# VII. NATIONAL INFORMATION SYSTEM FOR SCIENCE & TECHNOLOGY

## 1. INTRODUCTION

The increasing role of science and technology in the economic and social development of the country has generated a pressing demand for faster technology transfer to the industries. Apart from access to information generated within the country, it is also necessary to draw from the externally generated information to support internal efforts on research and development. Information centres that have come up to serve the needs of different industries and R & D units are therefore required to be coordinated and organized into an integrated system to avoid a haphazard growth and duplication of activities and in conformity with national and international standards.

The National Information System for Science & Technology (NISSAT) commenced its operations in 1977 with the objectives of organizing information support facilities for a customer base largely dominated by people engaged in research and academics. In tune with the changing global scenario and in pursuance of the national efforts in liberalization and globalization of the economy, NISSAT reoriented its programme activities continually in order to be useful to a wider base of clientele in diverse subjects. Besides establishing the internal linkages between the information industry, its promoters and users, NISSAT has been main efforts to establish a bridge between information resource developers and users in Indian and other countries.

## 2. THE BROAD OBJECTIVES

The broad objectives of NISSAT are:

* Development of national information services

* Promotion of existing information systems & services

* Introduction of modern information handling tools & techniques

* Promotion of international cooperation in information

* Development of indigenous products & services

* Organization of skill development programmes

* Promotion of R & D in Information Science & Technology

### 2.1. Subject Coverage

The NISSAT programme has the mandate to cover the entire spectrum of science and technology. However, during the process of programme implementation, special care is taken not to dwell upon subjects already being handled by other national programme like the BTIS, ENVIS or an agency like the ICAR. NISSAT solicits the views of other programmes/agencies which are responsible for a subject under the allocation of their business. NISSAT requests for the expert views of institutions/individuals working on a given subject or its allied areas when required. As a proactive and progressive step, NISSAT has taken the onus on itself to strengthen the library movement in the country through the introduction of modern information technology, tools and techniques.

As the boundaries between science and technology, social sciences, arts and humanities are fast disappearing, emphasis on activities on one area can not subsist without the support for the other. Therefore, in due course, NISSAT would need to adopt the non-S & T subjects as well. Already, NISSAT does not differentiate between the S & T and non-S & T areas in the implementation of the library networks and manpower development programmes.

NISSAT is being implemented through several sub-programmes which include inter alia :

* Development and maintenance of National Information Centres on specific subject areas

* Resource Sharing through Library Networks

* Facility for Information Access through Internet and National database access centres

* Programme on Coordinated Research Outputs - Analysis based on CDROM Databases

* Database Development Activities and R&D Studies

* Man Power Development Activities on Information Science & Promotion of Computer Applications in Institutions

* Publication of Information Today & Tomorrow

## 3. NISSAT CENTRES

### 3.1. Sectoral Information Centres

A sectoral information centre is established on a product, discipline or a mission. Sectoral Centres provide bibliographic as well as factual and numeric information to meet the various information needs of academicians, scientists, technologists, entrepreneurs, management executives and decision makers.

The Sectoral Centres are usually built around the existing information resources and facilities. They maintain extensive collections of published and unpublished documents in the from of books, periodicals, R&D reports, technical reports, standards, patents and trade literature in their subject areas.

A list of the NISSAT initiated National Information Centres in different Sectors is provided in the **Table 1.**

**Table 1. The NISSAT Sectoral Information Centres**

| | SUBJECT AREAS | ACRONYM | HOST INSTITUTION |
|---|---|---|---|
| 1. | Leather Technology | NICLAI | Central leather Institute, Chennai |
| 2. | Food Technology | NICFOS | Central Food Technological Research Institute, Mysore |
| 3. | Machine Tools Production and Engineering | NICMAP | Central Manufacturing Technology Institute Bangalore |
| 4. | Drugs and Pharmaceuticals | NICDAP | Centrall Drug Research Institute,Lucknow |
| 5. | Textiles & Allied Subjects | NICTAS | Ahmedabad Textile Industry's Research Association Ahmedabad |
| 6. | Chemicalls & Allied Industries | NICHEM | National Chemical Laboratory, Pune |
| 7. | Management Sciences | NICMAN | Indian Institute of Management, Ahmedabad |
| 8. | Marine and Aquatic Sciences | NICMAS | National Institute of Oceanography, Goa |
| 9. | Tea | NICMAT | Tea Board, Calcutta |
| 10. | Advanced Ceramics* | NICCAC | Central Glass & Ceramics Research Institute, Calcutta |
| 11. | Bibliometrics* | NCB | Indian National Scientific Documentation Centre New Delhi |
| 12. | Crystallography* | NICRYS | University of Madras, Chennai |
| 13. | CD-ROM* | NICDROM | National Aerospace Laboratory, Bangalore |

* NISSAT support to the centres at serial no. 10 to 13 has since been withdrawn.

