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EDUSYNC – Smart Classroom Management System

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Abstract
A Smart Classroom Management System (SCMS) named EDUSYNC was developed to enhance learning and simplify classroom operations. This system incorporates elements of Learning Management Systems (LMS) and Content Management Systems (CMS) by utilizing modern technologies which include React.js, Node.js, MongoDB, and Large Language Models. It promotes active learning by giving students interactive tests in programming languages like Python, C++, and Java. By enabling teachers to oversee grades, authorize duty requests, and monitor student absences, the platform promotes mentor-mentee engagement. Students can use a built-in resume generator to produce professional resumes and use bar and pie charts to visualize their academic achievement. Parents can also keep track of their children's attendance and leave records and keep an eye on their academic progress. Chatbots are incorporated into EDUSYNC to help students with their educational queries improving.

Keywords: *Academic Progress Tracking; Chatbots; Interactive Quizzes; Learning Management System; Smart Classroom Management System*

1. Introduction

This is the EDUSYNC - Smart Classroom Management System, a web-based development project aimed at enhancing information management for educational institutions. Our platform securely collects and organizes data about faculty and students, ensuring easy access for teachers, parents, and students. Educators can utilize the system to input student grades and authorize leave or on-duty (OD) requests, thereby boosting communication and efficiency within academic operations. Beyond administrative functions, EDUSYNC provides a range of learning resources. Students can participate in interactive quizzes in commonly used programming languages, arrange meetings with mentors via an integrated calendar, and receive instant support for their inquiries through a chatbot. The platform also features a resume-building tool, allowing students to craft professional resumes directly within the application. A distinctive element of EDUSYNC is the Parents-Connect feature, which allows parents to track their child's academic performance and attendance, promoting increased engagement in their educational experience [1].

2. Proposed System

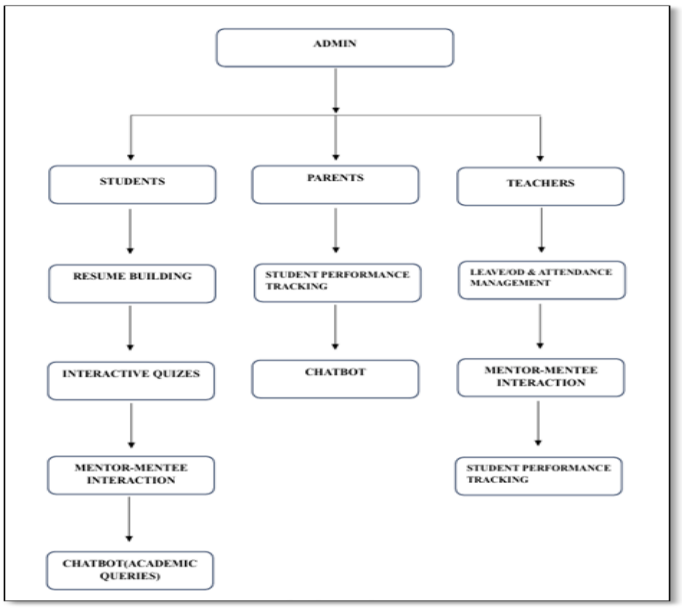

Figure 1 System Architecture

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3. Working Model

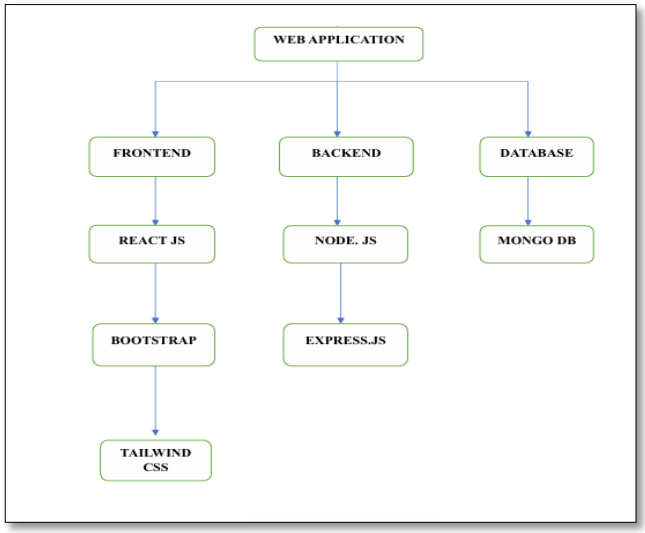

Figure 2 Working Model

4. Problem Statement

Colleges have their own systems to track student performance, and there are various websites available for students to practice programming languages. However, there are fewer platforms to facilitate mentor-mentee connections. To address this issue, we have developed EDUSYNC, a smart classroom management system that aids both students and colleges [2]. This system will enhance efficiency for students, parents, and staff alike, shown in Figure 1, Figure 2, Figure 3.

