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PARENTS VISIT TRACKING SYSTEM FOR EDUCATIONAL INSTITUTIONS

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Abstract - *The Parents Visit Tracking System is a web-based application designed to streamline and enhance the management of parent visits in an institution. Built using ReactJS, Tailwind CSS, SQL, and GoLang, the system facilitates secure and efficient visitor tracking. It comprises three key roles: Admin, Security Staff, and Parent (Visitor). The Admin manages visit requests, approves or rejects them, and monitors visitor logs through analytics. Security Staff verifies parents upon arrival, records entry and exit timestamps, and ensures authorized access. Parents can submit visit requests, track approval status, and receive real-time notifications.*

The backend, powered by Node.js and GoLang, implements secure authentication and role-based access control (RBAC) using JWT. APIs handle visit requests, approvals, and attendance logging, while WebSocket integration enables real-time updates. The React.js frontend provides user-friendly dashboards tailored to each role, ensuring seamless interaction. The MySQL database efficiently manages visit records, logs, and user data, incorporating robust security measures such as password hashing, API validation, CORS enforcement, and input sanitization. This system significantly enhances visit management, improves security, and offers a structured, transparent approach to institutional visitor tracking.

***Key Words*: Visitor Tracking , Role-Based Access Control (RBAC),Web-Based Application , Authentication , Security, Real-Time Updates,MySQL Database, Visit Management, ReactJS , GoLang**

1.INTRODUCTION

Managing visitor entry, especially parental visits, in educational institutions has always been a critical aspect of ensuring safety and operational efficiency. Traditionally, this process has relied heavily on manual methods such as logbooks and phone-based appointment scheduling. While these systems provide a basic framework for visitor management, they are fraught with inefficiencies, including data inaccuracies, security loopholes, and a lack of real-time tracking capabilities. Moreover, manual processes often burden administrators and security personnel, who must oversee and process visit requests while managing the institution's broader operational needs.

The advent of digital technologies has enabled institutions to transition toward automated visitor management systems. However, most existing solutions either lack the features required to address role-specific functionalities or fail to offer the level of security demanded in a school setting. Recognizing these limitations, the Parents Visit Tracking System was developed as a comprehensive, role-based solution. This system leverages the power of modern web technologies through the ReactJS, Tailwind CSS, SQL, goLANG to provide a robust, scalable, and user-friendly platform. It allows parents to request visits, administrators to approve or reject those requests, and security staff to manage real-time check-ins and check-outs, all while maintaining a secure and well-documented log of visitor activities.

1.1 Problem Statement

The traditional methods of managing parent visits in educational institutions present numerous challenges that hinder operational efficiency and security. First, manual logbooks and paper-based systems are time-consuming and error-prone, often leading to inaccuracies in visitor records. These systems also make it difficult to retrieve past records, adding to the administrative burden. Second, the lack of real-time tracking means that security personnel and administrators cannot monitor visitor activities

effectively. Unauthorized access and entry go unnoticed, posing significant security risks.
Moreover, communication gaps between parents and administrators often create confusion regarding visit approvals or scheduling. Parents are typically unaware of the status of their visit requests, leading to delays and dissatisfaction. 12

Traditional systems also lack proper notification mechanisms to alert stakeholders about important updates, such as visit approvals, rejections, or changes in schedules. Additionally, the absence of data security measures in manual systems exposes sensitive visitor information to the risk of breaches, tampering, or loss. Finally, existing digital solutions that attempt to address these issues are often inadequate for educational institutions. They do not cater to role-specific requirements and fail to integrate seamlessly with institutional workflows. These limitations underline the pressing need for a digital, secure, and role-based visitor management system that automates processes while ensuring operational efficiency and data integrity.

2. Objective

The primary objective of the Parents Visit Tracking System is to create a secure, efficient, and user-friendly platform for managing parent visits in educational institutions. The system aims to streamline the entire visitor management process by automating manual workflows, reducing administrative overhead, and improving communication between parents, administrators, and security personnel. Key objectives include:
1. **Streamlining Visitor Management:** Automate the process of requesting, approving, and tracking parent visits, eliminating inefficiencies in manual systems.

2. **Enhancing Security:** Ensure secure user authentication through JWT-based login and enforce role-based access control (RBAC) to limit unauthorized access.

