EDUMATRICS PRO APPLICATION

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Abstract : Edumatrices Pro is an innovative educational software designed to revolutionize the management and access of student and staff data of an institution. This comprehensive project integrates advanced features to ensure a seamless and accurate data management. The platform boasts an intuitive user interface, allowing educators and administrators to effortlessly input and manage student data. The Edumatrices Pro application provides the real time attendance management for a staff of the particular period. This not only saves time but also allows for timely academic interventions and decision-making. With robust data integration capabilities, Edumatrices Pro provides restricted access to the staff and admin user to manage the data. The platform prioritizes security and data privacy, adhering to industry standards to safeguard sensitive student information. In summary, Edumatrices Pro also provides a transparency to the students about how their data is managed with user-friendly interfaces, advanced algorithms, real-time updates, and seamless data integration to enhance the efficiency and accuracy of academic performance evaluation in educational settings.

INTRODUCTION

In the ever-evolving landscape of educational technology, the need for a robust and comprehensive system to manage student data has become paramount. "EduMatricesPro" is an innovative Flutter-based application with a Django backend, designed to streamline the process of storing, managing, and updating student information within educational institutions. This project aims to provide a secure and user-friendly platform for students, staff, and administrators to access and manage academic data efficiently. The primary objectives of "EduMatricesPro" encompass ensuring the security and integrity of student data while offering a seamless experience for users with varying roles within the educational ecosystem. The application caters to students by allowing them to access their internal marks, attendance records, and personalized timetables. Staff members are empowered to efficiently manage attendance, update internal marks, and maintain class-specific timetables. Meanwhile, administrators have the capability to oversee and update the overall database, ensuring the smooth functioning of the educational institution. Built on the Flutter framework for the front-end and Django for the back-end, "EduMatricesPro" incorporates a structured system architecture to ensure scalability, responsiveness, and security. The database schema is carefully designed to capture the intricate relationships between students, staff, and academic information. Security is a top priority in "EduMatricesPro." The application employs a role-based access control system, allowing administrators, staff, and students to access functionalities specific to their roles. User authentication measures are implemented to guarantee that only authorized individuals can interact with and manipulate the data within the system.

LITERATURE REVIEW

The NFC-based attendance management system optimizes lecture time by utilizing short-range wireless communication. NFC tags on desks and readers in smartphones streamline attendance, with dual-platform accessibility for professors (PC web-app) and students (Android app). Challenges include dependency on NFC technology, smartphone compatibility issues, initial implementation hurdles, security concerns, and cost considerations. Overcoming these challenges is vital for the widespread effectiveness and accessibility of the system in diverse educational settings. [1]

The Research Center for Development of Science and Technology (PAPPIPTEK) at LIPI employs a Microsoft Access-based fingerprint attendance system. To enhance efficiency, the study transitions it into a Web-Based Attendance System, facilitating online applications and ensuring seamless data communication. Developed using the SDLC methodology, the system benefits employees with easy access to attendance information and online permissions. Sub-section personnel efficiently manage records, while management monitors attendance and performs approvals online. The key features include SDLC methodology, attendance tracking, and fingerprint technology integration. [2]

Fingerprint biometrics, a robust authentication feature, is applied in diverse contexts like access control and classroom attendance. This paper introduces two innovations: an Access Control System (ACS) for personalized door access and a Classroom Attendance Management System (CAMS) utilizing fingerprints. ACS showcases person-specific door access, while CAMS features a dynamic database, web interface, and multi-level access views. Both systems address existing shortcomings and mitigate spoofing risks. Fingerprint data, securely stored with timestamps, enables computation of statistics. Recognition accuracy experiments show promising results, with 87% for ACS and 92% for CAMS, making them scalable for real-time applications in employee attendance and high-security access. [3]

This study proposes a novel attendance management framework, integrating mobile and web applications to address challenges in higher education attendance systems. Students actively participate by registering with a selfie or signature on mobile devices, ensuring real-time data transmission. The web application adds flexibility for users to access records. However, concerns about subjectivity in registration methods and data privacy arise. Results from a trial in 2015 highlight the need for ongoing evaluation. Dependency on mobile devices and uncertainties about the system's ultimate effectiveness in attendance management are acknowledged. [4]

EXISITING METHODOLOGY

2.1 EXISITING SYSTEM

Amid the dynamic landscape of educational technology, Google Classroom stands as a cornerstone in ensuring the security of students' confidential information. As advancements in the computer and information fields reshape the educational landscape, Google Classroom addresses the paramount concern of safeguarding sensitive data through advanced encryption techniques and secure data handling protocols. Unlike conventional steganography methods employed in diverse fields, Google Classroom prioritizes encryption and access control mechanisms to fortify the privacy and integrity of student information. By employing state-of-the-art encryption during data transmission and storage, Google Classroom remains steadfast in its commitment to creating a secure and trusted environment for educational institutions. The platform's continuous efforts in adhering to stringent security standards underscore its pivotal role in preserving the confidentiality of student data, setting a benchmark for the protection of sensitive information within the realm of digital education.

