

DESIDOC: An Example of Paradigm Shift

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Abstract

DESIDOC has made considerable efforts over the years towards collection development and database development to serve the large number of scientists/engineers working in various Defence Research and Development Organisation (DRDO) labs/estts and top management at DRDO HQrs.

The Defence Science Library (DSL) of DESIDOC has developed into a major information resource centre by way of over 2.39 lakh documents in its collection. For achieving the optimum use of LIS resources, a user-friendly library automation software, DeLAS, has been developed with six integrated modules: acquisition, cataloguing, OPAC, serial control, circulation control, and Web OPAC. The DSL has been regularly subscribing CD-ROM and online databases. DESIDOC has initiated a project 'Virtual Walkthrough for Defence Science Library.' It has two modules: Module 1—General Browsing—Through DRONA, users can take virtual tour of the DSL which is completely user interactive that means that user can take the tour at his own pace and Module 2—Guided Tour—complements the text-based search of the user for the books with an extended multimedia interface.

DESIDOC made significant progress in the development of digital resources underlying digital library technologies that include: Full-text CD of Defence Science Journal (1950-2005); Patrika (Newspaper Clippings 2000-2005); DRDO Science Spectrum; Popular Science and Technology Series (13 books), Database of Photo Negatives of important events and so on. DESIDOC is bringing out a large number of regular and ad hoc special publications such as *Defence Science Journal*, *Technology Focus*, *DRDO Newsletter* and *DRDO Samachar* which have undergone various changes in terms of coverage, quality, and timeliness over the period of time. A large number of special publications are also brought out each year to meet the needs of DRDO HQrs and labs/estts. DESIDOC developed a large-sized 'DRDO website' providing information on key activities of the DRDO labs/estts, and technical directorates. This paper highlights some of the products created and services offered by DESIDOC to fulfill its vision of processing and dissemination of information to defence scientists.

1. HISTORY

DESIDOC started functioning in 1958 as Scientific Information Bureau (SIB). It was a Division of the Defence Science Laboratory (DSL), which later on became Defence Science Centre and now known as Laser Science & Technology Centre (LASTEC). The Defence Research and Development

Organisation (DRDO) library, which had its beginning in 1948, became a Division of SIB in 1959.

In 1967, SIB was reorganised with augmented activities and named as Defence Scientific Information & Documentation Centre (DESIDOC). It still continued to function under the administrative control of DSL. DESIDOC became a self-accounting

unit and one of the laboratories of DRDO on 29 July 1970.

DESIDOC was functioning in the main building of Metcalfe House, which is a national monument and a landmark in Delhi. In August 1988, it moved to its newly built five-storeyed building in the same Metcalfe House complex. Since it became a self-accounting unit, DESIDOC has been functioning as a central information resource for DRDO.

It provides scientific and technical information, based on its library and other information resources, to the DRDO HQrs, and its chain of laboratories located at various places through out the country.

1.2 Charter of Duties

- ❑ To function as a central resource for providing scientific information, documentation, library, reprographic, translation services to the DRDO HQrs/labs/eslts and to coordinate DRDO scientific information programmes.
- ❑ To develop databases on scientific information for DRDO and an information system for defence science and technology and to interface with other national and international agencies in the field of scientific information.
- ❑ To provide training and user education programmes for DRDO and all defence users and carry out R&D work in the field of scientific information/documentation.
- ❑ To provide consultancy and referral services to technical information centres (TICs)/libraries of DRDO and other defence organisations.
- ❑ To publish scientific and technical journals including books and monographs of the DRDO.

2. VISION OF DESIDOC

DESIDOC has a vision to be a centre of excellence in defence scientific information processing and dissemination and its mission is to create databases and data management systems for the scientists.

It has core competency in development of information resource; database creation;

design and development of application software for library automation; information retrieval system in a central environment; development of content, digitisation, and multimedia; web-based software applications; and technical editing and publishing.

3. DEFENCE SCIENCE LIBRARY

The Defence Science Library (DSL) of DESIDOC has been developed into a major information resource centre by way of over 2.39 lakh documents in its collection. It serves a large number of scientists/engineers working in various DRDO labs/eslts and top management at DRDO HQrs. A factor that underpins the research strength of the DRDO is their special access to the DSL's document supply service and information dissemination service on potential areas of their interests.

Our document supply service provides direct value to the DRDO laboratories. DRDO can rely on the DSL's centralised staffing, storage, and advanced IT infrastructure for providing the current and long-term access to its collection to satisfy the scientists' needs. The DSL was established as the nerve centre for providing contemporary information to the project leaders, top management, and researchers in defence science and technology.

During 2005, the DSL added 722 books, 4052 bound volumes of journals, and 2064 technical reports. The total collection of DSL, as on 31 December 2005, stood slightly over 2.39 lakh as shown in Table 1. In addition, DSL also received annual reports from about 150 institutions which include ministries and departments of the government, universities, public sector undertakings, and private R&D institutions.

For providing current information to the project leaders and research scientists, the DSL subscribes to scientific and technical journals and CD-ROM databases. During 2005, the DSL subscribed to 509 scientific and technical journals and seven CD-ROM databases and two online databases. Besides, the DSL also procured books, and technical reports.

