

Databases for Computer Aided Design
and Manufacturing

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This panel will discuss a rapidly expanding application area of databases: Computer aided design and manufacturing (CAD/CAM). CAD is playing an important role in diverse fields such as logic design, printed wiring board design, chemical process control, structural engineering, architecture, aircraft and automobile design, design of mechanisms, cartography, etc. On the one hand, all these applications have some common demands and requirements as far as the storage, retrieval, and manipulation of database of design data is concerned:

- it should be possible to represent a design object hierarchically to support top down or bottom up methodologies of design.
- design data of a single object is typically the whole database with which engineering and manufacturing processes must interact.
- multiple representations of a given design should be supported; e.g. VLSI design may exist as a block diagram, a functional description, a logic diagram, a mask layout etc. The system must maintain and enforce an equivalence among the different representations.
- changes at any level must be reflected up and down the hierarchy.
- versioning of data is necessary; yet redundancy among versions should be minimized.

From the above perspective, it appears that a single DBMS may be called upon to support a wide variety of CAD/CAM applications.

Each application area, however, lends its own semantics to the design database and presents its own peculiar needs. These range from the maintenance of meta-data to verification, handling of design changes, etc. Interactive graphics, representation and manipulation of geometry are required to various extents

in different applications. The variety of design applications points to a need for a specialized DBMS for each application area.

In a CAD/CAM environment the DBMS must provide a support to manufacturing in terms of the traditional applications of production scheduling, materials planning, inventory control etc. Hence, a DBMS for CAD/CAM must encompass the capabilities of existing DBMSs as a subset of its features.

The issues stated above are only a small sample of the issues we propose to take up in this panel. Generally, the panel will highlight the needs of CAD/CAM and discuss the adequacies and shortcomings of the current database technology to cope with the demands of this very significant application area for the mid and late 80's. We will try to provide a perspective into this emerging area from the viewpoint of educators, researchers, vendors, designers, and heavy users of the CAD/CAM technology.

PANELISTS

1. Richard Briggs, Structured Dynamics Research Corporation, Milford, Ohio 45150
2. Harley Feldman, Control Data Corporation, Arden Hills, Minnesota 55112
3. Chris Fuselier, General Electric Co. Charlottesville, Virginia 22906
4. Prof. Michel Melkanoff, UCLA, Dept. of Computer Science, Los Angeles, California 90024
5. Mike Monachino, IBM Corporation, Poughkeepsie, New York 12602