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National Information System

NATIONAL COMMITTEE ON SCIENCE AND TECHNOLOGY

Techno-economic information is to provide  
NATIONAL INFORMATION and other economic activities.

Administrators and all those  
information resources, policy framing and

1 NATIONAL ISSUES IN SCIENCE INFORMATION. In a information are not  
of the government have close links.

Scientific communities and national government activities are with one of  
and more cognizant of the pervasive role which science functions, scope and extent,  
plays in social and economic development of a nation. Government departments, industry  
information is beginning to be regarded as a vital national development, they spring  
tremendous growth in the output of scientific information, and without coordination  
people who use information, have brought about the need for information also towards  
transfer. It is required to be assured that all available scientific information in scope. The trend  
information is fully exploited by scientists, engineers, industry member of such sub-set  
makers and all others having a need for information. Science information system  
services, capable of drawing on world sources of scientific and technical information  
information, will serve a country as the prime coupling mechanism between its  
users and creators of information. If developed properly, it would serve to  
stimulate an information consciousness among potential information users.  
Improved accessibility to externally generated information is capable of reducing  
a country's need to undertake on its own time-consuming research and development.  
It can aid in the transfer of technology.

### 1.1 Need for National Science Information Policy

In developing countries, governments have a major responsibility for  
providing information services. To achieve a truly national information system,  
governments shall have to formulate a general information policy to which all  
organisations participating in these activities can subscribe. In India,  
information facilities are being built up at various levels by major science  
agencies and it becomes necessary on the part of the government to work towards  
a general plan, in agreement with the main information agencies, indicating the  
allocation of responsibilities decided upon. "Information policy is a major  
component of policy for science and technology. Just as science policy must be  
an integral part of overall government policy, linked to social and economic  
affairs, information policy must seek to assure that the world's specialised and  
professional knowledge is fully and properly used in guiding social evolution"

"The primary object of an information policy is to provide research  
workers, scientists, engineers, technicians, and managers and more generally  
all who have some part to play in scientific activity with access to information  
they need and this as economically as possible" The basic plan of action is to  
build a national information network on the existing infrastructure, by coordinating  
present activities, articulating the various services, developing their strong  
points, encouraging private and public initiative and filling in existing gaps. The  
government should clearly state its area of responsibility and the means it intends  
to employ such as specialised services, incentives, coordinating machinery,  
financial arrangements, etc.

and also provide for measures

organisations for building up  
al fields;

in the country at least one accessible copy  
scientific publication for use by our scientists;

es for providing information services to industry;

national referral centre which would direct the  
sting information sources;

- 5      tion of national union catalogues of holdings of libraries;
- 6      establishing regional dormitories for storing older material  
weeded out by service libraries;
- 7      generalising the use of microfilms and microfiches for documents  
which are occasionally used;
- 8      launching intensive propaganda for use of scientific and technical  
information;
- 9      undertaking periodical surveys for assessing information needs  
and uses in the country;
- 10     collaboration with international and other national organisations  
engaged in information services;
- 11     building up translation facilities in all languages;
- 12     building up computer facilities for information handling;
- 13     building up reprographic facilities in all information centres;
- 14     building up expertise in information field and training of adequate  
number of persons in documentation, information science, computer  
science, reprography and translation;
- 15     supporting research programmes in documentation, information  
science, computer science, reprography and translation;
- 16     providing financial support for projects in documentation,  
information science, computer science, reprography and  
translation; and
- 17     providing facilities for holding conferences, symposia, seminars,  
workshops, etc. in documentation, information science, computer  
science, reprography and translation.

## 2.0 NATIONAL INFORMATION POLICY. Techno-economic information is to provide production and other economic activities.

An essential approach to provide planned economic growth is to ensure that information resources are efficiently used. At the national level, policy framing and utilisation by all those who need to use information. In a developing economy, federal structure of the government and the provinces, scientific and technological activities are not well coordinated. A variety of information centres, with differing functions, scope and coverage, are taking shape in scientific institutions, government departments, industrial establishments, business firms etc. In a stage of development, they sprout piecemeal, without liaison between them, without plan, and without coordination. However, they function also towards supporting socio-economic objectives, which are national in scope. The trend in many countries is to coordinate or marshal a large number of such sub-sets of information services into a well structured national information system or network. The impetus for information network arises out of economic and time pressures which force organisations to share rather than duplicate information resources. Some form of overall organisation is needed to direct and coordinate the activities of many separate efforts. Some methods must be found out to coordinate the collecting policies of libraries and documentation centres, so that the national collection is shared by all. Information processing should be coordinated in order to eliminate unnecessary duplication of effort. The system must be organised to assure everyone access to information. There shall be no poverty in information availability. In advanced countries, rapidly increasing stock pile of machine-readable information has been responsible for the network concepts. The national systems are on the threshold of participating in the world-wide, cooperative management of science information under the UNISIST (World Science Information System) programme of Unesco.

