

Intelligent Health Monitoring System Using Internet-of-Things (IoT) with Challenges and Innovation

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ABSTRACT

One among the various applications enabled with the aid of the Internet of Things (IoT) is wearable technology, where smart and pervasive health care is an important one. Network sensors, either worn on the frame or embedded in our environments; make possible the collection of rich information of our physical and mental health. Captured on a continuous basis, aggregated, and efficiently supervised, such statistics can bring about a positive transformation in health care system

Keywords : Internet of Things (IoT), Temperature sensor DS18B20, Heartbeat sensor, Accelerometer sensor ADXL345, AD8232, IoT, visualization, analytics.

I. INTRODUCTION

Nowadays there is a rising captivated in wearable sensors and today several gadgets are commercially designed for private fitness care, fitness, and health awareness. Researchers have additionally taken into consideration programs of such technologies in scientific applications in remote health monitoring systems for long time recording and in cloud based sensing, management and to get entry of affected person's physiological information. Based on cutting-edge technological traits, you could simply consider a time within the close to destiny whilst your routine physical examination is preceded via three day duration of continuous physiological tracking the use of inexpensive wearable sensors. Over this interval, the sensors would constantly report indicators correlated along with your key physiological parameters and relay the resulting statistics to a database related together with your fitness statistics. The health practitioner could make a far better analysis on your health and endorse remedy, early

intervention, and life-style choices which are particularly powerful in improving the quality of your fitness. Such a period should have a tremendous effect on healthcare systems internationally and accuracy for diagnoses.

II. LITERATURE SURVEY

In India, a survey was performed to supervise the functioning of various clinical facilities and the development in healthcare transport with the introduction of information technology. The survey found out that affected person information in a number of the hospitals were no longer managed nicely; additionally the affected person referrals amongst diverse hospitals were extra or less primarily based on paper files. As facilities have been not available to exactly estimate affected person's history, the healthcare first-rate become inefficient. The survey discovered that healthcare centers may be advanced with the assist of Information Technology, specially the use of Electronic Health Records (EHRs).

According to the survey the use of EHRs is much less in use and at risk of disasters due to the complexity related to it. This paper results an easy and Employable EHR (EEHR) [1] this method also termed as Web EHR. This approach provides connectivity using web among various healthcare center, Thus it is easy for the maintenance and data sharing.

Healthcare is one of the primary desires to any man or woman. However, the physicians are not obvious in terms of care and cash with each and every affected person. One greater trouble related to the healthcare machine is the dearth of medical facilities to tune the patient's history to offer the powerful treatment. Therefore, it is important to optimise the healthcare system to make it extra efficient [2]. This paper depicts the implementation and deployment of wireless tracking of in-patients inside the medical institution premises. The deployed wireless structures collect pulse and oxygen saturation measurements from sufferers often. It additionally discusses the possibility of WSNs for healthcare in hospitals.

The key power of the Indian healthcare gadget is due to its nicely-educated scientific body of workers. Certain efforts have been made to enhance the high-quality of healthcare scenario [3]. This paper proposes a cloud computing primarily approach for integrating all of the medical institution facts from huge size to small size and thereby it may preserve the patient's information beneath one unit. This approach now not only reduces company hosiptals- but also makes sure that the government runs healthcare centers to be fair to the people. [4]. this paper discusses the efforts which have been made to improve the healthcare device and the results. It additionally affords the shortage of clinical equipment protection measures and the precautionary steps that want to be taken care to improve the first-rate of healthcare in India.

The increase of aged population and the extensive incidence of numerous persistent illnesses caused the

development of tele fitness systems [5]. It proposes the collective understanding of wearable technology for the remote expert system. The basic concept of this system is to demonstrate a home patient monitoring by making use of wearable devices, wireless communication and sensors. Majority of the road accidents are due to the driver's ill-health such as cardiac issues or other health related problem [6]. To avoid such road accidents and to provide the driver a quick medical facility, a health monitoring system is suggested. These system measures physiological parameters such as temperature, pulse rate, blood pressure, etc. and transmit the reading values using smart phone to the Internet. If any abnormal values are received from the driver, doctors and transport officers can be alerted about the driver's location and the system stops the car. Not only used to help drivers but also used to monitor any patient and report their condition to concern doctor.

III. ENTERPRISE RESOURCE PLANNING IN HEALTHCARE SYSTEMS

Clinicians, physicians, nurses and executives want excellent equipment to be able to enhance and cope with emerging scientific technologies and strategies to keep great healthcare provider. For instance, a clinic handles information from many distinct departments, some of which ought to be shared, so as to offer services. The statistics is used otherwise according to the characteristic of departments, inclusive of controlling and planning. Therefore, it's far essential to make these facts available to the perfect departments at the right time. Because information is an important a part of the healthcare system, it is depended on to perform the obligations of physicians, patients' home care, and persistent care. Hence, the combination of different offerings and methods might gain the healthcare organization and eliminate the traditional segregation of strategies, which has resulted in the decreased sharing of information. Integrated systems could allow the healthcare

employer to coordinate management and assist the efficiency of patient care. (therefore, ERP may want to help the healthcare zone by way of enhancing the integration of strategies and offerings. they suggested that if ERP changed into efficiently carried out in a healthcare business enterprise, it would promote full-size change, mainly in finance, human sources and capability, revenue, and admission assets.

