

ABSTRACT

With the increase in number, size and complexities of database applications both in the industrial and scientific fields, the development of sophisticated tools for their design and development has become more challenging. In recent years the research community has shown a great deal of interest in the development of automatic and semiautomatic tools for the database design aspects. The need of automation has arisen due to two major points : first, the non-availability and the scarcity of expert database designers; and second, to increase the quality of the database design products.

In the present work, we develop an expert system "View Modeling, Integration and Translation System (VMITS)" that automates the process of logical database design. A top-down approach to logical database design methodology for relational databases has been formalized and expressed as a set of rules that comprise the knowledge base of the expert system VMITS. The methodology is based on an extended entity-relationship model. Using this approach, first user views are constructed from the information requirements of different individuals or groups of users about a database application; next, the user views are integrated into a conceptual view expressed in terms of a set of entities; and finally, the

conceptual view is transformed into a set of normalized relations that represent the logical view of the database application.

There are three major elements of this research. First, a top-down methodology for logical relational database is presented. Second, the methodology alongwith some heuristics is formalized as a set of rules, which forms the knowledge base of the expert system for database design. Finally, the expert system is implemented in PROLOG.

There are several applications of the research. The systems can be used by all types of organizations (i.e. from small to large) to develop their own database internally. The system can also be used by consultants working in both the database and expert system areas.