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Project Progress Monitoring System

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ABSTRACT

Project development in educational institutions involves multiple stages, including topic selection, planning, development, implementation, testing, and final submission. Monitoring these stages manually can be difficult for students, staff members, and department heads. Traditional monitoring methods often depend on direct communication, physical meetings, and manual documentation, which may lead to delays in reviewing project progress and maintaining records. To address these challenges, this paper presents a Project Progress Monitoring System, a web-based application designed to support the monitoring and management of student project activities. The development demonstrates how web technologies can be applied to improve project administration in educational institutions. The system can be further enhanced with automated progress reports, notification facilities, detailed evaluation records, and additional user management features. The system aims to provide a centralized platform for organizing project-related information and supporting communication between students, staff members, and department heads. It is designed around a project review workflow in which project progress can be monitored and evaluated by the responsible authorities. The integration of frontend technologies, backend services, and database management provides a foundation for an organized and accessible monitoring process.

Keywords: Project Progress Monitoring, Web Application, Node.js, MySQL, HTML, CSS, JavaScript, Project Management, Student Project Tracking

1. Introduction

Project-based learning is an important part of engineering education. Students are required to complete academic projects to demonstrate their technical knowledge, problem-solving abilities, creativity, and teamwork. During project development, students must regularly update their progress and receive guidance from staff members and department heads. In many educational institutions, project monitoring is performed through manual documentation, classroom discussions, and direct communication. These methods may create difficulties in maintaining project records, tracking development stages, and reviewing student progress within the required time. To overcome these challenges, the Project Progress Monitoring System is developed as a web-based application. It provides a digital platform for organizing project monitoring activities and supporting communication between different academic users.

- To develop a web-based platform for monitoring student project activities.
- To provide a structured login interface for authorized users.
- To implement email-based authentication using registered database records.
- To connect the frontend, backend, and MySQL database.
- To reduce the difficulties associated with manual project monitoring.
- To provide a foundation for maintaining project-related information in a centralized system.
- To improve the accessibility and organization of project monitoring

The application is developed using HTML, CSS, and JavaScript for designing and implementing the frontend interface. Node.js is used to manage backend operations, while MySQL provides structured data storage. The system focuses on simplifying the process of accessing project-related information and establishing a structured monitoring environment.

1.1 Related work

Traditional project monitoring systems generally depend on manual reports, spreadsheets, physical meetings, and direct communication. Although these methods are useful for basic project tracking, they may become difficult to manage when several students and projects are involved .Web-based management applications provide an alternative by allowing information to be accessed through a browser. HTML, CSS, and JavaScript support the

development of interactive user interfaces, while backend technologies process application requests.Node.js provides a JavaScript runtime environment for server-side development. MySQL offers relational database facilities for storing and retrieving structured information. The proposed Project Progress Monitoring System combines these technologies to establish a digital environment for academic project monitoring.

1.2 Problem statement and objectives

Manual project monitoring creates challenges in maintaining records, accessing project information, and coordinating reviews between students and academic authorities. The absence of a centralized web-based platform can make project monitoring less organized and increase the effort required to track project development. Therefore, a web-based solution is required to support authorized access, connect application components, and provide a structured environment for monitoring student project development.

