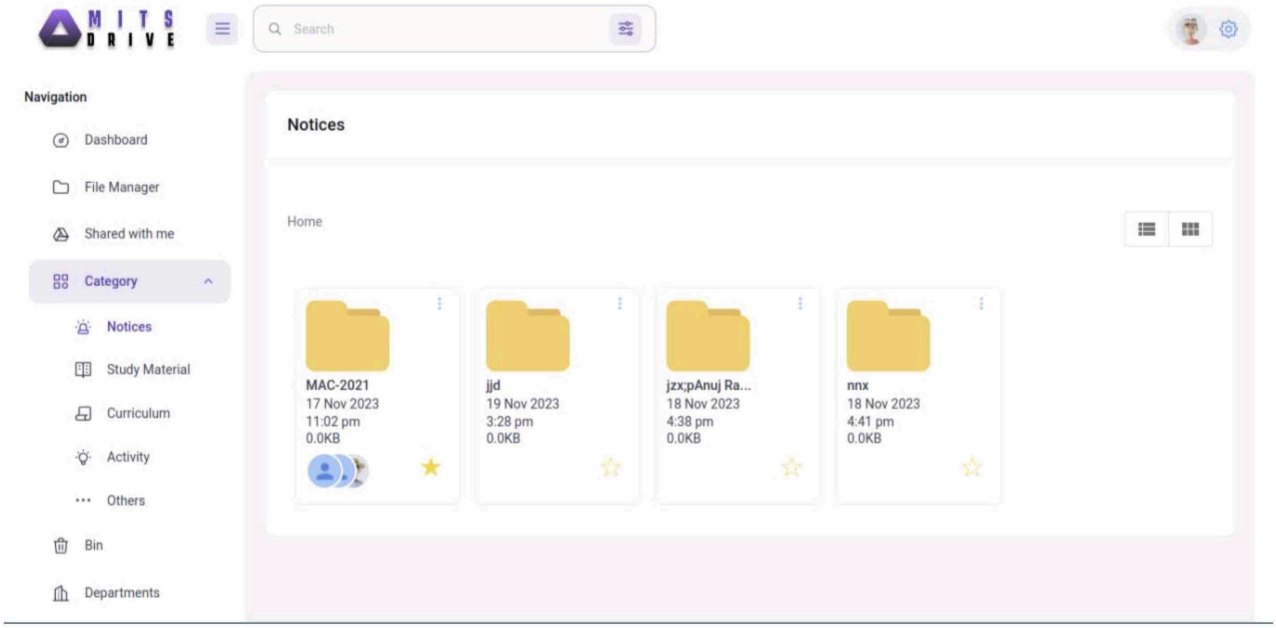

Fig. No. 21

Notices dashboard

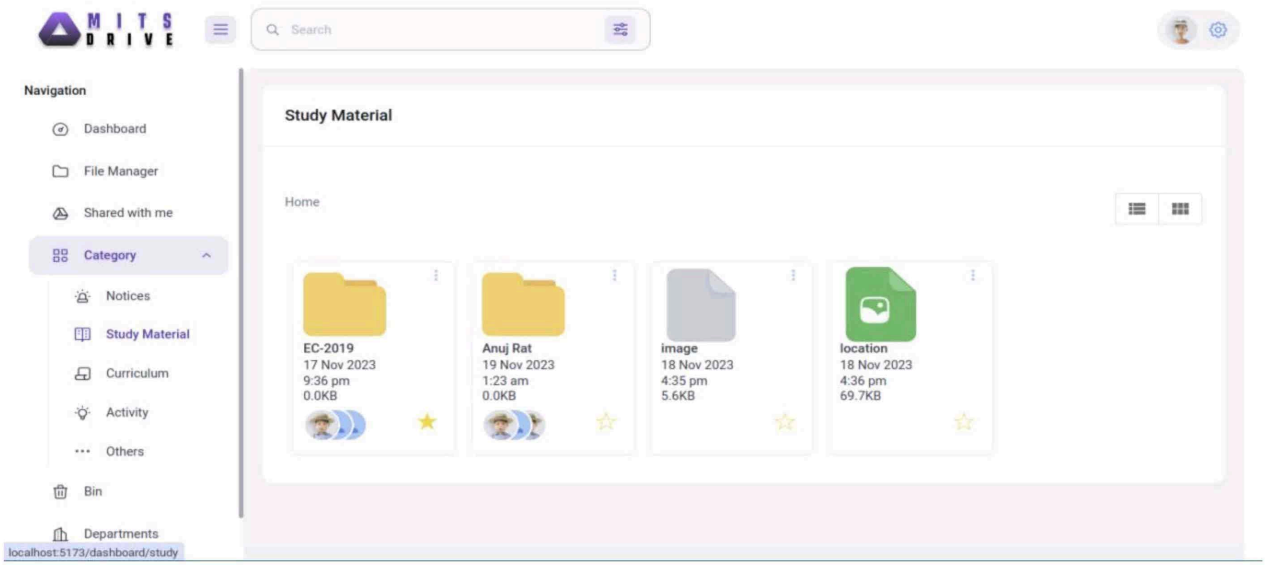

Fig. No. 22

Study Material For Users

- **Shared with:**

  Files shared on your email

