

# Smart Safety System using Raspberry PI

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## **Abstract:**

This paper deals with the monitoring and controlling the home and industrial modern situations progressively. Here the framework is utilized to screen and control parameters, are Earthquake, fire, Temperature, Voltage, Air quality (CO<sub>2</sub>), LPG gas spillage identification and control. The venture is intended to give a well being framework to the home and enterprises utilizing MasterCard estimated single board PC called Raspberry Pi, and furthermore it will speak with the IoT innovation. At the point when any strange condition happens the framework will tell to the concerned authority by mailing the pictures of the territory, send a SMS through GSM, Alert by the disturbing naturally and gives the updates of the region or room every once in a while by the IoT based web page, the framework can be introduced in a lobby of greatest zone 126ft x 21ft utilizing one Raspberry pi module. This is found in wide applications where physical appearance of individual isn't required constantly. This framework offers high exactness controlling and furthermore easy to understand with ease and supportive in rationing vitality.

**Keywords:** *IoT, Raspberry pi, GSM, sensors.*

## **I. INTRODUCTION**

Now-a-days people are especially stressed over the prosperity, comfort and security. One of such drew in zone is home and current zones. For the earth checking there must be taken some significant measures which should be immovably observed ceaselessly. The propelling advancements have changed the use and its broad assortment of execution to various sorts of devices. In this wander I had executed the possibility of IoT to oversee the prosperity parameters and forewarning. The Internet of Things (IoT) is the between frameworks organization of physical devices, vehicles, structures, things introduced with equipment, programming, sensors, actuators and framework arrange that engages the things to accumulate and exchange data. IoT empowers question be distinguished and controlled remotely in the

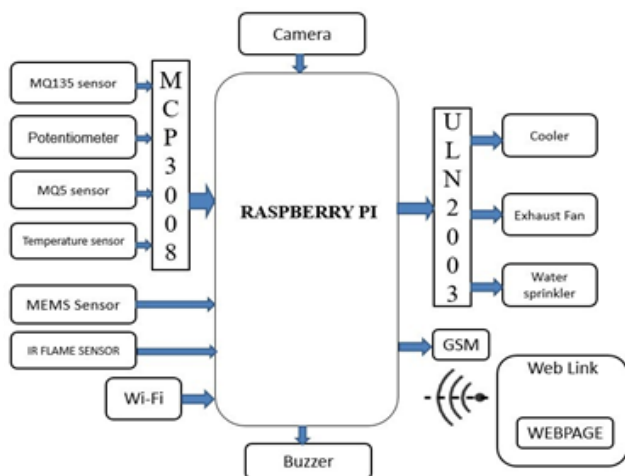
present framework establishment, making open entryways for organize coordinate which achieves viability improvements, accuracy and budgetary focal points to decreases human intercession.

In this paper we have used the possibility of remote frameworks organization using Raspberry Pi controller with a particular ultimate objective to control and likewise alerted the customer and go about as shown by the summons. This structure is laid out to a great degree versatile with a particular ultimate objective to give a straight forward interface. This can be presented easily. The realized shrewd security structure works using the item made in Python. The Raspberry Pi unit is connected with sensors presented on the mechanical assemblies used as a piece of the home and current condition. By using the IoT the abnormalities that are distinguished by the sensors in the room or area are frightened by sending a

SMS to the proprietor using a GSM and alert mail to the concerned authority.

## II. BLOCK DIAGRAM

The beginning of this paper deals with giving the supply to the board. The Raspberry Pi requires 5v to operate. After which the Raspberry Pi starts its booting process, which nearly takes 10 minutes. Meanwhile all the components like GSM, Sensors placed on the board get initialized. The GSM works when a SIM is inserted into the module. Then GSM checks for its networking. During this process a blue LED keeps on blinking so fastly which indicates that network checking is running. Then after the completion the LED blinking slows down. This is used to send an alert SMS to the authority.



**Fig. 1 Block diagram of system**

After the completion of network checking and booting process the sensors sense the conditions of their respective parameters. Also the authority can access to the webpage by a web link and by using camera to take images and it will forward to the authority mail address. Here when the abnormal conditions are monitored. A buzzer is also provided so that the abnormality when occurred the user can identify easily before checking the SMS that is sent. And for all the abnormal sensing a buzzer sound is produced. The concerned user can access the updates of the room or area by web address which is contain webpage and when an abnormal condition sense the loads

will automatically ON. Thus this system is very efficient and accurate in showing the values of the sensing units and also controlling them duly.



