

Door Lock System Using IoT & Android

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Abstract - This Concept contains the architecture and implementation of an internet of things based mobile application for a server room access control security system. This implementation has two devices i.e. mobile and the door; both are connected to the internet. The sensors are connected to the internet (IOT) to be monitored remotely from anywhere in the world. This system save log of door status information i.e. the lock unlock information is saved on the server and is displayed on the mobile application. The application also includes several other security features to enhance the security level and make the management process easy.

Key Words: Sensors, IOT Technology , Alarm, equipment control .

INTRODUCTION

Security has become a major concern in the twenty first century; everybody wants to feel safe at his or her own home, workplace and a safe environment as a whole. Smart door security system using Arduino and Bluetooth application is a project aimed at increasing and advancing the safety and security of lives and property of the people. The project deals primarily with the protection of doors and making it more secured within our houses, office or public related buildings. With the help of smart door, when indoors or while you are away from your home and workplace, the doors are protected primarily to grant access to only authorized persons using their smart phone and Bluetooth application. With the advancement of technology smart phone has become a household requirement. As of 2007 smart phones were not more than two percent of phone industries, but in 2009 the smart phone world has taken more than fifty percent of phone market With this it is quite logical to say that there is at least a smart phone owner in every house. Android Based Smart door locking system is designed to prevent unauthorized access, trespassing and intrusion. Banks, corporate offices, financial organization, jewellery shops, and government organization are some of the common targets where

unauthorized access, trespassing and intrusion take place. Normally the aim behind such activities is stealing money, jewels or any important documents for individual gain. The purpose of Android Based Smart door locking system is to provide a smart solution to overcome the challenges and provide a feasible solution. This system works on pre- decided password concept. It increases the security level to prevent an unauthorized unlocking done by attacker. In case the user forgets the passwords, system gives the flexibility to the user to change or reset the password. This automatic password based lock system gives user more secure way of locking-unlocking the system. In our daily lives, safety is a major concern. Every person requires a sense of safety. Our security pattern includes an access control system for doors. Traditional locks are no longer as secure as they once were; anyone can gain access by breaking these locks. We need to create a system that will assist 24 hours a day, seven days a week. Only authorized individuals have access to restricted areas thanks to a password-based door lock system. Arduino is in charge of the entire system. A keypad can be used to enter the password. The door opens if the password matches the password entered in Arduino. This password-based bolt structure will provide clients with a more secure and low-effort locking-opening mechanism. Mechanical door locks will be replaced by electronic door locks in the future, thanks to the security door lock automation system. With this smart phone we can simply interface it with a arduino (microcontroller) to keep our houses and offices safer and more secure with a single click to lock or unlock the resulting door. The microcontroller will be mounted on the door which will then communicate with the device through a Bluetooth module which will be connected to the microcontroller. This project is aimed at making security better and securing the lives and properties of people at home or their work places. So we are proposing the system based on bluetooth Available with every cell phone. For this we are using bluetooth unique ID produced during manufacturing. This system is reliable and very efficient on the basis of cost and safety.

PROBLEM DEFINATION

To make an efficient use of Android & Arduino Technology. Provide solution with least hardware requirement. To develop an application that is cost efficient To develop a application for home Safety. In order to make sure that every door is safe people now look for counter measures to protect their doors. With the vast and different forms of keeping doors locked from unauthorized persons many people tend to use low means of protection. Meanwhile the deployment is of more advanced technology like the use of smart door security is a step forward. This project aims to keep doors safe and also ease access. The latching of the door is solely controlled by smart phone via the Bluetooth connection established between the device and the microcontroller.

OBJECTIVE OF SYSTEM

1. To save time & efforts.
2. Easy maintenance and Updating of data.
3. To increase data security.
4. Familiarity with a smart door locking system based on a microcontroller.
5. Using Arduino to create a simple and smart door locking system.
6. Designing secured door lock to prevent unwanted access in the server room.
7. To give the user hassle free access without compromising security.
8. This system gives notifications about access to user of a smart phone application to control the movement of doors.
9. Interfacing of arduino uno with the smart phone via Bluetooth module to establish a connection between the arduino the smart phone
10. Controlling the position of a servo motor to open or close a door which I controlled and processed due to the response of the microcontroller

LITERATURE SURVEY:

1) Fingerprint Locking System

A fingerprint locking system is a locking system that uses a fingerprint sensor module to secure the user's finger print. The fingerprint sensor module uses an Arduino or a Raspberry Pi to operate. In the proposed system, there is three-level security. Any two levels of security users have to face to unlock the system. This is the ideal option for avoiding the hassles of a stolen or lost key or illegal access. The authorized user

must register his or her fingerprint in the system. The registered person's mobile number is then added to GSM, and a permanent image password is assigned to this user. As a first step, the unauthorized individual must choose unauthorized as the user type. The admin receives a random picture. The person must properly choose the random image. Otherwise, the system will go back to the first page.

2) Internet of Things

The internet of things, or IoT, is a wireless link that works in a door lock. With the help of IoT-enabled applications, the user may unlock the door with his smart phone. The servo library is introduced after the application is developed by creating a string variable that contains the unique device ID for the lock. The essential concept underlying the door lock's operation is the ID supplied by the Android phone via the created app.

