GAS LEAKAGE DETECTOR USINGARDUINO

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ABSTRACT-

The main aim of this project is to detect the Gas Leakage that can be detected by using Sensor. These sensors are widely used to detect essence of harmful gaseous. Buzzer gives an Audible sign in the presence of gas. Many accidents occur in day to day life like explosion because of gas leakage. Major harm is caused, if gas leakage is not detected early. But now we can detect the gas leakage using the gas sensor and in this IOT gas leakage detector, such IOT as well as Arduino based gas leakage detector systems canbe installed in homes, hotels and LPG gas storage areas. In this gas detector system it senses the gas leakage. If the gas in air is normal then the LED on the circuit will glow green giving a safe sign and whenever sensor senses the gas then the red led glow i.e., green goes off, sends a message and make a phone call to the owner and power goes off. So, this IOT based intelligent gas detector project will help in detecting the gas leakage in the surrounding areas.

KEYWORDS: *Arduino UNO, MQ2 Gas Sensor, GSM*

I.   INTRODUCTION

- What is IOT?

Internet of Things (IoT) is an ideal buzzing technology to influence the Internet and communication technologies. IoT allows people and things to be connected anytime, anyplace, with anything and anyone, by using ideally in any path/network and any service. This project introduces a thought or an idea for home computerization voice acknowledgment, also the development of a prototype for controlling smart homes devices through IoT and controlling of dumb devices through IoT by the means of Wi-Fi driven chipset solution - ESP8266.This is also acknowledged by the need to give frameworks which offers help to matured and physically impaired individuals, particularly individuals who lives alone. Smarthome or home automation can be said as the residential extension of building automation, it also involves the automation and controlling of lightings, ACs, ventilation and security which also includes home appliances such as dryers/washers, ovens or refrigerators/freezers which uses Wi-Fi for monitoring via remote for ease of use. Now a day's speed of the processing and comm'n through smart mobile devices at very affordable costs, to improve the life style concept relevant to smart life, like smart T.V, Smart cities, smart phones, smart life, smart school and Internet of Things.

- Why IOT Technology is important?

The term "Internet of Things" has come to describe a number of technologies and research disciplines that enable the Internet to reach out into the real world of physical objects. The term "Internet of Things" has come to describe a number of technologies and research disciplines that enable the Internet to reach out into the real world of physical objects. The Internet of Things, also called The Internet of Objects, refers to a wireless network between objects. From any time, any place connectivity for anyone, we will now have connectivity for anything.
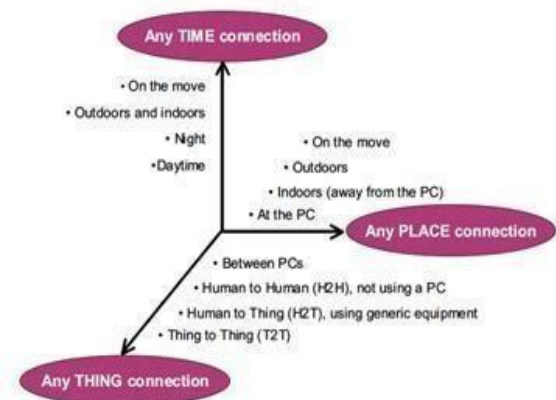

Figure.1: IOT Technology

The Internet of Things represents an evolution in which objects are capable of interacting with other objects. Hospitals can monitor and regulate pacemakers' long distance, factories can automatically address production line issues and hotels can adjust temperature and lighting according to a guest's preferences, to name just a few examples.

II. LITERATURE SURVEY

In past years many smart gas detector have been proposed to detect leakage of LPG efficiently. Some use different sensors like MQ6 in place of MQ5 [1]. Some programmed the system such way that it sends a text message to notify the user [2] Orto shut off the gas line automatically [3]. Some even used GSM and Wireless monitoring system [4]. This paper discuss about the real time observation of gas concentration in the surrounding and avoiding any future accidents.

