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Access Control System Using RFID Scanner

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ABSTRACT: Managing access to restricted areas can be done seamlessly and securely with the help of an RFID scanner-based access control system. This system offers effective and dependable access control by utilizing RFID technology to identify and validate people according to distinctive RFID cards or tags. Using RFID scanners to scan these tags or cards, the system verifies access permissions by establishing a connection with a central database. This procedure guarantees quick and precise identification, reducing unwanted access and strengthening security protocols overall. In addition, the RFID-based access control system is highly customizable, giving administrators easy access privilege modifications and entry record tracking. The system's user-friendly interface and strong security features allow it to maximize access control in a variety of settings, such as government offices, business buildings, and educational institutions.

KEYWORDS: RFID (Radio Frequency Identification), Scanner, Access, Control, Security, Administrative, Identification,

I. INTRODUCTION

The primary function of access control systems in contemporary security architecture is to prevent unwanted access to physical areas and resources. Using RFID (Radio Frequency Identification) scanners has become a popular option among the many technologies available for dependable and effective access control. The implementation of such a system will be covered in detail in this introduction, along with its advantages, elements, and consequences for security operations.

Fundamentally, the way an RFID scanner-based access control system works is by using distinct RFID tags to identify and validate people or things. These tags, which are usually included into cards or key fobs, can wirelessly transfer electronically stored data to RFID scanners. The scanners use radio frequency signals and are placed strategically at access points.

An important development in security technology is the deployment of an RFID-scanning access control system. This system provides a comprehensive solution for RFID technology by merging it with strong access management features in a smooth manner. defending real estate and possessions. The RFID-based access control system is a dependable cornerstone in guaranteeing safety and operational effectiveness as security issues continue to change.

The RFID reader recognizes an RFID-tagged person when they walk into a specified region. delivers the distinctive identification of the tag to the computer or microcontroller. The information from the received RFID tag is compared to the database of approved tags by the microcontroller or computer.

The barrier control system opens the door for access if the tag is approved. If not, access is refused. Attendance is recorded by the system.

II. RELATED WORK

Identification-Based Access Control System: Architecture and Execution:

An RFID-based access control system's comprehensive design and implementation are presented in this study by Smith et al. The study includes a thorough assessment of the system's security and performance aspects in addition to a discussion of the system's architecture, parts, and algorithms.

Using RFID Technology to Increase Security in Access Control Systems

This research article, written by Jones and Brown, investigates how RFID technology might be used to improve access control system security. The paper explores the advantages and difficulties of implementing RFID-based authentication techniques by comparing their efficacy to more conventional approaches.

A Review of RFID Technology Integration with Access Control Systems The review paper by Patel and colleagues offers.

The usefulness of RFID (Radio Frequency Identification) scanner-based access control systems in safeguarding physical access to buildings, rooms, and resources has attracted a lot of interest. A study of the literature on this subject covers a range of topics, such as applications, security issues, system design, and implementation.

The technical features of RFID-based access control systems have been the subject of several studies. These have included the hardware elements, including RFID tags, readers, and antennae, as well as the communication protocols that are used to transfer data. A 2019 study by Smith et al. examined various RFID technologies and their applicability for access control applications, emphasizing the significance of taking into account variables like security level, speed, and range.

Additionally, it has been investigated how to improve RFID by integrating it with other technologies like biometrics or mobile devices.

III. METHODOLOGY

3.1 DESIGN

To guarantee the efficiency and dependability of an Access Control System (ACS) utilizing RFID scanners, a number of crucial procedures must be taken during design.

First and foremost, it's critical to provide the system specifications, such as the user count, access points, and security tiers. This aids in figuring out the functionality and scalability requirements for the system. Next, choosing the right RFID technology is essential. It is important to take into account elements like compatibility with current infrastructure, frequency, and range. Accurate data transmission and seamless communication are ensured by selecting the appropriate RFID tags and readers.

After a technology has been chosen, the system architecture must be created. To provide the best possible coverage and performance, this entails figuring out where to put RFID readers, wiring, and network equipment.

Analyze the needs and requirements for the access control system, taking into account factors like the quantity of users, access points, security settings, and system integration.

Selecting the Right RFID Technology: Take into account read range, frequency, security features, and infrastructure compatibility while selecting the right RFID technology.