3.1 Library On Demand Services

3.1.1 CD-ROM Search Service

Over the years many CD-ROM databases covering bibliographic information as well as full-text of technical reports, conference papers, articles from periodicals, etc., are available at DSL.

The DSL provides bibliographic search service to its users. During 2005, the DSL is subscribing four bibliographic CD-ROM databases, three full-text databases and two online databases (Table 1) for providing information from the latest journals, reports, conference proceedings, etc., published worldwide. This service is provided free of cost to the DRDO scientists and other defence personnel. The DSL has also started procuring SPIE proceedings in CD-ROM format.

The DSL also subscribes journals for some other laboratories of DRDO and technical directorates as per their needs.

3.1.2 Document Supply Service

The DSL provides document supply service to its users. The requirement of documents (or photocopies of documents) from Indian and foreign literature is generally met through its own collection. Earlier the

documents were supplied in printed/photocopy format but nowadays this service is also given using digital format (if required by the readers). Other local libraries are consulted if the document is not available in the DSL. In case the document is not available in any of the libraries in India, it is arranged from other International information centres.

3.1.3 Reference Desk

Reference Desk is a newly introduced online reference service which provides the benefits of the latest information technology and DRONA (an intranet of DRDO namely DRDO Rapid Online Network Access) to the DRDO scientific community. The users can look for their demanded information on this page for viewing, printing or downloading. The full-text of information will be available for a limited period under subheading of current article, IEEE standards, US MIL standards/specifications and technical reports.

Referred article section enlists earlier published articles/documents provided by DSL to the users. The users can browse and send e-mail to DESIDOC for their requirements for enabling the full-text link again in the current article section. This

Table 1. CD-ROM databases as subscribed during 2005 by DSL

Database	Frequency of updation	Type of coverage	Subject coverage
Applied Science & Technology Index	Monthly	Bibliographic	600 journals on S & T
GDI-Global Defence Information (1987+)	Monthly	Bibliographic & abstract	47 journals on military science
INSPEC	Quarterly	Bibliographic & abstract	SPIE proceedings, journals on material science, etc.
NTIS (1983+)	Monthly	Bibliographic	US Govt reports
AIAA papers	Half Yearly	Full-text	Aeronautics & astronautics
Worldwide Spec. & Standards Spec.	Monthly	Full-text	Military science
ASTM	Bi-monthly	Full-text	Materials science
Metadex (Metals Abstracts)	Online	Bibliographic	Materials science
Janes Defence Magazine Library	Online	Full-text	Military science & technology



Figure 1. Reference Desk

service also includes bibliographies on important subjects as well as on new reference sources procured by the DSL. This service is available on DRONA.

3.2 Current Awareness Services

3.2.1 Newspaper Clippings Service

To keep the top management abreast of the latest developments that have relevance to defence R&D, defence technologies, defence policies, the DSL provides a daily newspaper clippings service. This service includes the scanning of Indian newspapers and magazines. Clippings are selected, marked, and arranged on the following topics of interest:

- Ministry of Defence
- DRDO
- National security and defence policy
- Science & technology
- International news
- Other news items on defence science and technology.

Besides special issues, 147 issues were brought out during 2005. The service is provided both in print and through DRONA for online access by DRDO labs/estts.

3.2.2 Current Literature in Defence Science & Technology

Current Literature in Defence Science and Technology (CLDST) is a current awareness

service published by DESIDOC every month. It provides bibliographic details of the articles pertaining to scientific research, new technologies, reviews, and editorials published in the leading scientific and military science journals. This current awareness service is meant to keep the DRDO scientists abreast with the latest development taking place in the field of military science & technology. It covers a total of 112 journals, out of which 49 journals are military science journals and 63 journals are science & technology journals. CLDST is available both in print and electronic version. Electronic version is available online since January 2001. The retrieval and accessibility of information from this service has been further enhanced by creation of a 'specialized subject index'. 1,719 articles were added to the database during the period, and 68 articles selected from these, were digitized and full-text of the same was uploaded to DRONA. Full-text of references selected from CLDST can be obtained from DESIDOC on request through e-mail/post.



Figure 2. CLDST service

3.2.3 IEE/IEEE Table of Contents (TOC) Service

The IEE/IEEE Current Contents service covers the table of contents (TOC's) of 120 Journals published by Institute of Electrical and Electronics Engineers (IEEE), and 13 Proceedings & one Journal of IEE, currently being subscribed by the DSL.

The TOC's are browsable alphabetically by journal titles, or subject-wise by links.

Contents are accessible, as soon as the journal is received at the DSL. This service provides TOC's of issues acquired by DSL from September 2004 onwards. This database is available on DRONA at: <http://10.2.51.79/ieee/TOCindex.htm>

3.2.4 List of Additions of Books

The DSL brings out a monthly *List of Additions of Books* which includes various documents, viz., books, conference proceedings, etc., received in the library during the period covered. This publication is distributed regularly in printed version as well as through e-mail to all the DRDO labs/estts in the first week of every month.

3.2.5 List of Additions of Technical Reports

The DSL subscribes technical reports in various subjects like aeronautical engineering, computers, lasers, military science, missile guidance, missile technology, nuclear technology, optics, propellents, telecommunication, etc. These reports are available in print, electronic and microfiche form. A '*List of Additions of Technical Reports*' is brought out on monthly basis and regularly updated on DRONA since August 2003 when it was started. Access to bibliographical details of new reports acquired and full-text copies of microfiche reports on request are provided.

