

PHYSICAL HEALTH RECORD SYSTEM OF A PATIENT USING CLOUD COMPUTING

DR.S.S.Lomte¹ Ms. Jyoti Madhukar Shinde²

Professor, Computer Science and Engineering, EESCOE&T, Aurangabad, India¹

Student, Computer Science & Engineering, Everest College of Engineering & Technology, Aurangabad, India²

Abstract— The Electronic Health Record System is used to enable the patient to get access their own medical data. This Medical data is coming largely from different clinical institution then there is no any way for the patient itself to control and maintained their own medical data or record. Patient or their guardian may desire to keep record of their medical history such as observed medical symptoms or measurement that facility may not be available in the EHR. Also Clinical decision taken by doctors without patient's previous medical history can be error full and even be harmful. Personal health care system which contains clinical data created by and for health professional for providing health care. Data about the patient resides in a health care provider's system but in PHR it is usually owned and controlled by the patient.

We propose a physical health record system based on cloud that allows to medical practitioner to constantly monitoring patients and create capability for dynamic creation of Clinical Document Architecture (CDA) document from a mobile device. A medical history stored in PHR can provide details of necessary information at a glance and there is no need to do investigation repeatedly which reduced the cost of repeated testing. To access current health record regarding major and critical diseases we used CDA document .It facilitates handover procedure. Also by using easy uploading module and decision support system we keep constant monitoring on medical data.

Keywords:- ABE(Attribute Based Encryption), CDA(Clinical Document Architecture), EMR (Electronic Medical Record), EHR(Electronic Health Record), GCM (Google Cloud Messaging), HKS(Knowledge Sharing System), PCP(Primary Care Physicians), PHR(Personal Health Record),PMD(Portable Medical Devices), XDS(Cross-Enterprise Document Sharing).

I INTRODUCTION

Now a day's health issues rate increases fastly. Every Person suffers from many Health related problems. so it is necessary to have an effective and efficient PHR system which allows patients to record Their own medical data and information related to the care of patient which is

maintained by patient. Individual's medical history is accessible online accurately and completely.PHR service allows a user to manage, create& maintain Her PHR like patient reported outcome data, lab results, allergies and drug reactions, cronic diseases, family history, illness and hospitalization, imaging reports like X-ray, lab test results, prescription record, surgeries, vaccinations, Observation of daily living etc. Data from devices like Smartphone from one place had made the storage and sharing of the health related data pf the patient more efficiently.

The PHR could be seen as the solution for clinical institution i.e health care providers which provide individual medic his/her al history. The patient record should be maintained with high privacy and security. The security schemes are used to protect personal data of the patients from public access. In physical health record system data may be entered by patient directly by typing into field or uploading or transferring data from a one file to another or from another website.

Our Paper is organized as follows: Chapter I explains about Physical Health Record System Introduction, Chapter II contains objective related to project. In Chapter III we discuss about Literature survey for physical health record system related papers. Chapter IV contains Module used in our proposed system Chapter V contains System Architecture details. It includes the description of system architecture, diagrams, figures which are necessary for the implementation of the proposed system. In chapter VI Applications and chapter VII concludes our discussion.

II OBJECTIVES

Physical health record system can be called as lifesaver as it gives in emergency the information like disease we being treated, medication taken for that different drug allergies, how to contact our family doctor.

- Physical health record enables us to easily continuously accessible and available.
- Multiple users can view their data and user friendly interaction such as i/p and o/p of data.
- It will respond quickly.
- Data kept confidential and secure.
- Patient can manage share control their own data ,update data into third party i.e cloud data center

Personal Health Record system stored electronic record of health-related information managed, shared, and controlled by the individual. PHR has been used in many areas such as knowledge sharing, continuity of care, preventive care, and clinical decision support. PHRs allow individual to keep patients health record in one place instead of paper based files in different doctors' Offices.

PHR can benefit clinicians to give better treatment and decisions by providing continue data. In case of emergency condition PHR can quickly provide critical information of the patient to provide diagnosis or provide treatment.

III LITERATURE SURVEY

M. Vijayapriya* and Dr. A. Malathi in their paper does the work related to improve the scalability. Here one to many encryption methods can be used such as ABE[7]. There exists a central server where owners place their own sensitive medical data, and attempted by the users to gain access. PHR documents can be accessed by users by the server in order to read or write to someone others PHR, a user can have simultaneously have an Access to multiple owners data which needs Multi-Authority Based Encryption (MA-ABE). To provide efficient key management secure access of PHR in a patient centric manner is the main goal of this system.

