

Android based Smart Door Locking System

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Abstract- In today's scenario we are totally dependent on internet to help us. This preview discusses about the Cloud based device with the help of ESP8266 and Arduino. The main aim is to unlock electric door lock using smart phone which has android app which uses IoT.

Keywords: *Arduino Uno, Android, BOLT IoT, Smart Phone.*

I. INTRODUCTION

Android-based Smart Door Locking System is used to prevent unauthorized access and trespassing and intrusion. This System can be used anywhere ranging from Jewellery shops to Financial institutions as well as private homes. This Door locking system also is equipped with Smart Door Bell which will, in turn, make the entire system complete and secure. This system is made with a vision to make door locks smart with IoT so that one can unlock his/her home door from anywhere

This System works on the cloud provided by Bolt IoT. The Android app is connected to the cloud. Once the user unlocks the door from Android application a request will be sent over the cloud to unlock the door. The devices which are used are Bolt IoT Device(ESP8266[MOD]) and Arduino UNO R3. The Bolt Module will receive this request from the cloud and send a signal to Arduino which will, in turn, unlock the lock. Smart Door Bell is also used which is used when a person who is at the door rings the bell. The Bolt device will send information to the android application which will notify the user that someone is at the door. Also each Bolt device has unique API key which will make the system more secure.

II. LITERATURE REVIEW

Smart Key Door with Wireless Security System using RF Signal [3] and Door Locking System using RFID Technology [4] using different mechanism to lock and unlock the door namely RF identification card (RFID).

Both using PIC 16F87XA as a micro controller. Besides that, the Main Door Security System using SMS [5] propose the uses of Short Message Service Text Messaging (SMS) as a mechanism to control the system via mobile phone to lock and unlock the door. Rabbit Microprocessor is use as a micro controller to perform this operation. Face Recognition Based on Auto-Switching 978-1-4799-5686-9/14/\$31.00 ©2014 IEEE 227 E.I.S Saadon Pusat Pengajian Diploma, Universiti Tun Hussein Onn Malaysia Johor, Malaysia eddy@uthm.edu.my Magnetic Door Lock System using Microcontroller [6] use face recognition as a mechanism to lock and unlock the door.

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E.I.S Saadon Pusat Pengajian Diploma, Universiti Tun Hussein Onn Malaysia Johor, Malaysia eddy@uthm.edu.my Magnetic Door Lock System using Microcontroller [6] use face recognition as a mechanism to lock and unlock the door.

III. PROPOSED SYSTEM

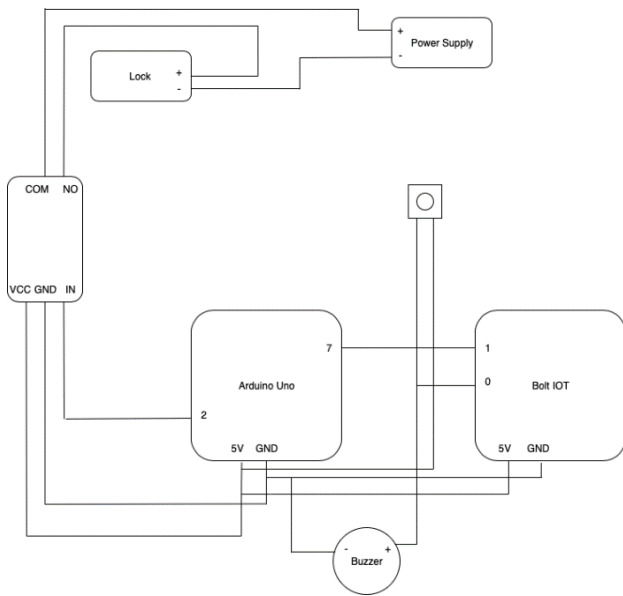


Fig.1. Proposed System

The door is controlled using cloud technology provided by BOLT IOT. You can control the lock using the android app provided with it.

Operation:

1. When someone press the bell, the BOLT IOT device (which is nothing but ESP8266 with custom firmware) reads the signal and then send a response via BOLT IOT cloud API, android app reads the response and sends a notification on users phone as "Someone is at your door ", you can then click on the notification and your android app will open. You can also open the door without the notification.
2. You need to login into the app for security reasons.
3. After successful logging into the app the user can then unlock the door by clicking on the open button.
4. After clicking on unlock button, BOLT IOT cloud API is hit and then it writes data on to the BOLT IOT device. BOLT IOT device also sends a response via BOLT IOT cloud API about the status of the device. If the device is not connected to the internet/cloud it will display error that "Device is Offline".
5. Then the BOLT IOT device send a digital write signal to Arduino, then Arduino writes a digital signal to unlock the solenoid lock. After a delay the solenoid lock is again locked automatically.