NISSAT supported sectoral information centres are well-equipped with modern information technologies. The mode of E-mail and Internet connectivity vary from one centre to another, but it is usually a combination of VSNL, ERNET and NICNET facilities. Given the high costs of leased lines, the centres are forced to use dial-up facilities. Only NICHEM, NICFOS, NICMAS have 64 Kbps lines through radio modems or VSATs.

Besides providing documents and preparing bibliographies on request, they offer selective dissemination of information (SDI), current awareness services (CAS), reprographic & micrographic services, industrial and technical enquiry services, technical translation and similar access-delivery services.

Some of the sectoral centres bring out serial publications of digests, indexing & abstracting materials and news highlights. Apart from publishing these in print form, the information is more often computerized.

The core activities of the NICLAI centre were focused on its development as a national centre for information on leather and allied industries. The areas of specialisation covered are leather science and technology, footware, leather goods, chemical engineering,colleges, polymers, leather economics, biochemistry, etc. The centre provides CDROM services using BIOSIS and document delivery services. The major database developed by the centre (Leather Science Abstracts), LECAT (Library Catalogue), PBCLRI (Publication of CLRI), PERHOL (List of periodical holdings of CLRI Library)

NICFOS centre is a clearing house for all types of information on food processing in the country and has initiated several information oriented programmes to fulfil the information needs of the food sector. The centre maintains seven databases on food technology. Some of the databases serve as supplement to the foreign database.

NICMAP is acting as a clearing house of information on machine tools and production engineering. NICMAP maintains about databases on bibliographical, statistical and

product categories. The centre hosted its data on TIFACLINE of CMC for on-line accessing by users.

The centre has already selected Informatics and Silver platter to publish and market its product "Database on Manufacturing Technology and Machine Tools - Mtech". These apart, NICMAP provided consultancy to African Regional Centre for Engineering Design and Manufacturing (ARCEDEM), NIGERIA to evolve an information strategy for ARCEDEM and set up an information centre there. NICMAP also conducted sensitization programmes in different African countries to make them aware of the modern methods of information storage and retrieval.

NICDAP centre provides CDROM based services using Medline, Chemical Abstracts, Popline, Excerpta medica, International Pharmaceutical Abstracts, Biotechnology Abstracts, Drug Information, NUCSSI etc. The centre also provides on-line services using Datastar - Dialog and STN. The centre has INTERNET connectivity through RENIC.

The Services provided by the NICTAS centre includes literature searches, translation, reference service, E-mail facility, and CDROM services using TTD database and colour index. The centre maintains six databases using UNIFY-RDBMS & custom made software. NICTAS continued the publication of TEXINCON and other state of art reports. The centre achieve self-sufficiency since 1994 and established an online database search centre.

NICHEM centre continued to perform well during the year 1998-99. More than 70% of its services are provided for industry, primarily chemical and pharmaceutical industry. The services provided by the centre includes repographic, document supply, translations, online search and patents. There has been a marked increase in the demand for patents and translation over the previous year. The centre also set up an internet facility to provide information to the clients, ordering of patents and journal articles, online searching etc.

The NICMAN Centre is providing services using ABI/Inform, Econlit, Social Science, Citation Index, Current Contents On Disc.-Behaviourial And Social Sciences. The centre developed a database consisting of records of current acquisition, articles and news items from Economics Times and Financial Express. The centre took initiatives in publishing its activities and tied up management development programme for extending information services to various programmes.

The centre has launched three information services such as information bulletin on management, current index on management and current contents in management & marketing. NICMAS centre maintains databases on Marine Science studies in Indian Ocean, Directory of Indian Marine Scientists and Contributions of NIO scientists.

An Indian National Oceanographic Internet Server (INOIS) established under NICMAS. The bibliographic databases available with NICMAS have been transferred into web format and published in INOIS server. The centre has developed a unique oceanographic search engine 'MANTHAN' on the web which would facilitate locating the oceanographic information/ data available on the web.

An Information Centre on Indian Tea would be established during 1998-99 to facilitate timely information on latest techniques and practices in India tea production, to access the latest market information on tea export, import etc and to provide a statistical database on India tea industry.

