Smart Door System

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Abstract: *In daily life, people have the need to know the identity of a visitor who comes to their organizations, regardless of whether they are there at that time. This need is even greater for people who suffer from some kind of disability that prevents them from meeting the visitor. To provide a solution in this sense, this paper proposes a smart model that performs the task of a doorbell, which should recognize the visitor and alert the user. To achieve that, this proposal incorporates technologies , notification to user and management of their responses. The complete process .i.e. recognition of visitor and notification to user and the related management problem divided into interrelated stages and their standardization issues are discussed later . Finally, to test the effectiveness of the model, three scenarios where integrated; each one was composed by different organizations over which the recognition of known and unknown individual was analysed.*

Keywords: Visitor recognition ,Smart doorbell, Response management, Scenario testing.

I. INTRODUCTION

Using physical keys to lock or unlock the door is the most natural way and everyone is acquainted with it. The physical key is a well-tested and well-known technology, but it also has its flaws. There can only be one unique key for a lock. For different locks you have different keys. Furthermore, carrying many keys is a burden and increases the chance of keys getting stolen, misplaced or lost. Our goal is to design a solution for secure access control that can replace physical keys for accessing door. We propose a solution using digital keys on smart phones providing wireless and automatic unlocking . The design will allow easy implementation and distribution of keys and the device will work autonomously. This will enhance the security and will eliminate the need of carrying physical keys. providing high efficiency.

A smart door system represents an advanced integration of technology into conventional door functionalities, designed to enhance security, convenience, and efficiency. Unlike traditional door locks, these systems employ various cutting-edge technologies such as biometric recognition, wireless connectivity, and remote access capabilities. ensure unparalleled security by granting access only to authorized individuals, thereby eliminating the vulnerabilities associated with traditional key-based systems. Additionally, smart door systems often incorporate wireless connectivity options, enabling homeowners to monitor and control access remotely through smartphones or other devices. This not only enhances convenience by facilitating keyless entry but also allows for real-time notifications and monitoring, enhancing overall security measures. Moreover, some advanced systems integrate with smart home ecosystems, enabling seamless automation and integration with other smart devices.

II. EXISTING SYSTEM AND ITS LIMITATIONS

The most used system for locking and unlocking the door is a lock and a physical key. The entire process is a mechanical one. If the key is lost, misplaced or stolen, then the entire locking mechanism has to be replaced. This problem with the physical keys intensifies when it comes to big companies where employees are needed to carry several keys for different doors. Apart from the extra burden, all the keys add to become vulnerable to getting lost. An alternative used for physical keys currently is RFID (Radio-Frequency Identification). There are RFID cards being used as pass keys. The RFID card reader unit is installed near the door. When the card is brought near the reader, it identifies the radio frequency of the card and thus verifies the key. Multiple cards can be paired with the device. But again, they are vulnerable to theft or getting lost.

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SCOPE OF PROJECT

The main aim of this project is to reduce human resources and efforts along with the enhancement of a smart city vision. Smart locks are set to redefine security and convenience in the future. IoT integration, and advanced encryption, they will offer enhanced protection while seamlessly connecting with other smart devices in homes and urban infrastructure. Expect greater affordability, eco-friendly materials, and evolving legal frameworks to address privacy concerns, making smart locks an integral part of the evolving smart home and smart city ecosystems.

PROPOSED SYSTEM

To tackle the above issues, we propose to replace physical keys with digital keys that:

1. can easily be distributed to users.

2. can only be used by the correct user.

3. can be restricted to a given time or date range.

4. can be specialized for each user .

Proposed model talks about how to make use of the recent advancements in technology to make our place safe and secure. The basic idea behind project is to implement the nearby security in a smart way. The proposed idea of using the protocol for transmitting the door status by using wireless mode.