**Fig2. System Hardware**

## III. IMPLEMENTATION PROCEDURE

The monitoring of the system is also done by logging into the particular webpage, and mailing area images to the concerned person. Due time when the sensing of abnormalities is done, their particular loads will be ON like

1. When fire is sensed i.e. if any flame or fire is sensed then the MOTOR is ON and controlled automatically and send SMS as FIRE IS DETECTED.

2. If LPG gas leakage is sensed then EXHUASTED FAN is ON and sent SMS asLPG GAS DETECTED.

3. When LM35 detects over temperature then Cooler Fan is ON and alert SMS is sent as

HIGH TEMPERATURE DETECTED,

4. If MEMS sensor detects the Earthquake then the system gives alert and sent SMS as

EARTHQUAKE DETECTED,

5. When potentiometer detects the over voltage then the system gives alert and sent SMS as

OVER VOLTAGE DETECTED,

6. If MQ135 senses the CO2 then the system gives alert and sent SMS as

AIR OVER POLLUTED.

LOADS USED:

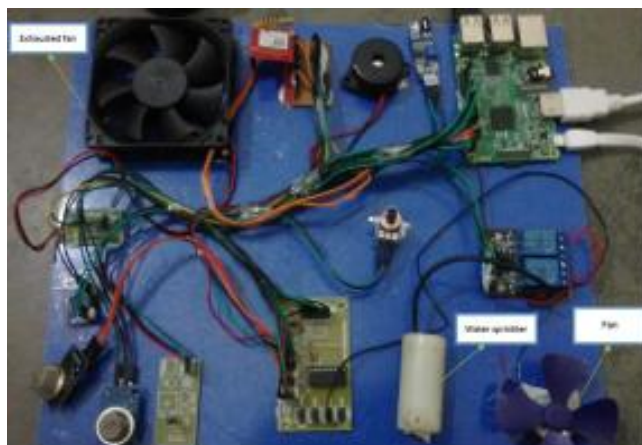
1. WATER SPRINKLER: When fire is sensed the motors automatically ON for controlling.

2. EXHAUSTED FAN: When LPG gas is detected the exhausted fan automatically ON and it can squeeze the gas and release them into the

outside.

3. COOLER FAN: A Fan provides controlling over the heat produced in the room and

automatically it turns ON when abnormality sensed.



**Fig 3. System Loads**

**IV. FLOWCHART AND WORKING**

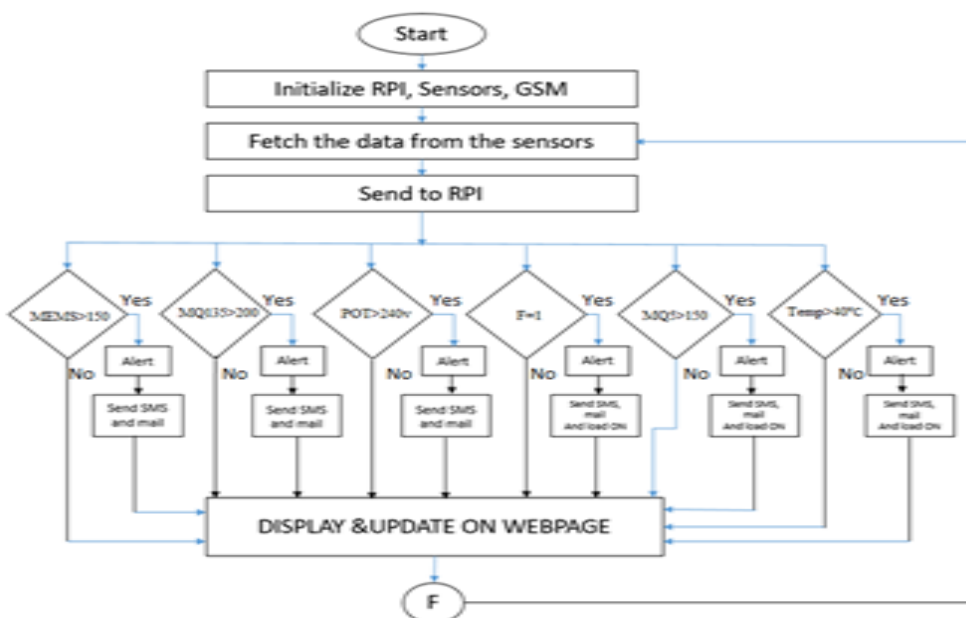
STEP 1: The initializing and network checking of all the components and GSM respectively are done.