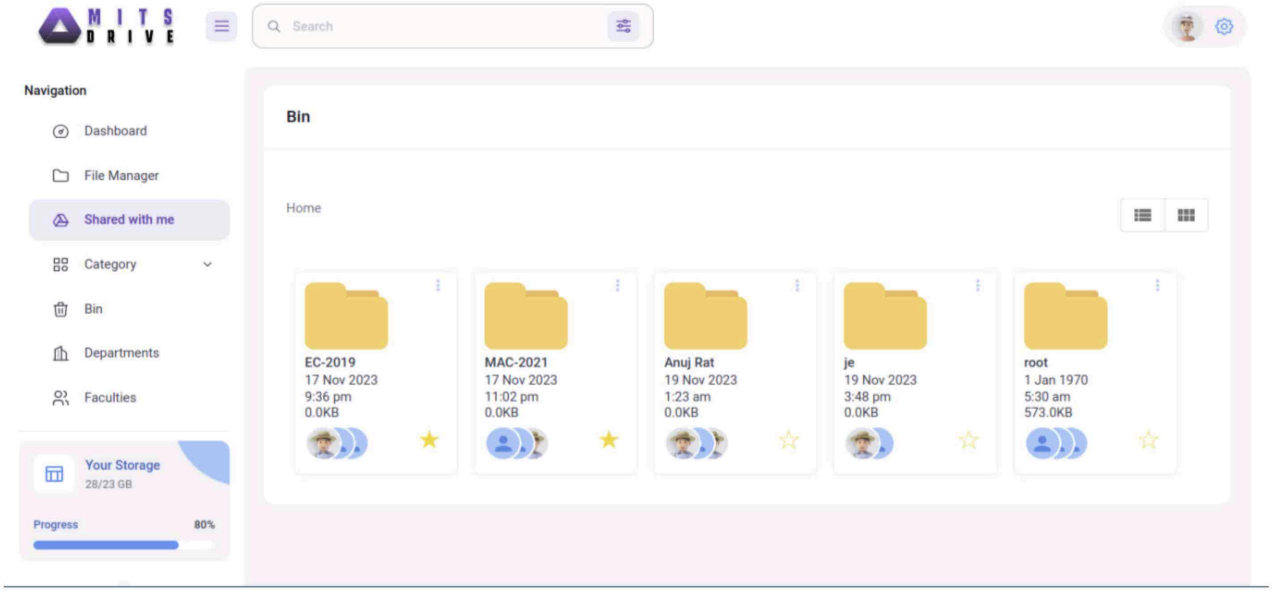

Fig. No. 23

Files Shared With Me

- **Bin:**

  Delete file will be in bin for 15 days and after that time they will be auto deleted

