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RFID Based Access Control System

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ABSTRACT: The RFID-based access control system is the solution designed to control access to a restricted area or information using RFID technology. The system uses RFID tags embedded in employee ID cards to register attendance without any direct contact with a machine. The tag contains the employee's ID and name, which are scanned by an RFID scanner to register the employee's attendance, time, and date. The RFID tags can typically store upto 1KB of non-volatile memory. The data is then processed on a NodeMCU, which uploads it to a database. The system prevents the spread of COVID-19 and other viruses by eliminating the need for direct contact and helps control access to sensitive information or areas. The system is secure and can be extended to include two-factor authentication for extra protection. Overall, the RFID-based access control system is a secure and efficient solution to control access using RFID technology.

KEYWORDS: RFID technology, Virus control, Access control, NodeMCU

I. INTRODUCTION

Access control systems are an integral part of modern security practices. They are used to control and monitor access to restricted areas, sensitive information, and valuable assets. In today's world, where security threats are becoming more prevalent and sophisticated, organizations need to deploy advanced access control systems to ensure the safety of their people, information, and assets. One such advanced access control system is the RFID-based access control system. This system utilizes RFID technology to control access to a restricted area or information. The system uses RFID tags that are embedded in employee ID cards to register attendance without any direct contact with a machine. The tag contains the employee's ID and name, which are scanned by an RFID scanner to register the employee's attendance, time, and date.

The RFID tags used in this system can typically store up to 1KB of non-volatile memory, which can be used to store additional information such as job title, department, and access level. The data captured by the RFID scanner is then processed on a NodeMCU, which uploads it to a database for further processing. The RFID-based access control system provides several benefits, including improved security, increased efficiency, and reduced costs. With this system, organizations can prevent unauthorized access to restricted areas or information and ensure that only authorized personnel can access them. The system eliminates the need for direct contact, reducing the risk of spreading viruses such as COVID-19, and other communicable diseases. Moreover, the system is easy to install, maintain, and expand. It can be customized to meet the specific needs of an organization and can be extended to include two-factor authentication for extra protection.

II. RELATED WORKS

[1] A Novel RFID-based Smart Door Lock System for Home Security

Authors: Yang, K., Su, X., Wang, S., & Zhang, Y.

This paper presents a novel RFID-based smart door lock system for home security. The system uses RFID technology to provide keyless access control to a home. The system consists of an RFID reader, RFID tags, and a door lock mechanism. The RFID tags are embedded in key fobs or cards, and the reader scans the tags to unlock the door. The system is secure and eliminates the need for physical keys.

[2] Development of a RFID-based Inventory Management System for a Retail Store

Authors: Mupondi, R., & Manyumwa, R.

This paper describes the development of a RFID-based inventory management system for a retail store. The system uses RFID technology to track the movement of inventory items within the store. The system consists of RFID readers, RFID tags, and a database management system. The RFID tags are attached to the inventory items, and the readers scan

the tags to track the movement of the items. The system provides real-time inventory tracking, reduces errors, and improves efficiency in the store.

[3] Design and Implementation of an RFID-based Attendance Management System

Authors: Adekunle, S.A., Adepoju, F.A., Onaolapo, J.A.

This paper describes the design and implementation of an RFID-based attendance management system. The system uses RFID technology to register attendance of students in a school setting. The system consists of an RFID reader, RFID tags, and a database management system. The RFID tags are embedded in student ID cards, and the reader scans the tags to register attendance. The system is scalable and can be extended to other applications such as employee attendance management.

III. METHODOLOGY

The system uses RFID tags embedded in employee ID cards to register attendance without any direct contact with a machine. The tag contains the employee's ID and name, which are scanned by an RFID scanner to register the employee's attendance, time, and date. The RFID tags can typically store up to 1KB of non-volatile memory. The data is then processed on a NodeMCU, which uploads it to a database. The system prevents the spread of COVID-19 and other viruses by eliminating the need for direct contact and helps control access to sensitive information or areas. The system is secure and can be extended to include two-factor authentication for extra protection. Overall, the RFID-based access control system is a secure and efficient solution to control access using RFID technology.

