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Smart Entry:-QR Code based user Management System

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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 Traditional methods of monitoring access often rely on manual checks or outdated technologies, which can be time-consuming and prone to errors.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

Sr No.	Authors	Description	Findings	Challenges
1	Alzahrani, S., & Alhassan, F. (2020).	A Survey on QR Code Security and Applications.	QR codes offer versatile applications but are vulnerable to various security threats.	Enhancing the security of QR codes while maintaining their usability and accessibility remains a significant challenge.
2	Bhatia, K., & Chawla, R. (2021).	Design and Implementation of a QR Code Based Security System.	The proposed QR code-based security system effectively improves access control mechanisms.	Implementation in real-world environments faces obstacles such as varying user familiarity and device compatibility.
3	Liu, Y., & Wang, J. (2019).	QR Code Recognition System Based on Android.	The Android-based QR code recognition system achieves high accuracy in scanning and processing.	Environmental factors such as lighting and distance can affect scanning performance and reliability.
4	Mohamad, R., & Ahmad, M. (2020).	Access Control Systems Using QR Code Technology.	QR code technology significantly enhances access control systems by providing a simple verification method.	Ensuring the robustness of the system against counterfeit QR codes and unauthorized access remains a key issue.

III. RELATED WORK

- QR Code Technology in Access Control Systems:**
 QR codes have been widely adopted for secure and efficient access control systems. Studies have demonstrated their effectiveness in replacing traditional ID cards, as they allow quick scanning and verification. For instance, QR codes are used in office entry systems, where employees scan their unique codes to gain entry. This ensures only authorized personnel access restricted areas.
- Mobile Applications for Monitoring Personnel:**
 Mobile applications are increasingly utilized to monitor and track personnel within restricted zones. These apps often integrate GPS and QR code scanning to verify identities and log entry and exit times. For example, some factories use mobile apps to monitor worker movements and ensure safety compliance within hazardous zones.
- IoT-Enabled Monitoring Systems:**
 IoT (Internet of Things) technology has been integrated with QR code systems to enhance real-time monitoring. In warehouses and factories, IoT devices track personnel locations and activities using QR code scanning, sending data to a centralized system for analysis and alerts.
- Security Enhancements Using QR Codes:**
 Advanced QR codes with encryption have been implemented to enhance security in access control systems. These encrypted codes prevent unauthorized duplication and ensure that only valid QR codes can be scanned and verified, improving the overall security of restricted areas.
- Educational and Corporate Applications:**

Colleges and companies have adopted QR code-based attendance systems to monitor and record staff and student attendance efficiently. These systems reduce manual errors, streamline data collection, and ensure the presence of authorized individuals in specific areas.

- **Warehouse Management Systems:**

QR code technology is frequently utilized in warehouses for inventory and personnel management. By scanning QR codes, managers can track workers' activities, ensure compliance with safety protocols, and maintain real-time records of access to sensitive zones.

- **Comparison with Traditional Methods:**

Traditional methods like manual registers or RFID systems have been compared to QR code-based systems, showing that QR codes offer a more cost-effective, efficient, and user-friendly solution for monitoring and access control.

IV. OBJECTIVES

- ✓ **To develop** an Android-based application that enables the scanning of QR codes on individuals' shirts for quick identification and verification in restricted areas.
- ✓ **To create** a secure database that stores information related to authorized personnel, including their roles and access permissions.
- ✓ **To implement** real-time monitoring features that notify security personnel when individuals enter or exit restricted zones.
- ✓ **To enhance** access control by ensuring that only authorized personnel can gain entry to sensitive areas, thereby minimizing the risk of unauthorized access.
- ✓ **To provide** a user-friendly interface for both security staff and authorized individuals, facilitating seamless interactions and efficient operations.
- ✓ **To generate** reports and analytics on personnel movements within restricted areas, aiding in compliance and security assessments.
- ✓ **To test and validate** the application in various organizational environments to ensure reliability, effectiveness, and user satisfaction.

