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Evaluation of Student Success Across the Subjects using MERN Stack

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Abstract: ***The Evaluation of Student Success across the Subjects is an essential tool in educational institutions, facilitating the efficient management and dissemination of student performance data. This paper presents the design and implementation of a SRMS using the MERN stack, an innovative technology stack comprising MongoDB, Express.js, React.js, and Node.js. The proposed system leverages the full-stack JavaScript environment to enhance the interactivity, real-time data processing, and user experience of the SRMS.React.js is employed on the frontend to provide an intuitive and dynamic user interface, making it easier for users to interact with the system effectively. We discuss the development process, focusing on the integration of these technologies, and demonstrate how the MERN stack facilitates rapid development and deployment of a web-based application. The system's performance is evaluated based on criteria such as response time, data integrity, and user satisfaction. Initial results indicate that the SRMS is not only faster and more reliable but also provides enhanced accessibility and user engagement compared to traditional systems.***

This paper aims to contribute to the academic community by providing insights into the application of the MERN stack in developing educational tools, thereby suggesting a pathway for future research and development in educational technology systems

Keywords: View results, CGPA and SGPA calculations, Number of Backlogs.

I. INTRODUCTION

In educational institutions, the Student Result Management System (SRMS) plays a vital role in managing and sharing student performance data efficiently. This paper introduces the design and implementation of an SRMS using the MERN stack, which includes MongoDB, Express.js, React.js, and Node.js. This project can collect and analyze data on student performance, track individual progress over time, identify areas of improvement, and generate reports for educators and administrators. By using the MERN stack, schools and educational institutions can streamline the evaluation process and provide more personalized support for students across different subjects. A character marks of every scholar must be displayed and revealed at a keystroke in step with any decided on format. An essential useful resource for instructors and college students to choose their performance. Merit listing printing via way of means of totals for a category via way of means of character concern marks for a category. Student overall performance in a specific situation or all of the topics should be expressed.

The main purpose of this project is to check the results of the students and can declare the merits. The Admin can add and update the details and results when needed. The Admin secure the data. The Faculty can see all Students Results and can know how many students have failed in that particular semester. Every user can make use of portal by entering their Id's and passwords to login and check the student's results. Evaluating student success across subjects involves assessing student performance in different academic disciplines to gain a comprehensive understanding of their overall academic achievements. This process includes reviewing grades, semester spga(semester points grade average), cgpa(cumulative grade point average) and percentage, and other relevant metrics to determine how well students are performing in various subjects. By examining student success across subjects, educators can identify the strengths and weakness of the student, tailor instruction to meet individual needs, and provide targeted support to help students to reach their full academic potential.

II. LITERATURE REVIEW

An associated studies is accomplished to research the running of current structures with the intention to circulate in addition with pupil end result tracking System.

Four present structures are taken into consideration greater relatable to the proposed system. The literature survey is mentioned below:

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1) Faculty Support System (FSS): Shana and Venkatachalam proposed a framework named Faculty Support System (FSS), it is considered a low-cost system because of the cost-effective, open-source analysis software they used, named as WEKA that is used as a facts mining tool. The area professional introduced the brand new rule idea decided via way of means of facts mining strategies together with category technique. These category strategies are used to expect the students' overall performance primarily based totally at the categorized statistics sets.
2) Student Performance Analyzer (SPA): SPA is secure web-based software that allows users to check the students' performance and track the record of the overall data. It is a device designed to analyze and show scholar evaluation data. It is utilized by establishments international to carry out evaluation through importing uncooked pupil records as soon as to the system. It identifies the students' overall performance on the idea of anticipated stage of student (above the anticipated, beneath the anticipated or on the anticipated). Other than that, it allows numerous varieties of students' overall performance reviews consisting of development reviews and success reviews to be generated.
3) Intelligent Mining and Decision Support System (InMinds): InMinds helps University Malaysia Sarawak (UNIMAS) to analyze the performances that depends on various factors in each department and course fields. The device allows the control in UNIMAS to manipulate the regions that wished interest via way of means of having clean examine the figures, formats, and the dangers involved. The features and flexibility provided by the system make the performance analysis optimized up to an ideal solution. Applied plots and charts to the machine to ease the pupil overall performance interpretation. It makes use of WEKA, an open-supply software program used for facts mining.
4) A study by Nithya and Uman (2018) investigated the effectiveness of a student performance management system in a higher education institution in India. The study revealed that the gadget made statistics control greater green and helped remove mistakes and delays in processing results. In addition, the system enabled better communication between teachers, students and parents, which led to better academic results.
5) Student Performance Analysis System (SPAS): SPAS provides University Malaysia Sarawak (UNIMAS) a user-friendly system, easy to navigate and not complicated. Mean while, the scholar overall performance prediction is protected with inside the SPAS to obtain the objectives. Furthermore, the reviews are generated in Portable Document Format (PDF) makes it without problems accessible. The device can assist academics to mechanically be expecting scholar performance, maintain tune and retrieve scholar's document in a selected route and semester, view the elements that have an effect on the scholar's prediction result, generate student's reports.

