IoT based Smart HealthCare Kit

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Abstract: -

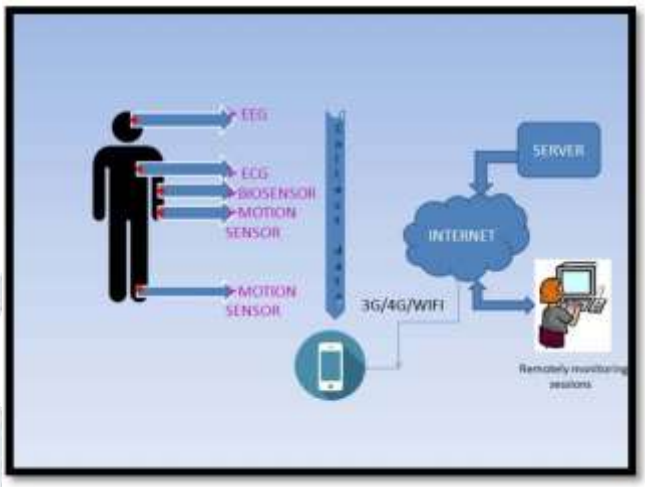
With the help of an ESP8266 development board, this paper describes the planning and implementation of an IOT-based health monitoring system for emergency medical services. Data streams are collected in real time and analysed to help users better understand health risks and reduce healthcare costs. The proposed model allows users to enhance health risks as well as reduce healthcare costs by collecting large data streams and sharing them with others in real-time and efficiently. When a patient needs to check his vital signs, heart rate, temperature, etc., he doesn't have to go to the doctor. With the help of this proposal, both patients and doctors can save time, and doctors can provide the maximum amount of help in an emergency situation. By connecting and collecting data through health status monitors, which might include patient's pulse, vital sign and ECG, the project will be able to provide proper and efficient medical services to patients. It will also be able to send an emergency alert to the patient's doctor with his current status and complete medical information.

Keywords **-Internet of thing (IoT); Medical Services; Health care; Health Monitoring.**

Introduction:

The acquisition and exchange of important data from network-connected devices via the Secure Service Layer defines IOT. Simply put, the Internet of Things (IOT) can be defined as the wireless network of devices connected to each other to exchange information. share and communicate data and generate new information to record and analyze for future use. The Internet of Things unfolds its full potential through central role play objects, i. H. "Smart" objects that use various sensors and actuators that perceive their context and can communicate with one another through built-in network capabilities, access to open source Internet services and interaction with the human world, which not only connects the world but is also robust and also plays an important role in relieving patients and doctors. a system that communicates between networked systems, applications, and devices that can help patients and clinicians monitor, track, and record vital GNS and medical information from patients. Devices include smart meters, wearable health belts, sports shoes, RFID-based smartwatches and intelligent video cameras. In addition, smartphone applications also help maintain medical records with real-time alarms and emergency services. Devices produce large amounts of information and data that providers have to deal with efficiently and are therefore very demanding. To meet this challenge of storing and analyzing big data, the Internet of Things Analytics (IoTA) technology is implemented, which converts raw data into useful. converts medically relevant data using techniques such as data mining and data analysis. It has been predicted that by 2020, more than 50 to 55 percent of techniques for analyzing raw data will make better use of this stream of machine-generated and instrumented data. IOT is based on several core technologies.Collecting data in real time from various sources, in this case an unlimited number of patients over a long period of time, has become very easy and fast thanks to the potential of IOT. They are used by intelligent sensors (sensor and microcontroller) that precisely measure, monitor and analyze a large number of health status indicators, which can include basic vital parameters such as pulse rate and blood pressure, oxygen content and blood sugar Smart sensors can be integrated into the medicine and pill bottles, that

are connected to a network and warn whether the patient has taken a planned dose of There are many significant advances and changes in IoT healthcare. The way we interact and communicate with people and other devices is changing and improving day by day. The results and the reduction in healthcare costs are possible thanks to the growth of information and communication solutions. active, as new data packets are efficiently collected, recorded, analyzed and shared in real time. Adopts this ever-growing IOT technology and reduces many inefficiencies in healthcare. For example, various medical devices such as exercise bands, health monitoring systems, and medicine cabinets have built-in smart sensors that make it possible to collect, store, analyze, and test the raw data that medical professionals will use to make the right decisions in the future.