STEP 2: Fetching of data from the sensors is seen.

STEP3: The fetched data is sent to the raspberry pi.

STEP 4: For each and every abnormality alert is given by buzzing, Mailing the images, SMS and their particular loads are ON. The camera can take the images of the room.

STEP 5: Update the data into the web page.



**Fig. 4 Flowchart**

## V. RESULTS AND DISCUSSIONS

Monitoring of Room or area parameters is done with the aid of the help of IoT WEBPAGE. The digital camera is used to take the images of room and when if any abnormal activity happens the images will send to concerned authority's mail address.

CASE 1: By using this webpage, the tracking of temperature is performed and those preserve on converting for every 3s. If abnormality is detected then alert SMS and mail is send and mechanically fan turns on for cooling

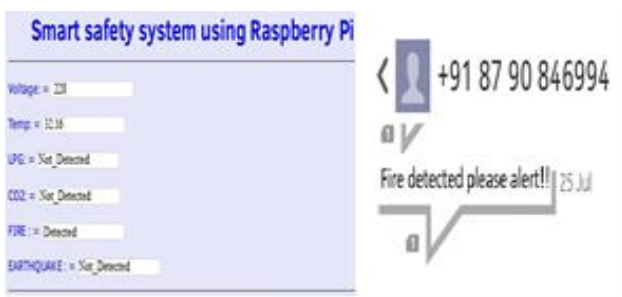


**Fig. 5 Monitoring of temperature sensor**



**Fig. 6 Webpage of the Temperature sensor**

CASE 2: By using of IR Fire sensor we can control the fire accidents, the parameter will displays on the webpage and it keep on refreshing for every 3s. If abnormality is detected then alert SMS is send, with buzzer and automatically water sprinkler ON.



**Fig. 7 Monitoring of IR Fire sensor**

CASE 3: By using this web page, the monitoring of LPG gas sensor is done and these keep on changing for every 3s. If abnormality is detected then alert SMS and mail will be send and buzzer and exhausted fan automatically ON.



**Fig. 8 Monitoring of LPG gas sensor.**

CASE 4: By using this webpage, the monitoring of MEMS sensor is done and these keep on changing for every 3s. If abnormality is detected then alert SMS and mail will be sent.



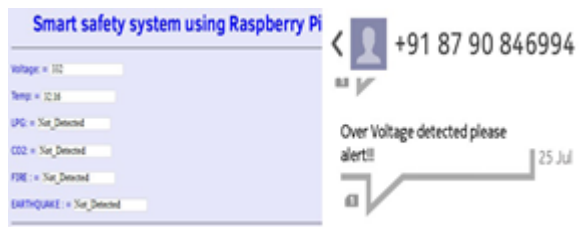
**Fig.9 Monitoring of MEMS sensor**

CASE 5: By using this web page, the monitoring of CO2 sensor is done and these keep on changing for every 3s. If abnormality is detected then alert SMS and mail will be send.



**Fig. 10 Monitoring of AIR QUALITY sensor.**

CASE 6: By using this webpage, the monitoring of Potentiometer is done and these keep on changing for every 3s. If abnormality is detected then alert SMS and mail will be send.



**Fig. 11 Monitoring of Potentiometer**

## VI. CONCLUSION

In this paper the layout and implementation of the interactive houses and industries by using tracking the machine parameters by using GSM and internet enabled measurements and manage. In the automation subject the internet primarily based tracking and automated manipulate of electrical equipment is forming as a trend. Through internet, through replacing of PC with the low price chip processor makes consumer to get records of different parameters of various sensors and send manipulate facts. For this motive the choice of selecting Mail and GSM is carried out because of the extensive coverage. As SMS is a text based protocol, and most primary GSM systems can have get right of entry to this device. The entire system might be very a whole lot secured through a password. By which it offers high safety, and the parameters may be monitored and controlled routinely whilst any abnormality is sensed.

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