Domestic Gas Leakage Detection Using IOT

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Abstract: We all know the importance of LPG in day today life but when the gas is leaked it can cause many damages and it can even take away the lives of people. It is important to alert the people when the gas is spilled out so, the proposed system is used to alert people using different sources. We shall use a replacement technology IOT (Internet of Things) to propose faster notification of gas leakage. It has a buzzer to produce alarm when the gas is spilled out and the user can note it when he or she is in the range and it also consists of DC motor to turn off the knob of cylinder automatically if the user is not in range. This are various technique used in the system to alert users when the gas is spilled out.
Keywords: IOT, LPG gas

I. INTRODUCTION

In commercial areas and cities, town and homes, the LPG gases are used where ever we required. These mostly used as fuels in the various purpose such as cooking, cooling and lightening. The LPG is a combustible gas. This is highly energy source and it contains mainly high amount of flammable chemicals compounds and it mainly contains the chemicals like propane and butane. These chemicals are high dangerous and highly flammable. LPG gas can rarely leak from the home. The leaked gas is very dangerous can cause human loss. The loss gas can increase the risk of the explosion. The LPG gas is an odour less gas so in order to detect the smell ethanol is added to the LPG gas so that we can find the smell of the gas. The LPG gas is also known as the cooking gas. In this issue we can resolve by using the gas leakage detector. By using the detector human loss can be decrease and we can save the people. The detector plays a important role and it can stops the loss of human and also protect the people. They are number of papers published on the gas leakages system. We have studied an article according to this topic "DOMESTIC GAS LEAKAGE DETECTION USING IOT". Many systems are proposed based on the Arduino but we are proposing the system using IOT.in this recent years the IOT developing rapidly. Any small issue the IOT is being the solution. So, we are also using the IOT to protect the human life. we are using the alarm to alert and to prevent from the fire accidents and this system is very helpful. The LPG leak detection system been used in this model so it can use the alternative current. It can use the regulator power of the 5V and also this power consuming is sufficient. We are using the gas sensor to detect the gas. The sensor's sensitivity is very high. There are 30 crores users of LPG in our country and its

40% of the population using the LPG gas so we have to provide safety for the user by using the gas leakages system. the existing system provides an alarm for the previous model. the model that we are using that gives the message to the phones and also it displays the messages on the screens to protect the people by displaying on LCD screens. The software used here is Arduino IDE and Embedded C. This are the various components we have used to achieve this project.

II. EXISTING SYSTEMS

The existing gas leakage system checks LPG gas level in the air and checks with the general gas limit setup and if it detects exceeding gas leakage than the general limit the system consisting of a GSM module will send a message to the customers and also gives an alarm. So, buzzer is used to alert the people. Even LED is used in existing system to alert the people. But this system only alerts the nearby people. One unique thing in the existing system is if the user is away or out of reach the exhaust fan is turned on automatically but the disadvantages of the existing system is manual setup which is dangerous to the operator, exhaust fan which has more wirings can cause fire accident because of improper wiring and it use GSM network which is quite slow in speed compared to WI-FI networks. So, to avoid these issues we are proposing the following method which is more secure.

III. PROPOSED SYSTEM

We shall use a replacement technology IOT (Internet of Things) to induce fastest notification of gas leakage. We shall use a DC motor to OFF the knob of cylinder regulator to avoid the accidental cases because of gas leakage. we'll also use a web site or application under the IOT technology to induce fastest response from the module. the opposite module and things which are utilized in this project is micro controller, fan, LED for indication, a buzzer to notify local peoples and gas sensor module to sense the gas leakage. So, this are various technique used in the system.
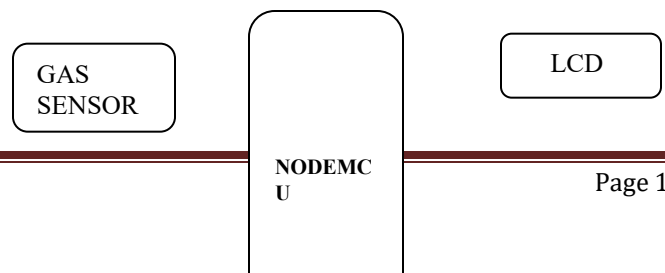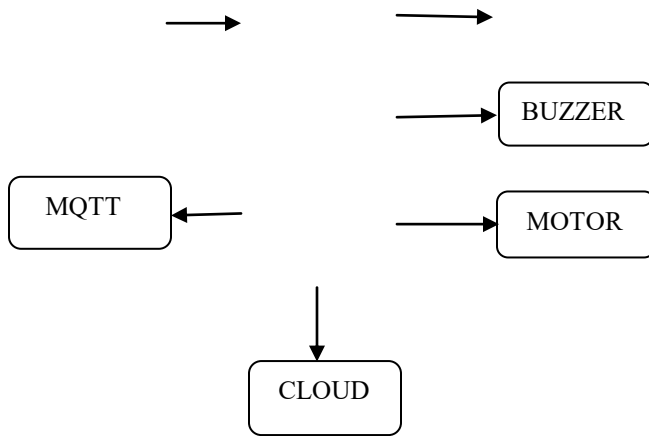
Fig. 2 Block diagram of the proposed system

A. GAS SENSOR

Gas sensor is also known as gas detectors and this are the electronic devices that detects different type of gasses. It can detect the gas leakage in our homes and other working places. The gas sensor has a good sensitivity with quick response. It is also a compact and portable gas detector which has long period with low cost. The range of the gas sensor is from 300 to 1000 ppm and it is suitable for the leakage detection. The sensor can be operated at the temperature from 10 to 50 degree Celsius.