## 3.2. VAPIS : Value-Added Patent Information Systems

With the changing economic scenario in the country and the impending IPR regime, it is imperative to strengthen the patents information activities in India. The fierce competition faced by Indian industries, the necessity of the awareness of competitions innovations and the availability of foreign technology have made the patent information vital for the industry.

Considering the expert manpower available in the national R&D systems and the increasing need from industries for technical information, NISSAT established Value Added Patent Information System (VAPIS) at National Chemical Laboratory, Pune and Central Manufacturing Technology Institute at Bangalore to offer specialized, value added information services. The services are based on databases pertaining to US, European, World, Japanese and other patents available on CDROM. Separate subset of the database on Chemicals is located at NCL, Pune and on Engineering in CMTI, Bangalore. The information on patent and IPR legislations, etc of various countries are located at patent office of CSIR.

The main objective of the centre is to take advantage of the expertise available with the host institutions to add value to patent information and offer such services to industry. The addition of value to patent information is made by analysing contents of the patents. Value addition to patent information involved understanding the contents of patents, and adding to them details of technology options, technology gaps, and other items of crucial information.

The orientation of the centres would be towards market needs with a clear indication of activities, target clientele and revenue earning projections.

## 3.3. CD-ROM National Collection Centre

NISSAT has established a national collection of all CD-ROM databases on India and about India at Foundation for Innovations and Technology Transfer at Indian Institute of Technology, Delhi in 1996.

A centre of this kind is deemed necessary to collect nationally produced documents on CD-ROM medium systematically as the Delivery of Books Act (1994) does not at present include provision to cover such products. However, the Centre buys the CD-ROM products instead of expecting free supplies by the CD-Producers.

The collection *inter alia* of the centre includes Indian products like:

| Indian Patents Database | Mtech |
| --- | --- |
| Business India | Electronic Corporate |
| Health Asia Environment Asia Directory | Gandhi |
| Goa-The Pearl of Asia | Guru Nanak |
| Hindi English Dictionary | India Mystica |
| Invitation India | Information interactive on Rajasthan |
| Karishma | Mythological Collections |
| Suchak | Taj Mahal |
| Karishma | Innoware Education |
| Kompass India | Yellow Pages |

The centre prepared a *Union list of CD-ROM databases acquired in various library/information centres in India*.

## 4. INTERNET BASED ACTIVITIES

### 4.1. WEB SERVERS

NISSAT has moved a step ahead by establishing web sites/servers so far on:

* Indian Ocean Server, at NIO, Goa

* MYLIBNET at CFTRI, Mysore

* Indian Consultancy at CDC, New Delhi

* Indian S&T at the IISc., Bangalore.

* Website on NISSAT

* Website on ISISCLEARING HOUSE

The Web server on Indian Ocean is a response to the recommendations made by the International Oceanographic Commission. It is also expected to help NIO to integrate its existing information activities for the provision of a one window information service. The NICFOS one is initially meant to facilitate the exchange of information among the libraries in Mysore under the MYLIBNET Programme and in due course organize information on Indian food industries.

The Indian Consultancy site hosts home-pages of consultancy organizations, their area of activities and also a mart for consultancy offers and those required. The S&T server project would be operational in 1998. It would include home-pages of R&D and academic institutions, information on materials and supplies, forthcoming events, employment opportunities, extra-mural support schemes of various agencies and so on.

## 5. INDIAN LISFORUM

In collaboration with the NCSI at IISc, NISSAT has set up an Electronic Mail Discussion Forum called LISFORUM for providers and users of information services in India. The facility provides an E-Mail based electronic forum for its participants to discuss issues of relevance to library and information services. The facility is available to users of ERNET and other networks that have connectivity to ERNET.

## 6. INFORMATION RESOURCE SHARING

With a mandate to facilitate provision of broad based information services in the country, NISSAT has taken initiatives for promoting resource sharing activities through Library Networks. These initiatives are aimed at ensuring better utilization of S&T information resources, minimization of functional load of information centres and encouragement of motivational factors to a large extent by better means of communication.

The NISSAT agenda for library networks is limited to the development of metropolitan systems, the logic being that libraries and library users in close geographical proximity can effectively utilize a library network. Given this, the goal of information/library networks is to interlink information resources in a metropolitan area such that users could access information irrespective of its location, format, medium, language, etc. Further, the development of such networks requires actions in several areas such as training, rationalization of acquisition of information resources, diffusion of standards, preparation of union lists, generation of database services apart from setting up hardware, software and communication facilities.