Vishnu Dahatonde, Ashish Jadhao, Akash Bhardwaj, Namish Diwate, Aaradhana Deshmukh One can maintain his PHR from his childhood and can use it anytime using Emergency Medical System (EMS) services which can be provided in various emergency situations. These services may include calling an Ambulance service till patient gets discharge from hospital. They develop a system that maintains PHR and provide EMS using cloud environment. It provides asynchronous notification using Google Cloud Messaging (GCM) which is a lightweight mechanism that uses push messaging technology for notification.[6]

S Vidya K Vani D Kavin Vidya describes the framework which provides efficient key management secure access of PHR in a patient centric manner is the main goal of this system.

The user data must consist of those users who make a access based on their professional such as medical researchers, nurses, doctors role.[3] Chang-Ji Wang^{1,2}, Xi-Lei Xu^{1,2}, Dong-Yuan Shi^{1,2}, Wen-Long Lin^{1,2} in this paper, propose a patient centric cloud based secure PHR system, which allows patients to securely store their own PHR data on semi-trusted cloud service providers & share selectively their PHR data with large number of users, including health care provider like nurses ,doctors, family members or friends. To reduce the key management complexity for users and owners, they divide the users on

cloud based PHR system into two security domains which are public and personal domain. Unlike from previous cloud based PHR system, PHR owners can encrypt their PHR data for public domain using the cipher text policy attribute-based encryption scheme. Only authorized users who satisfy the specified cipher text policy or who identifies dedicated identities can be decrypt the encrypted PHR data.

Soumya Parvatikar, Puja Prakash, Richa Prakash, Pragati Dhawale, S.B. Jadhav's proposed in this paper that to work in attribute based encryption and cryptographically enforced the access control for outsourced data. To improve upon the scalability of the above solution is to use one-to-many encryption method such as ABE [8]. Clementine Gritti¹, Willy Susilo¹, Thomas Plantard¹, Kaitai Liang² Wong³ promotes the issue of empowering patients using their health records has been well accepted in the community which is known as the personal health record i.e. PHR. We aim to provide the patients with the power of the cloud to conduct the outsourced work more efficiently. [9]

IV MODULES USED

In our proposed system we have three Users Modules Admin, Physician, Patients as shown in Fig1 which have different access and control for viewing data adding blocking patient, physician, updating profile of patient adding Treatment information etc.

A. Admin module

This Module is used to control all the process. Admin is a super user who creates the PHR data owner user and maintains the cloud server's configuration. Admin has the writes to add, edit or delete any type of data owners.

After logged in admin perform functions like Update profile of patient, Add/Block patient or physician, View health profile of patient or physician.

B. Patient module

In this module patient a person i.e. data Owner who will store the files in a cloud which in turn accessed by the authorized data users .i.e physician. Patient who will upload all the files in the system.

After logged in Patient module perform functions like Update profile, view Diagnosed report, add health Issues, View health profile on PC, View health profile on Mobile, View Treatment Info logged out.

C. Physician module

In this module physician i.e. data access user comes from different domains like Hospital, Insurance, Friends, Nursing homes, Test labs, Private care centre, family Doctor etc. After logged in physician perform functions like Update profile, View Diagnosed Report, view symptoms, set Disease, Add Treatment Info, Update patient health Profile.

