Selectives Update covers topics of current interest in computer graphics research and application. It also features conference previews and reports as well as short technical news stories. We welcome contributions from readers.

All submissions to Selective Update should be sent to Jerry Schneider, Selective Update Editor, IEEE CG&A, c/o Dept. of Civil Engineering, University of Washington, Mail Stop FX-10, Seattle, WA 98195.

Executives report experience with centralized design automation

Ware Myers, Contributing Editor

Most large corporations are decentralized into separate divisions with profit and loss responsibility. Many of these divisions have product engineering organizations that answer to the local division head, not to a corporate engineering executive. Where should the responsibility for the development of design automation tools fall, then? Should it be at the local or corporate level?

This was not exactly the question that the first panel at the 1983 Design Automation Conference addressed, for all the panel members were from large companies with an existing central DA structure. Rather, the six panelists shared their experiences in managing a central DA organization in a decentralized company and by so doing shed light on the issue.

The panel was moderated by Robert J. Camoin of IBM's General Technology Division. The members were Stephen Pardee of Bell Laboratories, Harry Smuda of Sperry Corporation, John W. Bremer of Honeywell, Robert W. Rozeboom of Texas Instruments, and W. Kreuwels of Philips Research Laboratories.

This year's DA conference, held in Miami Beach from June 27-29, attracted 1742 registrants and 600 exhibitor personnel and guests. There were 30 exhibits, many of which attracted interest with their engineering workstations.

In IBM, design automation is centralized in the sense that software is developed by a single organization, called Engineering Design Systems. EDS operates under a corporate charter but is located in the General Technology Division. It supports all technologies and products. Product Design—the DA tool users—is centralized to the operating units. However, each site has its own DA support function, called a DA center of competence, which serves as an interface between EDS and the end user.

"Getting these different notions to work together is an interesting challenge which requires much cooperation and many trade-offs," Camoin told a large audience. "Basically, what we do is superimpose a semiformal structure across the IBM formal structure."

The principal coordinating mechanism is the DA Users Council. It is composed of representatives from every operating unit and from EDS. One of its functions is to provide a means for the operating divisions to approve EDS's strategy and plans. In the process, says Camoin, who is head of EDS, trade-offs must be made.

Sperry's CAD operation is centralized, but the decentralized product development operations have their own support people to assist the designers to utilize the CAD tools that, for the most part, are centrally developed. However, some decentralized CAD development takes place at two or three of the development operations, according to Harry Smuda. One force for standardization is Sperry's single semiconductor fabrication operation. It insists upon having a standard interface to which all of the product development groups must adhere.

Sperry's CAD development is a line organization, funded at the corporate level for tools of use to all divisions and for long-range activities. It receives part of its funding from projects that have particular requirements. The organization is divided into three parts: a system design team, a development team, and a continuation team. To resolve the problems that arise in a centralized operation, Sperry has a CAD Users Committee, comprising not only design and development people but also manufacturing representatives.

Smuda believes that CAD can be separated into two aspects: CAD systems and CAD applications. Systems can deal with strategy, systems design, database standards, interface standards, and hardware design languages—the functions which ought to be standard throughout the entire company. Then CAD applications should plug into those standards, even those that may be developed in one of the decentralized units.

Texas Instruments also has a standard design data interface, which it calls Tidal. It is a combination of the company's hardware description language and other data languages into a common hierarchical structure. It provides an interface to manufacturing, as well as to various supported schools of design. In addition, the interface makes it easy to integrate third-party, commercial, or user-written software into the larger system.

Stephen Pardee of Bell Laboratories perceived some drawbacks to centralized DA. One is that the system may produce a lot of inertia and a long reac-
tion time. Another is the danger that in satisfying all customers the system will fully satisfy no one. Still, he saw even more advantages. A centralized system places the DA development organization above the critical mass in size. It provides a certain amount of synergy, sometimes more than a large set of small groups would produce. Its solutions are available to all groups—to the whole company.

Bell also has a standard interface, called the user command interface, which decentralized engineers can use to write special technology-oriented programs and which ties them into the system in such a way that they appear to be part of the regular structure of the system. "One of the nice things that come out of this," Pardee observes, "is that the winners can be distributed companywide, as they fit right into the system." He feels that to make centralized DA work effectively, "you have to recognize that the local people have to be able to get in and do their thing."

