Design & Development of Faculty Leave Management System

A

MINOR PROJECT-II REPORT

Submitted in partial fulfillment of the requirements

for the degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE & ENGINEERING

By

GROUP NO.12

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Under the guidance of

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June-2023

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Bhopal (M.P.)
Approved by AICTE, New Delhi & Govt. of M.P.
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Sagar Institute of Science & Technology (SISTec), Bhopal
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Bhopal (M.P.)

June-2023

CERTIFICATE

I hereby certify that the work which is being presented in the B.Tech. Minor Project-II Report entitled **Design & Development of Faculty Leave Management System,** in partial fulfillment of the requirements for the award of the degree of ***Bachelor of Technology*** in ***Computer Science & Engineering*** and submitted to the Department of Computer Science & Engineering, *Sagar Institute of Science & Technology (SISTec)***,** Bhopal (M.P.) is an authentic record of my own work carried out during the period from Jan-2023 to April-2023 under the supervision of **Dr. Meena Malik(Associate Professor).**

The content presented in this project has not been submitted by me for the award of any other degree elsewhere.

Signature

Hardik Kushwaha (0187CS201063)
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This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date:

Dr. Meena Malik	**Prof. Rahul Dubey**	**Dr. Keshavendra Choudhary**
Project Guide	**HOD**	**Principal**

ABSTRACT

Faculty leave management systems project focuses on bringing together a variety of processes and solving a couple of problems faced in faculty management. This project addresses the need for automation and simplification of employee data, leave requests, and leave grant management.

Faculty must plan their long leaves well in advance, and have a streamlined, automated system in place to handle leaves and manage work situations in advance. It demonstrates a strong work ethic and smoothens the work process. This is a method of assisting your staff in achieving their full potential and achieving your administration objectives.

As a results an automated faculty leave management system that is speedier, error-free, requires less paperwork, and is simple to manage is deployed. The system was created utilizing a software architecture approach to provide an automated system. Both the organization and its staff profit from an effective leave management system. It makes it possible to plan ahead of time for an faculty's absence. Faculties can seek leave, view previous leave history, and the administration can review and approve leave requests as well as track current leave through this project.

ACKNOWLEGMENT

It gives us immense pleasure to express our deepest sense of gratitude and sincere thanks to our highly respected and esteemed guide Dr. Meena Malik and our Project Coordinator Prof. Ruchi Jain, Department of Computer science and Engineering, SISTec, Gandhi Nagar, Bhopal, for their valuable guidance, encouragement and help for completing this work. Their useful suggestions for this whole work and co-operative behaviour are sincerely acknowledged.

We would like to express our sincere thanks to Dr. Keshavendra Chaudhary, Principal, SISTec, Gandhi Nagar, Bhopal for giving us an opportunity to undertake this project.

We would like to express our sincere thanks to Dr. Swati Saxena, Vice Principal, SISTec, Gandhi Nagar, Bhopal for giving us an opportunity to undertake this project.

We also wish to express our gratitude to Prof. Rahul Dubey, Head, Department of Computer Science & Engineering, for his kind-hearted support.

At the end, we would like to express our sincere thanks to all our friends and others who helped us directly or indirectly during the project work.

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LIST OF ABBREVIATIONS

ACRONYM	FULL FORM
VS code	Visual Studio code
CSS	Cascading Style sheets
HTML	Hyper Text Markup Language
JS	Java Script
ER Diagram	Entity Relationship Diagram

Chapter 1
Introduction

CHAPTER-1
INTRODUCTION

1.1 ABOUT PROJECT

The Faculty Leave Management System has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardships faced by this existing system. Moreover, this system is designed for the particular need of the institution to carry out operations in a smooth and effective manner.

The application is reduced as much as possible to avoid errors while entering the data. It also provides error messages while entering invalid data. No formal knowledge is needed for the user to use this system. Thus this proves it is user-friendly. Faculty Leave Management System, as described above, can lead to an error-free, secure, reliable, and fast management system. IT can assist the user to concentrate on their other activities rather to concentrate on record keeping. Thus it will help organizations in better utilization of resources.

1.2 PROJECT OBJECTIVE

The main objective of the Project on Faculty Leave Management System is to manage the details of Faculty Leave. It keeps track of the faculty leaves. The purpose of the project is to build an application program to reduce the manual work for managing the Faculty leave, Leave Type.

Chapter 2
Software & Hardware Requirements

CHAPTER-2
SOFTWARE REQUIREMENTS

2.1 INTRODUCTION

To install and use applications efficiently, we required certain software and hardware components of the computer system. The system requirements on the package will be listed by the application manufacturer. After installation of an application, you could face technical issues, if your computer system does not meet the system requirements. System requirements for the operating system will be hardware components, while other application software will list both hardware and operating system requirements and Brower. System requirements are most commonly seen listed as a minimum and recommended requirements. The minimum system requirements need to be met for the web application to run at all on your system, & the recommended system requirements, if met, will offer better software usability.

2.2 SOFTWARE REQUIREMENTS

Required software to work on this project:

- Languages:
  - HTML
  - CSS
  - JavaScript

- Frame Works & Libraries:
  - Express
  - Node.js
- Tools:
  - Visual Studio Code
  - MongoDB Compass

2.2.1 HTML, CSS, JavaScript

The **Hyper Text Markup Language**, or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as **Cascading Style Sheets** (CSS) and scripting languages such as **JavaScript.**

- **HTML**

  Stands for "Hypertext Markup Language." HTML is the language used to create web pages. "Hypertext" refers to the hyperlinks that an HTML page may contain. "Markup language" refers to the way tags are used to define the page layout and elements within the page.

- **CSS**

  Stands for "Cascading Style Sheet." Cascading style sheets are used to format the layout of Web pages. They can be used to define text styles, table sizes, and other aspects of Web pages that previously could only be defined in a page's HTML.

- **JavaScript**

  JavaScript has been around for a few years now, and it allows us to write code in a clever way which basically makes the code more modern and more readable.

2.2.2 Framework and Libraries

- **Express**

Express is a node.js web application framework that provides broad features for building web and mobile applications. It is used to build a single page, multipage, and hybrid web application. It's a layer built on top of Node.js that helps manage servers and routes.

Express.js is a small framework that works on top of Node.js web server functionality to simplify its APIs and add helpful new features. It makes it easier to organize your application's functionality with middleware and routing. It adds helpful utilities to Node.js HTTP objects and facilitates the rendering of dynamic HTTP objects.