In this proposed system has been used with home door lock access control based on the Concern persons will be informed successfully about the person detection via message alert generations along with details attached. In this system, we can use esp32 came because it is exactly accurate and real time processing unit.
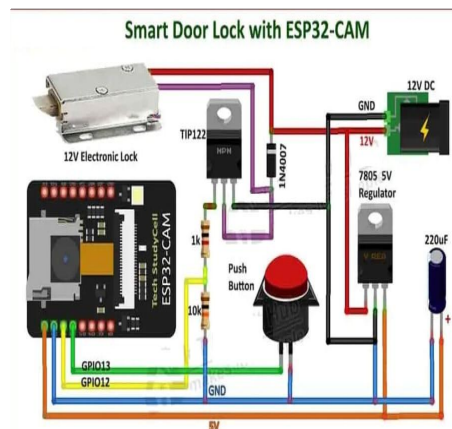
Block diagram
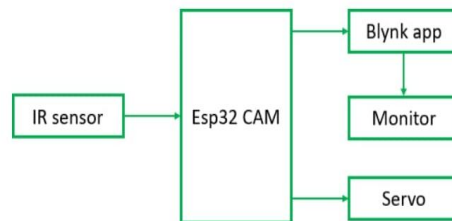
After setting up the Smart Door and making all the necessary connections to unlock the solenoid lock system that is by biometric system and wirelessly by app. To use the wireless system, we need to ensure that the ESP32 is connected to a wi-fi network. If the user clicks the unlock button in the app then the ESP32 send signal to the solenoid lock and the lock opens.
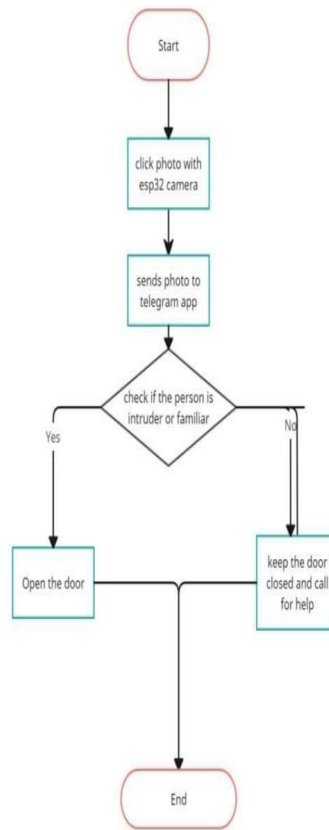
SCHEMATIC DIAGRAM

The above picture is the schematic diagram of Smart door.


Smart Door Lock with ESP32-CAM

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FLOW CHART

This flowchart outlines the steps from user approach to entry, ensuring security through facial recognition or authentication, logging entries, and completing the access process.

By understanding the flow chart we can say that Smart Door it works smartly, or we can say that it is an automatic door also It will work like when you will come Infront of this door After setting up the Smart Door and making all the necessary connections to unlock the solenoid lock system that is by biometric system and wirelessly by app. Use the wireless system, we need to ensure that the ESP32 is connected to a wi-fi network. If the user clicks the unlock button in the app then the ESP32 send signal to the solenoid lock and the lock opens.

Setup is given below

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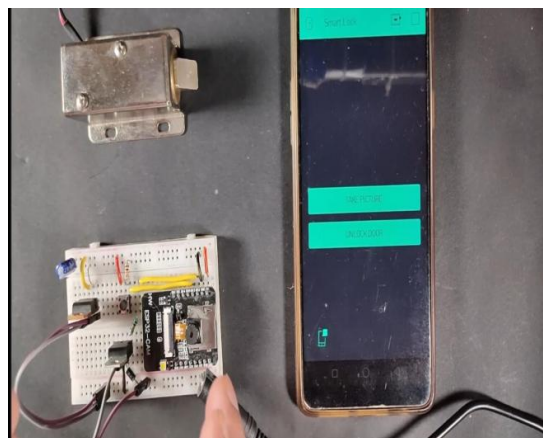
In the above picture we can see the setup of smart door system and how it will work .Also we can see the arrangements of the parts in the picture and how it will work step by step also the smart door setup involves the integration of advanced technologies to enhance the functionality and security of traditional entryways. Here are some key components and features of my smart door setup in the above picture. Implementing a smart door setup has greatly enhanced the security and convenience of my home. I believe that incorporating these technologies can provide similar benefits for you. If you have any questions or would like more details, feel free to reach out.

These are the hardware items which are used in our system

Hardware and Setup of project -
1. ESP32-CAM board
2. 12V Electronic Lock
3. TIP122 NPN Transistor
4. 7805 5V regulator
5. 1N4007 diode
6. 1k 0.25-watt Resistor
7. 10k 0.25-watt Resistor
8. 100uF 25V DC Capacitor
9. Push Switch
10. 12V DC supply
11. Project PCB

III. CONCLUSION

The proposed system allows remote access to lock or unlock the door without physical user interaction. The system fulfils the requirements of supporting autonomous locking device. The system has minimum requirements for hardware and supports customization of keys. The prototype-built shows that the design consumes minimal power, and the locking/unlocking of the door happens in 2 seconds on an average. Thus, the system proposed is feasible

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ohm Resistor 1 7 LED 1 8 FTDI 232 USB to serial interface board 1 9 12 Volt DC Supply 1 10 Arduino Uno 1 11 Arduino Cable 1 12 Finger print Sensor 1 13 Jumper wire As Required 14 Solenoid Lock 1 15 Micro SD Card 1 16 Bread Board 1 Research Journal Volume 9, Issue 3, 2019 ISSN NO: 2249- 2976 doi: 10.1120/ICECCO.2019.22492976

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