

Economic considerations for NTIS bibliographic data-base products *

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Economic considerations for producing the NTIS bibliographic data base and the distribution of products derived from it are of utmost importance to the National Technical Information Service. The principal reason for this concern is the Congressionally mandated requirement that NTIS produce and distribute its information products on a cost-recovery basis.

The requirement to operate on a cost-recovery basis has been included in the enabling legislation of NTIS since 1950. Prior to 1968, however, the Office of Management and Budget and the Congressional Authorization and Appropriation Committees did not require NTIS to recover costs associated with producing the NTIS bibliographic data base. Therefore, incurred costs to produce the data base were paid from appropriated funds. It was not necessary for NTIS to include costs of producing the data base in any of the products derived from it.

The data base was started in 1964. Typical of data bases started in that period, the principal thrust was to use computer photocomposition technology to produce printed announcement journals. Keying the data into a machine-readable device was done so that corrections and reformatting could be accomplished prior to preparing final printed pages. The only product produced from the data base in 1964 was the comprehensive announcement journal, *United States Government Research and Development Reports* (currently entitled *Government Reports Announcements and Index*).

Producing the NTIS data base is somewhat different and more complex than producing some other bibliographic data bases. Most bibliographic data bases include all or selected articles from some number of recurring printed publications. The number of publications included ranges from a few to several thousand depending on the subject content of the data base. Once a data-base producer has selected the publications to be included and arranged to receive them, collection of material is somewhat automatic. The producer needs only to receive the recurring issues of the publication.

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The NTIS data base is not assembled from articles in recurring publications. Instead, the data base includes bibliographic citations representing unpublished technical reports. In a real sense, each citation of the 70,000 reports announced each year represents an independent acquisition and collection effort. This is, of course, very different from citing a few hundred articles in a recurring publication that has required a single action to acquire it.

To add complexity, enabling legislation requires that NTIS search for and collect technical reports from both domestic and foreign sources. It is much more difficult and costly to locate and acquire foreign technical reports than to acquire those produced in the United States and funded by government entities. At this time some 15–20 percent of the citations entering the data base represent foreign technical research reports.

The content of each entry is fairly typical of bibliographic data bases. It includes the normal descriptive cataloging elements such as title, author, research organization, date, number of pages, and so forth. Each citation is encoded into some 500 subject field classifications. To refine subject searching, each citation includes 10–14 specific subject terms selected by an analyst from up to seven thesauri. The data base was designed to include abstracts and most records contain them. The typical abstract has 200–300 words.

When NTIS was advised by funding authorities that direct appropriations to offset costs associated with producing the data base would be phased out, it was necessary to develop immediately a plan of action to recover costs by other means. The charge to NTIS was simple: comply with legislation to recover costs through the collection of user fees. Accomplishing this would not be simple, but a two-pronged approach was adopted. First, an effort would be made to minimize costs and, second, new products would be developed and introduced to increase the revenue base that could absorb the costs incurred in producing the data base.

Several major efforts have been undertaken over the years to minimize costs. Some have been implemented over two or more years. Most have overlapped at one time or another with other efforts. Efforts are still continuing as NTIS constantly seeks new technologies and work improvements to reduce and/or control costs. Some of the major efforts have been:

- To develop interchange formats with the Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration. NTIS worked with each agency to acquire a magnetic tape containing bibliographic citations for the agency's reports. Data elements were standardized to the extent possible. NTIS converted the three agency tapes to a common format and added any special coding needed to complete the records. This reduced NTIS costs approximately 75 percent for adding these citations to the data base.

- To convert to an online minicomputer keyboarding system. This permitted direct keying by data catalogers, eliminating the duplicate writing and keying of entries. It also permitted online editing of data enabling corrections to be made while work sheets were in front of the employee keying the data. Substantial work improvement and productivity gains have been realized.

- To convert common use entries to codes. NTIS developed and implemented

numeric codes for such entries as research organizations, sponsoring agency, and others. Most codes are 5–7 characters. Frequently, keying the 5–7 characters replaces keying more than 100 characters. Accuracy is greatly improved since the computer converts the codes to textual data. There has been a significant productivity gain in keyboarding and editing.

- To establish a foreign cooperating organization program. As noted earlier, costs associated with acquiring and collecting foreign technical reports are very high. NTIS established a program whereby organizations in foreign countries could resell NTIS products. Cooperating organizations are permitted to purchase NTIS products at a discount for resale. In exchange, they are required to seek and acquire technical reports produced in their countries and to enter those reports into the NTIS data base, making copies available through NTIS. This has reduced the cost of acquiring foreign technical reports while at the same time greatly increasing the number of reports made available.

Concurrent with efforts to reduce and/or control costs, NTIS also initiated a program to develop and announce new products derived from information contained in the data base. The major products are:

- annual indexes
- weekly abstract newsletters
- a bi-weekly SDI service (SRIM)
- a data-base lease program
- published searches
- a microfiche title index

Introducing new products provided a larger revenue base to offset costs incurred. Listed below are the new products and the percentage each contributed to the total revenues used to offset the cost of producing the data base:

	1968	1974	1983
Announcement journal (GRA)	100 *	19	9
Annual index	–	11	5
Weekly abstract newsletters	–	25	16
Selected dissemination (SRIM)	–	35	44
Data-base lease	–	6	9
Published searches	–	4	16
Microfiche title index	–	–	1

* Most costs in 1968 were paid from appropriated funds.

The above reflects two facts. NTIS was able to develop products from the data base which expanded the revenue base. This was not surprising, as there was always the potential to produce new products. The more significant fact is the decline in revenues between 1974 and 1983 of the traditional printed products. The decline is almost 50 percent for the mix of the three products. These are the products that could be replaced by performing online searches of the data base via commercial online systems. In the view of NTIS, the decline was caused by the migration of users to online systems. If this is true, then it can be expected that the revenue contribution of the products will continue to decline.

After twenty years in the data-base services product area, the following observations are made regarding the current and future status of these products:

- Paper announcement index-type products will continue to decline, in the 5–8 percent range each year. Price increases will have to be effected each year to maintain an acceptable level of revenue. The necessity for these increases will ultimately lead to the point where the product cannot be produced. However, that should not happen in the next five to seven years. Through all this, the customer base that should remain to the end is the major libraries.
- The published search program has steady but slow growth potential. To exploit this potential it will be necessary to add more data bases to the program.
- Selected dissemination has the greatest growth potential of all NTIS products. It is important, however, to understand that the product will need to be interfaced with microcomputer technology if the growth is to be realized.
- The maximum customer base for leasing the total data base has probably been reached. Any future growth will have to come from leasing subsets of the data base, probably on floppy disks.

There is some pricing flexibility for all except the traditional printed products. Pricing is an important consideration and must receive careful attention as the number of microcomputer users grows.

NTIS has been successful in meeting its requirement to comply with the enabling legislation to operate on a cost-recovery basis. Costs have been tightly controlled and in many instances reduced. The current operating capacity is such that workloads could be expanded without increasing unit cost for any function. Productivity increases are achieved each year through continued work improvements.

The development of new products has been responsive to the needs of users and in coordination with the utilization of all resources and the need to increase the revenue base. Development of new products on a timely basis has been the most important aspect of the overall effort.

I think that the future for NTIS data-base products is bright. The future will be challenging as there will always be a need to keep product capability and demand together. Costs must be tightly controlled. The key to both product and cost considerations is the proper use of new and changing technologies as they become available. I believe products that can be used on microcomputers as stand-alone information systems are the ones for the future.