5. System Requirements

The software necessary for the successful completion of our project includes:

1. Code Editor: Visual Studio Code (VS Code) will be utilized for writing and managing the code.
2. MERN Stack:
   - MongoDB: A cross-platform document database designated for data storage.
   - Express: A back-end web application framework employed for managing server operations and routing.
   - React: A JavaScript library used for creating dynamic user interfaces.
   - Node.js: A cross-platform JavaScript runtime environment for running server-side code.

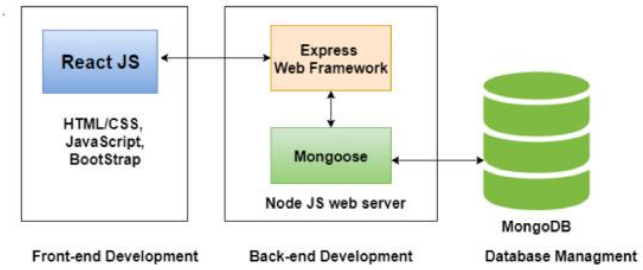

Figure 3 MERN Stack

6. System Implementation

- Admin Login: The Figure 4 admin can manage Teachers, Students and Parents Login, where admin can add members to the portal, deletes the members, add basic details of the faculty, students [3].

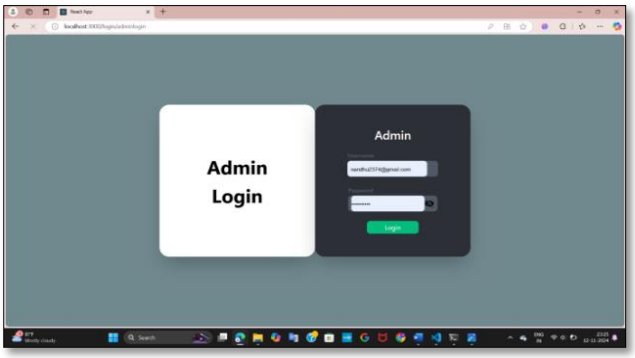

Figure 4 Admin Login

- Login: For each faculty Figure 5, student and parent has separate Login page, with unique ID and Password. So that, they can enter, view the details [4].

Figure 5 Login

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- Resume Builder: Figure 6, It is used to create Resume for Students to add them in their Profile, CV.

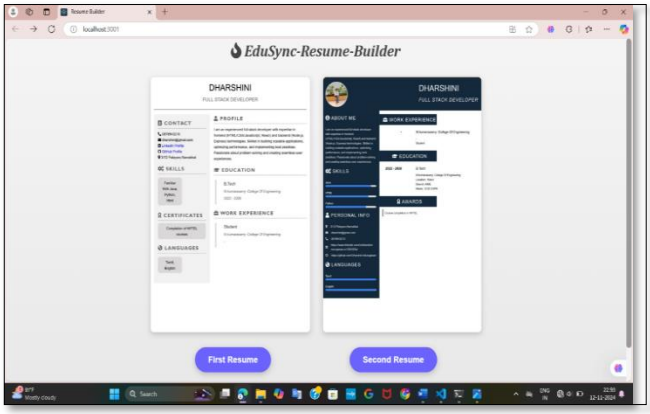

Figure 6 Resume-builder

- Chatbot: It is used by both Students and Parents, to clarify the doubts regarding usage of EDUSYNC platform and to gain knowledge about Interactive quizzes, Chatbot [5].
- Interactive-Quizzes: Students can solve company related quizzes in various programming languages like C, C++, java etc.
- Mentor-Mentee Connect: Using this application Mentees can easily schedule their meeting with Mentors in their Free time.
- Parents-Connect: Parents can track their Children Academic details in this application, also they can view their Children's On-Duty/Leave details.

