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ENHANCING QUARANTINE CARE: IOT-BASED MONITORING OF COVID PATIENTS' HEALTH

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ABSTRACT - Inside The primary purpose of the plan is to create a duplicate of the system that is already tracking patients. Biosensors are employed in the proposed method to precisely monitor physiological parameters such as blood pressure, heart rate, and body temperature. Wired communication technology allows for a variety of approaches to monitor the health of ICU patients. The smart structure continuously monitors the patient's health and transmits the data it collects to Wi-Fi remote sensor networks. A surgically implanted processor aids in analyzing the patient's role and the outcomes of numerous stored restrictions in the database. If the patient detects anything that isn't right, they will notify the medical professionals. The ARDUINO microcontroller, which operates at a high level, controls the system and produces the desired outcomes.

KE WORDS: IOT, ARDUINO, Heartbeat Sensor, Easy Pulse, Photo Plethysmo Graphy (PPG)

1. INTRODUCTION

In recent years, several remote health monitoring technologies have emerged. One of these is a smart mobile app designed specifically for remote health monitoring. Even though we use normal methods to communicate information all the time, we can't get the broadcast feature to work properly in remote medical services checking apps. Because the cradle is overloaded, the hub does not last as long and information flow is hindered, which is particularly detrimental to medical services. The problem caused by unlawfully obtained patient data has been discussed. The technical proposal includes a central door that takes information about each client and routinely delivers it to a central server, allowing doctors to monitor each patient's health. As a result, there is a considerable emphasis on establishing comprehensive monitoring procedures. Unlike spot checks, this type of monitoring can provide more information on a patient, assist in recording emergency circumstances, and handle any significant changes in a patient's ongoing medical status. Access to medical care is an essential element of everyone's everyday routine. Based on this understanding, it is critical for everyone to always stay within the necessary limits and take the appropriate drugs. When a person reaches an advanced age and is unable to effectively monitor their condition without the assistance of a top clinical specialist or cutting-edge technology, these cycles worsen. As people age, they are more likely to develop a broader spectrum of ailments, and they may face unexpected emergencies. To prevent this from happening, the patient must be satisfied with the clinic, be cared for by professional staff, and receive prompt assistance if something goes wrong.

2. LITERATURE REVIEW

To improve security, S. M. Riazul Islam et al.propose a smart shared safety replica and investigate how wearable technology, big data, and knowledge might be applied in a medical context. They examine various IoT and E-Health strategies and implementations around the world to see what they can do to promote long-term growth that adheres to social and economic principles. They also offer several topics for future

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research on IoT-integrated medical care, with an emphasis on unresolved challenges and issues.

Junaid Mohammed et al.used an IOIO-OTG microcontroller to monitor a patient's ECG wave from anywhere in the world. An Android app was developed specifically to monitor electrocardiograms (ECGs). To connect the Android phone to the IOIOOTG microcontroller, use either a USB cable or a Bluetooth dongle. The Android app for the wave is launched after receiving instructions on how to put it together. There is an Android app that allows you to view and save ECG waves.

Mohammed S. Jasses et al.employed a cloud-based design and a Raspberry Pi board to investigate how to monitor internal heat levels. A Raspberry Pi serves as the heat source in this article, and a wireless sensor network (WSN) is used to adjust these parameters. Following that, these details will be added to the websites hosted in the cloud at tip. Making use of the website's heat screen.

Hasmah Mansor et al. used an LM35 temperature sensor to monitor the temperature inside the device. The Arduino Uno board is used to communicate with the LM35 temperature sensor. Once a website for creating SQL data patterns has been developed. The page is linked to an Arduino Uno board. The sensor yield is then supplied directly to the location. When users log in to this website, they can view information regarding the interior heat height.

SYSTEM ARCHITECTURE

Fig 1: SYSTEM ARCHITECTURE

The outline 1 demonstrates that the proposed framework engineering consists of two major components: the screen unit and the sensor unit. Using various signal processing methods, the sensor unit collects and processes various forms of clinical data from a variety of sensors, including body temperature, blood pressure, heart rate, and others. Obtaining and arranging the patient's information more quickly and conveniently may result in a more comprehensive proactive assessment. The ruling group must be informed of the gathering restrictions. It examines data on distinctive qualities. When there is a deviation, the patient is notified by a buzzer and control indicator. Testing is carried out using an LCD panel. Another concern concerning the Internet of Things (IoT) architecture is that it is widely employed, particularly in scenarios such as Wireless Body Area Networks (WBANs), where patients must be regularly monitored by doctors to detect any potential health problems early. There are various types of wireless networks (WBANs), but the most common are Wi-Fi, Bluetooth, and ZigBee. WBAN systems must ensure that information flows reliably across several protocols, including Bluetooth LE, ZigBee, Wi-Fi, and others, so that devices can share data and collaborate with one another. While ZigBee and Bluetooth LE employ a low data rate to save electricity, their range is significantly smaller than Wi-Fi's. As a customer who is not static and can

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be examined, there is a considerable risk that they will lose access owing to an intersection, making it difficult to deliver proactive verdicts.

3. SYSTEM ANALYSIS

EXISTING SYSTEM

An intelligent broadcast system based on FPGA was used in the current framework to illustrate a remote health monitoring application. Because of its FPGA hardware design, this flexible primary motor necessitates the use of two 16-bit comparators, two 3-bit adders, one 3-digit comparator, and one 16-bit subtractor. The PR, QRS, and QT intervals are calculated consecutively using the 16-digit subtractor, beginning with their respective start and finish points at the beginning of the data. Sign acquisition collects and analyzes the patient's ECG data. The electrocardiograms (ECGs) of twenty people were examined, and the results were compared using a variety of criteria.

