MEDICAL AND SMART HEALTHCARE SYSTEM BASED ON IOT

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Abstract: **The Internet of Things (IoT) is a new concept that allows users to attach numerous sensors and quick devices to secure real-time data from the situation. Internet of Things (IoT) is in general to join the group about various devices. IoT show greater commit than working of healthcare, where its principles are alreadybeing applied to improve access to care, increase the quality of care and most important reduce the cost of care. The Internet of Things (IoT) provides an efficient and new life to the healthcare field. It also has a rapid development of many fields. But the more important are real in the field of Medical. In the modern health care environment, the usage ofIoT technologies brings benefit of physicians and patients, therefore they are applied to various medical areas (such as real-time monitoring, patient information management, and healthcare management).One of the better way the doctors are good to surely and instantly correct to use the suitable patient message's and including the patient medical record. Through the Internet of Things, tremendously improves the capacity of report and the patient care in the Medical field. So, Internet of Things offers an actual policy to connect the all the basics. The suggested design named as 'k-Healthcare' apply 4 layers; the sensor layer, the network layer, the Internet layer and the services layer. All layers cooperate with each other effectively and efficiently to provide a platform for accessing patients' health data using smart phones.**

Keywords: Internet of things(IOT), Body Sensor,RemoteMonitoring,k-Healthcare.

1. INTRODUCTION

In the new era of communication and technology, the explosive growth of electronic devices, smart phones and tablets which can be communicated physically or wirelessly has become the fundamental tool of daily life. The next generation of connected world is Internet of Things (IoT) which connect devices, sensors, appliances, vehicles and other "things". The body sensor network (BSN) technology is one of the most imperative technologies used in IoT-based modern healthcare system. It is basically a collection of low-power and lightweight wireless sensor nodes that are used to monitor the human body functions and surrounding environment.

Since BSN nodes are used to collect sensitive (life-critical) information and may operate in unfavourable environments, accordingly, they require strict security mechanisms to prevent malicious interaction with the system. Internet of Things (IoT) devices can be mostly used to facilitate distant health monitoring and emergency healthcare systems. At the present we are facing many challenges in the real world, which have to deal realistically. By the use of IoT challenges are rehabilitate, which consumes more time, resources and manpower. In the recent years the rehabilitation of Internet resources has become popular and also development of the smart applications like smart home. Compared to the traditional system, the smart rehabilitation is aiming at providing an effective treatment, sufficient interaction and quick reconfiguration to making the determined use of the medical resources according to the patient's particular requirements probable. Internet of Things is the primary technology for interconnecting all the medical resources of the rehabilitation systems. Also to combine the Networking technologies that enables a wide range of applications, devices or things to interact and communicate among themselves. Internet of Things (IoT) is mainly to connect the world through multiple devices. Cloud refers to a network or an Internet. In other words, cloud is something, which is located at remote location. Cloud can afford services by network, i.e., over public networks or private networks such as Wide Area Networks, Local Area Networks or Virtual Private Networks. Applications namely e-mail, web conferencing, customer relationship management (CRM), all run in cloud. Hardware and software can plays a major role in computing resources that are delivered to users from a Web-based service is referred to as Cloud Computing

Technology. It means using a grid of computers which deliver software and data by serving as a service-oriented construction to a shared pool of configurable computing resources. For detail, this technology can be most accomplished by retail businesses which require multiple servers during vacations and comparatively less number after that time, whose needs can be strictly met by the cumulative usage.

2. RELATED WORK

Research is going on in the field of IOT-healthcare which gives a clinical evidence that the raw data received from wireless network connected devices has contributed in managing and preventing chronic diseases and monitoring patients. Therefore, various health monitoring systems are getting wearable todays, including glucose monitors, ECG monitors, pulse audiometers, and blood pressure monitors. The advancement of BSN in healthcare applications have made patient monitoring more feasible. Recently, several wireless healthcare researches and projects have been proposed, which can aim to provide continuous patient monitoring, in-ambulatory, in-clinic, and open environment monitoring (e.g. athlete health monitoring). This section describes few popular research projects about healthcare system using body sensor networks. CodeBlue is a popular healthcare research project based on BSN developed at Harvard Sensor Network Lab. In this architecture, several bio-sensors are placed on patient's body. These sensors sense the patient body and transmit it wirelessly to the end-user device (PDAs, laptops, and personal computer) for further analysis. The basic idea of the CodeBlue is straightforward, a doctor or medical professional issues a query for patient health data using their personal digital assistant (PDA), which is based on a published and subscribed architecture. Besides, CodeBlue's authors acknowledge the need of security in medical applications, but until now security is still pending or they intentionally left the security aspects for future work. Subsequently, a heterogeneous network architecture named Alarm-net was designed at the university of Virginia. The research is specifically designed for patient health monitoring in the assisted-living and home environment. Alarm-net consist of body sensor networks and environmental sensor networks. Besides, the authors have developed a circadian activity rhythms program to aid context-aware power management and privacy policies. Furthermore, Alarm-net facilitates network and data

security for physiological, environment, behavioral parameters about the residents.

