Report DDC-TR-69-2

AD-713 200

TECHNICAL INFORMATION-AVAILABILITY VS SELECTIVITY VS COST

Herman W. Miles
Directorate of Development

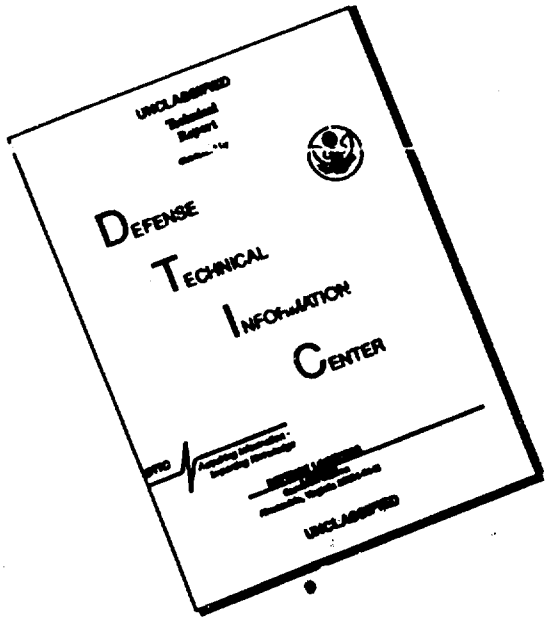
September 1969

Presentation For-
Annual Meeting of National Security Industrial Association-
Technical Information Advisory Committee

DEFENSE DOCUMENTATION CENTER
Defense Supply Agency
Cameron Station
Alexandria, Virginia 22314

14

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
Defense Documentation Center
Cameron Station
Alexandria, Virginia 22314

2a. REPORT SECURITY CLASSIFICATION
Unclassified

2b. GROUP

3. REPORT TITLE
Technical Information - Availability vs Selectivity vs Cost

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*
An Address

5. AUTHOR(S) *(First name, middle initial, last name)*
Herman W. Miles

6. REPORT DATE
16 September 1969

7a. TOTAL NO. OF PAGES
9

7b. NO. OF REFS

8a. CONTRACT OR GRANT NO.

b. PROJECT NO.

c.

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
DDC-TR-69-2

9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*

10. DISTRIBUTION STATEMENT
This document has been approved for public release and sale; its distribution is unlimited

11. SUPPLEMENTARY NOTES
Presentation at the Annual Meeting of National Security Industrial Association - Technical Advisory Committee-16 Sep 69 - Boston,Mass

12. SPONSORING MILITARY ACTIVITY

13. ABSTRACT
The goals and objectives of the DDC Development Program for the 1970 era are discussed in relation to the information transfer needs within DoD and how they affect the transfer of information between and among other government organizations. Specific emphasis is placed on the role of the organization generating information in response to the requirements and needs of information users and response to information needed from local scientific and technical information centers to assure better decisions and to establish better information transfer policy. The cost of maintaining information more accessible and on a more selective basis is also discussed.

DD FORM 1 NOV 68 1473

Unclassified
Security Classification

DEFENSE SUPPLY AGENCY
DEFENSE DOCUMENTATION CENTER
CAMERON STATION
ALEXANDRIA, VIRGINIA 22314

PREFACE

The long range goals of DDC are described in general terms. Rapidly advancing technology associated with communication of information dictates the establishment of a frame of reference within which DDC development resources should be applied. Specific projects are discussed of varying durations that will encompass a time span of ten years.

PREPARED BY:

HERMAN W. MILES
Directorate of Development

APPROVED BY:

WILLIAM A. BARDEN
Acting Deputy Administrator

TECHNICAL INFORMATION - AVAILABILITY VS SELECTIVITY VS COST

What is Information?

Webster defines the word information as, "the communication or reception of knowledge or intelligence." The invention of computers followed by their use in the information field during the 1960's has caused DoD management to realize there is as much danger in too much information as there is in too little. The real need is not just for information, but the right kind of information. Since different types cost different amounts of money, the main problem is to balance the value of potential information against its cost. Otherwise, the natural tendency is to seek as much information as one can get for a given cost - a sure prescription for generating mountains of information of the cheapest, least useful kind.

