DSIS: Director Scientific Information Services of Canada's Department of National Defence

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Introduction

The Director Scientific Information Services is the agency within of Canada's Department of National Defence which is charged with providing scientific and technical information in support of defence-related research and development. In the tradition of the Department of National Defence, the directorate takes the title of its senior official. In the tradition of government, the directorate is best known by its initialism, DSIS.

2. The History:

Two situations which existed shortly after the Second World War resulted in the establishment of DSIS. One was the formation of the Defence Research Board to undertake scientific and developmental work for the Canadian Armed Forces. It was soon realized that this new group of scientists and engineers had specialized information needs. The other factor, not unique to Canada, was the existence of a large body of scientific and technical information resulting from research and development performed during the war. Much of this information was in a form that was not readily accommodated or retrievable by traditional library procedures. The role of DSIS was to provide access to scientific and technical information of interest to our defence community by systematic handling of Canadian reports, and by using these to exchange with allied foreign countries for their information.

The information retrieval system that evolved was based on a controlled vocabulary. Sets of catalogue cards were produced for local retrieval files and for the files of associated libraries. Single copies were sent selectively to scientists as an announcement service, and still other copies were sorted by subject categories, pasted up on page format, and reproduced as an announcement bulletin.

In addition to the selective dissemination of announcements, the service included a selective circulation of documents to individuals and organizations. This early SDI service worked very well up to a point. One limitation, of course, was that the manual records and memories of eight Information Scientists could only accommodate about 500 clients. Another worrisome factor in the 1960s was the paper explosion which resulted from the increased scientific and technical effort throughout the world. The manual system was under strain from growing input load, and staff could not be increased. These factors, and perhaps the new technology of the times, resulted in a decision to convert to a computer-based system.

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The first necessity was to build up a machine-readable data base, starting experimentally in 1967. Despite under-estimating the requirements of the unforgiving computer for accurate input data, DSIS was able to input data to provide a Key-Word-Out-Of-Context (KWOC) announcement service. This service was valuable beyond its intrinsic worth when one considers questions of morale and budgetary justification, but it has now been discontinued in favour of other products.

Mechanization began using three punched paper tape typewriters with upper and lower case. The typewriters provided duplimats for the catalogue card system and the paper tapes were processed on outside computers.

In 1969 DSIS began inputting directly on magnetic tape, and the catalogue cards and announcement bulletins were prepared by the computer in camera-ready copy. At about the same time, approximately 1970, a computer-based Selective Dissemination of Information service was begun. The service proved to be more reliable both in relevance and in recall than the manual card announcements. Consequently, the card service was discontinued in March 1973. The last remaining function of the catalogue cards was for retrieval files in our own facility and in associated libraries. These were replaced by microfilm files and by a Retrospective Search System.

Throughout the seventies various automated configurations were studied or tried. Finally, in 1979, the in-house searching system was developed upon which DSIS' present services are based.

3. The Structure

Today the Director Scientific and Technical Information Services is a directorate in the branch of the Chief of Research and Development (CRAD) in the Department of National Defence. CRAD Branch came into being when the Defence Research Board was integrated into the Department in 1974. The Branch carries out defence-related R&D in 6 Laboratories across the country and through contracts with industry. The Chief, Dr. D. Schofield, is also scientific advisor to the Minister of National Defence.

DSIS is organized into three operational Sections plus an Administrative Unit: Information Services, Document Delivery and Collection Organization Services, Technical Services and Systems. The staff is small, just 34 established positions. The diversity of the tasks undertaken by this group is perhaps best reflected in the fact that 10 occupational groups of Canada's Public Service are represented among these positions. The Directorate also has access to expertise by contracting, and special employment programs.