2. System architecture

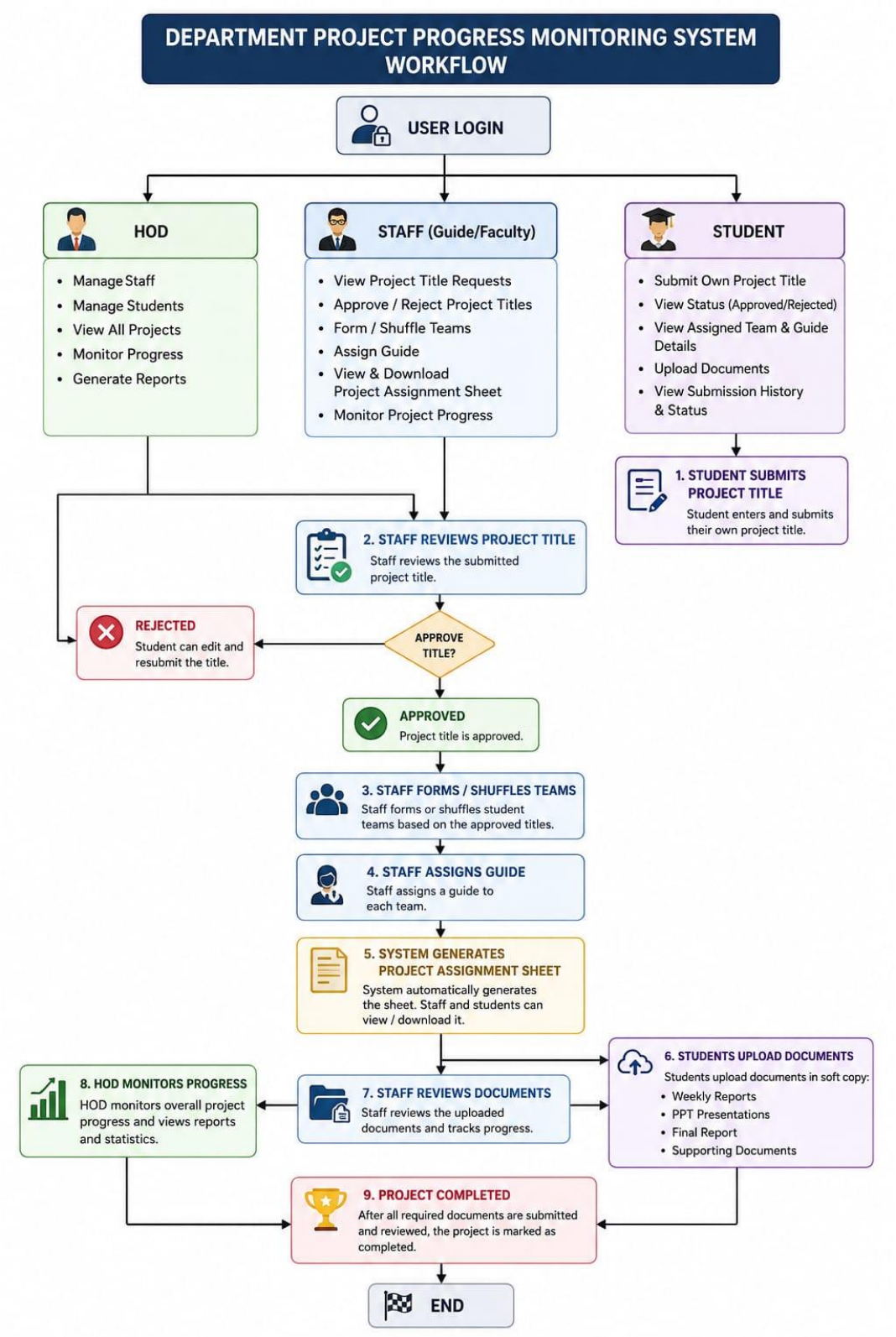
2.1 Overview

The Project Progress Monitoring System follows a three-tier architecture consisting of the frontend, backend, and database. These three components work together to provide a structured web-based application. The frontend acts as the user interface, where users can access the application through a web browser. The backend processes user requests and manages communication between the frontend and the database. The MySQL database stores the registered user information required by the application.

When a user enters login details, the frontend collects the information and sends it to the backend. The Node.js server processes the request and checks the entered email address against the records stored in the MySQL database. Based on the database response, the system allows or denies login access. This communication between the three layers forms the basic architecture of the proposed system.

The system also provides a foundation for organizing student project monitoring activities in an academic environment. It is intended to support a more structured approach to project progress reviews and communication between students and responsible academic authorities. The proposed monitoring workflow can be further extended with additional features in future development. The overall architecture establishes communication between the user interface, server-side application, and database. The integration of these components forms the basic working structure of the Project Progress Monitoring System and provides a foundation for future improvements.

This is also designed using a three-tier architecture consisting of the frontend, backend, and database. Each layer performs a separate function and works together to provide the required application functionality. The frontend is responsible for displaying the user interface and collecting information from users. The backend handles application logic, processes requests, and manages communication with the database. The database stores the registered user information required for authentication.



2.2 Technology Stack

The Project Progress Monitoring System is developed using a combination of frontend technologies, backend technology, and a database management system. These technologies are integrated to develop a web-based application that provides a simple user interface and supports communication between the different components of the system.

