THE FIRE ALARM SYSTEM BASED ON IOT

Dr. C.K. Gomathy[1], Ms. E.V. Vyshnavi[2], Ms. D. Devi Priyanka[3]

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Abstract: Fire is the most explosive thing which spreads at a quick rate. Apart from its advantages, its adverse effects include a threat to life and property. Many people across the world are losing their lives due to fire accidents. To prevent these situations, here comes our proposed project, "Fire Alarm System." In this system, the sensor notifies the nearest fire station and sounds an alarm; whenever it detects smoke or flame. Then the respective one gets alert so that immediate action can be taken and can control the damage up to some extent.

Keywords: GPS,Alarm,GSM Control,Fire alarm

I.   INTRODUCTION

Over the past few years, the Internet has become omnipresent and reached almost every edge of the globe. IoT is the network system of interconnected devices that collect data from surroundings to enable responsiveness without human intervention. It made human life simpler by converting their hard work into agile work.As we can see, many factories are accessible to the fire break out as they are aged and lack fire detection technology. It causes severe downfall to the owner in a financial crisis. Also, it leads to the vast destruction of human lives. To eradicate this situation, we introduce the fire alarm system to the factories. In this way, IoT technology has become handy in our day-to-day life.

II.   EXISTING SYSTEM

In this system, whenever the sensor detects smoke in houses, offices, banks, etc..., it alerts the people inside the building and makes them respond quickly. Here is the situation during the working hours. But what happens if the fire breakout takes place during late-night, non-working hours, or holidays. There will be no one to respond to the alarm or to inform the fire stations. Here comes the drawback, where the property will be damaged and makes an immense loss for the respected authorities.

III. PROPOSED SYSTEM

In addition to the existing system, we add some additional features to the device. Like, when the fire breakout takes place, that means any smoke or flame is detected by the sensor then it immediately sends a notification to the nearby fire station. This means a communication link has to be created in advance while a sensor installation has been doneAlso, it takes a bit of time for the fire extinguisher to come to the destination point. Meanwhile, the device sprays the co2 gas or in some devices spray water to reduce the severity of the fire.The IoT-based fire alarm system commonly has two sensors one is activated when temperature changes and the other one starts operating when it senses smoke.
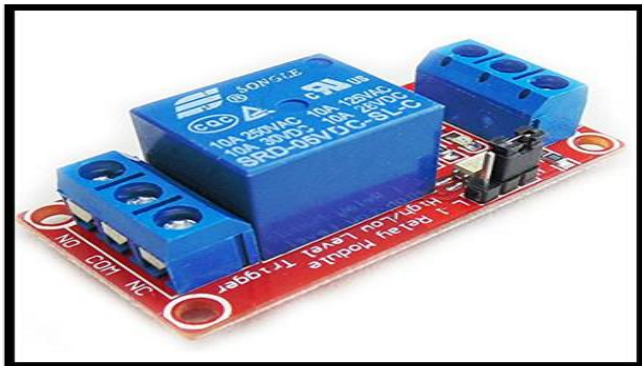
VI. DESIGN AND DEVELOPMENT

In the method of collecting information and data, a lot of sources had been referred to. Most of the information was obtained from the journals and article available on the internet about fire alarming system.

Hardware components:

