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Advanced patient monitoring system using integrated pulse oximeter and wireless temperature sensor

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ABSTRACT

This projects presents an IOT-based system that is a real-time health monitoring system utilizing the measured values of body temperature, and oxygen saturation of the patients, which are the most important measurements required for critical care. This system has a liquid crystal display (LCD) that shows the measured temperature, pulse rate, and oxygen saturation level and can be easily synchronized with a mobile application for instant access. The results obtained from the system were promising: the data acquired from the system are stored very quickly. The results obtained from the system were found to be accurate when compared to other commercially available devices.

Keywords: ECG, Energy consumption, Endto-end delay, Hospital healthcare, wireless sensor network, wireless body area network.

INTRODUCTION

At present day to make human existence more agreeable Wireless Sensor Network (WSN) are utilized to comprehend the basic states of human body. It is littlest unit which have remarkable highlights. The remote sensor upholds unwavering quality, versatility and so forth The body sensor network assists with peopling giving medical care administrations like clinical information access, clinical observing and correspondence with doctor in crisis circumstances through IOT or GPRS. It additionally gives completely far off strategy to gain and recognize and screen the physiological signs with no break in persistent's ordinary life. The remote sensor network improves life quality. The current observing framework sensor is set close to the screens or PC, which have constraint of patient's bed. In any case, in present day framework we utilized remote organization and remote gadgets which eliminates the limit of patient's bed. To make human existence more agreeable Wireless sensor organizations (WSNs) are an arising innovation in existing research and can possibly change the method of human existence (i.e., make life more agreeable). A remote sensor is the littlest unit of an organization that has interesting highlights, for example, it upholds enormous scope sending, versatility, dependability; and so forth Body sensor network frameworks can help individuals by giving medical services administrations like clinical observing, memory upgrade, clinical information access, and correspondence with the medical services supplier in crisis circumstances through the IOT or GPRS [1]. Likewise, these frameworks give helpful strategies to distantly obtain and screen the physiological signs without the need of interference of the patient's ordinary life, consequently improving life quality. The present frameworks need the sensors to be set bedside screens or PCs, and cutoff the patient to his bed. However, presently, there is no connection between the sensors and the bedside hardware because of the remote gadgets and remote organizations. The cutting edge medical services observing framework not requires the limit to the patient's to his bed. The patient can move around however in a restricted region from the control room or screen in the advanced framework. In this framework we additionally use foundation situated remote organizations, for example, 3G organization or business cell or remote LAN. Be that as it may, for this situation crisis sign may not

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communicated from patient to doctor on the grounds that the inclusion of foundation arranged remote organization changes with area and time.

LITERATURE SURVEY

There is Healthcare Monitoring framework utilizing WSN with Zigbee. In any case, fundamental disadvantage of this framework is that we can screen the patients for 100 meter distance as it were. The There is Healthcare Monitoring framework utilizing WSN with GSM we can screen the patients anyplace across the world. During the mid 1980s, simple cell phone framework was encountering fast development in Europe, especially in Scandinavia and United Kingdom, yet additionally in France and Germany. Every nation built up its own framework, which was contradictory with every other person's in gear and activity.

This was bothersome, on the grounds that not exclusively was the versatile hardware restricted to activity inside public limits, which in a bound together Europe were progressively insignificant, however there was likewise an exceptionally restricted market for each kind of gear, so economies of scale and the ensuing reserve funds couldn't be figured it out. The Europeans understood this from the get-go, and in 1982 the gathering of European posts and transmits shaped an investigation bunch called the gathering unique versatile (GSM) to examine and build up a container European public land portable framework. The proposed framework needed to meet certain models. Great abstract discourse quality.

Low terminal and administration cost. Supports for worldwide wandering. Backing for scope of new administrations and offices. Phantom productivity and ISDN similarity. In 1989, GSM duty was moved to the European Telecommunication Standards Institute (ETSI), and stage I of the GSM details were distributed in 1990. Business administration was begun in mid-1991, and by 1993 there were a day and a half organizations in 22 nations, with 25 extra nations having effectively chosen or thinking about GSM.

