IOT BASED SECURED HEALTHCARE MONITORING SYSTEM

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Abstract:

In fact, information systems are the foundation of new productivity sources, medical organizational forms, and erection of a global economy. IoT based healthcare systems play a significant role in ICT and have contribution in growth of medical information systems, which are underpinning of recent medical and economic development strategies. However, to take advantages of IoT, it is essential that medical enterprises and community should trust the IoT systems in terms of performance, security, privacy, reliability and return-on- investment, which are open challenges of current IoT systems. For heightening of healthcare system; tracking, tracing and monitoring of patients and medical objects are more essential. But due to the inadequate healthcare situation, medical environment, medical technologies and the unique requirements of some healthcare applications, the obtainable tools cannot meet them accurately. The tracking, tracing and monitoring of patients and healthcare actors activities in healthcare system are challenging research directions for IoT researchers. State-of-the- art IoT based healthcare system should be developed which ensure the safety of patients and other healthcare activities. With this manuscript, we elaborate the essential role of IoT in healthcare systems; immense prospects of Internet of things in healthcare systems.

Keywords – Global economy, IOT, Privacy, Healthcare.

1. INTRODUCTION

In healthcare industry, Internet of Things (IoT) provides an opportunity of discovering healthcare information about a tagged patient or medical object by browsing an Internet address or database entry that corresponds to a particular Radio-Frequency Identification (RFID) tag. But now, it is extended to the general idea of medical things, especially healthcare everyday objects, those are readable, recognizable, locatable, addressable, and/or controllable.

Fig.1.Basic structure

These objects may be equipped with devices such as sensors, actuators, and RFID tags, in order to allow patients, doctors, equipments and other healthcare actors to be connected anytime and anywhere with anything and anyone. IoT is not a simple extension of the Internet or an aggregation of Internet systems, and it covers a wide range of technologies including tagging, sensing, networking, computing, storage, and control, which together build feasible complex cybernetic physical and social systems to support these smart applications [1], [2]. Internet of things has dynamic capabilities to connect D2M (Device-to-Machine), O2O (Object-to-Object), P2D (Patient-to-Doctor), P2M (Patient-to-Machine), D2M (Doctor-to-Machine), S2M (Sensor-to-Mobile), M2H (Mobile-to-Human), T2R(Tag-to-Reader), intelligently connects humans, machines, smart devices, and dynamic systems which ensure the effective healthcare system, health monitoring system, medical assets monitoring and medical waste management system. Medical has ever remained one of the major applications of internet. The collaboration of internet and medical formed a sub-field e-health. An application of Internet and other related technologies in healthcare industry to improve the access, efficiency, effectiveness, quality of clinical and business processes utilized by healthcare organizations, practitioners, patients in an effort to improve the health status of patients.

2. EXISTING METHOD

The Existing method is "Secured Smart Healthcare Monitoring System Based on Iot" . It is very important to monitor various medical parameters and post operational days. Hence the latest trend in Healthcare communication method using IOT is adapted. Internet of things serves as a catalyst for the healthcare and plays prominent role in wide range of healthcare applications. In this project the PIC18F46K22 microcontroller is used as a gateway to communicate to the various sensors such as temperature sensor. The microcontroller picks up the sensor data and sends it to the network through Wi-Fi and hence provides real time monitoring of the health care parameters for doctors. The data can be accessed anytime by the doctor.The controller is also connected with buzzer to alert the caretaker about variation in sensor output. But the major issue in remote patient monitoring system is that the data as to be securely transmitted to the destination end and provision is made to allow only authorized user to access the data. The doctor can see by logging to the html webpage. At the time of extremity situation alert message is sent to the doctor through GSM module connected to the controller. Hence quick provisional medication can be easily done by this system.

