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Research Paper

Online Attendance Management System

¹Yamini Chouhan, ²K Yashwanth reddy, ³K Shweetha Reddy, ⁴A Kalyani, ⁵S Vamshi

¹Assistant Professor, ^{2,3,4,5}Students

Department of CSE (Software Engineering)

Siddhartha Institute of Technology & Sciences, Narapally

thirumanasa@siddhartha.org.in, 23tq1a5642@siddhartha.co.in, 23tq1a5660@siddhartha.co.in,

23tq1a5656@siddhartha.co.in, 23tq1a5653@siddhartha.co.in

Abstract

The Online Attendance Management System is a web-based application designed to automate and simplify the process of recording, monitoring, and managing student or employee attendance. Traditional attendance methods such as manual registers and spreadsheets are time-consuming, require additional effort, and may result in calculation errors, duplicate records, or loss of information. The proposed system provides a centralized platform for maintaining attendance records efficiently and accurately.

The system allows authorized users such as administrators, teachers, or managers to register users, create classes or departments, mark attendance, view attendance records, and generate attendance reports. Students or employees can securely log in to view their attendance percentage, daily records, and attendance history. The system automatically calculates attendance percentages and helps identify users with low attendance.

An administrator can manage user details, departments, classes, subjects, and attendance records through a centralized dashboard. All attendance information is stored in a database, making it easy to search, update, and retrieve records whenever required. Authentication and role-based access control can be implemented to protect attendance information from unauthorized access.

The main objective of the Online Attendance Management System is to reduce manual work, improve attendance accuracy, save time, and provide an organized method for attendance tracking. The system can be further enhanced with QR code attendance, biometric authentication, facial recognition, real-time notifications, mobile access, automated reports, and analytics. Overall, the proposed system provides a reliable and user-friendly solution for modern attendance management.

I. Introduction

The Online Attendance Management System is a web-based application developed to automate and simplify the process of recording and managing attendance. In traditional attendance systems, attendance is usually recorded manually using registers, spreadsheets, or paper-based methods. These methods require considerable time and effort and may result in errors, duplicate entries, and difficulties in maintaining attendance records.

The proposed system provides a centralized digital platform where administrators, teachers, or authorized staff can manage attendance efficiently. Users can register and log in securely according to their assigned roles. Teachers or administrators can create classes, subjects, departments, and user records, and can mark attendance for students or employees on a daily basis.

The system automatically stores attendance records in a database and calculates the attendance percentage based on the recorded data. Students or employees can log in to view their attendance status, daily records, and attendance history. Administrators can generate attendance reports and identify users whose attendance is below the required percentage.

The system reduces paperwork and manual calculations while improving the accuracy and accessibility of attendance information. Authentication and role-based access control can be implemented to protect attendance records from unauthorized access. The system can also provide notifications when attendance falls below a specified limit.

The main objective of the Online Attendance Management System is to provide a simple, accurate, secure, and efficient solution for attendance tracking. In the future, it can be enhanced with QR code scanning, biometric authentication, facial recognition, mobile applications, automated notifications, real-time dashboards, and attendance analytics.

II. Literature Survey

Several studies have been conducted to improve traditional attendance management systems using modern technologies. Traditional paper-based attendance is time-consuming, requires additional data entry for report generation, and can be vulnerable to proxy attendance. Research on automated attendance systems has explored technologies including RFID, biometrics, QR codes, mobile applications, Bluetooth, GPS, and facial recognition. A systematic review of automated attendance systems examined 204 identified papers and selected 90 relevant studies, highlighting the increasing use of automatic identification technologies in educational and organizational environments.

Biometric-based attendance systems use characteristics such as fingerprints and facial features to verify a person's identity. These systems can provide stronger identity verification, but they may require specialized hardware and can introduce concerns related to privacy, cost, and environmental conditions. RFID-based systems use RFID cards and readers to record attendance automatically, reducing manual effort but requiring dedicated readers and identification tags.

QR-code-based attendance systems have become another popular approach because smartphones can be used for scanning without requiring specialized attendance hardware. Recent research has explored dynamic and time-limited QR codes to reduce proxy attendance, while web-based implementations can provide real-time attendance records and automated reports. However, basic static QR codes may still be vulnerable to sharing or misuse, so additional authentication or location-based controls can improve security.

