Health Information Systems: Current Challenges and Developments

Findings from the Yearbook 2008 Section on Health Information Systems

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Introduction

The aim of health information systems is to contribute to a high quality, efficient health care, for patients, and medical research. This field is expanding, strongly influenced by modern information technology even though unevenly distributed among different income and ethnic groups[1]. Since the 1990s, advances in computer power and connectivity have created new ways to manage health data and diseases [2,3]. Due to the drop of costs, computing power is available to small healthcare clinics and average citizens [4]. In addition, this same computing power is available in smaller, mobile platforms such as the cell phone [5]. These will allow a sophisticated access to the internet where the cell phone will be used as a portal for health information, follow-up and monitoring [6,7]. Improved user interfaces have made interacting with information systems easier and more intuitive [8,9]. The informatics methodology and technology are expected to address new challenges such as continuous quality of care in aging societies, developing solutions to tackle specific health problems in developing countries, and opening novel opportunities for global access to health services and medical knowledge. Ubiquitous computing resources and networks, easing worldwide transmission of data, will permit to conceive new types of information systems and architecture for health care, including new kinds of health monitoring [10]. Health information systems have evolved during the last decade towards regional and nation-wide health network [11]. The focus has changed from institutional hospital information systems to eHealth supporting seamless availability of patient data across different health care facilities. Novel system architectures will include flexible IT solutions to support local specificities in order to ensure a federated access across health centers [12,13]. Moreover, many projects deal with the design of structured information models, networked data repositories, patient identifier services, as well as privacy, security and legal matters [14,15].

Best Paper Selection

The best paper selection of articles for the section 'health information systems' in the IMIA Yearbook 2008 follows the tradition of previous Yearbooks [16,17]. As a result of a comprehensive review process, four excellent papers published in 2007 were selected from peer-reviewed journals in the field of medical informatics. Table 1 lists the selected papers. This selection represents of course only a small portion of the world wide current research topics in the area of health information sys-
The development of open source software is also an important way to foster continuous research in well established fields such as picture archiving and communication systems (PACS) [21].

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References

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Table 1 Best paper selection of articles for the IMIA Yearbook of Medical Informatics 2008 in the section ‘Health Information Systems’. The articles are listed in alphabetical order of the first author’s surname.
OpenSourcePACS: an Extensible Infrastructure for Medical Image Management

The purpose of the OpenSourcePACS project is to provide an open source architecture for a picture archiving communication system (PACS), that can also support and integrate new functionalities emerging with the rapid evolution of the medical imaging field. This paper provides a detailed overview of the architecture of the system, describing technical aspects of the main components of the OpenSourcePACS project: the image order entry, the image server, the image viewer, and the reporting/viewing results. All modules were built using Java and open-source frameworks and application servers. An example of application of the open source PACS has been implemented to support primary care/specialist communication (between the requesting physician and the radiologists in a preliminary read). The majority of the code has been released to the open source community. The authors hope that OpenSourcePACS will foster new developments in PACS and recommend the system to academic and research communities.

Durand T, Spacagna H, Verdier C, Biron P, Flory A
The Rhone-Alpes Health Platform
Methods Inf Med 2007;46(4):451-7

This paper describes the Rhône-Alpes region health information system that connects a large number of health care institutions located in the south eastern part of France populated by 6 million inhabitants. The project included several directions which have ensured a successful project: 1) no system had to be rebuilt, but a direct connection to the system according to local computerizing capabilities was provided, 2) a bottom up model was used that involved key health actors (physicians), 3) an easy to use interface to retrieve medical information was developed. The architecture of the system and a corresponding functional scenario are detailed. The system federates regional health repositories and serves as a unique web-based portal to health information. A specialized component had to be built in order to set up patient identification on a regional basis. The iconic interface management system was built to provide a standardized view of all medical components organized along a chronological view. The system has received approval from the French regional authority. Due to the interest it generated, other projects will be incorporated and all healthcare facilities of the Rhône-Alpes region should be connected to the system by 2010.

Odero W, Rotich J, Yiannoutsos CT, Ouma T, Tierney WM
Innovative Approaches to Application of Information Technology in Disease Surveillance and Prevention in Western Kenya

The surveillance, epidemiology, prevention, and control of injuries in middle and low income countries constitute a central but difficult health problem to address. This paper describes the first step in implementing a simple and inexpensive approach to generate accurate and timely information for patient care, monitor distribution patterns and develop targeted interventions for injuries in Kenya rural communities, where patients are hard to track and accurate information difficult to obtain. Hand held GPS devices are used to capture data regarding exact location of injuries, which is downloaded and linked to the patient medical database. Furthermore, the existing computerized medical record system has been enhanced by a geographical information system (GIS). As a result, existing medical record patient data, along with coincidental findings and spatial location analyzed by the GIS can identify areas of clustering of particulars injuries. As such, it can be used for targeting local injury prevention and control efforts. This is an original pilot system in which a general propose electronic medical record system was complemented to target a specific clinical problem in a developing country, in order to improve patient care, public health education, and research.

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