Express is a part of **MEAN** stack, a full-stack JavaScript solution used in building fast, robust, and maintainable production web applications.

- **Node.js**

  Node.js is an open-source and cross-platform runtime environment for executing JavaScript code outside a browser. You need to remember that Node.js is not a framework and it's not a programming language. Most people are confused and understand it's a framework or a programming language. We often use Node.js for building back-end services like APIs like Web App or Mobile App. It's used in production by large companies such as Paypal, Uber, Netflix, Walmart, and so on.

  Node.js = Runtime Environment + JavaScript Library

2.2.3 Tools for Development

- **Visual Studio Code**

Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and MacOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

- **MongoDB Compass**

MongoDB Compass is a powerful GUI for querying, aggregating, and analyzing your MongoDB data in a visual environment. Compass is free to use and source available, and can be run on MacOS, Windows, and Linux.

- **GitHub**

GitHub is a Git repository hosting service that provides a web-based graphical interface. It is the world's largest coding community. Putting a code or a project into GitHub brings it increased, widespread exposure. Programmers can find source codes in many different languages and use the command-line interface, Git, to make and keep track of any changes.
GitHub helps every team member work together on a project from any location while facilitating collaboration. You can also review previous versions created at an earlier point in time.

Chapter 3
Software Requirements Specification

CHAPTER-3
SOFTWARE REQUIREMENTS SPECIFICATIONS

3.1 FUNCTIONAL REQUIREMENTS

ACTORS

- Admin
- Principal
- Hod
- Faculty

Functional Requirements:

- **Admin**
  1. Register Faculty, Hod, and Principal
- **Principal**
  1. Approve/Deny Leave
  2. View/Edit Profile
  3. Upload Profile Photo
- **Hod**
  1. Approve/Deny Leave
  2. View/Edit Profile
  3. Upload Profile Photo
- **Faculty**
  1. Apply Leave
  2. Track Leave
  3. View/Edit Profile
  4. Upload Profile Photo

3.2 NON-FUNCTIONAL REQUIREMENTS

1. Usability
2. Flexibility
3. Maintainability
4. Compatibility

Each Non-Functional requirement is described below:

1. Portability:

Portability means how effectively a system performs in one environment compared to another.

2. Flexibility:

If the need arises in the future, the software can be modified to change the requirements.

3. Maintainability:

The software can be easily repaired and modified if a fault occurs.

4. Compatibility:

Highly compatible systems typically function well when other applications are running on a device. Compatibility also allows people who have different operating systems to use the same applications.

Chapter 4
Software Design

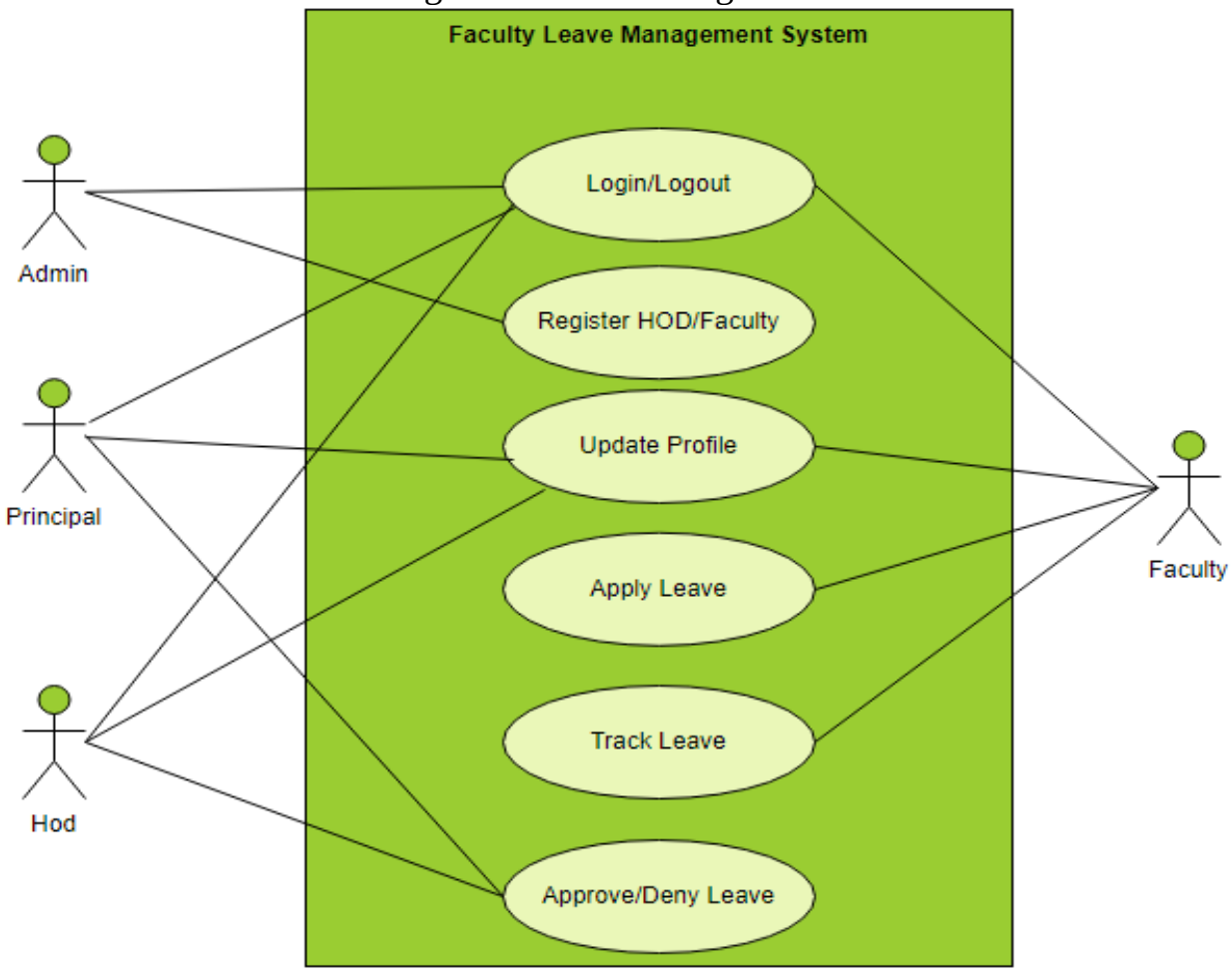
CHAPTER-4
SOFTWARE DESIGN

4.1 Use Case Diagram

The purpose of use case diagram is to capture the dynamic aspect of a system. However, this definition is too generic to describe the purpose, as other four diagrams (activity, sequence, collaboration, and State chart) also have the same purpose. We will look into some specific purpose, which will distinguish it from other four diagrams.

