The Changing Role of Secondary Information Services

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Stated as simply as possible, the basic purpose of secondary (abstracting and indexing) services is to save the time of the user. They identify the primary literature so that the user has access to recorded knowledge on either a current or a retrospective basis. In his detailed study of abstract journal development between 1790 and 1920, Manzer states that the early secondary services were "undertaken to provide a convenient, current digest and index to ... provide for scholars effective bibliographic control of the evergrowing body of journal literature on both a current and retrospective basis". Initially, secondary services were developed for the polymath scholars of the 18th and 19th centuries. They evolved to cover specific scientific disciplines with such services as Physic Abstracts (1898), Chemical Abstracts (1907) and Biological Abstracts (1926).

Responding to the pressures of the 20th century with its two World Wars, the development of nuclear energy (with its potential for both good and ill), the space race and man's growing concern with the environment and the use of fossil fuels, a different kind of secondary service was established. These were mission or project oriented services aimed at a particular goal or objective. They included such publications as Nuclear Science Abstracts (1948), International Aerospace Abstracts (1961), Fuel and Energy Abstracts (1960) and Energy Abstracts (1974).

The difference between discipline and project/mission oriented services was clearly defined in the National Plan for Science Abstracting and Indexing Services prepared by Robert Heller and Associates for the (then) National Federation of Science Abstracting and Indexing Services in 1963. This division was confirmed ten years later in 1973 by the Federation's members, who include many of the major producers of secondary services in the United States, with a few non U.S. members. The difference between the two types of secondary service is defined as follows:

- discipline based services which aim to provide a comprehensive coverage of a given field of knowledge by capturing the literature at the time of its primary publication; adequately abstracting and indexing it; making this secondary information available as quickly, broadly and conveniently as possible; and storing it for later use;

- project or mission oriented services which aim to serve an identified user group that has a specific area of interest usually identified in terms of a task rather than a specific discipline. Usually such groups are either inter- or intra- disciplinary.

In a study conducted by Arthur D. Little for the U.S. Government published in 1978, it was suggested that the discipline and project/mission oriented services marked two overlapping eras in information service development. The Arthur D. Little study suggests a third era of information service has arrived, namely the era of problem oriented service. This is defined as follows:

- problem oriented services are those in which information is utilized for "societal" problem solving - such tasks as public policy formulation, decision making and crisis management. They draw on the discipline and the project/mission based services as well as providing new types based on today's society and its needs.
In order to examine this idea, recent changes in secondary services will be explored under four headings - the form of the physical product, the pricing structure of the secondary services; the needs of the people using the service; and the philosophy of the secondary service producers as they seek to respond to the demands of their users, the realities of the economic climate and the potential offered by modern methods of information transfer.

THE PRODUCT

The late 1960s saw the major secondary service producers shift from manual production methods to machine-based systems. This shift presented the information community with a new product in machine-readable form. This could be searched by many more access points than those offered by the traditional printed index. In addition, there was the possibility of searching on natural language vastly increased the store of searchable terms (and increased the headaches of the searcher coping with the rich variety of uncontrolled vocabulary). Machine-based systems also offered the possibility of combining and coordinating search concepts far beyond the capability of the manual or printed index.

This change in the physical form of the product led to other changes in product development. Service producers became more aware of the possibility of producing cooperative products and a growing awareness of the benefits of standardization developed. Although standardization had long been paid a certain amount of lip service, the advent of the machine-based service caused significant progress to be made. A machine-based file that was used initially in batch mode during the sixties and the early seventies by large industrial companies, government departments, research organizations and academic institutions had to be supplied in an internationally recognized standard machine-readable format. This became even more important later in the seventies when online systems vendors made their appearance.

The availability of a standard machine-readable file led to a number of cooperative ventures on the national, bilateral, regional and, in some cases, international level. Some of these occurred at the internal level - and an example of this is the studies carried out by BIOSIS, Chemical Abstracts Service and Engineering Index, Inc., to examine style, overlap and coverage. This resulted in agreement on a common bibliographic format and the subsequent publication of a style guide that could be used by other secondary services. The possibility of merging selected sections of the file produced two different organizations to produce a new product became possible.

