

Security Enhancement of Health Information Exchange Based on Cloud Computing System

D. Padmini Bai¹, P. Preethi M.E.²

¹2nd year ME, Department of Computer Science and Engineering, Kongunadu College of Engineering and Technology, Tamilnadu, India

²Assistant Professor, Department of Computer Science and Engineering, Kongunadu College of Engineering and Technology, Tamilnadu

Abstract: *To describe our CDA document generation and integration Open API service based on cloud computing, through which hospitals are enabled to conveniently generate CDA documents without having to purchase proprietary software. CDA document integration system integrates multiple CDA documents per patient into a single CDA document and physicians and patients can browse the clinical data in chronological order. In proposed work is providing security to the CDA document and a unique identity (id) is generated and given to the patients for avoiding the interchanging and duplication of medical reports. Every detail in CDA Document is Encrypted and stored in Database. All Details in CDA Document is secured using various Security Algorithms.*

Keywords: CDA, cloud computing, software as a service

1. Introduction

Health Level Seven has established CDA (Clinical Document Architecture) as a major standard for clinical documents. CDA is a document markup standard that specifies the structure and semantics of 'Clinical documents' for the purpose of exchange. The first version of CDA was developed in 2001 and Release 2 came out in 2005. Several projects adopting CDA have been successfully completed in several countries a difficulty arises still when additional hospitals start employing the CDA document arrangement since the data dispersed in dissimilar document are rigid to administer. In preceding project, we depict our CDA document production and addition Open API service supported on blur computing; through which hospitals are enabled to expediently produce CDA documents without having to buy proprietary software .our CDA text addition scheme integrate manifold CDA papers per enduring into a solitary CDA text plus physicians in addition to patients be able to look through the scientific information in chronological arrange. In this scheme we are as long as safety toward the CDA file plus a sole individuality be generated and known toward the patients meant for avoiding the interchanging and repetition of health check news. Our scheme of CDA article age group and mixing is based on blur computing plus the check is obtainable in unlock API. Developers by unlike platforms therefore are able to use our scheme to improve interoperability.

The Electronic Clinical Communication Implementation (ECCI) is a programmer enlarged by the NHS Scotland to make sure that staff contributes to suitable data information about patients automatically. The major aspire is to crash the barriers sandwiched between GP and hospitals examines by enabling patient data to flow among dissimilar healthcare subdivisions employing electronic release summaries.

Conversely as seen in pilot studies by NHS Scotland still despite the fact that the electronic delivery technique of discharge Summaries has a lot of competition over paper the consequences of this reviews propose that the content of the discharge summary is more important than delivery method. The report concludes that the greater important requires to

be placed on the averages, quantity and quality of discharge summary content.

2. Existing System

CDA generation software is not centralized and it is platform dependant. So an open API is developed to process the CDA document. For Example, if the document is create under Windows platform, Separate cost is needed to process the document in Java platform. Moreover, duplicate records for same patient can be generated. Medical Record is confidential about the Patient. But the security to the Medical record is not provided. Our CDA document generation and integration Open API service based on cloud computing, through which hospitals are enabled to conveniently generate CDA documents without having to purchase proprietary software. Our CDA document integration system integrates multiple CDA documents per patient into a single CDA document and physicians and patients can browse the clinical data in sequential order. Developers using different platforms thus can use our system to enhance interoperability. The key literature review requirements and associated goals were identified and a detailed literature review was carried out. A discharge summary is a document produced during a patient's stay in hospital and issued when or after a patient leaves the care of the hospital. The primary recipients of the discharge summary are healthcare providers who were providing the patient care prior to the hospital admission and will provide care to patient after discharge.

3. Disadvantage

There is a possibility of interchanging of patient's document in case of lag knowledge about the documentation process. Missing of documents while collecting it from a patient. The healthcare providers don't take care to the patient after discharge. The HIS development platforms for hospitals vary so greatly that generation of CDA documents in each hospital invariably requires a separate CDA generation system. Also, hospitals are very reluctant to adopt a new system unless it is absolutely necessary for provision of care. As a result, the adoption rate of EHR is very low except for

in a few handful countries. Unfortunately for now, a solution that integrates multiple CDA documents into one does not exist yet to the best of our knowledge and there is a practical limitation for individual hospitals to develop and implement a CDA document integration technology.

