



IOT BASED PATIENT HEALTH MONITORING SYSTEM

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ABSTRACT

Healthcare is given the extreme importance now a-days by each country with the advent of the novel corona virus. So in this aspect, an IOT based health monitoring system is the best solution for such an epidemic. Internet of Things (IoT) is the new revolution of internet which is growing research area especially in health care. With the increase in use of wearable sensors and smartphones, these remote health care monitoring has evolved in such a pace. IoT monitoring of health helps in preventing the spread of disease as well as to get a proper diagnosis of the state of health, even if the doctor is at far distance. In this paper, a portable physiological checking framework is displayed, which can constantly screen the patient's heartbeat, temperature and other basic parameters of the room. We proposed a nonstop checking and control instrument to screen the patient condition and store the patient information's in server using Wi-Fi Module based remote correspondence. A remote health monitoring system using IoT is proposed where the authorized personal can access these data stored using any IoT platform and based on these values received, the diseases are diagnosed by the doctors from a distance.

KEYWORDS :- Internet of Things, Health, Sensors.

1. INTRODUCTION

Health is always a major concern in every growth the human race is advancing in terms of technology. Like the recent corona virus attack that has ruined the economy of China to an extent is an example how health care has become of major importance. In such areas where the epidemic is spread, it is always a better idea to monitor these patients using remote health monitoring technology. So Internet of Things (IoT) based health monitoring system is the current solution for it. Remote Patient Monitoring arrangement empowers observation of patients outside of customary clinical settings (e.g. at home), which expands access to human services offices at bring down expenses. The core objective of this project is the design and implementation of a smart patient health tracking system that uses Sensors to track patient health and uses internet to inform their loved ones in case of any issues.

The objective of developing monitoring systems is to reduce health care costs by reducing physician office visits, hospitalizations, and diagnostic testing procedure. Each of our bodies utilizes temperature and also pulse acknowledging to peruse understanding wellbeing. The sensors are linked to a microcontroller to track the status which is thus interfaced to a LCD screen and additionally remote association with have the capacity to exchange alarms. If framework finds any sudden changes in understanding heart beat or body temperature, the framework consequently alarms the client about the patients status over IOT and furthermore indicates subtle elements of pulse and temperature of patient live in the web. In this manner IOT set up tolerant wellbeing following framework viably utilizes web to screen quiet wellbeing measurements and spare persists time. There is a significant capability between SMS based patient flourishing viewing and IOT based patient

checking framework. In IOT based framework, subtle parts of the patient flourishing can be seen by different clients. The explanation behind this is the information should be checked by passing by a site or URL. While, in GSM based patient.

2. Hardware requirements

- LCD Display
- Heartbeat Sensor
- Temperature Sensor
- Wi-Fi Module
- Push Buttons
- LED
- PCB's
- Aurdino UNO

Block diagram:

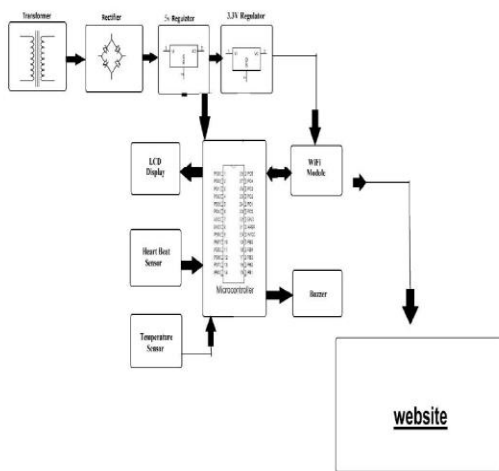


Fig 2 block digram

LCD Display:-

A Liquid crystal display (LCD) is a thin, flat panel used for electronically displaying information such as text, images, and moving pictures. It is an electronically-modulated optical device made up of any number of pixels filled with liquid crystals

and arrayed in front of light source (back light) or reflector to produce images in color or monochrome.

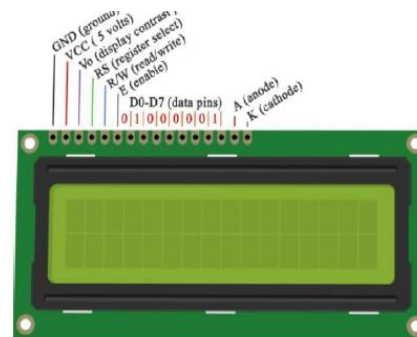


Fig 2: LCD Display

LCD's are used in a wide range of applications, including LCD televisions, computer monitors, instrument panels, aircraft cockpit displays, and indoor and outdoor signage. Small LCD screens are common in LCD projectors and portable consumer devices such as digital cameras, watches, digital clocks, including smartphones. LCD screens do not use phosphors, they rarely suffer image burn-in when a static image is displayed on a screen for a long time, e.g. the table frame for an airline flight schedule on an indoor sign. The LCD screen is more energy-efficient and can be disposed of more safely than a CRT scan.

