



# An Iot Based Telemonitoring System for Covid -19 Quarantine

Hemavathy J <sup>a</sup>, Tamilbharathi S <sup>b</sup>, Yogitaa Devi R.C <sup>c</sup>, hemaramya27@gmail.com<sup>d</sup>

Asst Professor, Dept of IT, Panimalar Engineering College, Chennai, India

<sup>b,c</sup> UG Scholar, Dept of IT, Panimalar Engineering College, Chennai, India

**Abstract.** The drastic changes in our today's day to day life is due to the evolution of novel corona virus. This disease completely changed the entire person irrespective of their age and other factors. So, to reduce the number of people affecting this virus, our government announces the concept of Quarantine. Though there were not effective in this concept, but the number of cases affected has been reduced. As a result, the common people cannot be able to go hospitals for their checkups. Even people who affected corona also not able to go hospital as there was limitation in the stock of beds in hospitals due to the increasing cases. And the main thing is that those people not wanted to spread their corona to life saving doctors and other medical staffs. So, our paper proposes an online telemonitoring system for Covid Affected persons and also to the common people to detect covid, check their risk in their covid related signs and also to provide the guidance to the victims phone regarding their diet to overcome covid through SMS. The Technology we are using to implement this model is Internet of things (IOT). With the help of certain sensors and microcontroller to acquire and process the data collected by those sensors and some internet facilities (wifi) to transmit the data to station mode, this model will be implemented.

**Keywords.** *Quarantine, victims, covid, Internet of Things, microcontroller, station mode*

## 1. INTRODUCTION

From 2019 still now, the world is affected by severe disease called corona virus has created a lot of impacts in every people's life. It also highly affected the Indian economy. Even though the concept came like work from home, not all the sectors are satisfied with this concept. Nearly 53% of commerce has been severely affected due to this novel corona virus. The cases have been increasing day by day. At one point, there were limitations in stock of beds in hospitals. People can't able to admit in hospital for their treatment. There were no calls from higher authorities to people who affected corona which has been discovered by corporations. So, To tackle these problems, this paper proposes the online health care monitoring system in which the critical conditions of their health is being noticed by them by sms and also in case of any emergency, the diet measures also sent to their mobile through sms. This method is implemented by using the concept of (IOT).

IOT is the most common technologies that have been employed in many recent applications. It is influencing our daily lifestyle from way we behave. The wonderful concept behind this is the connection of many things (devices) with the help of internets. Sensors play a major role in IOT concepts to collect the data from the users. Nowadays many sensors have been introduced for the various applications. Sensors are embedded in every physical device in which the data's are being shared. Here things means nodes .

The nodes must have the following capabilities like Data Acquisition, Data processing, Data communication. ADC is used to convert the information in analogue form to continuous form. Data Acquisition means that it should acquire the data irrespective of way sending either wired or wireless mode and also it should store the data in any variable.

### 1. Existing System:

There were many researchers have developed a model related to online monitoring. Those papers are inspired us to research on this Topic. Some of those related works are,

**Mohammad Monirujjaman Khan** et.al discovered an IOT based virtual health tracking system for the covid patients. This model involves certain type of sensors like temperature sensor, pulse sensor ,

DS18B20 Sensor and hardware like buck convertor

,arduino,16x2 LCD Display, Bluetooth module and node MCU. In this system, three major signs of covid has been detected .They are body temperature, rate of pulse and level of oxygen saturation. For immediate tracking, these signs are coincides with the patient's registered mobile

.It has been synchronized like an application in mobile.

**Nizzar AI Balsam** et al discovered a wearable gadget to monitor some important risk signs of covid patients in this quarantine time. This device With the help of runtime data, this device alerts the respective medical chief's during the occurrence of any unusual situations. Certain sensors which are wearable are attached to the thing or node in IOT cloud in which the information is examined and progressed to explain the various level of health condition of patient. This model is carry out with the help of three layered services .

**Saksham Gera** et al discovered a wonderful telemonitoring system for patient care in online mode. This model comprises of five common elements which helps in evaluating a health of the patient. The main theme of this model is to collect the above data with the help of wearable sensors and with the help of those data, the recommendation for the check up of patient's should be provided. The technology behind this concept is Internet of Things (IOT).

