Published by :
http://www.ijert.org

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 13 Issue 4, April 2024

Patient Health Condition Monitoring System by Using IOT

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Abstract

Patient Health Monitoring System (PHMS) is a new solution using IoT technology that can be used to monitor and track patients' health in real time. Thanks to advanced data analysis and machine learning algorithms, PHMS can provide real-time information and alert healthcare providers to any abnormal or potentially dangerous conditions. Integrating IoT technology into healthcare not only improves care efficiency but also facilitates early detection and health management, ultimately helping to improve patient outcomes and reduce healthcare cost.

INTRODUCTION:

In recent years, the integration of Internet of Things (IoT) technology into healthcare has revolutionized patient care and management. The Patient Health Monitoring System (PHMS) proposed in this article uses the powerful functions of IoT devices that can be used to realize effective and continuous monitoring of the patient's healthy consumption. Routine patient care often includes routine check-ups or hospital visits, which may not reflect important health conditions or early warning signs. But patients beyond PHMS gives doctors the go-ahead for their health, leading to ongoing care hours to do. This article explores the design, implementation, and benefits of patient health monitoring using IoT wearable devices. By using IoT devices to monitor patient health, Healthcare organizations can improve patient care, reduce healthcare costs, and support health management. This article aims to provide a better understanding of the potential of IoT technology to revolutionize patient care and improve health outcomes. Abbreviations and Abbreviations: IoT: Internet of Things

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OBJECTIVES:

The main aim of the project is to develop and implement an intelligent patient health assessment. Sensors are placed on the patient's body to detect the patient's body temperature and heart rate.

Maintenance Time:
Continuous, real-time monitoring of vital signs such as heart rate, blood pressure, body temperature, and activity level using IoT wearable devices.

Preliminary Investigation:
By analysing the data collected from wearable devices, health problems or damages can be detected early and timely intervention and preventive measures can be taken.

User-Friendly Interface:
pursues the creation of an intuitive and effective system that provides easy access to medical information, alerts and recommendations for patients and doctors, encouraging patient participation.

Scalability and Flexibility:
Designing flexible and adaptable care systems to different patients, healthcare environments, technological changes in IoT and legacy urine technology one Section.

Evaluation and validation:
Has developed a care system that can be adapted and adapted to different patients, healthcare environments, and technological changes in IoT and technology.

EXISTING SYSTEM:

Systems used for healthcare are permanent care systems that can be diagnosed while the patient is in the hospital or in bed. The procedure is now common and can only be performed in intensive care units. In the current system, patients must be hospitalized for regular patient care. This is impossible when you leave the hospital. This system cannot be used at home. We want to create a system that will help protect the patient's health not only while sleeping but also when he gets out of bed. The main idea of the system is to send information from web pages and constantly monitor patients over the internet. Such a system will constantly check important physical parameters such as temperature and pulse, compare them with predetermined intervals, and instantly warn doctors and patients if these values exceed certain limits.

Drawbacks:
In the current system, patients must be hospitalized for regular patient care. This is impossible when you leave the hospital. This system cannot be used at home. Current systems measure the health status of patients and use zig bee, Bluetooth protocol, etc., which are used for short communication only to send information. It is sent via . Providers do not need to access this content.

PROPOSED TECHNIQUE:

Healthcare uses a chain of custody to monitor patients' health.

Expected Advantages:
Belt-based devices can continuously monitor vital signs and health such as heart rate, respiratory rate, activity level, and physical activity throughout the day to have a good understanding of the patient's health status. Unlike traditional medical equipment, the device is lightweight, invisible and easy to carry, allowing patients to continue their daily activities without any discomfort or discomfort. The equipment in the gloves regularly monitors vital signs and health, detecting abnormalities or deviations in the vital time, allowing timely intervention and preventive measures to reduce health risks. The system generates instant reports and alerts for adverse health metrics or critical events, allowing for timely intervention and reducing the risk of problems.

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METHODOLOGY

The IoT patient monitor has 3 sensors. These are temperature sensors, heart rate sensors and breathing sensors. This project is useful because doctors can monitor their patients' health by visiting a website or URL. Nowadays, many IoT applications are also being developed. Now doctors or family members can monitor or track patients' health through Android apps. To run an IoT-based healthcare project, you need Wi-Fi connectivity.

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The microcontroller or Arduino board connects to the Wi-Fi network using the Wi-Fi module. If there is no Wi-Fi network, the project will not work. You can create a Wi-Fi zone using a Wi-Fi module or even an access point on your smartphone. The Arduino UNO board continues to read the inputs from these 3 sensors. It then sends the data to the cloud by sending it to a specific URL/IP address. Then repeat the process to send the data to the IP after a certain period of time.

COMPONENTS OF HARDWARE

1 . ESP 32 Wi-Fi Module

ESP32 series low-cost microcontrollers feature built-in Wi-Fi and dual-mode Bluetooth. The ESP32 series uses the Tensilica Xtensa LX6 dual-core or single-core, Tensilica Xtensa LX7 dual-core or discrete RISC-V CPU. in detail. and power management modules. The ESP32 was designed and manufactured by Espressif Systems, a Chinese company based in Shanghai, and manufactured by TSMC using the 40nm process. It replaces the ESP8266 microcontroller. Programming languages, frameworks, platforms and environments for ESP32 programming.

