iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** III **Month of publication:** March 2024

DOI: https://doi.org/10.22214/ijraset.2024.59016

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue III Mar 2024- Available at www.ijraset.com

A Review on Real Time Patient Health Monitoring System Using Cloud Technology

Vijay V. Chakole[1], Anshul Ganorkar[2], Nutan Amru[3], Khusbu Bihone[4], Ankit Dhote[5]
[1, 2, 3, 4, 5]*Department of Electronics & Telecommunication Engineering KDK college of Engineering, Nandanvan Nagpur, Maharashtra, 440009*

Abstract: ***The rising demand for advanced healthcare solutions has driven the development of innovative technologies aimed at improving patient care. This project introduces a Real-Time Patient Health Monitoring System, which utilizes cloud technology to its full potential. By incorporating cloud infrastructure, data science, and real-time analytics, the system offers continuous monitoring and analysis of crucial health metrics such as SpO2, temperature, and pulse rate. Designed with wearability in mind, the system's architecture ensures uninterrupted monitoring and instant feedback for both patients and healthcare professionals. Cloud technology enables seamless data storage, retrieval, and real-time analysis, thereby providing comprehensive insights into a patient's health status. The project's scalability guarantees its suitability for various healthcare environments, rendering it a versatile tool for hospitals, clinics, and remote healthcare scenarios.***
Keywords: IoT, Smart Monitoring, Health, Remote, Communication etc.

I. INTRODUCTION

In the ever-changing realm of healthcare, technology plays a pivotal role in reshaping the approach to patient care. Leading this transformative charge is the Real-Time Patient Health Monitoring System, a pioneering initiative poised to revolutionize healthcare delivery principles. This system focuses on continuously monitoring vital health indicators such as blood oxygen saturation (SpO2), body temperature, and pulse rate. Its distinguishing feature lies in seamlessly integrating state-of-the-art technologies like cloud technology, data science, and machine learning to offer proactive and tailored healthcare solutions for each patient.

The emergence of the Real-Time Patient Health Monitoring System represents the culmination of advanced technologies converging strategically to enable timely and personalized healthcare interventions. Through the strategic integration of wearable tech and cloud-based analytics, the system aims to establish a sophisticated healthcare ecosystem beyond traditional diagnostic and treatment methods. It seeks to create an interconnected network capable of not only monitoring but also proactively addressing individual patients' distinct health needs.

This project signifies more than just a technological advancement; it embodies a fundamental shift in the philosophy of patient care. By leveraging modern technologies to their fullest extent, the Real-Time Patient Health Monitoring System aims to enhance patient engagement, improve healthcare outcomes, and optimize the broader healthcare system's efficiency. As we delve deeper into subsequent chapters, we'll explore how this system aligns with evolving healthcare demands and the transformative impact it promises to deliver.

The Real-Time Patient Health Monitoring System, with its innovative approach and integration of advanced technologies, represents a significant stride toward a future where personalized, real-time monitoring becomes central to patient-centric care. It serves as a beacon of progress in healthcare, ushering in an era where technology is utilized not only for diagnosis and treatment but also for proactive health preservation and enhancement. Subsequent chapters will delve into the intricate workings of this system, shedding light on its potential to improve patient outcomes and reshape the broader healthcare landscape.

II. LITERATURE SURVEY

[1] According to the authors' review, this is a flexible and measurable health indicator for patients using 6LoWPAN technology. The main benefits lie in the integration of different technologies and communication solutions. The consequences of the Internet of Things represent collaboration in many areas such as communications, media and electronics.

[2] According to the author's research, it is a mobile phone-based healthcare system with self-assessment capability, sharing together in the Internet of Things - the new paradigm uses intelligent These objects not only collect information from their environment and interact with the physical world, they also interact with each other through collaboration to exchange data and information between them.

©IJRASET: All Rights are Reserved

[3] As the authors do Research on managing information and connections in networks Another big sensor: Integrates into medical decision-making processes, data processing, wireless communications and the development of technology based on data mining. These advances are critical to the development of personalized medicine, and new areas are being explored in this field.

[4] A study of healthcare applications reviewed by the author introduces the Internet of Things (IoT) as a solution to provide knowledge documentation for the multi-agent use of Radio Frequency Identification (RFID). and IoT technologies. Good understanding. The aim is to increase access to quality healthcare and improve the quality of healthcare.

Architectural Concepts and Future Directions. The system uses international technology available in the world and is especially suitable for large areas. Communication between two terminals is initiated using a smartphone, and the first interaction occurs during synchronization useful for creating a heart rate monitor for change.