Albeit normalized in Europe, GSM isn't just an European norm. GSM networks are operational or arranged in very nearly 60 nations in Europe, the Middle East, the Far East, Africa, South America, and Australia. In the start of 1994, there were 1.3 million supporters around the world. By the start of 1995, there were more than 5 million supporters. The abbreviation GSM presently appropriately represents Global System for Mobile correspondences. The designers of GSM picked a problematic (at that point) computerized framework, instead of the then-standard simple cell frameworks like AMPS in the United States and TACS in the United Kingdom.

They had confidence that progressions in pressure calculations and computerized signal processors would permit the satisfaction of the first standards and the nonstop improvement of the framework as far as quality and cost. The almost 6000 pages of GSM proposals attempt to permit edibility and cutthroat development among providers, however give sufficient normalization to ensure the appropriate interworking between the segments of the framework. This is finished by giving useful and interface depictions to every one of the useful substances characterized in the framework.

EXISTING WORK

Care of fundamentally sick patient, requires unconstrained and exact choices so life-securing and lifesaving treatment can be appropriately applied. Insights uncover that consistently a human is losing his/her life across the globe. All the more close in India, ordinary numerous lives are influenced by cardiovascular failures and all the more significantly on the grounds that the patients didn't get ideal and legitimate assistance .This paper depends on checking of patients. We have planned and built up a dependable, energy effective patient observing framework. It can send boundaries of patient progressively. It empowers the specialists to screen patient's wellbeing boundaries (temp, heartbeat, ECG, position) progressively. Here the boundaries of patient are estimated constantly (temp, heartbeat, ECG) and remotely communicated utilizing Zigbee. This undertaking gives an answer for upgrading the unwavering quality and adaptability by improving the presentation and forces the executives of the patient checking framework. In the framework the patient wellbeing is persistently observed and the procured information is broke down at a unified ARM microcontroller.

In the event that a specific patient's wellbeing boundary falls beneath the limit esteem, a mechanized SMS is shipped off the pre-arranged Doctor's versatile number utilizing a standard GSM module interfaced to the ARM microcontroller. Here, we are utilizing Zigbee for remote transmission. The Doctor can get are string of a specific patient's data simply by getting to the data set of the patient on his PC which is ceaselessly refreshed through Zigbee beneficiary module.

PROPOSED SYSTEM

The center goal of this venture is the plan and execution of a keen patient wellbeing global positioning framework. Shows the outline of the proposed framework. The pulse oximetric sensors are

inserted on the patient body to detect the temperature and heartbeat of the patient. Two additional sensors are place at home to detect the moistness and the wireless temperature of the patient where the patient is remaining. These sensors are associated with a control unit, which figures the upsides of the multitude of four sensors. These determined qualities are then sent through an IoT cloud to the base station. From the base station the qualities are then gotten to by the specialist at some other area. In this manner dependent on the temperature and pulse oximeter, the specialist can choose the condition of the patient and proper measures can be taken.

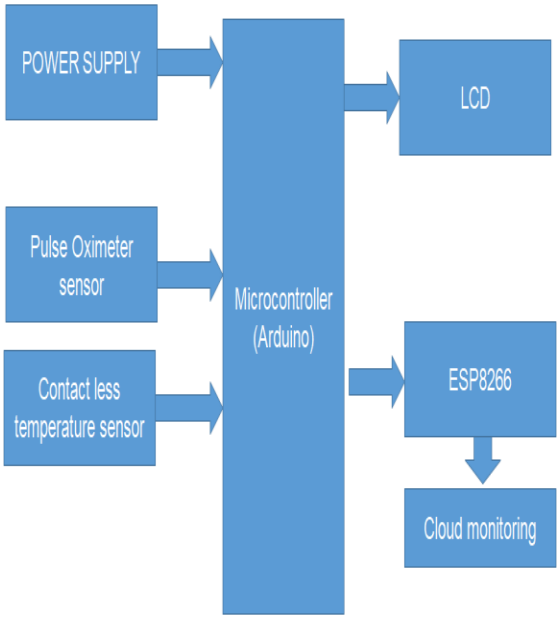

Fig 1:

DESIGN OF PATIENT BODY SENSOR NETWORK SYSTEM

In this system we are continuously monitoring the patient's different parameters such as wireless body temperature, Pulse oximeter and transmitting this data to the doctor's cabin continuously as well as displaying data at transmitter side so that patient also observed the relevant outputs and then at the receiver side or in doctors cabin the data is collected with Wi-Fi and microcontroller and displayed on relevant displays. The device can be used outdoors. The Atmega8 is a 16-bit microcontroller that has a number of special features not commonly available with other microcontrollers: - Complete system on-a-chip — includes LCD control, ADC, I/O ports, ROM, RAM, basic timer, watchdog timer, UART, etc.

