HEALTH MONITORING SYSTEM BASED ON IOT

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Abstract - Nowadays, individuals are apprehensive about visiting hospitals for medical consultations because of the COVID-19 epidemic. As a result, internet consultations have become more popular. However, physicians are compelled to treat patients without enough data since they are unable to do the diagnostic checks typically performed on them in hospitals. Our gadget captures the necessary data and sends it to the doctor, solving these difficulties.

Keywords: COVID-19, Hospitals, Patients, IoT

1.INTRODUCTION

When it comes to technological advancements, people's health is always a major concern. An example of how medical services have become very important is the recent COVID-19 pandemic, which has partially crippled China's economy. It is always a good idea to test these patients using faraway wellness monitoring technology in locations where the pandemic has prevalent. There is currently no better solution than an IoT-based health monitoring system.

Patients may be seen outside of traditional clinical facilities (such at home) with the use of the Distant Patient Checking plan, which increases access to human administration offices while decreasing expenses. An intelligent patient wellness global positioning system that uses sensors to track the patient's vitals and the internet to alert loved ones in the event of an emergency is the primary goal of this project. The reduction of medical care expenditures via the elimination of unnecessary doctor's appointments, hospital stays, and diagnostic tests is the overarching goal of developing monitoring systems. When assessing whether or not we are healthy, every cell in our body employs temperature and heart rate monitoring. A microprocessor monitors the state via the sensors, which are then interfaced to an LCD panel and, moreover, remote relationships may exchange warnings. If the device detects any irregularities in the patient's heart rate or core temperature, it will notify others around about the patient's condition.

Objectives

We want to improve the efficiency and reliability of online medical consultations. Plus, to let the doctor see and access the patient's physical health measures even when they're at a faraway place.

Target users

Paralyzed patients of any age and elderly patients between the ages of 50 and 80 make up the bulk of our device's user base, since they are the ones most impacted by the present crisis. The device's onlookers and medical professionals are its secondary users.

2. Literature Review

In the past, doctors would simply take a patient's pulse by holding their hand, but now, thanks to technological advancements, it's possible to do just that using a variety of sensors and other tools. Among these was the emergence of the Internet of Things.

The Internet of Things (IoT) is going to play a major role in healthcare and is predicted to be a very successful industry in the coming years. Among the many significant uses of the Internet of things, health care applications stand out. The Internet of Things has several applications in the medical industry [1]. The Internet of Things (IoT) facilitates communication amongst people by actively involving their health and wealth via wearable devices. New developments in the Internet of Things may be traced back to the continuous enhancement of remote sensor networks. The internet of things has great potential for improving people's health. This medical care framework allows for the instant observation of individuals with medical issues, allowing for the prompt provision of answers for these patients. Wearable technologies may monitor the patient's activity and condition in real time, allowing for this kind of arrangement to be experienced in an expected way. This study aims to provide a comprehensive investigation of collecting sensor data, analyzing the information, and providing an

advice to spectators and patients about different health limits, as well as physicians' recommendations [4].

The investigation of technology for the purpose of enhancing health care is a broad area of active study. There are a plethora of consumer-ready smart healthcare gadgets and systems that rely on the Internet of Things (IoT). Among the many duties that these tools may help with are patient monitoring, keeping in touch with physicians, enhancing rehabilitation performance, and more [2].

There are a plethora of health monitoring systems that help people in some manner. In recent years, a plethora of feature-packed gadgets have been presented. However, can we be sure that all of these devices will be as dependable, affordable, and user-friendly as their prototypes? The components used in the manufacturing process are the reason for this. Therefore, we developed a gadget that can monitor patients' vital signs in an effort to address these issues.

3. Proposed system

After carefully thinking about our goal and talking about it with others, we decided to solve the problem by making a smart device that could track the patient's health in real time and let the doctor see and use it. The patient can also see important information on the screen, which lets them keep an eye on their health.

The temperature, SpO2, heart rate, and ECG of the patient are all tracked by our system in real time and shown in the program. We also check the weather, humidity, and air pressure in the area to see if they have any effect on the patient's state.

