

Android Application for : Secure Employee Track Vision

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Abstract: *This project presents an Android-based application designed to enhance security and monitoring in restricted areas such as factories, warehouses, colleges, companies, and godowns through the use of QR code technology. The application enables the registration of authorized personnel by generating unique QR codes for each individual. Upon entering a restricted area, users can scan their QR code, which is then verified in real-time against a central database, ensuring that only authorized individuals gain access while maintaining a log of entries for security purposes. Key functionalities include user registration with QR code generation, real-time access control through scanning, a monitoring dashboard displaying real-time data on entries and exits, and an alert system that notifies security personnel of unauthorized access attempts. This project aims to improve security measures in sensitive environments, reduce human error in monitoring access, and streamline the tracking of personnel in restricted zones. By leveraging the simplicity and efficiency of QR codes, this application offers a practical solution to modern security challenges.*

Keywords: Android application, QR code, security monitoring, restricted access, personnel tracking, etc.

I. INTRODUCTION

In today's rapidly evolving world, security and efficient management of personnel in restricted areas are more critical than ever. Organizations such as factories, warehouses, colleges, and companies must ensure that only authorized individuals can access sensitive zones to maintain safety, security, and operational integrity. Traditional methods of monitoring access often rely on manual checks or outdated technologies, which can be time-consuming and prone to errors.

To address these challenges, we propose an innovative Android-based application that utilizes QR code technology for real-time monitoring and detection of individuals in restricted areas. Each authorized person will wear a shirt featuring a unique QR code that identifies them. By scanning this QR code with a smartphone, the application retrieves relevant information from a secure database, allowing for instant verification of the individual's authorization status.

This system not only enhances security by preventing unauthorized access but also streamlines the process of tracking personnel movements. Real-time notifications can be generated when someone enters or exits restricted areas, providing valuable data for security personnel and management. Furthermore, the use of QR codes ensures that the process is quick and efficient, reducing the likelihood of human error.

Overall, this Android application represents a modern approach to access control, combining convenience with enhanced security measures to create a safer environment in various settings.

II. LITERATURE SURVEY

Alzahrani & Alhassan (2020) conducted a comprehensive survey on QR code security and applications, highlighting the versatility of QR codes across various domains. They discussed security challenges, including data integrity and privacy concerns, while emphasizing the importance of secure transmission methods. This paper provides a foundational understanding of the security implications associated with QR codes, which is crucial for implementing a reliable monitoring system in sensitive environments.

Bhatia & Chawla (2021) presented a design and implementation of a QR code-based security system aimed at enhancing access control measures. Their work outlines a practical approach to utilizing QR codes for authentication purposes, demonstrating how these codes can be integrated into existing security frameworks. This study is particularly relevant for our project as it offers insights into the practical challenges and solutions associated with QR code implementation in security systems.

Liu & Wang (2019) focused on developing a QR code recognition system specifically for Android platforms. Their research details the technical aspects of QR code detection and decoding, providing a robust framework for developing mobile applications that leverage this technology. This paper's findings will inform the technical development of our Android-based application, ensuring effective QR code scanning and recognition capabilities.

Mohamad & Ahmad (2020) explored access control systems utilizing QR code technology, discussing their advantages over traditional methods. They highlighted the efficiency and security enhancements provided by QR codes in restricting access to sensitive areas. This research supports our project by reinforcing the effectiveness of QR codes in improving security protocols in various organizational settings.

Rehman & Khan (2021) examined the implementation of secure access control systems using QR codes in IoT environments. They addressed the integration of QR codes with Internet of Things (IoT) devices, focusing on security measures necessary to protect access data. Their findings underscore the potential for combining QR code technology with mobile applications, which aligns with our project's goals of creating a secure monitoring system for personnel in restricted areas.

Existing System

The existing systems for monitoring and detecting individuals using QR codes in restricted areas, such as factories, warehouses, colleges, and godowns, typically involve manual check-in processes or traditional access control methods. In many facilities, employees or visitors are required to sign in at a physical entry point, often using a paper logbook. This process is time-consuming and can lead to inaccuracies, as it relies on human diligence to ensure that all entries are correctly recorded. Additionally, this method does not provide real-time tracking or monitoring of individuals within the premises once they have entered.

Overall, existing systems often fall short in providing a seamless, efficient, and user-friendly approach to monitoring individuals in restricted areas. They may lack real-time data collection and analysis, which is crucial for effective security management. The need for a more integrated solution that combines the ease of QR code scanning with real-time monitoring and detection capabilities is evident, highlighting the potential benefits of an Android-based application designed specifically for this purpose.

