

REVIEW OF PATIENT HEALTH MONITORING SYSTEM IN HOSPITAL USING IOT

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Abstract: In this paper, a smart health care system is proposed that provides the suitable functional condition of the patient. IOT devices can be used in most of the fields which makes day to day life more easy and comfortable. It is conceivable to collect blood pressure, sugar level and temperature of patient's body etc which are helpful in knowing present physical condition of the patient. Thus, system is helpful in providing medical care and additional phase to be followed in instance of some critical situation. This system decreases the consumption of time of patient to visit hospitals every single time when he need to check his physical conditions of his body. Individuals who are busy can also monitor their health at regular interval. If data is not consistent or if it is irregular, emergency notification will be received by care takers. The increased use of mobile technologies and smart devices in health has triggered great impact on the world. Health professionals are gradually taking advantage of benefits of these technologies carry, thus creating a significant development in health care in medical situations. Chronic diseases such as diabetes, heart attack and blood pressure among others are remarkable in the world economic and social level problem. In general, a health care service provider receives data from its users. The purpose of this article is to progress an architecture based on an ontology accomplished of monitoring the health and workout routine recommendation of patients with chronic diseases.

Keywords: Sensors, Raspbian OS

1. INTRODUCTION

In this paper, we introduce the system called IOT based patient health monitoring system using lab view and wireless sensor network (WSN) the system will be able to take patients physiological parameter and transmit it wirelessly and displays the sensor data. In the patient monitoring system based on IOT project, the real time parameters of patient's health are sent to cloud easily internet connectivity these parameters are sent to a remote internet location so that user can view particulars from anywhere in the world. There is a major difference between SMS based patient health monitoring system and IOT based patient health monitoring system. In IOT based system, details of the patient health can be seen by many users. The reason behind this is that the data needs to be monitored by visiting a website, in VRL (Vision Lab Vision). Whereas, in GSM based patient monitoring, the health parameters are sent using GSM via SMS. One more benefit of using a desktop computer, laptop, using an android smartphone, using a tab or tablet. The user just needs a working internet connection to view this data, there are various cloud service providers which can be used to view this data over internet.

Generally, it is difficult to keep track on abnormalities in heartbeat count for patient itself manually. The average heartbeat per minute for 25-years old ranges between 140-170 bpm while for 60-years old it is around between 115-140 bpm and body temperature is 98.6 Fahrenheit. Patients are not well versed with manual treatment which doctors normally use for tracking the count of heartbeat. There are various instruments accessible in market to keep track on internal body changes. But there are many parameters in maintenance part due to their heavy cost, size of instruments and mobility of patients. IOT authorized procedure utilize sensors that get physiological data from the patient's body and utilizing gateways and the cloud to analyse and store data this information is sent wirelessly to the doctors for propel examination and survey.

2. WIRELESS SENSOR NETWORK

Several sensors are required in order to collect the user information that replicate its activity and medical sense. A wireless sensor network (WSN) is a wireless network which consists of structurally dispersed autonomous devices that use sensors to monitor physical or environment conditions. These autonomous devices, combine with routers and a gateway to create a WSN system. Sensor networks are the key to gathering the information needed by smart environments. These sensors should be lightweight in order to be wearable. A pulse oximeter sensor is used to measure the amount of oxygen dissolved in blood, based on detection of Hemoglobin and Deoxyhemoglobin. An ECG (electrocardiogram) sensor is used to obtain a cardiac information such as the rate and rhythm of heart. ECG sensor also provides evidences of damage that ensue to different parts of the heart muscle. A nasal airflow sensor is used to measure the breathing rate to determine whether the patient is in need of respiratory help. A temperature sensor is used to measure the temperature of any part of the body. The blood pressure sensor is fully automatic, intelligent device and easy to operate which shows systolic, diastolic and pulse readings.

3. ARCHITECTURE

The architecture of patient health monitoring system involves three phases; they are collection phase, transmission phase, utilization phase. To collect the required data from the patient body area network is constructed. The parameters used to diagnose the disease vary from each disease. Hence every parameter is sensed by discrete IOT devices which are associated to the patient. The devices which are associated in the body of the patient are known as BAN (Body Area Network) in the data collection phase.

The basic devices used to collect the blood pressure, heart rate and temperature of the patients are Blood pressure module, heart rate monitor, temperature etc. Depending on the patient's situation the collected data is transferred to the doctor through different communication channel. The devices which is used in the transmission phase are Wi-Fi or Bluetooth devices. The information which is collected from the IOT devices are communicated to the local system which contains software to crisscross the threshold level of parameter. The normal body temperature in a human being is 37 degrees Celsius. The temperature greater than 37 degrees Celsius is considered as an abnormal. The collected data of the patient's which is updated in the patient health monitoring system is observed by the doctors, attenders of the patient using mobile phone application or through any additional web. The doctors can view the details such as temperature, heart rate, blood pressure etc. which are associated with their patient's. the data of the patients is updated in the server for every 60 seconds. The data of the patient can not only be updated by seeing present body status but also can be updated by patients or any caretakers of patients by accessing the patient details of the patient by using identification number or registration number to login and view the details. The mobile application shows the risks in red color to warn the patient if the temperature is high, blood pressure level increases and the heart rate is not in the normal pulse. These arrangements can be exploited to safely catch, exchange the patients' health information from a grouping of sensors which is reported to medical specialists through remote network who can make appropriate health proposals.

4. DESIGN

The design of the system is divided into two parts:

Hardware components:

- Temperature sensor (LM35)
- ECG sensor
- Heart rate sensor
- Blood pressure sensor
- Accelerometer
- Raspberry Pi

Software components:

- Raspbian OS
- Server (Things Speak)
- Python IDLE

Cloud Server

Cloud processing has three distinct components: storage, analytics and visualization. The system is designed for long term storage of patient's biomedical information as well supporting health professionals with diagnostic information. The collected user's data is communicated to a cloud server which is responsible for facilitating the accessibility of such a data anywhere through the internet. Additionally, Visualization is a key condition for any such system because it is unrealistic to ask physicians to pore over the voluminous data or analyses from wearable sensors.

The cloud server core is a large database that has enough space to accommodate the huge amounts of data for the different sensors for long times to track the history of the system user. Data can be accessed through the internet using dynamic webpages. In the implementation of the cloud server, both Apache and MySQL run on the same virtual machine (VM) running Ubuntu 14.04. The vSphere control panel is used to increase the resource allocation of the VM with a minimal downtime and without data corruption. The VM which is implemented can be easily moved to a dedicated cloud hosting platform such as an EC2 instance on Amazon Web Services (AWS).

CONCLUSION

The internet has enormously altered the way we live, intercommunicating between people at a virtual level in numerous contexts spanning from professional life to social relationships. As health care facilities are important part of our civilization, programming these services diminish the burden on humans and comforts the determining process. The alarm system that consists of signal and LED in the system alerts the doctors and he can act more quickly when threshold value is reached. The system can be prolonged by adding more features to the mobile applications like connecting the ambulance services, leading doctor's list and their specialists, hospitals and their superior facilities etc. The impartial of evolving monitoring systems is to condense health care costs by reducing physician office visits, hospitalizations and diagnostic testing procedure. The GSM technology benefits the server to update the patient data on website. The patient health monitoring system include how to secure the access of the data and will develop a mobile application that allows access of the data on handheld devices in future

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