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IJIEMR Transactions, online available on 14th June 2017. Link :
http://www.ijiemr.org/downloads.php?vol=Volume-6&issue=ISSUE-4

Title: Health Monitoring and Management Using Internet of Things Technology.

Volume 06, Issue 04, Page No: 957 – 960.

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Health Monitoring and Management Using Internet of Things Technology

***B.VEERASWAMI NAYAK **B.VEERA NAGABABU**

Abstract - *Medical Carelessness at right time is the reason why many of the people are suffering from unpredictable death. To overcome this vital problem, we are developing a system, as because Now a day's healthcare is the most important aspect in human life in many countries. Our system carries hardware kit and Android application, the heart rate, temperature of body, are sensed by the sensor in hardware kit. The System based on IOT is used for remotely accessing data. In order to access the data globally, IOT used to keep all updated information on web pages' time to time and stored data on clouds. There is an Android based application that can access data from server through Wi-Fi to let us view the sensed data. If any of the abnormalities are found those must be fixed, so it will send message to patient and respective doctor. The present situation of patient and his location via GPS to provide urgent medical help. Will be present in the message with respect to message important information to server which will plot the graph of information will be sent so that doctor will be able to view it using URL. There is another facility included which is telemedicine system is this patient can submit symptoms to the server and can get disease name and send prescription. The main moto of designing this system is to monitor patients in hospital as well as patient at home. And it is also helpful as well as suitable for the healthcare centers in villages and rural areas where medical facilities are not available in good extent.*

***Key Words*:** ARM 7,WIFI, Telemedicine system, IOT

1. INTRODUCTION

Internet of Things is visual so it is a physical quantity. A wide network of various physical quantities such as sensors and electronic software are embedded together and they have ability to collect and share data around us and across Internet. Internet of things is very much beneficial in the fields such as healthcare, smart cities, smart environment, etc. Our system deals with set of modules are which gives the facility of interacting the patient with the doctor through telemonitoring. A set of medical sensors is used to sense the data from patient and this sensed data is relayed to raspberry pi anywhere in the world for the diagnosis of patient using Internet. For easy of accessing the data we can store data on cloud of medical history. The architecture of our system design is to monitor patient from anywhere privately of home as well as in hospital. The system is very
much suitable for a villages healthcare center where lack of medical facilities is available.

1.1 Motivation

1.The system covers long distance and supports no. of devices with high speed, useful in rural areas.

2.The according to our literature survey existing system uses ZigBee that provides short range which was limited to Hospital .

3. The proposed system uses IOT which provides more facilities like Monitoring continuously . The system was used for monitoring temperature,heartbeat and position of patient .

4.Instated of using 1 sensor we are trying to use 3-4 sensors for cover max amount of diseases (which is also a limitation of this project).

1.2 Goals and Objective

1.The system is useful while there is any emergency it provides medical help when required

2.System tries to give Basic guidelines for some minor health issues. i.e. if some is having headache, body pain because of cold we can suggest them medicines.

3. It help basic regular checkups for rural areas, where medical facilities are not
available.

4.To keep updated information on webpage which can be accessed from anywhere (as new information gets updated) globally.

2. LITERATURE SURVEY1. A comprehensive ubiquitous healthcare solution on an android mobile device

Nowadays it has become important to focus on healthcare awareness and also the growth of wireless mobile technologies. For this reason, ubiquitous health care solutions have become important as it provides services at anytime and anywhere.

To complete our needs android smart phone device has put fourth mobile monitoring terminal to observe and analyze ECG [electrocardiography] waveforms from wearable ECG devices in real time under the coverage of wireless sensor network.
wireless sensor network in a healthcare we are able to reduce complications of wire networks and we can move a healthcare from one location to another desired location. Mobile phones are used as barcode decoder for medicinal care as an extension to monitoring schemes. In order to

provide better and more comprehensive healthcare services. We can use barcode decoder to verify and assist out patient in the medication administration process.