How does one go about measuring and evaluating information? How can one predict the value of a system set up to provide it?

1. Information is something that reduces uncertainty, usually at a cost.

2. Information has value only in the context of a specific situation.

3. The amount a decision maker should be willing to pay for information depends on the likelihood that it will change his decision. The decision maker to whom I refer is the scientist or engineer who really makes decisions as he acquires new knowledge or applies knowledge in a new environment.

I am sure that corporations sponsoring technical information centers or technical libraries are also interested in the questions regarding the value of information and information systems.

The subject of today's conference is: overcoming the barriers to transfer of scientific and technical information and data. I suppose you can translate the objectives to a need for better information systems or better information processors. Information processors consist of techniques, policy, procedures, equipment, and people. I submit that the greatest barrier to information transfer is people - their traditions, their shortsightedness, their attitudes The significance of the latter is particularly evident in people's attitudes towards government. As an illustration, each of us wants a reduction in the spiralling costs, a reduction in our personal tax bills by restructuring of tax laws - many of us as individuals eye critically the oil industry with its favored position of unusual depletion allowances - yet, each of us becomes concerned when government services are reduced. It is not my intent to talk about a reduction in government, but to make you aware of the DoD need to scrutinize, control, and reduce the DoD budget to the extent possible.

The DDC budget in excess of $10,000,000 is visible. The cost of running DDC does not represent the total cost of operating the systems that DDC is involved in. Cost-effectiveness analysis must consider data pertinent to the total DoD information transfer process and not be limited to that data associated only with DDC's internal operations. To achieve the desired result, we need to know more about this information exchange program and the value of our services as they affect total dollars spent for RDT&E throughout government, not only in DoD.

Goals of the DDC Development Program

General goals are to make information:

*More accessible

*More available

*More selective

Specific goals are to:

*Improve Information Generation - By identifying more precisely what information should be recorded, how, in what form, and new methodologies for its transmission to information collection activities.

*Minimize Barriers to Direct Dissemination - By reducing the number of processes and organizations now involved from the time information is generated until it is available for use by individuals.

*Increase the Capabilities of Libraries as Information Centers - By recognizing local libraries as a first and principal source of information, and by providing them with the necessary tools to do a more effective job.

*Develop Hybrid Digital-to-Film Storage Capabilities - By explciting computer-to-microfilm technology to provide central or remote access to information in a more rapid manner.

*Identify and Program Creative Association Patterns - By attempting to recognize the combinatorial processes required for storage and recall of information and establishing self-organizing, self-adaptive, interactive systems.

*Eliminate Systems Incompatibilities - That would prevent DoD access to and exchange with other national R&D information networks, such as those being established by NASA, AEC, Department of Commerce, and the National Libraries.

*Establish Integrated Systems - Both within the DDC/DoD community and in the DDC system interface with other federal information systems.

*Establish Regional DoD Information Networks Interfaced with Other National Information Systems - That will make direct access to information from DDC, AEC, Department of Commerce, NASA, and other National Networks - utilizing the same terminals, inquiry language, and shared data banks feasible for DoD engineers and scientists.

*Stratify System Needs - By defining user requirements more explicitly and relating system products and services to specific user audiences.

*Promote the Development of Policy for Information System Management Within DoD - Through specific programs to encourage more effective transfer of information from source to user.

Stepping back from generalities, we can identify specific tasks that we must accomplish in the next decade to achieve these goals. Obviously achievement of these specific tasks is dependent on availability of resources. Also, as our knowledge increases, our goals and related tasks are subject to change.

By 1972

Test Information Value in the Market Place

Let me start by talking about service charges. Service charges started with the release of a presidential executive order dated May 17, 1966. This order, which was sent to the heads of all federal departments, agencies, and executive offices, directed that those who render federal services to special groups should charge those special groups for the federal services rendered. As you know, AEC, NASA, and DDC now have service charges associated with different products. In addition, some of the DoD Information Analysis Centers and the Smithsonian Institution's Science Information Exchange now charge for their services. DDC personnel will evaluate the impact of service charges for hard copy documents on the (1) indiscriminate ordering of DDC documents, and (2) promotion of microfiche. The Selective Dissemination of Microfiche program recently announced by the Clearinghouse will be carefully watched to determine if associating a price tag with certain subject classification schemes does indeed define document distribution requirements. Formulation of DoD policy with respect to service charge will be the objective of many conversations and surveys undertaken by our personnel.