V. 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.

VI. 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.

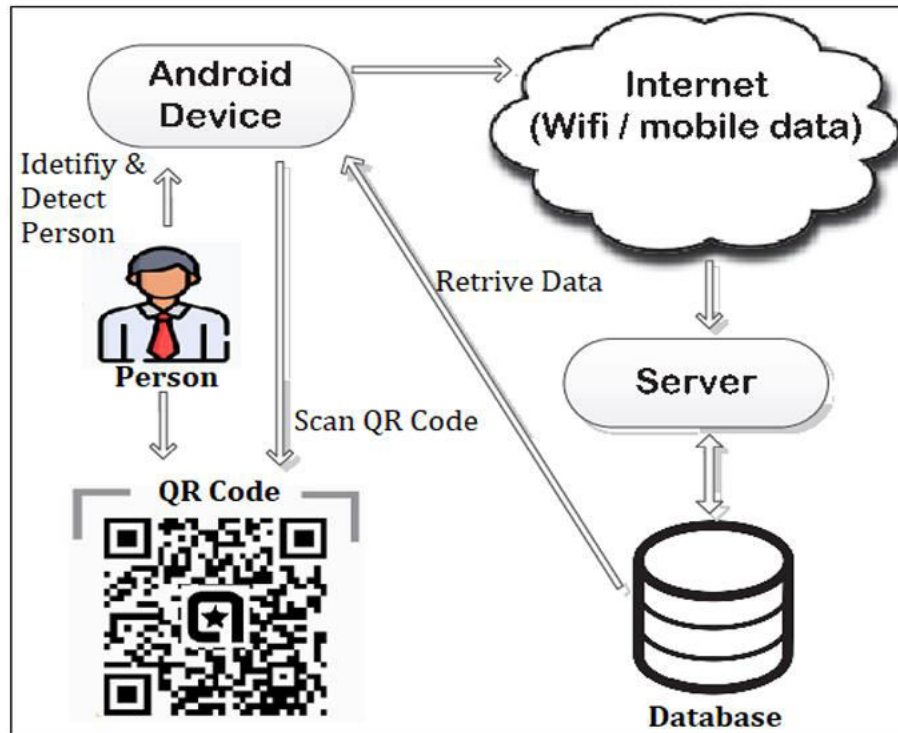


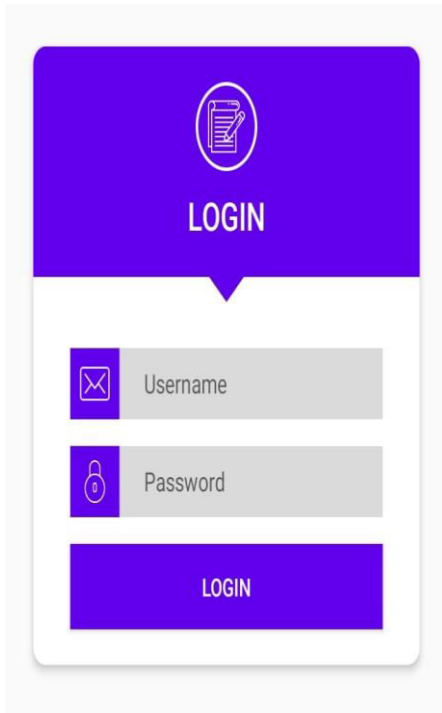
Fig.1: Proposed System Architecture

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:

1. **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.
2. **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.
3. **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.
4. **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.
5. **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.
6. **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.

