CRS Model Design for Personal Health Records
Protection with BIG DATA Analysis

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Abstract: Big Data is the hottest trend in the IT technology, the capacity of the data has increased the terabytes to Zeta-byte. In healthcare field huge amount of data are produced in every days. This data is maintaining and protecting are complex problems. Even each general hospital is getting a large amounts of information stored and managed. In this case, there are very few studies on the methods to utilize the clinical information and medical research details efficiently and effectively. For the efficient analysis and utilization of medical BIG DATA stored in eRecord i.e. EMR (Electronic medical record) data. In this regard, in this paper, medical information, medication information, medical test results and allergy information were implemented up to Entry level using Clinical Document Architecture (CDA), the international medical standards, Health level 7 (HL7) and CRS (Care Record Summary) integrating these information was created reliable and Securable Electronic medical Record are Implemented. This paper mainly refers to patients medical eRecords are sharable between hospitals.

Keywords: Big Data, CRS, EMR, CDA, HL7.

I. INTRODUCTION

Big data in healthcare refers to electronic health data sets so large and complex that they are difficult (or impossible) to manage with traditional software and or hardware. Using big data concept solves these problems easily. With the recent development of IT technology, large amount of data ware exposing in every year. In medical field huge amount of data are produced in every days. This data is maintaining and protecting are complex problems. Even each general hospital is getting a large amounts of information stored and managed. In this case, there are very few studies on the methods to utilize the clinical information and medical research details efficiently and effectively. For the efficient analysis and utilization of medical BIG DATA stored in eRecord i.e EMR (Electronic medical record) data.

In this paper, hospitals medical care information, medication information, medical test results, side effects and allergy information were implemented using Clinical Document Architecture (CDA) method, the international medical standards, Health level 7 (HL7) and CRS (Care Record Summary) integrating these information was created reliable and Securable Electronic medical Record are Implemented using CRS with CDA and HL7 formats. This paper mainly refers to patients medical eRecords are sharable between hospitals.

II. OVERVIEW OF BIG DATA

Big Data is the hottest trend in the business and IT world right now. We are living in the age of big data where due to the rapid development in the computational power and the WWW are producing an overwhelming amount of data, which has led to the need of a change in the existing architectures and mechanisms of the data processing systems. Up to 80 per cent of health data is unstructured as documents, images, clinical or prescribed notes, etc. Big Data’s Three V’s are given bellow

- Velocity – (Speed) how fast the data is entering the systems
- Variety – (Different data formats) includes all types of structured and unstructured data
- Volume – (Size of data) the potential data capacity of terabytes to petabytes.

III. EXISTING SYSTEM

The previous failed in Data persistence, durability and security as well as high computational power is of utmost importance to achieve the goal. Hospitals can’t share patients record each other. Regulatory risks are related to data encryption and prevention of unauthorized access, keeping privacy and confidentiality of data. These are the most important requirements of Health Insurance Portability and Accountability Acts (HIPAA), each of these should be fulfilled in this paper.
IV. PROPOSED METHOD

To achieve the efficient analysis and utilization Electronic medical records are stored in BIG DATA. The information stored in the EMR it includes personal information like patients Name, Address, Mob, mail ID, DOB, medical information, surgery results, side effects, referred Doctor information, etc. these information are stored in one single file i.e CRS eRecord. This paper mainly refers to patients medical eRecords are sharable between hospitals.

V. DESIGN MODULES

A. Authentication

The main function of this module is to create interface between application and user. The authentication of the username and password is carried out. If user is authentic then he get access to his record.

B. CRS

CRSs are made from clinical data stored in the medical record system of each hospital. These CRSs are stored and managed by hospitals. The information stored in the EMR it includes personal information like patients Name, Address, Mob, mail ID, DOB, medical information, surgery results, side effects, referred Doctor information, etc. (The CRS list shown in the Table 1) these information are stored in one single file i.e. CRS eRecord. Below Figure 1. shows the patient’s medical information uploading to Database.

C. Information sharing

The medical information, medication information, medical test results and allergy information were sharing one hospital to another hospital using encryption and decryption method when & where they need it. Below figure 2 shows the patient’s medical eRecord sharing between hospitals.

D. Electronic Medical Record

An electronic medical record (EMR) is a digital version of a paper chart that contains all of a patient’s medical information, medication information, medical test results and allergy information. An EMR is mostly used by providers for diagnosis and treatment. Electronic health records (EHRs) go beyond the data collected in the provider’s office and include a patient history. A patient’s medical eRecord delivered by mail to specialists and hospital. Table 1. shows the patient care record list. Below Figure 3. shows the sample medical eRecord (care record summary).

<table>
<thead>
<tr>
<th>CRS Details</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient header</td>
<td>Includes Name, DOB, Gender, Address, Mob, mail ID, Blood group, etc.</td>
</tr>
<tr>
<td>Medication Information</td>
<td>Name of Condition, Medical notes, Related records,</td>
</tr>
<tr>
<td>Allergies &amp; Side effects</td>
<td>Allergy by (Drug, Environment, Food), Allergy Info, Reactions info</td>
</tr>
<tr>
<td>Surgery Details</td>
<td>Name of surgery, Results, Surgery notes</td>
</tr>
<tr>
<td>Referred Doctor</td>
<td>Name of Doctor, Hospital Name, Contact No.</td>
</tr>
<tr>
<td>Visit History</td>
<td>Admit and Discharge Information (Date, month, year, Time)</td>
</tr>
</tbody>
</table>

E. The HL7 Clinical Document Architecture

CDA is a flexible standard and is unique in that it can be read by the human eye or processed by a machine. HL7 is a standard format for medical field records. Current society hospitals are following CRS with CDA and HL7 formats.
VI. CONCLUSION

The personal health record system needs security against attackers and hackers. Scalable and Secure sharing includes basic securities to protect the information from unauthorized access and loss. This paper proposed the new approach for existing PHR system for providing more security using Encrypting technique. Hospitals update and stored patient’s Medical information (all info available in one file) to the database using CRS model. Using CRS model clinical document makeup standard, securable and enabled efficient medical treatment through exchange of medical information from one hospital to another hospital.

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REFERENCES