Implementation of Health Care Unit using Web Server through IoT

G. Rajkumar*, A. Shalini**, A. Sujatha***, G. Vinothini**** & E. Yuvarani*****

*Assistant Professor, Department of Electronics and Communication Engineering, S.K.P Engineering College, Tamil Nadu, INDIA. E-Mail: rajkumarsac{at}gmail{dot}com
**UG Scholar, S.K.P Engineering College, Thiruvannamalai, Tamil Nadu, INDIA. E-Mail: shalusweety1295{at}gmail{dot}com
***UG Scholar, S.K.P Engineering College, Thiruvannamalai, Tamil Nadu, INDIA. E-Mail: sujasuji{at}gmail{dot}com
****UG Scholar, S.K.P Engineering College, Thiruvannamalai, Tamil Nadu, INDIA. E-Mail: vinoganasekaran{at}gmail{dot}com
*****UG Scholar, S.K.P Engineering College, Thiruvannamalai, Tamil Nadu, INDIA. E-Mail: eyuvarani26{at}gmail{dot}com

***Abstract*—**In emerging field of development Internet of Things (IoT), makes all the objects interconnected and it has been recognized as the next revolution. We use Health care patient monitoring. In a hospital health care monitoring system it is necessary to constantly monitor the patient's physiological parameters. For example a pregnant woman parameters such as blood pressure (BP) and heart rate of the woman and heart rate and movements of fetal to control their health condition stem, a coordinator node has attached on patient body to collect all the signals from the wireless sensors and sends them to the base station. In this paper presents a monitoring system that has the capability to monitor physiological parameters from multiple patient bodies. In the proposed sensors on patient's body form a Wireless Body Sensor Network (WBSN) and they are able to sense the heart rate, temperature rate, respiration rate and EEG. This system can detect the abnormal conditions, issue an alarm to the patient and send a SMS/E-mail to the physician.

***Keywords*—**Database; Health Care; Internet of Things; Monitoring System; Patient Monitoring.

***Abbreviations*—**Blood Pressure (BP); Internet of Things (IoT); Keep In Touch (KIT); Universal Asynchronous Receiver Transmitter (UART); Wireless Body Sensor Network (WBSN).

I. INTRODUCTION

IN recent years, growth of internet is tremendous and has been further extended to connecting things through internet. All devices are connected to one another with various smart technologies to create worldwide ubiquitous network called Internet of Things (IoT).The key enabling factor of IoT is medical and health care. IoT devices are used to collect monitor, evaluate, and notify the patient with information. The monitoring of a patient by the doctor is still a challenging task. To analyse the health condition of the patient, various medical parameters are needed about patient. Collecting the parameters and communicating them to doctor through IoT. We measure the patient physiological parameters are Heart beat, Temperature, EEG and Respiratory sensor. These parameters are measured if any abnormal conditions are noticed alarm is indicated to the patient relatives through the SMS/E-MAIL. The patient reports are generated daily basics and it is stored in IoT page itself it is useful when doctor is not nearby patient. Doctor is monitoring a patient continuously through the IoT patient monitoring.

II. LITERATURE SURVEY

2.1. Author: Chaitali Kulkarni et al., [1]

In this paper on "Health companion device using IoT and wearable computing"[Chaitali Kulkarni et al., 1], 2016 Our approach is to develop a wearable device that will monitor the temperature and pulse rate of the person on a regular basis and enable early detection of deterioration. If the person's temperature or pulse rate crosses the critical level, the device will alert the person's relatives his/her deteriorating condition with the person's current location. It also includes generation of a daily analysis report helping the doctors to get a better understanding of the person's Condition and thus helps in better diagnosis. It continuously uploads data on cloud with helps doctor to create monthly report of particular person.

2.2. Author: Tae-Yoon Kim & Sungkwan Yown [2]

In this paper on, "Multihop WBAN construction for Healthcare IoT systems", [Tae-Yoon Kim & Sungkwan Yown, 2], 2015. It is expected that the Internet of things (IoT) applications for medical services can be one of the most remarkable solution for taking aging population which is in the rapid growth. IoT consists of communication and sensor accomplish purpose. In the diverse kinds of networks,

wireless body area network (WBAN) is a highly suitable communication tool for the medical IoT devices. There are many researches about WBAN and sensor networks, which are mainly focused on energy efficiency.

