Covid-19 Health Monitoring System using Internet of Things

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***Abstract*:- Healthcare has become one of the principal issue with the rise in human population and medical expenditure. For a healthy life, it is essential to follow human body's vital signals. Continuous Monitoring of patient's vital signals cannot be provided outside hospital. Asit is hard to monitor the patient's condition for 24 hours, it was proposed in this paper to observe continuously the condition of patient despite the patient being busy with his routine and to screen the health status to the doctors through Internet of Things. This paper proposes health monitoring system using non-intrusive biomedical sensors that measure five parameters like ECG, heartbeat, temperature and blood pressure. Proposed method makes use of Arduino Controller to which non- invasive biomedical sensors are connected. Theoutput is displayed on any digital monitoring system using Arduino. The data obtained from the sensors is uploaded to the Thing Speak cloud to store and to access patient's information by their doctors or by the concerned for necessary follow-ups in real- time .IoT is a powerful domain where sensors can connect and data is viewed over the Internet.**

Keywords:- Arduino Controller, Temperature Sensor , Heartbeat/pulse Sensor, RFID module, SpO2 [Saturation of Peripheral Oxygen]

INTRODUCTION:

Currently, the COVID-19 pandemic is one of the major global issues faced by health organizations. As of November 19, 2020, the total number of people worldwide confirmed to have been infected with SARS-COV-2 is more than 56.4 million, while the total number of fatalities from the coronavirus is more than 1.35 million, thereby proving that COVID-19 cases are surging worldwide. The normal pulse rate ranges between 60 and 100 beats per minute for typical individuals. The average resting pulse rate for adult males and females is approximately 70 and 75 bpm, respectively [8, 9]. Females over the age of 12 typically have higher pulse rates than men.

However, the pulse rate for COVID-19 patients is abnormal and requires aid from an emergency medical assistant. The internal heat level of an individual depends on various factors, such as surrounding temperature, gender, and dietary pattern, and the temperature ranges between 97.8°F (36.5°C) and 99°F (37.2°C) in healthy adults [9– 11]. Various factors, such as influenza, low- temperature hypothermia, and other diseases, may prompt a fluctuation in; therefore, it is essential. body temperature. In most diseases, includingCOVID-19, fever is a common symptom.

PROPOSED SYSTEM:

A block diagram and flowchart were used as guides to visualize the arrangement of steps to be followed throughout the system management process. When the cycle stream was created, it directed essential periods of any future activities from the beginning to the end of a system. Circuit diagrams were utilized for the planning, development, and support of electrical and electronic gears. For a well- information is made available to the doctors or to the concerned persons from family using internet. This device uses oximeter sensor and temperature sensor which gives the proper values to the controller. Generally, in normal condition SpO2 ranges form 95- 97 and developed system, these diagrams were truly temperature from 36-37. The values recorded significant. Figure 1 shows a block diagram of are uploaded to Blynk so they can be viewed the proposed system. The diagram shows that when the system block power of the from anywhere using internet. The person must practice hand hygiene - wash hands for at least system is switched on, the sensor starts taking 20seconds. Place a fingertip on MAX30100 values. Here, the system has two types of Oximeter sensor and also place a finger on sensors for measuring SpO2, pulse rate, and LM35 Temperature sensor. The sensors start temperature. The sensors measure the recording the data and send it to Node MCU. physiological data from a human body and The Node MCU transmits the data to the then pass the analog values to the Arduino, mobile phone using the Wi-Fi module. In the which converts them into digital data. The Blynk app 2 labeled value widget and 1 Super server sends the measured data to the mobile Chart is used to display the data. This data is application and displays the data through an LCD display simultaneously. received by the mobile using the internet and displayed in the Blynk app. The normal body temperature ranges from 36- 38°C and the oxygen level (SpO2) level anges from 95-

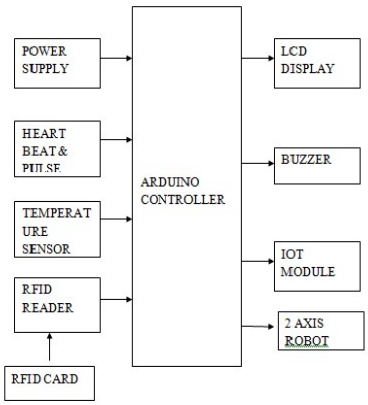
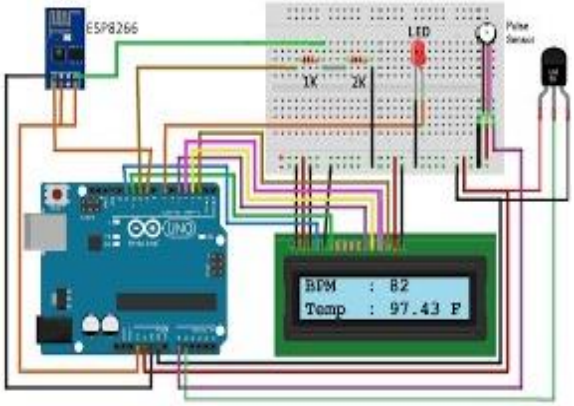


Fig (1) Block Diagram of Monitoring system

WORKING:

98%. If the readings are above or below this range for a long time then the patient requires medical attention. Accordingly, the medical staff will take further actions.

The Arduino controller biomedical parameters like monitors the Temperature, Heartbeat, RFID module and Pulse. The controller is given a supply of 5V. The biomedical parameters are measured using a Temperature sensor, Heartbeat sensor



Fig(2) Working Diagram.

RESULT:

The proposed IoT based system has been structured in such a way that it can help to recover from the tremendous loss occurring because of the COVID-19 pandemic. The system is successful at achieving the goals which were set primarily. As maintaining the physical distance plays a crucial part in combatting the virus, the proposed approach enables the healthcare professionals to provide their service to the patients by monitoring them remotely. The proposed system can establish a low-cost health monitoring system with significant efficiency. Additionally, the feature that generates real-time data enables the authority and healthcare professionals to get notified in time to respond to a critical situation quickly. The proposed system also opens an opportunity to understand the patient's health better and provide proper treatment by getting information on the severity of COVID-19. Thus, patients with other diseases can be treated accordingly without the possibility of being mistreated. The embedded multiple sensors for the system were developed as a prototype and can be improved even more by adding other sensors.

TEMP	HEART BEAT	ECG	SALINE BOTTLE	FALL DETECT	Date / TIME

Fig(3) Expected Output.

CONCLUSION:

The whole world is affected by the COVID-19 pandemic. The proposed IoT-based system can play a significant role in saving lives and be of great service in the health sector. It can be an excellent asset for healthcare professionals and the authorities to confront the virus. Infected and suspected cases can also get the necessary healthcare and can be adequately monitored by this system. As physical distance can be maintained with the help of the system while providing treatment, the risk of healthcare service providers to get infected from treating any patient can be reduced. The embedded multiple sensors showed excellent accuracy in detecting biological and environmental data. The processing units, i.e., Raspberry Pi, Arduino modules, can efficiently upload the data to the cloud network or cloud storage. The ML algorithms implemented for the system in the cloud shows quite a significant result. However, the size of our dataset was comparatively small. But with more data collected from COVID-19 patients, the dataset can be expanded to enable more accurate analysis and prediction for the proposed system. As per the future improvement, we are working on developing the system with more accurate biological sensors and improving the performance of the Machine Learning Algorithms.

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