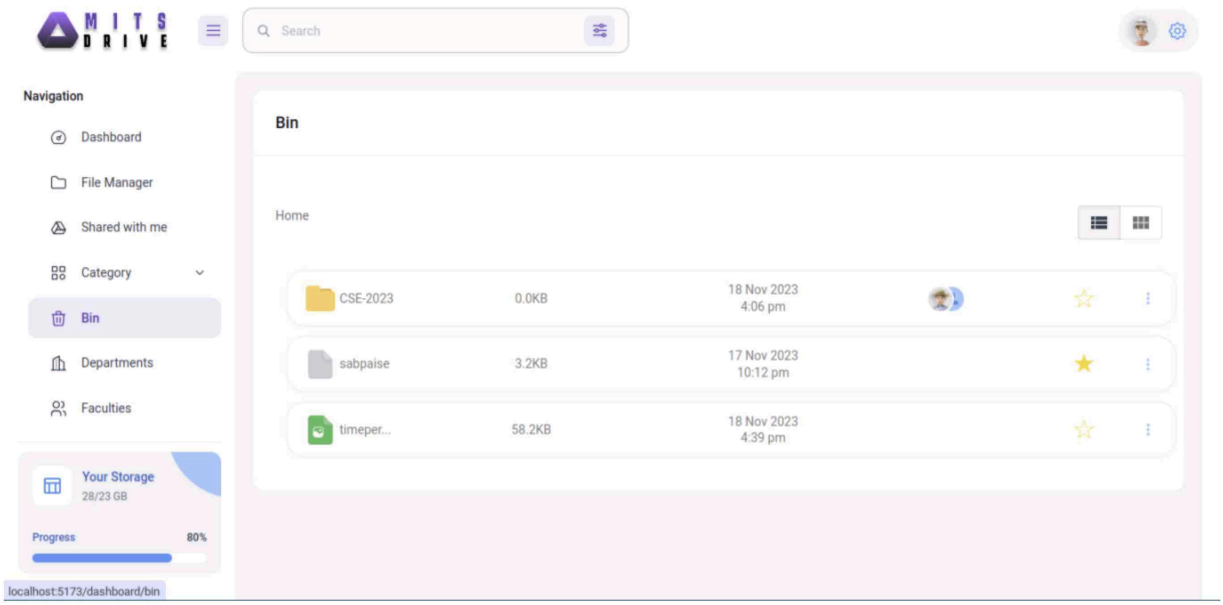

Fig. No. 24

Trash Bin

- **Other Functionalities:**
  - Files and Folder with ownership

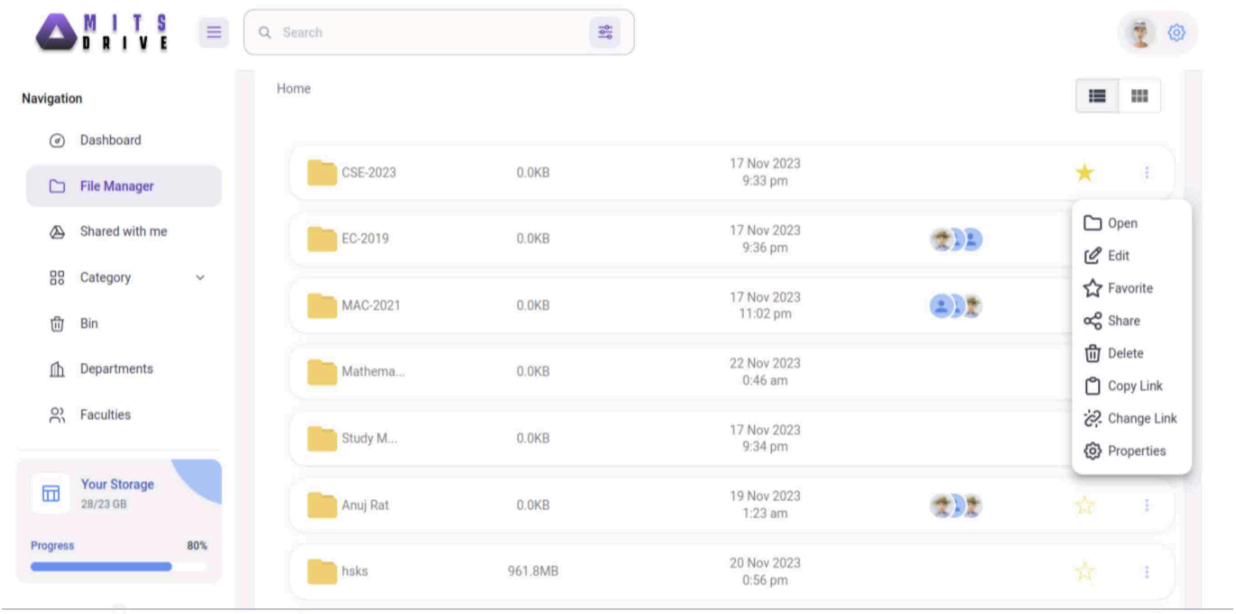

Fig. No. 25

Files and folders ownership

- Files and Folder without ownership

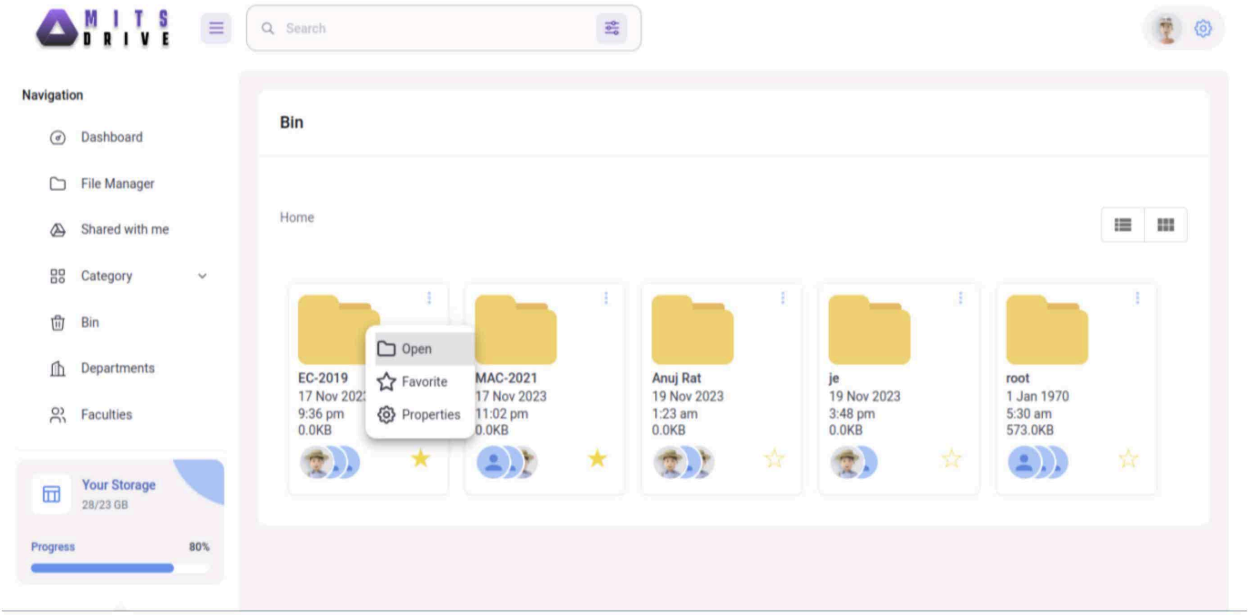

Fig. No. 26

Files and folders without ownership

- **Open Files:**

Fig. No. 27

Uploaded Image on the MITS DRIVE

2.3 Modelling

2.3.1 User-Friendly Experience

- **Intuitive Interface:**
  - The system is designed to offer an intuitive and easy-to-navigate user interface.
  - Focus on creating an environment that balances security with accessibility.

2.3.2 Secure Document Management

- **Controlled Access:**
  - Implements secure access controls to regulate document viewing and sharing.
  - Prioritizes the confidentiality and privacy of shared educational materials.

2.3.3 Collaboration Features

- **Efficient Communication:**
  - Facilitates seamless communication between faculty and students.
  - Provides a platform for document requests, fostering improved collaboration.