2.2 DRAWBACKS:
i. Dependency on Google Ecosystem.
ii. Limited Offline Funtionality.
iii. No Integrated Attendance System.
iv. No Collaboration Features.

PROPOSED SYSTEM

The proposed system, "EduMatricesPro," aims to enhance and streamline the existing educational management processes by leveraging the latest technologies and providing an advanced feature set. Building upon the foundation of the current system, the proposed system introduces several key functionalities and improvements to elevate the overall user experience for students, staff, and administrators.

3.1 ADVANTAGES:
i. User-Friendly Interface.
ii. Timely academic interventions.
iii. Time and Resource saving.
iv. Transparency for students.
v. Enhanced academic performance evaluation.

METHODOLOGY
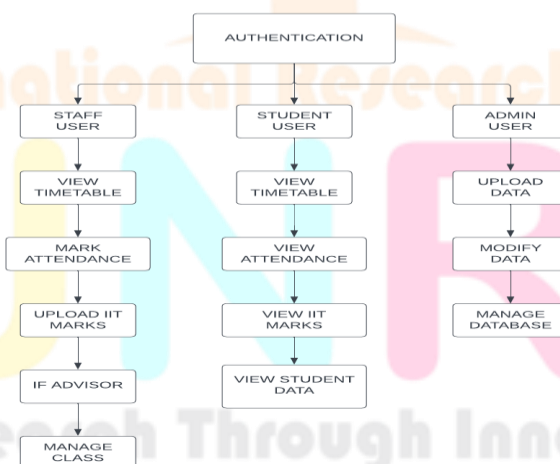
work flow of the application

WORKING

The system's authentication process involves users providing their credentials, which are then validated against stored data in the database. Successful authentication results in the generation of a secure token for the user's session, granting access to personalized dashboards. Authenticated students can view internal marks and attendance, staff members access timetables and manage attendance, while admins have comprehensive tools for database management and analytics. Real-time collaboration features and a centralized communication hub enhance collaboration and communication. Robust security measures, including encryption and secure authentication, safeguard user data throughout interactions, ensuring confidentiality and integrity. Authenticated parents have access to a dedicated portal, reinforcing transparency and communication with the educational institution. The system prioritizes data protection and security to provide a seamless, collaborative, and secure educational management experience.

EXPERIMENTAL RESULTS
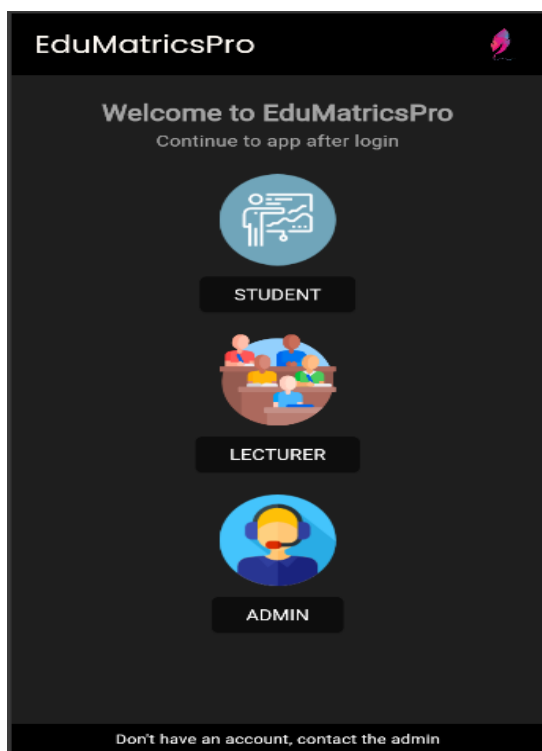
first use of the app
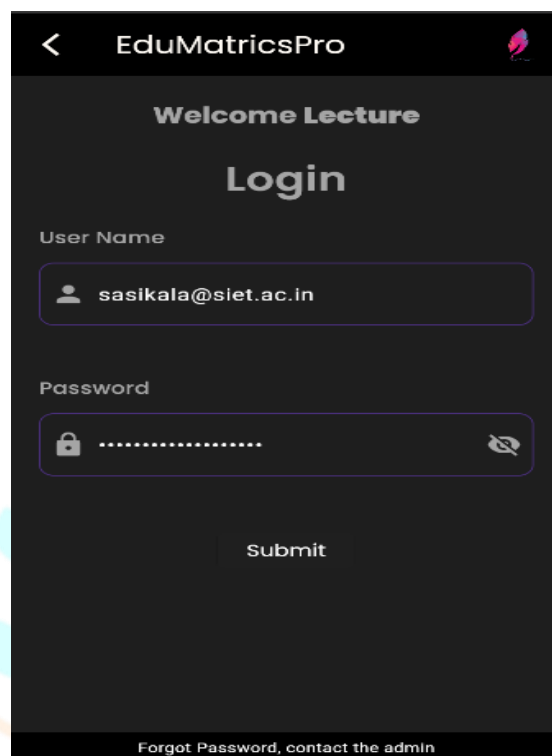
login screens

