Health Monitoring Systems by using IOT Devices in the Real time Environment

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Abstract: At the same time, managing health and work has become a matter of concern for most individuals in this fast-pace globe. There are well recognized problems of long waiting times in hospitals or outpatient tracking. The problem needs a health surveillance scheme that can seamlessly monitor daily health parameters and track the heart rate and report them to the individual involved through the GSM module. Different surveillance systems have developed with advances in technology and made it easy for people. This article describes present health research and development. Different systems introduced to define the missing regions and what can be achieved to achieve a better output than present scenario systems have been compared and assessed.
Key words: IOT, Health surveillance, GSM, Sensor, Bluetooth.

I. Introduction

An efficient way to assess the health situation of every person is through the health surveillance scheme. It helps to monitor anywhere at any time. Health surveillance is a helpful field of studies for every single person to review fundamental routine health parameters and can also be used to monitor cardiac rates. It is a great way to reach the state of the body at any moment, rather than spend time on booking all appointments, and then wait for the doctor's office. The information preloaded will also save the time since critical cases can be reviewed rather than a routine checks at the clinic. This document discusses the different health parameters, examines and analyzes all current equipment, and plans our strategy to creating an apparatus that simultaneously satisfies the inconveniences of current devices.

II. Architecture and Its Devices

Figure 1 presents a general diagram which visualizes a health surveillance scheme.

A. Health Monitoring Of Systems Incorporate With The Gsm

In cardiovascular surveillance systems GSM modules have been integrated. The system basically checks and transmits information that the sensors collect to the microcontroller, where it is transmitted by the microcontroller over the air using GSM technology. The sender communicates the data to the individuals involved as a SMS. The SMS shall state the urgency accordingly if the situation worsens.
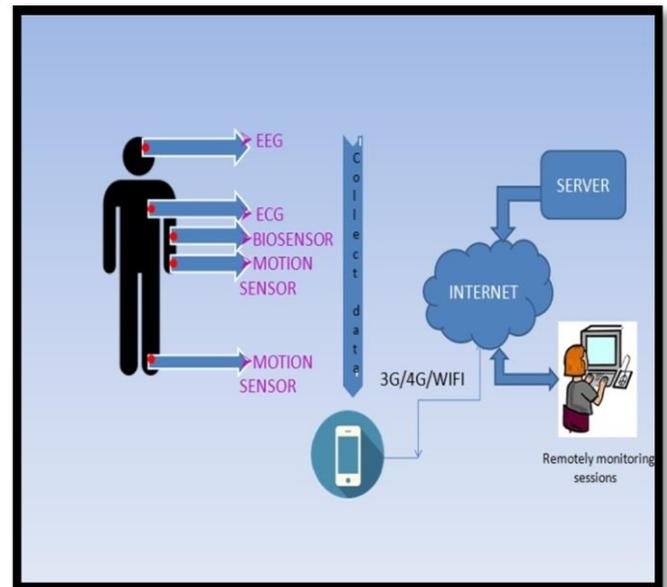

Figure 1: IOT - basing health surveillance visualization.

B. Health Monitoring Of Systems Which Incorporated With The Bluetooth

Mainly Bluetooth systems were suggested for the detection of Alzheimer's disease. Various access points can be put anywhere so that the individual is linked by the highest signal obtained from the point of access to the device. The motion of the patient database allows and tracks the device with Bluetooth and transmits the motion identification software to the individual consenting to monitor the database to detect whether the individual is affected by Alzheimer's disease or not.

C. Health Monitoring Of Systems Which Incorporated With Mobiles Phones

The creation of IMHMS can help anyone track their health and the problems involved. The related individual will be able to understand the medical feedback from the information gathered by the bio sensors through this scheme. Since mobile telephones are an significant component of our lives, they can seamlessly incorporate several health facilities.

D. Health Monitoring Of The Existing Hardware Equipments

The earlier used hardware for surveillance are:-
1. Optical sensor unit: the transmitter would transmit infrasound waves and a photo sensor would be mounted

together with the receiver that would have a transmitter and a receiver.

2. Signals: The output signal should be prepared for reading or processing by the block counter before entering in to the pulse counter block. A set of lower pass filters and an amplifying structure is included in the signal conditioning unit.

