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IOT Based Health Monitoring System

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Abstract: ***The increased use of smart phones and smart devices in the health zone has brought on extraordinary effect on the world's critical care. The Internet of things is progressively permitting to coordinate sensors fit for associating with the Internet and give data on the health condition of patients. These technologies create an amazing change in medicinal services during pandemics. Likewise, many users are beneficiaries of the M-Health (Mobile Health) applications and E-Health (social insurance upheld by ICT) to enhance, help and assist continuously to specialists who help. The main aim of this 'IOT Health Monitoring System' is to build up a system fit for observing vital body signs such as body temperature, heart rate, pulse oximetry etc. The System is additionally equipped measuring Room Temperature and Humidity and Atmosphere CO level. To accomplish this, the system involves many sensors to display vital signs that can be interfaced to the doctor's smart phone as well as caretakers' smartphone. This prototype will upload the readings from the sensor to a server remotely and the information gathered will be accessible for analysis progressively. It has the capacity of reading and transmitting vital parameters measured to the cloud server and then to any Smartphone configured with Blynk App. These readings can be utilized to recognize the health state of the patient and necessary actions can be taken if the vital parameters are not in prescribed limits for a longer period.***
Keywords: IOT Health Monitoring System, Vital parameters, Blynk App

I. INTRODUCTION

As a proverb says "Health is wealth", health is a fundamental element of people's need for a better life. Unfortunately, health problem is globally spread as it has created a dilemma because of certain factors such as poor health services in some countries, the presence of large gaps between rural and urban areas, physicians and nurse unavailability during the pandemic time.

IoT is making any objects internally connect in the recent decade and it has been considered as the next technological revolution. Smart health monitoring mechanism, smart parking, smart home, smart climate, smart industrial sites and agricultural fields are some of the field applications of IoT.

The most required use of IoT is in healthcare management which provides health and environment condition tracking facilities. IoT is nothing but linking sensors or computers to the internet utilizing networking. The values from sensors are updated to Blynk Server via NODEMCU to handheld devices or smartphones. It is a simple, efficient, much smarter, scalable, and compatible way of tracking and optimizing care to any health problem. Nowadays, modern systems are providing a flexible interface, assistant devices and mental health management to lead a smart life for the human being.

Heart rate and body temperature are the two most significant vital signs for human health. Heart rate is the per-minute rate of heartbeats, commonly known as the pulse rate.

Normal heart rate will be in the range of 60 and 100 beats per minute for healthy people. In healthy adults, it is likely to range between 97.8 °F (36.5 °C) and 99 °F (37.2 °C). Different factors such as flu, low-temperature hypothermia, or any other illness may lead to a fractional change in body temperature.

In almost all illnesses, fever is a typical symptom. Various methods exist to invasively and non-invasively assess the heart rate and body temperature. It is suggested that a healthcare should be provide good room atmosphere conditions to ensure comfort to the patients. Some parameters like room humidity, level of gases like CO, and CO2 can determine the air quality of room environment. These toxic gases and certain levels of humidity are very harmful to some patients. For normal condition, the room humidity should be between 30 and 65%.

There are several fatal diseases like heart disease, diabetes, breast cancer, liver disorder, etc. in medical sector but the main concern of our developed system is to monitor the vital signs of all types of patients and the patient's room environment. This project proposes a customized healthcare system that monitors the pulse and body temperature of patients as well as room humidity and CO gas level of patient's room via sensors and transmits the data through Wi-Fi that enables the medical staffs and family members of the patient to view the parameters remotely through Blynk App.

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II. OBJECTIVES

The main objectives of IOT Based Health Monitoring System are as follows:

