Editorial

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Going Abroad of Korean Health Information Systems

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Seoul National University Hospital has recently announced the signing of a Memorandum of Understanding (MOU) to export its hospital information systems to Saudi Arabia and the United Arab Emirates [1]. The Korea Health and Welfare Information Service (KHWIS) has agreed to export its cloud computing based Public Healthcare Information System (PHIS) to the Philippines Ministry of Health. The Mongolian Ministry of Health is also interested in adopting the PHIS because a majority of its health institutes are public and they are widely spread out across a large territory. Both the Philippines and Mongolian government believe that the PHIS can reduce maintenance costs and easily implement the system without the use of highly skilled IT personnel. The BIT, a Korean IT Company, is developing the National Health Information System for Iraq and it recently exported a hospital information system to the International Medical Center in Mongolia. The Korea Digital Hospital Export Agency (KDHEA) has also signed an MOU to export information systems to military hospitals in Columbia.

Healthcare institutions in Korea have become increasingly digitized in the past ten years. Almost all hospitals have adopted the computerized provider order entry (CPOE) system, patient management systems, and insurance claim systems using electronic data interchange (EDI). Over 80% of tertiary hospitals have adopted Electronic Medical Records (EMRs) and picture archive and communication systems (PACSs) [2]. Over 3,500 public health institutes are implementing the Web-based PHIS using the cloud computing approach [3]. The high adoption rate of information systems in Korea is one of the highest in the world.

Healthcare Informatics Research (HIR), the official journal of the Korean Society of Medical Informatics, has introduced the development and use of information systems for selected Korean hospitals since 2010 to enable them to share their experiences in developing and implementing systems. All nine hospitals that have appeared in HIR were implementing CPOE, EMR, PACS, and a clinical data repository or data warehouse. And three hospitals were implementing enterprise resource planning (ERP) systems: Severance Hospital, Asan Medical Center, and Gil Hospital.

On the other hand, each hospital has unique features. For example, Yonsei University Severance Hospital has used medical record items to create clinical documents for EMRs, which allowed for easy data entry and improved the reusability of medical information [4]. Distinctive features of Asan Medical Information Systems (AMIS) were the high alert-medication recognition system, the integrated patient monitoring system, and the clinical indicator management system [5]. Samsung Medical Center extensively used smartphones to provide mobile access of patient information [6]. Seoul National University Bundang Hospital, which is the first Stage 7 hospital outside of North America, has adopted and utilized an innovative and emerging information technology system to improve the efficiency and quality of patient care [7]. The closed-loop medication administration (CLMA) system automatically delivers containers of medication with radio-frequency identification (RFID) tags from pharmacy to wards. At a ward, nurses use a PDA to scan a patient's wristband RFID tag before administering a medication.

The PHIS developed by KHWIS covers 3,501 public institutes including 254 public health centers, 1,346 health subcenters, and 1,901 health posts throughout the country with one server based on cloud computing architecture [3]. A high-speed broadband network allows for implementation

of CPOE on a real-time basis. The PHIS supports 47 public health services including tuberculosis and vaccination in addition to clinical services, such as CPOE and EMR. Moreover, the PHIS supports a real-time information exchange with eight government agencies, including the Health Insurance Review Agency (HIRA) and Korea Center for Disease Control. The PHIS was patented by the Korean Intellectual Property Office and Patent Cooperation Treaty, and was accredited as ISO 9001.

As the Korean government strongly promotes the export of such health information systems, several leading hospitals and government agencies, such as KHWIS and HIRA, are actively exploring the possibility of exporting their systems. While Korean health information systems have high technical excellence with a wide variety of functions, there are several weaknesses to overcome before they can become a leading product in a competitive international market. First, most Korean health information systems are based on EMR for the treatment of patients, rather than Electronic Health Records (EHRs) for life-time healthcare of individuals. Therefore, they lack EHR functionalities and interoperability. However, most countries emphasize the importance of a sharable EHR (life-time collection of summarized individual health and clinical information) for their national health information infrastructure in order to share patient information among public health institutes. Second, many Korean health information systems have not followed international health informatics standards, such as ISO/TC 215 or Health Level 7. Since standards are essential to ensure interoperability of EHRs, the successful deployment of Korean health information systems to health institutes abroad largely depends on how well Korean health institutes overcome these weaknesses.

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