3.2.6 Defence Science Abstracts

Defence Science Abstracts is an abstracting service brought out as a fortnight publication and is available on DRONA. It covers scientific research work related to defence science and technology, which are published in the Indian and foreign journals, and are available in the DSL. Each record contains bibliographic information with abstract. The records are broadly classified in aeronautics, astronautics, armaments, electronics, computing and combat simulation, chemical technology and propellants, combat vehicles & engineering, life sciences, materials science, missiles, and naval science.

3.2.7 Current Periodicals Directory 2005

A compilation of the periodicals received in the DRDO libraries during 2005 was prepared and made available on DESIDOC website on DRONA. The directory has 1734 entries.

3.3 Database Development— Bibliographical

Earlier all the services were provided through manual searching of holdings of the library and were supplied in printed form. Now DSL has created databases of its holdings. These databases are being regularly updated by adding records of newly acquired documents. All these database are available on DRONA. Some of these databases are:

3.3.1 Online Public Access Catalogue

An Online Public Access Catalogue (OPAC), a computerised database of the holdings of DSL has been developed. The database covers bibliographic details of books, conference proceedings and technical reports, held by the library. The database can be searched by author/editor, accession number, descriptors, subject, International Standard Book Number (ISBN), report number and any word occurring in the title field. Any DRDO personnel can access it 24X7 on DRONA. A total of 71417 records of books are available on OPAC.

3.3.2 Bound Volumes of Journals Database

The DSL subscribes to a good number of S & T journals in the areas of defence, military technology, IEEE, IEE publications, physics, chemistry, polymer science, electronics, materials science, and computer science, etc. Using in-house software, a database of the bound volumes has been developed which provides search facility by title, or keywords of the titles. It covers journal titles from 1961. The no. of records in this database is 53,388.

3.3.3 Defence Science & Technology Articles Database (DEFSTAD)

It is a bibliographic database of the articles selected from core journals subscribed by the DSL. The objective of the database is to



Figure 3. OPAC

facilitate current and retrospective search of the journal articles available in DSL. All the articles pertaining to defence technologies, policies, weapons, and R&D activities published in the journals received in DSL from 2000 onwards are incorporated in the databases. It covers a total of 112 journals, out of which 49 journals are covered by military science and 63 journals covered by science and technology. The database is developed using software WINISIS and is searchable on title, author, name of the journal, etc. The databases is updated regularly. A total of 1719 records were added during 2005.

Design and development of Pilot version of “Web-enabled DEFSTAD database” completed using WWWISIS and final implementation is underway.

3.3.4 SPIE Database

SPIE database provides the users to access bibliographic details of articles published in SPIE conference volumes. Full-text of these articles is available in DSL and can be obtained on demand. This database contains 74,427 records at present. In 2005, a total of 10,732 records are added to the database.

3.3.5 DRDO Research Publication

The DRDO Research Publication database is a bibliographical database that covers research papers, papers published in

conference proceedings/presented in conferences, seminars, symposiums, patents granted to DRDO scientists/labs, etc; books and other publications published by the DRDO scientists. The search can be done through title, authors, name of journal, conference, year of publication, subject, type of document, laboratory, etc. For full paper, users can contact the authors for which name of the laboratory is mentioned.

3.3.6 Translation Database

DESIDOC provides translation of the articles/papers published in important foreign languages into English to the DRDO scientists. A number of documents were translated into English and added to the Translation Bank, a database of translations done at DESIDOC. The database, available on *DRONA*, provides users the access to bibliographic details of translated documents and copy of translation can be obtained on demand.

3.4 Database Development— Full-Text (Digital Libraries)

Development of digital libraries has changed the way the traditional libraries operate. The main focus of the libraries has shifted to making the full text of information available at the desktop of the users. DESIDOC has initiated the process of developing ‘Digital Library’ and undertaken a number of activities. Table 5 shows the status of full-text databases developed in-house.

3.4.1 Defence Science Journal Database

A full-text database of the articles published in the *Defence Science Journal* (DSJ) has been developed which is the first in house developed full-text database which provides value-added searches like author, title, keyword, etc. The database covers areas of defence, military technology, electronics, food science, physiology, nuclear medicine, psychology, etc. During 2005, a total of 41 papers were added in the database.

Data coverage - 1950-2005

Number of papers- 2068



Figure 4. Translation database

Number of pages-22,220

Number of pages added in 2005 - 395

The database is also available on CD along with user friendly retrieval software.

3.4.2 Patrika—Newspaper Clippings Database

A database of defence-related newspaper clippings is operational on *DRONA*. News items and editorials from 17 Indian newspapers published in English and Hindi

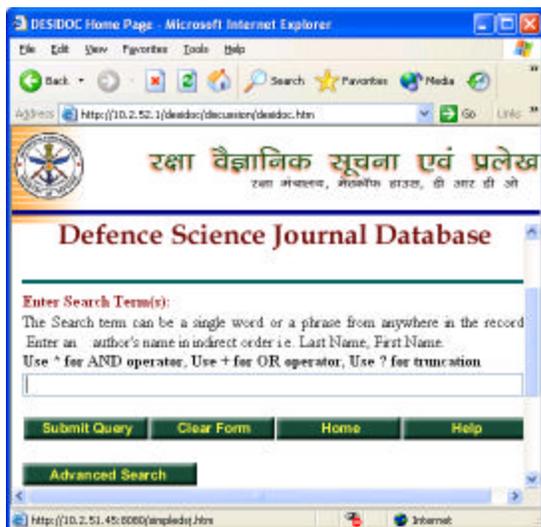


Figure 5. DSJ database

languages are covered in this database. Clippings database is updated online daily. A total of 1839 clippings were added in 2005.

