

IoT based Smart Kitchen

Apsingekar Vrishabh¹, Anake Prajkta², Kanhere Abhijeet³, Uike Hemant⁴

¹⁻⁴UG Student, Electrical Engineering Department, All India Shri Shivaji Memorial Society's College of Engineering Pune, Maharashtra, India.

Abstract - The kitchen is one of the significant spots in a house. Security factor is the fundamental viewpoint that should be considered during the movement in the kitchen. The presence of gas spillage, uncontrolled fire and inordinate temperatures should be immediately distinguished and tended to. The motivation behind this examination is to make model of kitchen security framework utilizing Internet of Things. The framework is planned utilizing 3 sorts of sensors and Arduino UNO. Temperature sensor is utilized to screen temperature, IR Flames sensor is utilized to recognize fire, MQ-6 sensors are utilized to distinguish gas spillage in the kitchen. The sensors yield are then associated with the Arduino which will control the transfer. The hand-off goes about as a fan switch in case of a gas release, uncontrolled fire and unreasonable temperature increment. Under these conditions, Arduino will likewise turn on the caution and the drove, and send data to the worker. The outcomes show that the framework can work as per the ideal determinations.

Key Words: Arduino UNO, Flame Sensor, Gas Sensor, Temperature Sensor

1. INTRODUCTION

These days the presence of the Internet of Things (IoT) has effectively changed the human existence. IoT is an idea that permits objects around us to speak with one another [1]. This capacity will cause objects to comprehend what people need with no order, including giving significant data any place we are [2] [3]. In regular day to day existence, individuals perform different exercises. One of where human action is the kitchen. With an assortment of exercises led in the kitchen, will unquestionably make the kitchen temperature conditions immediately changed. Notwithstanding temperature, the utilization of gas ovens has a high fire hazard. In light of that, the utilization of IoT in the kitchen is important to keep the kitchen cool consistently be agreeable and to decrease hazard due from the utilization of gas ovens.

While the average cost for basic items is going up, there is a developing concentration to include innovation to bring down those costs. In light of this the Smart Home venture permits the client to construct and keep a house that is adequately keen to keep energy levels down while giving more computerized applications. A brilliant home will exploit its current circumstance and permit consistent control whether the client is available or away. With a home that enjoys this benefit, you can realize that your house is performing at its best in energy execution. By executing this

framework, it is feasible to investigate a wide range of designing difficulties, including programming, PCB plan, Wi-Fi, TCP/IP conventions, Web Server rationale plan, and different viewpoints. This computerization framework gives incredible bits of knowledge to the difficulties of programming and equipment plan.

1.1 Objective

- 1) To design a complete kitchen automation system
- 2) To monitor different parameters such as LPG gas, smoke, fire and temperature.
- 3) To collect the data through microcontroller and send it to IoT
- 4) To design an alarming system if conditions become worst.

2. LITERATURE SUREVEY

The innovation is developing at a high speed and has altered each circle of human life. Specialists have made huge commitment in changing the substance of the kitchens. Directly from mechanized apparatuses to altered kitchens, everything has been upset. We have checked on and dissected the various plans or techniques which have been proposed by various analysts worried about various kinds of Monitoring with an objective of making a redid framework which screens kitchen climate boundaries like light force, room temperature, fire recognition, movement location and LPG gas level. In this audit we have attempted to break down just those plans or procedures where the scientists have added to ensuing improvement in the current strategies The survey incorporates research papers, distributions, web sources and other accessible writing to give a complete near investigation.

Consistently the advanced individuals anticipate that new device and new technology should improve on their everyday life. The pioneers and analysts are continually attempting to discover new things to fulfill individuals yet the cycle is as yet endless. During the 1990s, Internet availability started to multiply in big business and buyer markets, however was as yet restricted in its utilization on account of the low presentation of the organization interconnects. During the 2000s Internet network turned into the standard for some applications and today is normal as a component of numerous venture, modern and buyer items to give admittance to data. In any case, these gadgets

are still principally things on the Internet that require more human collaboration and observing through applications and interfaces. KITCHEN climate observing is one of the significant measures to be firmly checked progressively for wellbeing, security and solace of individuals. With the headways in Internet advances and Wireless Sensor Networks (WSN), a recent fad in the period of omnipresence is being figured it out. Gigantic expansion in clients of Internet and changes on the web working advancements empower systems administration of regular items. Web-empowered frameworks have offered extraordinary guarantee to customers. Savvy home conditions have developed to where ordinary items and gadgets at home can be organized to give the occupants new intends to control them. Advances in computerized hardware have empower the improvement of little in measure and impart in brief distances sensor hubs. They are minimal expense, low-power and multifunctional. The sensor hubs comprise of detecting, information handling, and correspondence parts, influence the possibility of Wireless Sensor Networks (WSN) in view of collective exertion of an enormous number of hubs. There are an enormous number of investigates managing WSN applications, yet it is as yet conceivable to investigated in WSN advancement and upkeep. The plan and advancement of a savvy observing and controlling framework for kitchen climate progressively has been accounted for in this paper. The framework primarily screens kitchen climate boundaries like light power, room temperature, fire identification, movement discovery and LPG gas level, has been created. The framework can screen the situation with kitchen and send an email or potentially a ready SMS by means of GSM network naturally, if the conditions get strange, to a concerned specialists cell phone. The concerned authority can handle the framework through his cell phone by sending AT Commands to GSM MODEM or by making the fundamental strides in client email, which is secret word secured. Clients can screen and control transducers on dynamic Web pages upgraded with Embedded C. This framework tracks down a wide application in regions where actual presence is preposterous constantly. The framework offers a total, minimal expense, incredible and easy to use method of constant checking and controller of kitchen. A model is created and tried with high exactness result.