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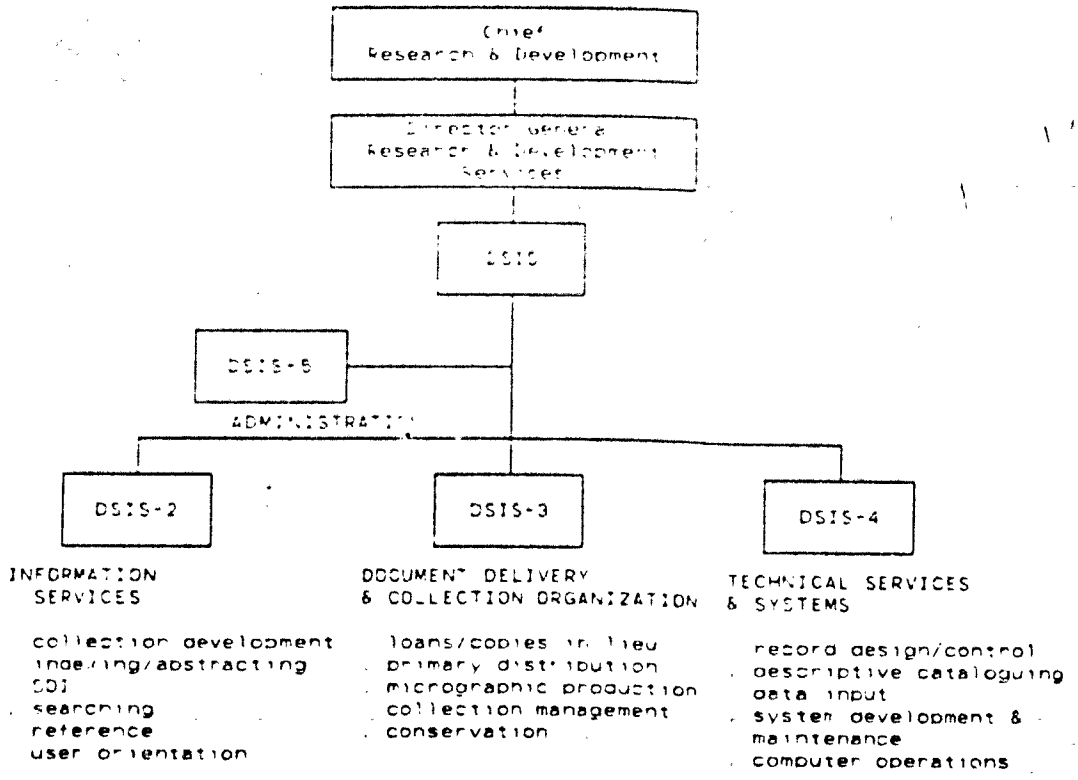
Table 1

DIRECTOR SCIENTIFIC INFORMATION SERVICES



DSIS has also been assigned functional responsibility for the information services in the 6 R&D laboratories from Esquimalt, British Columbia to Dartmouth, Nova Scotia. DSIS advises the Branch Chief, the Chiefs of the laboratories and their librarians on information issues. DSIS also develops and coordinates cooperative projects amongst the libraries in the Branch, convening a committee of CRAD Information Managers to develop the projects, share information, etc.

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4. The Authority

The current mandate of DSIS is stated in the Department of National Defence Organization Book, A-AE-D20-00/AG-001. In these official Terms of Reference, DSIS is responsible for:

- developing and managing centralized operation of DND services for the identification, evaluation, subject analysis, in-depth retrieval and timely dissemination of STI (Scientific and Technical Information), including research-in-progress, to support Departmental research and development;

  co-ordinating the exchange of defence research and development reports with foreign sources;

  operating an official report co-ordination system for the Department;

  developing a program to disseminate information on CRAD programs and activities to the Defence Community and, where appropriate, the general public;

  providing departmental inputs into national and international technical information organizations.

The important elements of the DSIS mandate are repeated in a Canadian Forces Administrative Order, 57-11. This order also instructs staff in the Department that

- copies of all scientific and technical documents prepared by or for the Department shall be sent to DSIS for cataloguing and announcement;

  scientific and technical documents obtained during visits, through international agreement, direct receipt, etc., shall be sent to DSIS for recording.

The requirements to channel requests for foreign documents through DSIS and to deposit copies of foreign documents is reinforced in the National Defence Headquarters Manual of Standing Operating Procedures for International Programs. Whenever possible, DSIS tries to ensure that these procedures are reflected in new international agreements involving exchange of defence-related scientific and technical documents.

