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Reading Problems in an Industrial Information Center*

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An important function of an industrial information center is to control, not multiply, the reading problem by selective use of available commercial services. When necessary, and economically feasible, specialized internal services are developed. Some of these services are described.

Gone are the days when a chemist could know by name all the people working in closely related areas of chemistry. Personal correspondence was, in the last century, a wonderful way of being aware of all advances in one's specialty. Keeping up with the literature was not overly difficult, now, however, it is impossible to be aware of all the international literature. A chemist today, especially in industry, knows only a few names of people working in his area of chemistry, he does not even know the names of all the research chemists in his own corporation. Keeping up with the literature is a major problem.

Chemistry can no longer be broken down into three simple sections, inorganic, organic, and physical; *Chemical Abstracts* now has 80 sections, and the boundaries between sections cannot be clearly defined. Should borazines be considered as inorganic or organic compounds? Should detergents, such as alkylbenzene sulfonates blended with phosphates or nitriloacetate, be classified as organic chemistry, biochemistry, or ecology?

The problem can be further magnified by the type of person requiring chemical information. Most industrial (chemical) information centers or libraries have four main types of client:

1. The corporation executive (domestic and/or international)
2. Market development and research
3. Legal counsel and patent attorney
4. The technical person—e.g., chemist, chemical engineer, physicist, mathematician, life scientist, etc.

The information needs and interests of these types of clients frequently overlap—i.e., there is no clear boundary, for both the corporation executive and legal counsel are interested in license agreements relating to the transfer of technical know-how. The patent attorney and the technical person are both concerned with technical information published in patents and in the general worldwide literature. The information center has two main categories of material for this varied audience, short-term information and literature for storage and retrieval. Short-term information can be exemplified by price quotations listed in the *Oil, Paint and Drug Reporter*, the preliminary reports on chemical imports published by the Tariff Commission, or potential 5-year-hence markets as projected by one of the economic forecasting services. Material having limited life also includes news releases relating to proposed expansions of manufacturing facilities, corporate mergers, and acquisitions. Documents suitable for storage and retrieval can be briefly described as those containing technical information of lasting value, which includes physical properties, thermodynamic data, methods of synthesis, production yields, toxicity data, etc.

Apart from information published in technical and trade journals, there are two other sources of current research material which are of utmost importance to the industrial information center. One is the ever growing number of printed patents. Although the number of U.S. patents exceeds that of any other country, foreign patents constitute the predominant part of world patent literature. Owing to differences in national patent laws, foreign patents are an important source of published information for the use of corporation executives. A U.S. patent takes approximately 2 to 3 years to issue after filing, and normally ideas are well evaluated before filing so that more than five years may lapse between the idea stage and patent protection. Many foreign countries issue patents very promptly—i.e., within six to eighteen months from date of filing. These foreign patents serve as an indicator of the research being undertaken, with a view to commercialization, by one's competitors. One commercial organization, Derwent Publications Ltd. (United

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Kingdom), offers a variety of services, based on abstracts of patents for manual or computerized scanning and searching. One reason technical personnel in the U.S. appreciate this type of service is that the abstracts are in the English language. For the research chemist, the language used in patents is already foreign, a patent is a legal document, without further complications of foreign terminology in a foreign language. The information center may have access to several hundred thousand patents, depending on the interests of the research and market research departments of the corporation. With U.S. patents, a numerical collection of chemical patents (about 25% of those issued) may be on microfiche or microfilm rather than hard copies; for many searching purposes (especially state-of-the art, validity, and infringement), a collection based on the U.S. Patent Office classification system is preferable. A subscription to specified groups (classes and subclasses) of U.S. patents will result in regular receipt of all patents issued on a weekly basis in those specific groups. The U.S. patent literature can be searched, back to 1950, by a commercial computerized operation (IFI/Plenum Data Corp., Washington, D.C.)—this can provide essential background information for a new project.