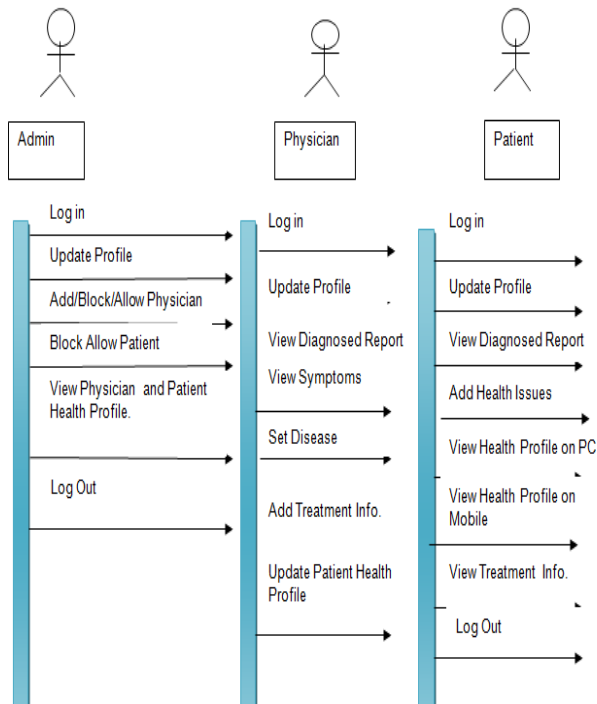


Figure 1 Sequence Diagram

V SYSTEM ARCHITECTURE OF PROPOSED SYSTEM

A. System Architecture

PHR architecture has two main components Data i.e information collected, stored exchanged and analyzed by the PHR, Infrastructure i.e the platform that handles data storage, processing and exchanged. PHRS allow patients to enter their health related data into their health care providers EHR system so patients able to show their own data any time anywhere can transfer much more to the patient than stand-alone PHR [2] allow patients to keep together their entire medical history in one place. The health related Information that patients may store for their personal use may also be valued by healthcare providers can share any time. Mostly Shared medical records are universally acceptable. A personally controlled PHR, which is connected with a primary care EMR, can manage communications for the appointments and prescriptions at acceptable cost also.

As shown in Figure 2 The first step is to collect personal medical data including measurements periodically and upload to the repository in the cloud. The medical data can be any personal medical data that is meaningful to each individual such as lab test results, CT-Scan images, medication, chronic disease, observed medical symptoms such as shortness of breath, or scanned immunization record.

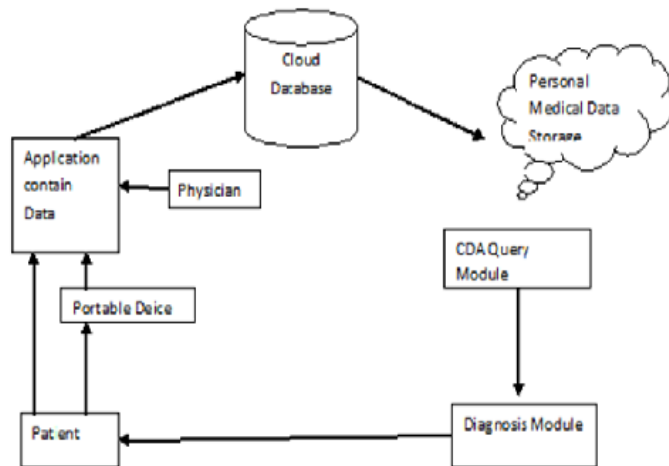


Figure 2 Architecture of Personal Health Record System

Most of medical data such as the measurements from portable medical devices (PMD), observed symptoms, medication, etc. may be included in CDA documents. When a CDA document is uploaded to the cloud, the CDA query module is used to retrieve relevant data from CDA files and convert health related data i.e observed symptoms in a text file so it can be used with the diagnosis module. The diagnosis module takes the output from the CDA query module as input for the analysis. It compares the observed symptoms and other measurements against facts such as major symptoms and minor symptoms of diseases.

In this system there are three types of end user Admin, Patient, physician. All three users has to access the application running in cloud application server with proper URL showing on web browser. Each user has his own unique user id and password to enter their data to perform all functions comes under them. At a time any number of users can able to access the application i.e at a time more than one user can be handled by application.

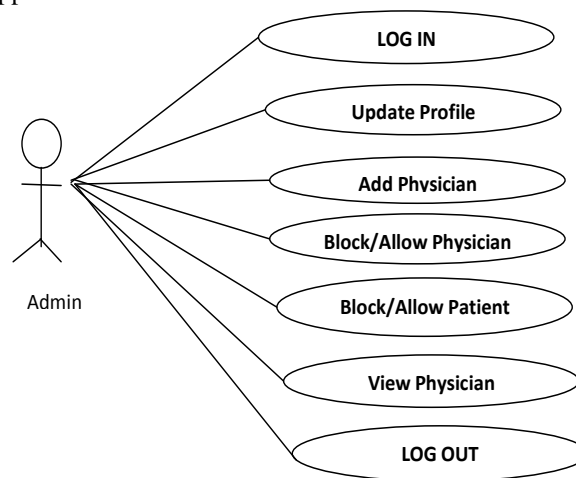


Figure 3 Use Case Diagram

As shown in Figure 3 use case diagram admin can login into system and update profile of patient add physician also able to



allow and block physician and patient to restrict the access view physician list and log out successfully also.