3.4.3 Microfiche Documents

With a new facility, MS6000 microfiche scanner, DESIDOC performed the task of scanning and digitizing the microfiche documents given by DRDO labs in selected categories viz. Missile Technology, Lasers, Acoustics, Avionics, etc. During 2005, a total of 414 (27208 pages) microfiche were scanned, digitized, and records updated on *DRONA*.

3.4.4 Machine Translation

Keeping in view the growing interest of DRDO researchers community in accessing the multilingual scientific literature, an on demand service—'Machine Translation Facility', has been initiated which entails translation of foreign language documents (including patents, books, journal papers, technical reports, and reference material, etc.) into English. Currently the service is offering translation of seven languages viz. French, German, Italian, Russian, and Japanese.

With the implementation of OCR (optical character recognition) facility and dictionary support for multiple languages, digital files of translations were provided.

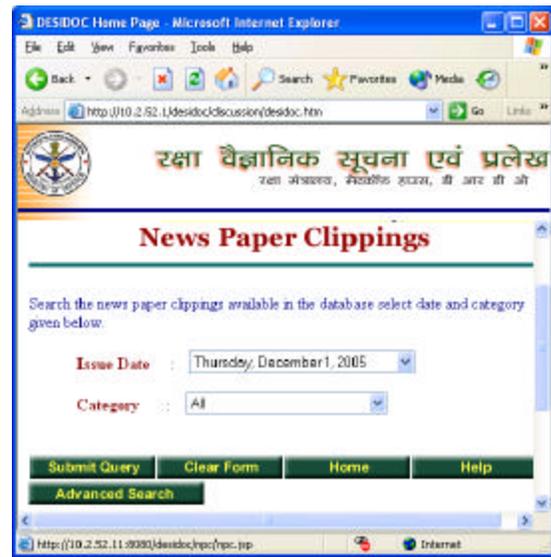


Figure 6. Newspaper Clipping service

3.5 Internet Facility

Internet facility was created during 2000 to facilitate browsing and searching of electronic information resources over the net. Eight terminals are provided exclusively for users of the library. In addition, DSL also searches internet for meeting day-to-day requirements of top management.

Internet is also used to access free content pages of Science Direct and Uncover Services as well as the content pages of some of the subscribed journals from publishers like John-Wiley, IEEE, Cambridge Science Abstracts, etc.

4. NETWORK SERVICES

Communication is a fundamental process necessary for individual expression as well as for an organisation. The ability to communicate is the essence of being human. Communication and communication technologies are inextricably linked. Communication technologies are evolving into increasingly sophisticated global networks. The internet and the local area networks (LANs) are communication media available not only as an economic market but to meet the full range of scientific, social, cultural, and political needs of individuals and groups.

The development of the internet and LANs has revolutionised the field of information access and delivery. Hence, DESIDOC has taken the initiative by providing internet and *DRONA* services to DRDO labs/estts located in different parts of India for fast communication among the scientists to exchange ideas, information, research results, problems, and solutions.

DESIDOC has established a Network Services Division which is responsible for designing, hosting, and maintenance of DRDO website on Internet; *DRONA* administration and co-ordination; designing, hosting and maintenance of DESIDOC website; internet services through ISDN, leased line and dial up, software development; creation of bibliographic databases and full-text databases; hardware maintenance and network management; support for IT-based CEP courses; interaction

with academia; project training of students; and Directors' Conference; e-mail facility to all DRDO officials; and so on.

DESIDOC has initiated a project 'Virtual Walkthrough for Defence Science Library.' Virtual tours are completely user interactive that means that user can control the tour. He can take the tour at his own pace and can stop in each room and have a good look around. He can choose where to go and can return to any room in the tour at any time. The files are picked up as requested by the user by clicking on the 'hot spots'. The videos can be hyperlinked through the Macromedia Flash player which offers a round-about view of the video, continuously looping through it.

4.1 Virtual Walkthrough Project

The project 'Virtual Walkthrough for Defence Science Library' has following two modules designed and developed:

(a) Module 1—General Browsing

This module provides the user with the interface to view the virtual tour of the DSL, that allows users to visit the library and its services virtually through the network.

(b) Module 2—Guided Tour

It complements the text-based search of the user for the books with an extended multimedia interface for fast retrieval of books in the DSL.

4.2 DRDO Website

DESIDOC has developed a large-sized 'DRDO website' providing information on key activities of the DRDO labs/estts, technical directorates, as well as regular publications of DRDO, and hence, the electronic dissemination of information to the DRDO scientists/engineers was given a major thrust. A new search engine for searching the news on the DRDO website has been developed.

