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IOT Based Smart Door Locked System Using Node MCU

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Abstract: ***People are experiencing more security issues around the world today, and security has become the most important concern everywhere in the world; as a result, security has become increasingly important in recent years. Security refers to the safeguarding of our lives and property. It is critical to ensure the safety of people and their valuables in order to prevent illicit handling. As a result, concentrating on door lock or gate security is critical to minimize more difficulties in the monitored area. The goal of this project was to create an internet-connected door lock that could be simply put on a variety of doors, operated via the internet, and trusted for security. Modern homes are gradually moving away from traditional switches and toward a centralized control system with remote control switches. A smartphone-controlled home automation system gives a modern answer. The most significant advantage of our proposed system is to build smart door lock which can be access remotely via mobile, to increase security of the house and to design and implement a cheap and open source home automation.This project will make human lives more versatile with enhanced security, ease, and the ability to live an upper-class lifestyle, resulting in our lives becoming much simpler, finer, accessible, and stable.***

Keywords: Door lock system, NodeMCU, Home automation, Relay, Webpage.

I. INTRODUCTION

The idea of connecting common physical objects to the internet is referred to as the "internet of things" in computers. connected to the internet and able to recognise and comprehend other devices' interactions items found online. The Internet of Things (IOT) is a technology framework for communicating with electrical items in the modern computer age. Due to its flexibility and ease of use, wirelessly operated gadgets have been gaining market domination in a number of sectors, including consumer electronics and home security. This kind of technology is referred to as the "internet of things." With the use of this technology, new automation systems for homes, businesses, and other settings are being created.

The major goal of smart home technology is to improve living conditions by introducing networking tools and equipment within the home. A smart house allows for complete automation, resulting in comfortable living conditions and additional advantages for those with disabilities. Every door locking system now in use requires a traditional key or some other type of NodeMCU to access the system.By creating an HTML webpage, users can access the door lock and open or close it.

By employing other wireless connections, this strategy can be expanded to commercial areas such as ATMs, vending machines, etc.

The house is one of the structures that has been utilised as a place to stay for a very long time. Home owners spend the majority of their time outside the house. In big cities, these kinds of things happen frequently. As a result, the home frequently goes unoccupied for extended periods of time, especially around special occasions like Christmas, New Year's Eve, and Eid. Living in such conditions can motivate burglars to commit theft. Homes get smarter as technology develops. Modern homes are quickly transitioning away from traditional switches in favour of a centralised control system with remote control switches. The most significant advantage of our proposed system is to build smart door lock which can be access remotely via mobile, to increase security of the house and to design and implement a cheap and open source home automation.This project will make human lives more versatile with enhanced security, ease, and the ability to live an upper-class lifestyle, resulting in our lives becoming much simpler, finer, accessible, and stable.

II. LITERATURE SURVEY

This paper suggests a technology that will make human lives more versatile by enhancing security, ease, and the ability to live an upper-class lifestyle, resulting in our lives becoming much simpler, nicer, more accessible, and consistent. It shows inventiveness in house control by replacing manual keys with digital codes and knocks for a door lock at home, anticipating future security trends and replacing hi-tech manual locks with Digital Smart Locks. Furthermore, the implementation expenses of the developed system have been maintained to a minimum, making it accessible to anyone looking for home protection. The Digital Smart Home, in contrast to the rest of the technologies described in the literature review,

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It's simple to manage and implement. It supports IoT, cellular technology, and a non-proprietary open-source Android operating platform. The proposed viewpoint registers, as well as the essential architecture, to work with Wi-Fi technology for integration, an Android-based App for client ingress, and client testimonials for dependability and verification. The structure laid out might then be developed to encompass other facets of house remodelling and dependability. Additionally, these research projects are routinely supplemented to accommodate non-Android operating systems.

