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HEALTH CARE MONITORING SYSTEM USING COGNITVE IOT AND WIRELESS BODY AREA NETWORK

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ABSTRACT - Wireless Body Area Network (WBAN) is a wireless sensor network (WSN) which can be wearable or implantable in the human body. WBAN is an emerging technology in the field of healthcare system. WBAN has received great attention due to its applications in the field of health, medical, entertainment services and many more. The main idea behind WBAN technology is to deploy them in the medical system to replace wires with the help of sensor nodes implanted into the patient's body or placed around the patient body. It is very helpful to the elderly people or people with any disability to provide medical facility at home or in any emergency condition. In this health care monitoring system they measure some of the vital parameter of the human body (Blood pressure, temperature, ECG, etc..,). The data which are measured from human body are transfer via wireless sensor to the android smart phone for further analysis. And we are going to use COGNITIVE IOT, which compares the received data with the trained data stored in any Web server or Cloud. Using this we can able to know the status of the patient without even touching the patient. We use BLUETOOTH LOW ENERGY (BLE)sensor for long range transmission physiological data. Every patient details are stored in the database for future reference. If any change occurs in the physiological parameter alert message will be sent to the doctor immediately along patient current location.

Keyword: wireless body area network, Bluetooth low energy, health monitoring system, cognitive IOT

I.INTRODUCTION

In medical field, there was less development in medical equipments and healthcare systems. Due to the lack of technologies and facilities, the patient's lives were put to danger in emergency conditions. Medical facilities were providing with full of wires and very complex to handle it for patient. The Medical field is very developing nowadays and Wireless body area network (WBAN) is one of the emerging technology in the field of healthcare system which is able to change the whole process of the medical systems and its way ofdelivery. Many medical devices such as Electrocardiography (ECG), temperature and pulse sensors, all have been also moved to WBAN technologies. WBAN technology can able to reduce the problem of wires in the healthcare system and the patient's comfort has been increased and also provides ability for healthcare to monitor the patient remotely via cloud environment. The efficiency of using Bluetooth will be reduced by using Bluetooth Low Energy where the energy consumed is very low. By using the concept of Cognitive IoT, the data generated by the connected devices will be integrated with the actions those devices can perform. Cognitive IoT can perform understanding, reasoning and learning on the generated data.

II.BASIC STRUCTURE

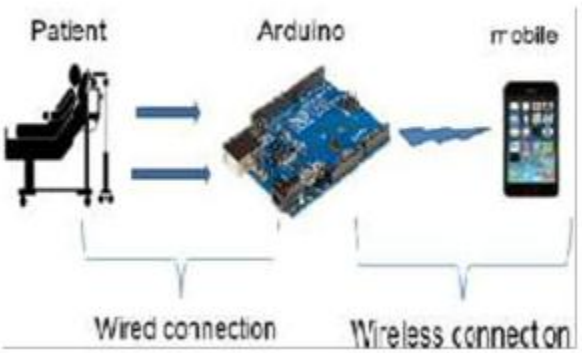

Figure No 1: Normal flow diagram

This diagram shows the basic modules used in the healthcare monitoring system. The patient date is collected using arduino board which is embedded with the sensors and sent to mobile application wirelessly.

Devices used in our System:

There are various devices in WBAN architecture.

[1]Sensor nodes: It is a node in a sensor network that is capable of performing some processing, gathering sensory information and communicating with other connected nodes in the network.

[2]Arduino board: Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world.

[3]Database: In this unit database is maintained and further sent to a specialist for consultancy or proper medical guidance.

III.OVERVIEW

1.This survey "A Wireless Health Monitoring System based on Android Operating System [1]" is based on health monitoring system which monitors the physiological parameters of the patient. If those parameters become critical then the alert message is send to the respective physician. In this system they had used Bluetooth for transmission of data.

2.This survey "The Health Care Monitoring Using Android Mobile Phone [2]" is also based on health monitoring system which monitors the physiological parameters of the patient. In this system they had used WiFi and sensor nodes approach which makes this system more complex.

3.This survey "Real time wireless health monitoring application using mobile devices [3]" is also based on health monitoring system which monitors the physiological parameters of the patient. In this system they had used Zigbee technology and also the WiFi technology for data transmission which makes the system even more complex to develop.

IV.ARCHITECTURE

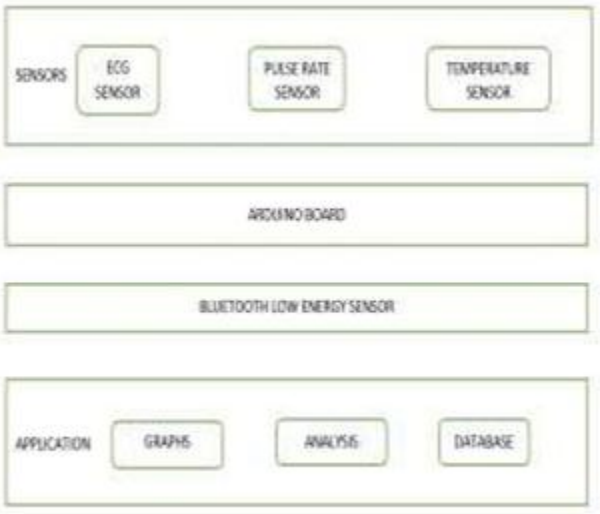

Figure No 2: Architecture diagram

i.RETRIEVING PHYSIOLOGICAL DATA:

This module explains about the working of wireless body area network. There are several sensors attached to the body of the patient which sense the physiological parameter. The sensors used in our project were ECG sensor, temperature sensor and pulse rate sensor. The sensor and Arduino are connected through wired connection. The electrocardiogram (ECG) is a diagnostic tool that is routinely used to assess the electrical and muscular functions of the heart. A temperature sensor is a device, typically, a thermocouple or RTD, that provides for temperature measurement through an electrical signal. A heart rate monitor is a personal monitoring device that allows one to measure one's heart rate in real time or record the heart rate for later study.

