IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 3, March 2025

Educonnect

Tanisha Phalke, Lavanya Tonde, Shruti Bansode, Mrs. Arati Patil
Sou Venutai Chavan Polytechnic, Pune, Maharashtra, India
phalketanu1205@gmail.com, bansodeshruti03@gmail.com, lavanyatonde2730@gmail.com

Abstract: *The increasing need for a streamlined and efficient student management system has led to the development of EduConnect. EduConnect is an integrated digital platform that facilitates communication between teachers, students, and parents through a multi-login system. The system consists of three primary user roles—teachers (admin), students, and parents—each with specific functionalities. Teachers can upload study materials, model answers, notes, and exam timetables while also recording attendance and student marks. Based on student performance, the system generates lists of weak and bright students. Additionally, attendance records determine defaulters based on a 75% threshold. Students can access study materials, timetables, and their own performance data, while parents can monitor their child's marks and attendance. This paper details the system architecture, functionalities, and implementation of EduConnect, demonstrating its potential to enhance educational management.*

Keywords: Attendance Tracking, Academic Performa-Nce, Digital Learning

I. INTRODUCTION

The need for effective and automated student management systems has grown in importance for educational institutions in the digital age. The manual, labour-intensive, and error-prone nature of traditional approaches to student record management, performance monitoring, and teacher-student-parent communication is common. A comprehensive student management system called EduConnect was created to address these issues by offering a centralized platform that improves academic transparency and enables real-time data management. Three different logins are available on the multi-role platform EduConnect: Teacher (Admin), Student, and Parent. Exam schedules, notes, model answers, and study materials can all be uploaded by teachers. Additionally, they have the ability to record unit test scores, which allows the system to create lists of students who perform well and those who don't. Teachers can also monitor student attendance, determining students whose attendance is less than 75%. Study guides, notes, sample responses, exam schedules, and unit test results are all available to students. They can also check their attendance status and see if they have been classified as bright or weak students. To ensure openness and involvement in their child's educational journey, parents, on the other hand, have restricted access to their child's academic records, including grades and attendance. EduConnect uses a scalable and secure architecture that combines a strong back-end data management system with an intuitive front-end interface. Real-time updates, secure authentication, and smooth data flow are all guaranteed by the system. This essay examines the system's architecture, operation, and deployment, emphasizing how it could boost student achievement and educational administration.

II. LITERATURE REVIEW

[6]Managing student information efficiently has long been a challenge for educational institutions. [1]Traditional methods often rely heavily on manual record-keeping, resulting in errors, delays, and limited accessibility to academic data. With the growing need for efficient and automated systems, various student management platforms have been developed to simplify processes such as attendance tracking, performance evaluation, and communication between teachers, students, and parents.However, many existing systems focus on isolated features, such as grade tracking or attendance monitoring, without integrating these crucial elements into a single, cohesive platform. EduConnect addresses these gaps by offering a comprehensive solution that combines multiple features within one system. [2]Inspired by automated monitoring solutions used in railway systems to detect track obstructions and improve passenger safety, EduConnect employs automation to enhance educational management. Just as surveillance cameras and image processing algorithms are utilized to identify landslides or track defects, EduConnect leverages real-time

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 3, March 2025

data processing to manage student records efficiently. Teachers can upload study materials, model answers, and exam timetables while also recording student marks and attendance. The system automatically analyses this data to generate categorized lists of weak and bright students, helping educators provide timely support to those in need. Additionally, the system identifies defaulters by tracking students with attendance below 75%, ensuring institutions can take necessary actions to improve attendance rates. EduConnect further enhances transparency by providing students and parents with secure access to academic records. Students can conveniently view their marks, attendance, and available resources, while parents can monitor their child's performance and attendance status. This level of visibility not only promotes accountability but also encourages active involvement from parents in their child's education.Despite advancements in student management systems, many platforms still rely on fragmented data handling, making it difficult to obtain a comprehensive overview of student progress. EduConnect overcomes this limitation by integrating academic performance tracking, attendance monitoring, and role-based access into a single platform. By automating critical processes such as defaulter identification and performance evaluation, EduConnect reduces the administrative burden on teachers while improving overall efficiency in educational management. This integrated approach ensures that students receive timely guidance, parents stay informed, and institutions operate more effectively.