**Mwaffaq Otoom,** et al a discovered a run time covid detection and monitoring scheme. This helps us to reduce the patient's who were waiting for their covid test report as well people who can't able to get proper treatment duringtheir covid cycle due to this pandemic time. The framework used in this model is IOT (Internet of Things). This technology helps us to collect the relevant data from the users and with the help of some components; it detects the patient's who have suffered with covid as well as it helps to monitor those people.

## 2. Hardware used:

**Sensors:**Sensors are the brain of the Automation. As we allknow that IOT, Automation are the recent leading developing technologies, These sensors secure vital role in producing outputs of a model which are implemented by the technology called IOT.Sensors are the devices which helps to detect the changes in any physical quantities and in case of any changes, it will report in the form of electrical signal. Sensors are classified into two types .They are Direct sensors( Detect physical changes and in case of any changes, it gives directoutput) and Indirect Sensors(Detect physical changes and in case of any changes, it does not give direct output rather than it will make some inner conversions and then give results.). In this proposed model, there are some sensors used for detecting the novel corona virus like Temperature sensors

**1. Temperature Sensor:** As we are in the world in which various diseases are evolving, it is mandatory to all keep our body temperature in normal. Most of the diseases are starting from increase in the temperature of the body, it is more important job for all common people to check up their body temperature regularly, but, in this busy world, people are not getting enough time to visit hospital for checking their body temperature. So, to handle this situation, certain sensors have been introduced to check person's body temperature. A sensor which is used to check body temperature is called Temperature sensor. It is also used to track the temperature gradient. The sensor converts the analog value to common digital measurable value.

**2.Oximeter Sensor:** Another important biological sign for this risk of covid is saturation of oxygen level. So, in this program we have used oximeter sensor for track a person's oxygen saturation. This is based on NON-Invasive method. In This model, this oximeter sensor device must be kept on very thin part of the human body, Mostly experts uses patient's finger tips or earlobes or infants foot. Main motive for this type of sensors is that to get effective result, is that these types of sensors must be overlapped to sensitive part and also tothe part which have higher blood flow rates that pave the way for heat transfer. Spectrometer is theprinciple that was used for the working of oximeter sensor.

**3. Bluetooth Energy module:**Bluetooth lower energy is made for linking the machine low consumption of power. It is wireless communicable technology that is mainly used for transmits energy in small packets over a shortinterval to authorize small machines to transfer information

.In day to day life, we are using many device for the purpose of interaction such as smart mobile,wireless headphone ,and laptop which is many up of blue tooth lower energy to produce logical circumstance in between our devices.

**4.HeartBeat Sensor:**A sensor which is widely used to compute rate of heart is known the Heartbeat Sensor.During COVID-19 pandemic, a pulse sensor is used for measuring the heartbeatof an infected person. It is a plug and play sensor that is placed on the top of a vein at fingertip or earlobe. As all we know that Health is wealth ,it is mandartory to all to check the basic checkups with respect to their ages. In that basic checkup,heart rate monitoring is very vital. The sign that isindicated by heartbeat sensor to indicate that is heart is blinking is seen by the blinking of LED light that is overlapped in heartrate sensor.

**5.GSM Module:**A GSM modem or GSM module is a hardware device that uses GSM mobile telephone technology to provide a data link to a remote network. A customized GSM module is designed for wireless radiation monitoring through SMS (Short Messaging Service. The purpose of GSM is to dispatch information from control unit to base unit We use GSM 900 which uses at 815 to 915Megahertz to dispatch information from the mobile station to the base unit. In 25Megahertz Bandwidth 124 carriers are produced with Strait (channel) spacing of 200 kilohertz Frequency Division Multiple Access.