A multi-hop WBAN construction scheme that consists four operations, the clustered topology setup, mobility support a transmission efficiency enhancement. As an auxiliary benefit, the proposed scheme achieves an energy efficient features the reducing the number of total control messages.

2.3. AUTHOR: Dohr et al., [3]

In this paper "Doher et al., [3] monitors blood pressure level using Keep In Touch (KIT) and closed loop health services. In KIT method, KIT is connected to the java based mobile phone.It getting patient information through the data is send to mobile phone in closed loop services, the data is getting from mobile phone.

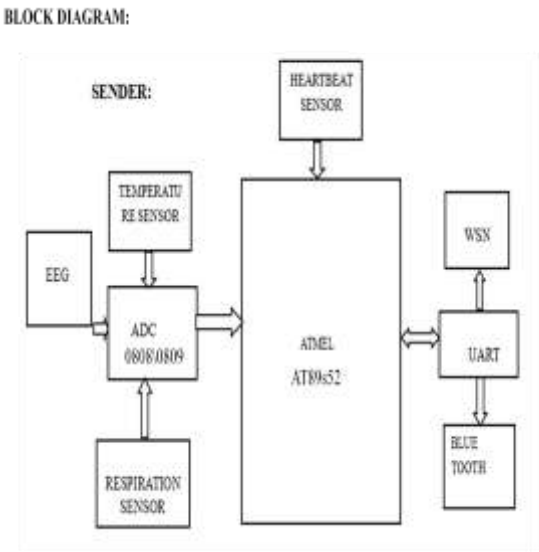
2.4. Author: Eui Jik Kim et al., [7]

In this paper, "Transmission Frame Assignment for Latency bounded Data Delivery in WSNs", design and performance evaluation of a latency bounded and energy efficient MAC scheme for wireless sensor networks that require time critical communication LB MAC provides the predictability for an end to end sink data delivery time through the TDMA multi channel transmission frame assignment considering the routing path of the tree network

III. HARDWARE REQUIREMENTS AND EXPLANATION

3.1. Block Diagram

The block diagram is as shown below



RECEIVER:

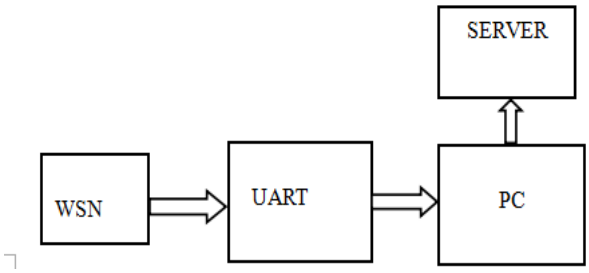


Figure 1: Block Diagram

3.2. Working

3.2.1. ATMEL

It is family of the Microcontroller by atmel, with low power, high- performance Cmos 8-bit Microcontroller with 8k bytes of system programmed flash memory Its main part of kit, Input power supply 230v is given and delivered to the kit. It's processing the input and delivered output to the UART. Step down transformer is used to convert 230v to 12v [Junaid Mohammed et al., 4].

3.2.2. ADC

ADC 0809 is 8 channel A/D inputs with addressable Multiplexer with easy interface to all microprocessors Operates ratio metrically or with 5vdc Output meets TTL requirements on chip clock generator 0v to 5v analog input voltage range with single 5v supply and NO-Zero or full scale adjust required.

3.2.3. UART

Universal Asynchronous Receiver Transmitter (UART) is the microchip with programming that controls a computer's interface to its attached serial devices. Specifically, it provides the computer with the RS-32C Data Terminal Equipment (DTE) interface so that it can "talk" to and exchange data with modems and other serial devices. UART is used to communicate between the two devices that is operation parameters and pc [Hasmah Mansor et al., 5].