2. Android based body area network for the evaluation of medical parameters

There are various vital parameters in this system. They are ECG, heart rate, heart rate variability and fall detection. The telemedical system is the system which focuses on the system which focuses on the measurement and evaluation of these vital parameters. In some android smartphones, there are two different designers of a (wireless) body networks the real-time system features several capabilities.

Tthe use of the smartphone sensors, data transmission and emergency communication with first responders and clinical server. It is very important to smart and energy efficient sensors. This can be compensated. In the first ZigBee based approach, sensor nodes acquire physiological parameter perform signal processing and data analysis and transmit measurement value to the coordinator node. Sensors are connected via cable to an embedded system in the second deign. In the both types of system, Bluetooth is used for transferring the data to an android based smartphone.

3. Communication and security in health monitoring systems - a review

The fast improvement of sensing devices and radios lets us move powerful and flexible remote health monitoring system. In the vision of the future internet of things(IOT). This vision leads to the new requirement and challenges, and these have to manage. So as to design and implement of such system. Maintaining the gap between sensors nodes and the human body and the internet becomes challenging task in terms of comfortable and suitable communication. The system will not have to provide functionality but it should have to be highly secure. In this paper, we provide a survey an existing communication protocols and security issue related to pervasive health monitoring by explaining their limitation, challenges, and possible solutions. We introduce a generic protocol stack and design towards handling interoperability in heterogeneous low power wireless body area networks.

4. Design and development of e-health care monitoring system

As we are dealing with e-health care monitoring system, our system designs are based on the wireless sensor networks (WSN) and smart devices. It is very important to have strong networks between doctor, patient, and care givers judges the condition of the patient. Sensors are used to monitoring of patient surrounding as well as health, these sensors are medical and environmental sensors. Sensors are relayed to the prior devices through the transmitter amd them to the end user. In this system doctor and care takers can observe patient without exactly visiting the patient actually. And furtherly they can upload medicines and medical reports on the web server which after can be accessed by the patient anywhere at any time. It is very much easy process and convenient for both the doctors and patient. With the help of this data doctors can understand and observe patient from private home patient to public health care centre patient. This is the cost reducing technique. We have also defined the sets of add on services which include real time health advice and action (retina) and parent monitoring.

3. PROPOSED SYSTEM AND IMPLEMENTATION

ARM 7 is used by proposed system to get monitored patient heart rate, body temperature,position . The data sensed by sensor is relayed on ARM7 . The monitor screen of computer using ARM 7 is used to monitor the patient diagnose anywhere in the world using Internet. Using the IOT module the all updated information of each patient is displayed on web page and we can access that data from any location in the world using devices such as mobiles, laptops, etc. The updated information of web pages which can be

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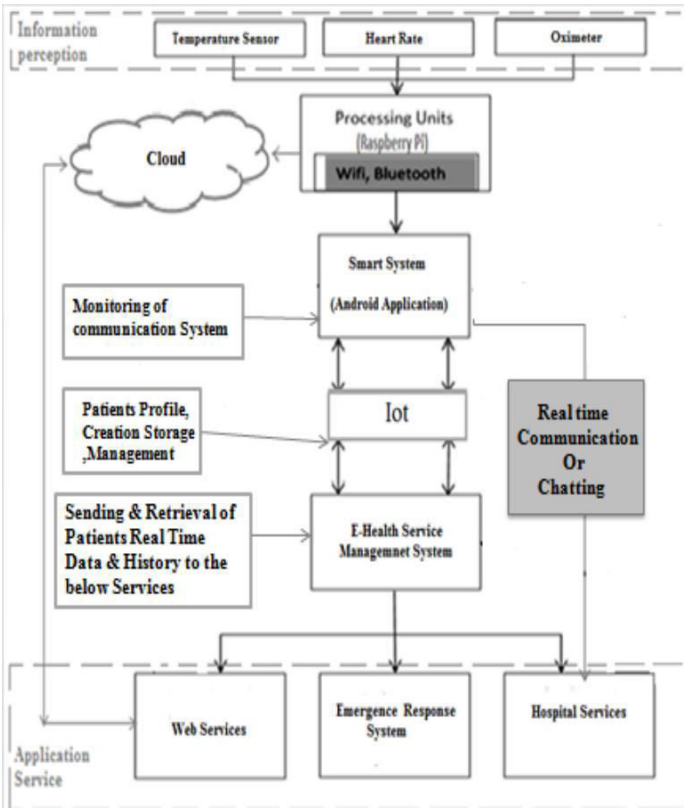