III. CONTENTS

3.1 BACKGROUND

Educational institutions have long faced challenges in managing student information effectively. Traditional methods of student management often rely on manual record-keeping and paper-based processes, leading to inefficiencies, data loss, and limited accessibility to crucial academic information. These issues are particularly prominent in managing student performance, attendance tracking, and communication between teachers, students, and parents. The absence of a centralized and automated system often results in fragmented data management, lack of real-time insights, and delays in addressing student performance issues. In response to these challenges, EduConnect has been developed as a comprehensive student management system that integrates multiple academic functions into a single platform. Built using Angular for the frontend, an SQL database for data storage and management, and APIs for seamless communication, EduConnect automates critical processes such as performance tracking, attendance monitoring, and academic resource management. The system is designed to provide secure, real-time access to academic data, enhancing the overall efficiency of educational institutions.

EduConnect features a multi-role login system that offers distinct functionalities for teachers (admin), students, and parents. Teachers can upload study materials, model answers, notes, and exam timetables through the Angular-based interface. They can also record unit test marks, which the system automatically analyses to generate categorized lists of weak and bright students. Additionally, the system monitors student attendance and generates a defaulter list for students with attendance below 75%, enabling teachers to address attendance issues promptly.

Students have access to their academic performance, attendance records, and study materials through a secure login. They can also view their inclusion in the weak or bright student lists and check their attendance status. Parents have restricted access, allowing them to monitor their child's performance and attendance records, thereby promoting accountability and improving communication between stakeholders. EduConnect leverages real-time data processing to provide up-to-date insights and streamline administrative tasks, ensuring a more organized and transparent academic environment.

3.2 SYSTEM SPECIFICATION

Frontend Design:

EduConnect is built using Angular, a well-liked framework for developing dynamic and flexible web applications. The frontend experience is designed to be user-friendly, responsive, and compatible with a range of screen sizes and devices. Angular's component-based architecture facilitates modular development and improves code reuse and scalability. Real-time data availability and easy navigation are guaranteed by the interface's structured dashboards for parents, teachers, and students

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 3, March 2025

Data-Management:

EduConnect uses an SQL database for storing and managing student data. The database is structured to handle large volumes of data, including student records, attendance logs, marks, and uploaded academic resources. SQL queries are optimized to ensure fast retrieval and processing of data, even under heavy usage. The database structure follows a relational model, ensuring data integrity and consistency across the platform.

Performance-Tracking:

Teachers can record unit test marks, which are stored in the SQL database. The system processes this data in real time to generate categorized lists of weak and bright students based on predefined performance thresholds. Automated analysis enables teachers to identify students requiring additional support and modify teaching strategies accordingly.

Attendance-Monitoring:

EduConnect includes a robust attendance tracking system. Teachers can record student attendance through the interface, and the system automatically calculates attendance percentages. Students falling below the 75% attendance threshold are categorized as defaulters, and a defaulter list is generated for teachers and parents to view. This automated process reduces the administrative burden of manual attendance tracking and ensures accurate reporting.

API-Integration:

EduConnect employs RESTful APIs to facilitate seamless communication between the Angular frontend and the SQL database. APIs handle data exchange, ensuring that student records, attendance logs, and academic materials are updated in real time. The API architecture allows for scalability, making it easy to integrate additional features or external systems in the future.

Role-Based-Access-Control:

EduConnect employs a secure authentication and authorization system to define user roles. Teachers have administrative access, enabling them to upload materials, record marks, and track attendance. Students have read-only access to their academic data, while parents have limited access to view their child's performance and attendance records. This role-based structure ensures data security and prevents unauthorized access.

Communication-and-Notifications:

EduConnect supports real-time notifications to inform students and parents about exam schedules, study material uploads, and attendance status updates. Teachers can also send customized alerts to specific students or groups, facilitating better communication and engagement.