Use case diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirements. Hence, when a system is analyzed to gather its functionalities, use cases are prepared and actors are identified.

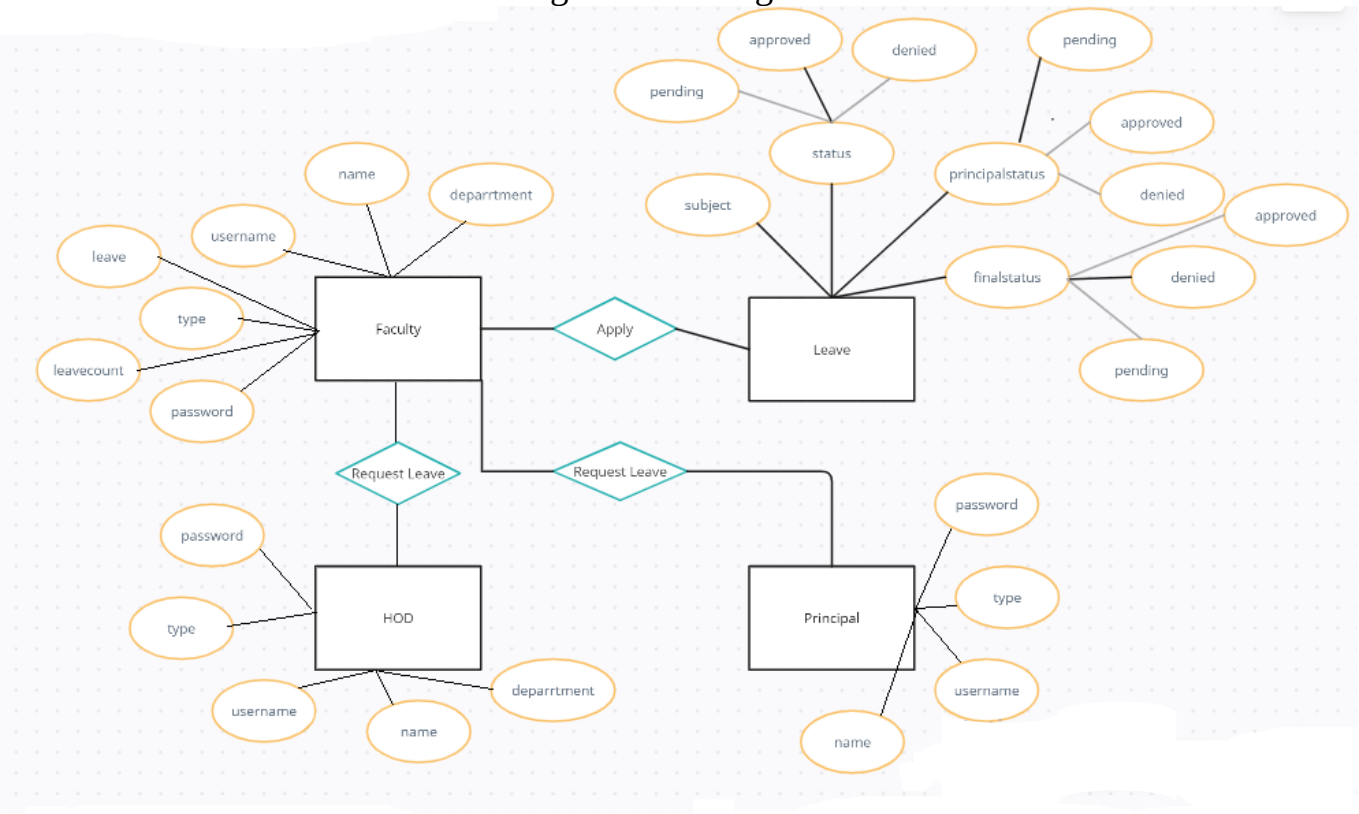
fig. 4.1 Use-case diagram



4.2 ER Diagram

An Entity Relationship Diagram (ER Diagram) pictorially explains the relationship between entities to be stored in a database. Fundamentally, the ER Diagram is a structural design of the database. It acts as a framework created with specialized symbols for the purpose of defining the relationship between the database entities. ER diagram is created based on three principal components: entities, attributes, and relationships.