III. PROBLEM STATEMENT

In existing system, over the years that the process of manual results has been carried out across almost all educational institutions. The process is not only time consuming but also sometimes inefficient resulting in the false calculations of the students sgpa, cgpa and percentage. Today, we need not maintain pen and paper-based results.

IV. PROPOSED METHODOLOGY

The proposed machine has 3 roles Student, faculty, and Admin. The entire system is used by three roles and managed by the admin. The facts saved with inside the database could be retrieved via way of means of the folks who've get right of entry to get right of entry to the facts. The admin has full access to the system. The Faculty can access partial information that is viewing student's results and as well as analysis of the result.

The student has a right of entry to view his/her profile and end result in their semester. The architecture of this System is designed to be robust, scalable, and secure, addressing the common challenges faced by traditional result management systems such as data inconsistency, lack of real-time updates, and difficulties in scalability.

MongoDB offers a flexible, schema-less database that accommodates diverse data types and structures, which is crucial for handling the multifaceted nature of educational data. Express.js and Node.js create a lightweight, efficient backend, capable of handling numerous requests simultaneously, thus ensuring system responsiveness.

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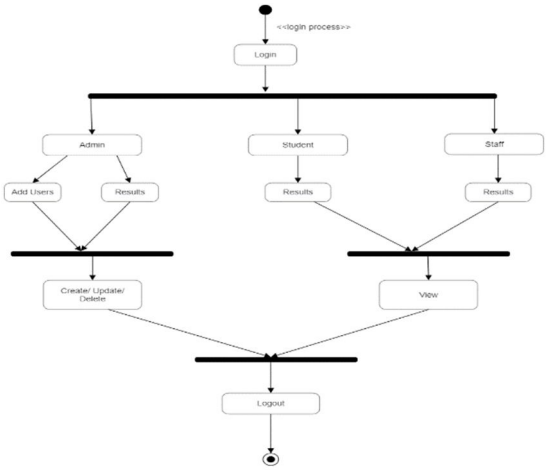


Fig: 1. Architecture and working of the system

Fig 1 shows the architecture and working of the proposed system. This architecture provides a scalable and maintainable solution for the Student Result Management System, leveraging the MERN stack.

V. RESULTS AND DISCUSSIONS

1) *Signup Page:-* In this different users register as student faculty and admin as shown below figure.



Fig: 2. Signup page

2) *Login Page:-* In this page the user selects his type of user and login with his credentials.

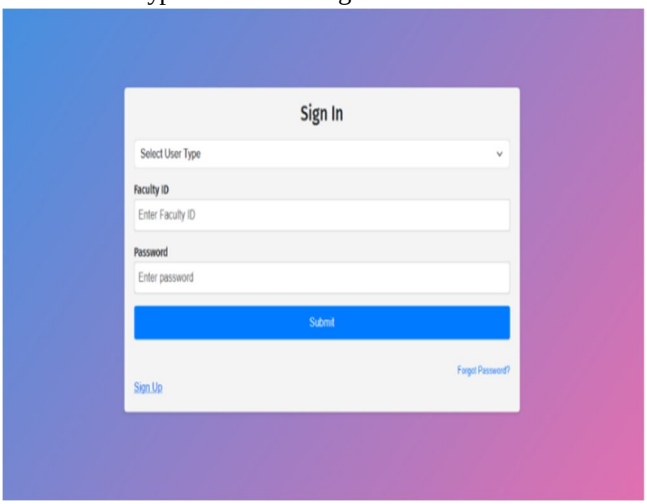


Fig: 3. Sign In page

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3) *Student Page:-* Students login with their Hall Ticket number and password and check results of all sems and can calculate their sgpa cgpa and percentage they can only view the results.

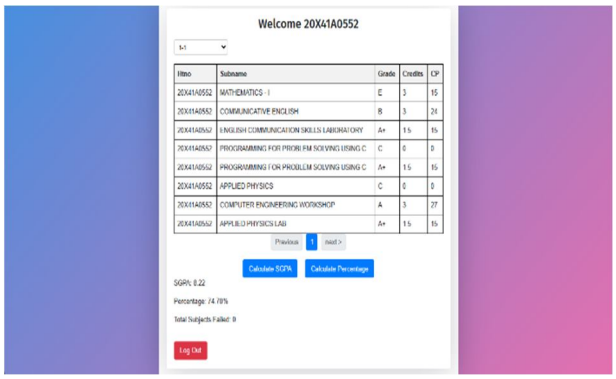


Fig: 4. Student page

4) *Faculty Page:-* Faculty Login with their Id's and password to login and can check every students results and can check failed students in a particular semester and filter out their particular subjects.