[8] According to the authors, the use of simple microwave techniques to monitor the activity of the heart depends on changes in the envelope of amplitude-modulated waves as they pass through the body. This approach introduces the use of wireless microsensor networks in medical monitoring and environmental awareness.

[9] According to the study's authors, they created a Wi-Fi sensor network designed to monitor patients for chronic diseases. Their homes are monitored remotely. While existing wireless sensor technology allows one to check blood pressure, pulse and temperature, this project integrates all parameters in a single system. Additionally, all sensors can be attached to the patient and the completed data is sent to the internet via the Internet of Things (IoT).

[10] According to the author, the LSTM network is very effective in detecting diseases and predicting possible events even with limited data. The goal is personalized treatment with interventions based on patient information and real-time monitoring information. Secure communication protocols such as MQTT can ensure the integrity and confidentiality of data during transfer between the device and the cloud platform. Promote user-friendly interfaces that enable patients to participate in healthcare and decision-making processes. It is also important to be able to provide immediate feedback between doctors and patients with data obtained from continuous monitoring.

[11] The authors highlight the potential of integrating AI-powered virtual assistants into systems to provide rapid education and health education. Cloud-based big data analytics technology can be used to identify general patterns and trends in patient populations to inform public health assessments and management strategies.

Collaboration issues can be resolved through standard information systems and open communication protocols, thus promoting collaboration and information sharing between hospitals. Blockchain technology offers the promise of secure and transparent data management, increasing patient trust and managing health information. Advocacy for continuous monitoring of evolving business models and best practices for cloud-based healthcare.

III. PROBLEM IDENTIFICATION

Health stands as a cornerstone of human well-being, yet global health challenges persist due to various factors such as inadequate healthcare services and significant disparities between rural and urban regions. The shortage of medical professionals exacerbates the situation, particularly during critical times.

The healthcare sector has swiftly embraced the Internet of Things (IoT), recognizing its potential to enhance service quality and effectiveness, particularly benefiting the elderly, individuals with chronic illnesses, and those in need of constant monitoring. Despite this, access to medical facilities remains a challenge in many parts of the world, exacerbated by the COVID-19 pandemic, preventing routine health check-ups for blood pressure and body temperature.

Lengthy processes and a shortage of healthcare professionals further hinder access to care. This project aims to address these issues by reducing time consumption.

In recent years, IoT applications in healthcare have surged, with smart patient health monitoring systems being touted for their potential to streamline processes, reduce costs, and improve efficiency. With such systems, individuals can conveniently monitor their health parameters and receive real-time reports, enabling early disease detection. Parameters such as body temperature, heart rate, and blood pressure play crucial roles in diagnosing illnesses, and this project provides data on temperature, pulse rate, and oxygen levels, facilitating proactive healthcare management.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

IV. PROPOSED SYSTEM

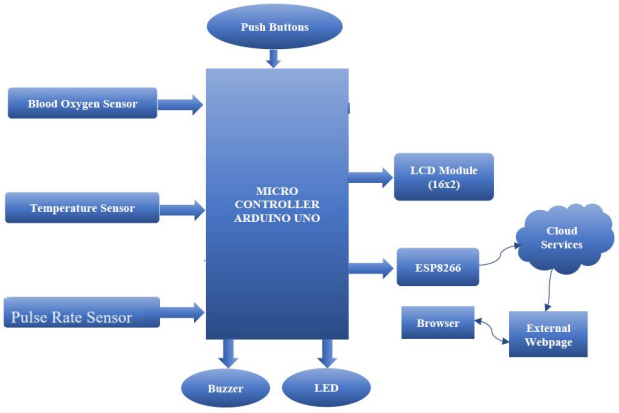


Fig. 1. Block Diagram of system

The project envisages IoT as an intelligent heterogeneous network capable of communicating and sharing data over the Internet. In traditional healthcare models prevalent in developing countries, patients are required to visit a medical practitioner or doctor daily, a method viewed as disadvantageous by both patients and medical staff. To address this, the project aims to develop an IoT-based health monitoring system equipped with specific sensors capable of monitoring various health parameters in real-time. These sensors are attached to the patient's body, and the collected health data is displayed on an LCD module.

Patient health data is securely transferred to the cloud for storage and updated for the prescribing doctor's review and treatment. The development of a yacht-based digital hospital healthcare device using various sensors such as a blood oxygen sensor, NodeMCU, pulse rate sensor, ECG sensor, Arduino Uno, and temperature sensor is described in this paper. IoT-based systems have the potential to enhance medical care and reduce patient costs by automating continuous data collection and analysis.