### 2.1 Objectives of National Information System

A national information system would embrace the following objectives:

- 1 The provision of a national service relevant to present needs and capable of development to meet the future needs of the generators, processors, disseminators and users of information;
- 2 The optimum utilisation of existing information services and systems and the development of new ones;
- 3 The promotion of national and international cooperation and liaison for exchange of information;
- 4 The support and active encouragement of development of facilities for education and training in information science and technology to provide qualified manpower which will render possible the implementation of a national information policy;
- 5 The support of, and active participation in research, development and innovation in information science and technology to increase both the efficiency of information services and the quality of the information which these services provide; and

...d also trained officers which  
...ted to play an part in the flow of infor-  
...taining close touch with current scientific and  
...research and practice and a continuing close  
...on with the users. One such service would be Information  
... Analysis Centres. Such centres select, evaluate, and synthesise  
... information in well defined special fields and/or in those areas  
... pertinent to specific missions, and present it in a form best  
... suited to the needs of users, either in research or technology or  
... management.

## 2.2 Infra-structure for National Information System

In order that information centres and special libraries may cooperate more effectively within a network, it is essential that the following major elements are present:

- 1 Good communication facilities - linking the users to the network of information centres and inter-linking within the network; use of existing telecommunication facilities and developing new communication facilities for effective operation of the system;
- 2 Physical information resources (libraries, documentation centres etc.) - adequate collection; rationalisation of acquisition programme; sharing the responsibility for developing strong collections in special fields;
- 3 Trained library and information personnel - sufficient strength; better service conditions; training facilities;
- 4 Linkages to significant economic, educational and R&D sectors - internal and external;
- 5 Two way communication channels with the users of information;
- 6 Good organisational system - application of improved management techniques that bring together and energise the resources, personnel and linkages;
- 7 Standardisation in patterns of service - facilitates inter-change of information; and
- 8 National policies that promote systematic development of the infrastructure.

## 2.3 Kinds of Information

The National Information System should take into account the need for different kinds of information. Scientific information, techno-economic information and management information are all appropriate to the needs of a technologically advancing nation. The aim of scientific information is to provide

information for scientific research. Techno-economic information is to provide information for development, production and other economic activities. Management information is to provide planners, administrators and all those engaged in management of R&D, information relevant to policy framing and decision making. It is obvious that these three spheres of information are not identical. But they intersect each other in many respects and have close links. For supporting scientific and industrial development of a country, each one of them has its importance. The National Information System should, therefore, provide for serving all the above kinds of information.

### 3 EXISTING FACILITIES IN INDIA FOR DISSEMINATION OF INFORMATION,

#### 3.1 Central Bodies

The Indian National Scientific Documentation Centre (INSDOC), established in 1952 under the CSIR, has been offering national service relevant to the information needs of scientists and technologists. Responsive services such as document procurement service, photocopying service, bibliography and reference information service and translation service and anticipatory services in the form of bringing out information publications such as the Indian Science Abstracts, are being provided by the Centre. It has also taken up several projects for carrying out its information dissemination function. The National Science Library Project of Insdoc, of which a nucleus is functioning since 1964, when fully developed, is expected to build a comprehensive collection of scientific material by way of supplementing the existing national collection, disbursed in various science libraries, so as to ensure that all worthwhile scientific publications are available within the country for use by our scientists.

The Library and Technical Information Section of the Bhabha Atomic Research Centre, Bombay, has an extensive collection of nuclear science literature and is well equipped to provide a wide range of information services. It is participating in the computer-based International Nuclear Information System (INIS) of the International Atomic Energy Agency, Vienna.