First use of the app, this is the screen that appears when the user lunches the app for the first time.This screen appears when the user logs-out of an account that they have logged in.

Login Screens, this is the screen that appears when the user clicks the respective-login button. The loading screen appears when the user enters the required credentials and click the login button.
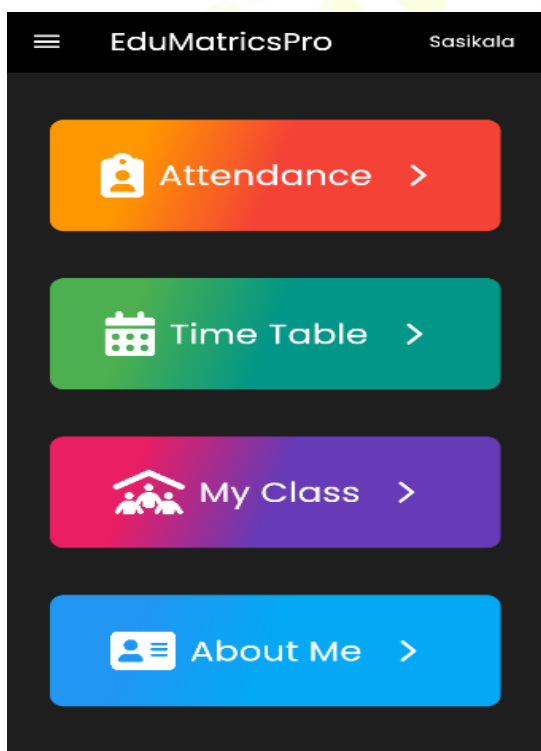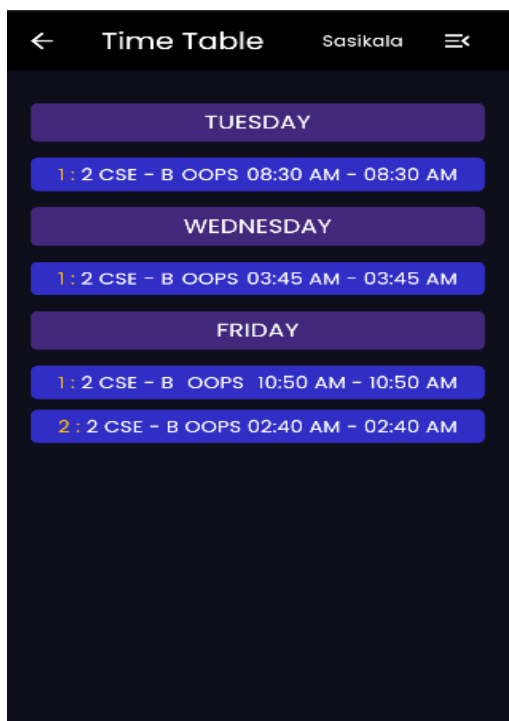

staff home screen
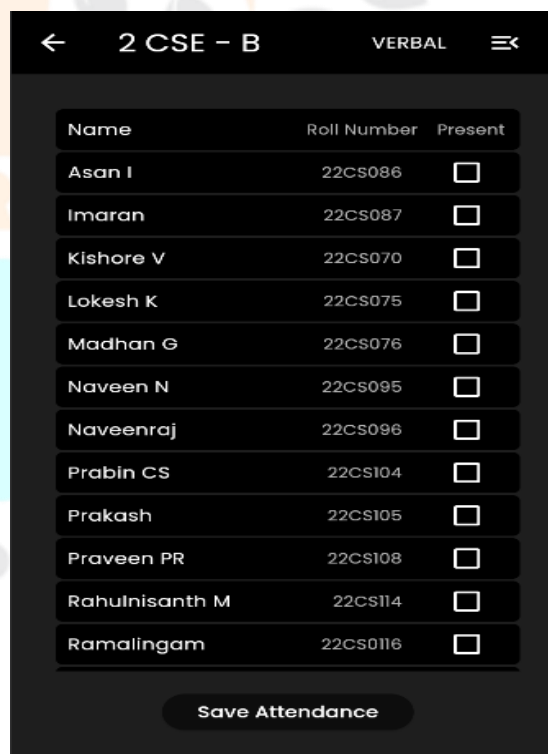
class to be attended

Staff Home: This screen is the home screen of the application for staff-users. The app redirects to the home screen once the user is logged into the app.

