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Body Sensor Networking

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Abstract **-** The objective of this project is to monitor the patients remotely. In this new era of IOT there are many technique with which we can do so many things with the help of various devices like sensors, GSM modules and LCD displays .The internet of things is one of the best Smart technology in this new era with which we can connect internet into physical device and can do various activity. We can also collect all types of information. This leads to the effective framework. Recent approach in wireless sensor networks have facilitate the cognizance of pervasive health care monitoring system for patients. In this project, we propose a off the beaten track medical monitoring system for heartbeat, blood pressure, ECG, and temperature data. Monitoring centre is a station which consist of real time analysis and warning mechanism for emergency diagnosis .We are using sensors like heart beat sensor, blood pressure sensor, microcontroller Lpc2148, an temperature sensor to detect the abnormalities in the human body and send a message through GSM module and also give alarm during emergency .These all can done using mobile application with the help of sensors. We use embedded C which is a very easy coding language to write the code and install it in the Arduino. We also use the LCD display to show the message.

Keywords- microcontroller Lpc2148, temperature sensor, blood pressure sensor, heart beat sensor, ECG Sensor, LCD display, GSM module, Embedded C, Arduino, Wi -Fi module, Mobile application.

I. INTRODUCTION

A recent report predicted that there will be two billion older people in the upcoming years. More than half of these elderly people are expected to live unassisted. Medical research surveys suggest that half of the people older than 65 suffers from at least one chronic illnesses. Presently, complex Healthcare monitoring systems offer continuously monitoring a large number of biological signals, investigate them, explain them to take the appropriate action .or alert the patient if necessary.

A patient said to be wired to these devices in order for his quintessence to be monitored while sitting and doing their work without any disturbance. This system estimate, transcript and give accurate results of the body measurements. While maintaining body temperature and different readings in its original or existing state and taking care of the patient and their comfort. Our device is very compact and built on a low power, diminutive, low-cost solution suitable for monitoring elderly people and for those people who are suffering from the chronic illnesses and take care of themselves at home without anybody help. It will give sufficient and accurate information in real time, and make it available off the beaten track. The entire body sensor network module intention is to achieve perfect clinical accuracy storing it into database with the help of cloud and transferring the detail accurately to the patient doctor and their family members. The challenges are significant, but so are the opportunities. With significance development in technology in the IoT sector in the past couple of years, the hardware is getting cheaper and accessible, the internet is becoming cheaper and faster and more and developers are trying to integrate IoT in every little thing in our life .With this technology not only can we solve our problem more efficiently and quickly but we can also monitor our progress.

The goal of our project is to make a device which can accurately measure patient body temperature and give them the accurate result as many time they try to measure their body temperature using different sensors present in our device. This device is user friendly with the help of the mobile application which is use to connect to the device with the phone for more information about their body measure .By using this device people can track their health issues whenever they require without anybody help. It will also help doctors to check patient and give them best medical facilities and medical treatment after checking their routine readings of their body.

II. RELATED WORK

There have been many past projects both on big and small scales to tackle the problem of patient body abnormalities by using different sensors. Some of the projects are textile –base sensors. Which take care of transferring data with the help of internet to the remote areas connected to the device .The device can be connected to internet in any form such as Wi-

Fi or mobile data in order to transfer the detail from device to remote servers. Most of these projects in this sector are more focused on a project which deals with the secure transfer rather than how to efficiently collect accurate data it in one place for future use.

There have been many Projects on body sensor and networking but the projects to collect accurate data and secure transferring and preserving data for future use has never become a mainstream problem.

III. METHODOLOGY

Our project aim is to make a device which correctly measure the body temperature and other problems and detect the abnormalities inside the patient body and then send us information through GSM module so that we can effectively deal with the problem.

- The patient monitoring system is having two parts, which is lightweight remote medical monitoring unit and monitoring center which is nothing but a mobile application to keep the track of the report which is taken from the device with the help of internet connectivity with that device using GSM module.
- In this project we put forward a remote healthcare medical monitoring system in other words BSN for heartbeat, blood pressure and temperature data.
- Monitoring center is a station which consists of real time analysis and alert mechanism for emergency and diagnosis.

IV. RESULTS AND DISCUSSION

Our project is designed using microcontroller in the Arduino environment. It is come up with a design of an embedded system which is used for IoT applications. After uploading the code in the device it will show the result in the LCD as well as in the mobile application with the help of GSM module. It will also help in transferring the data securely with the help of some network security protocols. This device will also help in storing data into the database for future use.