The Library of the Indian Agricultural Research Institute, Delhi, is one of our oldest and biggest science libraries. In 1969, a plan was worked out to establish a national system of agricultural information, around the facilities available in IARI Library and by designating it as the National Agricultural Library and the National Agricultural Documentation Centre.

The National Medical Library of the DGHS, is equipping itself to offer countrywide library and information services.

The Defence R&D organisation has established the Defence Science Information and Documentation Centre (DESIDOC) in Delhi to provide a full range of information services to scientific personnel in defence establishments.

The Patent Office has recently worked out a plan for the establishment of a Patents Library and Information Centre and it is expected that implementation of the plan will take place soon.

The Indian Standards Institution, Delhi, has an exhaustive collection of national standards of many countries and is in a position to offer standards information service.

The SIET Institute, Hyderabad, has established a documentation centre for providing information service to small industries sector.

The Indian Council of Social Sciences Research has established in 1969 - the first year of its existence - a National Social Sciences Documentation Centre at Delhi. It has already taken up several projects for providing documentation and information services to social scientists.

### 3.2 Science Agencies

Major science agencies such as the Atomic Energy Commission, the Electronics Commission, the Space Commission, the Council of Scientific and Industrial Research, the Defence Research and Development Organisation, the Indian Council of Agricultural Research, the Indian Council of Medical Research, the Indian Council of Social Sciences Research etc. have R&D establishments functioning under them. These establishments are important centres of scientific and technological activity in our country. They have developed adequate information base for supporting their R&D programmes. The libraries and information centres attached to them are subject-oriented. Some of them have developed unique facilities for offering information services in their fields of specialisation on a rational scale.

### 3.3 Central Government Departments

In addition to the science agencies, several central ministries and departments dealing with scientific subjects have also research establishments functioning under them. Many of our older scientific institutions such as those of the Indian Meteorological Department, and the Geological, Botanical, Zoological and Anthropological Surveys come under this category. They have rich collection of material and are building up information facilities.

### 3.4 State Governments

State Governments are mostly concerned with scientific subjects such as agriculture, forestry, animal health, public health, public works and transport. They may have research establishments devoted to these subjects. Some of the State Government scientific institutions are in existence for a number of years. Library and information facilities are expected to be available in these institutions.

### 3.5 Academic Institutions

Indian Universities, which are now about 90, are regarded as centres for pure research. Some universities have set up Centres for Advanced Study in special disciplines. Scientific collections in libraries of some of our older universities are strong. By and large, the collection in a university library is correlated to the years of its existence and size and scope of the university.

Agricultural universities, being set up in various States, are keen about providing adequate library and documentation facilities and are taking suitable measures.

The Indian Institutes of Technology at Bombay, Delhi, Kanpur, Kharagpur and Madras, the Indian Institute of Science, Bangalore, and the Indian Statistical Institute, Calcutta, are centres for advanced study in scientific and technological subjects. The libraries of these institutions are well developed and equipped to provide active information services.

Agricultural, veterinary, medical and engineering colleges are springing up in a large number in various parts of the country. Some of them have facilities for instruction even at postgraduate and doctorate levels and are equipped for carrying out research. They are usually supported by adequate library facilities.

### 3.6 Private Institutions

Scientific institutions established by private agencies, foundations, individuals etc. and by learned societies come under this category. Some of them have developed library and information facilities.

### 3.7 Industrial Establishments

Industries, in public and private sectors, are increasingly aware of the importance of R&D and are taking steps to set up separate R&D units. As a consequence, the importance of documentation and information services is also realised and many of our industrial establishments are setting up information centres.

### 3.8 Facilities for Training

In view of the increasing importance of documentation and information services, qualified manpower to handle information work has become an essential requisite. To cater to this need, postgraduate training courses at Master's level are being provided by the Documentation Research and Training Centre, Bangalore and INSDOC, Delhi.

## 4. NATIONAL INFORMATION SYSTEM IN SCIENCE AND TECHNOLOGY IN INDIA (NISSAT)

The NCST, at one of its recent meetings, had made a recommendation that an information system on technology be developed with the nucleus of information facilities available in the laboratories of Government scientific agencies and public and private sector industries, by the CSIR on behalf of the DST. Dr. Peter Lazar, who carried out a Unesco Mission in March-April 1972, on a request from CSIR, had recommended in his report, the development of a National Information System in Science and Technology.