Integrate Auto/Demand Dissemination Program

The document distribution process, as it pertains to users of government information services, is concerned with the awareness and identification of documents newly accessioned by information processing organizations. Once the existence of a document has been recognized, various techniques are available for transferring the document from the source to the user. The ultimate user could be another information transfer processing and storage point, such as a technical library, or it could be an individual scientist or engineer. There are several distribution schemes for effecting the transfer of documents from the original source to the ultimate user. The most direct document distribution method is primary distribution by the source. A second means is automatic distribution on the basis of a predetermined profile of user needs. A third process, secondary distribution after announcement, has been employed by DDC and its predecessors for over 20 years. In this time we have experienced all of the inherent delays involved in this process. The DDC development objectives are:

*To interface and integrate DDC's announcement and document distribution with the user's announcement and document distribution system, considering the fact that the user must integrate into his own system input from other sources along with DDC's information.

*To reduce input preparation costs at all facilities maintaining a store of RDT&E document information.

*To determine the correct mix of distribution services.

*To resolve the role of DDC as a document provider by collecting information to determine whether DDC should function as a wholesaler or a retailer or both.

*To disseminate to individuals with an information need only that which is directly beneficial.

Some DDC development projects directed towards accomplishing the above objectives are:

*Acquire Prototype Large-Scale Reproduction and Handling System for Experimental Automatic Document Distribution of Microfiche.

*Establish a System for Coordinated Automatic Technical Report Dissemination.

*Modify Automatic Microfiche Production and Handling System for Demand and Automatic Document Distribution.

*Determine the Impact of Automatic Document Distribution on Primary Distribution.

*Investigate Other DoD Information Processors' Data Collection, Storage, Retrieval, and Distribution Functions.

Acquire Prototype Microfiche Handling Equipment

DDC is sponsoring the development of microfiche handling equipment that can identify a document and move it from its storage place for the purpose of viewing on a screen and fiche-to-fiche or fiche-to-hard copy reproduction. Documents can be identified by any type of accession number and code in conjunction with a large-scale computer and be selected by interrogation through a keyboard device.

Acquire Prototype Microfiche Viewing Equipment

DDC is cooperating with the Office of Education in the procurement of prototype microfiche viewers capable of being used by a student in a library, the office, or home.

Establish Prototype Magnetic Tape-Microfiche System

This consists of achieving with data in microform the same capabilities for storage and manipulation as is now possible with computers and data in magnetic tape form. It would provide the ability to index information in microform and recall it from microform storage using Boolean search logic to the extent that indexing and retrieval are now possible with ADP equipment.

Establish Natural Language Data Base

Current processing of both technical reports and WUIS input requires that access points in the form of index terms selected from a preestablished word list, i.e., a thesaurus, be assigned to each document by technically competent professional indexers. The current system also requires that all search requests be forwarded to DDC where trained bibliographers must restructure these requests in terms of the same work list used in indexing. An artificial, predetermined vocabulary is not immediately responsive to the changing demands made by the ever-widening horizons of science and technology. Its use imposes constraints both on the users of DDC services and on DDC itself. Improvements in information processing technology, particularly in the introduction of on-line communication, necessitate using as access points to the system vocabulary what is natural to the user of the system. Such a user will not necessarily be an information specialist. The feasibility of using natural language processing requires evaluation in support of on-line searching. The development objective is to free both the user and the processor from the constraints imposed by artificial language.

Integrate Data Bases

A fully integrated system would allow the capability to provide answers from all of the DDC data bases as a result of a single inquiry. As an illustration,

we could possibly respond to all inquiries about a single contract with scientific and technical information and management data on current, on-going work (DD 1498), work that is completed and documented (DD 1473), and contractor performance.