3. PROPOSED MODEL

The k-Healtcare model proposed in this paper for efficient of IoT in the field of medical and healthcare consists of four layers .

A. Sensor Layer The bottom layer of the model is called a sensor layerwhich is the heart of the model, there are different sensors lyingon this layer, e.g., RTX-4100, wireless two-lead EKG, Arduino& Raspberry Pi, blood oxygen sensor, pulse oximetry, andSmart Phone sensors. RFID performs the object identificationautomatically by reading the tag, which attached to objects. Thepassive RFID is mostly used which has no power/ batteryrequirement, it takes power from the RFID reader and becomes active to communicate with the reader. The main idea of WSN is to get data from the environment and pass data through the network to the centralized storage. The modern smartphones have certain sensors built-in by default, e.g., accelerometer, gyroscope, proximity, barometer, temperature, humidity, gesture, etc., which makes it easier to use (as no external sensors are used). In k-Healthcare we use these built-in sensors to get data and send the data to remote data storage for further processing. The communication between the sensor layer and the network layer is done using IEEE 802.11/b/g/n, IEEE 802.15.4, IEEE 802.15.6, ZigBee etc.

B. Network Layer The Network layer plays the key role in communication toconnect the devices with WAN using different protocols(TCP/IP), technologies and standards like 3G, 4G, ADSL,DSLAM, and Routers. The sensor device sends the data to aconnected device, e.g. smart phone or RFID reader which isconnected to home gate or the Internet via Ethernet / Wireless.

C. Internet Layer This layer provides the functionality of data storage andmanagement. For this purpose, we use the cloud storage. Thecloud storage provides the facility to store the data into logicalpools. The physical storage may be one server or multipleservers, typically owned and managed by a hosting company.The cloud provides different services and algorithms ondemand like cloud storage, cloud data store, cloud SQL,BigQuery, RESTful services for iOS, Android, JavaScript andmachine learning algorithms.

D. Services Layer This layer provides direct access of data to professionalmedical facilities and stakeholders such as doctors, emergencycenters, hospitals, and medicine supply chains. The doctor caneasily manage the patients, view the medication

history, andprovide remote support in case of emergency. The patient canalso access the data on provided interface any time anywhere.This layer supports different protocols and techniques likeHTTP, HTTPS, JavaScript, RESTful web services etc.
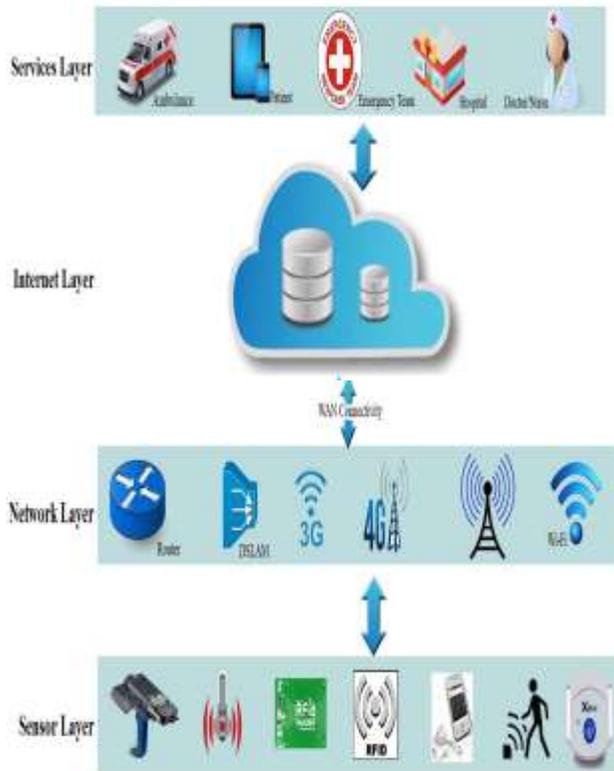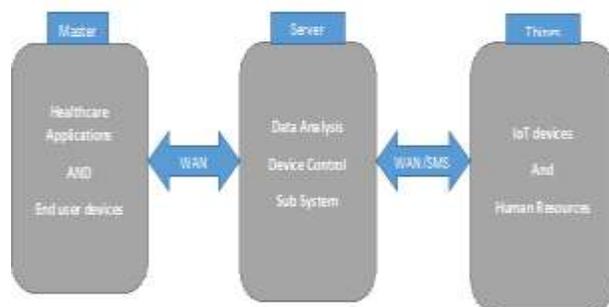

Fig3.LAYERS OF IOT

Fig3.1 INTERNET OF THINGS

4.CONCLUSION

In this paper IoT technology is introduced in medical science. It is widely used for doctors and this technology introduces an easy way to curing the patients, if any new disease is occurred. Here, we utilize the existing enhancement of cloud security protocols for authenticating the treatment information. By using Internet of Things will reduce the time required for patient to become into normal stage. Internet of Things will create a major impact on medicine, and contribute to an overall improvement in its quality. In future, new devices for remote patient-monitoring and communication systems have been implemented that needs to be scalable, on demand platform and infrastructure services for minimizing the expenses in buying and upgrading new software's as well as hardware's.

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