#### 4.1 Planning and Organisational Aspects

The NISSAT would be based on the existing information facilities. It would develop as an integrated national system by making full use of the information potential of the country, by coordinating the activities and by seeking the cooperation of individual information centres, according to well defined guidelines and division of responsibilities. It may fill up the existing lacunae in information services by establishing new ones. It may develop and apply internationally compatible national standards for information techniques and methods to facilitate inter-change of information. It may develop and introduce modern information technology and managerial methods in information work.

The NISSAT would work towards the evolution of National Information Policy outlined in 1.1. Major science agencies in the federal sector are constituents of the System. An Advisory Committee consisting of science planners, administrators, scientists and information scientists, drawn from science agencies such as the Atomic Energy Commission, the Electronics Commission, the Space Commission, the Council of Scientific and Industrial Research, the Defence Research and Development Organisation, the Indian Council of Agricultural Research, the Indian Council of Medical Research, the University Grants Commission, the Patents Office, the Indian Standards Institution, the Indian Council of Social Sciences Research, the Planning Commission, and other government departments dealing with scientific subjects may be constituted to formulate short-range and long-range programmes, to ensure necessary inputs of men and material, to assign priorities, and to evaluate performance.

#### 4.2 Coverage

The scope of the NISSAT would cover all branches of science and technology, including agriculture, medicine and public health. It would also embrace nuclear science and defence science, as far as non-classified information is concerned. It would also cover patents and standards information.

#### 4.3 Structure of the NISSAT

The functioning of the NISSAT would be in several tiers. The present and proposed national centres of information (NCs) in science and technology, medicine, agriculture, defence science, nuclear science, patents, standards, small industries, social sciences, etc. would constitute the top level of organisation. They are mission-oriented information centres operating at national level. The regional centres of information (RCs) like the Regional Centre of Insdoc at Bangalore, would constitute the second level. The branch information centres (BCs), which are subject-oriented and providing national service are in the third level of organisation. The local information units (LIUs), forming part of individual R&D establishments and serving the specific needs of the users in their parent institutions, are the lowest level of organisation.

The NISSAT is a flexible system, with its components operating under a variety of ownerships and jurisdictions, but collaborating together under the guidance of a coordinating body. What is envisaged is some sort of federation of

many scattered and previously existing information centres and libraries and establishing new centres for areas not covered already in order to fill up gaps in information facilities. Where necessary, the existing centres would be upgraded and the facilities augmented. The establishment and maintenance of information centres in the various levels would be the responsibility of the agencies or the institutions to which the information centres belong.

NISSAT will give particular attention to the development of:

- 1 a national science information policy;
- 2 techno-economic information facilities for management and decision making and on the application of modern computer and reprography technology to information work;
- 3 documentation of information services in new areas, capable of supporting economic and social development;
- 4 coordinated policy for the information systems of all sectors of national activity;
- 5 national plans for important types of information service, especially mechanised information services;
- 6 information services at all levels (local, branch, regional and national); and
- 7 a national network of mission-oriented centres of information.

#### 4.3.1 National Information Centres (NCs)

The NCs are responsible for coordinating, organising and providing information at national level for large sectors of national endeavours. They are mission-oriented centres. The NCs may have the following responsibilities under the NISSAT:

- 1 Planning and coordination activities of BCs coming under their jurisdiction;
- 2 Developing and maintaining document collections, serving as the national base for information work;
- 3 Promoting cooperative acquisition of foreign literature;
- 4 Compiling national union catalogues of collections available in their sectors;
- 5 Maintaining data banks, containing data relevant to the activities and the development of the sector;

- 6 Bringing out current awareness services on Indian scientific literature and on selected foreign literature either bearing interest for several branches or fields where BCs do not yet exist;
- 7 Providing translation service;
- 8 Procuring copies of documents, on request, from whichever source available;
- 9 Providing reprographic facilities for copying documents and distributing information;
- 10 Organising information dissemination services, including data retrieval, based upon their own holdings and data, and on the utilization of information services available on magnetic tapes;
- 11 Organising training facilities in information science, documentation, computer science, reprography, translation, etc.;
- 12 Carrying out and supporting research in documentation, information science, computer science, reprography, translation, etc.
- 13 Providing advisory services to RCs, BCs and LIUs; and
- 14 Developing relations and cooperation with foreign documentation and information centres.