HTML (HyperText Markup Language): HTML is used to create the basic structure of the web application. It defines the elements of the web pages, including headings, forms, input fields, buttons, and other interface components. It provides the foundation for designing the login page and other application pages.

CSS (Cascading Style Sheets): CSS is used to enhance the appearance and layout of the application. It controls colours, fonts, spacing, alignment, backgrounds, and other visual properties. It helps create an attractive, organized, and user-friendly interface.

JavaScript: JavaScript is used to add functionality and interactivity to the frontend. It handles user interactions, validates input where required, and supports communication between the frontend and backend. It helps make the application more responsive and interactive.

Node.js: Node.js is used for backend development and server-side processing. It receives requests from the frontend, processes login information, performs authentication operations, and communicates with the MySQL database. It acts as the main application layer between the frontend and database.

MySQL: MySQL is used as the database management system for storing and retrieving registered user information. It maintains the email records required for the authentication process. The backend checks the entered email address against the registered records in the database to determine whether the user is permitted to log in.

Visual Studio Code: Visual Studio Code is used as the development environment for writing, editing, and managing the project source code. It supports the development of frontend and backend files within a single workspace.

The integration of HTML, CSS, JavaScript, Node.js, and MySQL establishes the technical foundation of the Project Progress Monitoring System. Each technology performs a specific role and contributes to the overall functionality of the application.

2.3Security

The Project Progress Monitoring System includes a basic authentication mechanism to restrict application access to registered users. The login module verifies the email address entered by the user against the records stored in the MySQL database. This process helps prevent unregistered users from accessing the application.

3. SYSTEM IMPLEMENTATION

The Project Progress Monitoring System is implemented as a web-based application by integrating frontend development, backend processing, and database management. The implementation process focuses on developing a user interface, establishing server-side functionality, connecting the database, and testing the login authentication mechanism. HTML, CSS, and JavaScript are used for frontend development, while Node.js manages backend operations and MySQL provides database storage.

The development process is carried out in different stages to ensure proper communication between the application components. Initially, the frontend. interface is designed and developed. The backend is then configured to receive user requests and process authentication details. Finally, the MySQL database is connected to the backend to verify registered email addresses. The integrated application is tested to confirm that registered users can access the system and unregistered users are denied access.

3.1 FRONTEND DEVELOPMENT

The frontend is developed using HTML, CSS, and JavaScript to provide an interactive interface for the Project Progress Monitoring System. HTML is used to organize the structure of the web pages, while CSS is applied to improve the layout, colours, alignment, and overall appearance. JavaScript is used to handle user interactions and support communication with the backend. The login interface allows users to enter their registered email address and submit the login request. The frontend collects the entered information and sends it to the backend for verification. The response received from the backend is used to provide the appropriate result to the user.

3.2 BACKEND DEVELOPMENT

The backend is developed using Node.js to manage the server-side operations of the application. It acts as an intermediate layer between the frontend and the MySQL database. When a user submits the login form, the backend receives the request and processes the entered email address .The backend communicates with the database to check whether the entered email address exists in the registered records. Based on the result of the database verification, the backend determines whether the login request should be accepted or rejected. This functionality forms the main authentication process implemented in the current version of the system.

3.3 DATABASE DESIGN

MySQL is used as the relational database management system for storing the registered user information. The database maintains the email records required for login authentication. The backend uses database queries to retrieve and verify the registered email addresses whenever a login request received. Currently, three registered email IDs are maintained in the database for testing and application access. The database connection is established

through the Node.js backend, allowing the application to retrieve the required information during authentication. This database structure provides the foundation for maintaining additional project-related records in future development.

3.4 BACKEND AND FRONTEND INTEGRATION

The frontend and backend are integrated to enable communication between the user interface and server-side operations. The frontend collects the login information and sends it to the Node.js server. The backend processes the request, communicates with the MySQL database, and returns the authentication result.The integration is tested to ensure that the application components communicate correctly. The successful connection between the frontend, backend, and database confirms the basic working functionality of the Project Progress Monitoring System.