Using the IoT, they can now get raw data in real time from an unlimited number of patients over a continuous period of time through intelligent devices connected in a networked network. A full understanding of the technology will take some time. We will see medical experts perform diagnoses and critical tasks better and more reliably. All of this means that not only will you get reliable results, but you will also save a lot of time. Internet of Things (IoT) has virtually limitless potential and is constantly evolving. An IoT-based health monitoring system that collects all patient data including heart rate, blood pressure, and EKG would send alerts to the patient's doctor with their complete medical information. A better and more robust solution to this challenge is being sought with the help of this document.

RELATED WORK

On-going research into IOT health care shows that raw data received from devices connected to the wireless network has helped treat and prevent chronic disease and monitor patients, according to a clinical study. , EKG monitors, pulse audiometers and blood pressure monitors are some of the portable health monitoring systems that are available today. Similar to the Internet of Things (IoT), we will also examine the future development of IoT-based products and services that belong to one or more domains, including automation and artificial intelligence.

Assorticate with: environmental protection, green technology, etc. Cooey Smart Healthcare [1] is a healthcare technology company. Using Bluetooth-enabled devices, you can automatically record your medical data. Protect your health by storing, analyzing and sharing your medical records with friends and family members. Based on your health analysis, we can provide you with smart advice and services. They also give you health warnings and messages. As well as being able to connect with various health care providers such as pharmacies, labs, home health care and teleconsultations, it also allows you to monitor your health reports remotely.

Smart Blood Pressure Monitor

Smart Body Analyzer

and Smart Glucometer

Health monitoring system Cooey collects, stores and analyses raw medical data in order to provide patients with vital sign warnings in advance. Personalize their services based on their health. A health management application with personalised services, for customers. Personalized health management for chronic conditions is the goal of this programme. In the last mile, no other product or application can connect a patient with their health professional. Cooey is able to network and offer its customers focused services with the help of the rd platform. Cooey offers a number of third-party platform services, including:

- Bluetooth pressure monitor and pressure balance allow you to automatically record medical data, which can then be accessed remotely by your health care professionals. Health tips are provided based on the patient's profile and vital signs, as well as his or her medication history.
- As a result of this, a patient's current health status can be reflected in a dynamic profile that can be used by doctors for a more detailed analysis. Chronic patients and prenatal care are the primary targets for Cooey's intelligent services.
- Devices that record medical data can be shared and analysed.
- Based on the Smart Recommendation Engine, Smart Assistance offers personalised advice and recommendations.
- Mobile API for health management is offered by MAssist.
- This is a web portal that works on mobile devices, such as laptops and tablets. It helps you collect, store, use, and share health information for yourself and your family. Microsoft Health Vault Health records can be kept in one place, organised and available online (e-book maintenance) for medical emergencies. Queues can be monitored and you're constantly aware of your health. Your health status is constantly updated with the help of a single data entry and the addition of additional data. These applications include websites, computer programmes, and mobile applications that can help you with your health further analysis. Your collected health information.It also has multi-app connectivity so information can be shared with anyone.

It contains:

• Up-to-date allergy and medication lists

• The latest home health information (such as blood pressure, glucose and weight)

• Your HealthVault medical history helps you not only store and organize this information, but also relay it to your doctor. You can keep your data close at hand and accessible from anywhere with an Internet connection on a PC, smartphone / tablet, you can record and save your diagnostic results, prescription history and visit logs for a list with an unlimited number of affiliated laboratory stores, medical institutes, and hospitals Clinics that submit and log data to your HealthVault. You can easily transfer your medical records and keep them in HealthVault for future reference. They can easily be saved and shared with your medical advisors and kept handy for future reference. The sender transmits the information in the form of an SMS to the interested persons; if the condition deteriorates, the SMS indicates the urgency. BLUETOOTH MONITORING SYSTEM Bluetooth enabled devices have been proposed to help detect Alzheimer's disease anywhere to keep the person with the strongest signal received by the access point connected to the device. As the patient database moves, it is captured and tracked with the Bluetooth enabled device and transmitted to the relevant authorized person who buys motion detection software, where the database is monitored to check whether the person has Alzheimer's disease or not. MOBILE PHONES The development of IMHMS can be useful in helping any individual with monitoring their health status and related issues. Through this system, the prospect can get the medical feedback based on the data collected by the biological sensors. AVAILABLE HARDWARE EQUIPMENT FOR HEALTH MONITORING The hardware units previously used for monitoring are:

