

National Electronic Medical Records integration on Cloud Computing System

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Abstract

Few Healthcare providers have an advanced level of Electronic Medical Record (EMR) adoption. Others have a low level and most have no EMR at all. Cloud computing technology is a new emerging technology that has been used in other industry and showed a great success. Despite the great features of Cloud computing, they haven't been utilized fairly yet in healthcare industry. This study presents an innovative Healthcare Cloud Computing system for Integrating Electronic Health Record (EHR). The proposed Cloud system applies the Cloud Computing technology on EHR system, to present a comprehensive EHR integrated environment.

Keywords: Cloud Computing, Electronic Health Record, Integration

Introduction

EHR is an electronic record that stores patient's clinical history information in a health record system, accessible and managed by care providers [1]. Patients registered in independent EHR systems in different hospitals suffer from transferring their files to other hospitals. Such difficulties can be defeated by integrating EHR systems in healthcare institutions. But EHR integration (the process of patient information sharing among health care providers and exchanging them over the internet with other healthcare providers) remains a huge challenge and a serious concern since it is exposed to theft, security violation, and standardization difficulties [2].

Proposed Cloud system for EHR integration

A new healthcare cloud system has been proposed for unification and integration of EHRs. The proposed system utilizes all features of cloud computing combining them with EHR system features to gain one unified central system that controls electronic health records in the cloud infrastructure. It represents the solution to all hospitals in the region or country with an opportunity to use and share EHR.

System Components:

1. *Cloud's Central Database* that represents the data repository of EHR's.
2. *Unifier Interface Middleware*: It remains in the cloud and responsible for masking the heterogeneity and standardising the communication between different EHR systems and the cloud EHR system.
3. *The Cloud web portal*: It issues request messages and receives responses from the cloud system via secured network connections.

Discussion

The proposed system provides a standardised unified environment for different EHR systems to communicate freely without any barriers.

The proposed system overcomes the challenges of implementing EHR systems for several hospitals such as maintenance complexities, staff training and high cost. In all cases, the proposed system has the following advantages: It presents comprehensive and successful healthcare services. It allows several healthcare providers to communicate and easily share patients EHR information through the healthcare cloud system. Moreover, it overcomes the challenges of EHR system integration such as network security concerns and information standardization difficulties and it presents a configurable and scalable EHR system in cloud computing platform for healthcare providers. The system also maximizes healthcare services quality outcomes by releasing them from technology problems. Finally, the proposed system facilitates the healthcare delivery process and then offers patients easier, reliable and corporate healthcare life.

Security is one of the major issues and concerns patients have about EHR and integration. The cloud system uses the latest security technology and the privacy of the patient data is ensured by a patient authorizing mechanism.

Conclusion

The paper has proposed a new concept of integration of EHRs using a cloud Computing System. A cloud computing system has been designed to accommodate two types of healthcare providers. The first one has an EMR system that has been connected with the cloud system through an interface. The second healthcare provider has no EMR on premises. The cloud system holds a central database for all those healthcare providers without local EMRs. The cloud has a central EHR system that is integrated with outside healthcare provider local EMRs.

References

- [1] Spil, T.A.M, Katsma, C.P, Stegwee R.A, Albers, E.F, Freriks A. and Ligt E. Value, Participation and Quality of Electronic Health Records in the Netherlands. *IEEE Computer Society. System Sciences (HICSS)*, 2010 43rd Hawaii International Conference on January 2010, 1-10.
- [2] Sun, J and Fang, Y. (2010). Cross-Domain Data Sharing in Distributed Electronic Health Record Systems. *IEEE Transactions on Parallel and Distributed Systems*, 21 (6), 754 - 764.