3. PROPOSED METHOD

Our Proposed System Title Is "Iot Based Secure Patients Monitoring System".In This System The Same Microcontroller Is Used But The Internet Connection Is Done By Means Of Lan Cables Connected To Pc.In Addition To This The Sensors Like Pulse Oximeter Mcp6004 Is Used To Monitor The Patient's Heart Rate And Blood Pressure. The Sensors Can Be Attached To The Patients Textile Electrodes.The Previous System Has Disadvantages Due To Aes128 Encrypting Algorithm. Here We Use The Rse(Reed Solomon Encrypting) Algorithm. To Make Patients Comfort We Use Textile Electrode Or Sensor Attached To The Patient's Bed. In Case Of Emergency There Is A Sms Alert Or Missed Call Alert To The Doctor. Furthermore, Buzzer Sound Also Used.The Gsm Modem Is Connected To The

Microcontroller Which Is Responsible For Sms Alert. Otp Method Is Introduced.The Adult's Fall Detection Of Can Be Recognized Inside The Patient's Room.
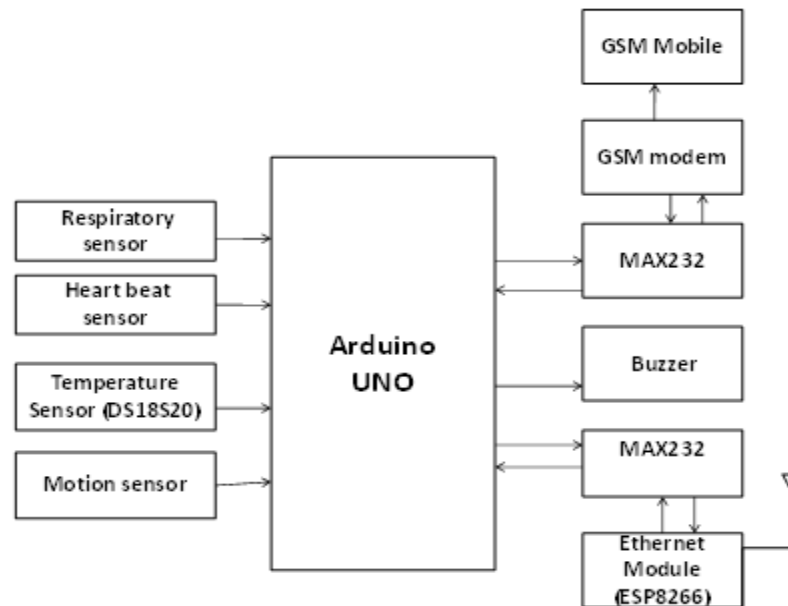

Fig.2. Block diagram

Medical has ever remained one of the major applications of internet. The collaboration of internet and medical formed a sub-field e-health. An application of Internet and other related technologies in healthcare industry to improve the access, efficiency, effectiveness, quality of clinical and business processes utilized by healthcare organizations, practitioners, patients in an effort to improve the health status of patients [4]. Along with many other services, online appointment services in particular are the most common e-health services [3]. E-health is one of small component of IoT based healthcare management system, in which an online interaction of a patient to a doctor is made possible and easy along with easy access to online healthcare record checking for the patients. Whereas IoT based healthcare system consists all this plus identification and tracking of patients and doctors locations, tracking of patient's health records and tracking locations of hospital equipment etc. IoT have also enabled intelligent behavior of some equipment which alarm automatically when near to expiry or auto informing a relevant doctor if concerned patient is brought to Intensive Care Unit.

4. STRUTURE OF IOT

Through the Internet of things, anything in the healthcare system can be identified tracked and monitored on demand anytime anywhere [1]. Internet of things is considered as remarkable revolution after the blooming of Internet with ICT based industry. Internet of things has three basic components,