E. A. Hurd[1] of the U.S. Patent Office has commented on some of the solutions being developed within several cooperating Patent Offices "to ease the pains, costs, and burdens of document growth." The first noted change is in document characteristics, a new front page format has been adopted by several countries. This front page contains all bibliographic data elements, including fields of search and references cited and in the U.S., an abstract prepared by the applicant. In 1970, the U.S. Patent Office was to have started a tape library of patent full-text; this file would have provided for direct machine transfer and dissemination of patent information for computer data systems. For economic reasons, this proposed tape library has not materialized to the stage of benefiting the individual chemist. In addition, Patent Offices are looking to commercial documentation service companies which seem to offer a way for bringing some control to information problems.

The second nonjournal source of current research material is the Federal Government. The U.S. Government can be considered as the world's largest publisher of technical information. This information appears, owing to Government sponsored research and development carried out by Federal laboratories, Government contractors, and grantees. Some material of importance to the industrial information center appears in legislative publications, which includes not only bills before Congress but also hearings on those bills and amendments to bills. The Federal Register contains new or revised rules and regulations of executive agencies, approved rules and regulations and notices of actions by those agencies. This publication is becoming more important with increased public interest in ecology. Government reports of interest are those documents giving results of research and development carried out by or for Government agencies, such as Department of Defense, Atomic Energy Commission, and NASA. There is no uniformity in the way reports are handled by various agencies, some of the reports are handled by the Government Printing Office with all the attendant problems of limited printing. Also about 20% of the AEC and 40% of the DOD reports fall into the limited and classified category so that frequently a division of a corporation may be unable to obtain a copy of a report of work done by the corporation at another location.

The language problem further complicates the volume problem. For the more than 10,000 periodicals covered by *Chemical Abstracts*, there are about 35 languages, including English. An industrial information center usually is concerned with material published in one of six languages—English, German, Japanese, Russian, Italian, and French. If foreign language skill plus knowledge of the subject matter is not readily available within the organization, use can be made of one of the many commercial translation services. The cost of quality translation is fairly uniform. English translations of complete Russian periodicals are available within one year of publication of the original Russian. In some instances a one year wait may be too long and the expense of a custom translation is justified. At $35 to 40 per thousand words, a comparatively short article will run up a bill of several hundred dollars. Even if translation skills are available within the research department, the expense (about $175 to 200 per 8 hours) of using a bench chemist as a translator may be higher than using the commercial service.

To assist the chemically oriented person, who would like to have the time to read 1000, 2000, or 5000 publications (journals, patents, reports), many organizations resort to a documentation or centralized information system. This may be a selective, critically evaluated abstract service as offered by *Verlag Chemie* (West Germany), any one of the twenty-six scientific-technical tape services, including *Chemical Abstracts*, listed in the survey published by the American Institute of Physics and American Society for Information Science,[2] or an internally operated system.

An internally operated system frequently uses a combination of commercial documentation services plus the corporation's own technical information service. In this way, the storage and retrieval system can include information from journals, government reports, patents, and the corporation technical reports. The journal literature is covered by the use of Chemical Abstracts Service's *CA Condensates*' tapes, and patent information is from two prime sources: U.S. patents from the *Official Gazette* abstracts or the individual copies received on a weekly subscription basis, and Derwent's Central Patents Index service for foreign patent information from 12 countries. Government report information can be obtained from a variety of sources, which include *U.S. Government Research and Development Reports* (USGRDR) of the National Technical Information Service, *Technical Abstract Bulletin* (TAB) of the Defense Documentation Center (DDC), *Nuclear Science Abstracts* of the U.S. Atomic Energy Commission (AEC), and the abstract journal *Scientific and Technical Aerospace Reports* (STAR) of NASA.

The corporation information system may be manual or computerized or a combination of the two. A description of the services given by a manual system in effective operation at Celanese Research Co. was published earlier this year.[3] The services include current awareness and selective dissemination of information (SDI)—this manual operation generates "three services, a weekly Review of journal and government literature, a weekly Patent Bulletin and a manual SDI based on 125 profiles." The cost and manpower requirements for the services are given. It was found "that the package of the three services costs the equivalent of 40 minutes per week of the average professional's time."