Optical sensor unit: it would have a transmitter and a receiver; the transmitter would emit infrared waves and the photodetector would be installed with the receiver. to the signal unit: The output signal before entering the pulse counter block must be processed so that the counter block signal can be read or processed. The conditioning block consists of a series of low pass filters and an amplifier structure. Heart rate counter unit: This block is used to calculate the output signal generated by the signal conditioning block. The signals must represent a high frequency; otherwise, a low signal does not indicate a heartbeat. 10 s timer unit: This block is used to count the pulses. The process is carried out by calculating the input signal of the timer block over a period of 10 seconds.Some other hardware requirements used are:

Esp8266 (nodemcu)

Max30100 (pulse oximeter sensor)

Ds18b20 (temperature sensor)

Pulse oximeter: the device is used to measure the pulse. It absorbs red and infrared light by pulsing blood. Oxygenated blood absorbs red light at 660 nm, whereas deoxygenated blood absorbs infrared light at 940 nm. It has two LEDs and two light collectors. Sensors that measure the amount of red and infrared light that rays of light leave tissues. This device provides data on oxygen saturation as well as cardiac output. Arduino microcontroller: It is a 8-bit, low power consumption microcontroller. It has a breakthrough based on RISC. The architecture consists of a set of instructions that only require one clock cycle the microcontroller can achieve a performance of 1 MIPS / MHz, which is reflected in a much lower power consumption.

Temperature sensors: They are used to measure the heat or energy generated by a particular body in order to measure the changes that occur as a result of that generated heat. There are two types of temperature sensors, specifically known as contact and non-contact temperature sensors.

Temperature Sensor: This type of temperature sensor requires physical contact with the body, which is sensed and used, through conduction, to monitor the change in temperature.

Non-Contact Temperature: This temperature sensor uses radiation to monitor changes in temperature. consists of detecting any movement or body, and they come in different types:

• PIR Passive Infrared Detects the heat of a body.

• Area reflection type It uses the reflection of the infrared rays emitted by LEDs to measure and detect the distance from the person, and to know whether or not the person is in the prescribed area.

• Vibration detects vibrations. Bluetooth module: This module transmits the data that must be sent to the smartphone via Bluetooth so that it knows the heart rate. RFID reader: This implementation is very effective as it is inexpensive and easy to maintain. The devices can be tracked at any time using the RFID reader.