3) Knock-Pattern Using Arduino and GSM Communication

This system, which consists of Arduino, GSM Module ,Servo Motor, and other components, employs a 'Secret Knocking Pattern' that is only known by the owner of the safe, luggage, or other property or item on which the device is mounted. For the lock to open, the knocking pattern must be used only at a certain location, which is only known by the owner. The secret pattern can only be changed after the secret knock has been unlocked. Because there is no key to be copied, this approach fully eliminates the worry of duplication. [3]

4) Keyless Entry System Based on Arduino Board with Wi-Fi Technology

A key less entry system that focuses on the use of an Arduino circuit board, a Wi-Fi module, and the PHP programming language to provide access to a closed door. The suggested solution, which uses an Arduino Uno board and a Wi-Fi shield to unlock the door without a key, is described. The internet connection allows the system to unlock the door from any place, unlike traditional systems, which have a limited range.

5) **RFID Based Access Control System**

A magnetic door lock is administered through an RFID reader in the suggested system, which begins the authentication and validation of the user or regulates access in short. In addition, the systems keep track of each user's access and exit records in the form of a log report for each access. To avoid unforeseen circumstances, the administrator of the central subsystem can terminate the validity of any user at any moment.

6) **Paper: “Infrared Optical Wireless Communication for Smart Door Locks Using Smart phones”. Volume 4, No 4, April 2016 Journal of Global Research in Computer Science.**

Kaustubh Dhondge, Kaushik Ayinala, Baek-Young Choi, Sejun Song 12th International Conference on Mobile Ad-Hoc and Sensor Networks, 2016. With the recent rapid advancements in the Internet of Things (IoT), one of the applications being developed is that of smart door lock (SDL) systems. SDL are intended to offer high security, easy access and easy sharing. Unlike existing SDL solutions that mostly use biometrics or crunched RF spectrum, we uniquely propose to use Infrared (IR) optical wireless signal (OWS) using IR light emitting diode (LED) of smart phones. We designed and developed a complete system of Android smart phone app including physical layer encoding, a cloud server and programmable hardware prototypes using Arduino as well as Raspberry Pi. Optlock includes multi-level security schemes including user registration, authentication and authorization using one-time-password (OTP). This extensive experiments show 100 accuracy with 1.33 kbps of averagedata rate is achieved up to 20 meters of distance between a smart phone and a lock. It allows convenient remote access, easy access control and sharing as well as high security.[6]

7) **Paper: “Software card emulation in nfc enabled mobile phones great advantage or security nightmare”**

M. Roland in Fourth International Workshop on Security and Privacy in Spontaneous Interaction

and Mobile Phone Use, 2012, pp. 1. Software card emulation is a new approach to advance the interoperability of NFC with legacy contactless smartcard systems. It has been recently introduced to NFC-enabled mobile phones by Research In Motion (RIM) on their BlackBerry platform. Software card emulation aims at opening and simplifying the complex and tightly controlled card emulation functionality. While this form of card emulation, that gets rid of the secure element (a device tightly controlled by the big players), is a great chance for development of innovative NFC applications, it potentially makes card emulation less secure and paves the way for interesting attack scenarios. This paper evaluates the advantages and disadvantages of software card emulation based on existing application scenarios and recent research results.[7]

SYSTEM ARCHITECTURE

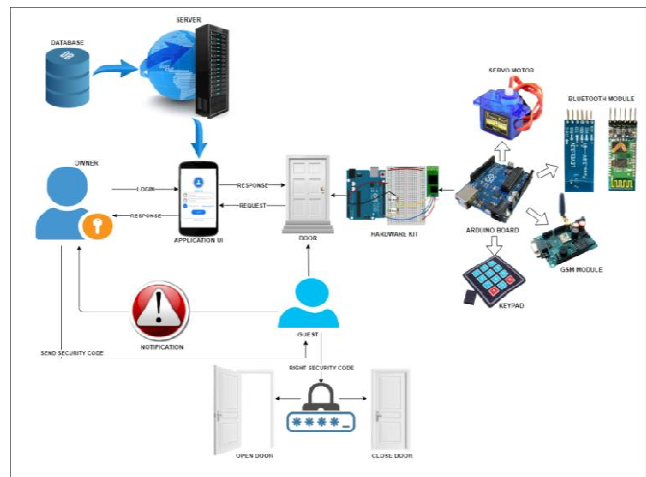


Fig -1: System Architecture Diagram

ADVANTAGES

1. Ease of use.
2. Programmable Security Clearances
3. Automatic Door Lock/Unlock Scheduling
4. Centralized Management
5. Easy maintenance and Updating of data.
6. To increase data security.
7. Smart locks increase accessibility with no

compromise on security.

SYSTEM REQUIREMENTS

• Software Used:

1. Operating System: Windows XP and later versions
2. Front End: HTML, CSS
3. Programming Language: Java
4. Dataset: Firebase

• Hardware Used:

1. Processor – i3
2. Hard Disk – 5 GB
3. Memory – 1GB RAM
4. Smart Phone

CONCLUSION

Thus “Android Based Smart Door Locking System” is a modern successor of the conventional door locking system. This system is very cost effective and easy to install and is designed under different modes which makes it useful. “Smart Door Locking System Using Android App” is a modern take on the traditional door lock. The innovation generated by the lock system with no more direct touch between the user and the lock is the end of the topic of smart Lock utilizing Arduino. This method is both in expensive and simple to set up. Finally, it was revealed that the project performed as expected and that it can be implemented. Because the Arduino UNO microcontroller is used in this project, the design is simple, and the project may be completed in less time than with other techniques. A safe locking/ unlocking system based on a keypad and Arduino is proposed in this paper. Adding a password on the Arduino side improves the security of the system.

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