Development Journey of Clinical Data Analysis and Reporting System (CDARS) in Hospital Authority of Hong Kong

MCY Cheng[a], YH Tong[b], TC Kwok[a], ITH Cheng[a], APM Chung[a], JKY Leung[a], MTS Fung[a], NT Cheung[b]

[a] *Information Systems and Standards Section, Information Technology Services, Hospital Authority of Hong Kong*
[b] *Health Informatics Section, Information Technology Services, Hospital Authority of Hong Kong*

Abstract

The Clinical Data Analysis and Reporting System (CDARS) has been implemented in Hospital Authority of Hong Kong (HA) to provide value-added information to support different aspects of healthcare services for management decision, clinical audit, planning and research. It facilitates the retrieval of clinical data captured from different operational systems for analysis and reporting and provides good quality information to support retrospective clinical and management decisions by integrating the clinical data resided in Data Warehouse.

Keywords:

Information systems, Clinical decision support system

Methods

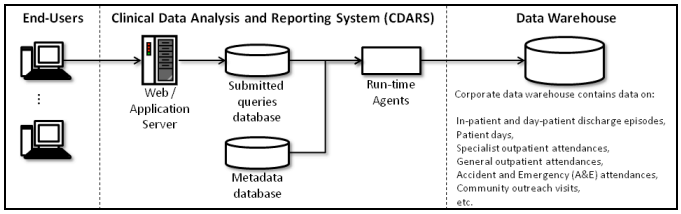

Figure 1 – CDARS Architecture

CDARS is a web-based in-house developed retrospective clinical decision support system. The pilot version of the application was released in 2002. CDARS adopts a 3-tiers architecture comprising graphical user interface, application layer and backend database. The front-end user interface is web-based such that clinicians are able to access the system from any workstations in HA's clinics and hospitals. The application layer is responsible for processing all the queries submitted by the end-users. The run-time agents process the queries submitted and generate Structured Query Language (SQL) procedures for execution in backend database.

A number of techniques are used to design CDARS to maximize usability, extendibility and performance.

The front-end user interface uses a multi-page wizard to guide the users in submitting queries in CDARS by simply going through four steps: define data scope, define selection criteria, group criteria, define report layout. This divides a detailed query submission into manageable steps.

The business logic of each CDARS data element, criteria, dimension and measurement is described in metadata. Metadata is maintained by using administration tools to reduce turn-around time of data definition addition/update/deletion.

The back-end processing of queries takes advantage of the parallel processing capability of data warehouse to increase the system throughput. All queries are classified into "small" and "large" categories and processed by different pools of agents to minimize the overall query processing time.

Results

CDARS is well accepted by end-users, CDARS end-user training is getting exceptionally positive response. There is a gradual increase in CDARS utilization. In 2008, the total number of queries submitted in CDARS has reached 102,083 which represent a 484% increment compared to 2002.

Conclusion

The increasing demands of information in HA have been met by the information systems such as CDARS. Since the quality of CDARS reports reflect the quality of source data, users become aware of clinical IT systems data quality and are motivated to enter quality and structured data into source clinical systems. Moreover, CDARS help drive users and stakeholders of the source operational systems to think more thoroughly so that the collection of operational data can fulfill the informational needs for clinical and management decisions.

Address for correspondence

Ms Marita Cheng (mcycheng@ha.org.hk)
Dr Anna YH Tong (tongyh@ha.org.hk)
Mr Michael Fung (fungmts@ha.org.hk)