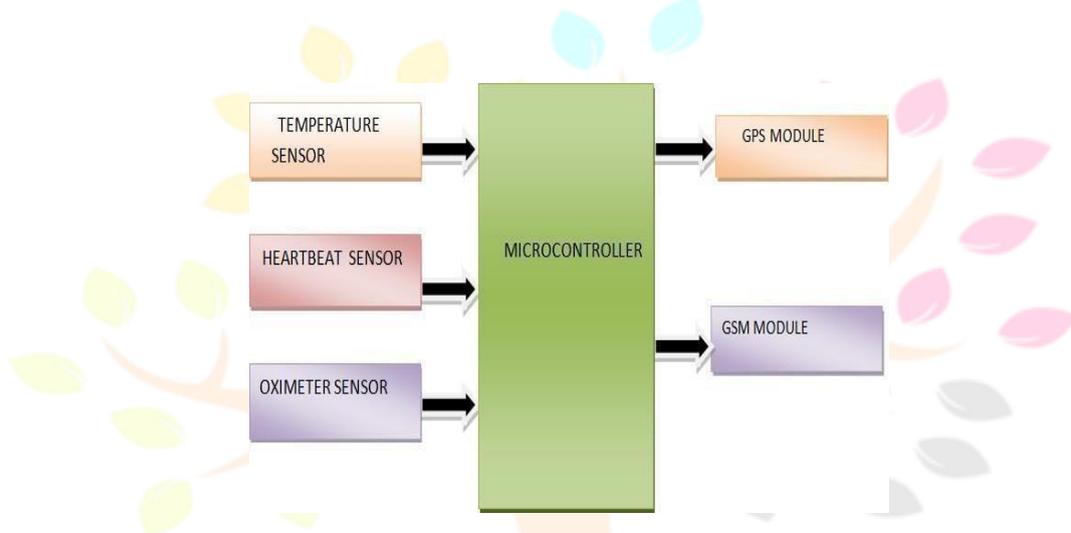
**6.GPS Module:** Global Positioning System module consists of many small minute processors and transmitting aerial which transparently get the information through a space station. From there, it will receive the checksum from each visible satellites along with other pieces of data. Global Positioning System module uses PM (phases modulation) which is a rare technique compared to AMand FM modulations.When the data is to be modulated into the carrier signal, the carrier signal suddenly shifts the phase by 180 degrees. Global Positioning System is the satellite space station thatis used to receive station information from GNSS Satellites..It will track the audio information and also space transmitting medium . Using GPS module we can easily track the information in the technology called Internet Of things .

## II.LITERATURE SURVEY

| AUTHORS                     | CONTRIBUTION   | LIMITATION  |
|-----------------------------|--|---|
| H.Ting and W.Zhuang et al., | This IOT based patient monitoring system is used for detecting Alzheimer diseases. In this model, patient will carry a Bluetooth enabled device and in the nearest stations of patient's home, an access point has been setted.during the movement, the information is forwarded to doctors. | There is accurate functionality in this model.  |
| Mr. Ojas Sonnis et al.,     | This IOT Based Telemedicine system is mainly introduced for detect bed ridden patient's. This system paves the way for both virtual doctors as well as virtual nurse. It is used for monitoring patient's healthusing certain sensors and also keep the relation of patient into up to date  | The major drawback in this system is that it needs internet which is not available ateverywhere     |
| AkshaKumar Siddhu et al.,   | This paper is the review about covid patients with the help of medical images. Here the detection of covid i done by the technology called Machine learning. Here X-ray act as a database and patients medical images .  | There may be non accuracy in the image detected by medical image reasoning through X ray.           |
| Hasan K. NAJI.,             | This IOT based proposed model is introducedmainly for detecting vital signs of covid patients'. In this the device is like in the form of bracelet. By using various sensors and also suitable range of WIFI module, major signs which are related to COVID can be easily monitored.         | The disadvantage is that there may be someno surety in the idle of covid patient's to wear bracelet |

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| Nizar Al. Bassamet al.,    | This IOT Based proposed model is discovered for the detecting purpose of covid. Here the device which aware the respective doctors in case of any changes in vital signs that is responsible for cause of corona virus is employed in the form of wearable device in which one edge is connected to IOT. | The proposed model will slow down its work in case of bad quality network. This is the major drawback of this model. |
| IbrahimKaremHanoon et al., | This cloud based proposed model is implemented to monitor covid diseases and also reduce the risk of getting covid. The sensors involved in this model are Temperature, oxygen saturation and also heart rate. Internet of things is also used to implement this covid health monitoring system.         | The range employed in this modules is sometimes notable to track the mobile to send the alert information            |

