

Electronic Personal Health Record Systems Development Based on Integrated Medical Information



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Abstract

An electronic personal health record (PHR) is a tool that enables patients to access, manage, and share their health information with health-care providers. Supplementary medical information provider of PHR is electronic medical record (EMR) systems, defined as a digital version of the traditional paper based medical record for an individual. The EMR represents a medical record within a single facility, such as a doctor's office or a clinic [1]. The advantages of patient access to the electronic medical record (EMR) through integrated personal health records (PHR) may be substantial, and foremost is the enhanced information flow between patient and practitioner [2]. These records are shared across area networks, enterprises internet or other information networks. Despite these benefits, data security, privacy and user authentication are enormously important for accessing important medical data over insecure communication [3]. The goal of this vitro study is to create a system that incorporated advanced methods to integrated medical information (PHR & EMR) without the need for an internet connection.

Keywords: PHR; EMR; Big data; Network security

Introduction

Health data computerization within Clinical and Medical Information Systems should allow the reuse of health data for clinical and medical health purposes. Two of the objects allowing the integration of healthcare and medical information systems are the Personal Health Records (PHR) and Electronic Medical Records. A personal health record is an electronic application used by patients to maintain and manage their health information in a private, secure, and confidential environment [4]. A large variety of provider, payer, and third party organizations, including organizations not traditionally involved in healthcare such as Google, are discussing, developing, and in some cases bringing to market various types of PHRs [5]. Supplementary medical information provider of PHR is electronic medical record (EMR) systems. Electronic medical records are computerized form of patients' health information containing their current and past diagnoses, current and past medications, allergies, past consultations, lab results etc., used in healthcare facilities [6]. Electronic health record (EHR) systems, and Personal health record (PHR) are generally recognized as the core set of any large scale health information technology. While PHRs [7] and

EMRs have many potential benefits to patients, caregivers, and institutions, the supporting evidence of specific benefits and the business case for PHRs and EMRs adoption are limited. Ensuring the security of electronic PHRs and EMRs is an important issue in the minds of consumers and the internet security technology supporting PHRs and EMRs are still evolving. Network connected medical devices, in particular, may create vectors for attacks on networks, on the devices themselves, and on the patient information they contain [8]. Furthermore the United Nations World Health Organization (WHO) administration intentionally does not contribute to an internationally standardized view of medical records nor to personal health records [9]. The objective of this in vitro study is to create a system that incorporated advanced methods to integrated medical information (PHR & EMR) based on webless (having no webs) system to overcome these barriers. This system is included in seven steps.

Step 1: Embedded medical information: Medical information is incorporated into the design of clinical storage for compression. Software programs embed various categories of medical information in the electronic documents, healthcare providers create.

Step 2: Convert medical information from ASCII format to DNA format using DNA Modeling method: Using DNA format has its own advantages like ability to compress, encrypt, store and decrypt medical data to construct data base structures for patient related documentation.

Step 3: Medical data compression: In this step, a novel medical data compression algorithm, termed DNA Modeling algorithm, is presented for compression applications.

Step 4: Medical data encryption is a form of data security whereby medical information records are disguised.

Step 5: Medical data storage: is a device (chip card) that provides electronic storage and retrieval functions for medical information.

Step 6: Medical data decryption: is employed as part of the process to medical data recurrence.

Step 7: Medical data carving: is the process of extracting a collection of medical data from a larger data set.

Methods

We have recognized that the progression to integration between the two applications PHRs and EMRs offers the potential for better, more efficient patient care and improved health outcomes. To achieve this goal requires that many medical devices be interoperable with other types of medical devices and with various types of health information technology [10]. The foundation for such data integration is hardware and software that embed, compress, store and carve medical information. To achieve these aims, several methods have been proposed. Software programs embed various categories of medical information in the electronic documents, healthcare providers create. The method and process for embedding, compression, encryption and carving of medical information platform is based on DNA Modeling system. The method uses a table called the Quarter Code table, which is the set of characters and numbers. In this table every number between 0 and 255 (numerical representation of a character in ASCII code) is translated into a unique string of four letter alphabet. Letters A, C, G, T are chosen, since they are the same as used in DNA sequences. In this way it possible to utilize tools originally programmed to DNA sequences analysis.

There are a variety of concerns in regards to protecting embedded medical information collected on wearable devices. When all pixel values of text are converted to virtual DNA sequences, it is presented as encryption data. Encryption of medical information is essential to reduce risks of clear text interception of medical data. Statistical inference methods are used to detect embedding, compression, encryption and carving of medical information in sequence of characters. Card medical information storage device provides electronic storage and carry this medical information, in statistical format. When card is inserted into a computer, the process of extracting a collection of medical data from a larger data set, through the steps to enter information will start.

Conclusion

In conclusion, integration between the two applications, (personal health recorder and electronic medical recorder) can represent the general health conditions. This system provides the ability to begin to build a medical information model across the two applications that are in scope.

Discussion

One of the greatest challenges facing the medical today is the integration of two personal health record and electronic medical record applications. There are a number of methods that can be used to integrate the two applications behind Medical Information. The integration of large numbers of information into a small chip is an enormous improvement. However along with this system comes a unique set of technical problems. Multiple chips are often arrayed to achieve higher capacities (The Daily Circuit) however the quality of higher speed and larger capacity are required to the data acquisition and the process of replaying an audio or video recording storage system. Therefore an area of future work for us is to propose mathematical method of statistics that visualize on medical card, making it possible to handle large data sets and to make accesses vastly more efficient.

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