#### 4.3.2 Regional Information Centres (RCs)

The establishment of RCs will help in utilising fully the literature resources available in various parts of the country. India being vast, one national centre alone cannot effectively exploit literature resources scattered all over the country. By establishing RCs in major centres of scientific and technological activity, it would be possible to aim at a greater utilisation of our literature resources. In major cities, science libraries are concentrated and scientific collections are rich. Science libraries in our country are gradually developing their collection and they should be fully exploited for the benefit of the entire scientific community. It would, then, be possible to minimise our dependence on foreign documentation centres for procurement of copies of documents required by scientists.

The RCs are not subject-oriented. They would cover all branches of science and technology including Agriculture and Medicine. Insdoc has established a Regional Centre at Bangalore and it is offering documentation services since 1964. Insdoc has drawn up proposals, for establishing during the Fifth Plan period, regional centres in Hyderabad, Bombay, Calcutta and Madras.

The main objectives of RCs are:

- 1 to survey the information sources of the region and to organise their mobilisation for meeting the information demands of the region;

- 2 to establish, maintain, update and publish regional union catalogues of literature resources;
- 3 to establish a strong reprographic unit and to serve the region with reprographic copies of information sources; and
- 4 to procure, on request, documents within and outside the region.

#### 4.3.3 Branch Information Centres (BCs)

Information and data work requires institutional support, access to information resources and reprographic facilities. BCs which are subject-oriented (missions-oriented or discipline oriented) would, therefore, be developed from the most suitable LIU, having already developed strong information base. They would serve all institutions in the discipline of the branch. They would form a channel for disseminating information between the NCs and LIUs. In order to progress from workshop to industrial level and thus render valuable service to a larger community of users, these centres need to be encouraged, supported and articulated.

The inputs required for the operation of the BCs may have to be provided by the institutions to which they belong. The centres would be staffed by science trained officers. Their services are expected to play an essential part in the flow of information, by maintaining close touch with current scientific and technical research and practice and by continuing close association with the users. The BCs would create information banks in their areas of specialisation. They would select, evaluate and synthesise information in well defined special fields and/or in areas pertinent to specific missions and present it in a form best suited to the needs of users, either in research or technology or management.

The BCs would be entrusted with the responsibility for coordination of information services within a branch. They may promote the creation and development of LIUs by offering advisory services and assistance in information systems analysis, design etc. They may also develop and maintain relations and cooperation with foreign information centres and professional bodies in their branches.

The main role of BCs is to provide following information services:

- a specialised current indexing and abstracting services including SDI (Selective Dissemination of Information) services;
- b Subject bibliographies;
- c Subject union catalogues;
- d Information retrieval on request;
- e Information on patent specifications and standards, etc.;
- f Information on scientific, technical and economic data;

Preparation of surveys, state-of-art reports, scientific and technological forecasting, and other types of techno-economic and special management information service.

The BCs would build up and maintain a document collection supplementing those of the institutions in the Branch. The BCs would build up data bank relevant to the scope and activities of the Branch. They would envisage developing computer based information services for the branch, in cooperation with NCs and assuring national and international compatability. The services would be based partly on processing of Indian and foreign literature and on retrieving data from their own data banks but chiefly on utilising existing and future specialised information services available on magnetic tapes.

To begin with, BCs could be developed in major industrial disciplines. The development of BCs for at least ten areas is suggested for being taken up during the Fifth Plan period. BCs can be set up at the CSIR laboratories for the following subjects:

Metallurgy	Glass & Ceramics	Cement
Chemical Technology	Mining Industries	Textiles
Leather Technology	Coal	Tea
Food Technology	Public Health	Jute
Aeronautics	Oceanography	Rubber
Electronics	Medicinal Plants	Paints
Mechanical Engineering	Building	Wool
Petrochemicals	Road	
Pharmaceuticals	Instrument Technology	

Preliminary work has already taken place for developing adequate information base, capable of providing national service, in the National Aeronautical Laboratory, Bangalore, the Central Food Technological Research Institute, Mysore, the Central Leather Research Institute, Madras and the National Metallurgical Laboratory, Jamshedpur. Therefore, the development of BCs for Aeronautics, Food Leather and Metallurgy could be taken up in the first phase itself around the nucleus of the facilities available in these laboratories. Additional areas such as Fertilisers, Transport, Building Industry, Heavy Engineering, Petrochemicals and Mining are also suggested for being taken up in the Fifth Plan, for creating the BCs.