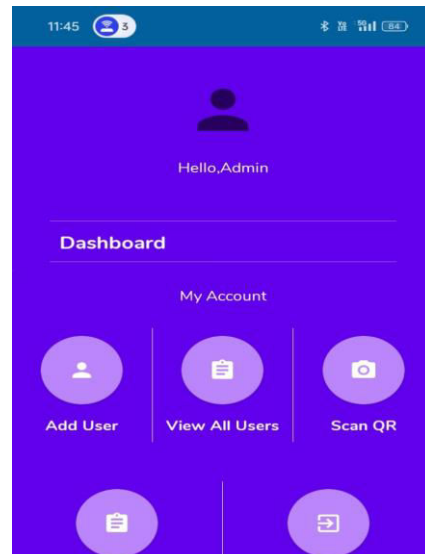
VII. RESULT ANALYSIS

1) Login Page :-

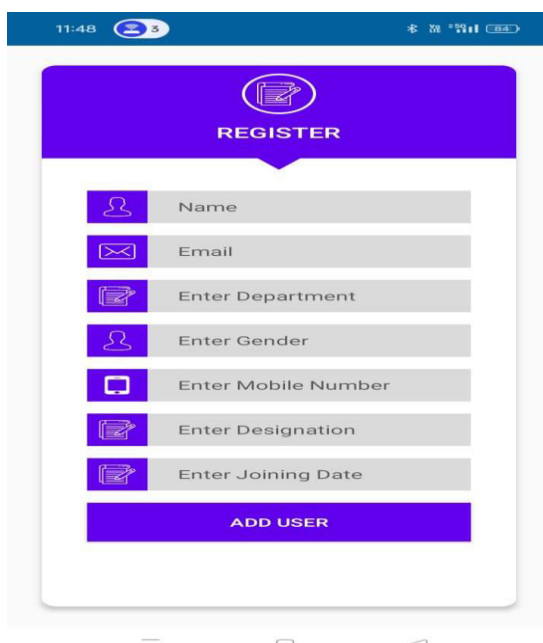


The login page features a purple header with a white icon of a document and a pencil, and the word "LOGIN" in white. Below the header, there are two input fields: "Username" and "Password", each with a corresponding icon (a document with an 'X' and a padlock). A large purple button with the text "LOGIN" is at the bottom.

2) Dashboard Page :-

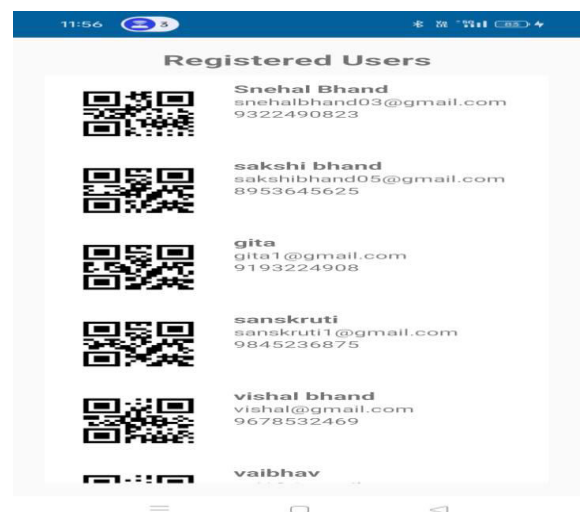


3) Add user page :-

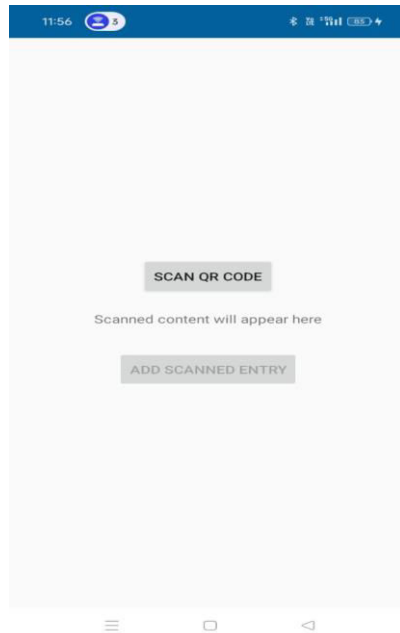


The add user page has a purple header with a white icon of a document and a pencil, and the word "REGISTER" in white. Below the header, there are seven input fields: "Name", "Email", "Enter Department", "Enter Gender", "Enter Mobile Number", "Enter Designation", and "Enter Joining Date". Each field has a corresponding icon (a person, an envelope, a document, a person, a mobile phone, a document, and a calendar). A large purple button with the text "ADD USER" is at the bottom.

