Development of Personal Health Records System for Medical Consumer

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Abstract. These days, many organizations are applying PHR(Personal Health Record) to their information system to allow patients to manage their own health information by viewing and editing their own medical data. G Hospital, a South Korean tertiary hospital, developed a PHR system to satisfy patients’ right to know. The system uses CCR+ which is the standard data format when the system interfaces with other services and PHR supported devices. A Separated database was established on the PHR server to manage PHR data. Protocol (SSL) and data encryption technology and mandatory authentication solution were applied to the system for security. The PHR system is expected to fulfill patients’ right to know and promote to prevent chronic disease prevention by providing information for self health management.

Keywords: Personal Health Records, medical information, self management, smarthome

1 Introduction

The need for PHR is increasing as the importance of self health management, medical data, and amount of health related data increases. Also, distribution of home monitoring devices and smartphones are accelerating PHR application. In 2000, Beth Israel Deaconess Medical Center(BIDMC) launched a hospital-based PHR called PatientSite (www.patientsite.org) as a group of clinicians and patient advocates in New England that all healthcare data ultimately belongs to the patient [1]. PHR can be a solution for hospitals to provide patients a tool for self decision on their medical record. The Personal Health Working Group (PHWG) of the Markle Foundation defines PHR as: “an electronic application through which individuals can access, manage and share their health information, and that of others for whom they are authorized, in a private, secure, and confidential environment” [2]. US managed care organization Kaiser Permanente provides Health Connect Online which provides allergies, immunizations, future appointments, diagnoses, instructions from past visits,

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and laboratory results related information as well as functions for patients to book appointments, reorder prescriptions, and communicate with healthcare professionals by email [3]. In Europe, The LifeSensor allows patients to store and manage information about their current health status, medical history, results, images, and documents and access for selected healthcare team members or caregivers to view, add, or update information [5].

This study introduces a PHR system developed by G Hospital, Korean tertiary hospital, which can fulfill patients’ right to know and provide value added services using medical data.

3 System Architecture

Based on ASTM’s (American Society for Testing and Materials) CCR (Continuity of care Record), which is patient health summary standard, a way to create flexible documents that contain the most relevant and timely core health information about a patient, G Hospital’s PHR system applied CCR+ as a data format, which is modified version of CCR into Korean language.

The name of G Hospital’s PHR system is u-CAREnote. The system provides various information on occurred in hospital such as past visits, and laboratory results, upcoming appointments, reorder prescriptions, and medication, vital signs record, operation history, vaccination and so on. Also, the system provides chemotherapy and radiation therapy related information for cancer patients.

Because it is illegal by law to store medical data produced in hospital in outer database, PHR server only delivers data to the application and web service from hospital’s the EMR (Electronic Medical Record) database. However, PHR server stores data input by users. The system architecture is shown on Fig. 1. As shown on Fig. 2., encrypted protocol (SSL), data encryption and self authentication technologies are applied to the system.

![Fig. 1. u-CAREnote consists of Android OS application and web-based services. Only necessary data from the EMR database are saved into the PHR server to provide information to users.](image-url)
4 User Interface Development for Mobile Platform

Mobile PHR application for Android OS provides various functions such as health check up, Vital signs, medication, chemotherapy, radiation therapy, operation history, vaccination, procedures, past visit, and laboratory results. Also, users can view their appointment schedule and health examination result without visiting hospital.com. Because the system interfaces data from the EMR database, users can review their latest medical data measured at hospital without delay.

5 Conclusions

Many PHR tools and programs are developed and providing various services these days. Application of PHR in hospitals may generate healthcare cost savings while promoting patients’ health and knowledge conditions [6].
u-CAREnote, the PHR system developed by G hospital located in South Korean tertiary hospital, allow users to view their latest medical data which can fulfill patients’ right to know in novel method. This system is expected to promote patients’ health conditions by increasing knowledge of their health conditions. Not only data, value added tools such as personalized health management contents based on medical data will be provided in the near future. Also, integrated PHR platform which enables data interoperability is required to gather patients’ data occurred in many institutions.

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