2.3.4 Responsiveness

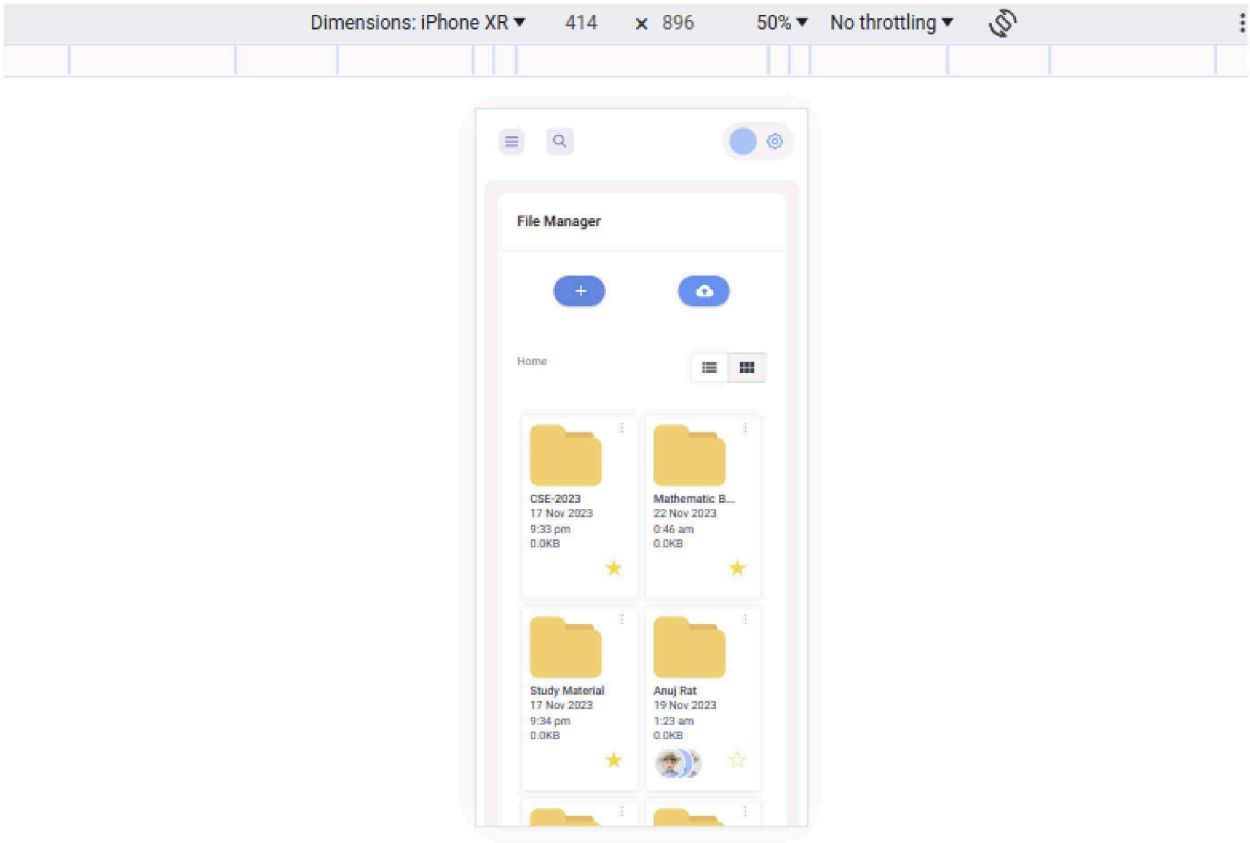

Fig. No. 28

IPHONE RESPONSIVE FOR IPHONE XR

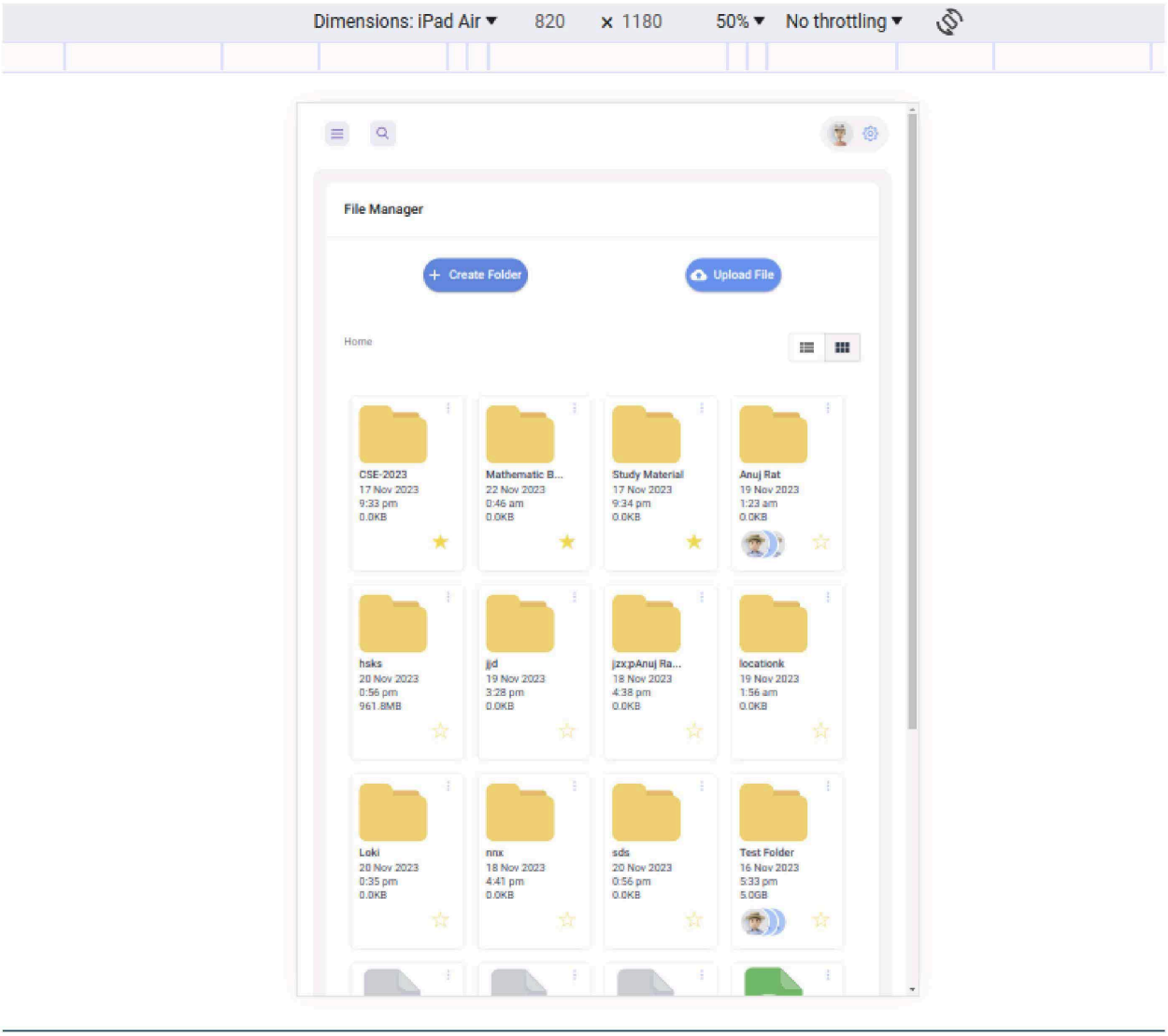

Fig. No. 29

RESPONSIVE FOR IPAD

3. Methodology

3.1 Software

3.1.1 Frontend Development

- **React for Dynamic UI:**
  - Leveraged React to build a dynamic and responsive user interface.
  - Utilized Vite for faster development and efficient build processes.
  - Incorporated Material-UI (MUI) components for a cohesive design system.

3.1.2 Backend Development

- **Node.js and Express.js:**
  - Implemented the server-side using Node.js for its performance and non-blocking I/O.
  - Utilized Express.js for creating a lightweight and efficient backend framework.

3.1.3 Database Management

- **PostgreSQL Integration:**

- Employed PostgreSQL as the relational database management system for secure and efficient data storage.
- Ensured optimal database design to enhance data retrieval performance.

3.1.4 Security Implementation

- **Bcrypt for Password Hashing:**
  - Integrated Bcrypt for secure and optimized password hashing.
  - Implemented secure access controls to protect sensitive data.

3.2 Coding

3.2.1 Full-Stack Development

- **React-Node-PostgreSQL Stack:**
  - Adopted a full-stack approach with React for the frontend, Node.js for the backend, and PostgreSQL for the database.
  - Ensured consistency across the entire development stack for streamlined coding practices.

3.2.2 Document Management Features

- **Upload and Sharing Functionality:**
  - Implemented features for faculty to upload study materials securely.

- Developed selective sharing mechanisms for faculty to control document access.

3.2.3 User Section Features

- **Efficient Resource Access:**
  - Ensured optimal coding practices for students to seamlessly access shared study materials.
  - Implemented document request features with a focus on efficient processing.

