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# IOT Based Lock System

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***Abstract:*** ***The Sole purpose and vision which our project entitled to is clearly subjected to serve the home automation. Safety has been a paramount at every level, even if we talk official premises or in the household areas. Intercom Automation also works over the same nexus, as periodically by the time things have changed in every field, as foremost the technology has always been taking a leap of success nearly every half a decade. Intercom Automation is entitled to a pacific vision of Home Automation. Intercommunication between AI and humans is taking world to a new revolution keeping in mind all the regularities. As the name suggests the Intercom Automation is purely a combination of intercommoned automation between a commanding human and machinery, seeking a perfect blend of security. In the project we are designing an IoT based lock system which will further undue it's operations on a particular command. The name is inspired with the functionality itself, since it is the Intercommunication between human species and is derived for the use of automation. Apart from this, specific keys will also be there in case the machinery does passes by some glitches or is not able to recognize the stored voice. This lock system will certainly be boosting the anti theft manifestos as we look forward to making it much more prolific and valuable.***

***Keywords: Arduino Uno, Wi-Fi Module, Google Assistant, IFTTT***

## I. INTRODUCTION

As we know locks are used for safety purposes, and this advanced lock system serves the same application and purpose. The project will help in developing a much secure and reliable lock system which will be a next step towards a high commanded anti-theft program. The phone and voice will come in collaboration to sense the out bringing meant for any use.

Similarly, this highly advanced IoT based lock system will conform to the raised security standards. The lock in machinery equips an Arduino Board in connection with a Wi-Fi Module (ESP 8266) also known as Node MCU. In addition to this the couple of freeware software are further in order to connect Wi-Fi modules and to do the same with the mobile phone of the owner of lock. Blynk, IFTTT are the two freeware being used in addition to the Google Assistant which will be the command receiving branch of the device. As far as the mechanism is concerned, to operate the lock the user has to give command to the Google Assistan or a link can also be generated by the IFTTT for the same which is in connection with the assistant.

Command will only be operated by the owner of the lock via the Google Assistan since the mobile phone and the unlock concern will be the sole discretion of the user only. If we talk about safety, the lock will come with a Google assured safety since the Assistant will be the paramount here in the case, a phone can only initiate Google Assistant commands when it is unlocked, if locked no one will be able to access it. In Android phones, the Google Assistant is pre-installed as default companion, whereas iOS users can easily download the Google Assistant application for usage of this particular lock.

For the more safe side, a key will also be provided in order to open it in a normal way, if the machinery meets any glitch or is not behaving properly so that the user is not restrained and confined only to the digital manifesto of the project. The key serves as a security token for access to the locked area; only persons having the correct key can open the lock and gain access. In more complex mechanical lock/key systems, two different keys, one of which is known as the master key, serve to open the lock.

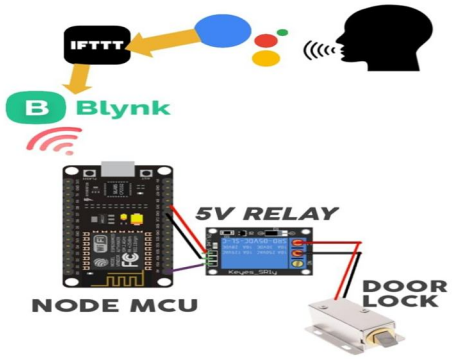


Figure 1: Complete circuit diagram

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First of all a NODE MCU (Wi-Fi Module/ ESP 8286) is connected to a 5V relay and that particular relay is connected to the lock which the user will be having. This completes the hardware part of the project. Forth this, the ESP 8286 is connected to the Blynk app for the internet connectivity of the module and for the restoration of the commands. Later on the Google Assistant will come into play and it will be there in connection with the IFTTT, which is an abbreviation for "IF This Then That". The sole purpose of connecting Google Assistant with IFTTT is to operate the lock with the voice commands, since the lock opening links will be correlated to the Google Assistant™. Thereby, the user will be easily able to operate the lock with his voice, as the voice recognition will come into play.

## II. VISION

The vision of the particular initiative depends on providing a reliable, safe and affordable home automation machinery, by means of which one can enjoy cheap automation with best of the safety and security standards which is not that easy to void and sealed with maximum integrity of Encryption.