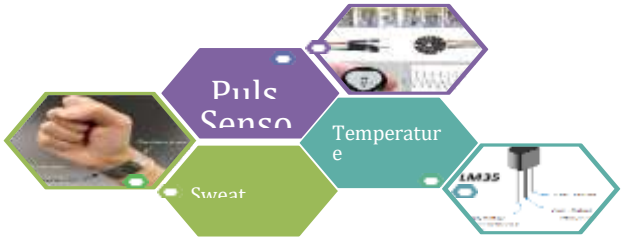


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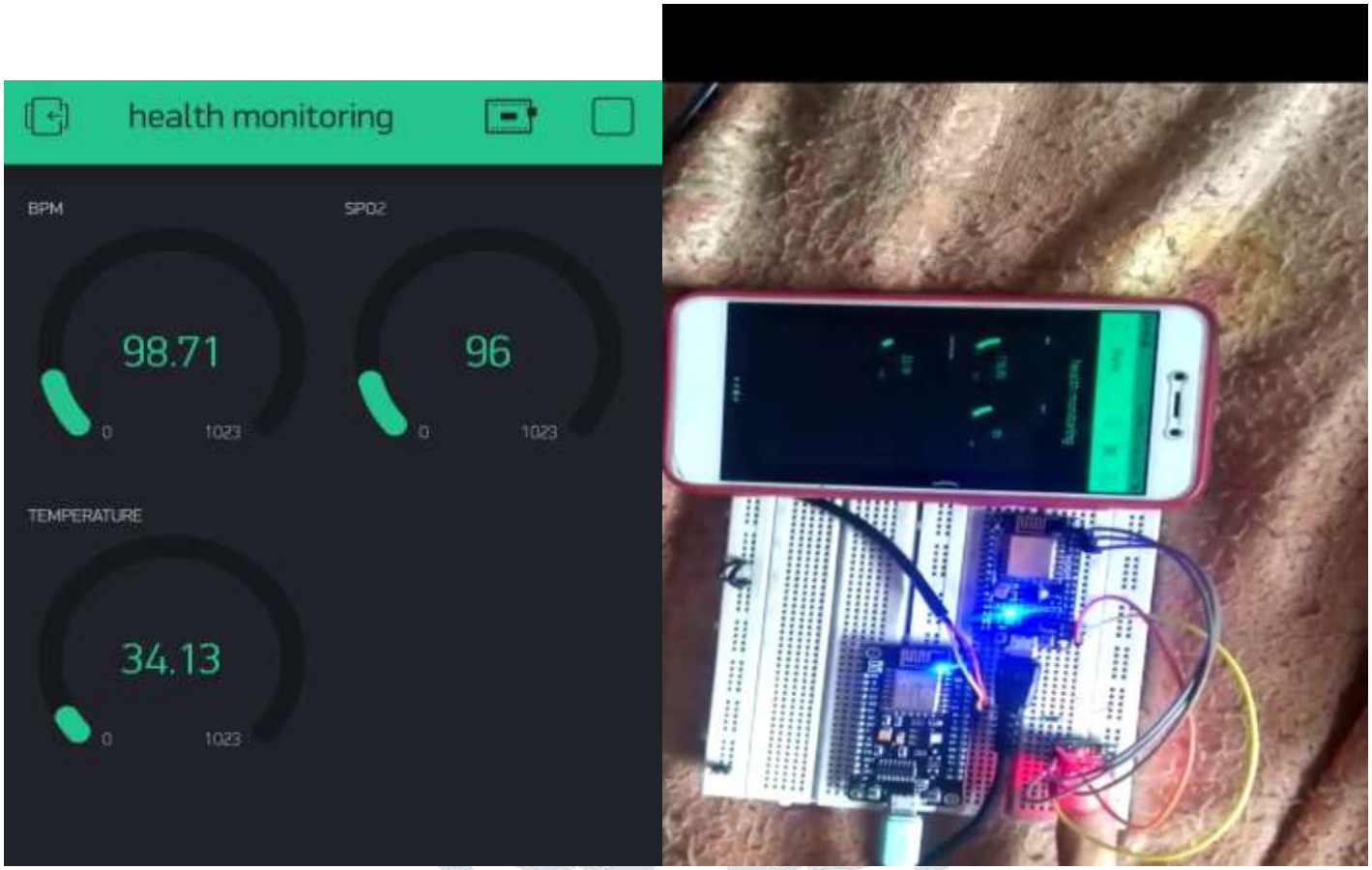
Figure 2 shows the various sensors used for designing the system

PROPOSED SYSTEM AND EXPERIMENTAL SETUP

Its main objective is to design and implement an intelligent patient monitoring system, which will be used in hospitals. An overview of the system is shown in Figure 1. Body-integrated sensors record temperature and heartbeat. In the patient's home, two more sensors will be installed to measure the humidity and temperature of the room. There is a control unit that calculates the four sensor values. They are then transmitted to the base station via the Internet of Things cloud. As a result of this, the clinician is able to access the values from a distance. The doctor can determine the patient's condition based on the temperature and heartbeat values, as well as the room sensor values, and can then take appropriate measures. The doctor will receive the patient's temperature via email.



CONCLUSION

Health monitoring system, according to the study, has proven to be a highly effective tool for monitoring health status. As a result, it's easier to keep track of one's own health. When easy-to-use equipment is available that can protect a patient's health, it helps to minimise the amount of time it takes to provide it and report this information to interested parties. As a result of this, the device must be able to move and be agile in a human's body, while also being very peculiar in terms of the monitoring of all the parameters set. Futuristic frameworks for this include a combined device that takes up less space and can be used outdoors without affecting results.

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