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Iot In Healthcare

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Abstract— *In this modern world of increasing population, IOT plays a vital role. It found its application in automated transportation, smart home, smart cities, agriculture, and healthcare. In hospitals, IOT is an important aspect in monitoring the patients. These technologies are brought mainly for elderly people. Body sensor network is constructed with wearable sensors for convenience of people living in rural areas. Through this network, the information about the patients is recorded. This paper describes the real time monitoring of patients in the absence of physicians and the manual collection of data is not required.*

Keywords— Body sensor network, monitoring, sensors, Lab view

I.INTRODUCTION

Internet of Things is the method of interconnecting the physical devices, where the exchange of information, analyzing of collected data takes place. IOT solves the difficulties existing in the health care. The difficulties are care takers should be aside the patients for all time and the entry of details for many patients is quite difficult. The main aim is to provide health care for the people in all the places. A BSN (Body Sensor Network) is a special purpose network designed to operate autonomously to connect to various medical devices. This reduces the discomfort of patients and increase the quality of people life in ecofriendly manner and improves remote monitoring of patients.Advanced healthcare networks driven by wireless technologies are predictable to support chronic diseases, early diagnosis, real-time monitoring, and medical emergencies.[1]

II. TECHNOLOGY IN IOT

A.Lifi

Lifi provides secure wireless communications, connectivity in hospitals. It provides the better operation of secure networked medical instruments, patient records, etc

B.Zigbee

The Personal Wellness Monitoring application uses several strategy that would be used in care, safety, and activity of the patients and elderly people. The information collected by these devices is analyzed by ZigBee devices[2]

C. Z wave(Radio protocol)

It is powerful and consistent enough for critical healthcare applications. A Z-Wave produced from defibrillator alerts the physicians when a heart patient needs assistance.

III.IOT BASED BODY SENSOR NETWORK

BSN consists of in-body and on-body sensor networks. An in-body sensor network allows communication between implanted devices and base station. In addition, an on body sensor network allows communication between non-wearable devices and a coordinator. This includes many wearable sensors. A wearable health-monitoring device using Body Area Network (BAN) can be integrated into a user's clothing[7]. The purpose of the sensor is to collect the details of the patients and forward them to coordinator. The different sensors are connected to the Arduino Fio transmitter board. Xbee module is connected to the transmitter board. The sensed values are wirelessly transmitted to the arduino receiver which is connected to the patient side computer and the values are read in LabVIEW which is connected to the Internet. An URL is generated by LabVIEW which can be accessed from any computer.

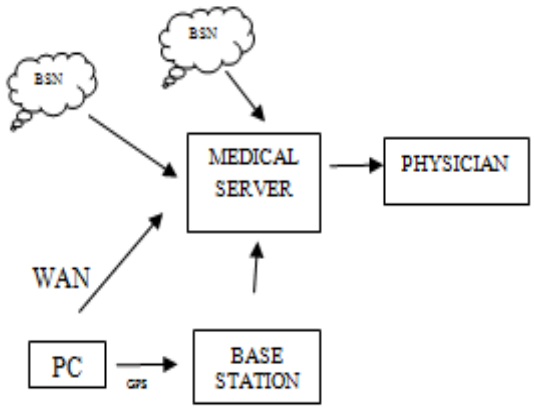

Figure1 Body sensor network

IV. PURPOSE OF IOT IN HEALTH CARE

It makes accessible for all the people who are suffering with lack of public transportation. In emergency situations the medical information of patients are arrived earlier. The collection and manipulation of data from patients are quite easy. Treatment outcomes are improved. Patient monitoring is likely to be the fastest area in the future. This is because it is necessary for early detection and prevention of diseases that may occur later in life. Applications include telemonitoring of human physicological data, tracking and monitoring of doctors and patients inside a hospital, drug administrator in hospitals and so on[3].

V. HARDWARE DEVICES

A.Arduino Fio

Arduino Fio is a microcontroller board works based on Atmega328v, which has 14 digital input/output pins .It is mainly used in wireless applications. The user can interface to sensors and/or actuators with various programming languages .The user can upload the program using USB. There are two ways you can upload new sketches to the Arduino Fio one can use an FTDI USB-to-serial cable, or adaptor board; or one can program it wirelessly, over a pair of XBee radios.