The pricing is one important thing always kept in mind while designing everything which is intended to serve humanity, here also we have kept all such possible factors in mind.

As far as the blend of project is concerned, it involves quite a few components like Node MCU (Wi-Fi Module), Arduino and a Solenoid operated lock as main components of the hardware circuitry, thereby the price of the overall project is restrained to less than $40. The price corroborates the affordability as fair as the Automation is concerned.

## III. HOME AUTOMATION IN PAST

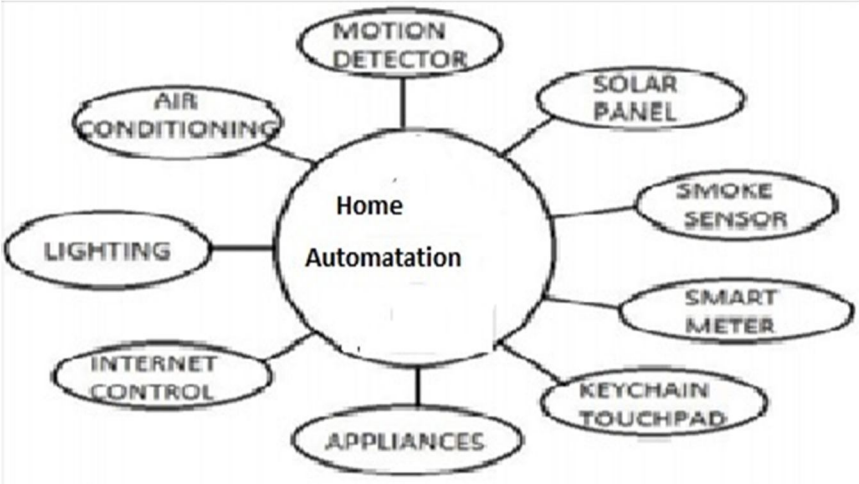


Figure 2 : Home Automation

Home automation really started in a physical sense with the formation of mechanization items, starting with home apparatuses. The centralization and automation of private exercises has its underlying foundations in the principal electrically-wired private structures toward the finish of the nineteenth century. The capacity to enlighten the room from a solitary switch radically changed the way we lived by making it simple and moderately safe to light vast regions for broadened periods around evening time.

1901-1920: The invention of home appliances- like refrigerators, washing machine, dishwashers, irons, toaster and garments dryers.

1966-1967: The invention of ECHO IV and Kitchen Computer- the ECHO IV was the first brilliant device. In spite of the fact that it was not industrially sold, the device could register shopping records, control the home's temperature, and turn apparatuses on and off. the "Kitchen Computer" was made for the current year. The apparatus was equipped for putting away formulas, yet didn't offer many models because of poor advertising. The cutting edge came as the Internet, which made an overall system of PCs in the 1990s. Before long, remote Internet as Wi-Fi turned into a typical apparatus in American homes.

2000's: The early 2,000's saw a further ascent in brilliant home innovation, including local tech, home systems administration, and different devices showing up available. A combination of short-range technologies created by Zen-Sys in 2005, this wireless technology creates a mesh network at the user's home and sends signals at the 900 MHz spectrum. The Z-Wave technology is capable of connecting a variety of devices to control appliances, door locks and even flood monitors.

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## IV. APPLICATIONS

### *A. Canary*

Canary is a New York-based startup founded in 2014 by Adam Sager, Chris Rill, Jon Troutman. They in the latest round of funding has raised 66.1 Million USD funding in 2018. They specialize in Home Security systems. Few versions of Canary like Canary Pro security camera have Camera, Siren and Air Monitor together in a single set-up.

### *B. August Home*

August Homes bring Smart Locks as the innovative product range that is dedicated to security and technical advancements of smart lock systems. Apart from their signature smart locks, they have doorbell cameras and other accessories. Jason Johnson and Yves Behar founded August Home in 2012. There are around 55 patents registered with August Home in Locks; Keys; Windows/ Door category.

### *C. HomeSeer*

HomeSeer is leading technology provider in the field of home automation since last 20 years. Smart Home Hubs are specialized product range from HomeSeer. It brings integrated automation and security controls for Lights, Garage Doors, Temperature, Door Locks, Water Valves and Security Cameras. Company claims that their products are easy to set-up, automate and handle. HomeSeer was launched in 1999 by Richard Helmke and continues to grow on steady path of progress since then.