HARDWARE

- Power supply unit
- Microcontroller ATMEGA8
- LCD display – 16x2
- Temperature Sensor
- Pulse sensor
- Wi-Fi ESP8266

SOFTWARE REQUIREMENTS

- Platform - AVR STUDIO
- In System Programmer - ProgISP 172
- Compiler – Win AVR

RESULTS

The above outputs describes about the different specified conditions:-
When the sensors are not connected they blynk software throws an output saying "kindly connect"
Blynk software displays the temperature; heartbeat in the form of beats per minutes (BPM) .if the temperature over 40 degree celcious, then blynk will show the notification of "fever".

Fig 2

CONCLUSION

This paper has presented an IoT-based health monitoring approach. Collected health parameters are sent, via a iot, to a data analysis module. The results are displayed via Web dashboards. The communication links of iot are low-cost, low-power and secure, thanks to the use of the transmission protocol. There are several areas for future research. First, we plan to implement the analysis module of IOT using machine learning techniques to enable a smart diagnosis of a patient's situation. Second, we want to develop an alert system to notify health professionals if critical situations have been detected.

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REFERENCES

1. Mathers CD, Loncar D. Updated projections of global mortality and burden of disease, 2002-2030: data sources, methods and results. world Health Organization (World Health Organization); October 2005.
2. You L, Liu C, Tong S. Community medical network (CMN): architecture and implementation. In: Global Mobile Congress (GMC), Oct 2011; 2011. p. 1-6.

3. Yang G, Xie L, Mantysalo M, Zhou X, Pang Z, Xu LD, Kao-Walter S, Chen Q, Zheng L. A health-iot platform based on the integration of intelligent packaging, unobtrusive bio-sensor, and intelligent medicine box. IEEE Trans Ind Inform. 2014 [online];10(4):2180-91. doi: 10.1109/TII.2014.2307795.
4. Rasid MFA, Musa WMW, Kadir NAA, Noor AM, Touati F, Mehmood W, Khriji L, Al-Busaidi A, Mnaouer AB. Embedded gateway services for internet of things applications in ubiquitous healthcare. In: 2nd international Conference on Information and Communication Technology (ICoICT); 2014. p. 145-8.
5. Ahmed MU, Bjorkman M, Causevic A, Fotouhi H, Lind M. en, ”“An overview on the internet of things for health monitoring systems,”. In: 2nd EAI International Conference on IoT Technologies for HealthCare; October 2015. p. 1-7.
6. Istepanian RSH, Hu S, Philip NY, Sungoor A. ’The potential of internet of m-health things “m-iot’ for non-invasive glucose level sensing. Annu Int Conf IEEE Eng Med Biol Soc Annual international conference of the IEEE Engineering in Medicine and Biology Society. 2011;2011:5264-6. doi: 10.1109/IEMBS.2011.6091302, PMID 22255525.
7. Takpor TO, Atayero AA. Integrating internet of things and eHealth solutions for students healthcare. In: Proceedings of the world congress on engineering 2015 Vol I WCE 2015; July 2015. p. 256-68.
8. Jara AJ, Zamora-Izquierdo MA, Gmez-Skarmeta AF. Interconnection framework for mHealth and remote monitoring based on the internet of things. IEEE J Sel Areas Commun. 2013;31(9), no:47-65. doi: 10.1109/JSAC.2013.SUP.0513005.
9. Riazul Islam SM, Daehan Kwak, Humaun Kabir M, Hossain M, Kyung-Sup Kwak. The internet of things for health care: A comprehensive survey. IEEE Access. 2015;3:678-708. doi: 10.1109/ACCESS.2015.2437951.
10. Yang L, Ge Y, Li W, Rao W, Shen W. A home mobile healthcare system for wheelchair users. In: 18th international Conference on Computer Supported Cooperative Work in Design (CSCWD). IEEE Publications; May 2014. p. 609-14.
11. Zawoad S, Hasan R. The enemy within: the emerging threats to healthcare from malicious mobile devices. Clin Orthop Relat Res, vol [abs]/1210.2149. 2012:1-9.