Figure: ESP 32 Wi-Fi Module

The ESP8266 started a mini revolution by packing Wi-Fi into a portable, affordable device with enough power and ports to handle simple tasks. According to Espressif, the Espressif ESP32 development board with Wi-Fi and Bluetooth has powerful capabilities and can be used in a variety of applications, from low-power devices to the most complex projects such as speech, music and MP3 decoding. Universal Wi-Fi-BT-BLE MCU module. Wi-Fi-enabled ESP32 NodeMCU Development Board The latest ESP-WROOM-32 module powers Bluetooth, a small, minimalist system development board that can be quickly dropped into a buttery loaf.

2. PLUSE SENSOR:

This is a low-power, low-cost, durable sensor that can be used in many different applications, making it popular in many different applications that require heart rate measurement.

Fig.2: Pulse sensor

When you look at the front of the sensor, you can only see the LED and photodiode. However, the actual circuit is behind the sensor. The low power bandwidth op amp in the circuit is configured to provide some gain in the circuit and we have a reverse voltage protection diode to protect the circuit from ESD and reverse voltage. Other capacitors and resistors on the PCB are used as RC filters to reduce external noise in the circuit.

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3. CABLE TEMPERATURE SENSOR:

Cable temperature sensors are used as signal sensors for electrical thermostats, regulators and thermometers. These sensors can be used almost anywhere you want to measure or measure temperature. The sensor can be mounted in the sensor housing or directly on the sensor. Digital thermometers can convert body temperature and humidity into digital measurements through a temperature sensor and connector. The Temperature System Sensor (TSYS) responds quickly to changes in process temperature in a small package designed for tight spaces. Optimized microcircuit design ensures fast switching times and low power consumption.

Fig.4: Digital Temperature Sensors

4. Respiratory sensor :

A respirator is a device used to monitor a person's breathing and patterns. These sensors can detect changes in pressure, air flow, or gas exchange to provide important information about a person's breathing. They are frequently used in medicine for patient care, sleep research, and respiratory therapy.

Fig.5: Respiratory Sensor

5. POWER SUPPLY:

The LM2596 DC-DC Buck Converter is versatile and effective for converting high voltage to lower output voltage, it can be used to power a variety of devices other than required from one location and there are now products made for added safety. . The

LM2596 is designed to step down the input voltage to a lower output voltage. It works by rapidly switching the input voltage on and off, then filtering and controlling the output to maintain a stable DC voltage.

Fig.6: Power Supply

SOFTWARE APPLICATION:

Blynk :

Blynk is a free application for smartphones and tablets that allows you to remotely control devices using the Internet of Things (IoT). With Blynk, you can easily create interfaces to control electronic devices, read sensor data, and view data streams from sensors or other devices. Blynk provides a library of predefined elements for buttons, sliders, images, and more, allowing you to create your own app interface without the need for coding.

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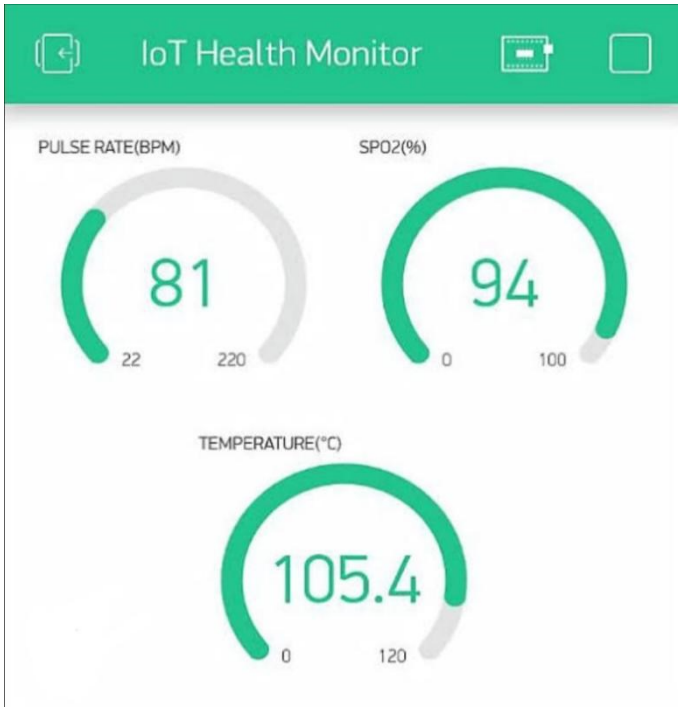

CONCLUSION:

The proposed health monitoring system can be used effectively in emergency situations because it can be monitored daily, recorded and stored in a file. Thanks to our work, doctors can also use IoT to monitor patients' health anytime and anywhere. Heart rate sensor, temperature sensor etc. All individual sensors will provide the necessary information. The
IoT belt effectively monitors patient health and provides instant information and alerts.
Accuracy of data collected by equipment compared to traditional monitoring.
Measure device user experience and comfort of use, including size, weight, and ease of use.
Benefits of using these systems, such as early detection of health problems, improved patient outcomes and reduced medical costs.

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