### *D. Vera*

Vera helps to simplify our daily complicated systems. Along with the controllers and side angled security cameras, Vera also produces Vera Sentinel (Advanced Camera Management) and Vera Easy Start (Personalized Set-up Assistance). Vera was started back in 2008, by Lewis M. Brown and is headquartered at Causeway Bay. With around 25 employee on board and number of clients, Vera has is one of the leading home automation solution company.

### *E. Lighting*

These days, smart lighting is all the rage. They can be scheduled to turn on/off and change their intensity. However, in future, it is possible for this to be taken a step further. With IoT enabled across the home, the lights can respond to other actions you take.

### *F. Doors*

In the future, doors can become smarter as well. Imagine them opening only when you enter or close. This may be made possible via a smart device or facial recognition. This can be taken to the next step by getting the rest of the house take actions in tandem with your entry.
For example, the lights can turn on as soon you as enter through the door. Alternatively, if you are leaving, they can turn off.

### *G. Windows*

Windows can become smarter as well. Imagine them automatically open the shutters when the sun rises and close at sunset. You may even be able to program them to close automatically when it rains. Consider the previous example of a home movie. Your curtains can lower whenever you are watching a movie.

### *H. Thermostat*

These days, you can control your home thermostat remotely via apps. In the future, you may not even need to do that. The thermostat will be able to recognise if you are nearing your home. It will then check the room and external temperature and set the right one for you. It may even recognize when you are taking certain actions and adjust accordingly such as when you are showering or exercising.

### *I. Home Routines*

It is already possible for much of the home to be connected with smart devices. There are smart sockets that automatically turn on/off devices. Smart alarms can play music when you wake up or even tell you the news. Voice assistants can even run entire routines where the lights, home appliances, thermostat, alarms and other devices are controlled.

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Going forward, this will be extended throughout the home. Consider the morning routine. The shutters will open right before you wake up to help you get rid of that grogginess. Even before you wake up, the coffee maker will start getting your morning cup ready. The bathroom will get the water heated for your shower. Your stereo will start playing some morning tunes as you have your morning cup. Your TV will also turn on and show you your preferred news channel. Of course, the thermostat will adjust to a comfortable temperature.

## V. SCOPE

Before proceeding any further, let's take a closer look at IoT. 'Internet of Things' is an umbrella term used for all technologies that enable the connection of a device to the Internet.

Such systems depend on the collection of data. The data is then used for monitoring, controlling and transferring information to other devices via the internet. This allows specific actions to be automatically activated whenever certain situations arise. In a simple example, consider a smart kettle. The kettle can be programmed to automatically turn off once it reaches a specific temperature. It might also send a notification to the user on the same.

Now apply the same concept to the entire home and all the devices present. That is a smart home powered by IoT. Instead of manually going up to the device and taking action, those actions can be taken at the press of a button. These days, most smart IoT home automation devices allow you to control them via an app or even via voice commands.

Now imagine if you did not even need to undertake such actions. In other words, the smart home will know when to take certain actions and automatically take them. This is where the future of home automation and IoT lies.

## VI. CONCLUSION

Once a dream, IoT home automation is slowly but steadily becoming a part of daily lives around the world. In fact, it is believed that the global market for smart home automation will reach $40 billion by 2020. This shouldn't be surprising when you consider the convenience and ease that smart home devices offer. Since these IoT devices are interconnected, it becomes easier to manage multiple operations. In fact, IoT home devices also help in reducing costs and energy, not to mention time as well.

Thereby, the whole motive isn't just to forge the Automation ahead, apart from that the Cheap Automation is something which this initiative works on at no additional cost, We know that, Automation isn't very much proficient and prominent specially in many parts of the world and that can be because of people not having much faith over it, but more due to the exorbitance. Thus, we hope this should be a massive success in promoting Automation as well for most of the people to get highest standards of security at minimal cost. We are using a complete different pattern as mentioned above by using a new derived component circuitry, however in assistance to RFID the storage of certain information can be included, whereas the fingerprint can be added to provide strength to the combination of the components initially being used that are Arduino, Wi-Fi Module (Node MCU) and Lock.