III. EXISTING SYSTEM

In primary focus intelligent gas leakage detector using Arduino is only possible for detecting the harmful gaseous and alert the people. Gas leakage is a serious problem and nowadays it is observed in many places like residences, industries, and vehicles like Compressed Natural Gas (CNG), buses, cars, etc. It is noticed that due to gas leakage, dangerous accidents occur. The Liquefied petroleum gas (LPG), or propane, is a flammable mixture of hydrocarbon gases used as fuel in many applications like homes, hostels, industries, automobiles, and vehicles because of its desirable properties which include high calorific value, less smoke, less soot, and eager harm to the environment. Liquid petroleum gas (LPG) is highly inflammable and can burn even at some distance from the source of leakage. This energy source is primarily composed of propane and butane which are highly flammable chemical compounds. These gases can catch fire easily. In homes, LPG is used mainly for cooking purposes. When a leak occurs, the leaked gases may lead to an explosion. Gas leakage leads to various accidents resulting in both material loss and human injuries. The risks of explosion, fire, suffocation is based on their physical properties such toxicity, flammability, etc.

The user is alerted about the gas leakage through SMS and the power supply is turned off. proposed the leakage detection and real time gas monitoring system. In this system, the gas leakage is detected and controlled by means of an exhaust fan. The level of LPG in cylinder is also continuously monitored. proposed the system in which the leakage is detected by the gas sensor and produce the results

in the audio and visual forms. It provides a design approach on software as well as hardware. In the existing method, different gas sensing technology is used but it acts like as an alarming device only. It will cost only 917 Bangladeshi taka which is equivalent to ten USD.

IV. PROPOSED SYSTEM

In this proposed system by using the Intelligent gas leakage detector using Arduino Nano it detects the gas leakage and alert the people, in addition to this it also gives an acknowledgement to the owner and power goes off as soon as high gas leakage is perceived.

"Gas Leakage Detector with SMS Alert using ARDUNIO and GSM module", will be a great help in terms of preventing any danger caused by gas leakage. The purpose of this project is to detect the presence of Gas leakage in the homes and working places. Apart from sound alarm and SMS alert it will call the owner. which is used in case of the nobody is present when the leakage occurs and to prevent accidents and property damage. It is cost efficient and reduce damage caused by the gas leakage.
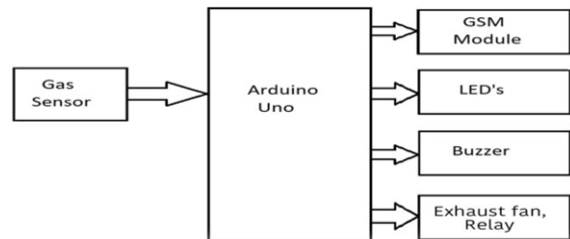

Figure.2: Block Diagram of Proposed System

V. SOFTWARE

For developing this project, we mainly used software is Arduino IDE 1.8.19. The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as Windows, Mac OS X, and Linux. It supports the programming languages C and C++. Here, IDE stands for Integrated Development Environment.

VI. METHODOLOGY

The idea behind of this project is to detect the Gas Leakage that can be detected by using Sensor. The presence of hazardous gas leakage (like LPG leak, Butane leak, Methane leak) or any such gaseous substance in a domestic

work places and also stored gases container gas which exhibits ideal characteristic is use. Produces a sound alarm upon gas leak. The usage of the gas brings great problems in the domestic as well as working places. The inflammable gas such as Liquefied petroleum gas (LPG), which is excessively used in the house and at work places.

The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of gas and protects the work places by taken correct precaution at correct time. According to ABS-CBN news 2017 that from January to June last 2017, the BFP has recorded a total of 2,522 fire incidents. It was traced that Gas is one of the major causes of fire during that year where half of the total which is 1,253 beside from the electrical causes. "

This system provides the information such as when a gas leakage is noticed, sensors of in the project are used to notice the gas leakage and immediately turns ON the buzzer for the danger indication. Buzzer is a clear indication of gas leakage. By the detection of the hazardous gas the alerting message reached to the person who has control over it from the GSM. Detection of the gas leakage is important and halting leakage is important equally.

The main objective of this project is that it is extremely accurate with a least cost, this project system is best to detect gas leakage and also warn people around by buzzer beep sound and an SMS & Call has been send to the responsible person for preparatory safety calculations. More than the lifetime Arduino has been a reason that thousands of projects from everyday bodies to complicated scientific mechanism. Their knowledge about the said matter contributions a lot to help the society in this subject area.