3.2.4. WSN

Wireless Sensor Networks (WSN) sometimes called Wireless Sensor and Actuator Networks (WSAN) are spatially Distributed autonomous sensors to monitor physical or environmental conditions such as temperature, sound, etc., WSN is now one of the key enablers for the internet of things where WSBs will play an important role in future internet by collecting surrounding context and environment information WSN receive input processed data it send it to the receiver side WSN.

3.2.5. Parameters

Parameters of patient body we measure is like EEG, Heartbeat, Respiratory and Temperature sensor. All these parameters are Analog signal but Heartbeat is digital signal

its directly connected to Analog signal are converted into digital signal using bridge rectifier it convert input supply 230v to 5v supply Parameters are measured with correct accuracy and results are shown in the Pc or Web Server [Istepanian et al., 6].

3.2.6. Bluetooth

Bluetooth is used to connect our mobile phone to see the patient status and monitoring in emergency condition Patients details are stored in database Visual Basic Software (VBS), in this we can see the output values of patients parameters in pc or chrome In receiver side WSN are used to connect the devices and receive the information from the UART and send it to the pc connected in receiver side. Link from VBS we can copy and paste in web server and see the patient status without visits of doctors.

IV. ADVANTAGES

- The patient health is monitored from any part of the world by using IOT (internet of things).
- Low cost and reliable.
- Manpower is reduced.
- The main advantage of this system in comparison to previous system is to reduce the energy consumption to prolong the network lifetime and extend the communication coverage to increase the freedom for enhance patient quality of life.

V. CONCLUSION

In our concept, we reviewed the current status and projected future directions for Internet of Things (IoT) Technologies into the clinical practice of medicine. Sensors, particularly those equipped with IoT intelligence, offer attractive ways for enabling observation and recording of data in home and work environments, over much longer durations than are currently done at lab visits. We measured ECG, Heartbeat, Temperature and Respiration parameters. All the values are shown in system and web server. Patient details are stored in database it can be useful in an emergency situation We conclude that patients are monitored through the web server without doctor visits regularly and emergency situation is avoided in Internet of Things.

REFERENCES

[1] Chaitali Kulkarni, Himami Kardhade, Sonali Gupta & Prashant Bhende (2016), "Health Companion Device using IOT Wearable Computing", *International Conference on Internet of Things and Applications (IOTA)*, Pp. 152–156.

[2] Tae-yoon Kim & Sungkwan Youm (2015), "Multi Hop WBAN Construction for Healthcare IoT System", *International Conference on Platform Technology and Services*, Pp. 27–28.

[3] R. Dohr, Modre-Osprian, M. Drobics, D. Hayn & G. Schreier (2010), "The Internet of Things for Ambient Assisted Living", *Seventh International Conference on Information Technology*, Pp. 804–809.

[4] Junaid Mohammed, Abhinav Thakral, Adrian Filip Ocneanu, Colin Jones, Chung-Horng Lung & Andy Adler (2014), "Internet of Things: Remote Patient Monitoring using Web Services and Cloud Computing", *IEEE International Conference on Internet of Things (iThings 2014), Green Computing and Communications (GreenCom2014), and Cyber-Physical*, Pp. 256–263.

[5] Hasmah Mansor, Muhammad Helmy Abdul Shukor, Siti Sarah Meskam, Nur Quraisyia Aqilah Mohd Rusli & Nasiha Sakinah Zamery (2013), "Body Temperature Measurement for Remote Health Monitoring System", *IEEE International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA)*, Pp. 1–5.

[6] R.S.H. Istepanian, S. Hu, N.Y. Philip & A. Sungoor (2011)," The Potential of Internet of m-health Things "m-IoT" for Non-Invasive Glucose level Sensing", *Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Pp. 5264–5266.

[7] Eui-Jik Kim, Jung-Hyok Kwon, Chul-Hee Kang & Sang-Hong Lee (2013), "Transmission Frame Assignment for Latency-Bounded Data Delivery in WSNs", *The International Conference on Information Networking 2013 (ICOIN)*, Pp. 428–433.