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The users of DSIS can be found throughout Canada. Approximately 40% are the scientists, technicians and managers of the Chief Research and Development Branch. Personnel at National Defence Headquarters in other components of the Materiel Group constitute another major segment of the DSIS user community. These may be project officers, civilian engineers, military officers, or operational and logistic researchers. Test and evaluation personnel, policy analysts, students at the Department's staff colleges and universities are also regular users of DSIS.

In total DSIS serves a core of over 1000 users on a regular basis.

6. The Services

Information Services and Products

SDI

DSIS offers Selective Dissemination of Information (SDI) services based on the DSIS update tapes and those of the U.S. Defense Technical Information Center and of the U.K. Defence Research Information Centre. These regularly computer-produced bibliographies are tailored to reflect both the current interests of an individual client or a group and his authorized level of access. Table 2, is a sample SDI citation in which the announcement and order form are combined.

This service remains DSIS' most popular with over 800 users subscribing to the service today. Naturally, the SDI service also generates the vast majority of document requests.

Individual Searches

In response to requests, DSIS Information Scientists search the DSIS data base and card catalogue, DROLS or one of the many scientific and technical data bases available on the systems DIALOG, CAN/OLE, BRS, or ESA/IRS. NTIS is the most heavily searched of the commercial data bases.

Reference and Verification/Location

The Customer Services Centre, with the support of the Information Scientists, provides a ready reference service to the users, and a referral services to other information services. The staff also complete, correct and confirm citations so that the documents can be located in DSIS and elsewhere.

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5. The Environment

In every aspect of its operations, DSIS continually balances the benefits of widest dissemination of information with the need to control this information flow. The producers of information may wish, or be required, to protect information for a variety of reasons: security, proprietary considerations, the terms of an agreement, etc. Often the determination of who may receive a document is not made simply on membership in a community, but on the more complex interpretation of the principle of Need-to-Know. Some of the areas of DSIS operation which are affected by the need to control the flow of information are:

. User registration, eg, of contractors, is rigorous;

Data base records contain fields noting security classification, availability limitations and to what users an item can be announced;

Secure storage is provided for all documents;

Electronic equipment on which classified material is being processed must be physically secure, and protected against electronic emanation;

All requests for bibliographic information and documents must be vetted against the user's Need-to-Know;

Items mailed are specially wrapped and marked.

There is no doubt that the requirement to protect is a grave and very costly responsibility.

With every change, whether in the terms of international document exchange or, in DSIS equipment, etc., security and other restrictions are taken into account. Nonetheless, DSIS wages a continual campaign to convince originators of sensitive material that items they deposit with the Directorate will be afforded appropriate protection.

Within the Chief Research and Development Branch, DSIS has an additional responsibility for developing the policy and procedures on publication of scientific and technical documents. At present, Information Services and Document Delivery Sections are drafting guidelines for authors and laboratory officials on how to determine document security and other aspects of availability, including how to mark the items.

5. The User Community

DSIS services are available to members of the Department of National Defence and to its current contractors. Contractors are required to register with DSIS through the Department of Supply and Services to gain access to bibliographic information and documents.

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DOCUMENT CLASSIFICATION: UNCLASSIFIED

DOCUMENT SENSITIVITY: UNLIMITED

ORDER NUMBER 86-00258

TITLE SUBROUTINES FOR DETERMINING THE GEOMETRY AND RESISTANCE OF SMALL WARSHIP APPENDAGES
AUTHORS Ellis, W.E.
CORP. SOURCE Defence Research Establishment Atlantic, Dartmouth NS (CAN)
REPORT NO. TM-85/220
REPORT DATE Nov 85 PAGES OF TEXT 45
REFERENCES 13
COSATI 1310, 0902
DESCRIPTORS Warships; Destroyers; Ship structural components; Naval architecture; Ship hulls; Resistance; Fins; Rudders; Sonar domes; Marine propellers; Drag; Skin friction; Subroutines; Computer programs
KEYWORDS Ship design; Keels