We have used ARM7 LPC2148 microcontroller development board .It has 12MHz crystal for system clock and 32 KHz crystal for RTC. It has 64-pin IC and total two ports. Port 0.0 and 0.1 is connected to Wi-Fi module and Port 0.8 and Port 0.9 is connected to GSM module rest all the sensors are connected to their respected Ports. We are using 9 volts AC and we are getting 5 volts DC output. This 5 volts DC output is divided into 1 volt each among different sensors like heart beat sensor, blood pressure sensor, temperature sensor and ECG sensor.16 X 2 LCD is used to show the result on the screen. MAX232 is an integrated circuit which converts the signals from the RS232 serial port to the proper signal which are used in the TTL compatible digital logic circuits.

There are different sensors which are used in the project each sensors have its own specialty such as Temperature sensor is used to measure amount of heat energy that allow to detect a physical change in temperature from a source and coverts data for the device. Same heart beat sensor help to measure the heart rate, blood pressure sensor helps to measure the blood pressure of the human. ECG sensor is a diagnostic tool that is routinely used to assess the electrical and muscular functions of the heart. If something happens it will give Alarm and send messages to the registered numbers in the SIM which we have inserted into the GSM module .At the same time it will show the data in the mobile application with the help of Wi-Fi module. These data will be stored in the mobile application database for the future use and the reference.

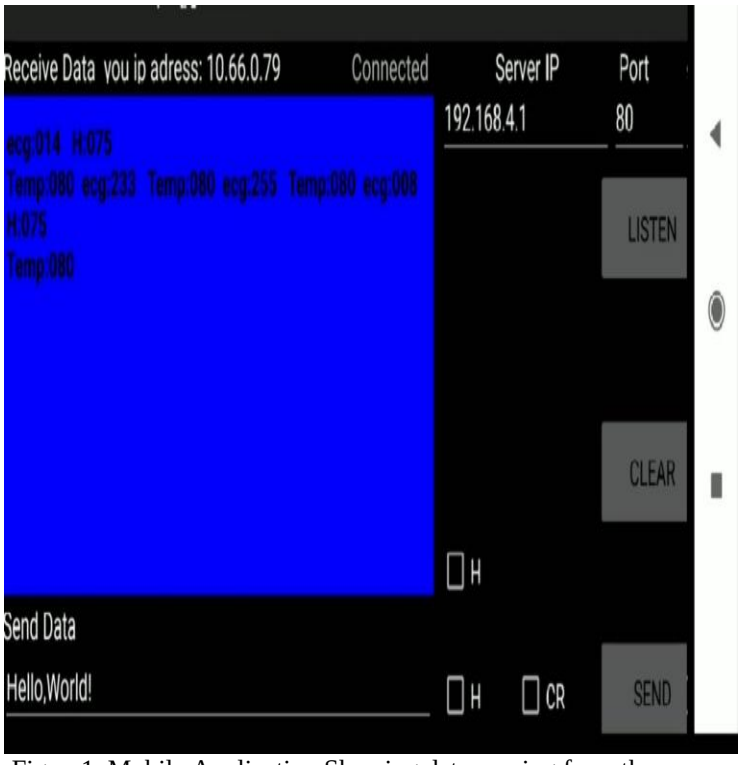

Figure1. Mobile Application Showing data coming from the sensors.

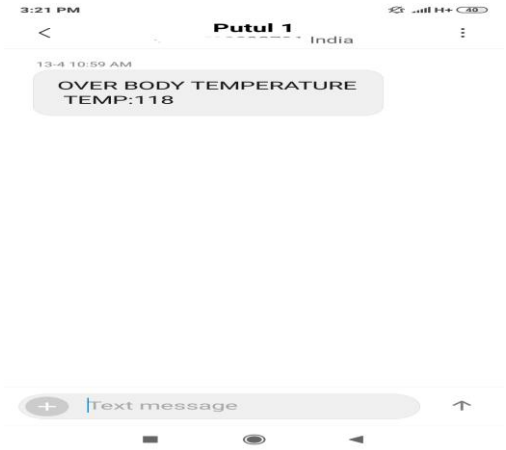

Figure 2. Message Received During Emergency.

V. CONCLUSION AND FUTURE SCOPE

Body Sensor Network is one of the emerging technology in this new era for monitoring patient health issue remotely which is often termed as e-healthcare.

Instead of going to the doctor for monthly checkup they can use this device in home without anybody help and can take care of themselves .This will also help the doctors to monitor their patient remotely. This device will help in taking the data accurately in the real time and storing in the database which can be use by the doctors to examine the patient health for curing disease .The entire health care monitoring system or BSN, which we have proposed can be merged into small unit as small as a wrist watch or a chip. So that the patients can easily carry this device with them wherever they go. And also it will not going to affect human body at any cost.