The DRDO website is hosted parallel at DESIDOC, NIC, and VSNL. The website is continuously monitored to prevent any security attack. The following seven domains for DRDO website are maintained: drdo.com; drdo.org; drdo.res.in; drdo.gov.in; drdo.mil.in; drdo.org.in; drdo.nic.in

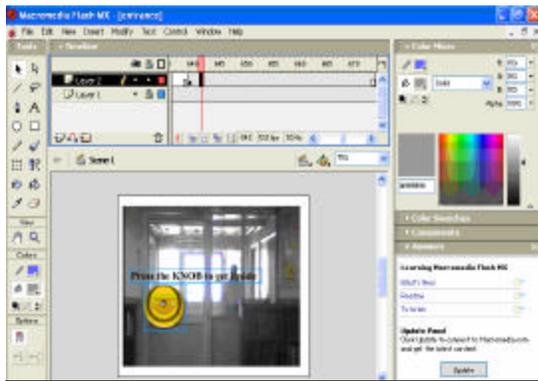


Figure 7. Virtual walkthrough of DSL

Some of the activities taken up are:

- ❑ Designing of DRDO home page with a fresh, innovative and exclusive look and added new features
- ❑ A search engine for searching the contents of website introduced.
- ❑ Web-based mail facility using indigenously developed software added.
- ❑ Tenders of the DRDO laboratories published from time-to-time in the newspapers made available
- ❑ Details of the posts advertised through RAC for the recruitment of scientists made available
- ❑ To attract the best talent utilities are made available from filling the application form to declaration of the interview results
- ❑ Release of advertisement for SET 2005, venue and roll no. for all students participating in the written test, results of the written test, date and venue of interviews, and result of interviews are uploaded.
- ❑ Information regarding the national and international events organised by various DRDO laboratories is made available at the site.
- ❑ DRDO website was also made available in Hindi using the in-house developed font—desifont.
- ❑ Uploaded the information regarding the DRDO laboratories, HQs and directorates, regular updation of information of existing home pages of DRDO labs and directorates on hourly basis.



Figure 8. DRDO website

- ❑ To encounter the cyber threat, an indigenously developed firewall and intrusion detection infrastructure is used. Log files are created and analysed constantly to see the traffic pattern.
- ❑ Additional security measures are implemented at various levels—router, switch, firewall, reverse proxy server, web server and operating system level security to overcome the threats of intrusion.

4.3 DRONA

DESIDOC is the main router centre (MRC) to 14 sub-router centres (SRCs) under Delhi domain. It is equipped with web server, mail server, database server, and firewall. The web pages of 14 DRDO labs/estts and DESIDOC have been hosted on the web server. The entire setup for this project is housed in a fireproof room and is operational for all the 24 hours. DESIDOC provides the required technical support to all the 14 SRCs.

DESIDOC initiated and configured advanced features in DRONA to handle the increasing number of nodes in DESIDOC as well as to share the resources of various labs/estts. Advanced layer 3 switches are configured to provide free channel for inter-departmental traffic. DESIDOC physically separated the DRONA and internet terminals for security; configured 100 Mbps using full-duplex fast ethernet and used advanced switches for the graphics-rich traffic; and user management and layered

security approach in three-tier application environment.

4.3.1 DESIDOC on DRONA

Some of the features available on DESIDOC site on DRONA features which are also being updated regularly as per requirement:

- ❑ Information regarding DESIDOC achievements, history, Director's profile, scientists' details, activities of all divisions of DESIDOC, telephone directory, etc.
- ❑ List of new books acquired by library on monthly basis
- ❑ Hindi version of DESIDOC site on internet
- ❑ DRDO Telephone Directory-2005
- ❑ Newspaper clippings database covering defence related news published in the leading newspapers.
- ❑ OPAC of DSL
- ❑ Database of translations done at DESIDOC
- ❑ Database of SPIE publications
- ❑ Catalogues of bound volumes of journals
- ❑ Current Literature in Defence Science & Technology (monthly) service
- ❑ DSJ full-text database with a search engine to access bibliographic details and full-text of papers published in DSJ
- ❑ Electronic version of forms for service book, materials management, regular updates like Govt holidays, quiz, birthdays, etc.



Figure 9. DESIDOC site on DRONA

- ❑ Video/photo coverage of events, such as DRDO Directors' Conference, National Science Day, National Technology Day, etc.
- ❑ Information about publications.

4.4 IT Support

- ❑ Establishment of the LAN, DRONA administration, maintenance, and hardware/software and other related support.
- ❑ Full IT support at Conferences' venue including set up of DRONA and internet nodes in the control room.
- ❑ Hardware and network support to all the divisions of DESIDOC.
- ❑ Internet facility to DSL users is now available. Also to expose the workforce of DESIDOC to the worldwide information for efficient working, internet services are provided.

4.5 Academics & Educational Activities

- ❑ Provides IT support for the CEP courses conducted at DESIDOC and manpower support for practical sessions.
- ❑ Provides IT training to students from various colleges and universities under the summer training/industrial training programme.

4.6 Software Development

As software development is one of primary task of DESIDOC to provide maximum services to the users, DESIDOC develops various software for providing better services to the users as well as to the employees of DESIDOC. Some of the software developed, whose project life cycle included analysis, design, development, testing, implementation, and review, are:

■ DeLAS Defence Library Automation Software

For achieving the optimum use of LIS resources, DeLAS, a user friendly software has been developed with six integrated modules for automating various library functions viz., acquisition, cataloguing, OPAC, serial control, circulation and Web OPAC. The software is accompanied with a detailed user

manual for help in installation and operation of the software.