A. Hardware And Software Requirements

Category	Component	Function
Hardware	Solenoid door lock	To Open/Close door
	1 channel 5V relay	To control high voltage
	NodeMCU(ESP8266)	As Data processor
Software	Arduino IDE	To Write and upload code/sketch
	HTML	For Webpage
	Proteus	For Simulation

Fig.2.1

B. Block Diagram Of The Proposed System

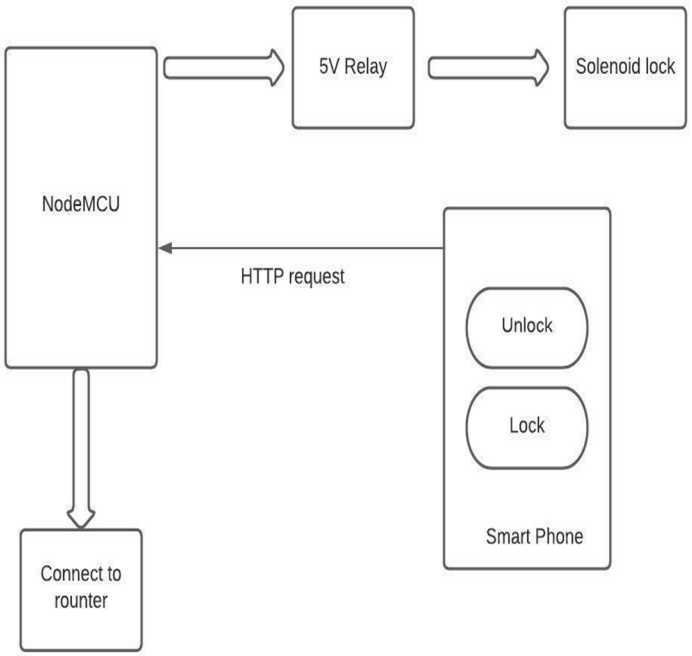


Fig.2.2

C. Flow Chart Of The System

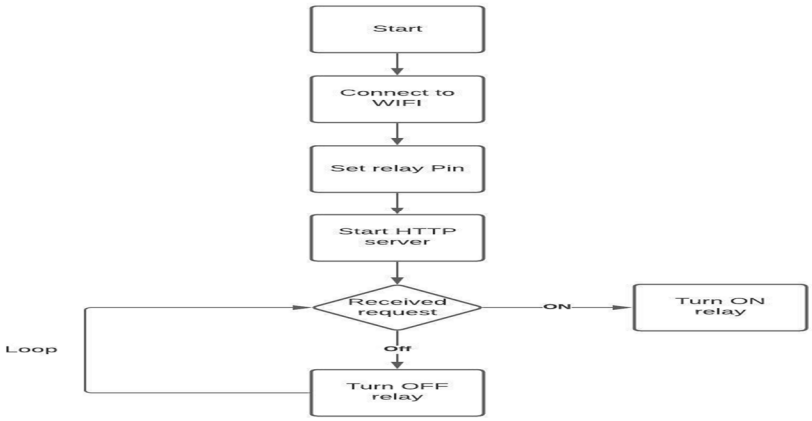


Fig.2.3

III. IMPLEMENTATION OF THE PROPOSED SYSTEM

In our project, we implemented a door locking and unlocking system that can be controlled remotely via a mobile application. A solenoid lock, a single-channel 12v relay, a NodeMCU ESP8266, and a 12v dc converter were utilized. A solenoid lock can be activated automatically by applying voltage to it. When an interrupt is activated in a solenoid lock, a low-voltage solenoid pulls the latch back into the door. The latch will remain in place until the interrupt is activated. The operating voltage of the solenoid lock is 12V. In an IoT smart door lock, the NodeMCU ESP8266 is used to connect a solenoid lock and a relay module.
A detailed explanation of the hardware and software used in this approach is given below.

A. Node MCU



The Node MCU platform is an open source IoT platform that is free to use. It includes software for the ESP8266 Wi-Fi SoC from Espressif Systems, as well as hardware for the ESP-12 module. The term "Node MCU" usually refers to the firmware rather than the development kits. The firmware uses the Lua scripting language. It is built on the eLua project and uses the Espressif Non-OS SDK for ESP8266. Lua-cjson and SPIFFS are two open source programmes that are used.

B. Solenoid lock

A solenoid is a coil made up of long, tightly wrapped cables with a diameter that is greater than its length. The Solenoid Key, on the other hand, is a hybrid of a key and a Solenoid that is commonly used to electrify devices like automatic locks and other similar devices. The Solenoid Principle was discovered by Andre Marie Ampere, a French scientist. In the field of engineering, this term refers to a device that converts energy into linear motion. An electromagnetic force is formed when an electric current is used to ignite a coil, pulling the iron at the coil's core in a linear path.

