

SMART BUILDING

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ABSTRACT

The internet of things (IoT) is connecting the devices and tools to the internet network to be controlled by websites and smart phone applications remotely and also to control tools and instruments by codes and algorithms structures for artificial intelligence issues. In case we want to create advanced systems using python algorithms, Wi-Fi or Ethernet connection is connected to our tools, equipment, and devices controlling them by smart phone applications or internet websites. That's actually the simplified definition of IoT.

Further than just using the IoT as a Smart Building to prevent the incident happening and it can be used as a security system and used for an industrial-use, this smart building project , device will get connected to WIFI, the minimum and maximum parameter can be set accordingly.

Such IOT as well as Arduino based gas leakage detector in a smart building systems can be installed in homes, hotels LPG gas storage areas. In this LPG gas detector system senses the gas using the MQ5 gas sensor. This device will continuously monitor the level of LPG gas present in the air. While monitoring, if the value of LPG gas in air is within the set limit then the RGB LED on the circuit will glow green giving a safe sign. Earthquake sensor is used to detect the vibration which is caused by the earthquake waves and helping button to help those people who are in danger when they weren't alone and no is there to help them.

If their is a leakage then alarm start hooting to aware the people and it also aware a security guard of the building that their is a issue so he takes some preventative steps to stop it.

INTRODUCTION

Life Safety is one of the important needs of every human being. Every person on earth wants that his or her belonging should be safe and secure. And it is well said that lies in our own hands keeping in mind this concept we have designed our project on security system of our Smart Building. This system is IoT based on an embedded project. Embedded means combination of both the software and hardware, in this we are implementing the security using three methods in our Smart Building, i.e.

- Smoke Detection
- Fire Detection
- Earthquake Alert(IR sensor)

A load control by a computer system has more advantages compared with the manual control load. Now a days there are many programs and applications help to control things better using codes and python algorithms in the artificial intelligence projects. In order to save energy and make loads monitored easily, this research suggests Smart Building project based on the IoT technology. This Smart Building is an Internet of Things (IoT) project that controls load with internet connection via Wireless Fidelity WIFI connection. A smart phone connected to internet with Blynk application as control panel, and NodeMCU microcontroller kit in other side as a controller that receives control command through WIFI signals. NodeMCU kit is built with ESP8266 WIFI receiver that able to process and to analyze WIFI signal to input the microcontroller. The WIFI receiver and the microcontroller are built in one kit to be used as IoT project. It is called NodeMCU.

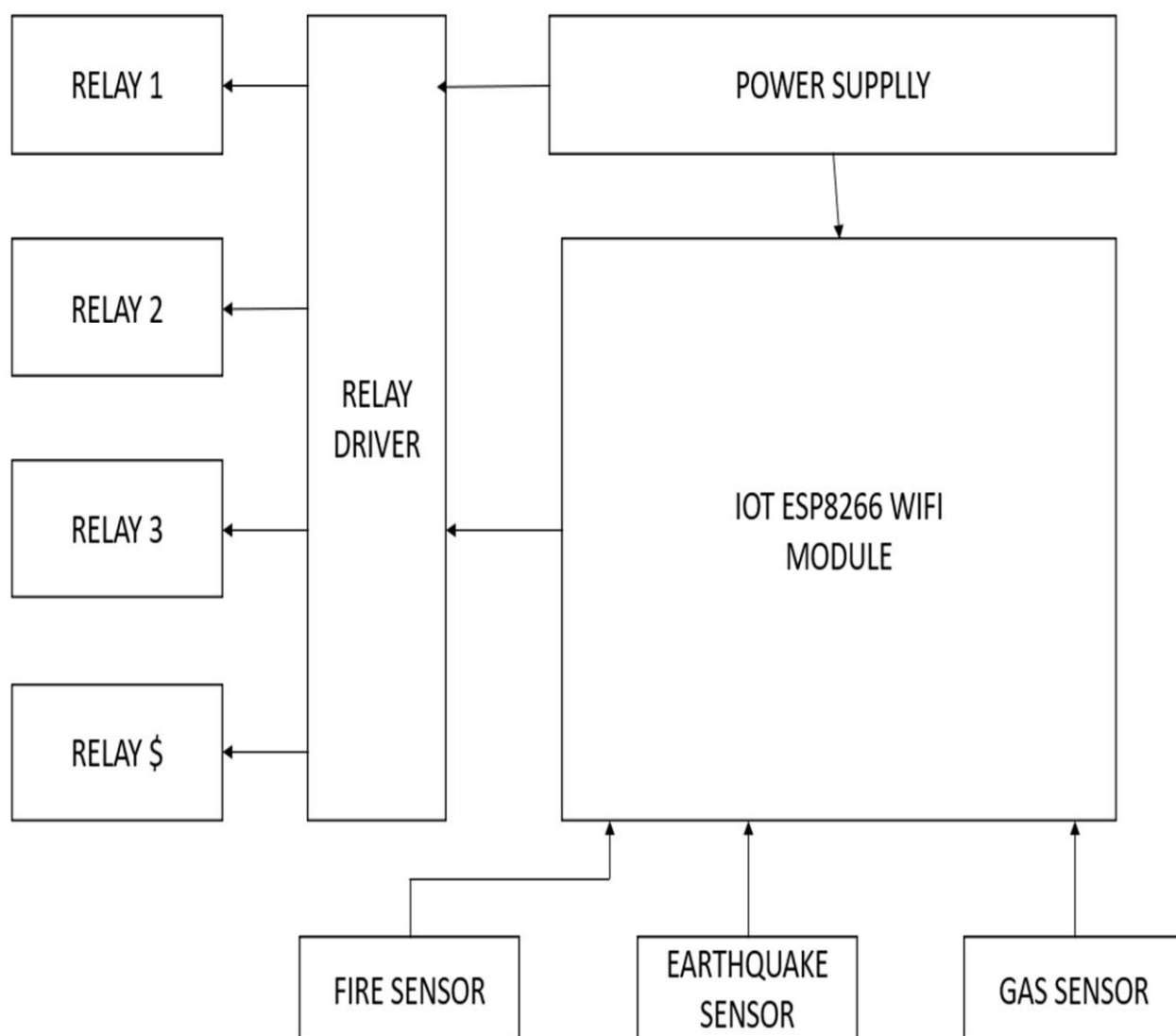
To connect our system to the Internet, we needs a Wi-Fi receiver, in my case we used ESP8266 that is connected as built-in in the NodeMCU board that contains a firmware runs with the ESP8266.