ABSTRACT An analytical method has been developed for the preliminary estimation of the resistance of a set of small warship appendages. The general design features of typical appendages are described and a standardization set of appendages is defined for use in a concept exploration model. Computer subroutines which generate the dimensional data and resistance predictions for destroyer-sized ships are described. Wind resistance of the superstructure and the above water portion of the hull, due to the ship's forward speed, is included in the calculation. Propeller diameter is a key variable in determining propeller performance, and is a primary dimension for sizing propeller shaft supports. The major factors which influence propeller diameter are discussed and a simple relationship between propeller diameter and hull draft is recommended.

Table 2

TO REQUEST CHECK HERE ☐

DSIS ACTION

Microfiche sent ☐ Hardcopy sent ☐

Document Digests

Document Digests are monthly announcement publications listing DSIS acquisitions for the period by COSATI field. One edition lists all acquisitions; the Canadian edition, which is for international distribution, lists only Canadian reports.

Computer Output Microfiche (COM)

Selected libraries in the Department are supplied with COM listing DSIS holdings 1969-date, with cumulative monthly updates. COM are issued in four series: accession number, subject, personal author and corporate source.

Document Delivery Services

Copies/Loans from the Collection

DSIS not only holds paper copies of each item in the DSIS data base and card catalogue, but also microfiche copies produced to international standards by the DSIS Micrographics Unit of selected titles prior to 1976 and for most items received since 1976. From this collection and other microfiche sets DSIS supplies microfiche copies to requestors (loans of paper by exception only). Last year over 31,000 microfiche were sent out and 1,600 items loaned.

ILL and International Requests

DSIS locates and acquires scientific and technical documents from other sources using the ILL network.

DSIS also processes requests for foreign classified or limited documents, vetting Need-to-Know statements and identifying appropriate channels and procedures.

Distribution

In 1984 DSIS performed initial distribution for 687 titles or 55,409 items. DSIS distributes the scientific and technical publications of the CRAD laboratories and AGARD, as well as DSIS products such as SDI.

As part of our international defence information exchange agreements, DSIS distributes copies of Canadian defence scientific and technical documents deemed suitable for foreign release to the defence documentation centres of Canada's allies. In the case of the U.S., DTIC retains the classified and limited distribution documents for

inclusion in DROLS and in TAB, but forwards the unlimited titles to NTIS. Unlimited documents are also forwarded by DSIS to Micromedia, a Canadian company that prepares indexes of government literature and provides copies directly in response to requests. DSIS also forwards microfiche of unlimited documents to the Canada Institute for Scientific and Technical Information of the National Research Council who have a broad national mandate to store, retrieve and disseminate scientific, technical and medical information for the use of researchers in government, universities and industry.

7. The Collection

The DSIS Collection Policy defines the two major components of the collection:

Documents held at DSIS and recorded in the DSIS data base or its predecessor, the card catalogue. These include Departmental reports and patents deposited with DSIS, limited or classified reports upon request from Allied nations, and selected reports of other Canadian government departments, universities, etc.

Documents held at DSIS but not recorded in the DSIS data base. The majority of documents in this part of the collection are U.S. unlimited/unclassified documents received by subscription in microfiche, and commercially published reference books.

Acquisition is normally by deposit or exchange, with only a few subscriptions and the occasional title purchased. The collection is archival and growing continually. At present DSIS holds over one million titles: 470,000 titles in paper copy, and an additional 450,000 titles on microform (35mm film, microcards, and the bulk on microfiche).

8. The Data Base

Table 2. illustrates a bibliographic record in the DSIS Master File. The descriptive cataloguing is done in accordance with a DSIS manual, originally modelled on U.S. Defense Technical Information Center practices. Although not identical, DSIS records are compatible with those of DTIC and the U.K. Defense Research Information Centre. Because SDI was for many years the only or the principal application of the DSIS machine-readable data base, formal corporate authority control was not developed. Today, as the retrospective data base gains importance not only as a searching tool but as a bibliographic utility for other Departmental information centres, DSIS is directing the creation of a corporate author authority file.