Cloud-based attendance management has also been studied for improving centralized data storage and accessibility. Research on cloud-based employee attendance systems indicates that cloud infrastructure can support the processing and storage of large amounts of attendance data and improve management efficiency. Such systems can also make attendance information accessible across different locations, provided that appropriate security and privacy mechanisms are implemented.

Based on the existing literature, the proposed Online Attendance Management System aims to provide a centralized and user-friendly platform for recording, monitoring, and managing attendance. The system can provide secure login, attendance marking, attendance history, automatic percentage calculation, report generation, and administrator management features. It can be further enhanced using QR-code scanning, biometric or facial verification, GPS-based validation, real-time notifications, cloud storage, and attendance analytics. Thus, the proposed system combines the convenience of online management with automated attendance technologies to provide a more efficient and reliable attendance solution.

III. System Analysis

System analysis is an important phase in the development of the Online Attendance Management System. The system focuses on understanding the requirements of students, teachers, employees, and administrators. It provides a centralized platform for recording and managing attendance digitally. Authorized users should be able to log in securely according to their roles. Teachers or administrators can create classes, subjects, departments, and user records. Attendance can be marked and stored electronically for each student or employee. The system automatically calculates attendance percentages based on recorded attendance. Users can view their daily attendance, attendance history, and current percentage. Administrators can generate attendance reports whenever required. The system should reduce manual work and minimize errors in attendance calculations. Authentication and role-based access can be implemented to protect attendance information. Overall, system analysis identifies the functional and technical requirements needed to develop an efficient attendance management system.

Existing System

In the existing system, attendance is commonly recorded using paper registers, spreadsheets, or manual record-keeping methods. Teachers or administrators need to mark attendance manually for every student or employee. Maintaining attendance records for a large number of users can consume considerable time and effort. Manual calculations may result in incorrect attendance percentages and reporting errors. Searching for a particular user's attendance record can also be difficult when records are maintained in separate files. Physical registers may be damaged, misplaced, or lost over time. Spreadsheet-based systems require regular updates and manual maintenance. Students or employees may need to contact teachers or administrators to check their attendance information. Generating monthly or semester-wise reports can require additional manual work. Traditional systems may also provide limited security and accessibility. Proxy or duplicate attendance can be difficult to identify using basic manual methods. Therefore, an automated online attendance management system is required to overcome these limitations.

Disadvantages of Existing System

- Requires considerable manual work.
- Attendance marking can be time-consuming.
- Manual calculations may cause errors.
- Paper records can be lost or damaged.
- Difficult to manage large numbers of users.
- Searching records can take more time.
- Report generation requires additional effort.
- Limited real-time access to attendance information.
- Spreadsheet records require regular maintenance.
- Proxy attendance may be possible.
- Limited security for attendance records.
- Students may depend on staff to obtain attendance details.

Proposed System

The proposed Online Attendance Management System is a web-based application designed to automate attendance recording and management. The system provides separate access for administrators, teachers, and students or employees based on their roles. Administrators can manage users, departments, classes, subjects, and attendance-related information. Teachers or authorized staff can mark attendance digitally through the system. Attendance records are automatically stored in a centralized database for easy access and management. The system calculates attendance percentages automatically based on the recorded attendance. Students or employees can log in and view their attendance status and previous attendance records. Administrators can generate daily, monthly, semester-wise, or customized attendance reports. The system can provide notifications when a user's attendance falls below a specified percentage. Role-based authentication helps prevent unauthorized users from modifying attendance records. Additional technologies such as QR codes, biometrics, GPS, or facial recognition can be integrated for improved verification. Overall, the proposed system provides a secure, accurate, convenient, and efficient solution for online attendance management.