The NodeMCU is coded via Arduino Integrated Development Environment (IDE) with the Universal Serial Bus port to tell the NodeMCU what to do, we make the NodeMCU controls four-channel relay kit by Blynk Application.

PROPOSED METHODOLOGY

Here this research is conducted and based on the important steps that are done to orienting the success indicator in connecting the NodeMCU ESP8266 module or other devices so they can be used to solve multi-objective problems. To achieve indicator, the stages of this research are as follows-

1. Analyze the problems to be studied regarding smart building.
2. Analysis of the needs. In this case we all needs in researching from journals, literature books, tools, and materials.
3. System designing. Designing tools must built using the NodeMCU ESP8266 module, and all the sensors used in this project.
4. System programming. We make a program using the Arduino IDE and the Blynk android application.
5. Testing tools. Testing tools with the program codes created and internet connections should used.
6. Making reports and summarizing the result of the experiments. See the system is responsive to the commands given to smart Building.

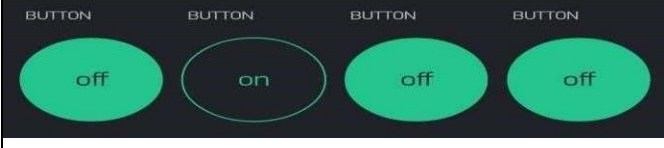
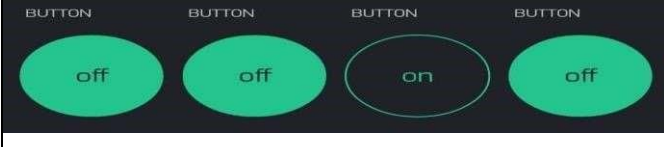