Establish On-Line Systems

An expanded on-line prototype may be authorized. It would include the Technical Report Data Bank in addition to the Work Unit Data Bank and would be linked to an increased number of terminals representative of the RDT&E community.

By 1975

Retrieval Services in the Local Environment

In the present relationship between DDC and its users all searching must be done at DDC. The use of a highly structured retrieval language necessitates a retrieval specialist. Without aids, not currently available, it is almost impossible for the untrained user to structure a search request to the DDC files and get the information he needs. The decentralization of at least part of the search function seems a desirable objective. It should increase the timeliness of responses both by allowing the user to complete some searches at his own location and be decreasing the work load imposed on the bibliographers at DDC.

Stand-Alone Retrieval Systems

DDC will investigate the usefulness of low-cost storage and retrieval devices for use at the local level in order to relieve the work load on large-scale ADP systems and maintain or increase the timely availability of information.

Regional Networks

A primary DDR&E objective concerning the transfer of technical and R&D management data consists of attaining operational status of an extensive on-line system with direct access to DDC as the central DoD R&E Technical Information Center. Access would be available to DDR&E, DoD Information Analysis Centers, R&E laboratories and their headquarters, the intelligence community, departmental and agency information centers, Federal Agencies, and selected prime contractors. It may prove more economically feasible to accomplish the DDR&E objective by establishing regional processing centers as opposed to a large centralized facility.

It is anticipated that attainment of the preceding objectives will result in fundamental changes in the processes by which information is generated, packaged, and stored for subsequent retrieval and dissemination. Such changes will involve employing varying and expedient combinations of media, tools, and response times.

To assist in determining the scope of these changes the following actions are under consideration: first, that a Development Advisory Board be established composed of representatives from industry, the academic community, and professional societies for the purpose of evaluating requirements and related technology to achieve these objectives; and second, that a working group be established composed of representatives from AEC, NASA, Department of Commerce, and other federal information activities to plan and implement separate but integrated and compatible network systems.

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Defense Documentation Center Cameron Station Alexandria, Virginia 22314	2a. REPORT SECURITY CLASSIFICATION Unclassified 2b. GROUP

3. REPORT TITLE

Technical Information - Availability vs Selectivity vs Cost

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

An Address

5. AUTHOR(S) (First name, middle initial, last name)

Herman W. Miles

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
16 September 1969	9	

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO.	DDC-TR-69-2
c.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d.	

10. DISTRIBUTION STATEMENT

This document has been approved for public release and sale; its distribution is unlimited

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
Presentation at the Annual Meeting of National Security Industrial Association - Technical Advisory Committee-16 Sep 69 - Boston,Mass	

13. ABSTRACT

The goals and objectives of the DDC Development Program for the 1970 era are discussed in relation to the information transfer needs within DoD and how they affect the transfer of information between and among other government organizations. Specific emphasis is placed on the role of the organization generating information in response to the requirements and needs of information users and response to information needed from local scientific and technical information centers to assure better decisions and to establish better information transfer policy. The cost of maintaining information more accessible and on a more selective basis is also discussed.

DD FORM 1 NOV 68 1473

Unclassified
Security Classification

OTHER DEFENSE DOCUMENTATION CENTER DEVELOPMENT PUBLICATIONS

Blumberg, S. E., "An Interim Progress Report of Computer-Output-Microfilm Activities and Experiences at the Defense Documentation Center," Report DDC-TR-70-2, AD-708 600, July, 1970.

Gordon, R. G., "Microfiche Viewing Equipment," Report DDC-TR-70-1, AD-701 600, March, 1970.

Klingbiel, P. H., "Machine-Aided Indexing," Report DDC-TR-69-1, AD-696 200, June, 1969.

Wicker, R. F., Neperud, R. M., Teplitz, A., "Microfiche Storage and Retrieval System Study: Final Report," SDC TM-WD-(L)-355/000/01, AD-710 000, August, 1970. Prepared under Contract DAHC15-70-C-0188 by the System Development Corporation, Falls Church, Virginia.