3. Heart Rate unit: Particularly this unit is used to calculate the signal output from the signal conditioning unit. Signals must be high, otherwise a small signal indicates that the heartbeat is not present.

4. Unit Timer 10 s: Essentially this block is intended for pulse counting. The procedure shall be performed by calculating input signal for 10 seconds to the timer block.

5. Display Unit: The Display device which has been used in pulse counter block output of 6 L (D5, D4, D3, D2, D1 and D0).

Few other hardware needs:-

1. **Pulse Oximeter:-**
The instrument is used for pulse rate measurement. It absorbs pulsatile blood into the red and infrarot light. The oxygenated blood absorbs red light at 660 nm, while deoxygenated blood absorbs infrarot light at 940 nm. It has two detectors for collection of LEDs and two light, which measure the red and infrared light that comes from the light rays in tissues. Data on oxygen saturation and cardiac output are provided by this device.

2. **Arduino Microcontroller:**
It has a low power consumption characteristic 8-bit microcontroller. The architecture of the RISC is advanced. The architecture consists of a command set, which only takes one clock cycle to perform. This allows the microcontroller to reach 1 MIPS / MHz performance, which leads to a much lower energy consumption.

3. **Temperature sensors**:
These are used for measuring a particular body's temperature or power, which allows for the measurement of modifications caused by this heat.
Two kinds are known as contact temperature sensors and non - contact temperature sensor.
Temperatures sensor contact–This sort of sensor needs physical contact with the sensing body and utilizes conduct to track change in temperature.
Non-contact Temperatures – Radiation is used to track changes in the temperature by this sort of temperature sensor.

4. **Motion sensor:** This sensor is primarily designed to detect any motion or body and is available in multiple kinds: PIR- Passive infrarrot Detection of body heat.
Area Reflecting type-It is used to evaluate the distance of the individual with reflected infrared rays emitted from LEDs and to identify and identify if the individual was in the prescribed area.
Vibration–Vibration detects.

5. **Bluetooth module**: In order to make you conscious of the heart rate, this module will forward the information to the Bluetooth-enabled Smartphone.

6. **RFID Reader:** It has low costs and offers easy maintenance. This application is very efficient. Devices can be monitored at all times with the assistance of RFID Reader. The different sensors used to design the system are illustrated in Figure 2.
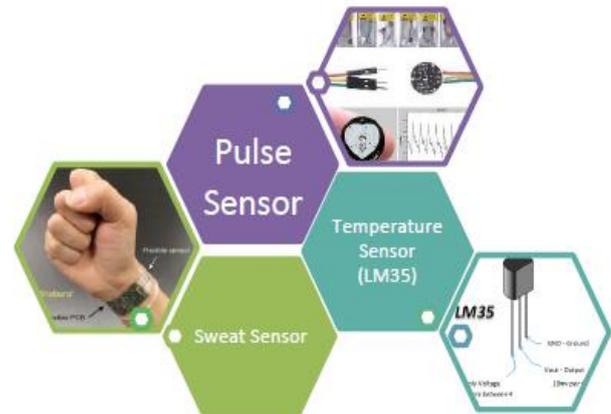

Fig 2: Various sensors which are used in the health monitoring systems

III. **Discussion with Evaluation**
The problems that have developed have been minor heart attacks and therefore further implications often cannot be detected. Many studies on this topic were published and numerous devices were constantly produced to address this severe health problem as quickly as possible. Continuous patient monitoring was a challenge because it prevents patient mobility, and everybody was the main focus. The enormous wired equipment not only prevents individuals from moving, it also disturbs the person mentally to be surrounded by cables.