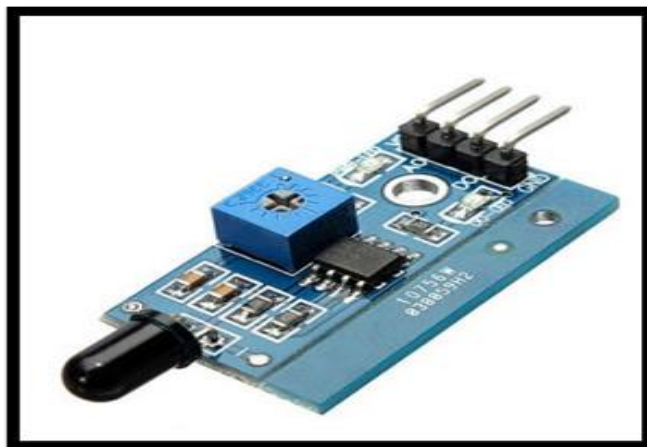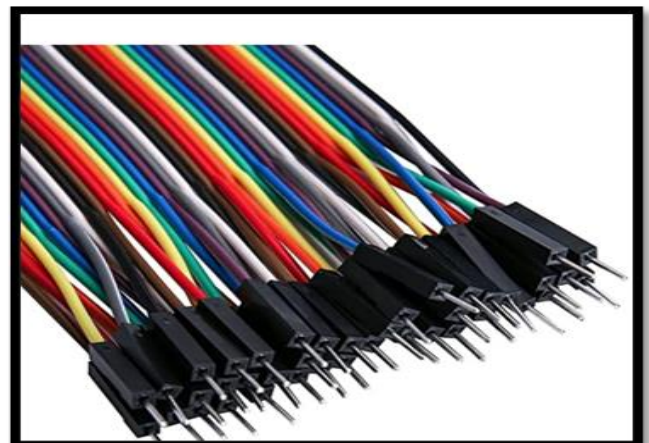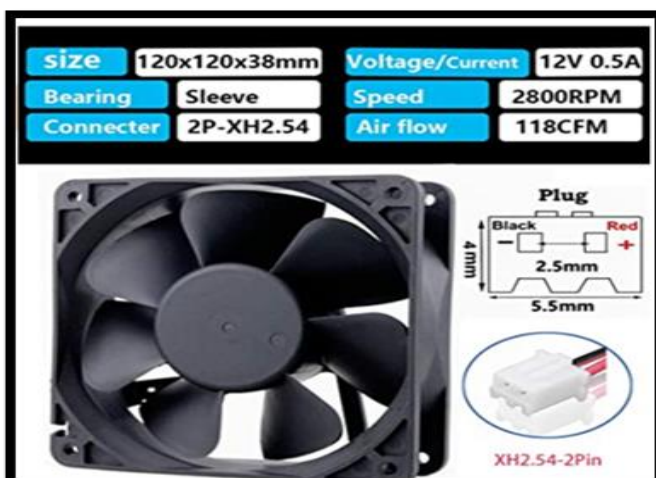→ NodeMCU ESP8266 12-E Development Board
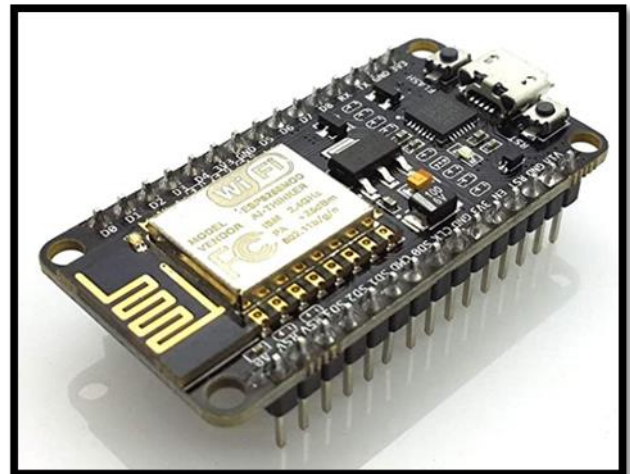
→ A 5V Relay Module