Fig-1: System Architecture

5. MATHEMATICAL MODEL AND ANALYSIS

System description:

• Input: Patient personal information, parameters sensed by sensors.

•Output: Provides medication depending on the health parameters without the physical presence of the doctors. Show sensor data history.

• classes: doctor, user, patient, patient appointment, diseases and symptoms.

• set theory:

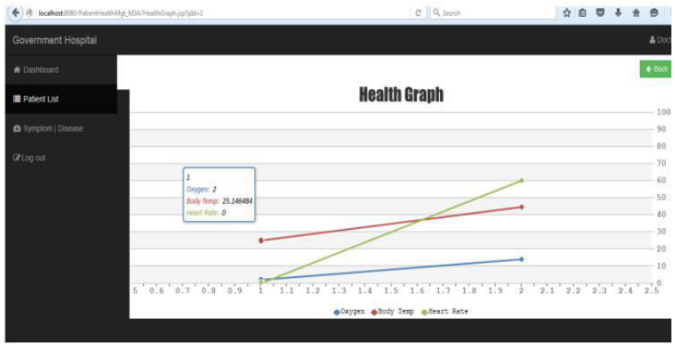
1. Let s = be a system for health monitoring.
2. Identify input as i= d1… dn
   Where di= no of patients. S= i
3. Identify t as output i.e. successful recommendation s= i, t, p.
4. Identify process p da=data acquisitions ce=client embedded system
   Webs= web services
   S = i, t, da, ce, webs

• success conditions: when the correct inputs are provided then patient gets
Proper diagnose with correct physical parameters.

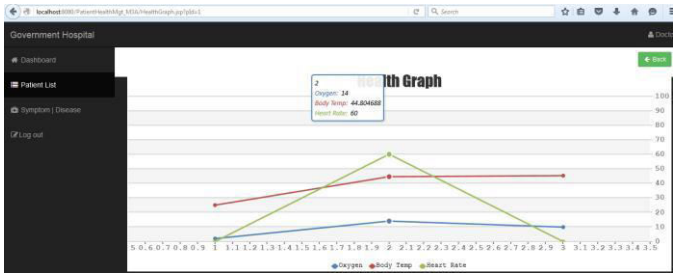
• failure conditions: when correct inputs are not provided then system may fail
To give proper medical help.

RESULTS

Here as per the (sensor) readings graph is being displayed which shows patient health record graphically (this graph automatically gets generated in our System). This readings may help doctor to monitor patients health on regular basics .



This graph is showing first Reading of Patient (With Reading one)



This Graph is showing Three Readings of Patient

7. CONCLUSIONS AND FUTURE SCOPE

We come to the conclusion that our proposed system is truly based on cloud computing and IOT. The data is stored using cloud computing, this data can be stored permanently and it is accessible from anywhere. Another advantage of cloud computing is we can keep the update of patient in an emergency case, doctors and care takers can immediately interface with the patient and can take a serious action on patient and also can provide medication depending on health parameters. There is no need for doctors and care givers to be present there, they can interact with patient without their physical present. The system is able to automatically generate the graph of body changes as emergency SMS doctor gets. E.g. If a patient is suffering from body temperature doctors can easily recognized the problem and thus will save the time for check-up. Our system is very much suitable in villages and rural areas where medical facilities are not available. This system keeps the privacy of patient at home as well as the hospital. This system has been concluded as essential and proven great for health care of patient.

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