B. Algorithm Used: Text Classification & Text Association Rule:

Text classification is the process of document classifying into predefined categories based on their contained decision making processes which is automated assignment of the natural language text. The text classification is the process which is primary requirement of text retrieval systems, to retrieve texts in response to a user query and text understanding systems which transform text into for producing summaries answering questions and for extracting data.

The text Association rule mining finds intersecting association or correlation relationships between a huge set of data items. Decision making processes. For decision making processes the discovery of interesting association relationships among huge amounts of transaction records is useful.

VI APPLICATION

Physical health record system is useful at Home Care center, Nursing Home, Private care facility where constant monitoring and control are needed. we can upload data files on Google drive ,drop box and by using url anybody can access data for particular patient.

VII CONCLUSION

In this paper, we proposed a personal health record system (PHRS) that is to self monitor and control personal health. Unlike clinical institution centric health record, entire medical data is managed and controlled by individual patient or their guardians. The PHRS are useful at home care, nursing home, or private care facility where constant monitoring and control are needed. The proposed PHRS satisfies important properties as accessibility, availability, reliability and confident ability. The cloud based repository may be shared with the clinicians when needed. The PHRS aimed to build long term personal medical history.

REFERENCES

[1] Li-Hui Lee, Yi-Ting, Ean-Wen Huang, Der-Ming Liou, "Design of a Personal Health Record and Health Knowledge Sharing System Using IHE-XDS and OWL", J Med Syst (2013) 37:9921 DOI 10.1007/s10916-012-9921-4
 [2]. Tang PC, Ash JS, Bates DW, et al. Personal health records: definitions, benefits, and strategies for overcoming barriers to adoption. JAm Med Inform Assoc 2006;13:121-5
 [3] S Vidya K Vani D KavinVidya" Secured Personal Health Records Transactions Using Homomorphic

Encryption In Cloud Computing"International Journal of EngineeringResearch& Technology (IJERT) Vol. 1 Issue 10, December- 2012

[4] Chang-Ji Wang^{1,2}, Xi-Lei Xu^{1,2}, Dong-Yuan Shi^{1,2}, Wen-Long Lin^{1,2} "An Efficient Cloud-based Personal Health Records System Using Attribute-Based Encryption and Anonymous Multi-Receiver Identity-Based Encryption" 2014 19th International conference on P2P, Parallel, Grid, Cloud and Internet Computing

[5].M. Vijayapriya, Dr. A. Malathi " On demand security for personal health record in cloud computing using encryption and decryption cryptography" International Journal of the Advanced Research in Computer Science and Software Engineering (IJARCSSE) Volume 3, Issue 9, September

[6] Vishnu Dahatonde, Ashish Jadhao, Akash Bhardwaj, NamishDiwate, AaradhanaDeshmukh "Personal health record and emergency medical services"International Journal of Engineering Research & Technology (IJERT)Vol. 3 Issue 1, January – 2014

[7] Ming Li, Shucheng Yu, and Wenjing Lou, "Scalable and secure sharing of personal health records in cloud computing using attribute based encryption", IEEE Transactions On Parallel and Distributed Systems 2012.

[8] SoumyaParvatikar, Puja Prakash, Richa Prakash, PragatiDhawale, S.B. Jadhav"Secure sharing of personal health records using multi authority attribute based encryption in Cloud computing "International Journal of Technical Research and Applications e-ISSN: 2320-8163,www.ijtra.com Volume 1, Issue 5 (Nov-Dec 2013), PP. 50-52

[9] Clementine Gritti¹, Willy Susilo¹, Thomas Plantard¹, Kaitai Liang², and Duncan S. Wong³" Empowering Personal Health Records with Cloud Computing"

[10] Walker J, Ahern DK, Le LX, et al. Insights for internists: "I want the computer to know who I am". J Gen Intern Med 2009; 24:727-32 [PMC free article] [PubMed]