IV. SYSTEM IMPLEMENTATION

A. Arduino Board

It is responsible for unlocking the door lock which it receives command from Bolt IOT Device.

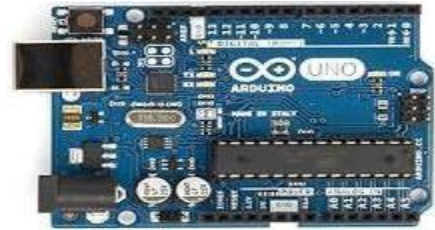


Fig.1. Arduino UNO Board.

B. Relay Module

Relay Module is an electrically operated switch. It is responsible for completing the connection of solenoid lock and the power supply.



Fig.2 Relay Module

C. BOLT IoT Device

BOLT IoT device is responsible for send the information to the cloud to which the android app on smartphone is connected. It is a modified version of ESP8266 which has BOLT firmware. It requires to be connected to WIFI.

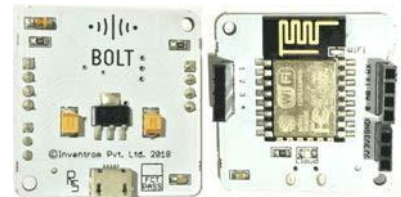


Fig.3. Bolt IoT Device.

D. Solenoid Lock

It is the door lock which is used in the project.



Fig.3 Solenoid Lock

Table 1 shows the system components and its purposes.

| Component Name | Purpose |
|-----------------|--|
| Arduino UNO | Receives signal from Bolt IoT device and unlocks the door lock via relay module. |
| Relay Module | It is responsible for completing the connection of solenoid lock and the power supply. |
| Bolt IoT Device | It is used for sending and receiving info to the cloud as well as Arduino UNO. |

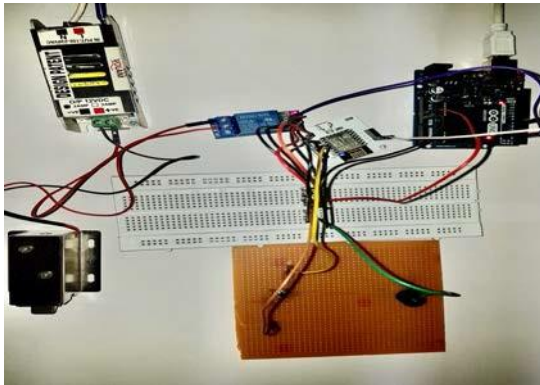


Fig. 4. System Representation

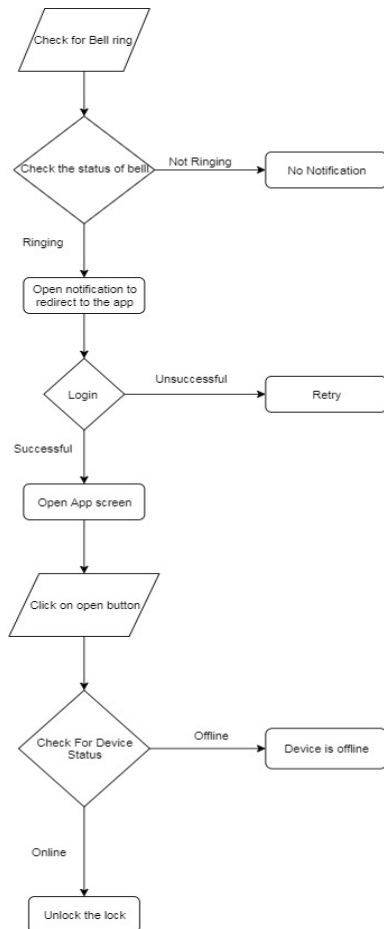


Fig. 5. Flowchart of Proposed Design

V. CONCLUSION

Thus “Android Operated Door Lock System” is a modern successor of the conventional door locking system. The conclusion of the discussion of Android Operated Door Lock using Bolt Cloud is the innovation created from lock system with no more direct contact between the user and the lock. This System is very cost-effective and easy to install. In conclusion, it was discovered that the project performed according to specification and can be implemented.

VI. FUTURE SCOPE

A rechargeable battery can be provided which can give power backup of 3-4hrs in case of power failure. Use of camera can also be done for surveillance. For further security, finger scanner, face recognition can be used. To avoid opening of door every time, voice conversation can also be done with the person on the other side of the door. If the user has smart home then it is possible to give access to the TV, Fan, Lights etc. through Mobile Application.

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