Advantages of Proposed System

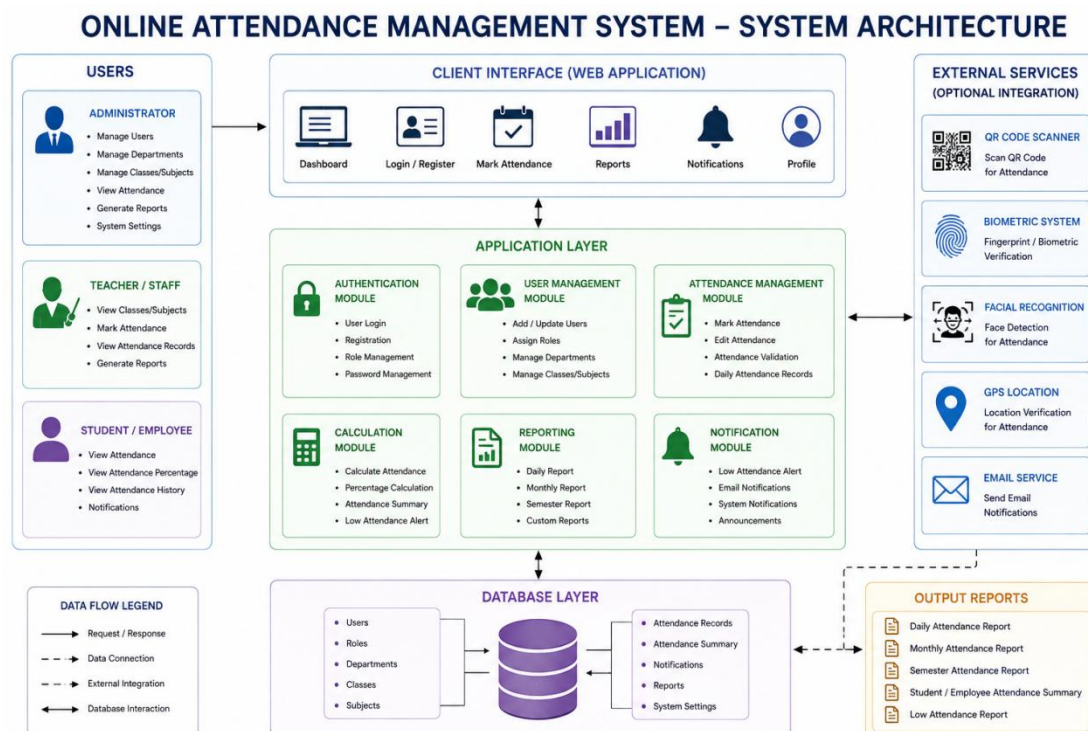
- Reduces manual attendance work.
- Saves time for teachers and administrators.
- Automatically calculates attendance percentages.
- Provides centralized attendance records.
- Reduces calculation and data-entry errors.
- Allows users to view attendance online.
- Provides quick attendance report generation.
- Improves accessibility of attendance information.
- Supports real-time attendance monitoring.
- Can be enhanced with QR code, biometric, or facial recognition.

IV. Methodology

The methodology describes the systematic approach followed for developing the Online Attendance Management System. The process begins by identifying the requirements of administrators, teachers, students, and employees. Functional requirements such as registration, login, user management, attendance marking, attendance viewing, and report generation are identified. Non-functional requirements such as security, usability, reliability, performance, and scalability are also considered. The system architecture and database structure are designed based on the identified requirements. Separate modules are developed for authentication, user management, attendance, reports, and administration. Teachers or authorized staff can mark attendance through the attendance module. The recorded attendance is stored securely in the centralized database. The system automatically calculates attendance percentages from the stored records. Users can access their attendance history through their respective dashboards. Administrators can generate reports and monitor attendance information. Each module is tested individually and then integrated with the complete system. Finally, the system is evaluated for accuracy, security, usability, reliability, and overall performance.

