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Patient Health Monitoring System

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Abstract: We are developing the system which can be useful for any person. The system continuously monitors the heart beat rate and temperature of a user. If a person is walking on the road and his heart beats' or temperature record goes abnormal, then the proposed system will be very useful in this case. Because we are giving guidance to the person by providing him/her a list of nearest hospitals and a list of health tips so that he can take some preliminary precautions by reading health tips and immediately go to the hospital for the treatment. So it is not mandatory that the person should be admitted in the hospital and then only he/she can use this system.

This application is capable of notifying the local hospitals in a particular area to patient/person in need. Person should be able to SMS his/her relatives about the crisis situation.

Key Word: **Wireless Patient Monitoring, heart rate sensor, temperature sensor, Arduino Board, Buzzer.**

1. INTRODUCTION

Technology has advanced at a very fast pace in today's world. Medical science and technology has had so many break through, that they are almost beginning to overlap each other and in certain scenarios even fusing with each other to help human beings. The project that we want to work on is one that has not been done before but will be very useful and effective in helping avoid deaths which are caused by the biggest concern of today's world...a cardiac arrest....heart attack.

What we want to achieve through this project is by some means try to convert the pulse rate into a measurable entity and keep a constant check on it to see if it functions normally. If not, the system should kickstart and following actions should immediately take effect: 1) Send information about the abnormality to a family relative/doctor 2) At the user's end. Give a complete list of hospitals that can treat such a condition and give a second chance to the person to get help 3) Take any messages that the user wants to record (eg: who to contact, his blood group, medical history, etc.) This not helps a rapid course of action to take place, but informs people in the vicinity that it is not just a minor condition, but needs serious medical help giving the user a fighting chance.

The existing system monitors only the record of patients who are admitted in the hospitals. But we are developing the system which can be useful for any person. The system continuously monitors the heart beat rate and temperature of a user. If a person is walking on the road and his heart beats' or temperature record goes abnormal, then the proposed system will be very useful in this case. Because we are giving guidance to the person by providing him/her a list of nearest hospitals and a list of health tips so that he can take some preliminary precautions by reading health tips and immediately go to the hospital for the treatment. So it is not mandatory that the person should be admitted in the hospital and then only he/she can use this system.

2. RELATED WORK

Microcontroller based system for wireless heartbeat and temperature monitoring using ZigBee. System is developed for home use by patients that are not in a critical condition but need to be constant or periodically monitored by clinician or family.[1]

The author uses Peripheral Interface Controller (PIC) 16F877 microcontroller as the hardware circuit to implement the system. He tries minimizing the power consumption used in wireless patient monitoring system. The communication between the hardware and software systems is in the full duplex communication via the XBee modules is explained.[2]

In [3] author reported the Outdoor Wireless Healthcare Monitoring System for Hospital Patients based on Zigbee.

Lew C. K. and M. Moghavvemi reported[4] through the study of A Simple And Low-Cost Remote Heart Rate Monitoring System, To a Patient , which used a portable transmitter, carried by the moving patient send the ECG data to the receiver. It is formed by the front-end module and the FM transmitter. The front-end module is used for ECG wave form detection from a patient's body and signal conditioning. The transmitted signal is received by an FM radio. Two PIC 16F877 microcontroller are programmed for heart rate counting and ECG waveform display.

3. PROPOSED SYSTEM

We are implementing a system i.e. Wireless Patient Monitoring System that can be used by any person at anywhere by monitoring health and getting health tips so that he can take some preliminary precautions by reading health tips and immediately go to the hospital for the treatment.

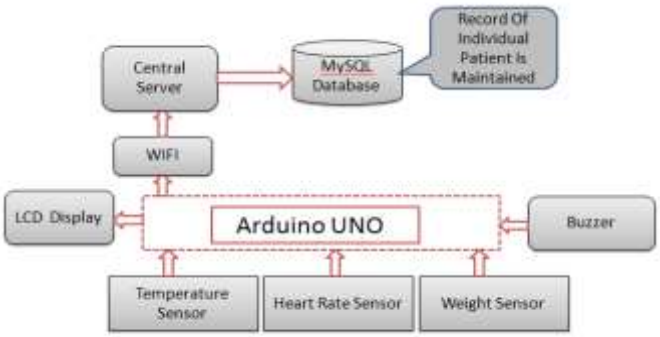

Fig.1: Block Diagram

This project describes about the system which keeps all the records of a patient such as temperature, heart rate, pulse rate, etc. If patient suffers from extreme condition, then system gives him a list of nearest hospitals. If needed, customer can use alarm. Above fig 1shows the block diagram of the proposed system.

System monitors heart rate, temperature, etc. specifically of multiple patients at a time. The system is able to send the vital data to administrator via SMS. The data is sent in the form of values. Administrator can send the data/commands back to system. The arduino microcontroller hardware board is connected to a PC where a centralized database/log of all the activities is maintained. The system keeps track/log of all the activities. Hence detailed record of patients is maintained.. Administrator can change the threshold values for alarms for individual patients either via SMS or via direct controlling the GUI based application provided. the values are displayed on the LCD screen.