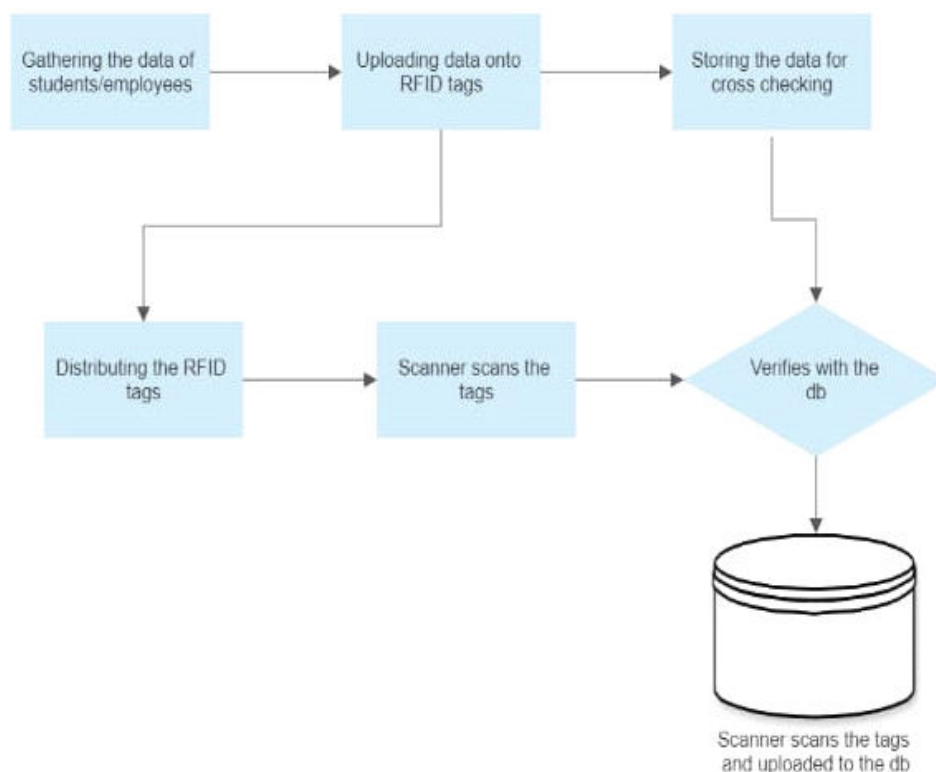


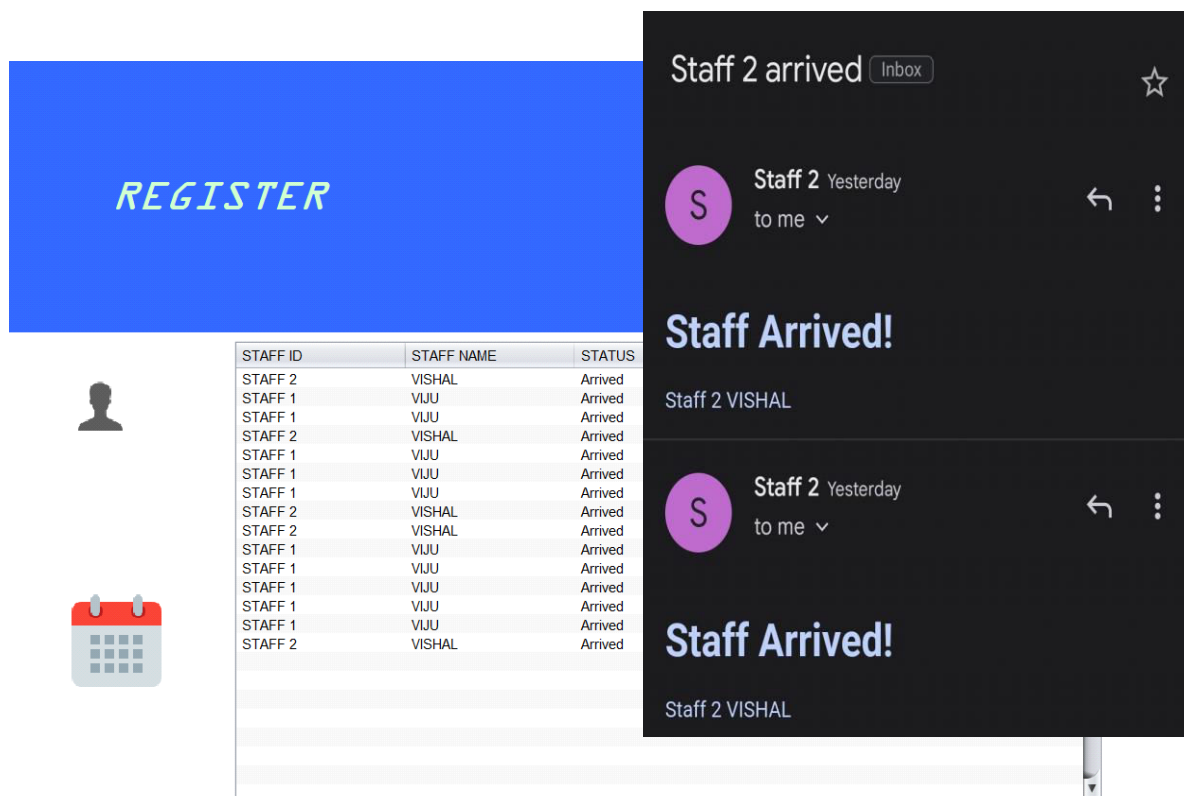
Fig.1 Flowchart for Access Control System



IV. EXPERIMENTAL RESULTS

S.No	Name	Date	Time	Status
1	Vishal	18/3/2023	8:20	Checking In
2	Viju	18/3/2023	8:30	Checking In
3	Sarath	18/3/2023	8:35	Checking In
4	Sarath	18/3/2023	4:20	Checking Out
5	Viju	18/3/2023	4:30	Checking Out
6	Vishal	18/3/2023	4:30	Checking Out

Fig 2. Application displaying the details of users



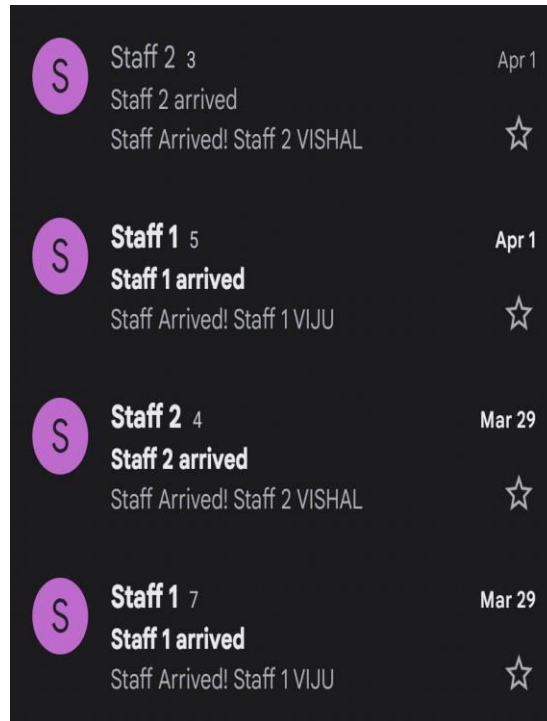


Fig 3. Mail of the user's details and status

V. CONCLUSION

In conclusion, the RFID-based access control system is a secure and efficient solution for controlling access to restricted areas or sensitive information. The system uses RFID technology and tags embedded in employee ID cards to register attendance without any direct contact with a machine, which prevents the spread of COVID-19 and other viruses.

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