NISSAT strives further to develop self-sustaining information systems. With this end in view, NISSAT goes to the extent of setting up general infrastructural facilities like network service centres including hardware, software, manpower, organizational requirements and communication facilities. The participating institutions in a network have to arrange for their own terminal hardware, software, manpower and to take the responsibility of database development. Of course, NISSAT extends support for training, and common facilities like development of standards,

preparation of union catalogues, data conversion and so on. Table 3 provides a list of Network Hosts and network services management bodies.

**Table 3. NISSAT Sponsored Metropolitan Information/ Library Networks***

| Network | Host Site | Management |
|---------|-----------|------------|
| ADINET | INFLIBNET, Gujarat Univ. Campus, Ahmedabad | Society drawing support from INFLIBNET |
| CALIBNET | Regional Computer Centre, Jadavpur Univ. Campus, Calcutta | Society |
| MYLIBNET | CFTRI, Mysore | Institutional Project |
| PUNENET | Bio-Informatics Centre, Pune Univ., C-DAC and NCL, Pune | Institutional Project |

Network activities like creation of OPAC bases, document delivery service facilities, inter library loan through local couriers (ILL), current awareness services (CAS), rationalization of periodicals acquisition, creation of Union lists of current subscriptions are taken up. With changed IT options, E-Mail, Remote login/ftp, Internet access services are offered to the participants. Network services centres also provide Online and CD-ROM based search services .

## 7. E-MAIL Connectivity

NISSAT has established E-Mail connectivity with its information centre and library networks through ERNET. This connectivity greatly enhances the resource sharing capabilities and also the efficiency of user services.

## 8. INFORMATION TECHNOLOGY APPLICATIONS

The demand for use of computers ranges from automation of routine management functions in libraries to information retrieval or analysis of global databases. Since the inception, NISSAT had accorded a high priority to all aspects of computer based bibliographic information processing. As a part of the programme, NISSAT acquired proven software packages like CDS/ISIS for bibliographic information processing & retrieval and IDAMS for statistical data processing. NISSAT subsequently obtained the official rights for distribution of the two packages in India from UNESCO.

As on date, there are about 1400 installations of CDS/ISIS and 45 installations of IDAMS in India. The implementation of CDS/ISIS is monitored regularly through exchange of information, user's group meetings (seven such meetings have been held so far) and periodic surveys.

SANJAY is a package developed by NISSAT in collaboration with DESIDOC to help the libraries and information centres in India to improve their house-keeping and service functions through automation. The package is totally menu driven and can be used even by non-professionals. The package was released for marketing in September 1995, and till now it has an installation base of 40 sites.

These apart, NISSAT has collected several of small packages and utilities like Fangorn, CCF-MARC and vice-verse, dBASE to CDS/ISIS and vice-verse, GLOB for global replacement, NEWSDI from Indian institutions and abroad for distribution among Indian users.

NISSAT has entered into an agreement with t he MINISIS Resource Centre at the SNDT Women's University for marketing of the package and applications development.

## 9. DEVELOPMENT OF SKILLS IN INFORMATION SCIENCE AND TECHNOLOGY.

Existing library and information science courses cannot keep pace with the rapid developments in the information field; there is a need to supplement these with continuing education programme at various levels. In view of the situation, NISSAT encourages and supports a variety of manpower development programmes which cover topics such as Application of computers in library and information centres, Use of personal computers & CDS/ISIS, TQM in library services, Technical communication, Scientometrics, Computerized cataloguing, CDROM/Online searching, Modern information access facilities to business and industry etc., Advanced Course on CDS/ISIS, Patent Information, Multimedia and Internet.

## 10. RESEARCH & DEVELOPMENT AND SURVEY STUDIES

### 10.1. Scientometrics & Informetrics in India

In consultation with and active participation of the subject specialists, the NISSAT has formulated a plan of action for scientometric and informetric studies in India. As a first step in the implementation of a programme of coordinated research, ten projects on *National Mapping of Science* using CA, Compendex, Inspec, SCI, Medline plus, BIOSIS, EMBASE, Georef, CAB, AGRICOLA, ISA database have been taken up. Table 5 provides the areas and institutions where the studies are being carried out:

**Table 5 : Project Areas under National Mapping of Science**

| Project Area | PI Institution |
|---|---|
| Agricultural Sciences | M.S. Swaminathan Foundation, Chennai |
| Biological Sciences | National lCentre for Scientific Information, Bangalore |
| Chemistry | National Chemical Laboratory, Pune |
| Engineering Sciences | Documentation Research & Training Centre, Bangalore |
| Geo-Sciences | Regional Research Laboratory, Bhopal |
| Indian Science | Indian Association of Special Libraries and information Centres, Calcutta |
| Mathematicall Sciences | MS Swaminathan Foundation, Chennai |
| Medical Science | Indian Council of Medical Research, New Delhi |
| Physics | National Physicall Laboratory, New Dellhi |
| Science & Technology | National Institute for Science, Technology Development Studies, New Delhi |

NISSAT also promotes and supports research and development and survey studies. The list of such projects/ efforts is given in Table 6.