fig. 4.2 ER diagram



Chapter 5
Output Screen

CHAPTER-5

OUTPUT SCREEN

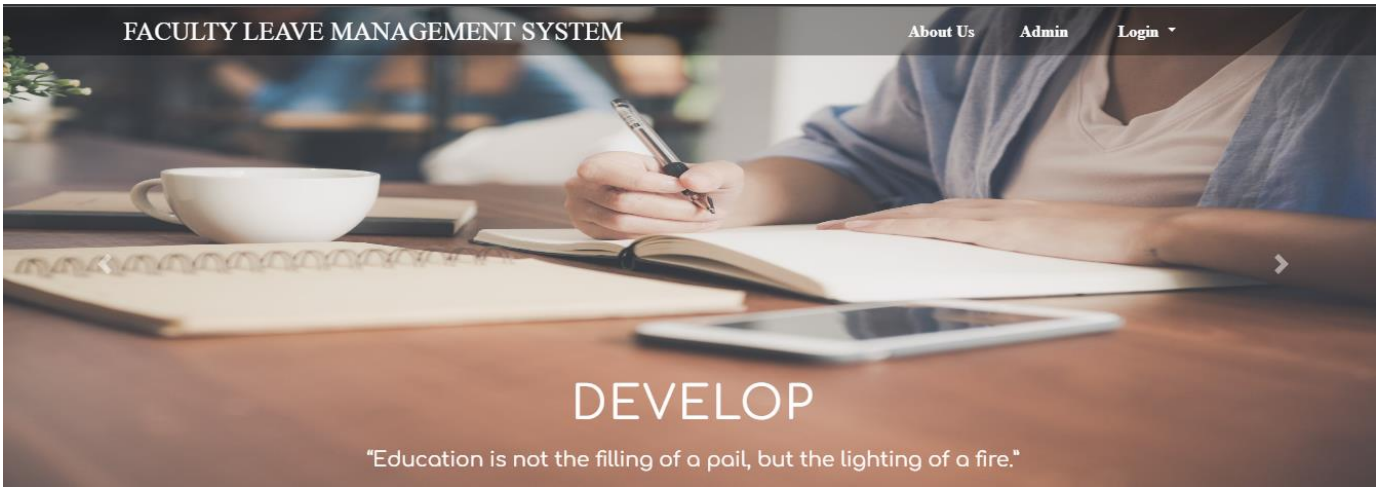


Fig.5.1 home page

Fig. 5.2 about us

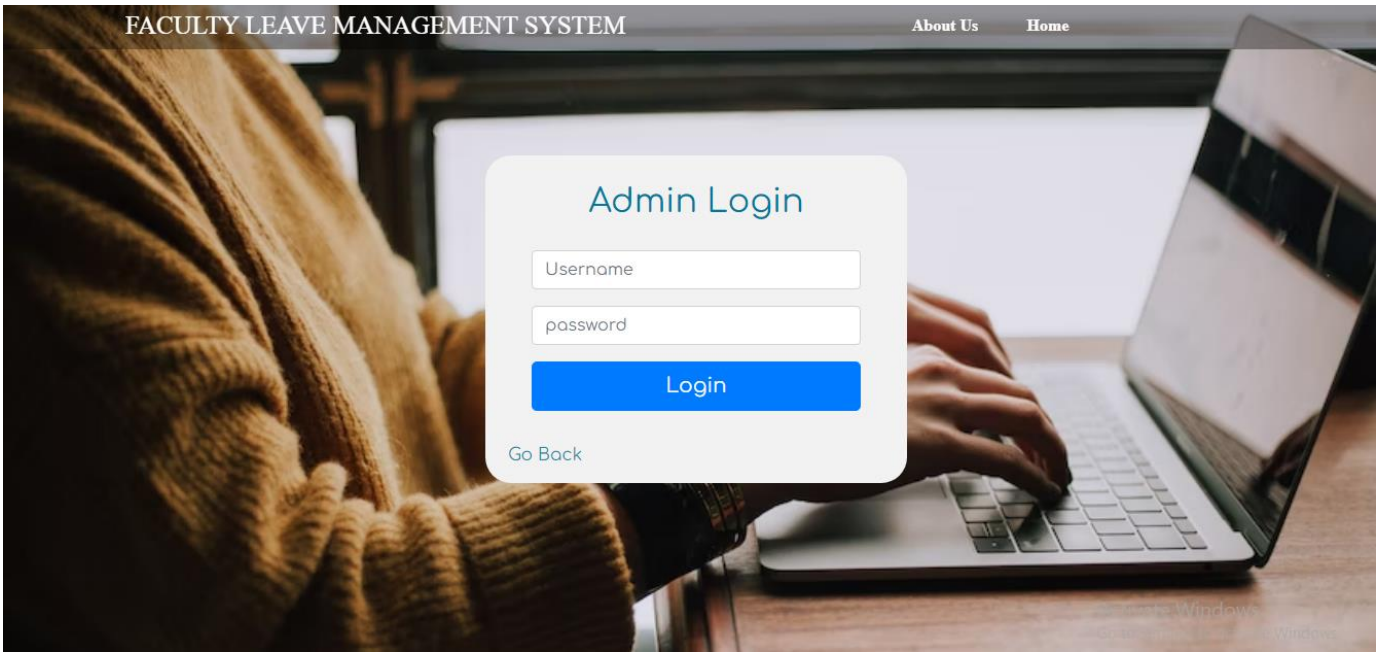


Fig. 5.3 admin login page

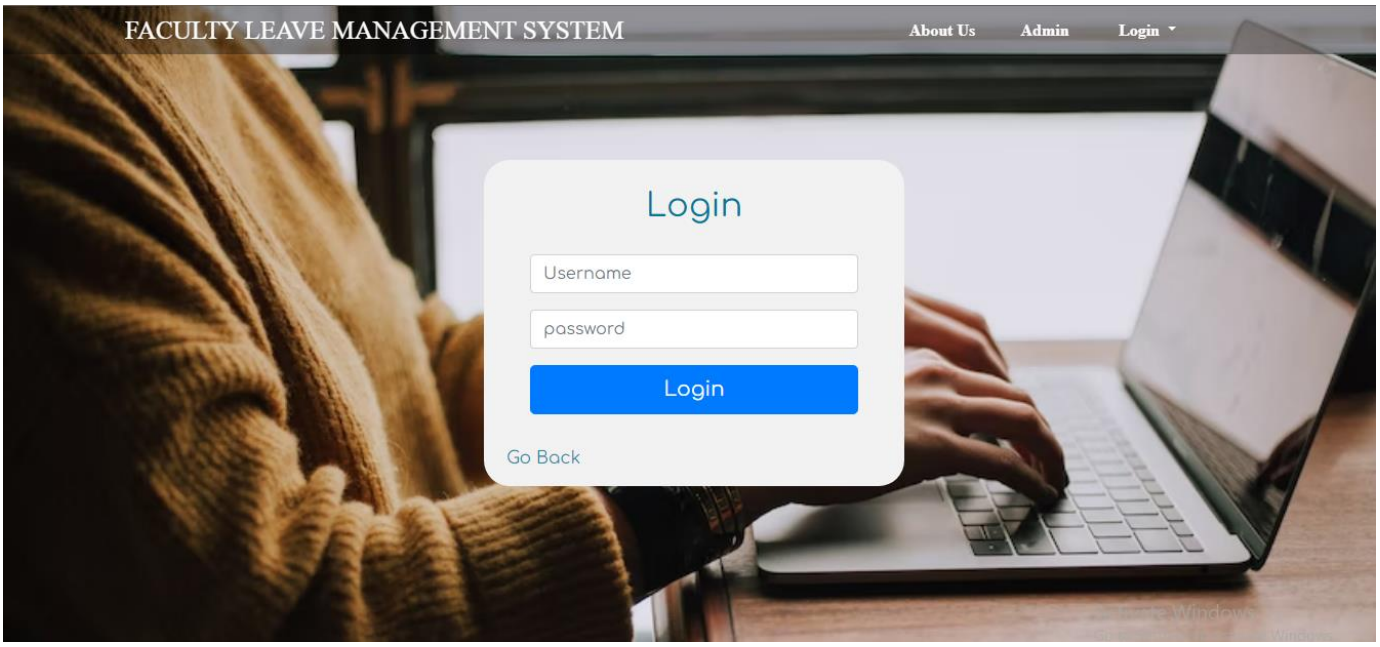


Fig. 5.4 faculty/hod/principal login page

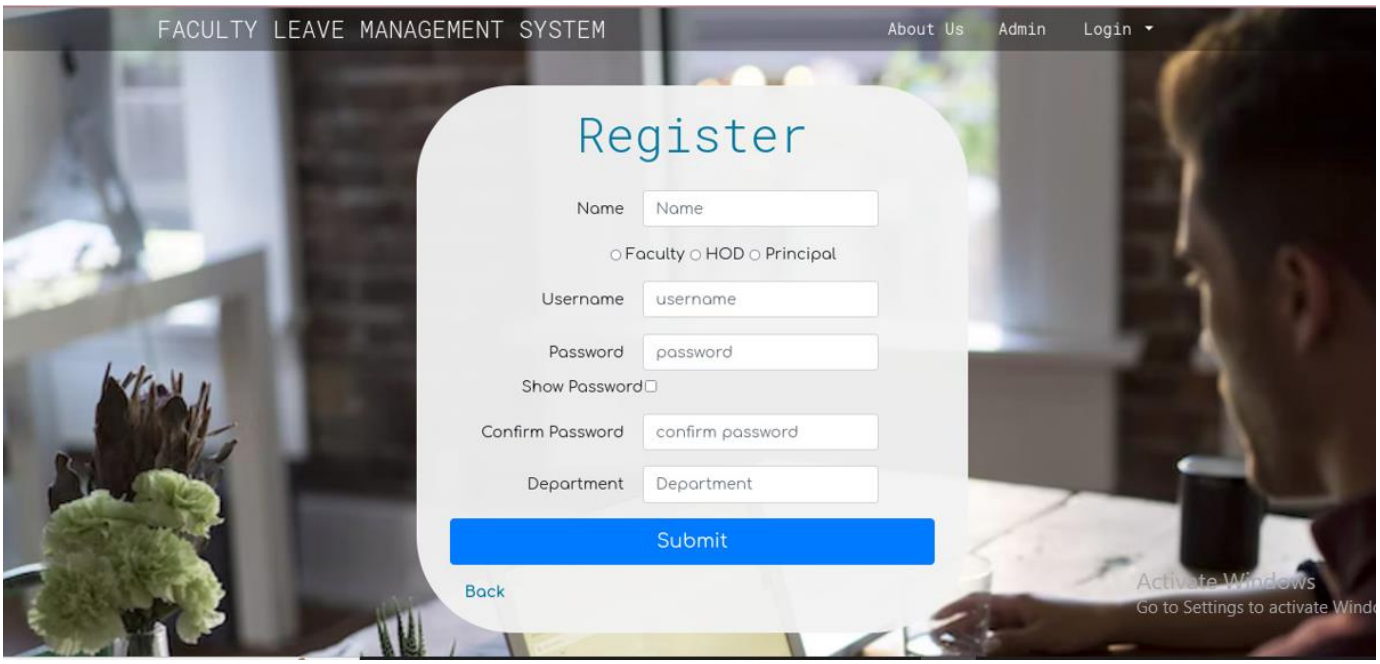


Fig. 5.5 Registration page

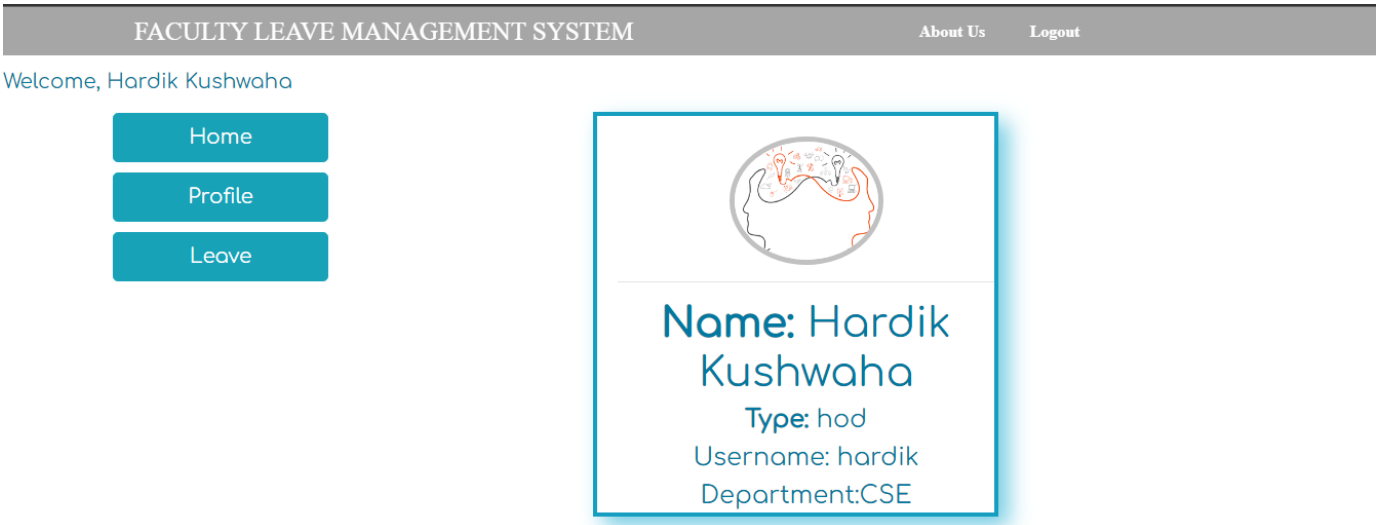


Fig. 5.6 home page

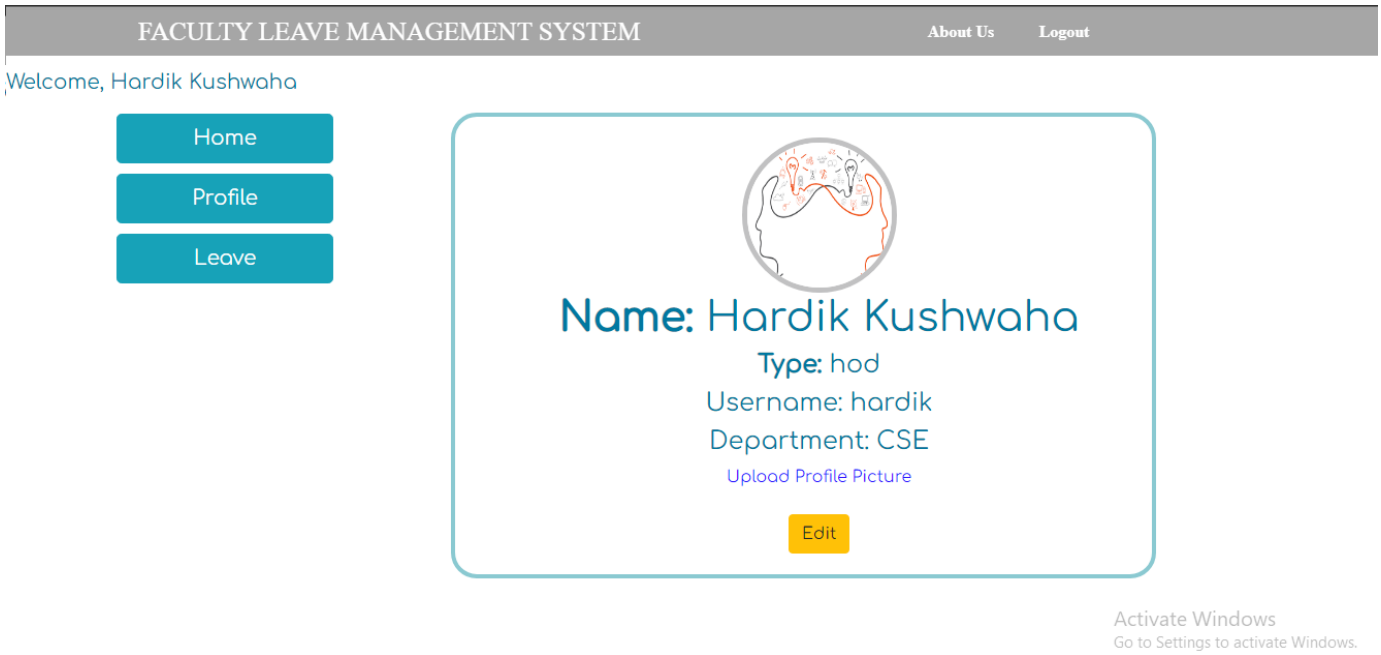