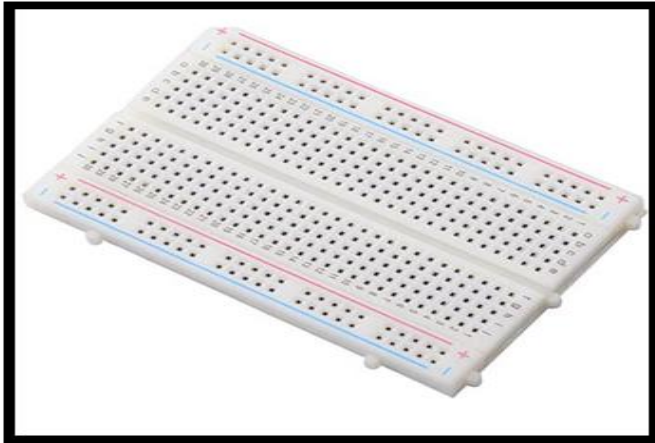→ Infrared Flame Sensor

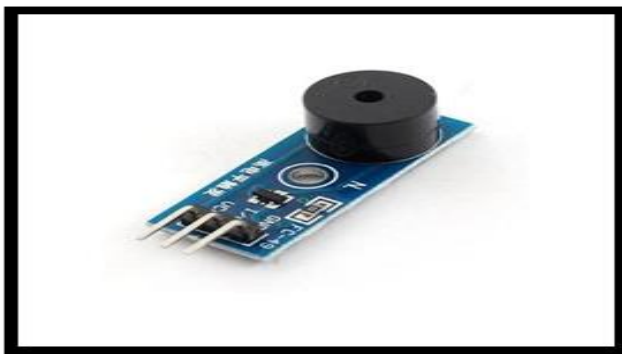→12 volt DC Fan

→ A LED

→ Few jumpers wires

→ 12-volt adaptor

→Breadboard

→Buzzer

After collecting all the data provided on web and articles the protocal idea is "Fire alarm system." The components required for this made to react properly for detecting smoke or flame, notifying and using a fire extinguisher.

V. IMPLEMENTATION TECHNIQUES

→**Hardware connections:**

Now let's start putting up our fire alarm system. First, We use a breadboard to build or test a circuit before finalizing a circuit design. Take breadboard and insert a NodeMCU ESP8266 12-E Development Board into it. Here the ESP8266 combines an 802.11b/g/n HT40 wifi transceiver, it not only join up with a wifi network and interacts with it, but it can also set up a network of its own, permitting other devices to connect directly to it. Now take the one pin of the flame sensor and connect it to the breadboard. A flame sensor is a 3-pin device that primarily detects the wavelength of the infrared rays emitted from flames through the phototransistor located at the tip of the

device. Connect the other pin of the flame sensor to the NodeMCU ESP8266 12-E Development Board. Take LED and connect both pins of it to the NodeMCU ESP8266 12-E Development Board. Take the 5V Relay module which contains three high voltage terminals that are connected to the device which you want to control. On the other side, it contains three low voltage pins which connect to the NodeMCU ESP8266 12-E Development Board.

Now connect pump DC motor to 5V Relay module. Also, join the 12V adaptor to the 5V relay module. Here, the DC motor is used to sprinkle water when the fire breaks out. The 12V adaptor provides a standardized 12 Volts DC output. Also, join the DC motor to the 12V adapter.

Finally, join the buzzer to the NodeMCU ESP8266 12-E Development Board. With this, we completed the arrangement of hardware components for our fire alarm system.
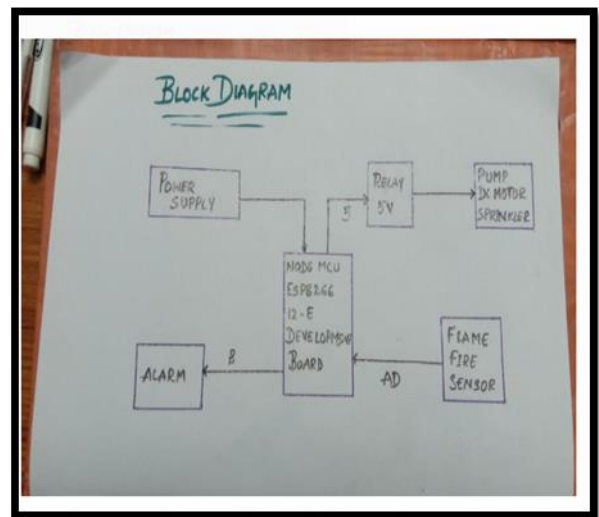

→**Software development:**

- C programming
- Blynk application

To develop software for this system, we use the C programming language. Also, we have to download the Blynk application from AppStore or play store to create our fire alerting app. To design this app we follow these steps.

First, open the Blynk application. Then click on the option to create a new project. Specify the name of your project. Here, we are naming our app as a "Fire alerting system." Click on the choice tools dropdown and select NodeMCU ESP8266. Initiate the connection type to Wifi. Finally, click on the create button, a verification proof will be sent to our mail id which is specified in the program code. Click anywhere on the screen and quest for the notification
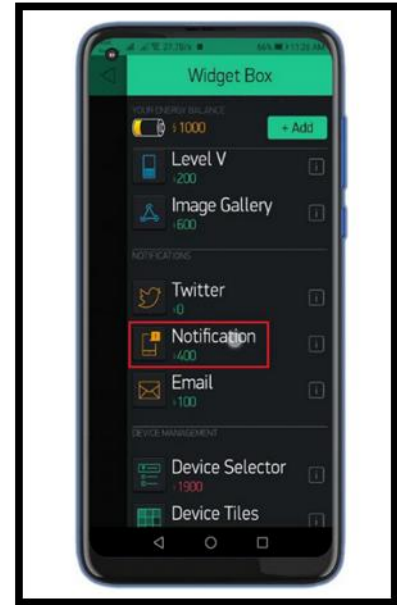

widget.