The microcontroller measures body temperature, pulse rate, ambient temperature, and oxygen saturation. The prototype of the sensor-based health monitoring system displays the output values of the sensors on an LCD, making them visible to patients. Authorized users can access this data from the cloud platform. The patient's health status is diagnosed based on the received values, and a medical professional makes the diagnosis. The doctor can then recommend the appropriate action and prescribe medications remotely.

V. FLOW DIAGRAM

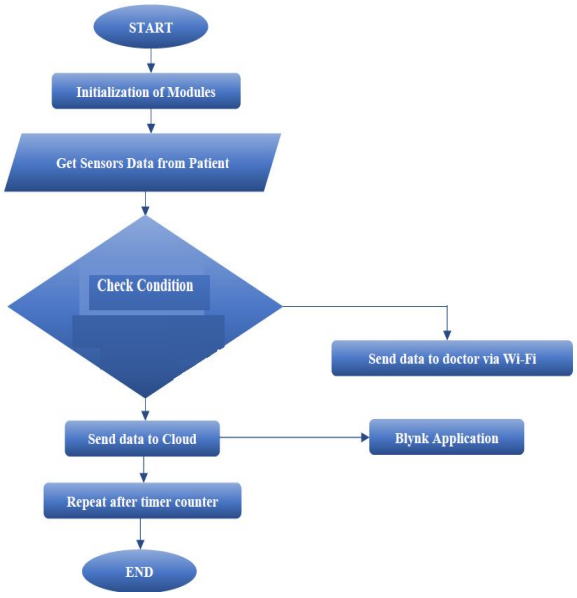


Fig. 2. Flow Diagram of system

The figure at the above illustrates a flowchart depicting the workflow of the automated monitoring system. Healthcare has gained paramount importance in today's world, particularly with the emergence of the novel coronavirus pandemic. In this context, an IoT-based health monitoring system emerges as a crucial solution. The Internet of Things (IoT) represents a significant advancement in internet technology, especially in the healthcare sector. The utilization of wearable sensors and smartphones has accelerated the evolution of remote healthcare monitoring.

IoT-enabled health monitoring plays a vital role in disease prevention and enables accurate diagnosis of health conditions, even when healthcare providers are at a considerable distance. This paper presents a portable physiological monitoring framework capable of continuously tracking a patient's heartbeat, temperature, and other essential parameters in real-time.

We propose a continuous monitoring and control mechanism to oversee the patient's condition and store their health data securely on a server using Wi-Fi Module for remote communication. Additionally, a remote health monitoring system utilizing IoT is outlined, allowing authorized personnel to access stored data via any IoT platform. Based on these values, diseases can be diagnosed by doctors remotely.

VI. CONCLUSION

The solutions outlined in this article offer new ways to deliver healthcare through the integration of IoT technology. The system aims to solve the limitations of the traditional medical model, especially in developing countries, where patients often face problems in receiving timely treatment, through the use of intelligent communications that can instantly communicate and share over the internet. In fact, the IoT-based healthcare system described in this article provides a solution for continuous patient care and management. The system uses special sensors attached to the patient's body to instantly collect important health information, including parameters such as body temperature, pulse, blood oxygen saturation and ambient temperature. This information is sent to the cloud for storage and analysis, allowing doctors to remotely monitor patients' health and make timely treatment decisions.

One of the key benefits of this system is the ability to generate continuous and reliable data for analysis, thus reducing the burden on patients and medical staff. The system provides real-time health information through the LCD screen and cloud platform, allowing patients to participate in health management and making it easier for doctors to diagnose and treat pain. In addition, the solution is based on data analysis results that show the development of IoT healthcare systems in practice, improving health and reducing patient costs. Research on the integration of smart devices, smartphones, and IoT platforms demonstrates the importance of telehealth in disease prevention and accurate diagnosis, especially in emergency situations. Beyond continuous monitoring and control through remote communication capabilities, this document addresses the need for timely access to medical services, especially in the context of the COVID-19 pandemic. Storing and accessing health information on the server using Wi-Fi modules further improves scalability and access to the system, allowing operators to check for diseases and prescribe medications on time.