3. BLOCK DIAGRAM

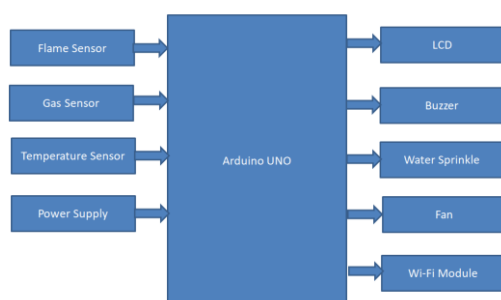


Fig 1 Block Diagram

1) Arduino Uno.

Arduino Uno is a microcontroller that is as of now famous. Arduino Uno utilizes ATMEGA328 as its microcontroller, has 14 advanced I/O pins and 6 simple sources of info. To program it, the Arduino is associated with the PC utilizing USB type A to type B or what we regularly call the printer link [4].

2) ESP8266.

ESP8266 is a wifi module that serves as a microcontroller enhancement such as Arduino to connect directly to wifi and create TCP / IP connections. This module requires about 3.3v power with three modes of wifi namely Station, Access Point and Both (tools). This module is also equipped with processor, memory, and GPIO where the number of pins depends on the type of ESP8266 we use. On this system, This device is used as Wi-Fi shield for Arduino which will connect to Wi-Fi network from available hotspot router. This device will send the collected data from Arduino to the server.

3) Temperature Sensor

LM 35 sends output data in the form of digital output without requiring analog pins. This sensor is very easy to use but has a measurement limit of only up to 60 ° C [5].

4) Gas Leakage Sensor (MQ-6).

Gas sensor MQ-6 is very useful to detect a gas leak in the kitchen. This sensor can detect flammable gases such as LPG, CH₄, CO, Propane to detect smoke from fire. It has a very quick response to gas leakage, but it takes a long time when it first starts up. In this sensor, there is a potentiometer that serves to regulate the sensitivity of the sensor. When the sensor detects a gas leak, the sensor's conductivity will increase depending on the amount of gas concentration detected [6]. In this system, MQ-6 is used to detect leaks on LPG gas.

5) IR Flame Sensor.

In this system, IR flame sensor functions as a fire detector. This sensor will detect fires based on the infrared wave spectrum generated by the fire.

6) Power Supply.

This system uses an adapter that will work on 100 - 240V. The resulting output is 5V, 1A. This power supply will be connected directly to the microcontroller.

4. RESULT

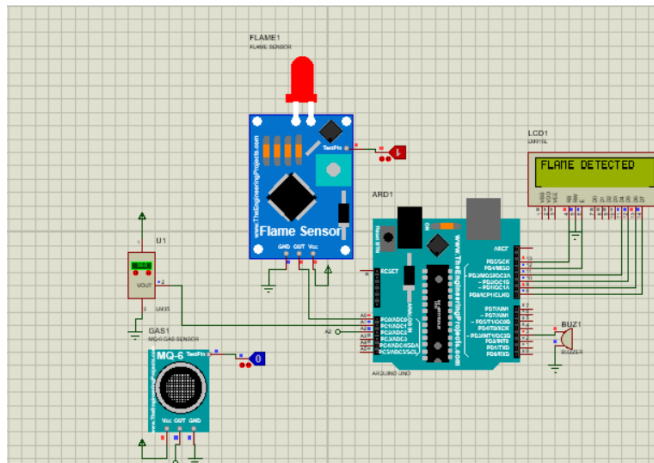


Fig 2 Proteus Simulation Of Our Proposed System

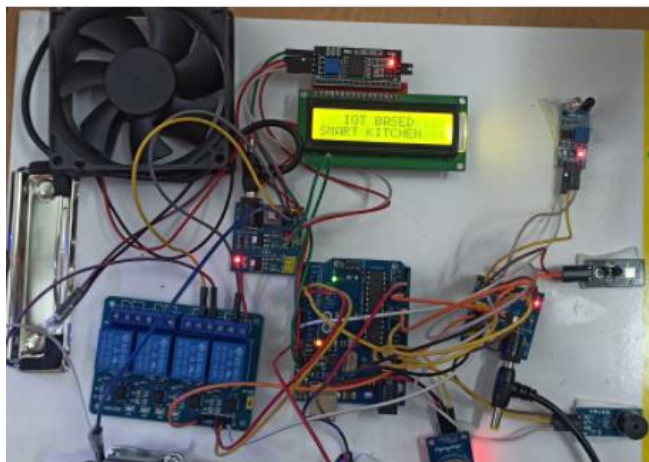


Fig 3 Result : Final Hardware

5. CONCLUSIONS

Based on the design and test of this system, the following conclusions can be taken:

- Based on the test, each of sensors contained in this system works well. After installing, calibration should be done so that the results can be in accordance with the expected.
- All collected data can be displayed on the web and apps. In the delivery of such information, is strongly influenced by the quality of Wi-Fi networks used.
- In simulated fires and gas leaks, the fan can function properly. A warning system can work. Email and SMS can be received directly by the mobile device.

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