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ASSOCIATION OF INFORMATION AND DISSEMINATION CENTERS

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Editor's Note: A workshop on the development of an online materials property data system was held recently. I was fortunate to receive an invitation to attend. Because the issues discussed there will be of interest to many ASIDIC members, this special issue of the Newsletter contains a report of the Workshop.

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Materials Data Workshop

On November 7-11, 1982, a Materials Data Workshop was held at Fairfield Glade (near Crossville), TN. The Workshop was jointly sponsored by the National Bureau of Standards (NBS), CODATA, and the German agency Fachinformationszentrum. About 75 people attended from the U.S., Germany, England, Holland, Canada, and Sweden. Attendees represented academic institutions, government agencies (NBS, CODATA, etc.), national laboratories (Oak Ridge, Lawrence Livermore), a search service vendor (Dialog Information Services), publishers (Wiley, North-Holland), and industrial organizations. Attendance was by invitation.

The purpose of the workshop was stated in the invitation to attend:

> "This workshop will examine the feasibility and desirability of online materials information systems covering the engineering and scientific properties of commercially available metals, ceramics, polymers, and composites...There exists significant interest by the engineering and scientific communities to have such a materials information system(s). But, it appears that for such projects to succeed, there must be coordinated cooperative efforts by several interested bodies...This workshop is designed to bring together in an intensive way key people...to identify the important issues relating to the development of these large materials information systems and to formulate some recommendations."

Discussion Groups

After three introductory overview talks on access to materials data, the group was divided into discussion groups. Each group discussed three general questions plus several questions focusing on a specific area. The general questions were:

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1. Is it now feasible to construct online materials data systems?

2. Is it timely to consider such projects?

3. How best can such systems be developed?

A synopsis of the issues considered by the groups follows.

Barriers

What problems can be identified that might prevent development of comprehensive online materials data systems? What should be the roles of professional societies, trade associations, private industry, information entrepreneurs, and the government in overcoming these problems? What aspects of the current economic, political, and technological climate might lower these barriers?

Economics

Can a model be constructed to (1) illustrate the flow of numerical data from the laboratory to its use by design engineers and (2) to measure the economics of both the present information system and an ideal computerized system? How can we approximate the economic value of ready access to reliable data? Who should pay for such information?

User Identification

Which of the following application areas have the greatest need for computerized properties databases: materials selection, structure and component design, and materials processing? What is the importance of producers, users, the educational community, and the general public in an improved materials properties data system?

Scope Definition

Which properties of which materials would be of broadest interest to main user groups? What is the minimum size file that would be attractive? What are the most significant present gaps in materials properties information that need filling?

Database Development

Should a system be built from the ground up or should it extract existing machine-readable files? Can we accept present reliable data or must it be reviewed again before being put into the system? How can the necessary standardization be achieved in a system of distributed databases with independent inputs?

Database Specification

How should the database be specified in terms of materials, properties, precision, validity, source, derivation, and test methods?

The User Interface

Should the system be queried by keywords or menus? Would it be preferable for users to access the system directly or through an intermediary? What auxiliary files should be provided (help facilities, cross referencing, unit

conversion, etc.)? What other capabilities should be provided (number lookup, file inversion, statistical analysis, graphical display, etc.)?

A few of the issues discussed in the groups were:

- There is a critical need for online access to materials data. Much data already exists in handbooks, etc., and some of it is even in machine-readable form. But there are relatively few online systems generally available now.

- Although several online materials data systems exist, the well-known problems of differing protocols and software searching systems, contractual barriers, and high charges impede general use.

- No single system can satisfy the needs of all users, but a "gateway" system allowing user-friendly access to many systems would solve many of the present problems. Note that the gateway envisioned here differs from present bibliographic searching systems in that the databases would remain on their host computers rather than being mounted on a single system. The gateway would therefore have to possess considerable intelligence. Microcomputers were recognized as having a large impact in this area.

- There was a strong feeling that published data are difficult to locate and often lag too far behind the state-of-the-art. CAD/CAM is a noticeable example.

- Materials selection is fundamental to many design and engineering decisions and processes. An online system would have a large impact in this area.

- Any system that is developed *must* be user-friendly. Lack of user-friendliness is a major barrier to the use of many online systems. The system should be capable of being operated by the end user rather than an intermediary. Not only standard features such as help messages are needed, but also special ones because of the nature of the data. Examples are unit conversion, material name cross-referencing, and possibly computational facilities.

- There was considerable discussion on the impact of such a system on the job security of designers and engineers. As with any computer-based system, some jobs may be eliminated, but new ones will be generated. Technology is advancing, and technical personnel must advance with it.