History:
Some of the current schemes have been evaluated and some weaknesses have been identified.
□□ The research uses the eHealth Sensor Platform to monitor the health information. The architecture is split by 3 modules which use the cloud to monitor information from the patient's health remotely, which comprise the sensing module, primary module and the interaction module.
□□ Sensors like the glucometer, accelerometer and airflow are used in the suggested scheme outlined in. Their focus was on cost-effectiveness. The body that transmits information through the cloud using zigbé is connected to medical sensors, as outlined above.
□□ The "actual time wireless health surveillance app using mobile phones" is another research conducted using a intelligent phone-based system to monitor health criteria. The greatest drawback of this scheme is that, if any, it will only be possible for health practitioners to monitor and advise their patients on health concerns.
□□ A different device is the Blood pressure sensing system, heart beating monitor, temperature sensor, GSM module, lcd, amplified, microcontroller. Two phones are built in, one with the GSM and the other with an RFID module. The third unit is FPGA, which transfers serially transmitted information to the Fixed Surveillance Station, consisting of the LabVIEW GUI PC.

Earlier the cardiac rates that have been developed have been used for 24 hours by microcontrollers, and a report has been forwarded to the physician after 2 hours. This device was inconvenient, as it was within a certain time frame that would not resolve the issue that we are looking at as suggested in the study when a minor heart attack happened before that2-hour term.

Another research promotes user experience. End user experience. Embedded with the Bluetooth module, the 3AHCare surveillance system allows measurement of ECG, blood pressure, blood oxygenation, breathing and temperature. This device works with the android app with a smartphone-to-app interface (3 G or WIFI). There is thus no need to communicate between devices.

In this study, a true-time wireless scheme for tracking parameters like temp., heart rate, oxygen saturation is described. The calculated outcomes are sent to a computer that serves as a storage device. Outdoor surveillance is not viable, but it sets up the way the doctor and the patient communicate.

The Wireless Temperature and Health Surveillance system with Zigbee is another tool. A transmitter and a receiver would contain this device. It would include the μC, Clock, ADC, ZigBee modem, Power Supply LCD and ADC. The sender transmits the data to be converted by zibmee. The finger is collected using LEDs and photor strength. The information is collected. Not mobility-friendly as it is a large display device.

The points shown in help the monitoring of physiological and cinematic parameters. This is defined exclusively for seniors. It utilizes GPRS for the transmission of sensor information as an interface. Parameters like SpO2 and heart rate will be the focus of the report. It has no flexible topology scheme for the network.

Another research by the "Smart Mobile Health Monitoring System" suggests that mobile devices can be embedded with and monitored seamlessly in health facilities. The deficiency is that information gathered does not only represent the informative information, making it a little complicated and requires a big storage ability as suggested.

As stated in Ambient Multi Prospective System (MPS) for a residential health surveillance scheme-The primary concept of creating this tool has been to tackle patients after surgery and how the additional hospital cost will be paid and this concept is therefore suggested. This instrument involves the following components: a HIS experimental platform that receives information from the patient's body via an internet linked sensor network via a PC. For e-mail exchange, SMTP is used. Three kinds of sensors, such as physiological parameters, environmental parameters and patient activity, are also used. CAN is used to build the domestic network. In the fundamental context of java, software such as java is used and more complicated coding is achieved. This unit also uses an automatic restart agent and an oxymeter. Overall, this scheme is effective and achieves the objective of the audience.

The wireless health surveillance system includes a heart rate / pulse, blood pressure, breathing rates and body temperature and op-amps to make sure that the conversion is properly read and adc is present. To obtain cardiac rates information, the oxymeter in this device is cut to the finger. The waist band is connected to the blood pressure device that measures the patient's blood pressure.

The paper outlines the wireless sensing devices that integrate wireless communication with civil-structure sensors. The development of wireless sensing devices is described.

The technique by which light incidents are caused on the surface and by attenuation, the contents of the surface are evaluated is also Close to Infrared Spectroscopy. The concentrations of hemoglobin based on the oxidized region and the deoxidized region are calculated by light incident. Also, the monitoring of muscle metabolism is regarded in order to prevent any interference due to the water and etc. NIR windows frame. A research frame work of the device recognised is formed in order to create the system more legible by providing the calculation of the blood cells with use of Modified Beer Lambert's Law.

This system describes in tracking the vital parameters and drop detection with tilt-monitoring for the patient in bed for the surveillance of any situation of bedding to overcome the inconveniences of different equipments studied. It includes all parameters, from the ECG to the GSM / GPRS Modema Temperature, which interface with the central controls to alter caregivers and prevent fatal conditions in case of an urgency.