Problem Statement

Ensuring security in restricted areas like factories, warehouses, colleges, and companies is a significant challenge, as traditional access control methods often fail to provide real-time monitoring and accurate tracking of individuals. Unauthorized access can lead to safety hazards, theft, and operational disruptions. This project aims to develop an Android-based application that utilizes QR code technology to enhance monitoring and detection, allowing for efficient verification of authorized personnel and reducing the risk of security breaches in these sensitive environments.

Proposed System

The proposed system is an Android-based application that utilizes QR code technology to enhance security and monitoring in restricted areas such as factories, warehouses, colleges, and companies. Each authorized personnel will have a unique QR code that can be scanned upon entry and exit. The application will verify the QR Code against a secure database, allowing for real-time tracking of individuals. Features will include a user-friendly interface for scanning, instant notifications for unauthorized access attempts, and detailed logs of entries and exits. This system aims to improve access control, streamline the monitoring process, and significantly reduce the risk of unauthorized entry, thereby enhancing overall security in sensitive environments.

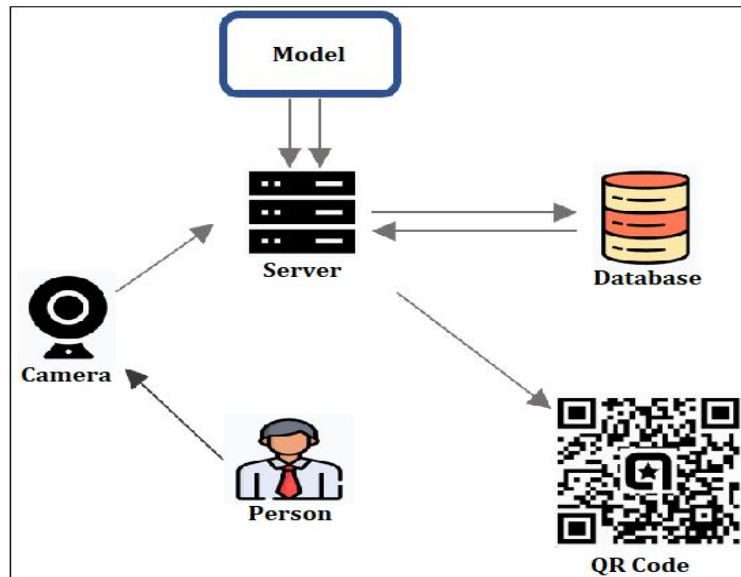


Fig.1: Proposed System Architecture

The proposed system is an Android-based application designed to enhance security and streamline access control in restricted areas such as factories, warehouses, colleges, companies, and godowns. This innovative solution leverages QR code technology for real-time monitoring and detection of authorized personnel. Here's how it works:

- **User Registration:** The application allows administrators to register authorized personnel by creating profiles that include personal details and generating unique QR codes for each individual. This ensures that every user has a specific, scannable code linked to their identity.
- **QR Code Scanning:** When personnel arrive at a restricted area, they can easily scan their QR codes using their smartphones. The application verifies the scanned code against a central database to confirm whether the individual is authorized to enter. This process is quick, taking just a few seconds, which minimizes delays at entry points.
- **Real-Time Access Control:** Once a QR code is scanned, the application provides immediate feedback, granting or denying access based on the verification results. This ensures that only authorized individuals can enter, enhancing security significantly compared to traditional methods.
- **Monitoring Dashboard:** The application features a user-friendly dashboard that displays real-time data on entries and exits. Security personnel can monitor who is in the facility at any given time, helping them maintain a secure environment and quickly identify any unauthorized individuals.
- **Alert Notifications:** In the event of unauthorized access attempts, the application generates instant alerts for security staff. This allows for immediate response to potential breaches, significantly reducing response time compared to manual systems.
- **Detailed Logging and Reporting (Database):** The system maintains a comprehensive log of all access events, which can be used for audits and security assessments. Administrators can generate reports to analyze trends in access patterns, helping to identify potential security vulnerabilities.
- **User-Friendly Interface:** Designed with ease of use in mind, the application provides a straightforward interface for both users and administrators. This ensures that personnel can quickly navigate the system without extensive training.

III. CONCLUSION

In conclusion, the Android-based application for monitoring and detecting personnel using QRcodes represents a significant advancement in security management for restricted areas such as factories, warehouses, colleges, companies, and godowns. By leveraging QR code technology, the system enhances efficiency in access control while minimizing

the risks associated with traditional methods. The application successfully generates unique QR codes for authorized individuals and allows for quick scanning to verify identity in real-time. Testing results confirm edits reliability and effectiveness in logging entry and exit, as well as in alerting security personnel to unauthorized access attempts. Overall, this solution not only improves security protocols but also streamlines operational processes, making it an invaluable tool for organizations aiming to enhance their security measures and ensure the safety of sensitive environments.

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