4. Proposed System

In this scheme we present a CDA document generation system that generates CDA documents on different developing platforms and a CDA document integration system that integrates multiple CDA documents scattered in different hospitals for each patient. CDA Software is designed and run under browser support; the documents are to be stored in the server. So it is centralized. CDA document is generated in XML format so it is easy to feed in any platform. So it is platform Independent. We providing each Patient with Unique Id so that, Duplication of CDA document for Single patient is restricted. Doctor can download the Patient CDA document by providing their Doctor's ID and Patient's unique Id and Password. After Login, Doctor can View the health check history report and illness History and it's equivalent Prescriptions and Treatments in complete Report manner. Added to that, Doctor can view the list of sickness or Abnormalities the patient is facing. The Doctor can view the Prescription in illness wise or Clinical wise. So the Doctor knows how to sight the instruction in sickness intelligent or scientific shrewd the novel updates in the CDA document reflected in the cloud server. For Security Purpose, All the data in CDA document is Encrypted while storing in the Cloud Server.

5. Advantages

- In this service is provided for free at low price to hospitals, existing EHR are more likely to consider adoption of CDA in their practices.
- Interoperability between hospitals not only helps improve patient safety and quality of care but also reduce time and resources spent on data format conversion.
- Data is encrypted so even server admin cannot view the data and also data is Secure.

6. Architecture Diagram



Figure 1: Architecture Diagram

7. Module Description

- 7.1 Doctor Registration
- 7.2 Patient Registration
- 7.3 Create CDA Document
- 7.4 Upload CDA Document
- 7.5 Download / View CDA Document

7.1 Doctor Registration

In this module, Doctor is intent to provide their personal and professional details. Separate User ID and Password is provided. Doctors Id can be verified.

7.2 Patient Registration

In this module, Doctor get the personal details and their Medical Details and others details. Each patient is provided with unique Patient ID and Password. By using this Patient can view or Download their CDA Document.

7.3 Create CDA Document

CDA Document is generated by Doctor after diagnosing the patients. CDA Document contains CDA Header, CDA Body, CDA Footer. CDA Header contains Creation of CDA Document, Date of Creation. A CDA Body file contains Prescription Details, Diagnosis Details. CDA Footer Details contains last updation of CDA Documents.