B. Pulse Rate Sensor

Heart beat sensor is designed to give digital output of heat beat when a finger is placed inside it[4].It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ. It consists of photodiode and IR Led, this is called Photo coupler. Photodiode resistance will change according to change in IR radiation. The detected output voltage change is based on the IR absorption. The intensity of reflected light depends upon the blood volume inside the fingertip. So, every time the heart beats, the amount of reflected infrared light changes, which can be detected by the photo diode.[5].

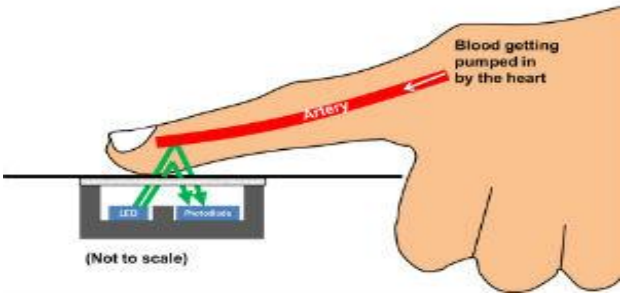

Figure 3. Pulse rate measurement

C. Temperature sensor

The temperature sensor used here is LM35. It is an integrated temperature device in which output voltage is proportional to corresponding temperature change in centigrade. It has low output impedance. LM35 device draws only 60 μA current from the supply. It is rated to operate over a temperature range between −55°C and 150°C.

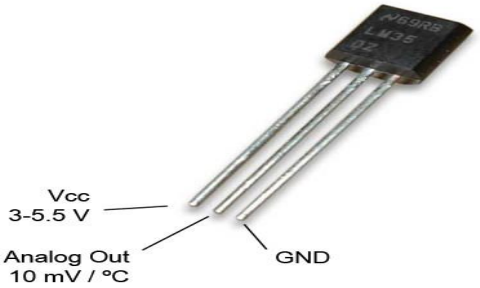

Figure 2 Temperature sensor

Table 1. Characteristics of LM35

OUTPUTIMPEDANCE	**0.4 OHM**
ACCURACY	0.5 degree Celsius
OUTPUT VOLTAGE	4V to 30V
SENSITIVITY	10 mv/degree Celsius

D. Blood Pressure Measurement

Blood pressure is measured using two parameters. systolic blood pressure, gives the pressure in your blood vessels when your heart beats and diastolic blood pressure, measures the pressure in your blood vessels when your heart rests between beats. In this measuring process, the sensor can transmit the calculated data to the data processing center, and have the functions of storing, recording and displaying the blood pressure data as well as receiving system can provide abnormalities reminders and physicians suggestions. Wearable health monitoring systems allows the patients to monitor the changes in vital signs and provide information to help and maintain health status[6].
Blood Pressure Levels

Normal

Systolic: lessthan120mmHg
Diastolic: less than 80mmHg
At risk (prehypertension)
Systolic: 120–139 mmHg
Diastolic: 80–89 mmHg

High

Systolic: 140 mmHg or higher
Diastolic: 90 mmHg or higher

E. EGG Measurement

A vital approach to diagnose heart diseases, ECG monitoring is widely studied[9]. ECG records the electrical movement generated by heart muscle depolarizations, which transmit in pulsating electrical waves towards the skin. ECG setup consists of four electrodes that are usually wet sensors, which uses conductive gel to increase conductivity between skin and electrodes.

VI SOFTWARE

LabVIEW

This software is used for processing the information collected from patients which includes function like integration. It uses dataflow programming .It extends its support code compiling, interfacing devices, parallel programming etc. It is an excellent graphical programming environment.

A. LabVIEW in health care

LabVIEW has three components block diagram, front panel, connector panel. The Embedded option embeds the front panel of the VI so one can view and control the front panel remotely. The Snapshot option displays a static image of the front panel in a browser. Snapshot does not allow you to interact with the controls of the VI from the browser. The Monitor option displays an animated snapshot that updates continuously. Monitor does not allow you to interact with the controls of the VI from the browser. Continuous monitoring with beginning detection likely has the potential to provide patients with an increased level of confidence, which in turn may improve quality of life.[8]

VII EXPERIMENTAL RESULTS

The proposed system is to view the vital information of the patients at the care taker side. The only thing needed is the computer and in the patient side internet connection and lab view software. The experimental values like temperature and blood pressure are executed in excel sheet.

VIII CONCLUSION AND FUTURE WORK

In this paper, remote monitoring of patients is done and the doctors are easy to report the physical parameters of the patients. It helps in better health monitoring of patients, secure data transfer, elimination of doctors care for a long time period ,alerting system to help patients from critical condition.. The future work is to include the data entry for multiple patients can be included.

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