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AN OVERVIEW OF SMART HEALTHCARE SYSTEM

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ABSTRACT:

A "smart healthcare system" is an intelligentinfrastructure that uses sensors to collect data, the Internet of Things (IoT) to transmitit, and computer devices use to analyze it. This paper discusses the smart healthcaresystem used in ambulances and Remote area. Also mention about the majorcomponent of smart health care system. Oneof the major problems is ambulances stuckin traffic congestion, which has a significant impact on ambulance services and increases the likelihood that a patient would pass away due to a delay in care. Different sensors, such as heart rate sensors, bloodpressure sensors, and ECG sensors, are used in smart ambulances to judge the status of vital parameters. The hospital's database willbe notified of these parameters' statuses at the same time that GPRS messages from the cloud will be used to control traffic signals. Authorities at the hospital will make plans inaccordance with the condition of critical metrics.

Key words: ***Smart Ambulance; Wireless Sensor Network;Health Monitoring System in Remote Area; Electronics Sensor***

I. INTRODUCTION:

With today's technology, patients may frequently receive care right away. A strong and dependable internet connection is necessary to guarantee that all crucial programs remain online and that the most recent information is accessible. The Smart Ambulance solution from Excelerate includes a number of our items and networking services. This includes the next- generation satellite technology and services, our on-board multi-wan router, the Linuxhub portable Wi-Fi Hotspot, Excell's 4G optimization antenna, and more. These components work together to build an environment for onboard connection that maximizes the potential of wireless, satellite, and cellular networks. This gives medical personnel access to a strong anddependable internet connection regardless oftheir location, allowing for smooth real-timedata transfer between the onboard gadgets and clinical leaders in other cities.

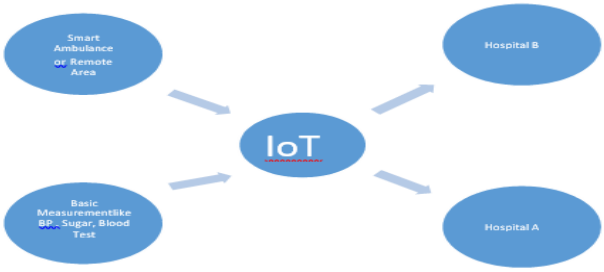

Fig 1 Smart Healthcare System use in Ambulance

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II. ROLE OF WIRELESS SENSOR NETWORK IN IoT

A wireless sensor network (WSN) is a key component of the Internet of Things (IoT) and plays a critical role in the collection, processing, and dissemination of data. WSNs are composed of a large number of small, inexpensive, and low-power devices that are capable of sensing and communicating data wirelessly.

The role of WSNs in IoT can be divided into three main functions:

- **Data Collection:** WSNs are used to collect data from various sensors, such as temperature sensors, humidity sensors, and pressure sensors, and transmit this data wirelessly to a central hub for processing and analysis.
- **Data Processing**: WSNs have the capability to perform local data processing, such as data aggregation and compression, to reduce the amount of data that needs to be transmitted and to increase the efficiency of the network.
- **Data Dissemination:** WSNs are used to disseminate the processed data to other devices and systems, such as cloud-based platforms, for further analysis and decision-making.

WSNs in IoT have a wide range of applications, including smart homes, industrial automation, environmental monitoring, and healthcare. The use of WSNs in IoT has led to the development of new technologies and applications, such as smart cities and wearable devices, that have the potential to improve the quality of life and increase the efficiency of various industries