Workshop Conclusions

After hearing and discussing the reports of the various groups, new groups (with new leaders) were formed to continue the discussion and arrive at some conclusions. The conclusions, endorsed by the attendees, included the following:

- The personal computer will continue to spread and computer literacy will grow. "Cottage industries" will proliferate; by 1987, the first of the "Atari generation" will enter the job market. Online systems will therefore become commonplace.

- A publicly available materials database is needed; one should be developed. It should be decentralized. International cooperation in

data gathering and evaluating is necessary to minimize duplication of effort. Presently available systems should be linked to any system developed.

- Although the system will be decentralized, an intelligent gateway will be needed to make access easy and widely available.

The following action plan was proposed:

1. The Workshop Steering Committee will send its report to the National Academy of Science and National Academy of Engineering (NAS/NAE) as soon as possible. (January 1, 1983 was suggested as a target date.)

2. The report will recommend the formation of a System Definition Committee (SDC) to define specific tasks leading to the system. Members of the SDC will represent the materials data community, computer and information services, materials users, government, and industry. The charge to the SDC will be to:

   a. Define system users and their needs.

   b. Define characteristics of the system.

   c. Identify legal issues that need to be addressed and solved.

   d. Define development tasks and schedules.

   e. Identify potential development organizations.

   f. Conduct a design review and submit a report of its activities.

   March 1, 1983 was suggested as a date for the SDC to begin its work. After defining the tasks, the SDC will continue in a monitoring function.

3. The NAS/NAE will implement the SDC's recommendations and will propose an organization to develop, manage, and operate the system. It will work with appropriate government agencies as necessary (NBS, CODATA, Congress). Within three years, a pilot system should be operating, leading to a fully functional system in five years.

4. Organizations which would benefit from an online materials data system should be contacted and asked for financial support. The Workshop Steering Committee will issue a press release soon and will eventually publish a detailed report of the activities of the Workshop. These media can be used to solicit support.

Finally, the benefits of a viable national materials database were summarized. The database will

- Provide "authoritative" data to users,

- Reduce duplication of data generation,

- Provide databases for CAD/CAM,

- Permit timely continuous updates and expansion,

- Provide distribution mechanisms for data on raw materials,
- Preserve proprietary rights,
- Create strong cost improvement thrusts,
- Focus on international cooperation rather than fostering competitive transborder data flow,
- Provide for increased productivity of small industries which otherwise have less extensive and effective access to data, and
- Reduce problems of product reliability by providing greater design assurance.

Personal Observations and Conclusions

The absence of many bibliographic database producers and search system representatives at this workshop was noticeable. Many valuable lessons have been learned in the first decade of bibliographic online systems; they should be carefully considered in the design of a materials property data system. The viewpoint of the library or information center should also be considered.

The action plan presented above is very ambitious, and the problems, though large, are technically feasible. Legal and proprietary concerns may prove to be the largest stumbling blocks. Nevertheless, the cause is worthy, and timing problems should not stop the implementation of the plan.

The conclusions and final proposals of the Workshop will ultimately be issued in the form of a report and made available to attendees and other interested persons.

ARIST

The *Annual Review of Information Science and Technology* (*ARIST*) Volume 18, is currently in preparation. It will contain 12 chapters on the following subjects: microcomputer technology and applications, information systems and services in selected Asian/Pacific countries, information systems and services in energy, the primary communication process, toxicology information systems, information and society, primary publication systems and text processing, secondary information systems and services, human factors in interactive computer dialogue, international information issues, bibliographic and information processing standards, and videotex and teletext. Anyone who has written articles on any of these topics is urged to submit them for review to the appropriate chapter author. A complete list of authors and their addresses can be obtained from Martha Williams, Coordinated Science Laboratory, University of Illinois, Urbana, IL 61801.

Meeting Reminder

The next ASIDIC meeting will be held in Charleston, SC on March 20-22, 1983. Its theme will be "User Education." Further details will be sent out early in January.

New Members

ASIDIC welcomes the following new members:

Member	*Representative*
Cambridge Research Institute 44 Brattle Street Cambridge, MA 02138	Edward F. West
Comstow Information Services 14 Red Acre Road Stow, MA 01775	Lynda W. Moulton
Commonwealth Agricultural Bureaux c/o OALS, 845 N. Park Ave. Tuscon, AZ 85719	Elaine Cook
Dataquest, Inc. 10340 Bubb Rd. Cupertino, CA 95014	Frank E. Manfredi