Heartbeat Sensor:-

Heartbeat Sensor is an electronic device that is used to measure the heart rate i.e. speed of the heartbeat. Monitoring body temperature, heart rate and blood pressure are basic things that we do in order to keep us healthy. Heartbeat Sensor is designed to give digital output of the heart beat when a finger is placed on it. When the heartbeat detector is working, the beat LED flashes in unison with each heartbeat. It works on the principal of light modulation by blood flow through finger at each pulse.

solve it in many different ways, but the earlier methods in several cases either SMS will be sent using GSM or RF module will be used to send patient's data from sender device to receiver device. Moreover, in the earlier cases the history of the patient cannot be displayed, only current data is displayed. So the purpose of this project is to maintain record of patient's data and to give emergency alert if required, using different technology which is Internet of Things (IOT); where it allows us to store patient's data on the cloud. Thus the history data of the patient will be available for doctors to access at any time from everywhere. By implementing this project we can monitor patients remotely and we can secure their lives by giving emergency alert in real-time.

APPLICATIONS

IOT allows medical devices to gather essential data and transfer it to doctors in real time. The reports provide perfect opinion on the patient's condition, irrespective of location or time. The connected devices and wearables will allow patients to connect with doctors from their homes.

ADVANTAGES

The major advantages of IOT in healthcare include:

- IOT enables patient monitoring in real time, thus significantly cutting down unnecessary visits to doctors, hospitals stays and readmissions.
- It enables physicians to make evidence-based informed decisions and brings absolute transparency.
- Continuous patient monitoring and real time data helps in diagnosing diseases at an early stage or even before the disease develops based on symptoms.

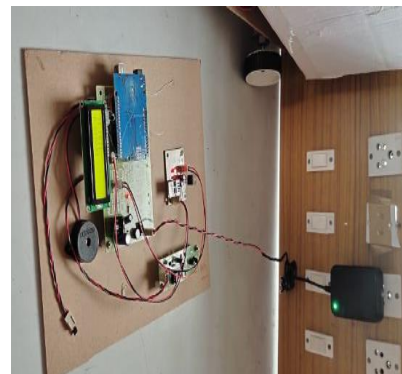
- Continuous health monitoring opens the doors for providing proactive medical treatment.
- Management of drugs and medical equipment is a major challenge in a healthcare industry. Through connected devices, these are managed and utilized efficiently with reduced costs.

DISADVANTAGES

Alternatively, some downsides that come along with the massive implementation of the IOT in healthcare includes:

- Privacy can be potentially undermined. As we've already mentioned, systems get hacked. Lots of attention will need to be focused on data security, which requires significant additional spendings.
- Unauthorized access to centralization. There is a chance that dishonest interlopers may access centralizes systems and realize some cruel intentions.
- Global healthcare regulations. International health administrations are already issuing guidelines that must be strictly followed by governmental medical establishments integrating the IOT in their workflow. These may restrict possible capacities to some extent.

4. Result:





The block diagram consisting of Transformer, Rectifier, 5v Regulator, LCD Display, Heart beat sensor, Temperature sensor, Wi-Fi module, Buzzer, Website. The patient's heartbeat and body temperature data is displayed on the LCD display device. The power supply 12v and regulator supply 5v is applied to the arduino microcontroller. The normal condition of the temperature is 31c and heartbeat is 75, on that normal time the buzzer is in OFF condition. The values of the temperature sensors and heartbeat sensors is stored in the database. The body temperature sensor, heartbeat sensor and room temperature values are calibrated using the microcontroller. By installing the MOBILE TELNET app in our smartphone and open with the IP address of 192.168.4.1 and connect the Wi-Fi. When the patient's heartbeat increases of above 75, automatically the buzzer is ON and it will give a message to our smartphone with the help of Bluetooth module. Then the medications can be prescribed and appropriate action can be suggested by the doctor even from a distance. So for all combinations of the input sensors, the output health state can be informed.