A. To monitor patient's vital signs continuously when the device is turned on and display them remotely through Blynk App.
B. The monitored data could be seen by medical staff and any kind of abnormality can be sensed by them remotely without any physical contact.
C. Reducing manual monitoring stress undergone by the medical staff as the device can be operated by anybody.
D. To ensure comfort to patients by keeping them in certain Temperature and Humidity Level by Monitoring these parameters of the atmosphere and the presence of Carbon Monoxide levels in the atmosphere along with the vital signs.
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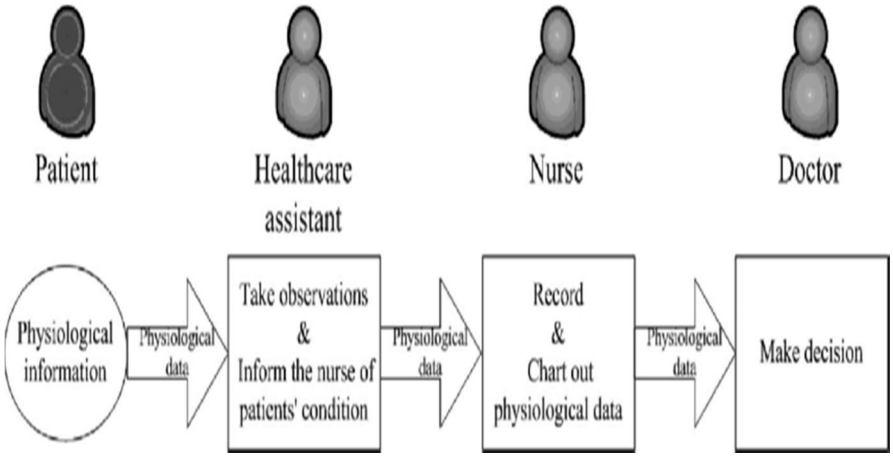
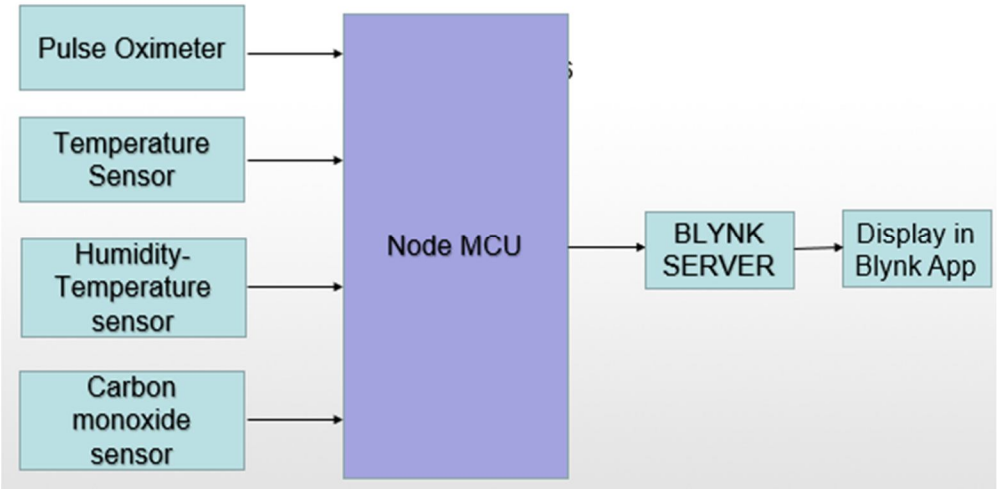
III.EXISTING METHOD



Traditional Health Monitoring is merely not possible in these days. The aged people may find sometimes difficult to consult the doctor for small health checks for which they may have to get strained by travelling and spend money. Sometimes it'll be difficult for paralyzed and bedridden patients also to visit normal health checks for which they had to travel causing much discomfort to them and it is also expensive. Sometimes the Doctors or Physicians may also find it difficult to visit all their patients due to paucity of time and their busy schedule. With the advent of Smart Medical gadgets these problems can be solved in a remarkable way.

IV.BLOCK DIAGRAM



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V. WORKING

The model consists of a Pulse Oximeter (MAX30100), Body Temperature Sensor (DS18B20), Humidity-Temperature Sensor (DHT-11), Carbon Monoxide Sensor (MQ-7), NODEMCU Microcontroller. All the Sensors are connected to the GPIO pins of NODEMCU and a suitable program is written in Arduino IDE software to read the values all the sensors and display them in Blynk App as well as in serial monitor of Arduino IDE software. After Compilation, the program is loaded to the NODEMCU using serial port. In Blynk App the values are displayed in widgets which are designed by drag and drop method. Each widget displays different parameters measured with some delay.

