Health Care Heart Monitoring System

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Abstract— **Internet of things (IoT) refers to the ever growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other internet enabled devices and systems. In India many patients are dying because of heart attacks and reason behind this factor is that they are not getting proper help during the period. To give them timely and proper help first we want to continuous monitoring of patient health. In this paper, we are going to develop Health Care application. The main primary aims of this paper to design an IOT based architecture for health related issues such as Heart Monitoring system, Pulse rate measurement. Arduino is acting as IoT proxy in this paper and is used to deploy the health information of patients into the database. The Data obtained through sensors are uploaded to the database and in case of any critical condition the SMS is send to the doctor or any family member. So that we can easily save many lives by providing them quick service.**

Index Terms—*Bio sensors, health care monitoring system, IoT.*

I. INTRODUCTION

Health monitoring system is used every field such as hospital, home care unit, sports. It is difficult to keep track on abnormalities in heartbeat count for patient itself manually. A normal resting heart rate for adult ranges from 60-100 beats per minute. For children ages 6-15, the normal resting heart rate is between 70-100 bpm. Patients are not well versed with manual treatment which doctors normally use for tracking the count of heartbeat. There are various instruments available in market to keep track on internal body changes. But there are many limits in maintenance part due to their heavy cost, size of instruments and mobility of patients. The biomedical sensor like heart rate sensor is used for monitoring the health condition which is integrated on single system on-chip. If any varied change takes place it is notified. This notification would help to take an appropriate action at an instance of a time. This would save patients from the future health problem which would arise. This would also help patient's concern doctor to take an appropriate action at proper time.

The system proposed consists the following:

- Sensors that gather patient health information and Raspberry pi is used to process these data and

- wirelessly communicate the data to other entities in the system
- Health care proxy through which sensor data is analyzed and to store them to the cloud for further analytics
- Real time alerting systems using mobile phones.

The proposed system offers less response time compared to the conventional remote health monitoring system. The physician could offer critical care advice using his mobile phone. The health care professionals would make use of the proposed solution to efficiently handle and make inferences from capacious and various healthcare data.

II. PROPOSED SYSTEM

The IoT system architecture of health care is shown in figure 1. The heart rate sensor is coupled with health proxy. The IoT agent plays the role of health proxy. The health parameters sensed are deployed into the cloud. The cloud technology enables the delivery of accurate medical information anytime anywhere by means of internet. Here we have a facility to connect the mobile phone directly to IoT agent through GPIO pins, the doctor's mobile phone could be used to collect health data of a particular patient from cloud. Proper medical guidance could be given in case of critical health condition is detected.
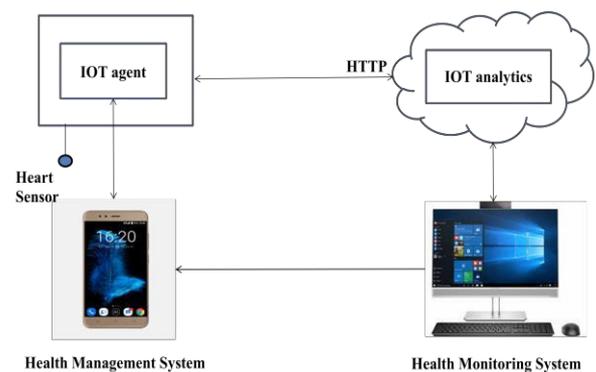
A. Block Diagram

Figure 1: Proposed IoT Architecture

III.   METHODOLOGY

The proposed health monitoring system consists of heart rate sensor. Sensors are used for health care data collection. The Health Monitoring sensors are touched by human to sample the physiological signals of the patient. Arduino is an open-source prototyping 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 and turn it into an output- turning on an LED. Hence it is being chosen for implementation in this proposed system. The sensor values are recorded using the Arduino programming.