■ **Automated Cash Purchase**

This web-based cash purchase system is designed to make the physical process of filling up the form for the cash purchase faster and reliable, keeping in mind the basic requirements of the staff from stores department, and users. This software allows the user to take a look into the previous transactions that were made along with the prices at which the items were purchased and user doesn't require to peep into number of files but he can get the result with just some mouse clicks.

■ **Network Monitoring and Management**

This system provides the ability to determine how effectively the work force is using the web to insure success of an enterprise and the ability to differentiate 'legitimate' from 'unacceptable' website visits.

■ **News Search Engine on Internet**

A complete web crawler that can extract news headlines from online editions of newspaper.

■ **Bilingual Database**

It is designed to convert the database records into Unicode.

■ **Automated Activity Report**

This software has been designed to record the activities of different groups of NSD online and a consolidated report is generated at the end of the week to submit to higher authorities.

■ **Tender Tracking**

The software is designed for use in website of DRDO. It tracks the hits and downloads of tender documents.

4.7 Database Products on CD

The following databases were made available on CDs by development of several software including full-text retrieval software:

- Defence Science Journal (DSJ) from 1950-2005

- Patrika (Newspaper Clipping Service) 2000-2005
- DRDO Telephone Directory-2005
- Annual Newspaper Clippings for 2005

5. PUBLICATIONS

For the scientific community, publishing is a medium that presents a platform to the aspiring and established authors to present their thoughts and works, whereas the publisher is responsible for ensuring the accuracy and timeliness of the information presented through quality editing, professional design and quality presentation; applying standards; regularly updating and keeping published information current; understanding and complying with copyright, privacy, intellectual property laws; and responding timely to inquiries and comments.

DESIDOC, being a central publication agency of DRDO brings out a large number of regular and ad hoc special publications to disseminate current information on various research and development activities being carried out by various DRDO labs/estts to the outside world. The regular publications, such as *Defence Science Journal*, *Technology Focus*, *DRDO Newsletter* and *DRDO Samachar* have undergone various changes in terms of coverage, quality, and timeliness.

A large number of special publications are regularly brought out to meet the occasional needs of the labs/estts and DRDO HQrs. Each publication goes through the process of planning, organisation, collection, compilation, editing, proof-checking, preparation of layout and design, and finally printing and uploading. The popularity of these publications is indicative of the efforts of DESIDOC to inculcate awareness about applications of Defence science and technology in both the Defence and the civil sectors. The priced publications are available to any one interested in receiving them. Others are for limited circulation and are available only to selected readers.

The publication work of DESIDOC is supported by a team of technical editors with good scientific background and sufficient in technical editing and specialists in printing.

The manuscripts are processed on personal computers and the processed texts are now transferred on offset ready sheets without having to recompose the entire matter again and checking proofs at various levels of composing. The networking has helped considerably to reduce the time gap between the preparation of manuscript and production of publications.

Desktop publishing software packages have been acquired to avoid the manual, time-consuming process of page make-up. All the correspondence is being done through e-mail either by DRONA or internet as applicable to expedite the publishing process.

The publications brought out by DESIDOC are briefly described below:

5.1 Defence Science Journal

DESIDOC brings out the Defence Science Journal (DSJ), a quarterly publication of the DRDO, Ministry of Defence, publishing original research and review articles, short communications, and technical notes, etc. The journal publishes research papers in various disciplines of science and technology, which by and large lead to tangible results for direct Defence applications. The major subject fields covered are: Applied physics, chemical technology, material sciences, biomedical sciences, computer sciences, engineering, electronics, and aeronautics. All papers received for publication in the journal are subjected to refereeing by the eminent peers who are active in the relevant fields of research.

Special issues of the journal are also brought out on the current topics of Defence interest under the Guest Editorship of the eminent scientists. The topics of the special issues and their guest editors are identified by the Editorial Executive Committee of the DSJ (EEC-DSJ). Besides, the proposals for the special issues received from the eminent scientists working in the specific subject areas from within DRDO and outside are also considered. The full text is available on CD and DRONA with search and retrieval software.

A database of the referees from academic and R&D organisations is maintained and regularly updated. This database contains 1350 entries.

5.2 DESIDOC Bulletin of Information Technology

DESIDOC Bulletin of Information Technology (DBIT) is a bi-monthly journal, which brings out the recent developments in the field of information science and technology to the notice of librarians, documentalists, and information professionals. The papers published in the Bulletin are indexed in Library and Information Science Abstracts (LISA) and The Informed Librarian. The full text of DBIT is being reproduced in electronic databases of HW Wilson Company, namely, OMNIFILE Full Text Select and OMNIFILE Full Text Mega. The bibliographic details and abstracts of papers published in each issue since 1998 are available on DRONA and DRDO site on internet.

5.3 Technology Focus

Technology Focus, a bi-monthly publication of DRDO, has an international circulation and acts as a window to the outside world providing information about the R & D activities covering products, processes and technologies taken up by various DRDO laboratories. The full text is available on DRONA since 1997.