3.3 Software Testing

3.3.1 Comprehensive Testing

- **Unit Testing:**
  - Conducted unit tests to ensure the reliability and functionality of individual components.
  - Addressed potential issues at the smallest unit level for robust code.

3.3.2 Integration Testing

- **End-to-End Testing:**

- Performed integration testing to validate the seamless interaction between frontend and backend components.
- Ensured the coherent functioning of the entire system.

3.3.3 User Acceptance Testing

- **Real-World Testing Scenarios:**
  - Engaged users in simulated real-world scenarios to validate the usability and effectiveness of the platform.
  - Gathered feedback for further refinement based on user experiences.

3.4 Code Summary

3.4.1 Backend

Summary

Date : 2023-11-22 01:58:17

Directory /home/ajrathor09182/mits_data/backend

Total : 8 files, 1626 codes, 19 comments, 245 blanks, all 1890 lines

Summary / Details / Diff Summary / Diff Details

Languages

language	files	code	comment	blank	total
JavaScript	4	1,261	19	238	1,518
HTML	2	331	0	4	335
JSON	1	27	0	1	28
CSS	1	7	0	2	9

Directories

path	files	code	comment	blank	total
.	8	1,626	19	245	1,890
. (Files)	2	73	5	11	89
public	1	7	0	2	9
public/stylesheets	1	7	0	2	9
routes	2	1,182	14	224	1,420
utils	1	33	0	4	37
views	2	331	0	4	335

Summary / Details / Diff Summary / Diff Details

3.4.2 Frontend

Summary

Date : 2023-11-22 01:55:01

Directory /home/ajrathor09182/mits_data/frontend/src

Total : 134 files, 12245 codes, 367 comments, 1134 blanks, all 13746 lines

Summary / Details / Diff Summary / Diff Details

Languages

language	files	code	comment	blank	total
JavaScript	109	10,475	327	933	11,735
XML	22	823	1	21	845
CSS	1	738	4	121	863
SCSS	2	209	35	59	303

Directories

path	files	code	comment	blank	total
.	134	12,245	367	1,134	13,746
. (Files)	4	141	41	31	213
assets	25	1,770	40	201	2,011
assets/css	1	738	4	121	863
assets/images	22	823	1	21	845

assets/images (Files)	4	385	1	7	393
assets/images /auth	6	253	0	5	258
assets/images /file	7	131	0	7	138
assets/images /icons	2	11	0	2	13
assets/images /users	3	43	0	0	43
assets/scss	2	209	35	59	303
hooks	1	12	1	6	19
layout	19	1,896	83	198	2,177
layout (Files)	2	51	2	14	67
layout/Custo mization	1	196	8	15	219
layout/Main Layout	15	1,641	71	164	1,876
layout/Main Layout (Files)	1	82	6	11	99

layout/Main Layout/Header	7	1,052	33	77	1,162
layout/Main Layout/Header (Files)	1	60	4	11	75
layout/Main Layout/Header/NotificationSection	2	465	13	25	503
layout/Main Layout/Header/ProfileSection	3	357	12	28	397
layout/Main Layout/Header/SearchSection	1	170	4	13	187
layout/Main Layout/LogoSection	1	16	3	6	25
layout/Main Layout/Sidebar	6	491	29	70	590

layout/Main Layout/Sidebar (Files)	1	84	4	11	99
layout/Main Layout/Sidebar/MenuCard	1	108	5	13	126
layout/Main Layout/Sidebar/MenuList	4	299	20	46	365
layout/Main Layout/Sidebar/MenuList (Files)	1	19	3	6	28
layout/Main Layout/Sidebar/MenuList/NavCollapse	1	136	7	16	159
layout/Main Layout/Sidebar/MenuList/NavGroup	1	48	4	10	62
layout/Main Layout/Sidebar/MenuList/NavItem	1	96	6	14	116

layout/MinimalLayout	1	8	2	5	15
menu-items	5	388	11	25	424
routes	3	220	4	24	248
store	5	57	8	17	82
themes	4	423	14	15	452
ui-component	27	3,403	61	247	3,711
ui-component (Files)	5	327	20	39	386
ui-component/cards	18	2,675	26	162	2,863
ui-component/cards (Files)	6	872	9	63	944
ui-component/cards/Skeleton	8	313	15	31	359
ui-component/cards/modals	4	1,490	2	68	1,560

