

## A NATIONAL INFORMATION SYSTEM

Over the past decade or so, scientists and engineers, particularly those in mission-oriented groups, have become increasingly aware of the scientific and technological literature. This awakening has prompted the over-use of the phrase "information explosion." It is a fact of life that the scientific and technological literature is large and that it is growing at a rate which is estimated to be doubling in about 12 years. Because of the size and growth, it has been all too easy for "concerned" people to hypnotize themselves by projecting the gross growth of the literature of the past 15-20 years into the "explosion" fear complex.

As a consequence "concerned" people have initiated an explosion of their own—the emergence of many abstracting and indexing services in science and technology. At the present time, there are approximately 300 such services, most of which are supported by private enterprise (such as Derwent, IFI, Institute for Scientific Information), societies (CAS, EJC, API), and the government (DDC). Most of these 300 abstracting and indexing services have been introduced over the past 20 years. Not many days go by without questionnaires on the needs for new services or mail describing a new service that will solve all information problems in a given area. Despite the circus of solo information services, industrial research groups must continue to have their own internal information systems to handle effectively and efficiently the information needs of the research environment from the viewpoint of their own unique needs.

Chemical Abstracts during 1967, it is estimated, will abstract approximately 200,000 articles and 37,000 patents. It has been estimated that the approximately 300 abstracting and indexing services will produce abstracts and/or indexes which total more than 2,500,000 items per year at a cost well in excess of \$50,000,000. Many documents are duplicated in many of these 300 services. It is difficult to estimate the amount of duplication, except that we know it is high.

All services must be concerned with the following:

1. Acquisition of documents
2. Reading and analysis of documents
3. Abstracting and/or indexing of documents
4. Publications and communication of the abstracts and/or indexes

The scientific community would be well served if there were at least one location in the United States dedicated to the acquisition of every scientific and technical document issued or published throughout the world. Acquisition by itself, however, is not sufficient unless the documents can be classified by the many and various information needs of the scientific and technical community as expressed by groups and the services serving

these groups throughout the world. The next obvious step is the efficient and quick communication of the classified acquisitions to the community.

Because the reading and analysis of documents is the most time-consuming and costly step in information processing, and the preparation of an information abstract the next most time-consuming and costly step (the second step being contingent on the first), it would be most economical to centralize these two processes in one location. An alternative would be to parcel out the reading-analysis-abstract preparation to a few central locations in some logically oriented fashion. Our most urgent task is to rationalize the structure of all information services into fewer, larger, and more highly specialized locations. The selective concentration of document acquisition, reading and analysis, and abstracting into one or a relatively few organizations is necessary for the following reasons:

1. Economic—cost of documents is high—highly sophisticated computers are very costly—no document should be read more than once for adequate classification and comprehensive abstracting, and input to a computer should be a one-time affair.

2. Availability of qualified information scientists—there just are not enough to go around and management personnel in this area is in very short supply.

Centralization of document acquisition, analysis, abstracting, indexing, computer-input, and computer-communication can be justified only in terms of conserving our scientific and technological literature heritage. Its objective must not be the elimination of existing information services. On the contrary, if centralization cannot result in the substantial improvement of these services at a considerable saving in cost and personnel, it will have been ill conceived and falsely dedicated.

The analogy I see for the centralized service and information services is the relationship between the men who make violins and those who play violins. One cannot exist without the other, yet their missions require different interests and skills. Because we have existed without the centralized service, many information services have been going nowhere at extremely high costs. A centralized service could give meaningful directions to information services at greatly reduced costs. It could give information services the input for the interpretation (selection, abstract orientation, and index orientation) and packaging of the information for the specific needs of their users or customers.

A national information system is not Utopian. It is a practical and economical solution to the paramount need of scientists and engineers for a reasonable control of their literature.

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