3. **Real-Time Tracking:** Provide real-time logging of visitor check-ins and check-outs, allowing security personnel and administrators to monitor activities seamlessly.

4. **Improving Communication:** Offer instant notifications to parents, administrators, and security staff regarding visit approvals, reminders, and visitor logs.

5. **Comprehensive Reporting:** Enable administrators to generate detailed reports and analytics, providing insights into visit trends and security metrics.

The scope of this project focuses on addressing the visitor management needs of educational institutions. The system is designed to cater to three primary user roles: Parents, Administrators, and Security Staff. Each role is provided with specific functionalities tailored to their needs:
● **Parents:** Can submit visit requests, view the status of their requests, and check their visit history through an intuitive web interface.

● **Administrators:** Have the ability to review, approve, or reject visit requests, generate daily or monthly visitor reports, and analyze trends using visual analytics.

● **Security Staff:** Can log visitor check-ins and check-outs in real-time, ensuring accurate and up-to-date records.
The system is built using this stack to ensure scalability and efficiency. It employs robust security measures, including encrypted data storage and role-based access control, to protect sensitive information. The architecture is designed to be flexible, allowing future enhancements such as the integration of biometric verification, facial recognition, and AI-powered analytics. By addressing current challenges and incorporating advanced features, the Parents Visit Tracking System offers a comprehensive solution that ensures operational efficiency, enhances security, and improves the overall visitor experience in educational institutions.

3. Result and Implementation

The implementation of the Parents Visit Tracking System successfully met the objectives set at the beginning of the project. The results demonstrate system's ability to streamline the process of scheduling and managing visits, enhance communication among stakeholders, and ensure data security. Below are the key results:
1. **Seamless Visit Request Management:** The system allows parents to submit visit requests with essential details such as the purpose, date, and time. Administrators can efficiently manage these requests by approving or rejecting them through an intuitive dashboard. The real-time synchronization ensures that updates are instantly reflected for parents and security staff, significantly reducing manual follow-ups and miscommunication.
2. **Real-Time Visitor Monitoring:** The security dashboard provides real-time access to the list of approved visitors, enabling security staff to log check-

ins and check-outs without delays. This functionality ensures accurate visitor tracking, which is critical for institutional safety and compliance.

3. **Enhanced Communication Through Notifications:** Automated notifications keep parents informed about the status of their visit requests. Administrators and security staff also receive alerts for pending actions, ensuring that all tasks are completed promptly. This feature has been a major improvement in reducing the communication gap between stakeholders.

4. **Data Security and Privacy:** The system employs robust authentication mechanisms, including JSON Web Tokens (JWT), to ensure secure user sessions. Passwords are encrypted using bcrypt.js, and API communications are protected with HTTPS. Audit logs provide transparency, enabling administrators to monitor user activities and detect suspicious behavior.

5. **Scalable and Modular Architecture:** The use of this stack allows for a scalable and modular system. The separation of concerns between the frontend, backend, and database ensures that each component can be maintained and updated independently. The system is also capable of handling an increasing number of users and requests without performance degradation.
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6. Role-Based Access Control (RBAC): The role-based system ensures that parents, administrators, and security staff can only access functionalities relevant to their roles. This minimizes the risk of unauthorized access and data breaches while maintaining operational efficiency.

The Parents Visit Tracking System has successfully demonstrated its ability to address the challenges of managing parental visits in educational institutions. The system's user-friendly design, real-time synchronization, and robust security measures ensure an efficient and secure workflow for all stakeholders. While there are areas for improvement, such as offline functionality and advanced analytics, the system's current capabilities provide a strong foundation for effective visitor management. By streamlining processes, enhancing communication, and ensuring data integrity, the system represents a significant step forward in modernizing institutional operations.

CONCLUSION

The Parents Visit Tracking System enhances the efficiency and security of managing parental visits in educational institutions. By leveraging modern web technologies like ReactJS, Tailwind CSS, SQL, and GoLang, the system streamlines visit approvals, real-time tracking, and role-based access control. It eliminates the inefficiencies of traditional manual processes, ensuring accurate visitor logs, secure authentication, and seamless coordination between administrators, security staff, and parents. This solution significantly improves institutional security, reduces administrative workload, and provides a structured, transparent approach to visitor management.

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