A Conceptual Framework for Clinical Data Warehouses

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In order to support the analysis of the information transformation process, quality, outcome, and cost of care delivered at a medical institution, an environment that integrates data from multiple clinical, administrative and financial systems is necessary. This integration becomes essential to facilitate the access and retrieval of the varieties of information. We propose how to rapidly specify a clinical data warehouse taking into account the value chain of a health care institution and covering three different layers of data analysis. In order to assess our proposal, we have developed an environment called FBCDataWare with data warehouse and clinical data repository capabilities that has been validated at the Unit of Cardiology and Cardiovascular Surgery/Fundação Bahiana de Cardiologia.

In the context of health care, two approaches have emerged: the clinical data repository, which represents an integration of dispersed operational databases to facilitate clinical analyses of a individual, and the clinical data warehouse, which represents an organization database to facilitate analyses of crossed patients' data. This project is based on the idea that a clinical data warehouse should support three layers of data analysis, also defended by Pedersen and Jensen (1998). A first layer of patient personal data aimed at providing better patient treatment. A second layer of the community data where the patient groups with common particularities are compared. Finally the layer of health institution data, where clinical, financial, and personal data of patients are combined to improve the quality of services offered. Therefore, it is possible to obtain a combination of A clinical data repository and A clinical data warehouse.

We propose how to rapidly specify a clinical data warehouse covering these different layers of data analysis. This approach is based on the principles of knowledge transformation and value proposition used by Mattison (1997) for the construction of a data warehouse in a telecommunications domain.

In order to assess this approach, an environment called FBCDataWare has been developed with data warehouse and clinical data repository capabilities. It was developed in ASP (Active Server Pages), JavaScript using WEB technology and OLAP Services. The FBCDataWare has been validated and it is in use at the Unit of Cardiology and Cardiovascular Surgery/Fundação Bahiana de Cardiologia to support patient care and clinical research, as well as general analyses performed by the institution.

Reference

MATTISON, Rob, 1997, Data Warehousing and Data Mining for Telecommunications, Boston – London, Artech House