An Electronic Information Centre is already in operation under the auspices of the Electronics Commission.

#### 4.3.4 Local Information Units (LIUs)

The LIUs (Special libraries, Information centres, etc.) operate in scientific institutions, government agencies, industrial enterprises, business firms, etc. Their number may be estimated to be around 600 at present, and more are springing up. They are of varying scope, standard and efficiency. The LIUs are the ultimate recipient of information from NCs and BCs. They

are expected to offer personalised service in anticipation of, and against specific requests, by providing scientific, technical and economic information necessary for the functioning of their parent institutions. Their services are directed towards work in progress in their institutions. The LIUs are also responsible for feeding information generated by their institutions to BCs and NCs.

## 5 MAIN ACTIVITIES AND SERVICES

### 5.1 Information Needs and Uses

There has been a lack of precise knowledge on the real needs of users of scientific and technical information. It is essential, in the first instance, to obtain information relating to the known and anticipated needs of users and the resources currently available to meet them. A survey of information needs and uses and the resources available has to be undertaken so as to plan the functioning of the NISSAT in the context of actual need and uses and to build up adequate resources for meeting them.

### 5.2 Acquisition

A policy for coordinating the acquisition of documents and their distribution among different libraries is essential and urgent in order that the libraries do not have unnecessary stock, that there is no undue duplication of material among libraries and that the available book purchase fund of the country is allowed to go the longest way for acquiring maximum number of titles. The acquisition policies and profiles of each institution should be clearly defined and coordinated within the branch, within the region, and at national level. The coordination may include mutually agreed acquisition profiles of institutions and subscription to periodicals and serials.

Most important of the material should be available in the institutional libraries for directly meeting the requirements of their users. The BCs should supplement the acquisition of individual institutions coming under its purview, with highly specialised and costly material, the use of which will be shared by all institutions in that branch. The BCs would be responsible for collection and deposit of unpublished literature such as research and development reports, trade literature etc. The BCs would in effect be the coordinating agency for acquisition of material for the institutions coming under them.

The RCs would build up a collection of general works and maintain a general reference library. They would collect and hold theses and dissertations prepared within the region. They would act as regional coordinating agencies in the National Cooperative Acquisition Programme.

The NCs would build up national collections, by complementing the branch and regional collections and by filling up areas not covered by them. A large reference library and a collection of indexing and abstracting services would be the core of the collection in NCs. They would take in a large number of periodicals by way of filling up gaps in national acquisitions. They would also

specialise in acquisition of foreign language literature, not being presently received to the desired extent by institutional libraries. They would also maintain depository of Indian scientific material in areas of their mission. In this connection, establishment of the National Science Library, the National Medical Library and the National Agricultural Library, deserves mention.

In the matter of building up our national collection, the goal would be that the libraries of NCs, RCs, BCs and individual institutions, taken together should ensure that at least one accessible copy of everything worthwhile published in the world, is being made available within the country itself, no matter where it is kept, for use by our scientists at all times to come.

### 5.3 Union Catalogues and Accession Lists

Setting up a decentralised network means that the constituent libraries must use common techniques for processing their collections. This is essential for purpose of interconnection and as a tool for readily locating documents in our libraries. Efforts are needed to induce the various institutions to share in the preparation of the national union catalogues, so that they can be made complete and upto date. In this connection, INSDOC has already initiated a Project for Compilation of the National Union Catalogue of Serials. The compilations, so far brought out, cover nearly 350 libraries. Insdoc has also developed programmes for compiling the union catalogues through computer.

Besides serving as location tools, union catalogues help in revealing strong and weak areas of our national collections. They would also be of help in coordinating our acquisition programme.

Towards the ultimate object of compiling national union catalogue, the following types of union catalogues may be of importance:

- a) Regional Union Catalogues, containing the integrated holdings of a region, prepared, maintained and published by the RCs; and
- b) Subject Union Catalogues, containing the integrated holdings of a Branch, prepared, maintained and published by the BCs.