PROPOSED SYSTEM

In the suggested system, the sufferer would communicate with others using WiFi. As a result, the body's resistance is lower. The patient is monitored using a variety of sensors, including devices that assess body temperature, heart rate, and mobility. Because of the microcontroller's complex design, recognized data is even less exact. The output from the microcontroller is relayed via the WiFi module. The information is then transferred via optical signals to the Wi-Fi module. This is made feasible for the user by using BLYNK, a cloud application for the Internet of Things (IoT). A variety of programs allow the user to quickly access and evaluate patient information over Wi-Fi.

4. IMPLEMENTATION

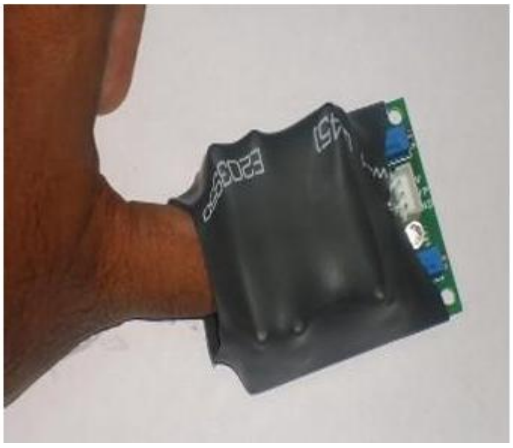

FIG 2: Heart Beat sensor

Heart Beat Sensor:

The heartbeat sensor's objective is to detect and investigate the temperature pulse produced when a finger contacts the sensor. To calculate the beats per minute (BPM) rate, connect the digital output directly to an Arduino board. The device controls the amount of light by timing the pulses to match the flow of blood in the fingertips. This sensor is constructed on the LM358 integrated circuit (IC). The dual low-power useful intensifier features a light indicator and a bright red LED. Two of them will be speakers, while the third will serve as a contrast. It is critical that the drive be extremely bright so that the light may pass through the finger and still be visible on the other end. As you move closer to the finger's tip, the veins that aid blood flow become less visible. This is because less light is reaching the indicator. Every heartbeat alters the process of finding, which is subsequently converted into an electrical signal.

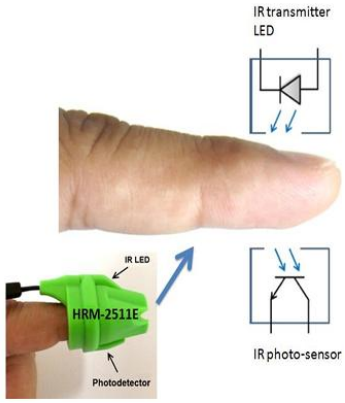

FIG 3 Transmission PPG Probe

Easy Pulse:

Photoplethysmography (PPG) is a non-invasive optical technology that detects the heartbeat wave

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by just touching a finger. The Easy Pulse sensor is intended to teach and guide individuals through the fundamentals of PPG. On one side, a photo detector detects minute changes in the amount of light passing through, while on the other, an infrared light source illuminates the finger. Changes in the photo detector motion are detected by changes in the tissue's blood volume. The information is divided and enhanced such that the PPG waveform remains clear and in time with the heartbeat. The core construction of Easy Pulse is based on the high-tech TCRT1000 optical sensor, which detects changes in blood flow in finger tissue and generates a false heartbeat that beats at the same pace as the actual one. We're pleased to inform you that Easy Pulse Version 1.1 has been launched. It includes some enhancements over the original design. When the new look is applied, a distinct outcome is produced that combines a complex heartbeat motion with a simple PPG waveform. Tindie is where you can purchase the Simple Pulse Version 1.1 Board. The Chinese store Electro has recently started selling it for $18.50, and they can ship it to more destinations across the world for less money.

Data Flow Diagram

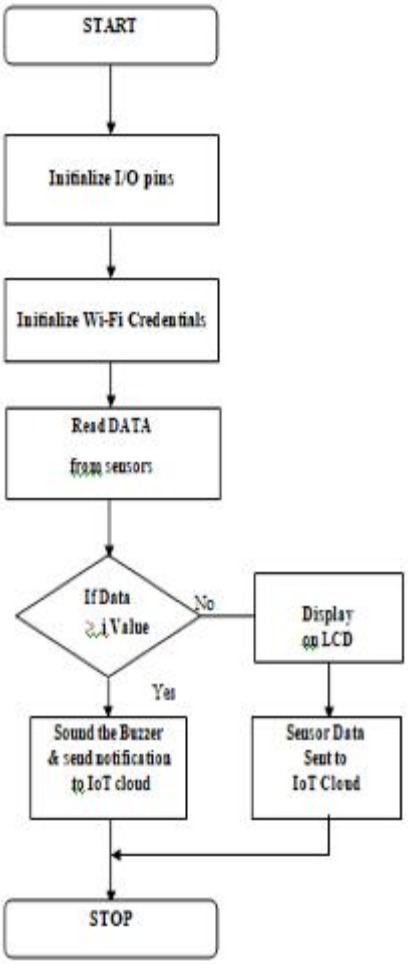

FIG 4: Data Flow Diagram

5. CONCLUSION

This article describes a system that combines an atmega328 microcontroller and Wi-Fi to monitor and control health remotely. The device can continuously monitor a patient's heart rate, blood pressure, and other key hospital indications. We've also devised a method for constantly monitoring the patients and storing their data on a server for continual tracking and oversight. The PROTEUS 7 simulation program will be used to determine how effective the exercise was.

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