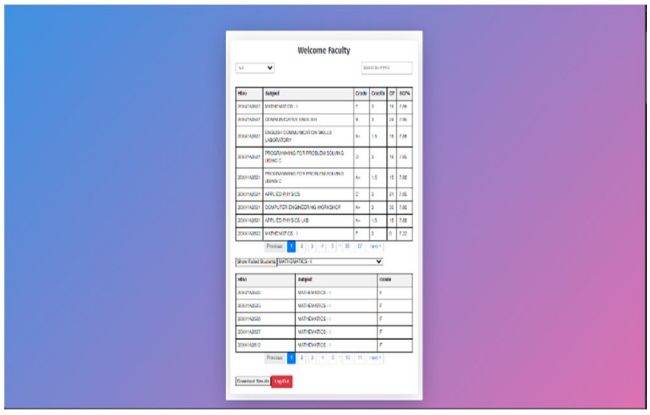


Fig: 5. Faculty page

5) *Admin Page: -* In Admin Home page admin can create update read delete users and save the details.



Fig: 6. Admin page

VI. CONCLUSION

In short, it can be stated that the Evaluation of student success across subjects is a key tool for educational institutions to manage student results effectively and efficiently, With functions such as student registration, assessment and evaluation, reporting and analysis, a student performance management system can help simplify administrative processes, improve communication between teachers, students and parents, and provide valuable information about student performance data.

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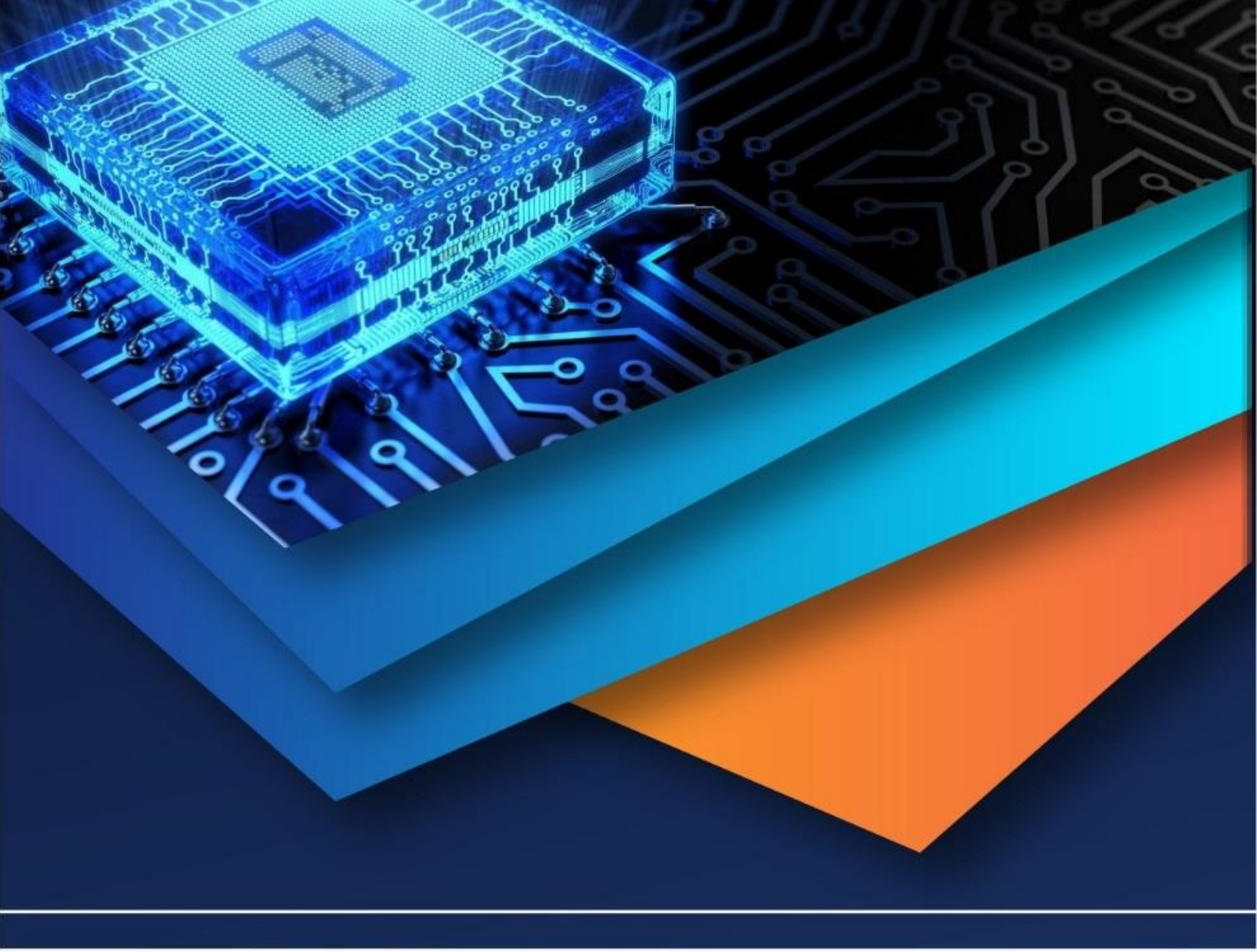
Implementing a student performance management system can increase productivity, improve learning outcomes and improve engagement between teachers, students and parents.

Overall, a student performance management system is an invaluable tool for educational institutions that want to optimize their operations and improve student learning outcomes.

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