System Architecture Design: Create the general layout of the RFID scanners, controllers, databases, and user interfaces for the access control system.

Database Design: Create a schema for the database to hold user, access permission, and access log data.

User Interface Design: Provide intuitive user interfaces so that users can communicate with the system and administrators can control access permissions.

The ACS's connection to other security systems.

3.2 COMPONENT SPECIFICATION

- Arduino Uno
- RFID Scanner
- LED Display 16*2

- Traffic Light Module
- Bread Board
- Servo Motor

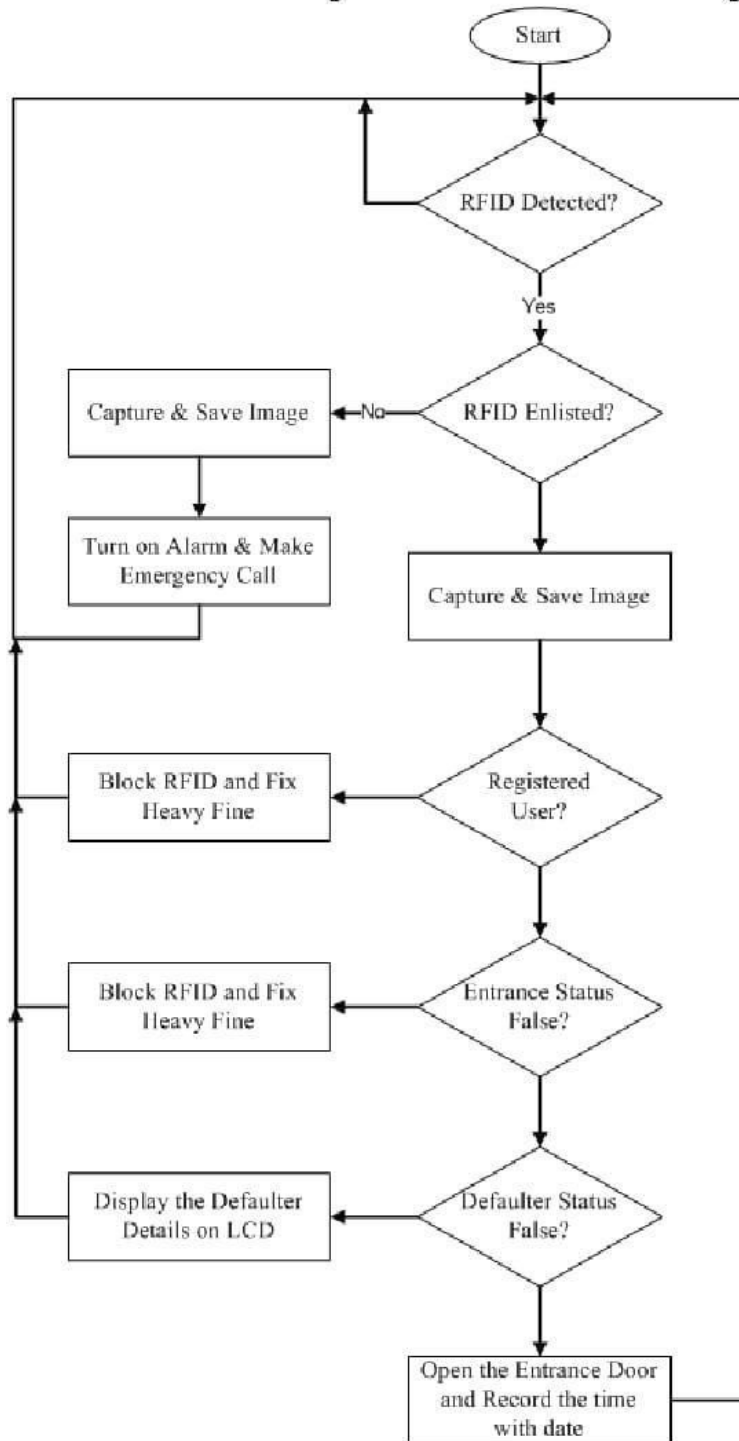


Fig.1.Flow Chart

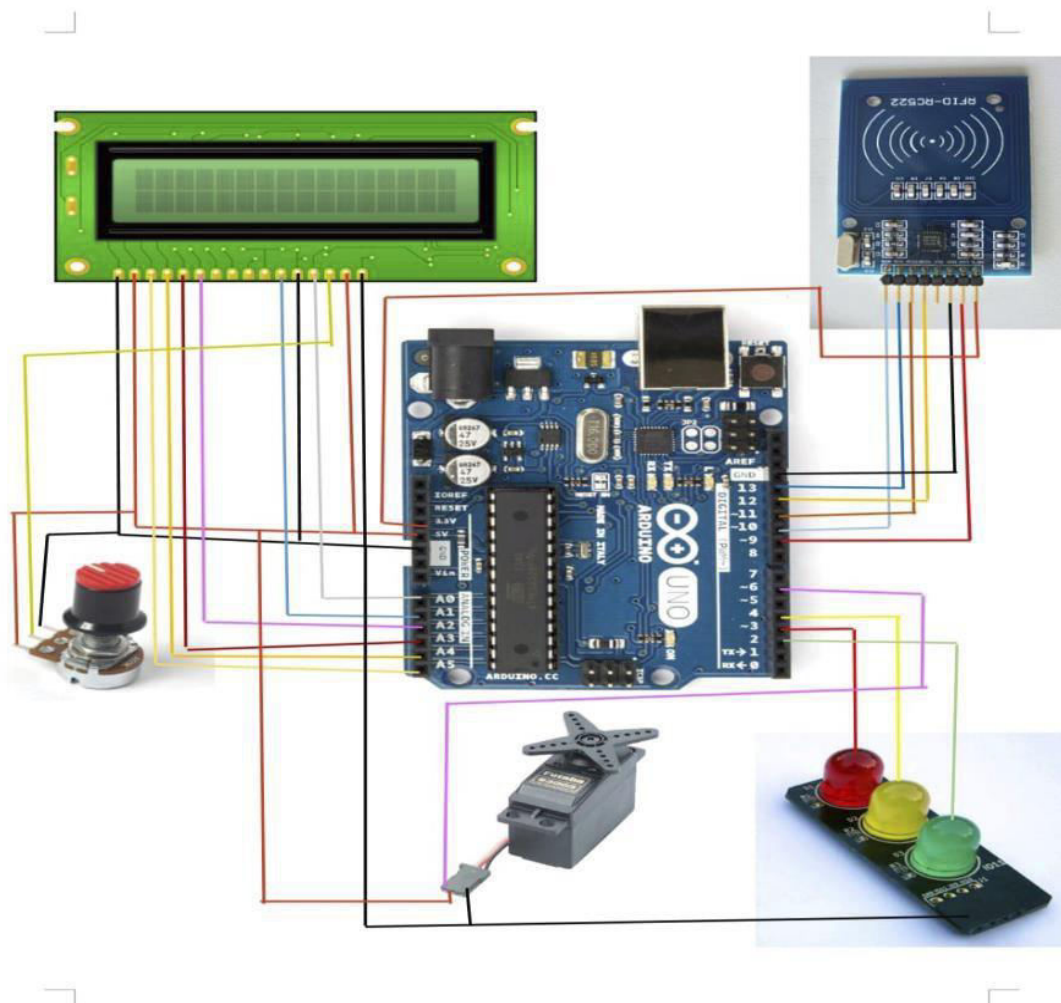


Fig- 2 Circuit Diagram

3.3 MODEL





IV. CONCLUSION

In conclusion, there are a lot of advantages for a variety of industries when employing RFID scanners to establish an access control system. By limiting access to only those who are permitted, it improves security by lowering the possibility of illegal entry and possible security breaches.

RFID technology also offers efficiency and ease, enabling accurate tracking of asset location or staff mobility as well as smooth access management. It also makes it possible for enterprises to keep thorough records of all access activities, which helps with audit trails and regulatory compliance. All things considered, organizations, companies, and communities looking to improve operational procedures while bolstering security measures should consider investing in RFID-based access control solutions.

Overall, the adoption Of RFID-based access control systems represents a valuable investment for businesses, Institutions, and communities seeking to bolster security measures while optimizing operational process.

ABBREVIATION

RFID - Radio Frequency Identification ACS - Access Control System

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