8. Data Flow Diagram

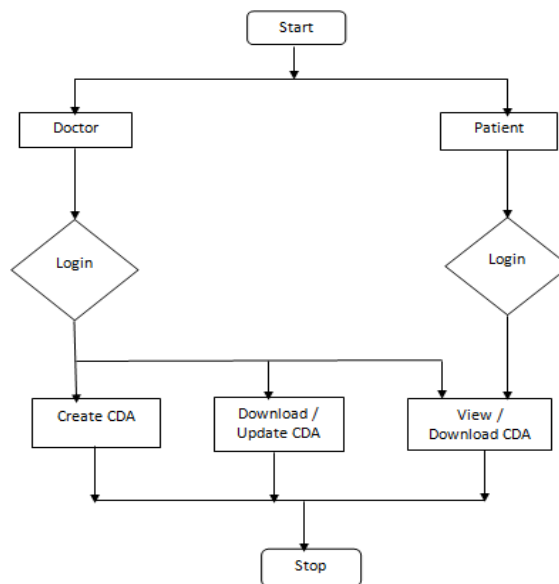


Figure 2: Data Flow Diagram

9. Output and Result

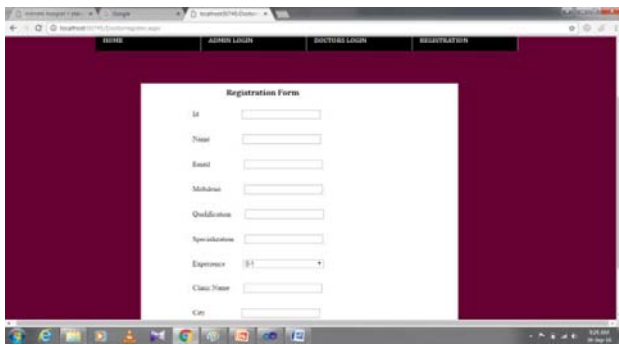


Figure 3: Doctor Login

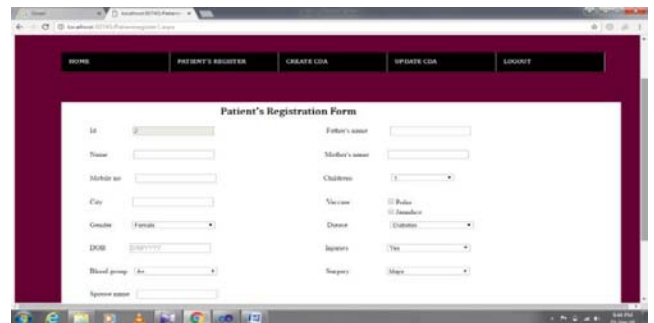


Figure 8: Patient's Registration



Figure 4: Admin Login



Figure 9: Create CDA Document

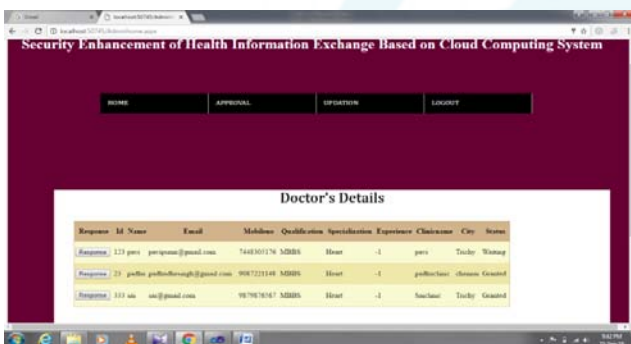


Figure 5: Doctor Request

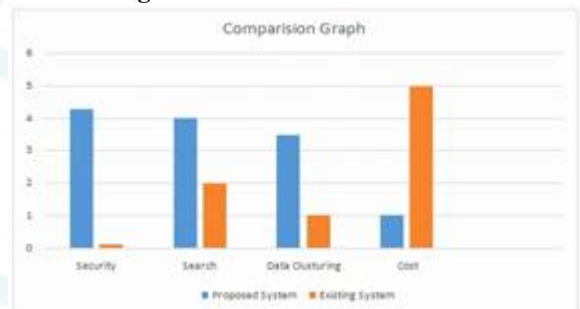


Figure 10: Comparison Graph

10. Conclusion and Future Work

The CDA document format for clinical information in normal design to promise interoperability between hospitals, a large number of HIE projects that use the CDA file arrangement have been under taken by lot of countries. Our cloud computing based CDA production and combination structure has a few articulated advantages over other existing projects. CDA file generation and integration system based on cloud server is more useful over accessible services for CDA file if the variety of CDA file increases. **Future work** is to provide a security in upload a CDA Document and Download /View the CDA Document and also the challenge to improve security while ensuring sensible superiority of service even with numerous users logged on the system at the similar time.

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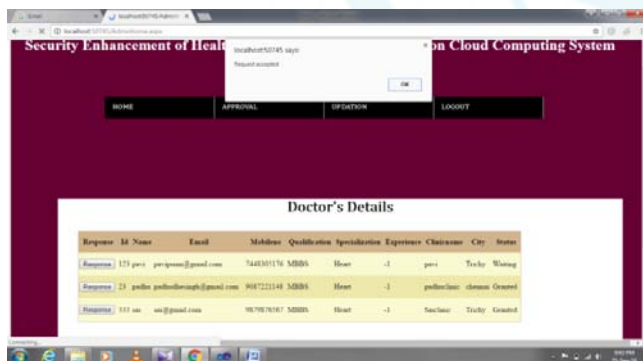


Figure 6: Doctor Request Accepted



Figure 7: Doctor Login

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