VI. CONCLUSION

An efficient IOT Health Monitoring System is developed to monitor the real time status of the patient's vital parameters irrespective of the presence of the doctor and also the atmospheric. The system collects information like temperature, blood pressure and pulse rate of the patient and updates the same to the doctor. The doctor can monitor the progress of patients' health now and then to advise them about their health or take any emergency action according to the vital parameters value obtained at a specific time.

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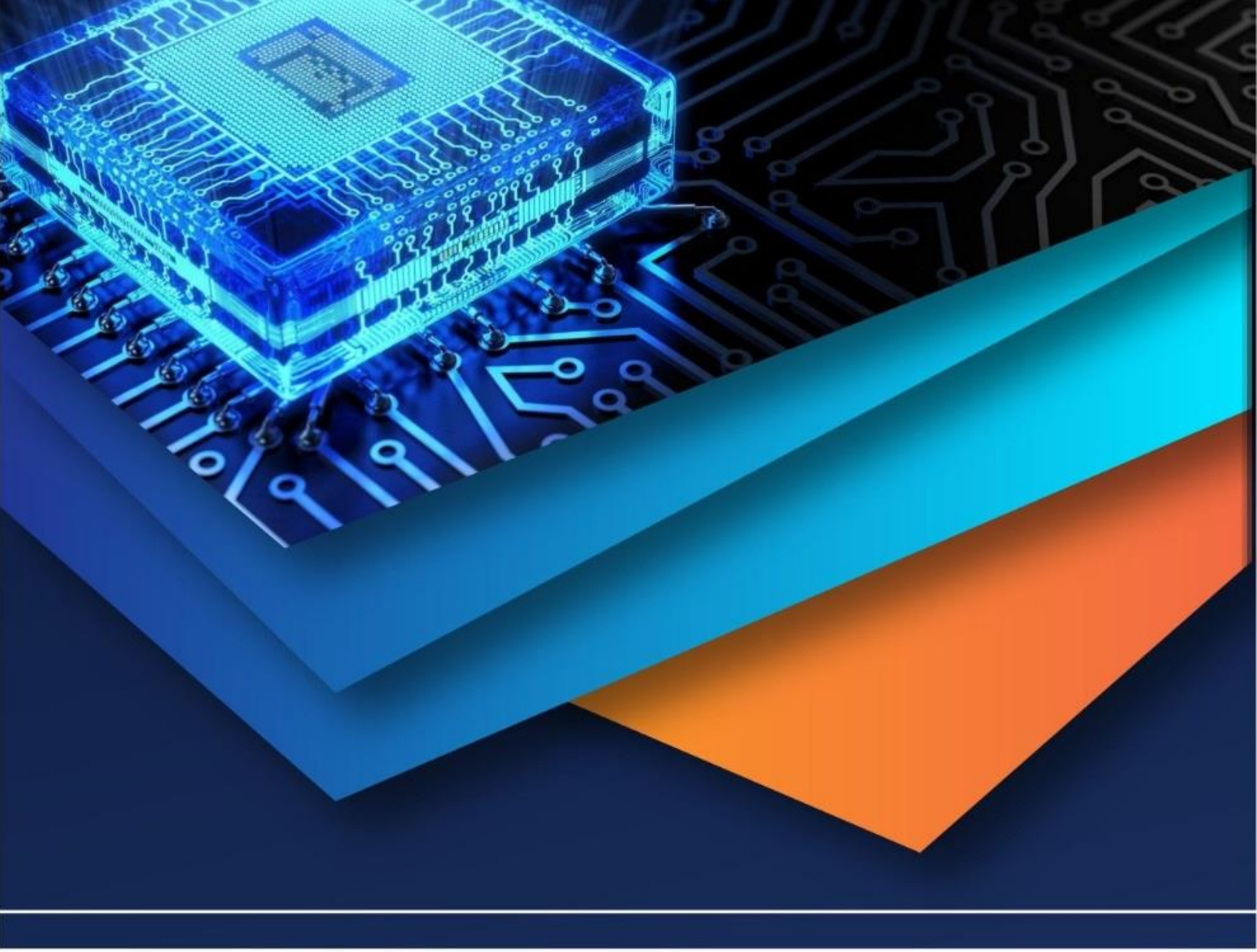

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