Security-and-Data-Privacy:

EduConnect employs secure communication protocols (HTTPS) to protect data during transmission. The system implements encryption for sensitive data and follows industry-standard security practices to prevent unauthorized access and data breaches.

Scalability-and-Future-Enhancements:

The modular architecture of EduConnect allows for future scalability and expansion. Planned enhancements include AI-driven performance analysis, predictive attendance monitoring, and integration with learning management systems (LMS). Additional features such as offline data access, multilingual support, and advanced data visualization are also under consideration to improve user experience and functionality.

EduConnect represents a comprehensive solution to the challenges faced in student management. By combining the capabilities of Angular, SQL databases, and APIs, the system provides a streamlined and automated platform that enhances academic oversight, improves communication, and ensures data-driven decision-making in educational institutions.

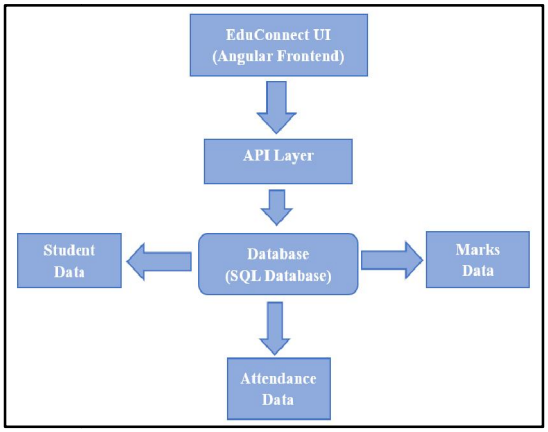
IV. BLOCK DIAGRAM

Working of Block Diagram-

EduConnect UI (Angular Frontend):

- Acts as the primary interface for teachers, students, and parents.
- Teachers can upload study materials, notes, model answers, and exam timetables.
- Teachers can record attendance and unit test marks.
- Students and parents can view academic performance and attendance records.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 3, March 2025



API Layer (Node.js/Express):

- Acts as a communication bridge between the frontend and the database.
- Processes user requests and manages data flow.
- Ensures secure data handling and real-time updates.

Database (SQL Database):

- Stores and organizes data into different categories: Student Data, Attendance Data, and Marks Data.
- Automatically updates and retrieves data when requested through the API.

Student Data:

- Contains personal and academic details of students.
- Links performance and attendance records to student profiles.

Attendance Data:

- Records daily attendance and calculates percentages.
- Automatically generates a Defaulter List for students with attendance below 75%.

Marks Data:

- Stores unit test marks and performance records.
- Generates Weak and Bright Student Lists based on test performance.

Automation and Real-Time Updates:

- Changes made by teachers are immediately reflected in student and parent dashboards.
- Automated processing reduces manual work and improves efficiency.

Secure Data Access:

- Teachers, students, and parents have role-based access to ensure data privacy.

V. PROJECT METHODOLOGY

The development of the "EduConnect" application involves a structured methodology that covers all stages from initial planning to full-scale implementation and future enhancements. The following outlines the key steps involved in the development process:

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 3, March 2025

Project-Initiation:
The project was initiated to address the growing need for an integrated platform that manages student information, academic performance, and attendance tracking. The primary objective was to create a centralized and automated system that reduces manual workload and provides real-time data accessibility. A development team with expertise in Angular for frontend development, SQL for database management, and RESTful API development was formed to execute the project.

Design-and-Development:
The frontend of the application was designed using Angular to provide a responsive and user-friendly interface. The design process focused on ensuring easy navigation and quick access to key features, including student data, attendance records, and academic performance. A RESTful API was developed to act as a communication layer between the frontend and the SQL database, ensuring efficient data handling and secure data exchange.

Database-and-Backend-Configuration:
An SQL database was implemented to store student information, marks, attendance, and study materials. The database was designed to allow quick data retrieval and support complex queries for performance analysis and reporting. The API layer was configured to handle requests and responses between the frontend and the database, ensuring data consistency and accuracy.

Data—Handling-and-Processing:
EduConnect automates the collection and processing of student data. Teachers can upload study materials, model answers, and exam timetables. The system automatically records student marks and attendance, identifying weak and bright students based on performance and highlighting defaulters with attendance below 75%. The automated processing reduces manual effort and ensures timely reporting of academic progress.