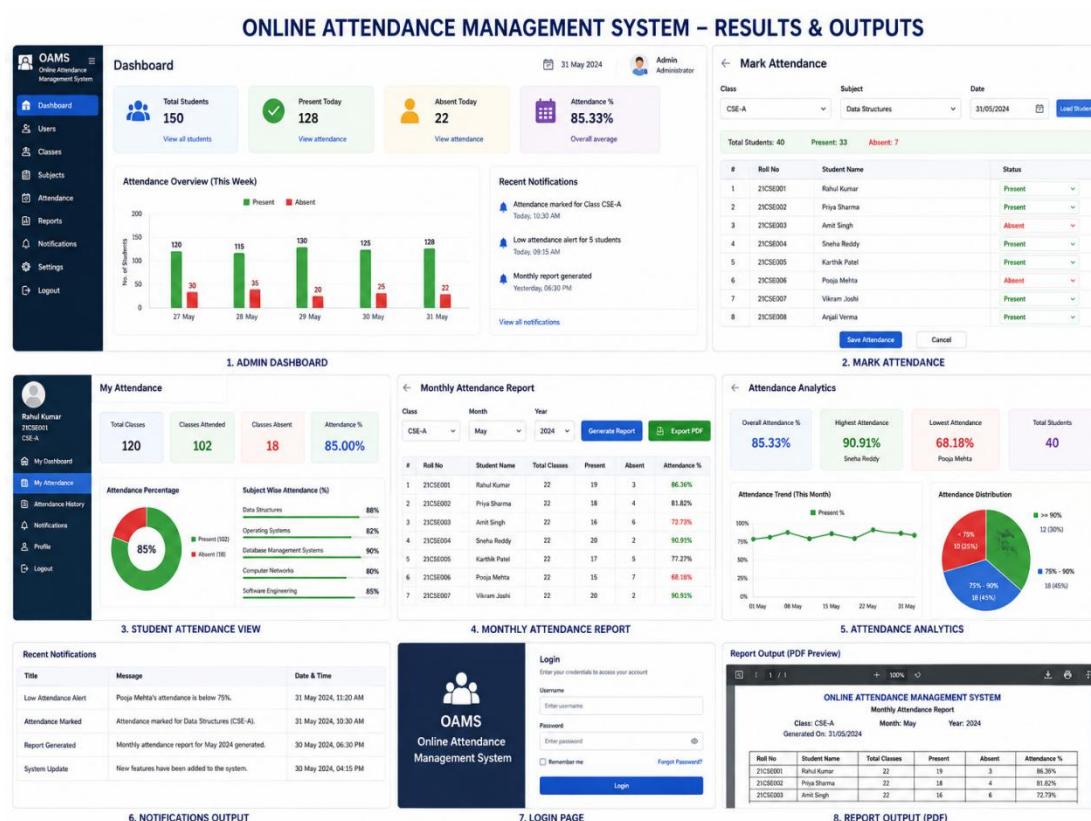
System Architecture

The system architecture defines the structure and interaction between the major components of the Online Attendance Management System. The proposed architecture consists of the user interface, authentication module, application layer, attendance management module, database, and reporting module. The user interface provides separate dashboards for administrators, teachers, and students or employees. Users first authenticate themselves through the login and security module. The application layer processes user requests and controls access according to assigned roles. Teachers or authorized staff use the attendance module to record daily attendance.



Attendance information is stored in a centralized database along with user, class, subject, and attendance details. The calculation module processes attendance records and automatically generates attendance percentages. The reporting module generates daily, monthly, semester-wise, and customized attendance reports. Administrators can manage users, departments, classes, subjects, and attendance records through the administrative dashboard. Notifications can be integrated to alert users about low attendance or important updates. QR code, biometric, GPS, or facial recognition modules can be added for automated attendance verification. Overall, the architecture provides a secure, modular, and scalable foundation for implementing the Online Attendance Management System.

V. Result and Output



VI. Conclusion

The Online Attendance Management System successfully provides an efficient and reliable solution for recording, monitoring, and managing attendance digitally. The system reduces the dependency on manual registers and spreadsheets, thereby saving time and minimizing human errors. Teachers or administrators can easily mark attendance, update records, and generate attendance reports through the system.

Students or employees can securely view their attendance percentage, daily attendance, attendance history, and status through their respective dashboards. The system automatically calculates attendance percentages and helps identify users with low attendance. The centralized database ensures that attendance records are stored securely and can be accessed whenever required. The proposed system improves the

overall efficiency of attendance management by providing role-based access, automated calculations, reporting, notifications, and centralized data management. It provides a user-friendly interface that makes attendance-related activities easier for both administrators and users.

Overall, the Online Attendance Management System is a useful digital solution that improves accuracy, accessibility, security, and productivity in attendance management. In the future, the system can be enhanced with QR code scanning, biometric authentication, facial recognition, GPS verification, mobile applications, real-time notifications, cloud integration, and advanced attendance analytics.

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