ui-component/extended	4	401	15	46	462
utils	1	21	8	6	35
views	40	3,914	96	364	4,374
views/dashboard	13	1,254	40	111	1,405
views/dashboard/Default	13	1,254	40	111	1,405
views/dashboard/Default (Files)	8	963	36	95	1,094
views/dashboard/Default/chart-data	5	291	4	16	311
views/pages	22	2,202	39	217	2,458
views/pages/activity	1	46	0	8	54
views/pages/authentication	10	1,233	39	117	1,389
views/pages/authentication (Files)	2	29	5	11	45

views/pages/authentication/auth-forms	4	932	20	74	1,026
views/pages/authentication/authentication3	4	272	14	32	318
views/pages/bin	1	45	0	8	53
views/pages/curriculum	1	46	0	8	54
views/pages/department	2	302	0	18	320
views/pages/faculty	2	302	0	18	320
views/pages/file	1	45	0	8	53
views/pages/notice	1	46	0	8	54
views/pages/others	1	46	0	8	54
views/pages/shared	1	45	0	8	53

views/pages/study	1	46	0	8	54
views/utilities	5	458	17	36	511

Summary / Details / Diff Summary / Diff Details

3.4.3 database

List of relations

Schema | Name | Type | Owner

--------+----------+----------+----------

public | auth | table | postgres

public | auth_id_seq | sequence | postgres

public | department | table | postgres

public | department_id_seq | sequence | postgres

public | downloads | table | postgres

public | downloads_id_seq | sequence | postgres

public | faculty | table | postgres

public | favorite | table | postgres

public | favorite_id_seq | sequence | postgres

public | file | table | postgres

public | file_id_seq1 | sequence | postgres

public | notification | table | postgres

public | otp_verification | table | postgres

public | otp_verification_id_seq | sequence | postgres

public | request_id_seq | sequence | postgres

public | users | table | postgres

public | users_id_seq | sequence | postgres

public | viewed | table | postgres

public | viewed_id_seq | sequence | postgres

4. Result and Conclusion

4.1 Effects of Parameters

4.1.1 Enhanced Document Management

The implemented features within MITS Drive have demonstrated a tangible improvement in document management within the college ecosystem. Faculty members experienced a streamlined process for uploading and sharing study materials, resulting in improved collaboration with students. The selective sharing functionality provided an efficient means for faculty to control access, ensuring that information reaches the intended audience accurately.

4.1.2 Improved Communication

The platform's design facilitated efficient communication between faculty and students. Document requests from students were met with responsive actions, enhancing the overall interaction within the educational community. The seamless integration of communication features contributed to a more engaged and collaborative learning environment.

4.2 Variation

4.2.1 Streamlined Document Requests

The variation observed in document management practices was effectively addressed through the MITS Drive project. The introduction of document request features significantly streamlined the process of acquiring specific materials needed for studies. Students experienced a more organized and efficient means of accessing resources tailored to their academic requirements.

4.2.2 Organized Document Handling

The variation in document handling practices, often a challenge in educational settings, was mitigated through the platform's departmental management features. Faculty members could categorize and organize materials based on academic departments, leading to a more structured and organized document repository.

4.3 Conclusion and Future Scope

The MITS Drive project has successfully addressed identified research gaps and provided an efficient solution for document management within the educational setting. The comprehensive features, including secure document management, selective sharing, and efficient communication, have collectively contributed to a positive learning environment.

4.3.1 Achievement of Project Goals

The project has met its primary goals of creating a user-friendly platform that enhances collaboration, communication, and document management within the college community. The implemented features align with the project's objectives, fulfilling the unique needs of both faculty and students.

4.3.2 Future Development Opportunities

While the current implementation has proven successful, there exist opportunities for future development. Integration of advanced collaboration tools, enhanced security features, and compatibility with emerging technologies are avenues for continuous improvement. The modular nature of the platform allows for seamless incorporation of future enhancements.

In conclusion, the MITS Drive project represents not only a successful endeavour in meeting the immediate needs of document management but also a foundation for continuous improvement and adaptation to the evolving landscape of educational technology.

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