### 5.4 Data Banks

The NCs and BCs would build up data/information banks relevant to their activities. The data bank in NCs will collect information on:

- 1 R&D activities in all the agencies and the departments and the laboratories;
- 2 Completed projects from these organisations available for commercial exploitation;
- 3 Status of technology abroad;

- 4 Status of R&D in developing countries, R&D country profiles;
- 5 Management information;
- 6 Manpower;
- 7 Industrial processes, licences issued, joint ventures, production;
- 8 R&D expenditure;
- 9 Infra-structure available for R&D;
- 10 Statistical data; and
- 11 Information systems available in the country, subject-wise, industry-wise, region-wise.

In addition, there would be also discipline-oriented data banks, created in the BCs. These banks will select useful information, analyse it with user interests and store it either in a conventional or a machine-readable form.

## 5.5 Current Awareness Service

### 5.5.1 Indian literature

Monographical literature is expected to be covered comprehensively by the Indian National Bibliography. As regards microdocuments, the examples of the Indian Science Abstracts and the Index to Indian Medical Periodicals, which are currently being brought out by two national centres, ie Insdoc and the National Medical Library may be cited. Other national centres may also bring out similar publications for the purpose of effective bibliographical control of Indian scientific literature. National indexing and abstracting services act as a feeder for coverage of Indian literature in major international abstracting and indexing services and they should, therefore, be promoted. For example, BARC is preparing the Indian input to INIS. Such a cooperation is also expected of us in the UNISIST (World Science Information System) programme of UNESCO.

Control of unpublished literature should be taken care of by the BCs, as it has to be further processed for being made use of. However, theses could be collected, processed and indexed more effectively by the RCs.

### 5.5.2 Foreign literature

Indexing and abstracting services, devoted to foreign literature and with universal coverage, for the purpose of providing current awareness service to our scientists, is neither necessary nor feasible at national level. In all major disciplines and branches of knowledge, international indexing and abstracting services are available and they can be made use of by BCs and LIUs for preparing selective current awareness services. However, the NCs may have to take care of those areas that cover the interests of many BCs. For example, the various



information publications being brought out by Insdoc for dissemination of Russian science information and the Current Literature on Science of Science may be mentioned.

Indexing and abstracting services are now increasingly available on computer based magnetic tapes. For example, CA tapes for Chemistry, COMPENDEX for Engineering, INSPEC for Physics, MEDLAR for Medicine and Agricultural Index are available. More and more of such services are being brought out. In NISSAT it is proposed that the acquisition of such costly tape services should be centralised at the national centres. However, the services to be generated from them, would be available to BCs who may, in turn, select, evaluate and synthesise information for transferring it to the users. It is hoped that the NCs would have their own computer facilities for this purpose.

#### 5.6 Selective Dissemination of Information Services (SDI)

The SDI services are expected to provide information which as closely as possible meets the interest profile of the user. The aim would be to furnish to the user not only titles and bibliographic reference but analytical abstracts of documents as well. Whether these services are performed manually or with a computer, their development is of prime importance. They can supply widely scattered users with the new knowledge they need to keep abreast. They also constitute a means of making information conscious potential users, who had so far been unaware of its importance.

#### 5.7 Information Analysis, State-of-the-Art Reports, Surveys, Forecasts

Users, who are in industrial and technological fields, need carefully selected data of practical importance and relevance. They need digested information, in a manner in which it could be straightaway assimilated and used. What they need is information and data which are immediately applicable to their work, or which can help to solve the problems, they face. In these cases, information has to be analysed in detail, keeping in view the interests of the users, and served promptly. The users are not satisfied with raw data or mere bibliographical citation of pertinent literature. They want the actual information. For this purpose, the source documents have to be analysed and pertinent information culled out and served. This type of work is expected of BCs.

Reviewing the state-of-art in particular fields is also to be undertaken by BCs. Such reviews have to be prepared for three levels of users - the research scientist, the industrial research engineers and production engineer. This service helps the users to be posted with the current advances being made in their specialities.

#### 5.8 Information Service to Industry

In a country with so large a number of small and medium-sized enterprises - often cut off from all sources of information - it is essential that the industries are provided with easy access to scientific and technical information, if they are to develop and contribute more actively to the national economy. The

industries have to be first of all convinced that they need information. Then, they have to be helped to find relevant information. Finally, they have to be advised as to how best to apply the information. Here again, the industries would require information in a manner in which it could be straightaway assimilated and made use of. Mere supply of raw scientific information would be of no avail to them. They are more in need of practical know-how, in techno-economic context. The information to be served has to suit their practical needs. For example, providing information about a manufacturing process for which raw materials are not easily available in the place of location, is of no consequence. Most of our small and medium-sized industries do not employ qualified persons and they are not in a position to use raw information. The information to be served has to be well digested and capable of being applied directly towards practical ends.