Block Diagram of Smart Building

RESULT

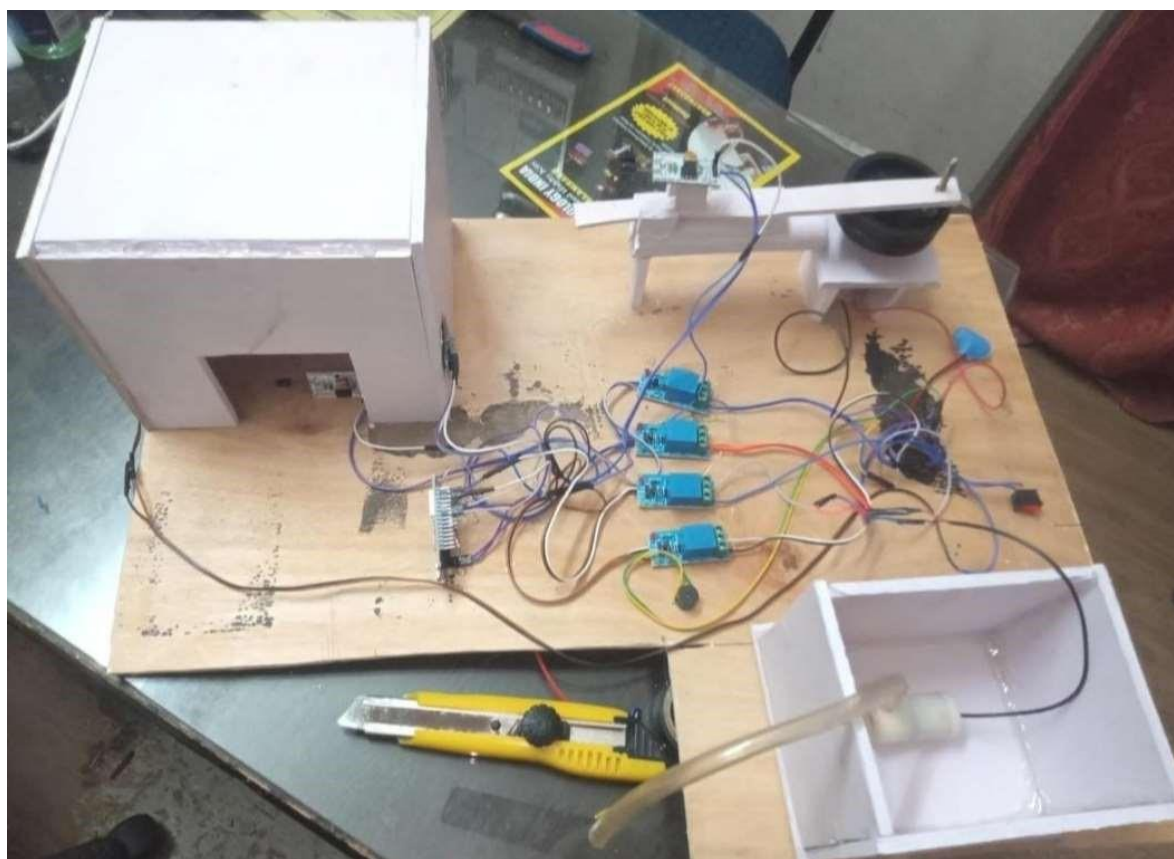
Light Control Test Results

The Light Control Test is done by pressing the ON / OFF button widget on the Blynk application on the respective Android smart phone for lights and fans. This is done after the system is turned on and connected to a Wi-Fi internet connection. If at any time the internet connection is lost or bad signal, then it also affects system performance. Table 1 shows switches test results.

Switch status	On	Off
	----	Relay 1 Relay 2 Relay 3 Relay 4
	Relay 1	Relay 2 Relay 3 Relay 4
	Relay 2	Relay 1 Relay 3 Relay 4
	Relay 3	Relay 1 Relay 2

		Relay 4
BUTTON off BUTTON off BUTTON off BUTTON on	Relay 4	Relay 1 Relay 2 Relay 3
BUTTON on BUTTON on BUTTON on BUTTON on	Relay 1 Relay 2 Relay 3 Relay 4	---

Table -1 Light Control Test



Fig

CONCLUSION

Based on the result of analysis of all the data obtained by testing the smart building with the IoT based NodeMCU ESP6288 module and the following conclusions is made:

- 1) The Smart Building with Internet of Things (IoT) based NodeMCU ESP8266 Module may be designed with the help of various components in hardware and software support so that it can be finally arranged into a Smart Building system that is controlled by the Blynk android application according to what is intended.
- 2) The Smart Building with this Internet of Things (IoT) based NodeMCU ESP8266 Module can be implemented to control some of the Building security including gas detecting, fire control, temperature monitoring, earthquake detector systems and etc.

This project provides a security system to our homes and earthquake detection system using Node MCU Board with internet and various sensors remotely controlled by Android OS smart phone. In this, Node MCU micro controller is used as an interface between user and hardware component and it is programmed and connected to the several components according to the requirements. A micro web server is used as an application layer for the communication between remote users and security systems. The entire system communication is enabled through internet and notifications are sent to user through the app BLYNK installed in smart phone. User can easily get information about the gas level in her home and exhaust can be automated by itself and push the buzzer in app to alert security about any disaster happening in the room. All of them together forms a smart home in a smart building having control and security system, based on IoT technology.

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