III. HEALTH MONITORINGSYSTEM IN REMOTE AREA

One of the main issues developing Nations are now dealing with is healthcare in rural areas. Mortality rates from illnesses are highsince more than fifty percent of the population lives in rural regions and there are few health services available. In light of the gloomy reality, new processes and procedures are desperately needed to guarantee that poor areas of our nation receive timely, high-quality healthcare. IOT is a cutting-edge instrument that might be crucial in fulfilling these criteria. In order to perform healthcare tasks like diagnosis, monitoring, and remote operations through the Internet, an IOT healthcare system connects all the available resources as a series of connections. In the Internet of Things, a network of objects that may interact with one another in real time such a network may be used to safely access a patient's health information using a variety of sensors, analyze the data using sophisticated algorithms, and then wirelessly send it to medical professionals so they can recommend the best course of treatment. The physical sensors used are those that offer comprehensive data on a patient's health. Information on body temperature, heart rate, blood pressure, and ECG is gathered using a combination of four sensors. The early signs of any illnesses in the human body are revealed by information about these disorders. These sensors work well and are simple to operate. In the absence of medical facilities and doctors, regular monitoring of the patient's body with these sensors might prevent harmful circumstances. By providing continuous monitoring in remote regions without access to medical facilities or doctors, these sensors can prevent dangerous situations from occurring. The sensors are connected to a microcontroller, which transmits the patient data to the specified servers for the recommendation of additional steps by the medical professionals. This network of gadgets and sensor-based system is ideally suited to our nation's current predicament. It would offer the most isolated people a cost- effective, dependable, and technologically

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sophisticated method of therapy. Thevarious system components are shown in Figure 2

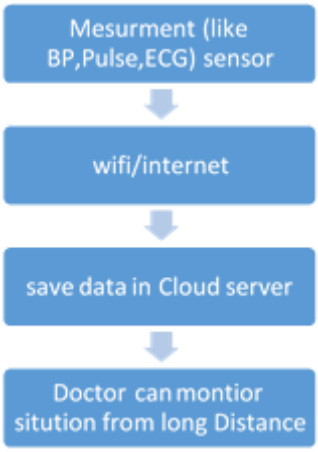

Fig 2 Smart Healthcare System use Remote Area

Smart healthcare systems refer to the integration of advanced technology and data analytics in healthcare delivery to improve patient outcomes and reduce costs. These systems use data from various sources, such as electronic health records, wearables, and IoT devices, to gain insights and make more informed decisions.

One key aspect of smart healthcare systems is the use of telemedicine, which enables patients to consult with healthcare professionals remotely. This can be particularly beneficial for patients in remote or underserved areas, or for those who have mobility issues.

Telemedicine also allows for more efficient use of healthcare resources and can reduce costs for patients and providers.

Another important aspect of smart healthcare systems is the use of predictive analytics and machine learning algorithms. These tools can be used to identify patients at high risk of certain conditions, such as chronic disease, and to develop personalized treatment plans. Additionally, smart healthcare systems can use real-time monitoring to detect early warning signs of deterioration and alert healthcare professionals to take action.

The use of wearable technology and IoT devices is also becoming increasingly common in smart healthcare systems. These devices can track a variety of health metrics, such as heart rate and activity level, and can provide patients with valuable insights into their health. Additionally, these devices can provide healthcare professionals with real-time data to assist in diagnosis and treatment.

Smart healthcare systems also rely on the use of electronic health records (EHRs) to store and share patient data. This allows for more efficient coordination of care across different providers and can help to reduce errors and improve patient outcomes. Additionally, EHRs can be used to conduct research and to improve population health management.

Overall, smart healthcare systems have the potential to revolutionize healthcare delivery by improving patient outcomes and reducing costs. However, it's important to note that these systems also raise privacy and security concerns, and the healthcare industry will need to address these issues to ensure the safe and effective use of smart healthcare technology.

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It includes aspects such as telemedicine, predictive analytics, machine learning, wearable technology, IoT devices, and electronic health records. However, it also raises concerns over privacy and security and needs to be addressed to ensure safe and effective use of smart healthcare technology.

IV. CONCLUSION

Healthcare is a fundamental human right and necessity, yet maximum developing nation's population, the most of whom live in rural regions, lacks access due to poor infrastructure, a shortage of medical professionals, and lack of access to even the most basic medical services. In order to further penetrate rural places, the current scenario necessitates a crucial paradigm change to a technologically enhanced medical system. The purpose of this overview is to discuss about an IOT-based system or smart system that is straightforward, trustworthy, and accountable for evaluating the user's critical health metrics. The system makes use of readily accessible commercial sensors to detect ECG, blood pressure, temperature, and pulse rate. The accessible doctors can obtain these numbers and continue with additional diagnostics after they have been delivered through the Internet to the server location. The approach is very pertinent to the current situation in emerging nations where there is a strong emphasis on providing rural areas with cutting-edge digital and communication technology

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