Fig. 5.7 profile page

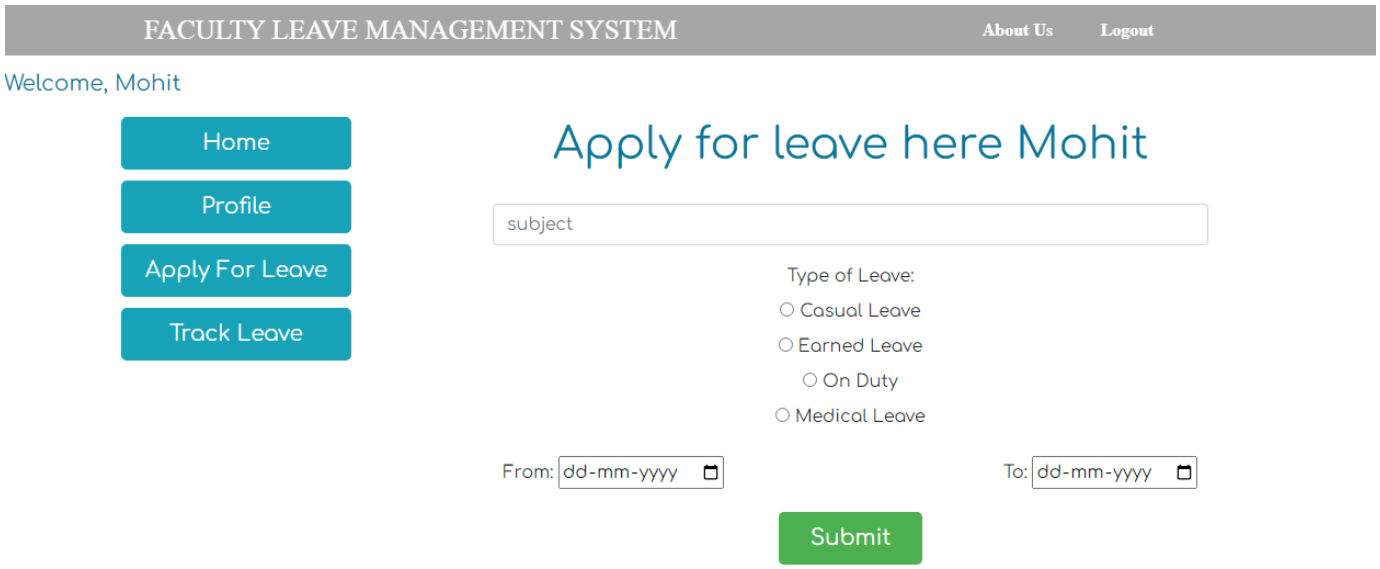


Fig 5.8 leave apply page

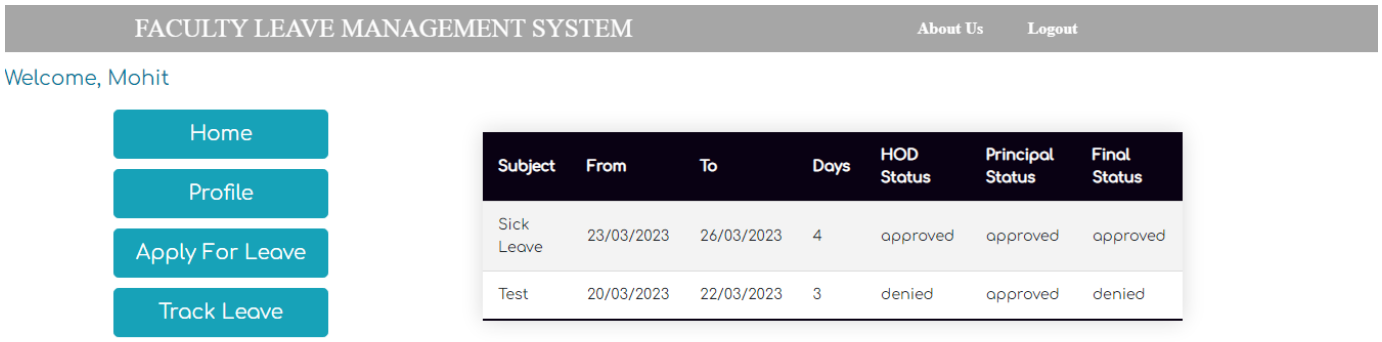


Fig 5.9 track leave page

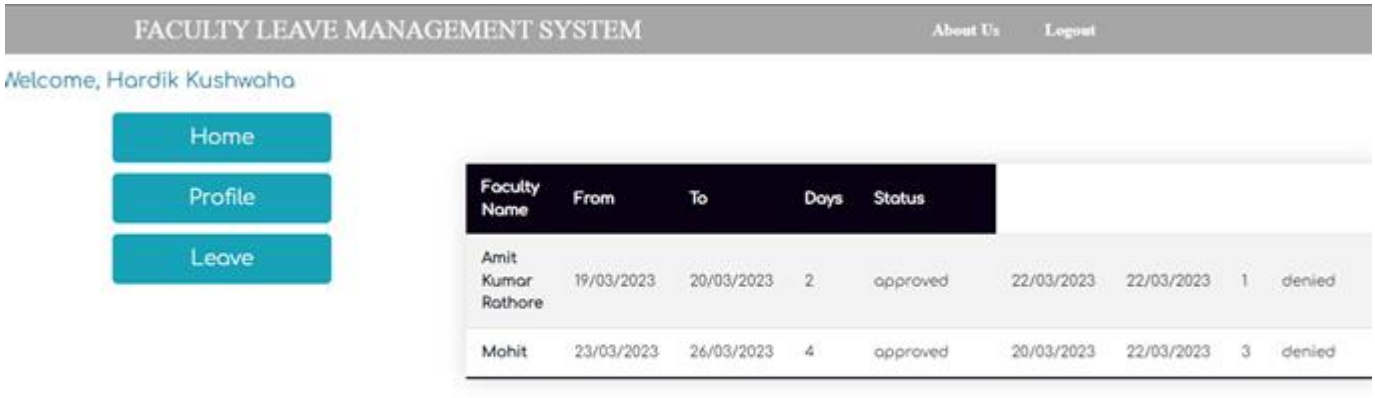


Fig.5.10 leave approval/denial page

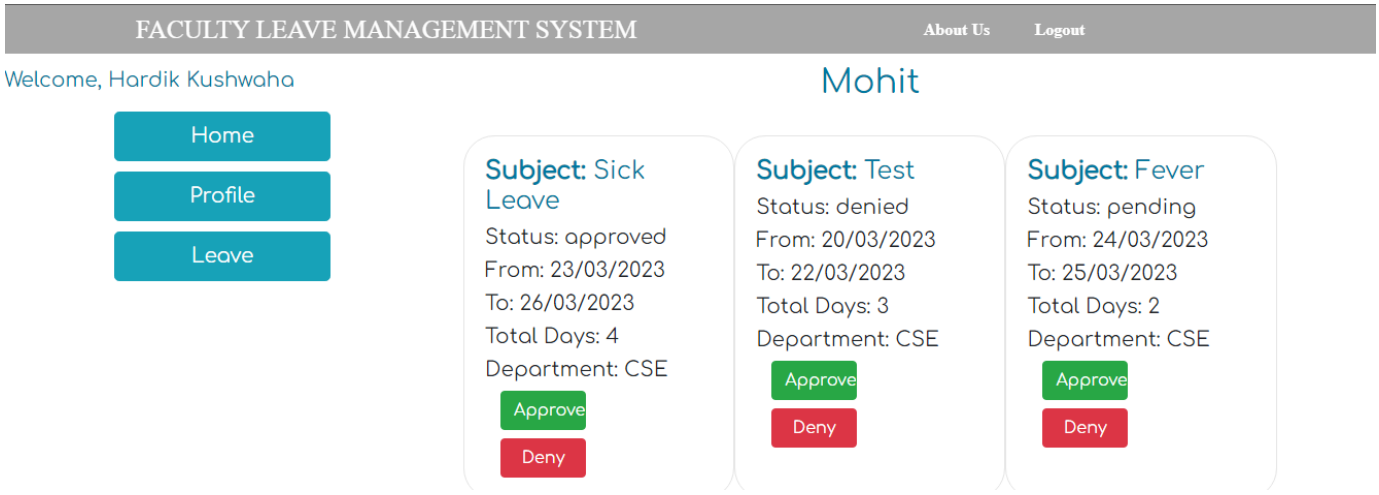


Fig.5.11 leave moreinfo page

Fig 5.12 profile edit page

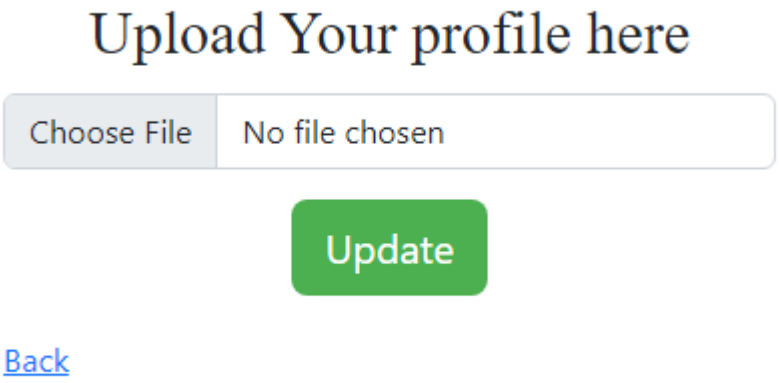


Fig 5.13 Upload profile photo page

APPENDIX-1 GLOSSARY OF TERMS

(In alphabetical order)

C

CSS CSS is an acronym that stands for Cascading Style Sheets which is a style sheet language that is used to express how a structured document like an HTML document should look. Together with HTML and JavaScript, CSS is one of the cornerstones of the World Wide Web.

E

ES6 JavaScript ES6 (also known as ECMAScript 2015 or ECMAScript 6) is the newer version of JavaScript that was introduced in 2015. ECMAScript is thestandard that JavaScript programming language uses. ECMAScript provides the specification on how JavaScript programming language should work.

Express Express.js is a small framework that works on top of Node.js web server functionality to simplify its APIs and add helpful new features. It makes it easier to organize your application's functionality with middleware and routing. It adds helpful utilities to Node.js HTTP objects and facilitates the rendering of dynamic HTTP objects.