C. Relay

An electromagnet activates a relay when a little quantity of current is provided to the signal pin. The 1-Channel 5V Relay Module is 5V 1-Channel relay interface board with screw terminals that may be controlled Arduino,AVR, PIC and ARM microcontrollers.A high-quality relay is included on the board,which can be handle up to 15 amps at 125 volts and 10 amps at 250 volts.

The common-C ,normally open-NO, and normally closed- NC connections on the relay are all attached to three pin screw terminals, making connecting and disconnecting the relay a breeze. The board contains a power indicator and a relay status LED to aid debugging.

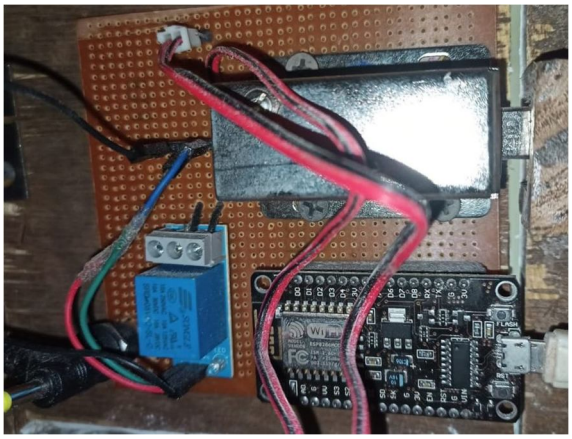


Fig.3.1 Circuit of proposed system



Fig.3.2 Model of proposed system

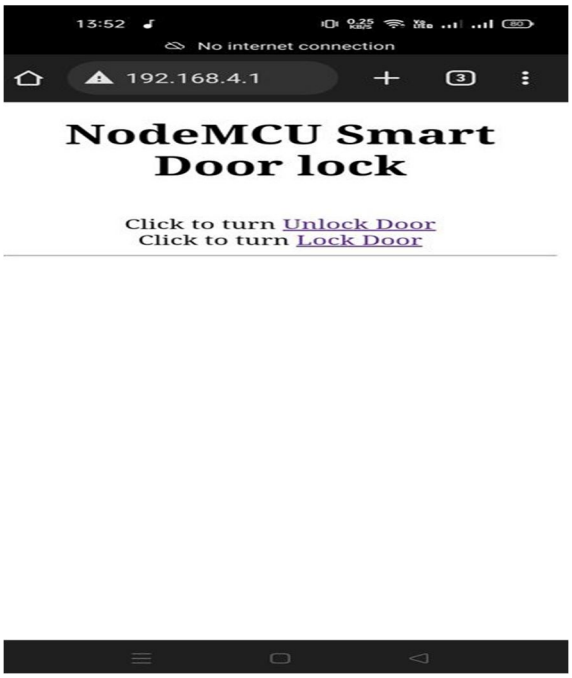


Fig.3.3 Webpage

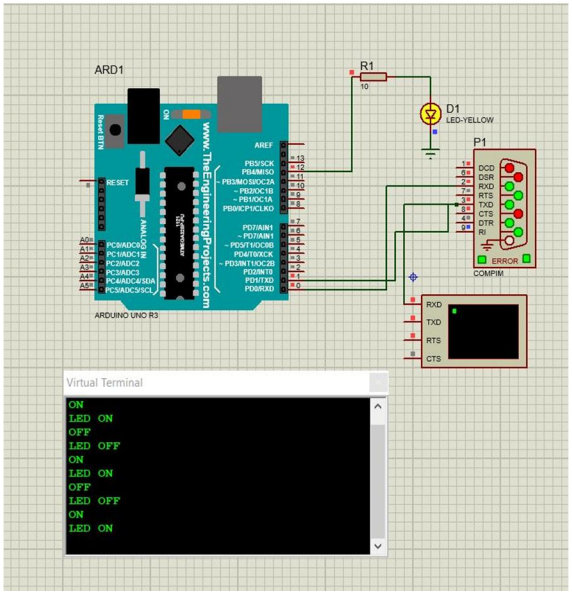


Fig.3.4 Simulation

IV. CONCLUSION

This project will make human lives more versatile with enhanced security, ease, and the ability to live an upper-class lifestyle, resulting in our lives becoming much simpler, finer, accessible, and stable. The cost of implementing the designed system has been kept low, making it affordable to.Everyone is looking for home security. In contrast to the majority of the technologies described in the literature review, the Iot-based door lock system is simple to implement and manage. It supports IoT, cellular technology, and an open-source Android system platform that is not proprietary. The proposed system intends to address the shortcomings of the current system and to improve it by implementing certain innovative ideas suggested by some related publications.