This paper shows a general overview of smart home project that are masterminded by their expected services. It also covers the survey of various technologies which emphatically support the home automation systems in reliable way. This paper recognizes a few future bearings of smart home research. The future healthcare service provider will consider the smart home powerful method for giving remote social insurance administrations, particularly to the elderly and disabled people. In future home automation will smarter and it would be extended to the large-scale environment.

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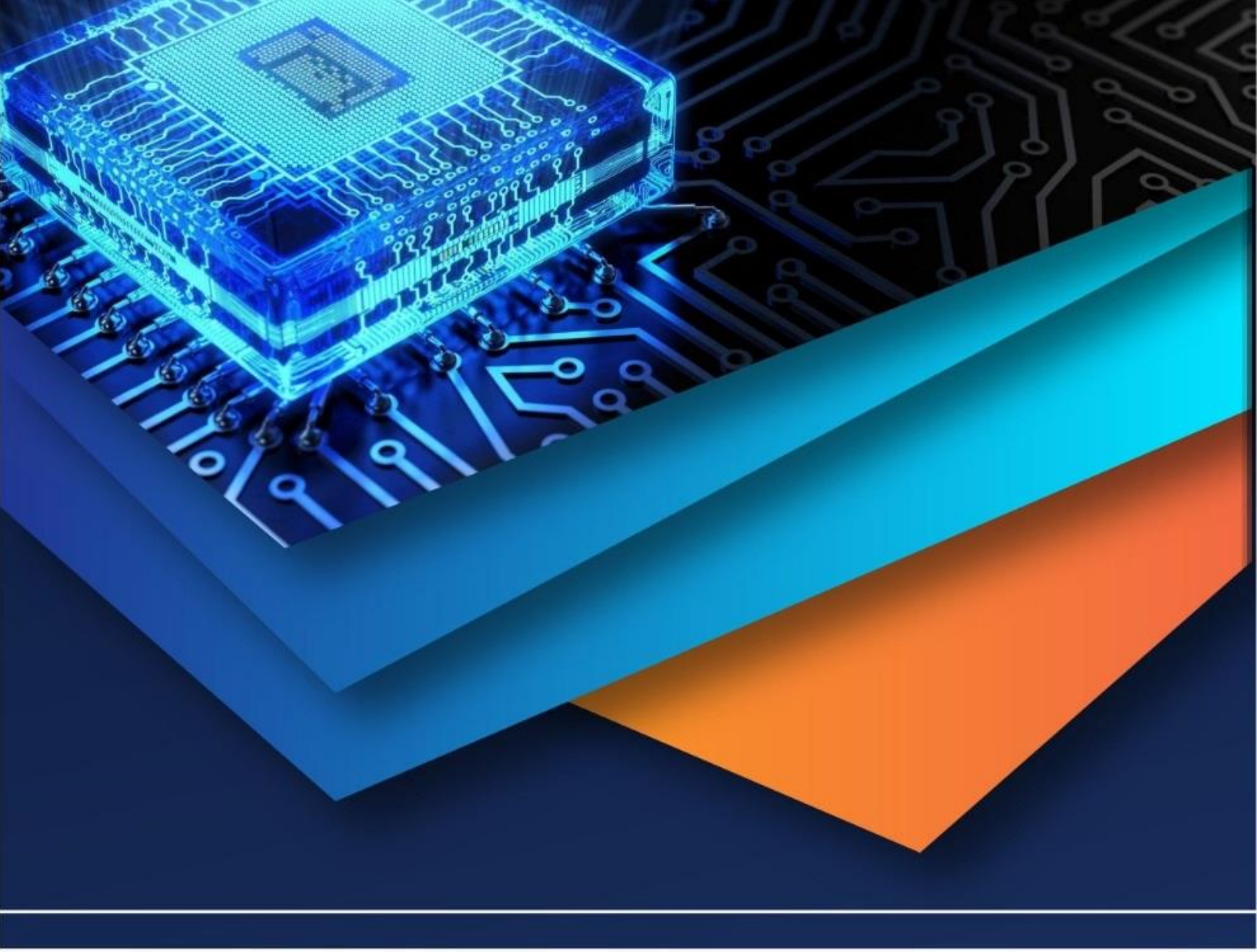

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