With this, our designed fire alerting system application is created successfully.

VI. RESULTS

Firstly, we tested the infrared flame sensor. During the test, we brought an incense stick and a lighter near the device simultaneously. It immediately detected the rays and gave the required response in a short period.Later, we tested the buzzers which, produced an intense sound that alerted the people in the surroundings. Finally coming to the motor, it started pumping water as soon as it detect smoke or flame. Coming to the software, the fire alarm system app responded quickly after detection and sent a notification to the registered mobile device. Hence, the working of the system is carried out successfully.

VI. CONCLUSION

Hence, the project fire alarm system was designed and implemented successfully. By using this, we can detect the fire break out in a short period and also can notify to the nearby fire station. Also, we can alert the people inside
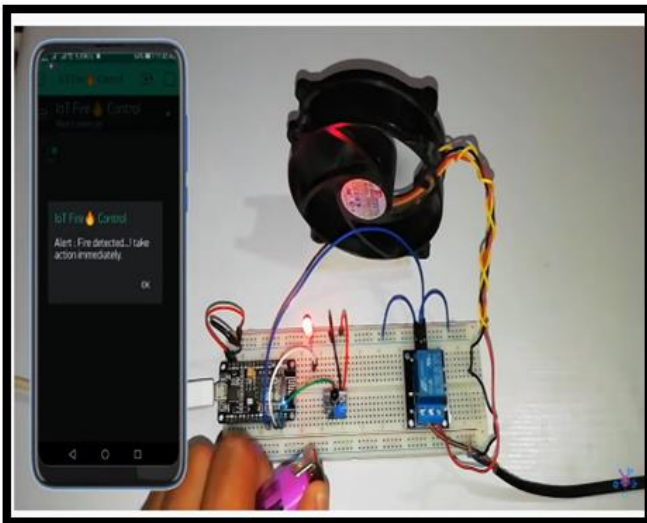
or outside in the surroundings. As it takes a bit of time for the fire extinguisher to arrive, it starts pumping water to prevent huge losses. So, this system can be used in offices, houses, or in any crowded places to prevent deaths or property loss up to some extent.

VII. REFERENCES

1. https://www.projectsof8051.com/iot-based-fire-alerting-system-project/

2. https://theiotprojects.com/iot-fire-detector-automatic-extinguisher-using-nodemcu/

3. https://www.youtube.com/watch?v=5sIEqxl2fvc

4. https://www.youtube.com/watch?v=Wp-3pkfmNFE

5. Dr.C K Gomathy, Article: A Semantic Quality of Web Service Information Retrieval Techniques Using Bin Rank A Cloud Monitoring Framework Perform in Web Services, International Journal of Scientific Research in Computer Science Engineering and Information Technology IJSRCSEIT | Volume 3 | Issue 5 | ISSN : 2456-3307,May-2018

6. Dr.C K Gomathy, Article: Supply chain-Impact of importance and Technology in Software Release Management, International Journal of Scientific Research in Computer Science Engineering and Information Technology (IJSRCSEIT) Volume 3 | Issue 6 | ISSN : 2456-3307, P.No:1-4, July-2018

7. Dr.C K Gomathy, Article: A Scheme of ADHOC Communication using Mobile Device Networks, International Journal of Emerging technologies and Innovative Research (JETIR) Volume 5 | Issue 11 | ISSN : 2349-5162, P.No:320-326, Nov-2018

Author's Profile:-

1.Ms.E.V. Vyshnavi Student, B.E. Computer Science and Engineering, Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya deemed to be university, Enathur, Kanchipuram, India. Her Area of Interest Internet of things.

2. Ms. D. Devi Priyanka Student, B.E. Computer Science and Engineering, Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya deemed to be university, Enathur, Kanchipuram, India. Her Area of Interest Internet of things.

3. Dr.C.K.Gomathy is Assistant Professor in Computer Science and Engineering at Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya deemed to be university, Enathur, Kanchipuram, India. Her area of interest is Software Engineering, Web Services, Knowledge Management and IOT.