ii.PROCESSOR:

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. The Arduino provide power supply to the sensor nodes. It will receive data from sensors and transmit them to the Android smart phone via Bluetooth Low Energy (BLE) sensor.The physiological

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parameters will be sensed every hour and those data will be stored in the database.

iii.TRANSMISSION OF DATA:

Bluetooth low energy (BLE) is the power-version of Bluetooth that was built for the Internet of Things (IOT). The power-efficiency of Bluetooth with low energy functionality makes it perfect for devices that run for long periods on power sources, such as coin cell batteries or energy-harvesting devices. Native support for Bluetooth technology on every major operating system enables development for a broad range of connected devices, from home appliances and security systems to fitness monitors and proximity sensors. This module acts as an interface between Arduino and The Android smart phone. The transmission range if BLE will exceed 330ft.

iv.USER APPLICATION:

The data received from via BLE will be analysed using the android mobile application. This module has two processes namely, Graphical view, Analysis.

Graphical View:

The received data will be stored in a online web server, then those data will be displayed in a graphical format. It shows the current status of the patient which is compared with the past records. It can reduce the time since the physician need not see the old records of the patient.

Analysis:

In this process the working of Cognitive IOT is used. Cognitive IOT is the use of cognitive computing technologies in combination with data generated by connected devices and actions those devices can perform. In a computer, system understanding means being able to take in large volumes of both structured and unstructured data and derive meaning from it that is, establish a model of concepts, entities and relationships. Reasoning means using that model to be able to derive answers or solve related problems without having the answers and solutions specifically programmed. And learning means being able to automatically infer new knowledge from data, which is a key component in understanding at scale. The actual process of this module is machine learning. The trained data sets will be stored in the online web server or a Cloud server. The data received from sensor nodes will be compared with the trained data sets (Rule based learning is used) then the status of the patient will be displayed according to the result of the learning. Andfinally if the physiological parameters cross the limit then the alert message will be sent to the respective physician or care-taker.

V.EXPERIMENTAL RESULTS:

The result will be in the form of graph i.e. for the pulse rate sensor the x axis will be the time in seconds and the y-axis will be the pulse rate acquired per 60 seconds. The received data will be automatically plotted in the graph. The graph also contains the historical datasets for future reference. If any abnormal condition occurs then alert message will be sent to the respective physician.

VI.CONCLUSION AND FUTUREENHANCEMENT

A smart phone based health monitoring system has been presented in this work. By using the system the healthcare professionals can monitor, diagnose, and advice their patients all the time. The physiological data are stored and published online. Hence, the healthcare professional can monitor their patients from a remote location at any time. Our system is simple. It is just few wires connected to a small kit with a smart phone. The system is very power efficient. Only the smart phone or the tablet needs to be charged enough to do the test. It is easy to use, fast, accurate, high efficiency, and safe (without any danger of electric shocks). As a future enhancement, we are going to implement this same system using Beacon sensor which may have larger functionalities than this system. If the Beacon is used then the data transmission range will be little higher.

VII.REFERENCE

[1]" By Dongdong Loua,b, Xianxiang Chena , Zhan Zhaoa , "A Wireless Health Monitoring System based on Android Operating SystemYundong Xuana,b, Zhihong Xua,b, Huan Jina,b, Xingzu Guo a,b, Zhen Fanga - a Institute of Electronics, Chinese Academy of Sciences, BeiJing,100190,China b University of Chinese Academy of Sciences, BeiJing,100049,China

[2]" By Pankaja Jadhav , Balaji Devkatta , Vidya Dhumal "The Health Care Monitoring Using Android Mobile Phone - Department of Electronics Engineering, Savitribai Phule University of Pune, PDEA's College Of Engineering, Pune, India

[3]" By Amna Abdullah, Asma Ismael, Aisha Rashid, Ali Abou-ElNour, "Real time wireless health monitoring application using mobile devices - Department of Electrical Engineering, Ajman University of Science and Technology, P.O. Box 2202, Fujairah, United Arab Emirates

[4] "Android Based Heart Monitoring and Reporting System" By Mayuri Navale ,Sandhya Damare , Rameshwari Chavan ,Renuka Dube , Prof. Suhas Patil – ComputerEngineering, KJCOEMR, Pune, India

[5]"Performance Evaluation of Healthcare Monitoring System over Heterogeneous Wireless Networks" By Sabato Manfredi Faculty of Engineering, University of Naples Federico II, Napoli, Italy

[6]By Aime V. Mbakop, Ashenafi Lambebo , Lalindra Jayatilleke and Sasan Haghani "Implementation of a Wireless Body Area Network for Healthcare Monitoring" - University of the District of Columbia 4200 Connecticut Ave, Washington, DC,

[7]Rim Negraa , Imen Jemilia , Abdelfettah Belghitha HANAlab "Wireless Body Area Networks: Applications and Technologies", University of Manouba, Tunisia - College of Computer and Information Sciences, King Saud University, Saudi Arabia

[8]" Emmanuel Davies, Kola Sanjay, J.Mohana "A Survey on Wireless Body Area Network - Department of Electronics and Communication Engineering, Saveetha School of Engineering, Saveetha University, Chennai, India

[9]Huan Jin, Zhen Fang , Xianxiang Chen , Zhan Zhan , ZhiHong Xu, DongDong Lou, XingZu Guo "ECG Auto-analyzing System on Android for 3AHcare Node", Institute of Electronics, Chinese Academy of Sciences, BeiJing, 100190, China.