7. Technologies Used

- HTML: HTML, which stands for Hyper Text Markup Language, is the standardized markup language used to create web pages. Other technologies, such as CSS for visual design and JavaScript for functionality, are typically employed alongside HTML to define a webpage's appearance and interactivity.
- CSS: Cascading Style Sheets (CSS) function as a stylesheet language that applies design elements to markup languages like HTML. CSS outlines the presentation of elements, dictating how they should be displayed on screens, printed media, in spoken form, or other formats.
- JavaScript: JavaScript is regarded as a compelling and adaptable programming language for the web. It facilitates the development of interactive websites and is known for being a lightweight interpreted language.
- React.js and Front End: React.js is utilized for constructing user interfaces (UI) that boost program efficiency. The front-end framework is suitable for developing interactive web applications, static sites, and e-commerce platforms [6].
- Express.js and Node.js Server Tier: Express.js, often simply referred to as Express, is a swift, minimalist web framework for Node.js. It allows developers to construct single-page, multi-page, and hybrid web applications. Node.js is an open-source, cross-platform environment that executes JavaScript code outside a web browser.
- MongoDB Database Tier: MongoDB is an accessible, cross-platform database system that is document-oriented. As a document database, it simplifies the process for developers to store both structured and unstructured data efficiently.

8. Result

The event management software was developed through thorough planning and guidance. This project follows an iterative waterfall approach. We successfully completed the task as scheduled. Each module and sub-module was constructed by exploring and studying relevant project materials. Our goal is to provide an effective web application for the EDUSYNC smart classroom management system.

Conclusion

Following the identification of issues in the earlier manual system, we developed a new platform that simplifies the management of the college's event activities. This system acts as a hub for various parts of the institution, such as administration, faculty, and students, facilitating a more integrated approach to event planning.The purpose of this initiative is to enhance the efficient management and automation of the entire event database, thereby streamlining

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operations and minimizing manual tasks. By centralizing event-related information and making it readily available across departments, the platform improves communication and increases productivity within the institution [7].

Future Scope

Users have indicated that further research could enhance the existing project. In the future, there is potential for the system to integrate additional features. We can utilize cloud storage to handle the large of data effectively. Furthermore, we plan to create a mobile version of this web application to facilitate user access. This will allow users to easily access and manage student information [8].

References

[1]. "Construction of Multimedia Integrated Management Information System for Smart Classroom Based on Internet of Things Technology," IEEE Xplore. Accessed Nov. 12, 2024. Available: [https://ieeexplore.ieee.org/document/10723992] (https://ieeexplore.ieee.org/document/10723992)

[2]. M. Mahalakshmi, S. Gomathi, and S. Krithika, "Event Management System," *Int. J. Innov. Sci., Eng. Technol.*, vol. 3, no. 2, pp. 1-10, Mar.-Apr. 2016.

[3]. Assistant Prof. K. Pinjari and N. Khan, "Smart Event Management System," *Int. J. Comput. Sci. Technol.*, vol. 4, no. 2, pp. 1-5, Mar.-Apr. 2016.

[4]. Verma and G. Srivastava, "Study on Event Management Applications," unpublished, Apr. 2017.

[5]. Ms. A. V. Sinhasane, Ms. A. N. Kashid, Ms. P. J. Kumbhar, Ms. P. R. Shirpale, and Prof. S. L. Mortale, "College Department Management System," Int. Res. J. Eng. Technol., 2018.

[6]. "Smart Classroom: A Review and Research Agenda," IEEE Xplore. Accessed Nov. 12, 2024. Available: https://ieeexplore.ieee.org/document/10182242.

[7]. "A Data-Driven Knowledge Discovery Framework for Smart Education Management Using Behavioral Characteristics," IEEE Xplore. Accessed Nov. 12, 2024. Available: https://ieeexplore.ieee.org/document/10182242.

[8]. "An Integrated Framework for Enhanced Learning Environments: IoT-Driven Smart Classrooms with Multi-Layered Security Protocols and Adaptive Infrastructure," IEEE Xplore. Accessed Nov. 12, 2024. Available: https://ieeexplore.ieee.org/document/9792387.