The establishment of the Documentation Centre of SIET Institute, Hyderabad is a step in the direction of offering industrial information services. The NISSAT has a major role to play in industrial information service. The present efforts of various small scale industries institutions in the country would be also integrated so that flow of information to small firms is ensured.

#### 5.9 Referral Service

Information may not have been always published. It may be held in one of the thousands of files and data banks. Those files are only partially used, because of their being unknown to the public. Some effort should be made to publicise the location and content of these sources. Sometimes, information can be obtained quite easily from specialists in the field concerned. A service must be provided to know who the specialist is and where to find them. Those who are in need of information, should be able to know as to which sources they should consult. More often, they may have no precise knowledge as to the source wherefrom they could seek information. A referral centre, where an inventory of all types of information sources in the country is maintained, would therefore be set up to direct the enquirer to the sources of information, for purpose of establishing contact quickly.

#### 5.10. Promoting Use of Information

The importance of information in research, development, production and other human activities has been stressed upon earlier. It has also been described that information is a vital national resource. Information, therefore, ought to have its market so as to derive its fullest benefits. There is need to create and step up demand for information by all those who are concerned with national development. The NISSAT has to find ways and means to make potential users, information conscious. It is an essential step even for the growth of the NISSAT. By stepping up demand for information, there is a possibility of our information services being placed on a self supporting basis and thereby depending less and less on government support.

Oral communication between information specialists and potential users of information, organising group discussions, demonstrations, seminars etc. and

establishing personal contacts, are a few measures adopted for promoting use of information.

Proper facilities for training in the use of scientific information have to be also organised. The training will help to improve the user's attitude to information and would promote use of information. It will be of help specially to those who are entering research career.

#### 5.11 Training in Information Science

The NISSAT has to take care of the manpower requirements for its efficient and proper functioning. In view of the growing demand for information services, the rapid advances in information field, the advent of computerisation of information systems and their extension at national and international levels, the country would require not only an adequate number of qualified information specialists but also managerial staff with broader training to plan, direct and administer new information systems.

#### 5.12 Research in Information Fields

Documentation and information science have been making great strides in recent years and have revolutionised the concepts in regard to the services expected of them. Information field has become a fascinating one for undertaking research. It offers a great scope for innovation and development. The importance of research in this field is increasingly being realised and advanced countries are making great efforts. India has also been making notable contributions especially in classification research. The role of Documentation Research and Training Centre is significant in this connection. The NISSAT has responsibility for promoting research in information field.

#### 6.0 Summary

Scientific information forms an important infrastructure for technological and industrial development of a country. Scientific information has, therefore, to be considered as an important national resource to be developed and made available to those who need it. This national resource has to be strengthened and coordinated, and all its components should be considered holistically as a part of the national system. Building up of a strong national information infrastructure would enable us to take full advantage of the World System of Scientific Information (UNISIST). The main objective of the national information policy will therefore be to provide research workers, scientists, engineers, management personnel, etc. with rapid access to information. To develop this economically, the national system will make full use of the information potential already available in the country, by seeking the cooperation of all information centres according to well-defined guidelines and responsibilities. The functioning of the system would, therefore, be at several levels, viz. national centres of information regional centres of information, branch information centres, and local information units. Active participation of all science agencies in the federal sector is a sine qua non for achieving an integrated national information system for science and technology.

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FORMATION  
SCIENCE AND  
TECHNOLOGY

	ICMR/ DGHS	MINISTRY OF INDUSTRIAL DEVELOPMENT			ICSSR	OTHER MINISTRIES	UNIVERSITIES
NATIONAL LIBRARY	NATIONAL MEDICAL LIBRARY	PATENTS INFORMATION CENTRE	STANDARDS INFORMATION CENTRE	SIET DOCUMENTATION CENTRE	SOCIAL SCIENCES DOCUMENTATION CENTRE		

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LEVEL 1  
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Information  
Centres)

LEVEL 2  
(Branch  
Information  
Centres)

AERONAUTICS	FOOD	LEATHER	METALLURGY	FERTILISER	TRANSPORT	BUILDING
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LEVEL 3  
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