PANEL: DATABASES FOR EXPERT SYSTEMS

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Expert systems (ESs) and database management systems (DBMSs) are going to be related very closely in the future. In the past, the artificial intelligence (AI) applications, particularly the ESs, have dealt with complex structures of data but have operated under the assumption that all data resides in primary/virtual memory. Traditionally, DBMS have dealt with simpler data in high volumes; they operate under an implicit assumption that data is stored on secondary storage devices.

With the growing popularity of expert systems and the diversity of their applications, it is becoming necessary to support high volumes of data in ESs. At the same time, the applications of DBMS are getting more and more complex with the new application domains involving computer aided design (CAD) which requires geometric information to be represented, storage of maps and other comlex graphic objects, need for interrelating various forms of the same information as in VLSI design, etc.

The knowledge of the real world, or "the universe of discourse," needs to be represented, stored, and manipulated in both types of systems. The similarities, differences, and potential interactions among the ESs and the DBMSs will be addressed by this panel. The different dimensions of this interaction to be discussed include the following:

a. Data modelling differences and reconciliations among ESs and DBMSs; issues related to levels of representation, inheritance of properties,dynamic redefinition, object-oriented languages, data manipulation, etc. (Lafue)

b. Treating ESs as applications of DBMSs. (Lafue)

c. Similarity of concepts between semantic network based ESs and DBMSs: possible use of ordering and indexing techniques, production rules and inference rules as integrity constraints, new knowledge generation at both the schema and instance levels, etc. (Morgenstern)

d. The relationship of database theory to the problems of the representation of knowledge in ESs and AI: deduction and inference, processing of incomplete information, meaning of queries and answers to queries, meaning of constraints, etc., theories of knowledge and belief. (Reiter)

e. Data base management vs. knowledge base management. (Siklossy)

f. DBMSs, ESs and PROLOG. (Woehl)

The panel will also address itself to some of the more general questions:

1. How should ESs "help" DBMSs (e.g., in database design, maintenance)?

2. Can ESs serve as the "connection to the real world" as far as DBMSs are concerned?

3. How can the conceptual schemas of the ESs and DBMSs be co-ordinated?

4. What are the special types of storage and manipulation facilities demanded by ESs from DBMSs?

5. How should the database technology be moving in order to meet the growing demands from complex applications, of which ESs are but one example.