User-Interface-and-Control:
The Angular-based interface provides a clean and intuitive experience for users. Teachers have access to features for uploading materials and entering marks, while students and parents can view academic progress and attendance through secure logins. Role-based access ensures that each user can only access information relevant to their role, enhancing security and data privacy.

Performance-Tracking-and-Reporting:
EduConnect analysis student marks and attendance records to generate categorized lists of weak and bright students. Teachers receive insights into student performance, allowing them to provide targeted support. The system also generates automated reports on class performance, helping institutions improve academic outcomes.

Testing-and-Validation:
The application underwent rigorous testing to ensure performance, data accuracy, and security. The frontend was tested for responsiveness across different devices, while the backend was tested for data integrity and processing speed. User acceptance testing (UAT) was conducted to validate functionality and ensure a seamless user experience.

Security-and-Access-Control:
Role-based authentication and secure login mechanisms were implemented to ensure data privacy. Teachers can access student data and upload materials, while students and parents can only view relevant information. The system uses encrypted communication protocols to safeguard data exchange.

Documentation-and-Reporting:
Comprehensive documentation was prepared, including system architecture, API endpoints, database schema, and user guides. The project report outlines the development process, system functionalities, and future enhancement opportunities.

Future-Enhancements-and-Scalability:
EduConnect is designed for scalability and future improvements. Potential enhancements include AI-based performance prediction, personalized learning recommendations, and automated alerts for attendance issues. The platform can be adapted for use in schools,
colleges, and universities, making it a versatile solution for educational institutions. EduConnect aims to provide an efficient, user-friendly, and automated solution for managing student data and academic performance, contributing to better educational outcomes and improved institutional efficiency.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 3, March 2025

VI. APPLICATION

EduConnect serves as a versatile platform that streamlines communication and information management within educational institutions. By providing a centralized system accessible via Android and iOS applications, it enhances the interaction between schools, parents, and students. The app allows users to access or upload details about student attendance, homework, achievements, and results, thereby facilitating effective engagement and monitoring of academic progress. Additionally, EduConnect integrates with a wide range of third-party applications, enabling customization of workflows and the incorporation of preferred tools within the platform. This integration ensures that all essential academic and administrative updates are easily accessible, promoting a cohesive and efficient educational environment.

VII. CONCLUSION

In conclusion, EduConnect emerges as a comprehensive educational coordination platform designed to enhance communication and streamline administrative processes within academic institutions. By integrating functionalities such as real-time messaging, assignment management, virtual classrooms, and a robust resource library, EduConnect addresses the evolving needs of modern education. The platform's user-friendly dashboards and well-structured reporting systems facilitate efficient school management, enabling educators to focus more on teaching and student support. Through the adoption of EduConnect, educational institutions can transition towards a more connected and efficient learning environment, ultimately contributing to improved educational outcomes and student success.

REFERENCES

[1]. Promoting Students' Social Interactions Results in an Improvement in Performance, Class Attendance and Retention in First Year Computing Courses Candido Cabo and Ashwin SatyanarayanaDepartment of ComputerSystems New York City College of Technology/CUNY New York City, USA

[2]. Optical Mark Recognition in Student Continuous Assessment José Luis Pérez-Benedito, Enrique Querol Aragón, Juan Alonso Alriols, and Ljiljana Medic.

[3]. Vaibhavi A. Dhopate Miss., Rahul J. Jadhav Dr., "Role of Angular in Web Development", Journal of Emerging Technologies and Innovative Research (JETIR), June 2021.

[4]. "Development And Acceptability of a Student Daily Attendance Monitoring System", 2021 IEEE 13th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM)

[5]. H. Y. Zhao and Q. Sun, "Research on the Design and Implementation of Student Information Management System", *Applied Mechanics and Materials*, vol. 687–691, pp. 2833-2836, Nov. 2014.

[6]. Y. Chunjiang, "Development of a Student Information Management System for Mobile Terminals", *DEStech Transactions on Engineering and Technology Research*, no. mcemic, May 2017