Collaboration of an Electronic Medical Record system and Data Warehouse in HIS

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Abstract

A large scale Hospital Information system (HIS) generally consists of two parts, the On-Line Transaction Processing (OLTP) system and the On-Line Analytical Processing (OLAP) system. The electronic medical record (EMR) system is a main element of the OLTP system, and the data warehouse (DWH) system not only assumes many important roles as the OLAP system but serves as the backbone for keeping medical care of the institution in high level by providing the best practice cases to the EMR system (Fig. 1). This paper will discuss the following points: the reason why OLTP and OLAP are necessary, and the roles of the DWH system.

Keywords:

HIS, EMR, Data warehouse

Introduction - Background

The study group, "Research on secondary use of medical information," a part of the Japanese Association of Medical Informatics (JAMI), was established in 2008. Although the applicable domains of secondary use of patient data have been spread extensively and it is an important subject in medical informatics, there are many DWH systems that cannot store adequate quality of data for practical use. Our objective is to develop the most efficient way to create a serviceable DWH system which uses patient data derived from sub-systems such as: a medical accounting system, an order entry system, and an EMR system. Moreover, we research ways to efficiently control the DWH maintenance procedure, and the method of analysis for extracting various kinds of outcomes and knowledge from the DWH system.

Method - Trial in Nagasaki University Hospital

In Nagasaki University Hospital, its HIS had been replaced with the new HIS in June, 2008. The new system has four key features: (1) full range order system provides more productive medical care, (2) increased efficiency of the business process by an outpatient examination booking system and a filmless imaging tests system, (3) support for team medical practice and quality of medical records by the computerized progress note of the EMR system, and (4) advanced input management system to ensure data accuracy and safety control. Furthermore, the following systems are now required to allow the DWH system to run smoothly: (1) a business analysis support system, (2) a medical documentation system, (3) an electronic clinical path system, and (4) a community health system. This collaboration becomes more important to clarify the role of DWH system. In consideration of the above requirements, we installed the clinical data repository system, "CiDAR" supported by NETMARKS INC., as a DWH system for Nagasaki University Hospital. CiDAR has the following features: (1) sophisticated functions for medical research and medical education, (2) quick response for real time inquiry and statistical processing, (3) flexible interface between various data supplying systems and a DWH system, and (4) robust data consistency preserving architecture for long term storage.

Conclusion - Necessity of DWH in HIS

A DWH system used as an OLAP system is essential to a HIS because an OLTP system in a HIS is mainly used for supporting the daily clinical activities and its structure is not always suitable for the analytical jobs. A DWH system is critical as the backbone for the best practice of the EMR system to maintain high quality medical care. A DWH system also keeps long term DBs against HIS vendor changing, redevelopment of regional medical networks, or medical indicators' driver [1].

Other publications related to the usage of DWH systems tend to emphasize tracking or detecting certain defined diseases through DB. However, this trial proves that refining the roles of DWH and creating the most efficient and serviceable DWH are valuable in HIS.

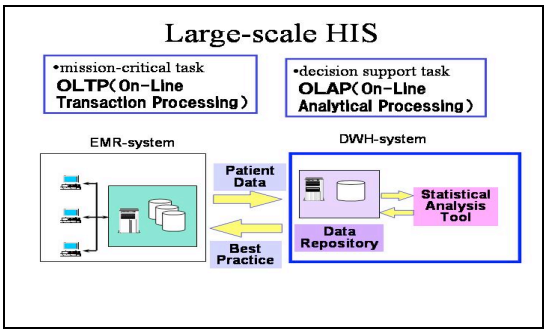

Figure 1- Large-scale HIS

Reference

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