namely RFID systems, middleware systems and Internet systems Savant. RFID system is one of the major components of IOT and it enables data to be transmitted by a portable device, called "a tag", which is read by an RFID reader and processed according to the needs of a particular application [9]. The data transmitted by the tag may provide identification or location information, or specifics about the patient tagged, such as (e.g. patient ID, age, sex, blood pressure, glucose level) therefore the RFID systems can be used to monitor healthcare objects in real-time, without the need of being in line-of-sight. This allows mapping of real world healthcare system into the virtual world system. Middleware savant system is software that bridges RFID hardware and healthcare applications. The emboldens of IoT technologies in healthcare will ensure the healthcare safety, exact patient, accurate drug, proper dose, right way and exact
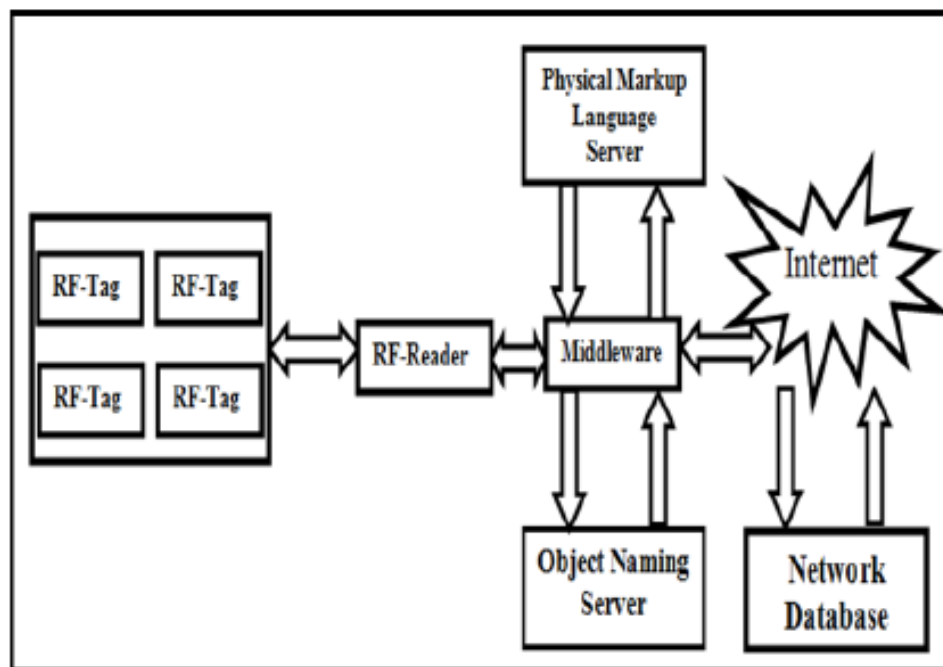
Fig.3.Basic components

time, by complying with the principles and regulations of HIPAA (Health Insurance Portability and Accountability Act of 1996) which mentions the standards of data exchange with protection and confidentiality of patient information, JCAHO (Joint Commission on Accreditation of Healthcare Organizations that emphasizes positive patient identification) and AHA (American Hospital Association) stressing guidelines for tamper proof non-transferable wristband minimizing the risk of losing transferred data. Internet of Things is a technological revolution that represents the future of computing and communications, and its development depends on dynamic technical innovation in a number of important fields, from wireless sensors to nanotechnology [1]. The essential functioning principles of Internet of things based on Radio Frequency Identification which is known as the soul of IoT, EPC technology used global unified products coding and wireless communications technology in order to tracing of healthcare objects, swank integrity of healthcare system. Medical products, labeled with EPC code stored electronic tags.

5. FUNCTIONING OF IOT

A higher, in time, need to be quicker, in space, and requires more strict storage conditions. Therefore, it made healthcare traceability an advanced technical requirement, while the development and stability of the healthcare system made a greater requirement [11].All nodes in healthcare system should be a integrated, harmonious division of medical staff and cooperation, and layout of the traditional healthcare system is comparatively complex, healthcare actors activities relatively unstable and so the delay caused by the healthcare organizations and asymmetric information, splits the chain between healthcare actors and enterprise [13]. It can be seen that the traditional healthcare system are often in motion or loose state of the information, timeliness, accuracy, and sharing, based on EPC technology, the application of medical things; a good solution to the above problem. An EPC have tag read and write data function, easy compactness and diversification of the shape, reusable, good penetration and data capacity and other characteristics, can adapt to frequent changes in the healthcare information system, Internet of things provides an effective way of real time remote monitoring system of healthcare actors through RFID tags, sensors, and actuators. The RFID tags in healthcare may be applied to patients, assets, medical staff and other objects, allowing the readers on gate frames, hospital wards and other treatment areas of hospital to detect and record interactions.

CONCLUSION

The name, Internet of Things, is syntactically composed of two terms, Internet and Things. As a result, it's usually considered that there are two versions of IoT, "Internet oriented" or "Things oriented". The "Things oriented" version focus on the technology developed to improve object visibility, such as awareness of its status, current location. This is undoubtedly a key component of the path to the full deployment of the IoT vision but it's not only one [19]. In past decades, the Internet has connected numerous devices. Why don't we take advantage of the existing Internet technology and connect smart objects around the world? [13]. We discussed the significance of IoT especially in healthcare system; immense prospects of Internet of things in HCS; extensive aspect of the use of IoT is dissimilar among different healthcare components and finally the participation of IoT between the useful research and present realistic applications. IoT and few other advance technologies are still in underpinning stage; mainly in the healthcare system.

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