**Table 6: Studies / Surveys supported by NISSAT**

| Activity | PI Institution |
|---|---|
| Beyond Institutional Boundaries: A study of collaborative linkages of Indian Science through Bibliometric indicators | NISTADS, New Delhi |
| Preparation of basic course materials for organizing a series of workshops on Patent Information for R&D and Business based on Case Studies | •NISTADS, New Delhi |
| Indicators of Industria lInnovation | NISTADS New Delhi |
| Database and Annual Publication on Bibliometric Indicators of Indian Science | NISTADS New Delhi |
| Holistic improvement of leather workers through information support in selected villages in Tamil Nadu | CLRI, Madras |

## 11. DATABASE DEVELOPMENT ACTIVITIES

In pursuance of its thrust on contents development, NISSAT encourages indigenous database development activities. Besides library catalogues, union catalogues and lists, the activity could be on subjects in which a global database does not exist, or on subjects in which Indian elements are not properly represented. Table 7 indicates the various projects supported by NISSAT during the period of support.

**Table 7: Indigenous Database activities supported by NISSAT**

| Database activity | PI Institution |
|---|---|
| Database of Indian Chemical & Pharmaceutical Industries | NICCHEM, NCL |
| Directory of manufacture of various kinds of Ferrous and Non-Ferrous and Special Castings | IIF, New Delhi |
| INDAB: Database of Indian Databases, Abstracting and Indexing Services, and Directories | ISAC-NISSAT |
| Indian Sugar Industry | VDIS, Pune |
| Directory of Libraries and Information Centres in India | GGSS, Ahmedabad |
| Database on Indian Website Using MINISIS | SNDTWU, Mumbai |
| Virus and Virology | NIV, Pune |
| Directory of Translators | INSDOC, New Delhi |

## 12. INTERNATIONAL ACTIVITIES

The activities of ASTINFO/UNESCO ( Regional Network for the Exchange of Information and Experiences in Asia and the Pacific/UNESCO ) are closely coordinated with those of NISSAT. The NISSAT Advisory Committee also functions as the National Advisory Committee of UNISIST and the National Advisory Group for ASTINFO.

UNESCO/ASTINFO often utilized NISSAT services for implementation of various programmes such as preparation of teaching aids for CDS/ISIS, CCF and MIS for libraries, course materials on marketing of information products and services and so on, apart from hosting of the ASTINFO Consultative Meeting in 1993. On several occassions, services of NISSAT were requisitioned for missions in countries like Bangladesh, Nepal and Malaysia. Recently, NISSAT has been given the responsibility to establish a Clearing house on CDS/ISIS software and creation of database on library network experts in ASTINFO region. A website is being established as a part of the programme.

NISSAT authored the section on South Asia in the World Information Report 1997. NISSAT also conducted a cross country analysis of the information scenario in Asia & Pacific Countries for the Study on the Information Infrastructure for Planning Information systems and Networks in Asia and Pacific Countries undertaken by UNESCO and the University of Library & Information Science Tsukuba.

Besides multi-lateral activities, NISSAT has also been providing inputs for bilateral cooperation. As a part of this programme NISSAT organized two Indo-Japan Workshops on Information in 1997.

## 13. INFORMATION TODAY & TOMORROW (ITT)

Under the banner of ITT, two specific activities are undertaken.

* A national meet of information industry, promoters and users, is held every year. The Information Today & Tomorrow meet, as it is popularly called, was held in Chennai during August 31 to September 3, 1998.

* NISSAT has been bringing out its *NISSAT Newsletter* — a quarterly newsletter since the beginning of the programme. Over the years, the format has undergone several revisions in keeping with the changing information scenario. Now, the contents include information on new tools and techniques, events concluded and announcements, interesting Internet sites, new database products and services. With a change in the title, *Information Today & Tomorrow*, the quarterly periodical is distributed free to 5000 individuals and institutions.