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TECHNOLOGY****ANDROID BASED PORTABLE HEALTH SUPPORT SYSTEM****Mr.Nalage Vipul Vijaykumar, Mrs. Pise A.C.**

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ABSTRACT

In the most recent decade the health support system have drawn extensive considerations of the specialists. The prime objective was to build up a solid patient observing system with the goal that the medicinal services master can screen their patients, which are either hospitalized or executing their day by day life exercises. In this system we introduce an android cell phone based remote health support observing system that can give constant data about physiological states of a patient. This system is intended to quantify and screen essential physiological information of a patient so as to precisely portray the status of her/his wellbeing and wellness. The system comprises of sensors, the information procurement unit, microcontroller and programming. The patient's temperature, pulse , ECG chart and so forth will be observed, shown, and put away by our system. The field test will be done of the proposed system to ensure reliability and accuracy

KEYWORDS: remote healthcare, mobile device, patient monitoring**I.INTRODUCTION**

Health is one of the challenges for human beings.. Healthy individuals also reduce pressure on the already overwhelmed hospitals, clinics, and medical professionals and reduce workload on the public safety networks, charities, and governmental (or non-governmental) organizations.

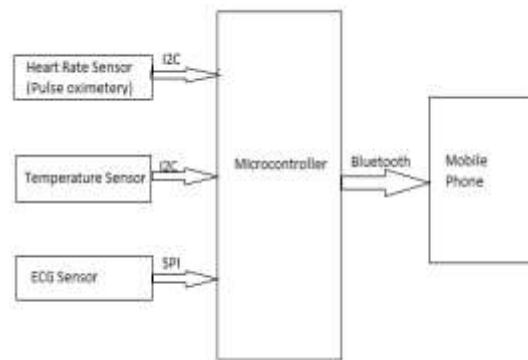
To keep individuals healthy an effective and readily accessible modern healthcare system is a prerequisite's modernized healthcare system should provide better healthcare services to people at any time and from anywhere in an economic and patient friendly manner. Currently, the healthcare system is undergoing a cultural shift from a traditional approach to a modernized patient centered approach. In the traditional approach the healthcare professionals play the major role. They need to visit he patients for necessary diagnosis and advising. There are two basic problems associated with this approach. Firstly, the healthcare professionals must be on site of the patient all the time and secondly, the patient remains admitted in a hospital, wired to bedside biomedical instruments, for a period of time.

In order to solve these two problems the patient oriented approach has been conceived. In this approach the patients are equipped with knowledge and information to play a more active role in disease diagnosis, and prevention. The key element of this second approach is a reliable and readily available patient monitoring system (PMS).The need for a real time recording and notification of vital signs of a patient is of prime importance for an effective PMS. By encapsulating the advantages of modern bioinstrumentation,computers.andtelecommunication technologies a modern PMS should acquire, record, efficient, timely, and hence an active database system must be associated with the PMS.

In this Paper a smartphone based wireless healthcare support system is presented, which can provide online information about medical status of a patient. The proposed system consists of sensors, adata acquisition unit, smartphone, and the LabVIEW program. The system is able to display, record, and send patient's physiological data.

II. MATERIALS AND METHODS

BLOCK DIAGRAM



Block diagram Android based portable health support system

A. ECG Electrodes

An ECG electrode is a device attached to the skin on certain parts of a patient's body — generally the arms, legs, and chest — during an electrocardiogram procedure. It detects electrical impulses produced each time the heart beats. The number and placement of electrodes on the body can vary, but the function remains the same. The electricity that an electrode detects is transmitted via this wire to a machine, which translates the electricity into wavy lines recorded on a piece of paper. The ECG records, in a great detail, are used to diagnose a very broad range of heart conditions. An ECG electrode is usually composed of a small metal plate surrounded by adhesive pad, which is coated with a conducting gel that transmits the electrical signal.

Figure:



ECG Electrodes

B. The LM35 Temperature Sensor

The LM35 series are precision integrated circuit LM35 temperature sensors, whose output voltage is linearly proportional to the temperature in Celsius (Centigrade). The LM35 sensor thus has an advantage over linear temperature sensors, calibrated in °Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient centigrade scaling. The LM35 sensor does not require any external calibration or trimming to provide typical accuracies of $\pm 1/4^\circ\text{C}$ at room temperature and $\pm 3/4^\circ\text{C}$ over a full -55 to $+150^\circ\text{C}$ temperature range. The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. As it draws only $60\ \mu\text{A}$ from its supply, it has very low self-heating, less than 0.1°C in still air.

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C. Blood Pressure Sensor

Blood pressure sensor is a device that measures the pressure of the blood in the arteries as it is pumped around the body by the heart. When our heart beats, it contracts and pushes blood through the arteries to the rest of our body. This force creates pressure on the arteries. Blood pressure is recorded as two numbers—the systolic pressure (as the heart beats) over the diastolic pressure (as the heart relaxes between beats). Some special features of blood pressure sensor includes (i) automatic measurement of systolic, diastolic and pulse, (ii) large LCD screen with LED backlight, and (iii) touch pad key. In addition a typical blood pressure sensor can store 80 measurements data with time and date

D. Microcontroller

The input is given to microcontroller through these sensor. The PIC microcontroller has inbuilt ADC. Where the conversion takes place and finally output is displayed on smart phone through Bluetooth.

E. Mobile Phone

Mobile is to display the real time output directly on mobile screen. Mobile phone is also used to generate the alarm by android phone to indicate the seriousness of patient body.

F. I2C

I²C (Inter-Integrated Circuit), It is typically used for attaching lower-speed peripheral ICs to processors and microcontrollers in short-distance, intra-board communication.

G. SPI

The Serial Peripheral Interface bus (SPI) is a synchronous serial communication interface specification used for short distance communication, primarily in embedded system SPI devices communicate in full duplex mode using a master-slave architecture with a single master. The master device originates the frame for reading and writing.

G. Bluetooth Module:

This module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connections. The Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband.

III. RESULTS AND DISCUSSION

1. We place three electrodes of ECG on the patient's body (i.e., right hand, left hand and Center).
2. We connect the temperature sensor, a blood pressure sensor, and blood glucose level sensor to the microcontroller.
3. we connect a wireless bluetooth module of system to the tablet (as a receiver) or the smartphone that has android software running on it to take the reading of the physiological data from the patients' body. The data are then processed and displayed.
4. The data are also saved according to the time and presented in a report format. In addition some personal details of the patient are also recorded.
5. The data is then published in the internet so that the patient's data can be accessed by the authorized healthcare personnel from anywhere at any time.

RESULTS

ECG OUTPUT

Output which is generated from ECG electrodes which is displayed on android mobile phone through the software running on it



ECG output on mobile phone

TEMPERATURE AND HEART RATE OUTPUT REPORT

Normal Values			
QRS Interval	Heart Rate	Blood Pressure	Body Temperature
{ 0.04 - 1.2 } ms	{ 60 - 100 } BPM	{ 120/80 } mmHg	37.4 °C

Your Test Results			
QRS Interval	Heart Rate	Blood Pressure	Body Temperature
0.06 ms	65 BPM	{ 110/70 } mmHg	37.0 °C

IV. CONCLUSION

This paper present “Portable health support system” which is easy to use by common man. By using the system the healthcare professionals can monitor, diagnose, and advice their patients all time

V. ACKNOWLEDGEMENTS

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