Each document receives extensive subject analysis as well. Up to 20 Keywords are assigned to each document from the Thesaurus of Engineering and Scientific Terms. Keywords are augmented by up to 20 DSIS Descriptors, eg, for project names, names of equipment or places. The COSATI codes (up to 6) assigned permit broad subject retrieval. The abstract, which is prepared or adapted from that appearing in a document, also enables users to determine the content of the document. While the abstract is not searchable with DSIS's present software, it will be a searchable field when the new system is introduced.

At present the DSIS data base contains approximately 76,000 records from 1969 to date. Several projects are underway to enhance the data base:

- Information Scientists and the Acquisition Unit are developing new procedures to maximize current scientific and technical information identified and collected.

  Retrospective conversion of selected earlier manual records has begun.

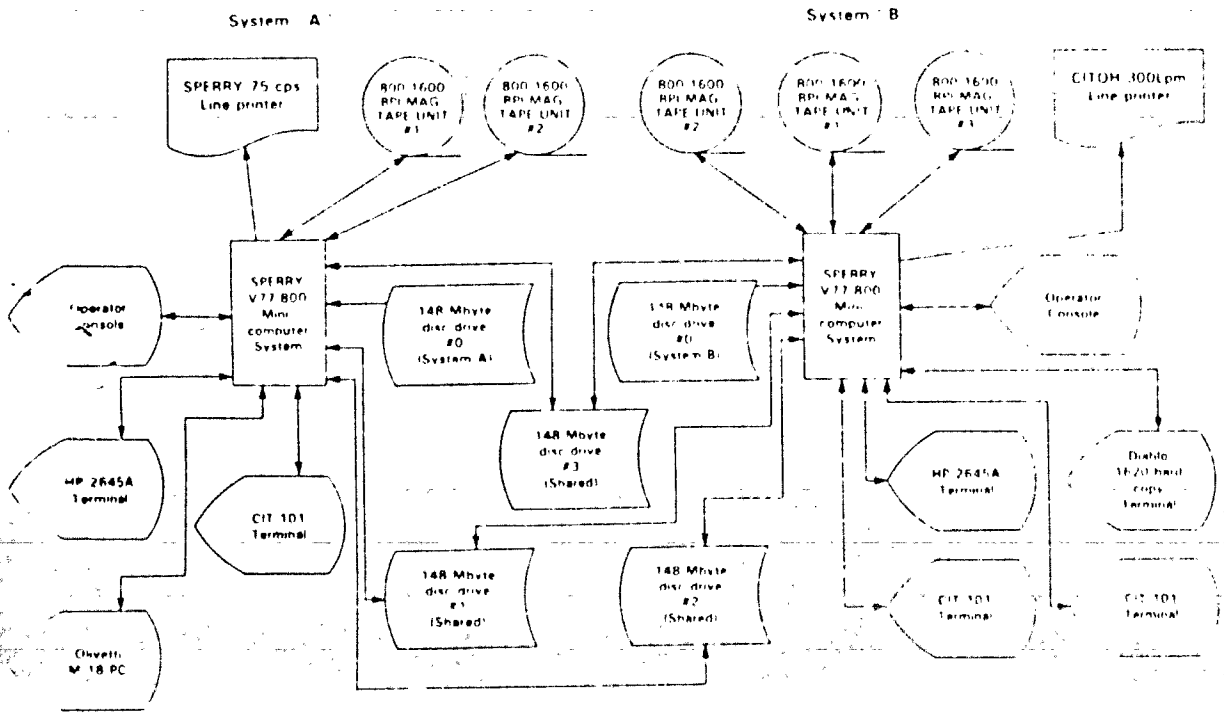
  Record improvement is underway, clearing up early records and enhancing subject description.

9. The System

Within a electronically shielded room, DSIS operates the small but sophisticated computer systems depicted:

DSIS COMPUTER SYSTEMS CONFIGURATION

Table 3



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The software, developed under contract for DSIS in the late seventies, has been continually improved by DSIS staff. However, as the system architecture is not compatible with the addition of new functions, DSIS is in the process of acquiring a replacement for 1987. The next system will be asked to support circulation, acquisition and to supply additional management information. A major element in DSIS plan is mounting the unclassified portions of the data base on-line. On-line access has been frequently requested by librarians and scientists in the community.