3.5 SYSTEM WORKING PROCESS

The system begins when a user opens the web application through a browser. The login interface is displayed, and the user enters the registered email address. After submitting the login form, the information is transferred to the backend for verification. The backend checks the entered email address against the records stored in MySQL. If a matching email record is found, the login process is accepted. Otherwise, the application denies access to the user. The authentication result is then returned to the frontend and displayed accordingly. This process demonstrates the working relationship between the frontend interface, backend server, and database. It provides a basic authentication mechanism for controlling access to the Project Progress Monitoring System.

4.ABOUT THE PROJECT

- The **Project Progress Monitoring System** is a web-based application developed to simplify and improve the process of monitoring student project activities. In traditional project monitoring, tracking progress, reviewing completed tasks, and maintaining project-related information can be difficult and time-consuming. This system aims to provide a centralized platform where project progress can be monitored and managed more efficiently.
- The application is developed using **HTML, CSS, and JavaScript** for the frontend, **Node.js** for backend development, and **MySQL** for database management. The frontend provides a user-friendly interface, while the backend handles application requests and communicates with the database. MySQL stores the registered user information, which is used during the login authentication process.
- The system includes an email-based login authentication feature. When a user enters an email address, the backend verifies it against the email IDs stored in the database. Currently, only three registered email IDs are authorized to access the application, while unregistered email IDs are denied access. The connection between the frontend, backend, and database has been implemented and tested successfully.The main objective of this project is to make project monitoring more organized, accessible, and efficient. It provides a foundation for improving communication between students and project supervisors and can be extended with additional features such as project submission, progress updates, review comments, and approval or rejection by project heads.
- The project is designed with the objective of making student project monitoring more organized and transparent. A structured monitoring approach can help students understand their project progress and enable supervisors to review project activities more systematically. The proposed system can also support a review process in which project heads can examine submitted progress and provide approval or rejection based on their evaluation. These review and approval features can be developed further as part of future enhancements.
- Another important aspect of the system is its scope for future development. Additional functionalities such as student and staff dashboards, project topic registration, progress report submission, milestone tracking, review comments, notification facilities, and project approval management can be incorporated. Role-based access can also be introduced to provide different permissions for students, staff members, and project heads. These improvements can make the application more comprehensive and suitable for wider institutional use.
- The development of this project also demonstrates the practical application of full-stack web development concepts. It combines frontend design, server-side programming, database connectivity, and user authentication into a single application. The project provides practical experience in integrating different technologies and understanding how data flows between the user interface, server, and database.
- The system follows a structured frontend, backend, and database architecture. The frontend acts as the user interface through which users interact with the application. When a user enters login details, the information is sent to the backend for verification. The backend communicates with the MySQL database to check whether the entered email ID is available among the registered email IDs. Based on the verification result, the system either allows or denies access to the application. An email-based login authentication feature has been implemented to provide controlled access to the system. Currently, three registered email IDs are stored in the database and are authorized to log in. If an unregistered email ID is entered, the system denies access. This authentication process helps restrict application access to registered users. The integration between the frontend, backend, and database has been implemented and tested successfully.

- Overall, the Project Progress Monitoring System demonstrates how web technologies and database integration can be used to develop a structured platform for student project monitoring. It also provides a foundation for future enhancements to support a more complete and effective project management process.

5.CONCLUSION

The **Project Progress Monitoring System** was developed as a web-based application to make student project monitoring more organized, systematic, and efficient. The main aim of this project is to reduce the difficulties involved in traditional manual monitoring methods and provide a centralized platform for managing project-related activities. The application was developed using HTML, CSS, and JavaScript for frontend development, Node.js for backend processing, and MySQL for database management. The frontend provides a user-friendly interface, while the backend handles user requests and communicates with the database to verify login details. The email-based authentication functionality was successfully implemented and tested, allowing only the three registered email IDs stored in the database to access the application and denying access to unregistered users. The connection between the frontend, backend, and database was also successfully established and tested. Through this project, practical knowledge of web development, server-side programming, database connectivity, and system integration was gained. The application provides a foundation for further development with additional features such as project submission, progress updates, milestone tracking, supervisor feedback, notifications, and approval or rejection of project progress by project heads. Overall, the Project Progress Monitoring System demonstrates the effective use of web technologies to support a more structured approach to student project management and can be enhanced in the future to meet the project monitoring requirements of educational institutions.

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