G

GitHub GitHub is a Git repository hosting service that provides a web-based graphical interface. It is the world's largest coding community. Putting a code or a project into GitHub brings it increased, widespread exposure. Programmers can find source codes in many different languages and use the command-line interface, Git, to make and keep track of any changes.

H

HTML HTML is an acronym for Hypertext Markup Language and is the standardlanguage for documents that have been designed to be displayed in a web browser. You have certainly met HTML in one way or another, as all web
pages on the Internet are written using a version of HTML.

I

IDE IDE is an acronym for Integrated Development Environment. It is the software suite used by developers in a development environment and is designed to maximize productivity and efficiency for the developer.

J

JS JavaScript is a lightweight, interpreted programming language. It is designed for creating network-centric applications. It is complementary to and integrated with Java. JavaScript is very easy to implement because it is integrated with HTML. It is open and cross-platform.

M

MongoDB MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL) which is deemed non-free by several distributions. MongoDB is a member of the MACH Alliance.

MongoDB Compass MongoDB Compass is a powerful GUI for querying, aggregating, and analyzing your MongoDB data in a visual environment. Compass is free to use and source available, and can be run on MacOS, Windows, and Linux.

N

Node.js Node.js is a cross-platform, open-source server environment that can run on Windows, Linux, Unix, MacOS, and more. Node.js is a back-end JavaScript runtime environment, runs on the V8 JavaScript Engine, and executes JavaScript code outside a web browser.

U

URL URL is an abbreviation for Uniform Resource Locator. It is often referred to as a web address. A URL is referring to a web resource and specifies the location of the resource on the network. Typically a web browser displays the URL of a webpage in the address bar.

V

VS Code Visual Studio Code is a streamlined code editor with support for developmentoperations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE.

W

www WWW is an abbreviation of the World Wide Web. Which is what we generally refer to as the web. In general terms, it is an information system where a document or other web resources like images or video can be identified by a URL. The documents are accessible through the HTTP protocol and are accessible through a web browser. It is very often labelled as the internet- which it is not synonymous with.

REFERENCES

WEBSITES (with exact URL up to page)

1. https://www.mongodb.com/cloud/atlas/lp/try4?utm_source=google&utm_campaign=search_gs_pl_evergreen_atlas_general_prosp-brand_gic-null_apac-in_ps-all_desktop_eng_lead&utm_term=mongodb%20online&utm_medium=cpc_paid_search&utm_ad=p&utm_ad_campaign_id=6501677905&adgroup=80628974360&cq_cmp=6501677905&gclid=Cj0KCQjw8e-gBhD0ARIsAJiDsaUmZ5_u0FBdcIvzhsLJEtrvN45Vy0RJxKjhbQJAA8GVYDz_SpUrZaEaAtPSEALw_wcB
2. https://www.w3schools.com/nodejs/
3. https://developer.mozilla.org/en-US/docs/Learn/Server-side/Express_Nodejs
4. https://getbootstrap.com/

PROJECT SUMMARY

About Project

Title of the project	Faculty Leave Management System
Semester	6th
Members	Hardik Kushwaha, Harshit Dongre, Him Shrivas, Mohit Malviya
Team Leader	Hardik Kushwaha
Describe role of every member in the project	Hardik Kushwaha Frontend Harshit Dongre Database Him Shrivas Backend Mohit Malviya Requirement Gathering
What is the motivation for selecting this project?	The problems are inefficient leave request processing and difficulty in tracking the leave records of faculties. By developing this application we can overcome these problems. This application will provide as- ✓ Easier management of employee absence ✓ Accuracy in tracking ✓ Real-time leave monitoring ✓ Provides insights through leave reports ✓ Accuracy and efficiency
Project Type **(Desktop Application, Web Application, Mobile App, Web)**	Web Application

Tools &Technologies

Programming language used	JavaScript(ES6)
IDE used **(with version)**	Visual Studio Code (1.76.1)
Front End Technologies **(with version, wherever Applicable)**	Html (5),CSS(3), JavaScript(ES6), Bootstrap(5)
Back End Technologies **(with version, wherever applicable)**	Node.js(18.14.0)
Database used **(with version)**	MongoDB(4.0)

Software Design& Coding

Total no. of front end pages	23
Total no. of tables in database	4
Front end validations applied (Yes / No)	Yes
Session management done (in case of web applications)	NO
Is application browser compatible (in case of web applications)	Yes
Exception handling done (Yes / No)	Yes
Commenting done in code (Yes / No)	Yes
Naming convention followed (Yes / No)	Yes
What difficulties faced during deployment of project?	NA
Total no. of Use-cases	1
Give titles of Use-cases	Faculty Leave Management System

Project Requirements

MVC architecture followed (Yes / No)	NO
If yes, write the name of MVC architecture followed (MVC-1, MVC-2)	NA
Design Pattern used (Yes / No)	NO
If yes, write the name of Design Pattern used	NA
Interface type (CLI / GUI)	GUI
No. of Actors	4
Name of Actors	Admin, Principal, Hod, Faculty
Total no. of Functional Requirements	5

List few important non-Functional Requirements	Reliability, Portability, Usability

Testing

Which testing is performed? (Manual or Automation)	Manual
Is Beta testing done for this project?	YES

Write project narrative covering above mentioned points

The Faculty Leave Management System is an online platform designed to automate the process of leave management for faculty members in educational institutions. The system enables faculty members to apply for leave online, and the application can be approved or rejected by the department head or supervisor. The system also allows faculty members to view their leave balances, leave history, and upcoming scheduled leaves. The system aims to simplify the leave management process and reduce the administrative burden on educational institutions. With this system, institutions can streamline their leave management process, improve communication, and ensure efficient and effective use of resources.

The system also provides a dashboard for faculty members to view their leave balances, leave history, and upcoming scheduled leaves. This feature enables faculty members to keep track of their leave usage and plan their leaves accordingly. The system ensures that the educational institution's leave policies are adhered to and that the faculty members' leave entitlements are accurately calculated and managed.

The Faculty Leave Management System improves communication between faculty members and administrators. The system sends automated notifications to the respective parties when a leave application is submitted, approved, or rejected. This reduces the need for face-to-face communication and ensures that both parties are kept informed throughout the process.

Overall, the Faculty Leave Management System offers significant benefits to educational institutions by simplifying the leave management process, reducing administrative burden, improving communication, and ensuring efficient and effective use of resources. It is a user-friendly system that requires minimal training and can be customized to meet the unique needs of any educational institution.

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