

IOT And Arduino Based Health Monitoring System

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Abstract: *Health carelessness is one of the major issues of humanity. People are suffering from unpredictable death due to health issue. To overcome this type of problem we develop system that monitors the health issue of human. In our system we collated the number of parameter's and supervise, send them to server. IOT (Internet of Things) is system where we used for access this data locally as well as globally. Our main aim is to design this system, to monitor patients in hospital, home as well as rural area for providing better facility to human.*

Keywords: *IOT, Arduino, E-Health.*

I. INTRODUCTION

Today increasingly growing number of people with chronic diseases, this is due to different risk factors such as dietary habits, physical inactivity, alcohol consumption, among others. According to figures from the World Health Organization, 4.9 million people die from lung cancer from the consumption of snuff, overweight 2.6 million, 4.4 million for elevated cholesterol and 7.1 million for high blood pressure. It is said that in the next 10 years, deaths from chronic diseases will increase by 17 per, which means in figures of about 64 million people¹, Chronic diseases are highly variable in their symptoms as well as their evolution and treatment.

The strength of IoT has great influence on our daily routine such as it makes human being capable to control the wastage of electricity by offering the concept of home automation system, monitoring the health of patients by using IoT based health monitoring system. IoT is widely used technology in the field of medical science. The IoT device is used to collect, monitor, evaluate and notify the about various parameters that can influence the health of patient. This project discusses the advantages of using android technology and Arduino for patient health monitoring system. In this technology the data is collected from a patient, to feed the same to two separate interfaces in which the patient parameters and details is displayed and sync the important information to a web based server. This can in turn be accessed by the doctor using an application installed in his android phone. He can analyse and send feedback in order to take preventive measures before he reaches the hospital in serious case. One message is also sent to their respective family members through their smartphone application. 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.

II. LITERATURE SURVEY

In the olden days the patients' health was monitored by catching his /her hand by checking their pulses. As, the time passed on and the technology for monitoring health got introduced, the quality of measuring and understanding the health conditions got better. The development in the technology grew to such an extent that now a days by wearing a small device, patient's health is getting monitored. Number of different research projects explores wireless sensor networks for monitoring patient health 24 hours. Few projects are concerned with developing wearable wrist worn belt, while others have developed based for monitoring individual patients during daily activity, at home, or in hospital. Han and Yuo et.al proposed wireless sensor network based e-health system based on radio-active and radio-passive positioning [1].

1. 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, pulse oximetry, plethysmography 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. Data acquisition in the (w) ban plus the 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 design. In the both types of system, Bluetooth is used for transferring the data to an android based smartphone.

2. 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.

3. 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 and 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.

➤ Need for the System

The computerized system was needed because there are following drawback in present manual system:

1. Keeping a record of all user was a very tedious job.
2. Searching a particular shop was tedious because it involve searching all floors which required more time.
3. Records is done automatically in computerized system unlike manual system.
4. Due to computerization data storage and retrieval is done efficiently.
5. Human involvement reduced.

6. Make system user friendly.
7. Sensors make work easy.

III. PROPOSED WORK

As discussed or reviewed from the literature related to this field and previous section, it is observed that many problems have been faced by the Physician along with patients. To overcome these problems, a new approach is proposed, i.e. telemetry system. It is a computerized communication procedure in which data is composed at remote or inaccessible point and transmitted to receiving apparatus for monitoring.

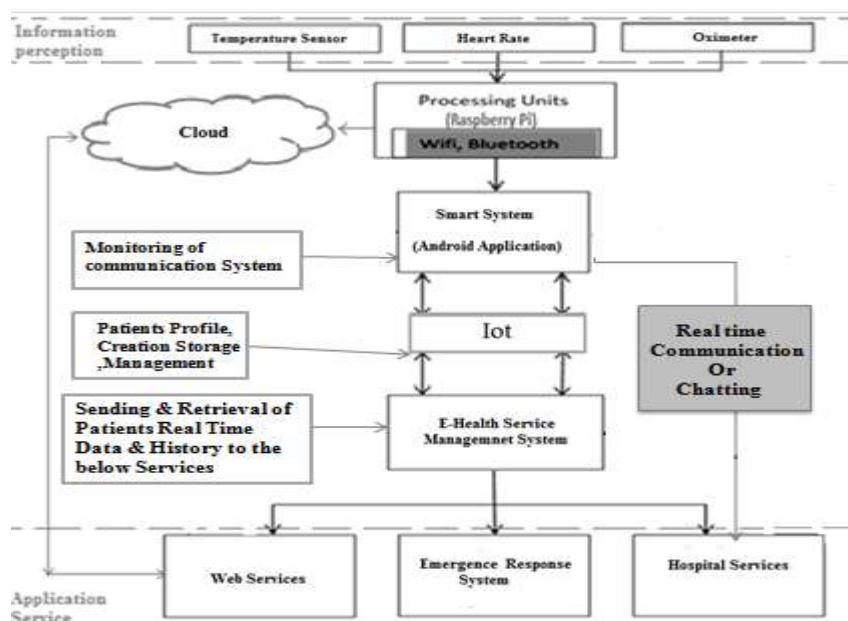


Fig. 1 System Architecture

1. Initially the patients temperature, Heartbeat data is sensed through the sensors which forwards the data to the micro-controller.
2. When the micro-controller receives the information about a patient, then it forwards the gathered data to the IoT Module.
3. Once the IoT module collects data from the controller, it then precedes the data to the server through telemetry system.
4. With the use of this system, data is stored on the server which can be used by the patient and the dedicated physician in future.

In this system all information of the patients has been stored on the server with the help of IoT (Internet of Things) device so that it can be accessed or available to each and every physician. This method is very useful for the patients and physicians, because it accumulates the time and money of the patients. So, both the physicians and patients can access the information easily regarding patient, anytime and anywhere.

IV. ADVANTAGES and APPLICATION

Advantages

1. The architecture of our system design is to monitor patient from anywhere privately of home as well as in hospital.
2. The system is useful while there is any emergency it provides medical help when required
3. 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.
4. It help basic regular checkups for rural areas, where medical facilities are not available.

Application

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

CONCLUSION

It is concluded that paper provides or proposed a new IoT based patient's health parameter recording system which can be accessible by the physicians of an organization. The system works by sensing the heartbeat rate, temperature of the patient and constantly saves the updated data to the server of the system. Thus the project discusses the benefits of Remote patient monitoring and overcomes most of the disadvantages of quality patient care. There is no need for doctors and care givers to be present there, they can interact with patient without their physical present.

FUTURE WORK

We enumerate the following points for future work:

Add yearly flexible view: Currently our system shows overview data for every month, which is also used as a navigation system. We would like to make this timeline exible with the use of a user initiated slider in the GUI. This would give the user freedom to view data either for a week, month, a couple of months or for the whole year. This feature will completely eliminate the need for separate monthly links on the side panel, making the website look cleaner.

Quantify stress for conclusions: The one thing we still could not attain was quantifying and concluding the stress graph. Through di_erent papers we have read that the domain experts go through the stress data and quantify objectively. There isn't a proper algorithm to quantify whether there is more or less stress according to the heart rate. For the future, we want to do some more research and try to analyse the calculated stress for conclusions.

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