In Honeywell, too, the development resources are decentralized, both organizationally and physically. Just this year Honeywell started a central program office for DA development that is designed to work like a contracting office with planning, specifications, and subcontracts.

Another problem, according to Honeywell's Bremer, concerns how the central organization delivers the good DA tools it develops to the user organizations. For organizations with a long history of using DA tools, this is not a problem. For some Honeywell divisions, however, he believes that it is a problem. To correct any conflict, he wants to use the company's in-house integrated circuit facility as the delivery focal point, since it has had contact with the divisions over a long period of time.

Bremer feels that independent divisions cannot be forced to use corporate-developed tools. Rather, he thinks the best solution is to build a "better mousetrap." He also intends to promote a common plan for the use of engineering workstations. One interesting angle is Honeywell's waiver system: If a division thinks it should take a path other than the corporate-supported one, it may seek a waiver. In effect, that raises the level of decision making to the general management level.

All the panelists agreed that there is no easy answer to the centralization-decentralization issue. What really has to be done is to balance one against the other for the best working solution.
Computer Society launches two new magazines

Two new magazines—IEEE Design and Test of Computers and IEEE Software—received final approval during the IEEE Board of Directors meeting in Denver last June. The new journals—both quarterly to start—are intended to fill important gaps in the society’s publication coverage of computer technology, according to Vice-President for Publications K. S. Fu, who made the announcement. Premiere issues of both magazines will appear in the first quarter of 1984.

The editor-in-chief of Design & Test will be Roy L. Russo of IBM, who currently serves as the society’s vice-president for technical activities. According to Russo, Design & Test will be heavily oriented toward industry and current products and processes, while at the same time maintaining the society’s traditional high standards of technical quality.

Editorial features will cover methods, practical experience, research ideas, and commercial products that aid in the design and test of chips, assemblies, and systems—e.g., design automation, CAD workstations, design software, computer-aided test, test equipment, self-test, and designing for testability.

Bruce D. Shriver of the University of Southwestern Louisiana will be the editor-in-chief of IEEE Software. Shriver, a member of Computer's editorial board since 1978, said that IEEE Software will carry tutorials and surveys on current techniques and new products in software design and development. It will focus on such topics as software tools, program reliability, design of software tests, personal computers as programming workstations, localization of bugs, and making programs readable.

Subscription fees for the new magazines will be $10/year for members and $55/year for nonmembers (i.e., institutions and corporate subscribers). A brochure on each new publication is available from the IEEE Computer Society, 10662 Los Vaqueros Circle, Los Alamitos, CA 90720.

CAD/CAM/CAE seminar and text announced

The Center for CAD/CAM Technology will hold a seminar on “Practical CAD/CAM/CAE” at the Hyatt Regency Hotel, Chicago O’Hare Airport, September 12 and 13, 1983. Lecturers will be S. H. Chasen and Harry G. Schaeffer.

Chasen has worked with computers since 1956 and with CAD/CAM projects since 1964. He is coauthor of The Guide for the Evaluation and Implementation of CAD/CAM Systems. Schaeffer has been active in the field since 1970 and is the author of the MSC NASTRAN Primer.

Chasen and his coauthor, J. W. Dow, are presently offering users and consultants a revised edition of the above-mentioned guide. The 1983 version of this reference text incorporates an additional 110 pages of new material, including a checklist for CAD/CAM benchmark considerations, certain basic modeling considerations, and a typical specification for comparative evaluation of geometric modeling and finite element modeling products.


Defense and graphics industries to gather


DCG '83 will have several program themes, including CAD/CAM; decision support and management graphics; training and simulation; and technical documentation and publication. It is expected to attract experienced and new users from around the world because of international interest and concern about defense preparedness and the more than $500 billion expended annually in worldwide military outlay.

For additional information on the DCG '83, contact Dorothy Bomberger, Director, DCG '83, 2033 M St., N.W., Suite 333, Washington, DC 20036; (202) 775-9556.