Figure 2: INVNT_11 Pulse Rate Sensor

i.   Raspberry pi 3 Model B

The Raspberry Pi is a series of credit card–sized single-board computers developed in Wales, United Kingdom by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science in schools and developing countries. The original Raspberry Pi and Raspberry Pi 2/3 are manufactured in several board configurations through licensed manufacturing agreements with Newark element14 (Premier Farnell), RS Components and Egoman. The hardware is the same across all manufacturers.

ii.   Arduino Board

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

iii.   Invento INVNT_11 Pulse Rate Sensor

Pulse rate sensor is used to detect heartbeat. It can be wore on the finger or earlobe and connected to Arduino via cables. It also carries an open-source program to display heart rate via diagrams in real time. Power supply: 3v~5v

IV.   RESULTS

The patient is made to press the heart beat rate sensor and his/her heart beat rate is recorded in IoT agent and further it is deployed in the database as shown below.
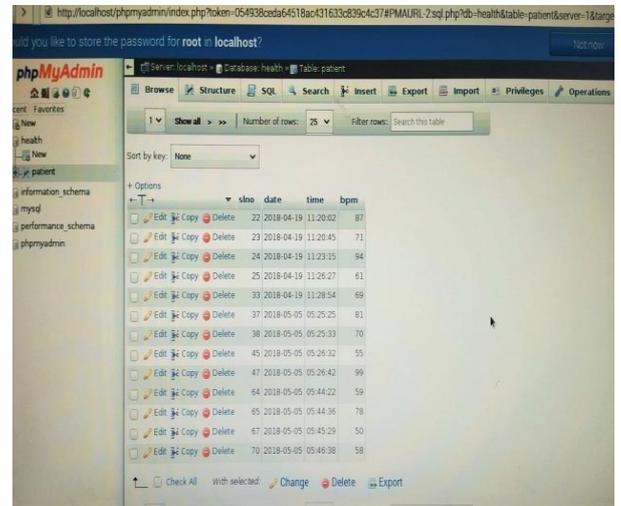

Figure 3: Pulse Sensor values inserted into database

Figure- 4 shows pulse sensor values of the patient, if pulse rate values goes greater than 72 than the message will be sent to particular doctor.

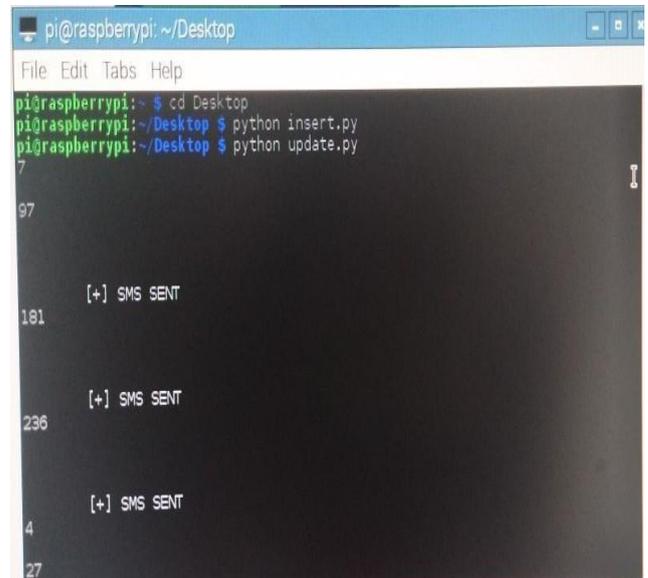Figure- 5 shows the message which would be received to the doctor
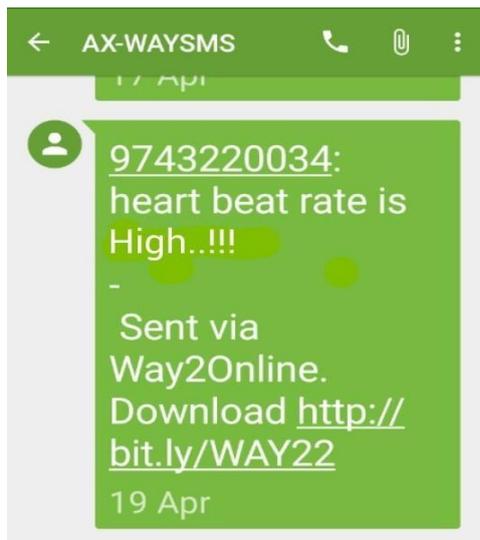

Figure 4: Pulse Sensor values

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Figure 5: Message sent to Doctor via way2sms

V. CONCLUSION

This Paper presents the importance of the Healthcare through IOT devices. It focuses on how to deal with health issues to the people who are residing in the remote areas or away from the doctors. Because of wireless data transmission, health related data will be send to doctor's mobile. So, sending message to the doctor gets immediate remedy related to the health condition. The proposed work offers the physicians to take advantage of the massive amounts of health care data and provide right intervention to the right patient at the right time.

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