In 1982 BIOSIS announced a new product - B-I-T-S. The name stands for the BIOSIS Information Transfer System and is the first commercially available secondary service to be designed for micro or desk top computers. B-I-T-S is designed for CP/M operating systems with a 48K memory and at least two 5½" or 8" floppy disk drives. Subscribers develop a research profile drawn from over 600 subject categories. They will receive monthly diskettes which will contain selected modified references drawn from the BIOSIS/Previews data base. The B-I-T-S record includes the BIOSIS identification number, abbreviated journal title, bibliographic data, additional keywords and Biosystematic details. The text of the abstract can also be supplied, if requested. In addition to providing the B-I-T-S service on 5½" or 8" floppy disks, BIOSIS is testing a number of information retrieval packages that are suitable for use with B-I-T-S.
THE PRICE

The machine-based secondary service was first made available in the 1960s on a lease or license basis, depending on the user group to be served. Online systems set their prices in part based on the system cost of handling a particular data base and in part from a royalty fee for each reference used. Although the relative economics of the machine file and the printed publication have been the subject of considerable debate, it is only in recent years that it is being reported that the income generated by the use of the machine file is contributing substantially to the total income received from the use of both product forms. Although this migration of income from the sale of the printed publication to the use of the machine-based file is now being documented, the printed product is still credited with 50-85 per cent.

Although the data base charges levied by the secondary service producer for the online use of the data base are worth watching, of more serious concern is the current debate on re-packaging. It has been recognized for many years that the re-packaging and re-use of secondary services is not only inevitable but desirable. However, today's technology allows for large scale "downloading" of large amounts of data from existing services. This can be reformatted, stored on tape or disk, for use in a microcomputer system. Secondary service producers are concerned that a large amount of material is being paid for once and then re-used many times without recompense to the secondary service producers.

Although there has been considerable discussion on this topic, no substantial solution has been found. The U.S. Association of Information and Dissemination Centers (ASIDIC) has been examining the problem for the past two years and looking at the possibility of a multi-tiered pricing structure for different levels of usage. However, how such a pricing mechanism might work does not yet seem to have been resolved.

However, BIOSIS may be setting a new trend in the pricing pattern that has been established for B-I-T-S. This service will be supplied on the basis of a "permanent, royalty-free license". This means that the subscriber may browse, search, modify records, add inhouse indexing terms, delete non-relevant records, and provide an SDI service for up to 10 other people who form an "affinity group". The license does not allow for diskette copies for transfer to anyone outside the 10 member affinity group and multiple copies of bibliographies produced from the B-I-T-S record are not allowed. The cost structure for B-I-T-S is as follows, with discounts for subscribers to BIOSIS printed services:

<table>
<thead>
<tr>
<th>Number of Records p.a.</th>
<th>Records Charge</th>
<th>Abstract Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st 1,000</td>
<td>.35</td>
<td>.17</td>
</tr>
<tr>
<td>Next 1,500</td>
<td>.25</td>
<td>.12</td>
</tr>
<tr>
<td>Next 2,500</td>
<td>.20</td>
<td>.10</td>
</tr>
</tbody>
</table>

Upon submission of the profile, BIOSIS staff review it for accuracy and estimate the number of items that will result for a full year. A B-I-T-S subscription may be initiated at any time. If, at the end of the subscription year, the profile yields a greater number of items than estimated, an adjustment will be invoiced. Charges for diskettes and postage are additional. It is estimated that 12 diskettes will cost $60.00 p.a.

BIOSIS is currently exploring the possibility of supplying B-I-T-S on magnetic tape under the same terms. This will mean that users will be able to use the tape via a main frame machine or convert the data for use on a microcomputer. The provision of B-I-T-S in either diskette or magnetic tape form marks a new method of pricing the secondary service. Under the conditions laid down by BIOSIS, the service is purchased, not leased, and there are no royalty or usage charges.
People are often considered in terms of information systems only as users, but they are also generators of the information package that has to be processed by these systems. It is possible to argue that the so-called information or publication explosion of the 1960s to date has been caused not by a vastly increased amount of information but by an increased number of human beings who are contributing to the flood of written information. The person is the beginning and the end of the information transfer loop. If the behaviour pattern of the human being as information generator is changing, it can be expected that the demands on the information system will also change.

