



A SURVEY FOR MONITORING PATIENTS HEALTHCARE INFORMATION IN CLOUD

DR.RAJKUMAR.R

Associate Professor, School of Computing Science and Engineering, Vellore Institute of Technology

ABSTRACT

Advancement in technology is limitless the world is computerized and smart phones make it more easy to access the technologies and connect it through internet utilizing these technologies towards healthcare save millions of lives in real time. We have reviewed the existing healthcare architecture systems and proposed a new way of healthcare monitoring service of a patient remotely with pharmacy medicine delivery. For secure authentication RFID card provided for the patient in order the place order for medicine and receive the delivery of medicine, emergency services are also available in terms of the wearable technology devices data from patient real time analysis.

KEYWORDS: Healthcare cloud, Radio frequency identification (RFID), wearable devices, Internet of things (IOT), pharmacy,patient.



DR.RAJKUMAR.R

*Associate Professor, School of Computing Science and Engineering,
Vellore Institute of Technology*

*Corresponding author

INTRODUCTION

In ¹ proposed an IOT smart architecture for healthcare systems to monitor and track the patients inside the hospital automatically through IOT, the architecture named as a smart healthcare system (SHS) that relies on different technologies with that to smart phones, Radio frequency identification (RFID) and Wireless sensor networks (WSN). The proposed architecture is able to collect real time data of patient health and based on some physiological parameter through a hybrid sensing network (HSN) with an ultra-low-power that is connected with 6LoWPAN nodes integrating with RFID UHF (ultrahigh frequency) capabilities. The collected data is transferred to a control center where with an advance monitoring system access the equipment's easily through internet. In ² from the introduction of 'm-health' which is defined as medical sensor, mobile computing and communication technologies for healthcare that makes the advancement in e-healthcare systems. The author has introduced a new novel model of 4G health which represents a view on the recent development with future implementation challenges on perspective of m-healthcare systems, as m-healthcare the development of 4G health systems with future service and applications makes the healthcare data transferring optimally.

Previous work

In ³ has proposed a data model that is semantic which stores and interprets the data that is derived from the IOT devices, then for accessing the data a method based on resource categorization has designed. For emergency medical they have demonstrated how to collect the data, integrate it and then interoperate IOT data that will provide support during emergency medical services. The meta-data model for ubiquitous IOT data accessing needed some function in order to access the data such as accessing the data in heterogeneous formats with building real-time applications and able to access the big data. In ⁴ has proposed an intelligent home-based platform that involve an intelligent based medicine box (iMedBox) communicates through Passive Radio frequency identification (RFID) connects with devices with flexible wearable device with bio-medical sensor to monitor the patient health are reports to the main system, in-home healthcare services for service and user experience. In ⁵ has surveyed on RFID usable in healthcare system with efficient energy saving and low cost, it is presented as state of the art of RFID for application to gather information form the devices such as data from sensors, temperature and other. In ⁶ Radio frequency identification (RFID) has become one of the major technologies used in the healthcare systems here to satisfy the security requirements of RFID that used in IOT for healthcare systems requirements have been discussed and presented a review on ECC-based RFID authentication schemes and found three schemes that will suitable for healthcare systems in performance and security. In ⁷ has surveyed on Internet of things (IOT) in industrial perspective as far they have surveyed about one hundred IOT smart solutions in marketplace that was