5.4 DRDO Monographs Series

The publication of DRDO Monographs is a regular activity of DESIDOC. New titles are being added to this series regularly. The design and layout of the monographs is significantly improved. Efforts are made to increase the number of photographs, which have given facelift to the monographs. The design work along with DTP is completely undertaken in-house.

5.5 DRDO Newsletter

DRDO Newsletter, a monthly house bulletin of DRDO, covers the manifold activities of DRDO labs/estts to inform members of the DRDO family and also the

scientific community at large. Besides reporting technical developments in DRDO, the Newsletter covers topics of varied interests such as personnel news, academic and cultural activities, visits of VIPs, and so on. The main objective of the publication is to enhance the communication among members of the DRDO family. Since 2000, the full-text of each issue is hosted on DRDO website on internet as well as on DRONA as soon as published.

5.6 DRDO Samachar

DRDO Samachar, a monthly Hindi publication covers the manifold activities of DRDO labs/estts to inform members of the DRDO family and also the scientific community at large. Besides reporting technical developments in DRDO, the Samachar covers topics of varied interests such as personnel news, academic and cultural activities, visits of VIPs and so on. Since 2000, the full text of each issue was hosted on DRDO website on internet as well as on DRONA as soon as published.

5.7 Marketing of Publications

Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods and services to create exchanges that satisfy individual and organizational objectives. It helps the organisation to focus on its limited resources and determine the user needs and then develop, promote and distributes a product or service to meet those needs. Marketing is a tool that helps to maximize exchange between the users and an information organisation. Sales promotion activity for all the priced publications is consolidated regularly. New subscriptions for DSJ and DBIT are obtained by participating in book fairs and book exhibitions.

The mailing of DESIDOC publications are computerised. The database of the mailing lists contains around 3000 records, and can give selected lists of various categories of addressed like government departments, R&D institutions, public sector units, etc. The search and edit facilities provided, enable

updating the database regularly. The mailing lists are taken on self-adhesive mailing labels.

6. MULTIMEDIA & REPROGRAPHIC ACTIVITIES

The importance of reprographics in the present context of information management system is well-recognised. Reproducing copies from a source document through photographic, xerographic or electronic means in the least possible time is normally the service expected from a reprographic facility.

Technical presentations using multimedia have come as a major requirement of the DRDO scientists/engineers. Keeping this in view, DESIDOC has established a multimedia and reprographic services group that provides services in the areas of video digitization and creation of multimedia CDs, photographic coverage, printing and lamination of photographs, audio/video production, and consultancy and training on technical presentations. This service is meant for DRDO top management, technical directorates, DRDO lab/estts and other defence units.

The Group is equipped with real time video editing hardware and software—Pinnacle Pro5 Audio/Video digitisation and Editing Studio along with other multimedia hardware and software. A large number of multimedia presentations are prepared regularly to meet the special needs for the DRDO scientists, both at labs/estts and for the DRDO HQs by developing and using a wide range of facilities.

Some of the services being provided are:

- ❑ **Multimedia Presentations** for top management at HQs
- ❑ **Audio/video (digitisation & editing)**—Directors' Conferences' Proceedings; transcription of SA to RM's addresses, and Technology Day addresses, DRDO products displayed on Republic Day, etc.
- ❑ **Designing and printing of covers**—Telephone directories,

publications, leaflets, calligraphy for CEP course certificates, CD covers, etc.

- **Photo/video coverage**—Seminars, meetings, conferences, workshops and exhibitions organised by DRDO locally and sometimes outside Delhi also.

Over the years DESIDOC has developed expertise in industrial photography, whereby the photographic facilities are provided to a large number of DRDO labs/estts in picturizing the products developed by them. DESIDOC played an important role in taking photographs of the products/ facilities in colour for publication in the product catalogue. To cater to these photographic activities, DESIDOC was equipped with current photographic equipment, including 35 mm SLR camera, 120 Rollei 66 medium format camera, Linhof 120 medium format camera, and their attachments (lens, filter, etc.), now the Division is also equipped with high mega pixel digital cameras for photography and a digital studio (with latest photo editing software and printers) is set up for providing instant photographs.

- **Database Creation and Maintenance of Photographs**—DRDO products, DESIDOC employees, photo negatives captured at different ceremonies, audio/video/CDs; digital photo of senior officers at DRDO HQrs, labs/estts, and Ministry of Defence Commands, slides and presentations. The photographs and 35mm slides from databanks are regularly supplied to different laboratories, DRDO HQrs and for publications.
- **Multimedia presentation/projection facility**—DRDO Directors' Conference, National Science Day and Technology Day Celebrations, etc.
- **Webcasting activities**—Video coverage of the celebration for the National Science Day and Technology Day for webcasting to all the DRDO labs/estts throughout India through DRONA.

7. EDITORIAL/ DTP SERVICES

A Technical Services Division has been established to provide editorial, designing, desktop publishing, and digital printing

services for the publications of the DRDO HQrs and other DRDO labs/estts. The division has been equipped with the latest scanners, high-end printers and computer systems that provide fast print solution for the urgent jobs. A team of editors and designers is involved in the job. A few examples where the editorial, designing, desktop publishing, and digital printing services provided are: *DRDO Science Spectrum (available in CD)*, *DRDO Technology Compendium*, *DRDO Awards (booklet)*, *Technical Brochures*, *Hindi Shabdkosh*, *Posters of Quality Policy & Objectives*, *Certificates*, etc.

