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School Management System

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Abstract: The management of student academic records in educational institutions is traditionally performed through manual record-keeping methods such as registers, spreadsheets, and paper documents. These approaches are often time-consuming, prone to human errors, and inefficient when retrieving or updating information. To overcome these limitations, a web-based School Management System has been developed to digitize and streamline the management of student information.

The system allows parents to securely log in and view important details such as student attendance and subject-wise academic marks. Teachers are provided with an administrative dashboard through which they can manage student data, update attendance records, and upload examination marks.

The proposed system is implemented using **Angular for the frontend interface, C# for backend processing, and a structured database for storing student records**. By integrating authentication mechanisms and centralized data management, the system ensures secure and reliable access to academic information. The automated platform improves transparency, reduces administrative workload, and enhances communication between teachers and parents.

Keywords: School Management System, Student Portal, Angular, C#, Web Application, Attendance Management, Academic Records.

I. INTRODUCTION

Educational institutions manage large volumes of student information including attendance records, examination marks, and personal details. Traditionally, these records are maintained manually using registers or spreadsheets, which often leads to inefficiencies in data management. Manual systems can be time-consuming, difficult to maintain, and prone to errors during data entry or retrieval.

With the advancement of web technologies, many institutions are adopting digital platforms to manage academic records more efficiently. A web-based **School Management System** provides a centralized platform where student data can be securely stored and accessed by authorized users.

The proposed system allows parents to log into a secure portal using a student ID and password to view their child's academic performance and attendance records. Teachers can update student data through a dedicated dashboard, ensuring that the information remains accurate and up-to-date.

By digitizing academic records and providing real-time access to information, the system improves communication between schools and parents while reducing administrative workload.

II. LITERATURE REVIEW

The use of information systems in educational institutions has increased significantly in recent years. Many studies have explored the development of web-based platforms to manage student records and improve academic administration.
In [1], the authors developed an online student information system designed to digitize academic records and simplify administrative tasks. The system improved data accessibility and reduced manual work but lacked features for real-time parent access.

Similarly, the system proposed in [2] introduced an automated attendance and marks management system for educational institutions. While the system improved efficiency, it focused mainly on internal administrative use rather than providing external access for parents.

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Another study presented in [3] introduced a web-based academic monitoring platform that allowed teachers to upload student performance data. Although the system enhanced academic monitoring, it did not integrate secure login mechanisms for parents or provide centralized student dashboards.

From the literature review, it is observed that existing systems primarily focus on administrative data management. However, there remains a need for systems that combine **secure parent access, teacher dashboards, and centralized student data management**. The proposed School Management System addresses this gap by providing an integrated platform for teachers, students, and parents.

III. METHODOLOGY AND PROPOSED SYSTEM

The proposed **School Management System** is designed as a web-based platform that enables efficient management of student information. The system integrates frontend, backend, and database layers to ensure smooth interaction and secure data storage.

3.1 System Architecture

The system follows a three-layer architecture consisting of the following components:

Frontend Layer:

Developed using Angular, this layer provides an interactive interface where users can log in, view student data, and navigate through the system.

Backend Layer:

Implemented using C#, the backend processes user requests, verifies login credentials, and communicates with the database to retrieve or update student records.

Database Layer:

A structured database is used to store student information including student ID, attendance records, and subject-wise marks.

3.2 System Workflow

The system operates through the following steps:

1. Student and academic data are stored in the database.
2. Teachers log into the system and update attendance or examination marks.
3. Parents or students log in using a secure student ID and password.
4. The system verifies the credentials through the backend server.
5. Once authenticated, the system retrieves student information from the database.
6. The data is displayed on the student dashboard in an organized format.

This workflow ensures secure access, efficient data management, and easy retrieval of student records.

IV. COMPARATIVE ANALYSIS

Traditional school record management systems rely heavily on manual data entry and physical record storage. These methods are inefficient when dealing with large volumes of student data and often lead to delays in retrieving academic information.

Existing digital systems provide automation but often focus only on administrative use without offering direct access to parents or students.

In comparison, the proposed **School Management System** provides several advantages:

- Centralized storage of student data
- Secure login system for parents and students
- Real-time access to attendance and academic marks
- Reduced administrative workload
- Improved transparency between schools and families

Therefore, the proposed system provides a more efficient and user-friendly approach compared to traditional methods.

V. NOVELTY OF THE PROPOSED SYSTEM

The novelty of the proposed School Management System lies in its integrated approach to managing student information while ensuring secure and transparent access for both teachers and parents.

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Secure Parent Access:
Parents can log into the system using unique student credentials to view their child's academic records and attendance information.
Teacher Management Dashboard:
Teachers can update student attendance and examination marks through a structured interface.
Centralized Data Storage:
All student data is stored in a secure database, ensuring consistency and easy retrieval of information.
Improved Communication:
The system strengthens communication between teachers and parents by providing real-time academic updates.
These features make the system a practical and efficient solution for managing school academic records.

VI. CONCLUSION AND FUTURE SCOPE

The proposed School Management System provides an effective solution for managing student academic records through a digital platform. By replacing manual record-keeping with a web-based system, the platform reduces administrative workload and improves the accuracy of student data.

The integration of modern web technologies ensures secure data storage, efficient data retrieval, and user-friendly interfaces for teachers and parents. The system enhances transparency in academic monitoring and strengthens communication between schools and families.

Overall, the School Management System offers a reliable and scalable solution for educational institutions seeking to modernize their academic record management processes.

VII. FUTURE SCOPE

Although the proposed system effectively manages student attendance and academic records, several improvements can be made in future versions.

Future developments may include the integration of a mobile application to provide easier access for parents and teachers. Additional modules such as **online fee payment, assignment submission, and automated notifications** can also be implemented to expand the functionality of the system.

The system may also be integrated with institutional ERP platforms to synchronize student data automatically. With these enhancements, the platform can evolve into a comprehensive digital education management system.

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