VI. DIAGRAM

a. Diagram of the device

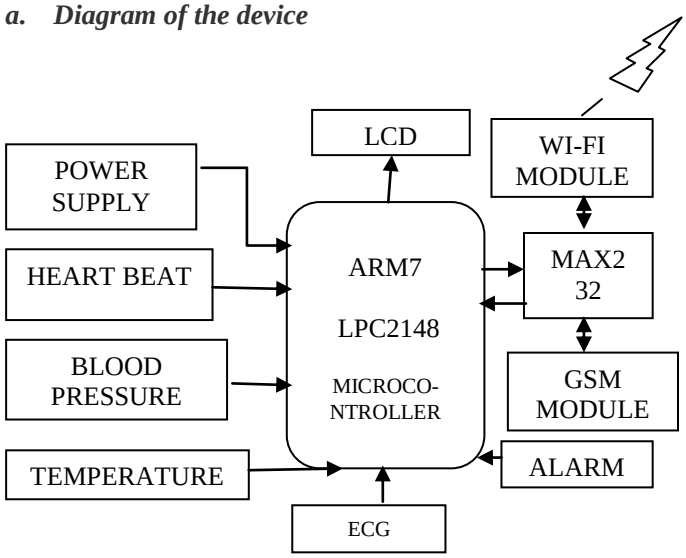

Figure 3. Block Diagram of the Project

b.

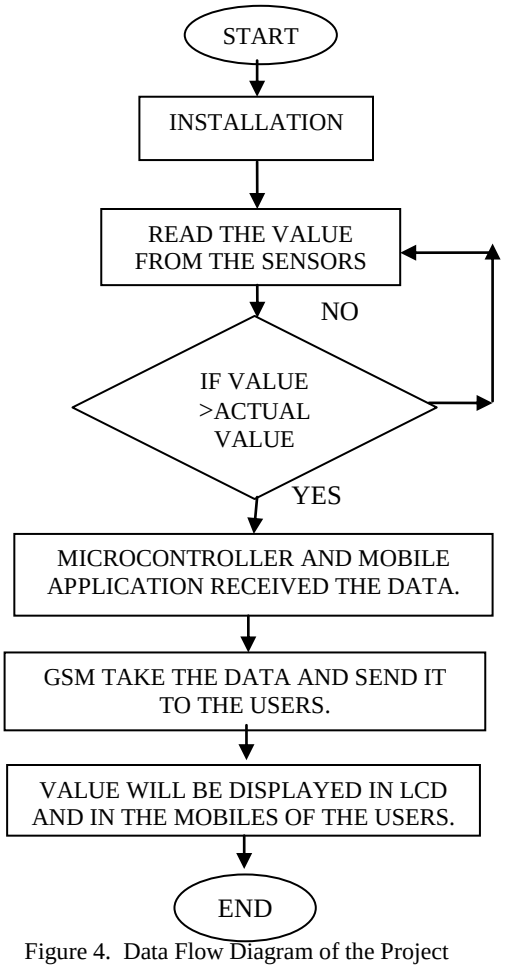

Figure 4. Data Flow Diagram of the Project

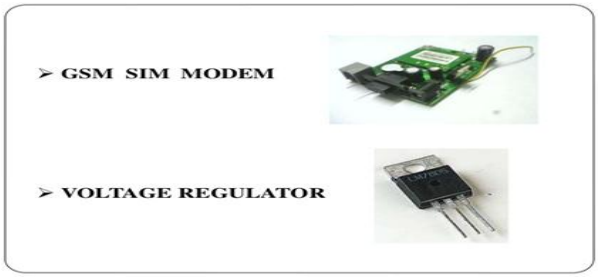

Figure 5 .Diagram of GSM SIM module and Voltage Regulator

Figure 6. Diagram of 16 X 2 LCD and Heart Beat Sensor

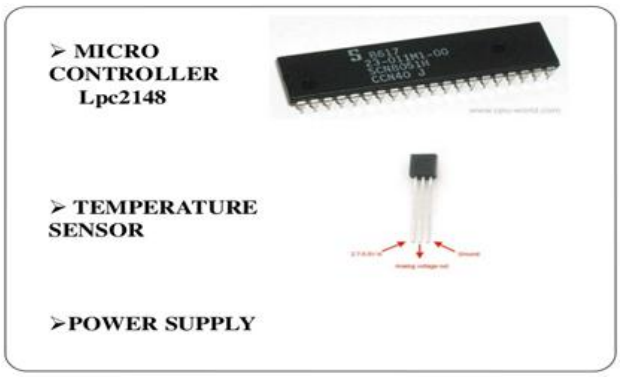

Figure 7. Diagram of Microcontroller and Temperature Sensor.

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