In summary, the concept of IoT-based medical systems represents a significant advancement in medical technology, providing services and quality solutions for remote monitoring and management of patients. Leveraging IoT technology, the system not only improves access to medical services but can also provide effective and personalized treatment recommendations. Going forward, more research and development is needed in this area to increase the efficiency and effectiveness of IoT healthcare solutions, ultimately improving patient benefit, health, and quality of care. In fact, the IoT-based healthcare services in this article provide solutions for continuous patient care and management. The system uses special sensors attached to the patient's body to instantly collect important health information, including parameters such as body temperature, pulse rate, blood pressure, oxygen saturation and ambient temperature. This information is sent to the cloud for storage and analysis, allowing doctors to remotely monitor patients' health and make timely treatment decisions. One of the key benefits of this system is the ability to generate continuous and reliable data for analysis, thus reducing the burden on patients and medical staff. The system provides real-time health information through the LCD screen and cloud platform, allowing patients to participate in health management and making it easier for doctors to diagnose and treat pain. Furthermore, the solution is based on data analysis results showing that the development of IoT healthcare systems in practice improves health and reduces patient costs. Research on the integration of smart devices, smartphones, and IoT platforms demonstrates the importance of telehealth in disease prevention and accurate diagnosis, especially in emergency situations. The ability to store and access health information on the server using Wi-Fi modules further improves the scalability and accessibility of the system, allowing employees to check for diseases and prescribe medications on time.

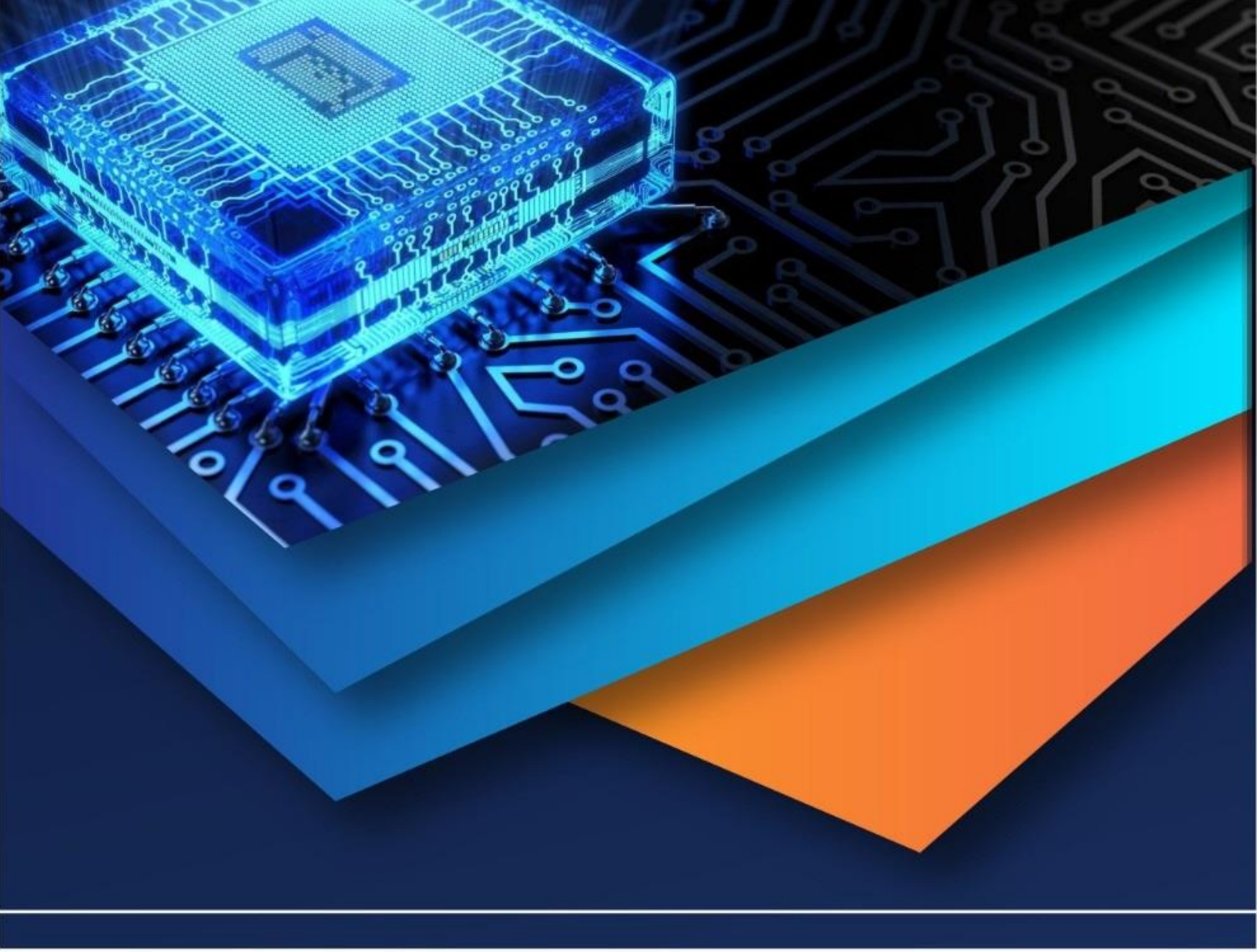
In summary, the concept of IoT-based medical systems represents a significant advancement in medical technology, providing services and good solutions for remote care and patient management. Leveraging IoT technology, the system not only improves access to medical services but can also provide effective and personalized treatment recommendations. Going forward, more research and development in this area is needed to increase the efficiency and effectiveness of IoT healthcare solutions, ultimately improving patient outcomes, health, and quality of care.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