### III. PROPOSED MODEL



### IV. TECHNOLOGY USED IN OUR MODEL

In our proposed model, we are using the most leading Technology which is IOT (Internet of Things). As we know that Internet of things is nothing but connection of nodes. And with the help of wifi module we can be able to implement a proposed model. The above figure consists of main block diagram of our proposed model. It contains various sensors like Thermometer Sensors, Heartbeat Sensors and oximeter Sensor and a microcontroller and connectors like GPS module, GSM module. With the help of this model we can easily be able to implement an IOT Based Telemonitoring System For Covid-19 Quarantine. The main reason for choosing these sensors is as this project is to provide welfare to covid affected person and it is mainly for maintain our regular body in these pandemic time, and research says that the important three biological signs of covid is changes in Body Temperature, oxygen rate and sudden panic stress corresponds heart rate..

### V. SOFTWARE ALGORITHM

During the crucial situation that is if any sensors indicated the changes in physical signs of human body, the following tasks should be carried out. If this rate become high warning message should be sent to patient's registered phone number and in case of covid patient, additionally, diet chart is also sent to patient's registered mobile number. As this covid provides high rate in affecting older people we are providing additional module that is in this case with the help of pre registered age in case of older people an additional message is also sent for their registered care taker.

1. GPS Module Transmitter and receiver pins is to be allocated.
2. Baud rate 9600 and Bitrates 4800 of buffer should be assigned
3. With the help of loop, the following tasks should be done
  - A) Examine the signs given by sensors
  - B) With the help of Global positioning system, information must be stored
  - C) Now, parallel and meridians conversion should take place.
  - D) Check whether the victim is affected covid or warning that chance to get affected by covid

- I. If the person is already affected covid, then provide the message to their registered phone number regarding diet plans to overcome their symptoms earlier
- II. If the person health signs tends that they may get affected soon, then provide them warning sign of covid along with that diet chart
  - E) Check the registered age of patients if the age is found to be too old, the along with warning sign, diet chart send these messages to their registered care taker

## VI. RESULT

As a result, in this IOT Based Telemonitoring System for Covid-19 Quarantine model, we can easily help the covid affected patient's as well as major symptoms of getting affected people in a efficient way. The technology behind this concept is Internet Of things (IOT). This model involves various types of sensors like Heart beat sensor, thermometer and oximeter Sensor and a microcontroller and connectors like gps module, gsm module . With the help of this model we can easily able to implement a An IOT Based Telemonitoring System For Covid-19 Quarantine. So, this model helps to number of times we went to hospital to check the covid and also getting proper treatment. Moreover in this critical pandemic time people are not comfort to go to hospital for their covid treatment and in hospitals also there were seldom limitations stocks of bed. So, our proposed model helps during this andemic time to get rid of spreadness of corona. The main module is that in case of any changes scanned by sensor, this model provide messages to patient's registered mobile number and also it send diet chart to their modile through SMS.

There is an increase in risk caused that are evolved in country due to this covis disease. It results in major death and also it affects our social economy also. Our government has taken lot of concepts like Quarantine and ways to prevent the spreading of COVID and it worked. Eventhough it worked because of the Quarantine there are people who they can't reach the hospitals for their urgent need and suffered a lot. So as a conclusion of our paper the sensors which we explained will be useful. The heartbeat sensor will monitor the rate of our normal heartbeat and gather the heartbeat while performing various physical activities so that we can able to know about how our heartbeat varies during the time COVID. By the use of temperature sensor we can measure one's body temperature so that we can proceed further treatment for the infected patient. The purpose of oximetry sensor is to check if our blood is well oxygenated. And with the help of connecting devices which helps to track informations, we can get all the information through the smartphones so need for the hospitals will be reduced and people will also get know about their health conditions during the time of pandemic.

## VII. FUTURE ENHANCEMENTS

Thus we have elucidated a idea which is more helpful to covid patients to reduce the number of times going to hospital and it overcome the limitation stock of beds ,thereby by using this model, it is easy to check the riskness of covid in home itself. In future these sensor can be further developed to get the patient's data easily in the home itself. And we can also develop more sensor like this so that it will be much easier to know about the health condition of the infected person. This paper describes about how IOT helps in checking the patients's health condition during COVID and providing the guidelines through SMS. Also it will make much comfortable for the patients if this project further developed. Now we are using three sensor, in future we will research more on this topic in depth and implement a model that will be much easier for the patients to recover from the COVID

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