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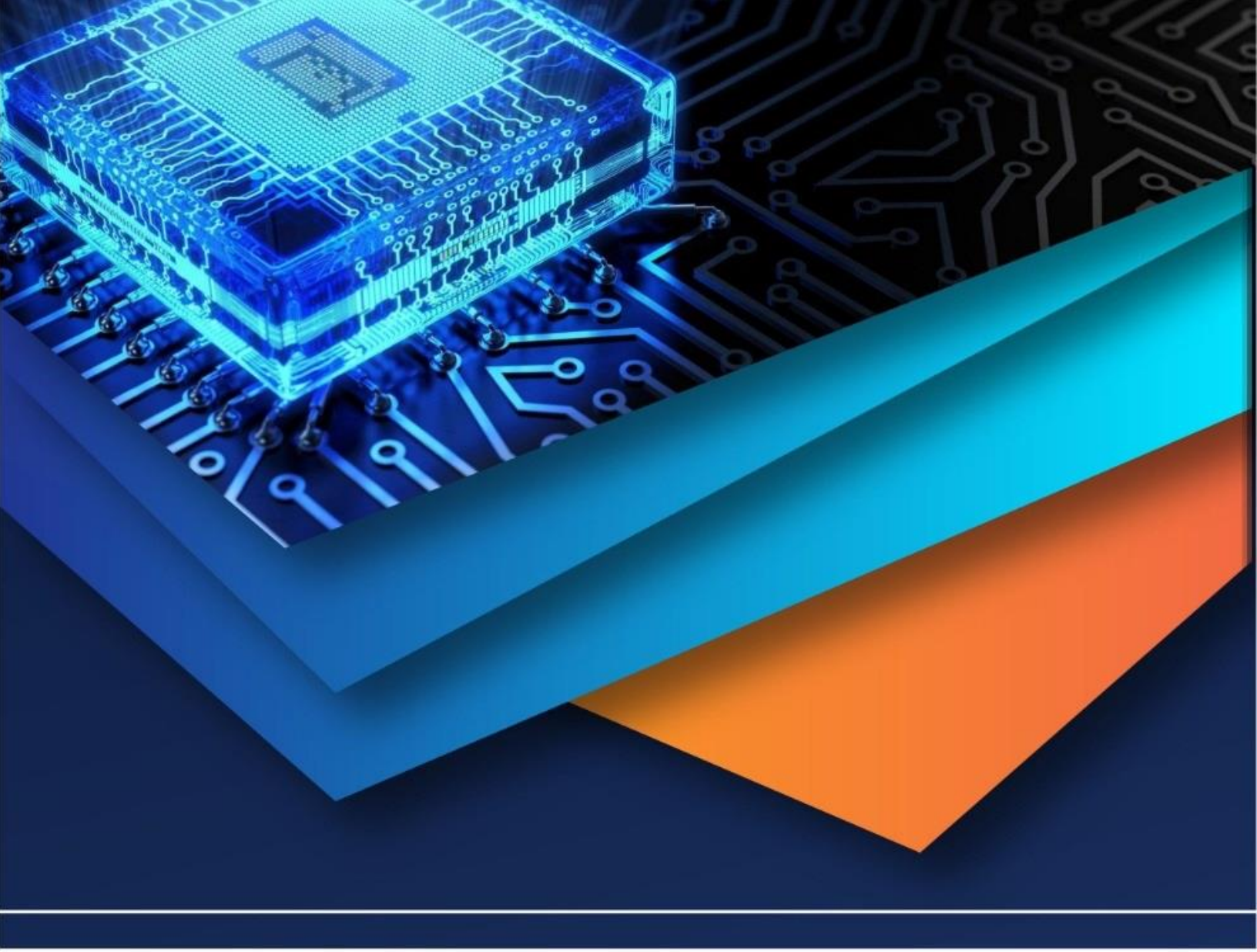
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