REFERENCES

[1] S. J. Jung and W. Y. Chung, "Flexible and scalable patient's health monitoring system in 6LoWPAN," Sensor Lett., vol. 9,no. 2, pp. 778–785, Apr. 2011.
[2] W. Y. Chung, C. Yau, K. S. Shin, and R. Myllylä, "A cell phone based health monitoring system with selfanalysis processor using wireless sensor network technology," in Proc. 29th Annu. Int. Conf. Eng. Med. Biol. Soc., Lyon, France, 2007, pp.
[3] G. Lawton, "Machine-to-machine technology gears up for growth," Computer, vol. 37, no. 9, pp. 12–15, Sep. 2004.
[4] C. Kim, A. Soong, M. Tseng, and X. Zhixian, "Global wireless machineto- machine standardization," IEEE Internet Comput., vol. 15, no. 2, pp. 64–69, Mar.–Apr. 2011.
[5] Real time wireless health monitoring application using mobile devices, International Journal of Computer Networks & Communications (IJCNC) Vol.7, No.3, May 2015, Amna Abdullah, Asma Ismael, Aisha Rashid, Ali Abou-ElNour, and Mohammed Tarique.
[6] Secured Smart Healthcare Monitoring System Based on Iot, International Journal on Recent and Innovation Trends in Computing and Communication Volume: 3 Issue: 7, Bhoomika.B.K, Dr. K N Muralidhara.
[7] Real time wireless health monitoring application using mobile devices, International Journal of Computer Networks & Communications (IJCNC) Vol.7, No.3, May 2015, Amna Abdullah, Asma Ismael, Aisha Rashid, Ali Abou-ElNour, and Mohammed ,Tarique.
[8] Secured Smart Healthcare Monitoring System Based on Iot, International Journal on Recent and Innovation Trends in Computing and Communication Volume: 3 Issue: 7, Bhoomika.B.K, Dr. K N Muralidhara.
[9] Goutam Motika, Abinash Prusty," Wireless FetalHeartbeat Monitoring System Using ZigBee & IEEE 802.15.4 Standard", 2011 Second International Conference on Emerging Applications of Information Technology, 978-0- 7695-4329-1/11, 2011
[10] S. M. Mahalle, P. V. Ingole, "Design and Implementation of Wireless Body Area Sensor Network Based Health Monitoring System", International Journal of Engineering Research & Technology, Vol. 2 Issue 6, pp. 105- 113, June 2013.
[11] M.Prakash, CJ Kavitha Priya, "An Analysis of Types of Protocol Implemented in Internet of Things Based on Packet Loss Ratio", Proceedings of International Journal of Information and Communication Technology for Competitive Strategies, ISBN: 978-1-4503-3962-9, 2016
[12] M. Prakash, U. Gowshika, T. Ravichandran, "A Smart Device Integrated with an Android for Alerting a Person's Health Condition: Internet of Things" Indian Journal of Science and Technology, Vol 9 (6), February 2016.
[13] Dr.A.Sabanayagam, G.Anish Girija," Design And Modeling Of Mobile Health Monitoring System", International Journal of Innovations in Scientific and Engineering Research (IJISER),vol4,no 2,pp.63- 65,2017.
[14] "Healthcare Monitoring System Using Wireless Sensor Network", D. Mahesh Kumar, Department of Electronics, PSG College of Arts and Science, Coimbatore - 641 014.Volume 04, Issue 01 Pages:1497-1500 (2012), ISSN:0975-0290.
[15] Polshettiwar, S., et al. (2022). An Overview on Cloud-Based Health Tracking and Monitoring System in Real-Time. Journal of Healthcare Engineering, 2022, 6615490.
[16] Iranpak, S., Shahbahrami, A., & Shakeri, H. (2021). Remote patient monitoring and classifying using the internet of things platform combined with cloud computing. Journal of Ambient Intelligence and Humanized Computing, 12(3), 3385-3397.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)