developed by small, medium and large enterprises. Based on the domain the solution are discussed under five categories such as smart city, smart home, smart environment, smart wearable, and smart enterprise. The paper has surveyed on the internet of things from the market perspective, very popular and innovative solutions for IOT are examined terms of context-aware technology perspective, the survey intended as a conceptual framework and guideline for research and development on internet of things. In ⁸ IOT is open to many challenges in term of data security and the individual's privacy, here they proposed a distributed architecture for IOT system with a authentication scheme of anonymity that ensures the safety of data such as sensor location, attacks on devices like cloning and so on. The proposed scheme has four indispensable components that maintain anonymity. In ⁹ has surveyed on Internet of things and overviewed on technical details that help to implement the IOT technologies, application and protocols, with the market opportunity for IOT governments expecting 212 billion entities that will be deployed worldwide in the end 2020. A three layered architecture developed for IOT for flexible layers such as application layer, network layer, and perception layer. In ¹⁰ for Parkinson's disease an approach that is on distributed platform as mentioned in the paper IOT devices upload the through smart phones to medical database and reviewed about the existing technologies in IOT and their technical platform that will used to cope the Parkinson's disease. In ¹¹ has introduced a timely manner and wireless communication stack to meet the power efficiency criteria for reliability and internet connectivity, so a relate key embodiments of power efficient IEEE 802.15 mac layer that enable connectivity universal for Internet of things. In ¹² for monitor the entire life cycle the author has presented an architectural framework for robust and efficient for e-healthcare systems, with the security threats of the existing systems is discussed and challenges are designed to achieve patient centric monitoring and high quality. In ¹³ has reviewed the recent advancement in internet of things (IOT) technology that can be used in healthcare applications, several prototypes results shown and several demo system integrated with radar systems are measured with reliable results. In order to ensure integrity in ¹⁴ each user wearing sensors from different location sends the sensor information to the health care station from health care station the information are forwarded to the specialized physician based on the compliance of each user. The medical server will send a key to the user encrypt the sensor information using the key and get the guidance of the specialized physician. If needed the physician can inform the emergence care to reach the user. In this paper they have proposed an algorithm and implemented to encrypt the information using a key, send the information to the health care center. In ¹⁵ Patient's real-time vital diseases symptoms are detected through wireless body area network (WBAN) and then analyzed the collected data in healthcare cloud platform with patient's history. Here, the mental statuses of patient's have been modeled as the discrete set of states of hidden Markov model (HMM),

and stored history of patients in cloud are considered as the observations of HMM. Subsequently, machine learning algorithm Viterbi is applied to find the mental state sequence and monitor suicide risk of mentally disordered patients. In¹⁶ an architecture is presented to real time monitoring based on IOT is proposed that the various clinical device used to measure the vital sign is replaced with the sensors and the information sensed is processed by the gateway called monere which is located in patients house. Monere act as a gateway to connect to internet. The movital is a module that is used to integrate the various devices that does not follow a common standard. In¹⁷ intelligent package and intelligent medical management a system is proposed in which there is imed box that record the medicine in box and register the new medicine and make a statistic on it. Each medicine is tracked and identified by RFID tags in it. The imed box can download the prescription from the hospital and make a reminder to user to have medicine. The patient activities such as taking the medicine, skipping their medicine, disposing their medicine without knowing are recorded and the user cannot open the imed box until or unless the open command given by the imed box. To enable all the things said above it has a wireless internet connection (Wi-Fi), display screens and speakers to alert the user. In¹⁸ obtaining heartbeat information with pressure cushion is a good method, which can collect heartbeat information without impacting people action. A new method to obtain heart rate by pressure cushions recording body vibrations with body sensor network. The rhythm and strength of heartbeat can also be noted because of changes in human heart rate. A weak pulse

be caused by heart disease or emotional state changing. In¹⁹ a hospital zone to render quality of service the system consists of a mobile-care device, which is responsible for capturing and wirelessly sending the patient's ECG data, a wireless multi-hop relay network (WMHRN) that is in charge of relaying the data sent by the former, and A residential gateway (RG), which is responsible for gathering and uploading the received ECG data to the remote care server through the Internet to carry out the patient's health condition monitoring and the management of pathological data. an emergency alert service using short message service (SMS), based on the detection of abnormal variation of HR, is also used in the RG to further enhance the healthcare service quality. The author's proposes an integrated methodology where mobile and Cloud plays a vital role in storing patients data's in case of emergency situations. The role of emergency situations in case rural healthcare will be more useful in case of this proposed system²⁰.

Proposed system

We propose healthcare system architecture for a wearable device to store data in healthcare cloud and give access to hospitals and doctors to monitor their health. Either in-patient or out-patient monitoring the health data is an important aspect that must be done regularly, the patient wear the wearable sensors like actuators and these devices will connect to the patient mobile and synchronize with the healthcare cloud. These data are used to monitor the patient's daily activities and their exercises like heart rate, pulse rate and so on.