As discipline based services grew into vast monoliths - from the mid 1950s on, the service producers realized that the size (and the resulting cost) of these services were removing them from the actual end user. The library, often paying special institutional subscription rates, was acquiring the service and the end user was consulting these copies. Mission or project oriented services were aimed at a particular user community, often a closed user group working on a particular goal - putting a man on the moon, developing a company product.

Online search facilities brought the secondary service back to the possibility of direct access by the user. Although the information intermediary emerged as a new breed of information worker in the 1970s, the most effective searching was usually when the intermediary and the end user worked together. Online search facilities were also established internally in industrial companies, information units, broadcasting facilities, etc., allowing even more direct involvement in the input, design and use of these facilities by the end user.

The increasing computer literacy of the population both at the adult and student level is becoming increasingly apparent. The availability of relatively inexpensive microcomputers and a growing number of people able to make use of them may well be one of the most significant factors in secondary service development during the 1980s. The pioneer work of BIOSIS in launching B-I-T-S has already been mentioned in this respect.

The use of microcomputers should also be considered with respect to two other aspects - namely the potential of "downloading" of data by individual users for storage, manipulation and reuse, and the use of telesoftware. Downloading allows users to obtain data for reformat and multiple use on personal desk top microcomputers. Telesoftware will allow users to copy computer programs on a central computer. The Centre for Educational Technology in the U.K. is making software available in this way.

It is perhaps less certain how the videotex and the optical disk systems will effect secondary service developments in the short term. However, secondary services form only part of the information transfer chain and those services that basically supply bibliographic references and related subject information should be concerned with current work on electronic document delivery systems. The user's need for information may not be satisfied until the actual document has been consulted. Future systems may well require an integrated, linked approach which will provide subject access points (subject index terms, abstract, etc); bibliographic record; facts/data; complete document text from a single system to satisfy the requirements of the user.

 Organizations calling themselves information utilities are developing in the United States (The Source; FIND/SVP) and in other countries. Subscribers are offered a total service supplied in a form specified by the client which could include primary and secondary material.
To return to the human being as generator as well as user of the information product, it should be noted that the method of generating the primary information product are changing. Recent studies have shown that there is increasing use of word processors and microcomputers among authors and potential authors.

THE PHILOSOPHY

This paper started by quoting a recently published U.S. report by Arthur D. Little in which the three eras of secondary service development are identified as:

Era I - discipline based systems; growth of knowledge motivation; user community comes from discipline involved; typical information vehicle is print medium; response time of months to years.

Era II - mission/project based system; "big" science and technology motivation; user group includes technologists, engineers and applications people committed to multi year periods; typical information medium printed reports, mechanized information systems, limited repackaging; response time of weeks, hours or minutes.

Era III which the Arthur D. Little study claimed to have started in the late 1960s and gained emphasis during the 1970s, is described as the era of problem based systems. In this era of service provision the systems are characterized as dealing with socio-technical problems. Examples given in the report include housing, transportation, job opportunities, preserving the environment, etc. Members of the user group include policy makers at all levels, industrial and consumer groups, media personnel. In addition, members of the general public form a transient, short term user group depending on the problem.

The three eras of information system development will continue concurrently. The suppliers of the discipline and mission based information services will continue to serve their particular user community. Arthur D. Little identifies the Era III information supplies as "online information supermarkets; commercial purveyors of repackaged government-originated information; database publishers/consultants; information intermediaries".

Database producers (secondary service publishers) are identified as an important group to provide Era III information products and services. This paper has discussed some of the background and recent developments that are indicators of the changing role of secondary services.

The Arthur D. Little report is entitled "Passing the threshold into the information age". The three eras of scientific information transfer are identified as "a continuing traditional Era that emphasizes transfer of disciplinary knowledge; a post World War II Era devoted to mission-related information; and an emerging Era oriented toward socio-economic technical systems problems". The typical information vehicles for Era III projected in 1978 when the report was published involved "heavy use of telecommunications and interactive remote technical computer systems, database publications, newsletters and all traditional media - which will eventually be integrated with automated office systems". It will be worth watching the development of secondary services during the 1980s as the requirements of Era III problem-oriented systems become established in today's Information Age.

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REFERENCES