The outcomes are readily achieved with PROTEUS software in this simulation system to provide patient monitoring in real time. Take sensor input and it is processed with a microcontroller. It sends the intimation to the caregiver in case of an emergency. The scheme, as suggested in, is low-cost, self-monitoring and effective in distant regions.

The study was carried out on various aspects after investigating the facts on distinct systems and assessing the overall effectiveness in (1-5) scale. The results were evaluated. Table 1 lists the key evaluation points:

TABLE 1:- EVALUATING FEATURES

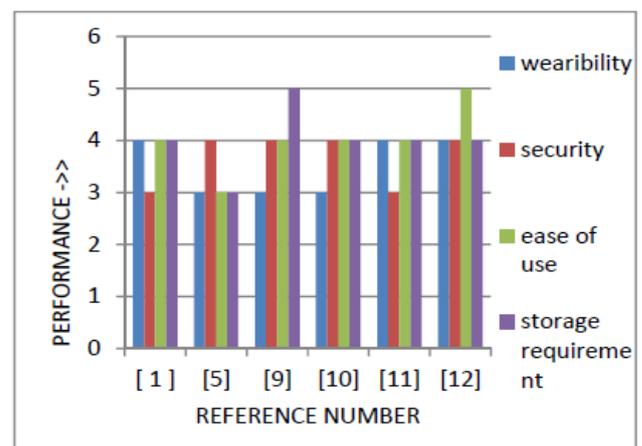| Wearibility	The device should be of considerate size and weight.
Security	Whether the data stored is securely transmitted
Ease of use	The system should be user-friendly easy to understand
Storage requirement	Is the system compatible to store patient's details history?

Fig. 3 Evaluation Graph

It can be understood after assessing a few equipment, how health is now a major focus in today's globe. However, with technological progress, there have to be more user-friendly medical treatments to make the job easier. Given the safety parameters and storage requirements, smarter systems need to only adapt the key data on the device and provide the patient data with more safety.

IV. Proposed Frame Work

In two stages, a system that includes a cardiac rate surveillance scheme that can be shown and understood by the flow diagram can better be understood:-
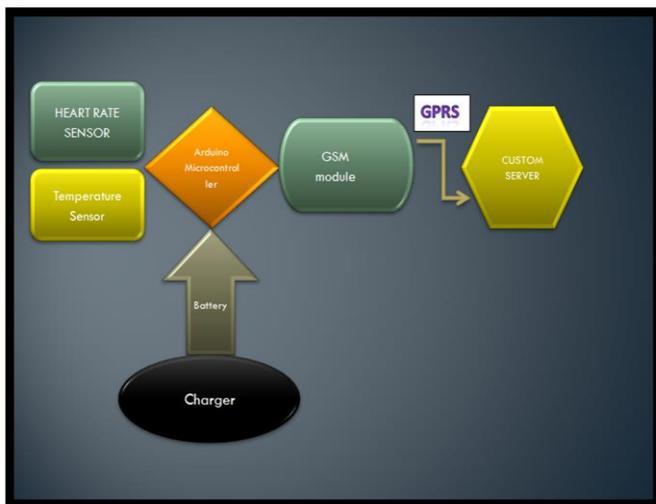

Fig. 4 Flow chart which is based on the heart rate monitoring

In addition to this, another instrument that can be used to control daily health parameters such as the temperature of the body and the running activity, body pressure, sleep or walking activity assessment etc. The unit must provide an effective safety and power management service.

The current equipment needs to fulfill requirements to outsource this software application, since only then can people correctly review surveillance. The surveillance systems systems must provide simple access to it and should be of tiny size in order to be carried to any other location. a software application can be produced to demonstrate the patient's status to the people involved.

V. Conclusion

The health surveillance scheme is an effective health surveillance scheme according to the research. It enables to monitor your health and keeps every person involved in the loop. It helps to minimize the time by offering user-friendly equipment that monitor the health of the patient and report same to the individuals involved. The main objective of the device is to enable agility and mobility of the device in a human being, and to track all the set parameters still very special.

This may be a future-oriented device that takes less room and operates simpler under any environment circumstances and does not affect the outdoor surveillance outcomes in particular.

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