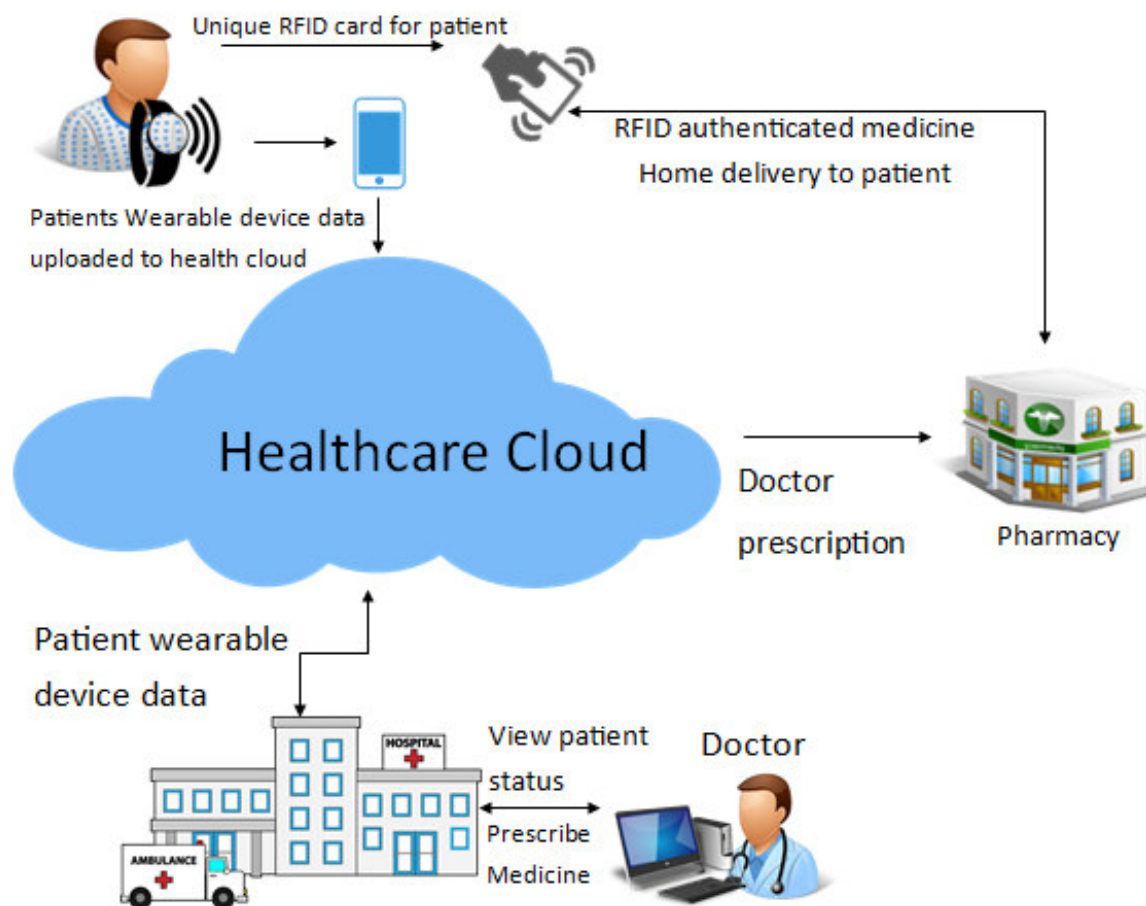


Figure 1
Wearable Healthcare system architecture

Healthcare cloud synchronize with the patient mobile with his unique patient_id and stores the data that is provided by the wearable healthcare devices, patient registered with specific hospitals and provides access to the doctors to view the records. Healthcare cloud has pharmacy registered with it and the patient specifies a pharmacy nearby to his location. The pharmacy APP is designed to locate the nearby pharmacy. A Cluster Head where all the pharmacy are registered with the healthcare cloud. The doctors prescribe medicines to patient the drug details are sent to the pharmacy for delivery to the respective patients or the neighbors who are identified by the unique patient_id. With the available the drugs can also be delivered to the patients at home with the help of Radio frequency identification (RFID), transaction and online payment is much easier depending up on the provider. RFID card will be given to each patient for his unique patient id with that patient can buy medicines for his prescription provided by doctor and it has the basic details of the patient. Hospitals with the help of an AGENT with the facilities available and equipment's which help the doctor's to monitor the patient health and fix the appointment for the patient if needed, in case of

emergency the wearable device reports about the patient condition and emergency needs, it can also help to contact the ambulance which are near to the patient location and reach to the patient location for a faster treatment. Doctor's view the patients data which are stored from the device to the healthcare cloud. The Doctor's communicated to the hospital or vice versa is done periodically to monitor the patient health and to check his status.

CONCLUSION

Healthcare system is developing tremendously but the technology measures are challenging where outcomes will be reached throughout if it is used properly. A suitable solution solves many problems in case of emergency, redundancy of data's where this system saves many lives and unusual or illegal use of drugs can be controlled. In real time our proposed solution helps the doctor to monitor the patient health condition from the hospital. RFID provides patients data security

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