Fig. 2 Gas Sensor

B. NODEMCU

NODEMCU is a friendly and also a cheap device estimated to other microcontrollers. The major advantage of NODEMCU is it has WI-FI built in support. As we all know WI-FI communication is faster compared to GSM communication, so this is one of the important reasons to use this device in the system. So here this device plays a very important role in system such that it acts as the brain of the system. The whole system is taken care by the NODEMCU so, this the main component of the project. This device is mainly used with

internet of things projects because it can be configured easily through software platforms.
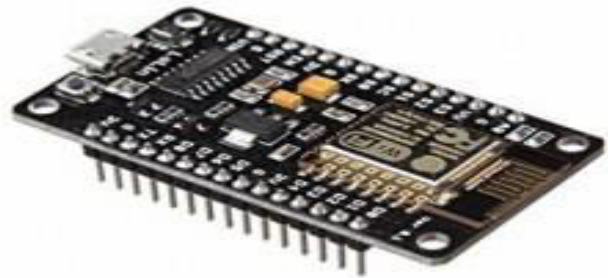

Fig. 3 NODEMCU

C. LCD

LCD is also termed as liquid crystal display. It is made by a combination of solid liquid. Liquid crystal is used to get visible image. LCD is used in many industries for example it is used by mobile manufactures, computer screen manufactures and etc. This technology is used because it is super slim and can fit into the system. There some unique advantages of LCD such as it is thin, light weight and it has a longer life span compared to other displays so, this are the key features of LCD. We have used this LCD display to alert the user. This also cost-low compared to other displays.
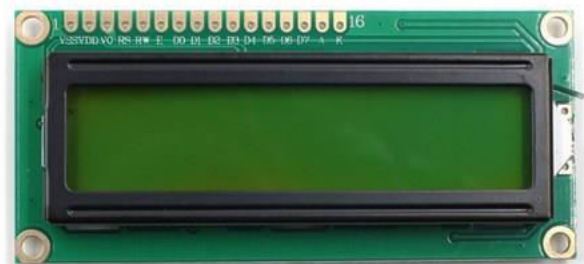

Fig. 3 LCD

D. MOTOR

A hardware which transforms DC electrical power to mechanical power is termed as direct current motor. The

working of direct current motor is, a conductor which is carrying a current is made to experience a magnetic force of field, the conductor encounters a mechanical force. So, this is the working principal of DC motor. We have used this device to turn of the knob of cylinder in our project. We all know that DC motor is commonly used in many places so, it is cheap and efficient device.

Fig. 4 DC motor

E. BUZZER

A buzzer is also a little yet efficient component to feature sound features to our project/system. It's generally a low-cost device but a great device to add sound feature in projects or systems. It is used to produce sound to alert the user when the gas is leaked out. The drawback is the sound can be heard when the user is in the range so, this the role of buzzer.

Fig. 5 Buzzer

F. MQTT

MQTT is called as "message queuing telemetry transport". It is also network protocol and mainly used with IOT projects. It acts as interface between the devices. It works on TCP/IP layers. It was published in the year 1999 by an organization called OASIS. We have used this in our project just to act as an interface between the user and system. The pros of this

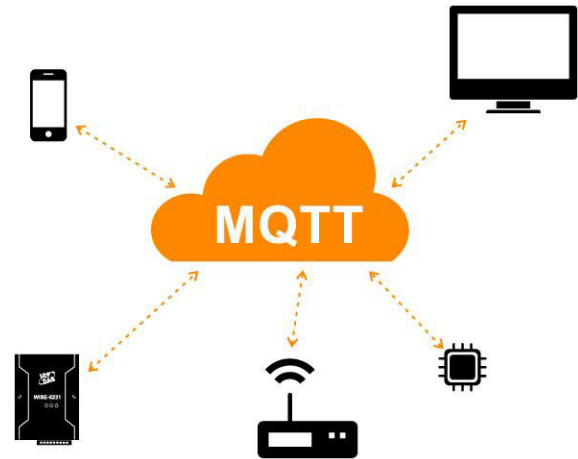MQTT is small in size and it consumes less power so, this are the key features of MQTT.

Fig. 5 Working of MQTT

IV. DISCUSSION

IOT makes things and objects in the world to be connected in a network so, that wireless networks and phones can share information. The gas leakage detection system thus developed is used to monitor and prevent the accidents that are said to commonly occur due to gas leakage. It uses gas sensors and relay in the detection phase. Whenever there is a breach in the threshold level, alarms are enabled and a message is sent to the owner and maintenance officer. Thus, the system detects the draining of gas using gas sensor. It alerts the owner and also sends the controller. LPG play an important role in day today life, whenever squandered it can harm life and property of people. Hence, we need to take extra care for spillage of gas. So, the motive of the project is to alert the people using different sources.

Fig. 6 Domestic Gas Detection Using IOT

V. CONCLUSION

LPG is consumed in many places such as homes, industries because of its own advantages. So, this device is used to detect gas leakage to protect our assets and lives. Sometimes it causes considerable damage to people and things. Hence, we can protect our house and save our lives with the use of our project using IOT. The decision of utilizing a constant gas spillage checking and detecting the yield dimensions of gas has been plainly seen by the assistance of this framework. In this project, LPG gas leakage will be sensed by the gas sensor. After the gas is detected in air more than the value of threshold, the LED lights up and buzzer sound is produced. A message is also sent to resident's cell phone and thus, alerts the resident about the incident. If the resident is not near buzzer sound the knob is turned off by the motor. The system can be used to avoid fire accident and provide house safety.

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