Skolnik and Clouser[4] have reported on "designing an information awareness and retrieval system for chemical propulsion literature." This system is a computerized operation restricted to Hercules' own technical reports and technical reports from U.S. Government agencies and contractors. The awareness bulletin produced by this system "has reduced almost completely the need for many scientists and engineers to examine TAB, USGRDR, and

STAR, as they did before the centralized system was set up." The advantages of the Multiterm indexing used in this computerized retrieval system are stated to be, computer-orientation, high information content, unique clarity of communication, inherent internal consistency, and high retrieval efficiency.

At the 160th ACS meeting in September 1970, a symposium was held on the "functions and contributions of the industrial information center." One paper[5] from that symposium gives some indication of the problem facing segments of the scientific community, "the National Federation of Science Abstracting and Indexing Services lists over 1800 (indexing and abstracting services) in 40 countries in its current edition. A more recent survey of Federation members (which includes *Biological Abstracts, Chemical Abstracts, Engineering Index,* etc.) shows that the member services alone will produce over 850,000 abstracts and citations this year...." To assist the chemist in reading the appropriate abstracts, industrial organizations have developed current awareness services such as the one at the Dow Chemical Company[6] which is based on internal information and *Chemical Abstracts.* Bowman and Brown[6] state that "the greatest impact these services have on an organization is one of cost. It costs us (Dow) about $100,000 a year to provide the services we mentioned...."

Another indication of the cost to the producer of information services can be gained from the recently announced $12.8 million National Science Library to be built in Ottawa by the Canadian National Research Council. According to the report in C&EN (Sept. 6, 1971), the Library "will fill requests for research information, provide computerized abstract scanning services, compile information from 12,000 periodicals, and maintain a pollution data bank and a list of federally supported research projects."

The industrial information center can paraphrase the words of Samuel Johnson, "Knowledge is of two kinds: we know a subject ourselves, or we know where we can find information upon it" to say that the center has two functions: to have the information available on site and to know where to obtain the needed information readily.

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Utilization of Terse Conclusions in an Industrial Research Environment*

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Terse Conclusions are used at Hooker Research Center by technical and management personnel as concise report surrogates, as an internal awareness mechanism, and as the key components in a Report Header Sheet System. A Terse Conclusion is concerned with the meaning of a document rather than the subject scope, as in an abstract. A Terse Conclusion is written for every project in a heterogeneous report. Weekly compendiums of Terse Conclusions, which have replaced abstracts at Hooker for Progress Reports, are circulated to the entire staff. These Terse Conclusions are also intended to aid in management decisions.

This paper describes use by the Hooker Research Center of Terse Conclusions to improve communication at all levels and to reduce the amount of reading.

Among the various representations, or surrogates, for the full text of a document are indicative abstracts—which indicate the general content of the document without data, informative abstracts—which include specific data, extracts, reviews, textbooks, annotations, summaries, precis, and the like. A kind of surrogate recently reintroduced is the Terse Conclusion. It closely resembles the aphorism of Hippocrates.

Document surrogates are essential in most information-retrieval systems. An adequate document representation or surrogate permits the user to make the same decisions as if he were using the complete document.[1-5]

Despite recent advances in information/computer science, the user of today's literature has an almost impossible task in keeping abreast—even in a narrow field. Organized bibliographic citations are unsatisfactory because the primary literature is often difficult and costly to retrieve—and is just as voluminous as before. Detailed abstracts are often too voluminous for rapid perusal, and they frequently hide the main forte or conclusion of the paper. A possible solution to this reading problem is the Terse Conclusion. Adequate document representation is still an unresolved problem. The correctly phrased Terse Conclusion (from which we can arrive at proper decisions concerning the status of a research project) can be an efficient report or document surrogate.

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