

AuthenTrack

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Abstract: The AuthenTrack system is designed to provide a smart and automated solution for managing student attendance in educational institutions. Traditional attendance methods such as manual registers and biometric devices often require significant time, effort, and maintenance. These systems may also face issues such as hardware failure and proxy attendance. To overcome these problems, the proposed system introduces a messenger-based attendance mechanism integrated with API technology. In this system, staff members send an attendance request through a messenger platform. Students respond to the message to mark their presence in the class. The system collects these responses automatically and processes them through a secure API connection. Each response is verified using important details such as student ID, response time, and Wi-Fi MAC address. This verification helps prevent unauthorized or proxy attendance. The verified data is stored in a centralized database for easy access and management. The system also allows staff members to view attendance reports quickly. Web technologies such as HTML, CSS, and JavaScript are used for the user interface. Backend technologies like Python or Node.js manage the server operations. MySQL is used to store attendance records securely. Overall, the AuthenTrack system improves efficiency, accuracy, and reliability in attendance management.

I. INTRODUCTION

Attendance tracking is an important task in educational institutions because it helps monitor student participation and academic discipline. Most institutions still use traditional attendance methods such as manual registers or biometric devices. These methods may require additional time and manual effort from staff members. Biometric systems also require hardware devices that may be expensive and require maintenance. Sometimes these systems fail due to technical problems or network issues. Another common problem is proxy attendance where students mark attendance for others. To solve these issues, a modern and automated attendance system is needed. The AuthenTrack system is developed to provide a simple and efficient attendance management solution. It uses messenger-based communication to collect attendance responses from students. Staff members initiate the attendance request using the messenger platform. Students respond to the request to confirm their presence. The system records these responses automatically through API integration. The attendance data is then stored in a centralized database. This approach reduces manual work and improves the accuracy of attendance records. The system is easy to use and can be accessed through a web interface. Therefore, AuthenTrack provides a reliable solution for modern attendance management.

II. LITERATURE SURVEY

The literature survey provides an overview of different attendance management systems developed by researchers using modern technologies. Many institutions have adopted biometric systems such as fingerprint scanners or facial recognition devices to improve the accuracy of attendance tracking. Some systems use RFID cards to identify students and automatically mark their attendance. In recent years, IoT-based attendance systems have also been introduced where devices collect attendance data and store it in cloud servers. Web-based attendance management platforms allow institutions to manage attendance records digitally. However, these systems often require expensive hardware devices and continuous maintenance. Some research studies also focus on mobile application-based attendance systems that allow students to mark attendance using smart phones. Although these systems provide convenience, they may still face security issues such as fake location or proxy attendance. Messenger-based communication systems have been used in some applications to collect user responses quickly and efficiently.

These systems demonstrate how communication platforms can be integrated with data processing systems. The survey indicates that automation and digital communication can improve attendance management significantly. Based on these research studies, the AuthenTrack system combines messenger communication and API integration to provide a secure and efficient attendance solution. This approach reduces dependency on hardware devices. It also improves flexibility and accessibility for both students and staff members.

III. PROPOSED SYSTEM

The AuthenTrack system is designed to automate the process of recording attendance using modern web technologies and communication platforms. In this system, attendance requests are sent through a messenger application used by students and staff. When the request is sent, students respond through the messenger to confirm their presence. The system automatically collects these responses through API integration. Each response is then verified using the student's identification details and Wi-Fi MAC address. This verification process helps prevent proxy attendance and ensures that only genuine responses are accepted. After verification, the attendance information is stored in a MySQL database. The system provides a web interface where staff members can manage attendance sessions easily. The interface is developed using HTML, CSS, and JavaScript to provide a user-friendly experience. The backend server processes the data using technologies such as Python Flask or Node.js. The system also removes duplicate or invalid responses during preprocessing. Attendance records can be accessed and analyzed easily by administrators and staff. This automated process saves time and reduces manual errors. It also improves transparency and accuracy in attendance tracking. Therefore, the proposed system offers an efficient and reliable solution for attendance management.

IV. EXISTINGSYSTEM

The existing attendance systems used in many educational institutions mainly depend on traditional methods such as manual registers, biometric scanners, and RFID card systems. In the manual attendance method, teachers record student attendance in registers during each class session. Later, this information is transferred into digital records, which requires additional time and effort. Biometric attendance systems use fingerprint scanners or facial recognition devices to identify students. Although these systems are more automated than manual methods, they require expensive hardware and regular maintenance. Hardware failure or network issues can also interrupt the attendance process. RFID card systems require students to carry identification cards to mark their attendance. However, these cards can be misplaced or misused by others. Another common issue in existing systems is proxy attendance, where students mark attendance for their friends. Some web-based attendance portals also exist, but they may require manual data entry by staff members. These limitations make traditional attendance systems less efficient and less reliable. They also require additional administrative effort to maintain records. Therefore, there is a need for a more automated and secure attendance management system. The AuthenTrack system aims to solve these problems using modern communication and API technologies. However, these cards can be misplaced or misused by others. Another common issue in existing systems is proxy attendance, where students mark attendance for their friends

V. IMPLEMENTATION

Objective

The main objective of the AuthenTrack system is to automate the process of recording and managing student attendance. The system reduces manual work by allowing staff members to send attendance requests through a messenger platform. Students can respond quickly using their devices to confirm their presence. The system automatically records these responses using API integration. This approach improves the accuracy, security, and efficiency of attendance management.

Data Selection and Loading

In the AuthenTrack system, attendance responses are collected from students through a messenger platform. When students respond to the attendance request, the system receives the data through an API connection. The system checks the student ID and response details to select valid entries. Only verified responses are accepted by the system. After verification, the selected data is loaded into the server for further processing and storage.

Data Preprocessing

Data preprocessing is used to clean and organize the collected attendance responses. During this process, duplicate responses and invalid entries are removed from the dataset. The system checks for missing or incomplete data fields and corrects them if necessary. The responses are converted into a structured format such as JSON or database tables. This helps the system store and process the attendance data efficiently.

System Modules

The AuthenTrack system consists of several modules that manage different system functions. The Admin module manages user accounts and attendance records. The Staff module allows teachers to start attendance sessions and view reports. The Student module allows students to respond to attendance requests. The Authentication module verifies user identity and ensures secure system access.

VI. RESULTS

The implementation of the AuthenTrack system demonstrates that messenger-based attendance management can significantly improve the efficiency of recording attendance. Staff members can initiate attendance sessions quickly through the messenger platform. Students receive the attendance request instantly and respond using their devices. The system automatically collects these responses and processes them through the backend server. The attendance data is verified to ensure that only genuine responses are accepted. Once verified, the data is stored in the database and can be accessed by staff members at any time.

The automated process reduces the need for manual attendance recording. It also eliminates errors that may occur during manual data entry. The system provides real-time updates of attendance records. Staff members can generate attendance reports quickly for analysis and monitoring. The use of MAC address verification ensures that students cannot easily mark proxy attendance.

The system also reduces the need for expensive hardware devices. Overall, the results show that the AuthenTrack system improves efficiency, accuracy, and reliability in attendance management. It provides a modern solution suitable for educational institutions.

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