IV. PROPOSED EXPERT SYSTEM

We have proposed a sturdy health tracking device that is sensible enough to reveal the condition of affected person automatically using IOT. It collects the status information via these systems which might consist of patient's temperature, movement, heart rate, blood pressure and ECG and sends an alert to affected person's physician as well as to the caretaker with his modern-day reputation. This could help the doctor and caretaker to monitor his affected person from anywhere inside the international. The device makes use of clever sensors that generates uncooked statistics records accrued from every sensor and send it to a cloud server in which the information can be further analyzed and statistically maintained to be used. The proposed approach of patient monitoring system monitors affected person's fitness parameters the usage of Raspberry Pi. After connecting internet to the Raspberry Pi, it acts as a server. Then the server robotically sends statistics to the internet site. Using IP address all and sundry can display the affected person's health reputation everywhere in the international the usage of laptops, pills and clever telephones. If those parameters are going ordinary it will routinely sends alert SMS to the doctors and loved ones. Block diagram of machine is proven in below Figure.

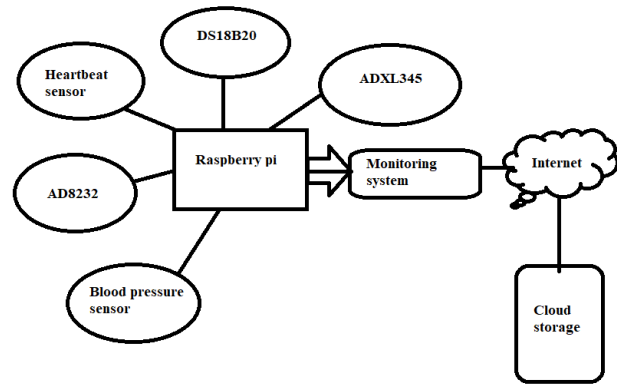


Figure1 : Block diagram

V. SYSTEM METHODOLOGY

1. Raspberry pi
It is a credit card sized pc. It is series of single board computers. It is doesn't include input devices but we attach separately.
2. Temperature sensor- DS18B20
It is a sensor that can measure temperature with a less amount of hardware and wiring. This sensor sends accurate temperature readings directly to the development board without need of a DAC using a digital protocol.
3. Heartbeat sensor(calculates BPM)
The speed of the heartbeat measured via the number of contractions of the heart in step with minute (BPM). The heart charge can vary in line with the body's bodily desires, inclusive of the want to take in oxygen and excrete carbon dioxide. It is generally equal or near the heart beat measured at any peripheral point. Activities that could initiate trade consist of physical workout, tension, sleep, strain, infection, and ingestion of drugs. The ordinary resting adult human heart rate range from 60 to 100BPM. Tachycardia is a fast coronary heart rate, defined as above a hundred BPM at rest. Bradycardia is a gradual heart price, described as under 60 BPM at relaxation. Several researches, in addition to professional consensus indicate that the ordinary resting adult coronary heart fee might be in the direction of a variety among 50 to 90 BPM. During sleep a slow heartbeat 40 to 50 BPM is considered normal. When the heart is not beating in

a regular pattern, this is referred to as an arrhythmia. Abnormalities of heart rate indicate disease.

4. Accelerometer sensor (ADXL345):

ADXL345 gives a digital output, 3-axis meter whose low power consumption and built in properties make it best for use in a wide variety of applications. We are using this sensor to measure both position and location of a patient.

5. ECG sensor (AD8232)

AD8232 is the technique of recording the electric activity of the heart over a time period using electrodes located at the pores and skin. These electrodes locate the tiny electric changes at the skin that get up from the heart muscle's electro-physiological pattern of depolarizing in the course of every heartbeat. It could be very commonly executed cardiology take a look at.

6. Blood Pressure Sensor

It is a sensor to measure human blood pressure. It measures systolic, mean arterial pressure and diastolic by using the oscillometric process.

7. Cloud computing sensing process

Internet-based computing that provides shared resources processing and data to computers and other devices on demand. It is an example for enabling ubiquitous, on-demand access to a shared heap of configurable computing resources Cloud and storage provide users and methods with various capabilities to store and process their data in third party data centers.

VI. CONCLUSION

The integration among wireless network sensor and cloud computing will create a new technology in many factors including patient monitoring with low cost, lowering the wide variety of occupied beds in hospitals, and enhancing clinical staff performance. Plan to improve the capability of the system by using adding greater sensors and the usage of it to accumulate statistics from a larger sample size of sufferers.

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