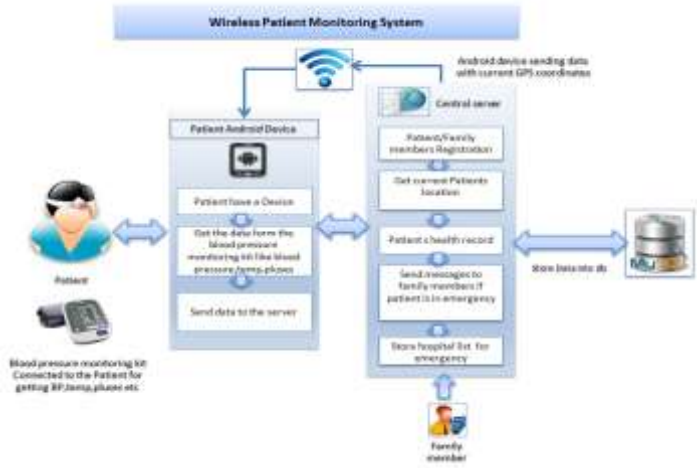

Fig.2: Architecture Diagram

- **System Features:** System must be able to monitor heart rate, temperature, etc. specs of multiple patients at a time.
- The system must be able to send the vital data (under shoot or over shoots in values) to administrator via SMS.
- Administrator must also be able to send the data/commands back to system.
- The J2ME program must maintain centralized database/log of all the activities must be maintained.
- A GUI based software must graphically display all the vital information.
- Administrator must be able to change the threshold values for alarms for individual patients either via SMS or via direct controlling the GUI based application provided

4. EXPERIMENTAL RESULT

The ECG Monitor Hardware monitors the heart beat rate (per min) through Heart- beat sensor and Temperature through Temperature sensor. It gives signal to the system when values are going below standard. The experimental setup is as shown in below figure.

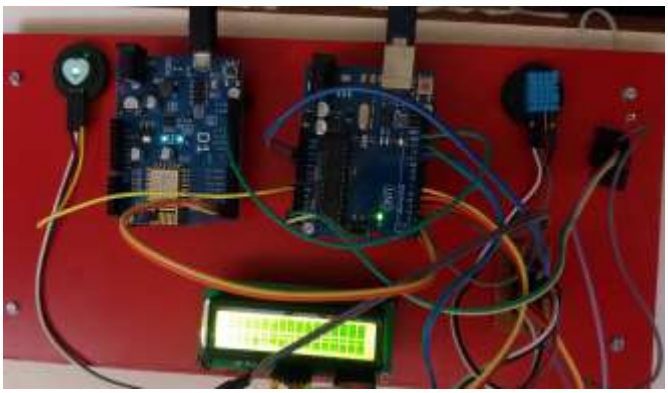

Fig.3: Experimental Setup

The body temperature of the patient can be displayed on the LCD screen as shown below.

Fig.4: Temperature Displayed

For using this system user have to register himself/herself to the system with all the details mentioned in the below figure.

Fig.5: Patients Registration

After registration user have to login to the system whenever he want to view all the details about the health parameter like temperature, heart rate and blood pressure.

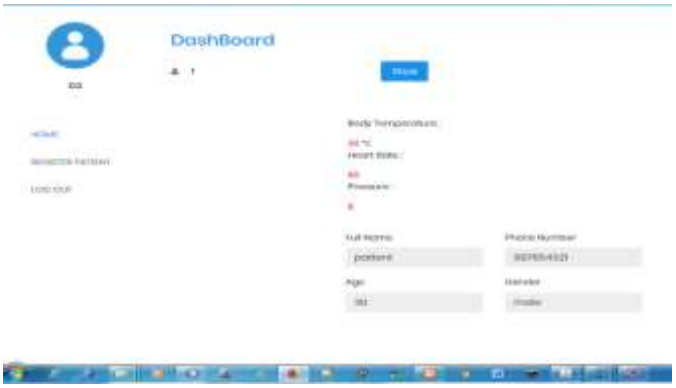

Fig.6: Patients Details

5. CONCLUSION

This project provides a great facility for patients which usually suffer from Heart attacks. So there is no need to continuously go to the physicians for checkup. Any person can use this system at any time. They can use these systems which continuously monitor the heart beat rate per min and also the temperature. The system not only monitors the record of patient but also helps him by giving health tips. Most of the heart attack patients lose their lives due to unavailability of preliminary treatment. This can be avoided by taking health tips from this system. System will also provide the list of nearest hospitals. So patient can immediately go to the hospital for treatment.

We can record some details of the patients for his family or his blood group, medical history, etc. User of the system can send alarm through the WIFI to inform the system that the condition is very much critical. There are two users of the system. One is normal user and another is Administrator. Normal user is given a unique username and password. Administrator is responsible to maintain the whole and sole system.

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