Attendance Sheet: This screen hoses all the student of a lecture hall that the staff is about mark attendance.
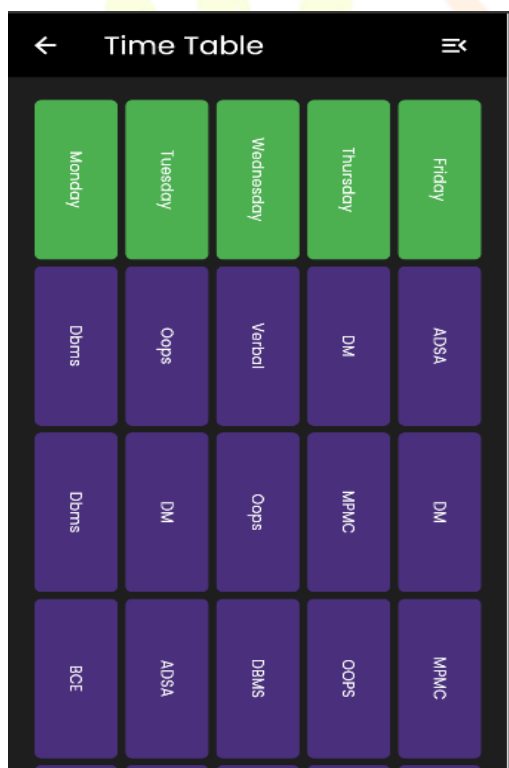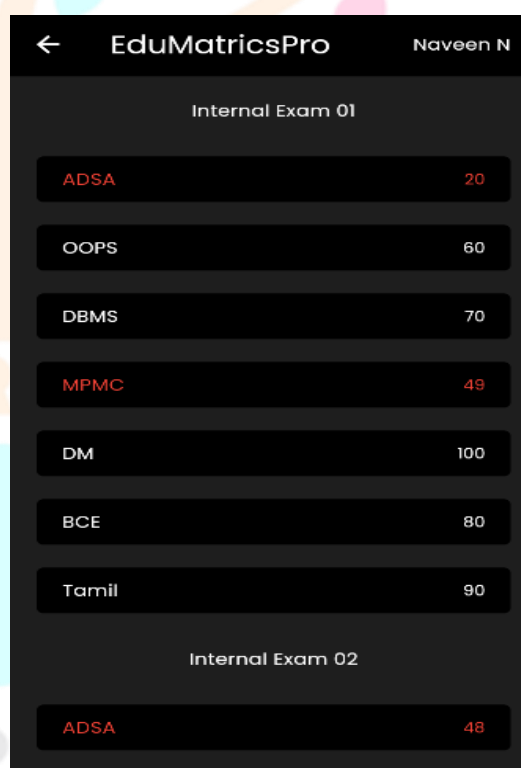
staff time-table   profile screen

Staff TimeTable: This screen shows current Time Table of the particular staff (user).
Profile Screen: This screen shows the profile of the respectie users with some restricted privileges.

student timetable   internal marks of student

Student TimeTable: This screen shows the current Time Table for a particular class students (users).
Mark Sheet Screens: This screen shows up the marks list of the particular student till the current academic year. And the other screen shows the internal marks of a particular semester of the student.
Attendance Sheet: This screen hoses all the student of a lecture hall that the staff is about mark attendance.

RESULT
Thus the application for maintaining the students academic data and for tracking attendance for the students of a class. The data and marks of the students are uploaded to the database through a web-portal that has been implemented using Django. This application was implemented using Flutter and Django. This application.

CONCLUSION

The "EduMatricesPro" project marks a significant achievement in educational management, focusing on user-centric design and data efficiency. The application streamlines administrative processes, reducing the workload through efficient data management and automation. Real-time collaboration and a centralized communication hub enhance the learning environment. The parental portal fosters transparency, providing parents with insights into academic progress. Security measures ensure compliance with data protection standards. Looking forward, "EduMatricesPro" aims for continuous improvement, with potential enhancements in LMS integration, mobile app refinements, and AI-powered insights. Gratitude is extended to stakeholders for shaping this impactful educational solution.

FUTURE WORK

The more refinement of the database structure that makes the data-management further easier to be handled. More refined portal for the data modification in the back-end for the admin user. More features for the frontend for the staff user to work efficiently in updating marks and maintaining students data. The use of integrated ai features in the frontend application. Additionally the refinement in the backend sever to work more efficiently is to be improver in the further development of the application.

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