From 0.72% of all kitchen accidents, LPG gas leaks have risen to 10.74% of all kitchen accidents. Therefore, gas leakage detection is the most critical safety problem. This project, therefore, represents the detection and alarm system for Gas leakage to prevent fire accidents and to provide house protection to create an alert warning system based on the Global System for Mobile (GSM) network. The presence of gases can be detected using it. "The sensors used in the circuit will detect that it turns on the LED whenever gas leakage, and at this time the GSM modem will send an SMS alert to the mobile user not that the gas has been leaked! "Please check" which provides notification in real-time. This device can be mounted in kitchens, storage rooms for LPG, factories, industries or any place that is considered appropriate.

ADVANTAGES

- High Sensitivity
- Quick Response Time
- Detection and prevention of any sort of gas leakage.
- Widely Detects Flammable and Toxic gases
- Improves the Safety
- Light Weight
- Portable System
- Cost Efficient

APPLICATIONS

- Gas Storage Areas
  - Homes & Factories
  - Hotels & Industries
- Fire Hazard Prevention
- Harmful Gas Detection
- Domestic Gas Leakage Detector
- Portable Gas Detector
- Industrial Combustible Gas Detector

VII.　EXPERIMENTAL RESULTS

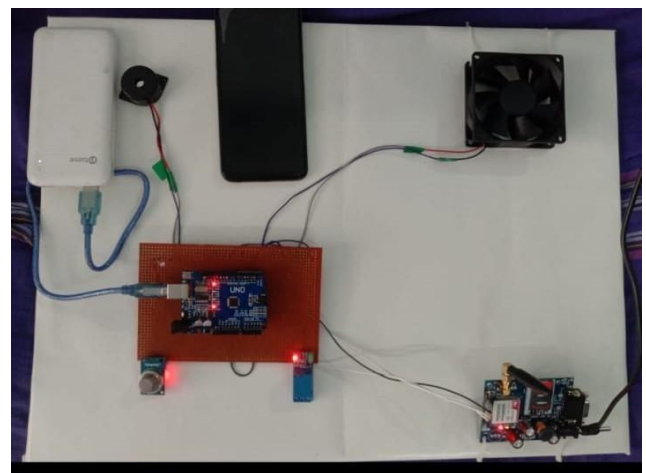The IOT based intelligent gas leakage detector using Arduino is done.
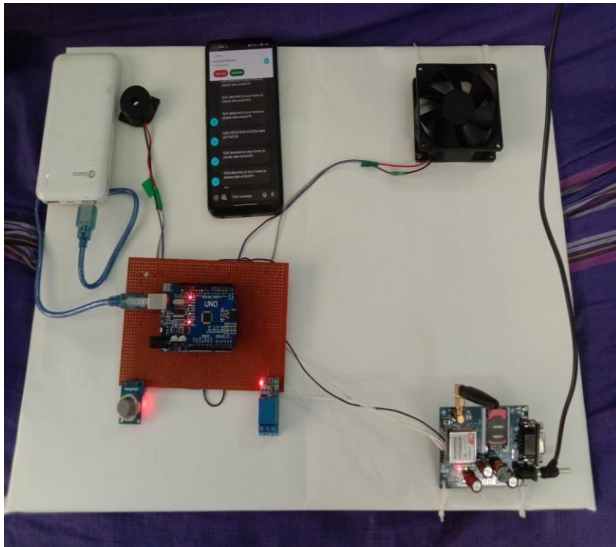

Figure.3: Before Gas Detected

Figure.4: After Gas Detected

VIII.   CONCLUSION

We conclude that this project "**GAS LEAKAGE DETECTOR USING ARDUINO"** has been successfully designed and test. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced components and with the help of growing technology the project has been successfully implemented. So, we can conclude that the IOT based intelligent gas leakage detector using Arduino detects the gas leakages with an alert is indicated and make a phone call to the owner and also power goes off. This is applicable usefully in the industrial and domestic purpose. A sensor senses harmful gases. In danger situations we are able to save the life by using this system.

IX.   FUTURE SCOPE

Our Project is a real-time project which can detect the gaseous easily. Certainly, this Project can be improved in Future. On the better half, we try to list some points for future aspect. After this project performance, that detection of the LPG gas leakage is incredible in the project system. Applicable usefully in the industrial and domestic purpose. In danger situations we are able to save the life by using this system. An alert is indicated by the GSM module. This project would also have a very positive impact on society as a result.

X.   REFERENCES

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