Cloud Healthcare-Records Manager

Asma Sultan AlShamsi, Nabeel AlQirim
United Arab Emirates University, UAE
{200424736, Nalqirim}@uaeu.ac.ae

Abstract. Recently, cloud computing (CC) has attracted the attention of many researchers and professionals as it provides a variety of solutions for different types of technical problems. One of these solutions is storage services. Cloud storage (CS) is expected to meet health industry expectations for maintaining health records and data. The importance of this focus in this research is that many healthcare providers face many challenges in managing their healthcare services in general and in controlling their costs more specifically. They are further challenged by adopting suitable novel technologies that could improve the quality of health services without increasing the cost, i.e., of storage services. CS service is one such technology that promises to store health records remotely allowing access to such records ubiquitously. This research reviews relevant literature about CC as a management solution for deploying health records and maintaining patients’ data. The suggested solution uses metadata to identify healthcare records in order to store and manage them. The research proposes an architecture that enables healthcare providers store and manage their data.

Keywords: Cloud storage, healthcare records data, metadata, Storage Management Architecture

1 Introduction

Due to the proliferation of many health information systems in hospitals, health data has increased exponentially. This raises the need for efficient and effective data storage and management systems. In addition, there is a plethora of local storage systems that are readily available to manage storing health records and health data. However, storing and managing health data in local storages is costly and inefficient and most importantly, minimizes the opportunity of sharing such data with other related stakeholders which could increase the overall health value. Indeed, many healthcare providers struggle in providing quality healthcare services, managing healthcare records, storing the huge amount of data, providing data communication among healthcare institutions, decreasing the ever growing healthcare budget related mostly to adopting new technologies that could manage such issues. In review of the literature [1,3,5,8,14,16], the main issues are summarized as follow:

a. Difficulties in exchanging healthcare data because the data are not unified.

b. Difficulties in managing healthcare records

c. Data communication issues between different health-care organizations
Cloud computing (CC) can be one vital solution for healthcare organizations that are seeking to improve healthcare services provided to health clients as it could decrease the cost of storing health data. The use of electronic health records (EHRs) in CC is one powerful application [1]. Healthcare industry is expected to spend $30 billion over nine years (2011-2019) [2]. CC allows healthcare organizations to facilitate the efficiency and scalability of system’s management. However, not all organizations fully succeed in using CC as a storage and as a management solution due to many limitations. These limitations are related mainly to storage performance and data identification.

This research investigates using CC as a storage and management solution for healthcare industry. The rest of the research is organized as follows, the following section provides background information about health records and health terminologies and discusses background information about CC. The section then discusses different management solution for managing healthcare records in the cloud. The following section introduces the suggested framework to handle and manage healthcare records. This is followed by an evaluation of the suggested framework. The final section concludes with final remarks and suggesting future work.

2. Literature Review

2.1 E-Health and digital health records

The terms electronic health record (EHR), electronic medical record (EMR), electronic patient record (EPR) and personal health record (PHR) define a set of concepts, including records collection about patients, medicines and diseases. These records are collected in order to process the data for health services [8]. “EHR” or “EMR” is a systematic collection of electronic health information about an individual patient or population [8]. The collected data is generated and maintained within healthcare institutions to give healthcare providers, patients and physicians access to a patient’s medical records [11]. Many processes can be done to the Digital records. It can transfer quickly from one place to another. Digital records allow the doctors to review the patients’ health history and help the hospitals to get a complete picture of the patient case. Digital records open the door for new opportunities in analyzing treatments, decisions making. Digital Records and e-health improve the efficiency and effectiveness of the health services [16].

2.2 Cloud Computing: A New Economic Paradigm

The CC is getting most IT stakeholders’ attention as it delivers on-demand services over the Internet in a more efficient and effective manner. Buyya [2008] defines CC as “A type of parallel and distributed system consisting of a collection of