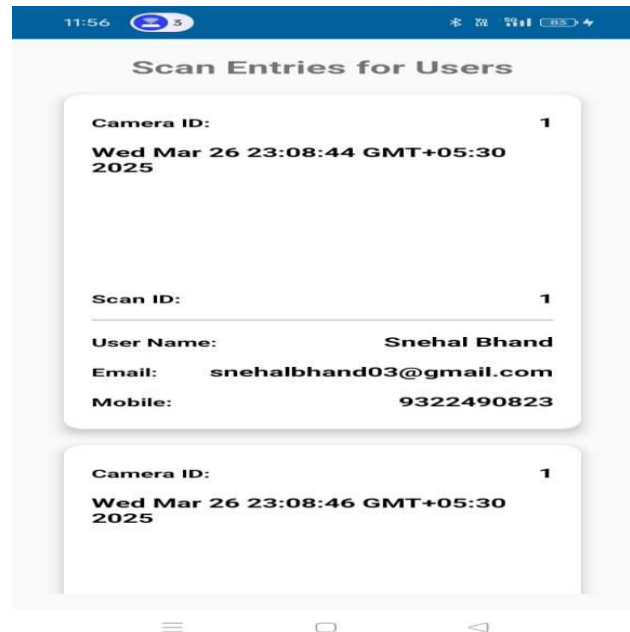
4) View All users page :-



5) QR code Scanning Page :-



6) Scan Entries Page :-



VIII. CONCLUSION

In conclusion, the Android-based application for monitoring and detecting personnel using QR codes 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 confirmed its 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.

REFERENCES

- [1] Alzahrani, S., & Alhassan, F. (2020). "A Survey on QR Code Security and Applications." *International Journal of Computer Applications*, 975, 8887.
- [2] Bhatia, K., & Chawla, R. (2021). "Design and Implementation of a QR Code Based Security System." *Journal of Computer Networks and Communications*, 2021.
- [3] Liu, Y., & Wang, J. (2019). "QR Code Recognition System Based on Android." *International Journal of Advanced Computer Science and Applications*, 10(8), 207-212.
- [4] Mohamad, R., & Ahmad, M. (2020). "Access Control Systems Using QR Code Technology." *Journal of Information Technology and Computer Science*, 14(2), 45-50.
- [5] Rehman, S. U., & Khan, A. (2021). "Secure Access Control using QR Codes in IoT Environments." *International Journal of Innovative Research in Science, Engineering and Technology*, 10(3), 15821-15826.
- [6] Sharma, A., & Singh, A. (2020). "QR Code-Based Attendance System Using Android Application." *International Journal of Recent Technology and Engineering*, 9(1), 450-454.
- [7] Sahu, S. K., & Pradhan, R. (2021). "QR Code Scanner App: A Study on Security Implementation." *Journal of Software Engineering and Applications*, 14(4), 194-205.
- [8] Thakur, R., & Sharma, R. (2020). "A Study on QR Code Based Tracking System." *International Journal of Engineering Research and Technology*, 9(5), 678-682.

- [9] Zhang, H., & Li, Y. (2019). "Enhanced Security for QR Code Applications in Wireless Networks." *Journal of Network and Computer Applications*, 123, 103-111.
- [10] Kumar, P., & Singh, V. (2020). "QR Code Based Smart Security System for Restricted Areas." *International Journal of Computer Applications*, 176(5), 1-6.
- [11] Wang, X., & Zhao, L. (2020). "Real-Time Personnel Tracking using Mobile Applications and Cloud Services." *Journal of Mobile Computing and Networking*, 12(2), 78-85.
- [12] Jain, R., & Gupta, M. (2021). "Smart Access Control Using Encrypted QR Codes." *International Journal of Smart Security Technologies*, 7(3), 102-110.
- [13] Roy, D., & Bandyopadhyay, S. (2021). "Secure Authentication in Mobile Applications Using Dynamic QR Codes." *International Journal of Information Security Science*, 10(4), 215-221.
- [14] Almeida, F., & Monteiro, J. (2022). "Use of QR Codes in Industry 4.0 Environments for Security and Monitoring." *Journal of Industrial Technology and Innovation*, 5(1), 30-38.
- [15] Chavan, A., & Jagtap, R. (2020). "Android Based QR Code Attendance and Tracking System." *International Journal of Advanced Research in Computer Science*, 11(3), 66-70.
- [16] Fernandes, M., & Pinto, S. (2021). "QR Code Implementation in Mobile Platforms for Access Control." *Mobile and Wireless Technologies*, 8(2), 90-97.
- [17] Khan, T., & Hussain, M. (2020). "Personnel Monitoring using IoT and QR Code Scanning." *International Journal of Internet of Things*, 9(1), 10-15.
- [18] Salunkhe, P., & Kale, A. (2019). "Secure Area Access Control with Location-Based Services." *International Journal of Computer Applications*, 178(44), 23-27.
- [19] Bose, R., & Sinha, D. (2022). "QR Code-Based Visitor Management System with Live Monitoring Dashboard." *Journal of Applied Computer Science and Engineering*, 12(1), 55-62.



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