8. PRINTING SERVICES

Printing is an important activity of DESIDOC for publishing regular as well as special publications of DRDO. More than 100 publications, covering about 10 lakh prints, are published each year.

The Polygraphy Division handles printing of both the regular and ad hoc publications and other materials like booklets, pamphlets, brochures, posters, etc. This Division has the facilities for preparation of negatives as well as positives, single colour printing, gold embossing, and screen printing. The Division is equipped with high quality equipments to expedite the printing jobs along with quality such as Heidelberg offset machine, computerised printing down frame for exposing the offset plates with a voltage stabiliser of 10 KVA/3 phase for print down frame; Punch registration system with pin bars for correct registration of the colour jobs; Auto roller cleaning machine for washing and cleaning of dampening rollers.

Besides regular publications (mentioned earlier), the Group regularly prints ad hoc publication such as *Technology Compendium*; *Purchase management*; *CEP Courses Handbooks*; *Citations and Awards*; *Envelops and special folders*; *C-PAR for Scientists*; and *Stores Management Guidelines*.

Miscellaneous printing jobs such as Letter heads, visiting cards, envelopes, invitation cards, greeting cards, certificates, etc., for DRDO HQrs and DRDO labs/estts are also being done by the Group.

9. TECHNICAL COORDINATION

Technical Coordination Group coordinates with various science and technology institutions such as DST, NISSAT, NIC, NISCAIR, NASSDOC, etc., as well as with DRDO HQrs. This Group coordinates various in-house technical activities, nominates the scientists to various professional committees, and holding of interviews for various posts. The group is responsible for bringing out the annual report each year.

10. HRD ACTIVITIES

The Human Resource Development Division conducts user education and training programmes in the areas of information technology, communication, technical writing, knowledge management and library and information science for scientific and technical personnel of DRDO labs/estts as well as of DESIDOC to update their knowledge and working skills. It invites scientists and managers of senior levels from other departments/organisations like CSIR, ICMR, ICAR, and public sector undertakings for lectures.

An information technology laboratory has been set up for providing hands-on training to the participants. DESIDOC conducts a number of courses in the areas of library automation, database development, online searching, digital libraries, internet use, technical communication, multimedia development, knowledge management, and other relevant aspects of information technology. Each year five to six courses are conducted.

The Division also conducts many short-term training programmes under the continuing education programme (CEP) of DRDO for the LIS professionals of DRDO labs/estts and DESIDOC.

This Division nominates officers and staff of DESIDOC for various training courses and workshops, meetings, conferences, and seminars organised by DRDO labs/estts and other institutions.

Under Apprentice Trainee Scheme, the trainees are trained to learn the job by

actually performing it under the supervision of experienced professionals in the field of library activities, computer applications, printing technology and other information services.. This Division recruits apprentice/trainees under one year training programme.

11. HINDI CELL

To follow the Official Language Policy, an official language implementation committee (OLIC) was constituted which coordinates with the officers/staff of the Centre and motivates them to do official work in Hindi. This committee reviews the Hindi related activities being done in the Centre and works towards the promotion for the use of Hindi in official work of the Centre. The activities regularly carried out by the Cell for official language implementation are: Celebration of Hindi Pakhwara—special competitions on essay writing, noting and drafting, dictation, story telling, poem recitation, translation, etc., to promote the use of Hindi in official work are organised. The Cell brings out annual publication Gyan Deep that covers technical articles, Hindi related articles, general articles, and poems. In 2005 the fifth issue was released.

The Cell regularly organises Hindi Karyashalas in which a number of speakers are invited from the ministries and the DRDO HQrs. The Cell regularly organises Hindi Sangoshthi. In addition, various activities such as co-ordination between the DRDO HQrs and DESIDOC, translation activities, loading of Hindi software on the DESIDOC computers, name plates in Hindi, bi-lingual stamps, etc., are also carried out by the Cell.

CONCLUSION

'Information drives the innovation' is the motto of DESIDOC and to meet the specialised needs of our researchers both in anticipation as well as on demand effectively and efficiently, DESIDOC has made considerable efforts over the years towards collection development and database development. DESIDOC is equipped with latest state of the art technologies with which

it provides its users effective and efficient services.

The DSL has been developed into a major information resource centre by way of over 2.39 lakh documents in its collection.

DESIDOC made significant progress in the development of digital resources underlying digital library technologies that include: Full-text CD of Defence Science Journal (1950-2005); Newspaper Clippings Service (Patrika 2000-2005); DRDO Science Spectrum 2005; Popular Science and Technology Series (13 books), Database of Photo Negatives of important events and so on. This is complemented by a database of English translations done at DESIDOC from foreign languages such as French, German, Spanish, Italian, Portuguese, Russian, and Japanese, available on DRONA, which

provides users access to bibliographic details of the translated documents to help researchers access to the right information.

With passage of time as the way of creation, access, storage and dissemination of information changed, DESIDOC also kept abreast and upgraded itself with contemporary technologies, be it information sources, services or human resource development. DESIDOC has come a long way in its infrastructure, sources and services—i.e., from traditional library to automated library, from traditional printing to digital printing; from print publishing to electronic publishing; and from manual services to network services. It has been a challenging task but the positive response of users and management is always an encouragement to DESIDOC.

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