The Network Relationships

CRAD Infomation Managers

DSIS is far from the only information resource for scientists and managers in the CRAD Branch. Each of the 6 Laboratories has a scientific and technical library with a collection of books, periodicals, and documents and selected audiovisual materials. All are served by a professional librarian supported by clerical staff. The staff are responsible to the Chiefs of the Laboratories and resources are provided from Laboratory budgets. A wide range of services is available from the Laboratory libraries: on-line searching and reference, document delivery, etc.

As noted in 3, The Structure, DSIS convenes a committee of the CRAD Information Managers to promote good management of Branch scientific and technical information services by:

- providing a forum for the discussion of current issues;

  developing policies and procedures;

  and developing and carrying out cooperative projects.

At the meetings which are held annually, or more frequently as required, each of the 6 Laboratories is represented by at least one librarian or information manager. To encourage the richest possible interaction, DSIS also invites information managers of scientific and technical centres from outside CRAD to participate as observers. Between meetings, the information managers do business by mail, telephone, facsimile and by ENVOY, an electronic mail system from Bell Canada.

Although the various Laboratory libraries and DSIS are now each proceeding independently to automate records, there are plans to form an automated network in the near future. Meanwhile, at CRAD Information Managers Meetings, agreement has been reached on standardization of records.

Some of the notable projects being developed by the group include:

- A manual of Laboratory library operations;
- Training for Branch library support staff;
- How to Find it: A Guide to Defence-Releated Scientific and Technical Information Sources in Canada.

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Other Libraries in the Department

There are numerous libraries and similar information resources in the Department of National Defence which have developed independently to serve the distinctive needs of the various locations, eg, the military colleges, Canadian Forces bases, the Commands, Director Documentation and Drawing Services, National Defence Medical Centre, the Directorate of History. One major cluster of libraries, controlled by the Departmental Librarian, includes the Main Library in National Defence Headquarters, its Branches and office collections. The Main Library holds unclassified library material in the subject fields of military arts and science; disarmament and peace keeping; military history; naval science, aeronautics; political science and management. Of particular note is their Charles H. Stewart Collection of Military Canadiana. The Library has automated its cataloguing through UTLAS.

Interaction among the many and varied libraries in the Department is not formalized at present.

Libraries Outside the Department

Two significant portions of the R&D program are contracted out to other government departments: the National Aeronautical Establishment at the National Research Council and the Communications Research Establishment of the Department of Communications. The libraries of these two centres have each developed important collections in support of the defence-related research. They are also repositories of the report literature of their establishments.

Libraries of defence technical literature can also be found in many of the Canadian companies and university centres who compete for defence contracts.

Again, no formal network exists to connect these libraries.

National/International Networks

Both the Departmental Librarian and DSIS represent the Department at the Council of Federal Libraries, a body convened by the National Librarian to advise her and to assist in co-ordinating the activities of federal libraries.

At the international level, the Technical Information Panel of the Advisory Group for Aerospace Research and Development affords DSIS and a representative from the National Research Council the opportunity to participate with senior information managers in NATO countries in a program to support NATO, the NATO nations and to promote cooperation among the member nations. AGARD incidentally provides an excellent opportunity to meet international counterparts for bilateral discussions.

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10. The Future

In the near future DSIS will be concentrating on expanding the active user community and delivering more units of service to current users by

- increasing visibility through publications, visits, etc.;
- modification of product design;
- offering new services such as on-line access;

So that quality and efficiency are sustained DSIS will be

- accelerating collection development;
- improving records and performing retrospective conversion;
- automating some document delivery functions.

With a steadily increasing demand for DSIS services, the future appears promising. DSIS will continue to meet the needs of its users for defence scientific and technical information by applying the new technologies, adopting new information handling techniques and changing with the information "culture" of its very specialized community.