ClinicalViews: object-oriented views for clinical databases

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ABSTRACT

We present here a prototype of a clinical information system for the archiving and the management of multimedia and temporally-oriented clinical data related to PTCA patients. The system is based on an object-oriented DBMS and supports multiple views and view schemas on patients' data. Remote data access is supported too.

BACKGROUND

According to the complexity level of the considered organization, a DBMS may have different groups of users, wishing to access stored information with a different perspective as function of their role and of the performed activities. Views are software constructs allowing the design of user-oriented database systems. A view may be a subset of the database or it may contain virtual data that is derived from the database but is not explicitly stored. The use of views permits to profile user needs and to create a suitable organization of pertinent data and knowledge, to integrate data from different databases, to define content-based authorizations, to simulate schema evolution.

DESIGN CONSIDERATIONS

The work has concerned the design and the development of an advanced user-oriented database system for the management of medical records related to patients that underwent PTCA interventions.\(^1\)

The proposed system is based on an object-oriented data model and supports data types modeling temporal aspects related to clinical information. Special tools have been designed for the definition and the management of views and view schemas. The system allows the definition of three different kinds of views. The first one is a not materialized view (the view extension is computed on demand and not stored in the database) defined on a single base class. It can be used to hide some of the properties of the related base class and to define new methods. The second type is a materialized view implementing either "object-preserving" or "capacity augmenting" views, i.e., persistent views having either a subset of the properties of the related base classes (or the same), or having extra properties. An aggregation view funded on more than one base class has been defined to aggregate data otherwise spread in several classes.

Views can be used for data entry, deletion, update.\(^1\)

Using these view constructs we defined some view schemas significant for particular user roles; special attention has been devoted to the case of the cath-lab physician, of the ward nurse and of the general practitioner.

SYSTEM DESCRIPTION

The system architecture is illustrated above. The clinical database has been developed using the OODBMS Ode. The client application interacts with the database server through a communication infrastructure based on the use of Internet and the WWW and allows remote access to clinical information. It has been developed as Java applet and may be run using any Web browser supporting Java.\(^2\)

CONCLUSIONS

We have designed and developed a prototype of an information system for the management of PTCA patients' medical folders. The system provides to each users group a suitable view of the handled data. Remote data access is permitted to authorized users.

References