3.2 Block Diagram of Proposed System
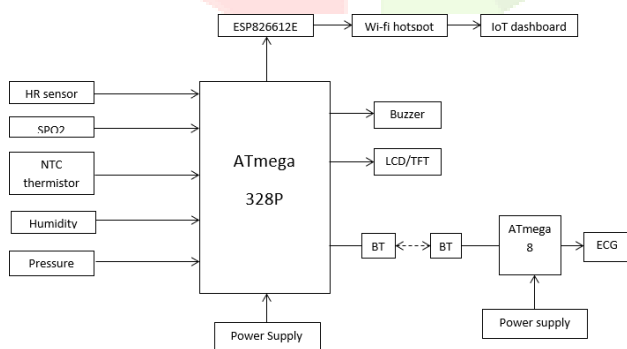
Our system has two parts: one is just for measuring the ECG, and the other is the main part, which has all the sensors and does all the processing. The ecg part is linked to the main part via Bluetooth. This is done to minimize any problems.

(because the patients could accidentally unhook the leads as they move around) of the patients and to get a more accurate reading of the ECG.

The main part has five sensors: an HR sensor, a SpO2 sensor, a temperature sensor for the patient, and a humidity, atmospheric pressure, and temperature sensor to evaluate the patient's environment and help the doctor figure out if it is affecting the patient's health. The device will also sound an alarm if the patient's temperature rises above the standard level.

4. System flow chart
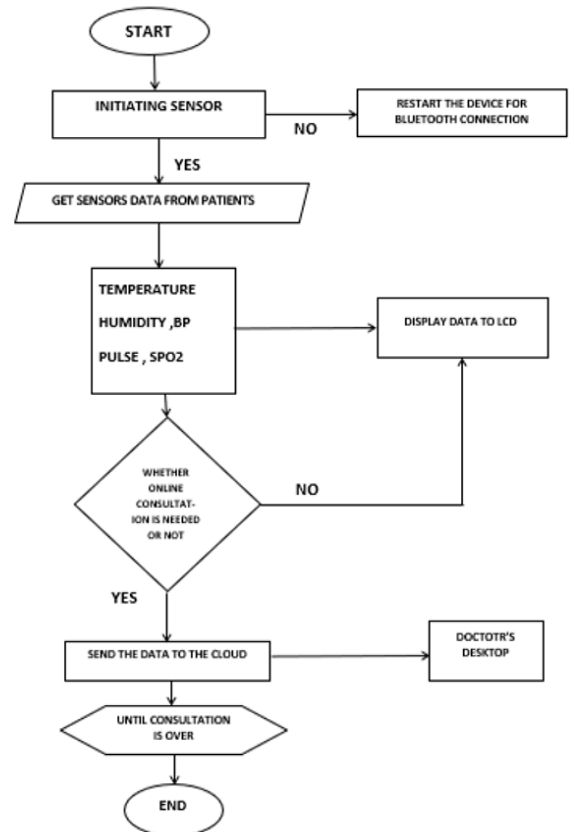
5. Algorithm

Step1: Initializes both transmitter and receiver section and establishes Bluetooth connection between the systems.

Step2: The AD8232 sensor collects the ECG values of the patient and the data is passed to the microcontroller ATmega 8 in the transmitter section. And the data is send to the receiver section via the already established Bluetooth connection.

Step 3 : Real time pressure value is sensed by the biometric pressure sensor BMP 180 which is a piezo resistive MEMS device. The data is collected by the

microcontroller ATmega 328 and is serially printed in the TFT display.

Step 4: The atmospheric humidity is sensed with the help of DHT 22 sensor and the value is serially printed in the TFT display.

Step 5: Heart beat of the patient is obtained with the help of Max 30100pulse oximeter sensor. Also the amount of oxygen content in the blood is measured. Both the data is printed on TFT display.

Step 6: The real time temperature of the patient is monitored by using temperature sensor and the temperature value is serially printed on the TFT Display.

Step 7: All the data collected by ECG sensor AD8232, BMP 180, DHT 22, MAX 30100 and Temperature sensor are pushed to the IoT platform by the ESP 8266 IoT module.

6. CONCLUSIONS

As healthcare facilities get older and their costs go up, more needs to be done to save money while still making sure patients get good care. In our project, we show a new way to discuss that doesn't involve doctors talking to their patients. The project is mostly for people who can't get in touch with their doctor. The project comes with a tool that can measure things like SpO2 level, body temperature, heart rate, blood pressure, ECG, and humidity in the room. The measurements are then processed and shown on the LCD screen so that people nearby can see them. At the same time, the readings are sent to the IOT panel via the wifi module. In real time, the doctor can see the patient's measured value. They can also see the patient's information and state of the last checkup, making it easy to see if anything has changed.

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