5. CONCLUSION

The Internet of Things is considered now as one of the feasible solutions for any remote value tracking especially in the field of health monitoring. It facilitates that the individual prosperity parameter data is secured inside the cloud, stays in the hospital care reduced for conventional routine examinations and most important that the health can be monitored and disease diagnosed by any doctor at any distance. In this paper, an IoT based health monitoring system was developed. The system monitored body temperature, pulse rate and room humidity and temperature using

sensors, which are also displayed on a LCD. These sensor values are then sent to a medical server using wireless communication. These data are then received in an authorized person's smart phone with IoT platform. With the values received the doctor then diagnose the disease and the state of health of the patient.

6. FUTURE SCOPE

In this paper, we found the importance and fruitful benefits of implementation of IOT in remote health monitoring systems. The compact sensors with IOT will make a huge impact on every patient's life, that even though they are away from home and physician, this helps them to reduce the fear of danger. The sensory data can be acquired in home or work environments. Also, the challenges in sensing, analytics and prediction of the disease are also highlighted and those can be addressed to provide a seamless integration into the medical field.

- Wi-Fi module is an external peripheral connected to arduino mega 2560. It is better if it is in built so, completely can be reduced.
- We use a IOT free account where by registering to particular website. It will be fine if it is possible to observe the ECG graph in IOT server.
- In this project we can observe only BP, in IOT server.

REFERENCES

1. S.H. Almotiri, M. A. Khan, and M. A. Alghamdi. **Mobile health (m- health) system in the context of iot. In 2016 IEEE 4th International Conference on Future Internet of Things and Cloud Workshops (FiCloudW), pages 39–42, Aug 2016.**
44
2. Gulraiz J. Joyia, Rao M. Liaqat, Aftab Farooq, and Saad Rehman, **Internet of Medical Things (IOMT): Applications,**



Benefits and Future Challenges in Healthcare Domain, Journal of Communications Vol. 12, No. 4, April 2017.

3. Shubham Banka, Isha Madan and S.S. Saranya, Smart Healthcare Monitoring using IoT. International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 15, pp. 11984-11989, 2018.

4. K. Perumal, M. Manohar, A Survey on Internet of Things: Case Studies, Applications, and Future Directions, In Internet of Things: Novel Advances and Envisioned Applications, Springer International Publishing, (2017) 281-297.

5. S.M. Riazulislam, Daehankwak, M.H.K.M.H., Kwak, K.S.: The Internet of Things for Health Care: A Comprehensive Survey. In: IEEE Access (2015).

6. P. Rizwan, K. Suresh. Design and development of low investment smart hospital using Internet of things through innovative approaches, Biomedical Research. 28(11) (2017).

7. K.R. Darshan and K.R. Anandakumar, "A comprehensive review on usage of internet of things (IoT) in healthcare system," in Proc. International Conference on Emerging Research in Electronics, Computer Science and Technology, 2015.

8. Internet of Things (IoT): Number of Connected Devices Worldwide From 2012 to 2020 (in billions). [Online]. Available: <https://www.statista.com/statistics/471264/iotnumberof-connected-devices-worldwide/>

9. P. Chavan, P. More, N. Thorat, S. Yewale, and P. Dhade, "ECG - Remote patient monitoring using cloud computing," Imperial Journal of

Interdisciplinary Research, vol. 2, no. 2, 2016.

10. Ruhani Ab. Rahman, NurShima Abdul Aziz, MurizahKassim, Mat IkramYusof, IoT-based Personal Health CareMonitoring Device for Diabetic Patients ,978-1-5090-4752- 9/17/2017 IEEE.

11. Valsalan P, Surendran P, Implementation of an Emergency Indicating Line Follower and Obstacle Avoiding Robot, 16th International Multi-Conference on Systems, Signals and Devices, SSD 2019.

12. Valsalan P, Shibi O, CMOS-DRPTL Adder Topologies, Proceedings of the 2018 International Conference on Current Trends towards Converging Technologies, ICCTCT 2018.

13. Valsalan P, Manimegalai P, Intend of power-delay optimized Kogge-Stone based Carry Select Adder, ARPN Journal of Engineering and Applied Sciences, 2018.

14. Valsalan P, Surendran P, Iot based breath sensor for mycobacterium tuberculosis, Journal of Advanced Research in Dynamical and Control Systems, 2018.

15. Firas Hasan Bazzari. "Available Pharmacological Options and Symptomatic Treatments of Multiple Sclerosis." Systema Reviews in Pharmacy 9.1 (2018), 17- 21. Print. doi:10.5530/srp.2018.1.4 .