Chapter 4.11
A Web–Based Application to Exchange Electronic Health Records and Medical Images in Ophthalmology

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ABSTRACT

This chapter describes a Web -based application to store and exchange Electronic Health Records (EHR) and medical images in Ophthalmology: TeleOftalWeb 3.2. The Web -based system has been built on Java Servlet and Java Server Pages (JSP) technologies. Its architecture is a typical three-layered with two databases. The user and authentication information is stored in a relational database: MySQL 5.0. The patient records and fundus images are achieved in an Extensible Markup Language (XML) native database: dbXML 2.0. The application uses XML-based technologies and Health Level Seven/Clinical Document Architecture (HL7/CDA) specifications. The EHR

standardization is carried out. The main application object is the universal access to the diabetic patients EHR by physicians wherever they are.

INTRODUCTION

Healthcare computing or medical informatics is one of the fastest growing areas of information and communication technology (ICT) application. Electronic records in health fall under the purview of health informatics. It is a combination of computation, computer science and medical record keeping. Recent technological advances have enabled the introduction of a great number of telemedicine applications in healthcare computing (Hung, K, Zhang, Y, 2003). The information systems are a necessary part of the telemedicine services. They provide storage, retrieval, connection and evaluation of the medical information. One of these systems is the Electronic Patient Record (EPR). They store and administrate all the medical data about a patient (Horsch, A, Balbach, T, 1999). An EPR is a fundamental part of health information technology and its use is growing quickly. It is indicative of the advances in medical informatics and facilitates the doctor-patient relationship. It can be organized either on a document-based backbone, or on a structured database system. An EPR transmitted through the Internet is especially important. It contains a private material of medical information for a patient.

In most European countries, the National Health Service (NHS) is investing large amounts in information technology (IT) (Mocanu, M.L, et al., 2004). In this context, the idea of electronic health records (EHR) has been around for a decade or more (Ferreira, A, et al., 2004). The EHR is a secure, real-time, point-of-care and patient-centric information resource for physicians. The EHR must enable the communication of healthcare information to support shared patient care, improved quality of care and effective resource utilisation. EHR may contain data about medical referrals, medical treatments, medications and their application, demographic information and other non-clinical administrative information. Some benefits of the EHR systems are their universal access, coding efficiency and efficacy, easier and quicker navigation through the patient record another (Smith, D, Newell, L.M, 2002). In spite of the advantages of EHR, there are several barriers to their adoption such as training, costs, complexity and lack of a national standard for interoperability (Gans, D, et al., 2006).

Many EHR-related initiatives have been announced in Canada. In May 2006, the government of British Columbia announced spending of $150 million towards the creation of online computerized medical records for doctors (Canadian Institute for Health Information, 2006). EHR-related initiatives are under way and each addresses a specific part of health care, primary, acute and community care. For example, the Ontario Primary Care Network in Canada is a pilot project involving approximately 40 physicians and 300.000 patients. Individual physicians are implementing office systems for the capture of patient information and support office administration. Community care providers are piloting projects to improve the delivery of services to their customers (Office of Health and the Information, 2001).

Nowadays, telemedicine applications often involve many institutions using different systems and technologies. This complicates the necessary technical standardization (Holle, R, Zahlmann, G, 1999). International and national institutions and organizations are concerned with standardization of EHR systems such as ISO Health Informatics Standards Technical Committee (ISO/TC 215), CEN Technical Committee (CEN/TC) 251, openEHR, Health Level 7 (HL7), Integrating the Healthcare Enterprise (IHE), Digital Imaging and Communication in Medicine (DICOM) to name but a few (Bott, O.J, 2004).

ISO/TC 215 has defined the EHR and also

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