The ER approach, relational technology and application development

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Among the tasks facing many application development teams today are the development of a logical data model, and using that data model to choose a data base management product. In the past many applications were limited to a single DBMS, one which was either based upon the hierarchic or the network data structure model. Most firms used DBMS products which supported one or the other, but usually not both.

The availability of a number of working relational implementations either as separate software, or as relational versions of existing DBMS products, and the high degree of visibility and favorable publicity attached to the relational model itself has persuaded an increasing number of firms to acquire them. Thus, many application teams now must make a choice of two supported, but substantially different data base structural architectures.

In the past, the application data modeling process created designs which were oriented toward the available DBMS. The logical data model was often framed in the manner of the logical data structure model of the prevailing DBMS, that is either in hierarchic or network form. Because of the popularity of the relational products, and the comparative simplicity of the relational model, many designers today attempt to frame their data in tabular form.

However, just as the analysis of the application processing requirements must be objective and unbiased toward any particular processing mode, the data modeling process must be objective and data structure independent, to avoid biasing the analysis toward one or the other of the products. Those designers who develop an ER model but do not take the additional step of evaluating the model against each DBMS’s natural data structure will find that they have caused themselves unnecessary problems when they force their data into an incompatible data structure model.

Each application’s data has a natural structure. The use of the Entity Relationship model can graphically illustrate this natural structure and can be a strong indicator of which DBMS will be most effective. Although most analysts assume that their application’s data can be stored under any DBMS with equal effectiveness, in practice the natural structure of the data will make one DBMS more effective than another.

The fully attributed ER model provides a wealth of information for the analyst to make a proper DBMS evaluation. A detailed evaluation not only of the entity structures, but also of the attributed relationships provides a sound guide to an appropriate DBMS choice. Thus a true logical data modeling step, using a structurally independent modeling technique has become indispensable to the application analysis and design process.