Chapter VI

Empirical Evidences, Conclusions & Suggestions

While the main objective is to make an empirical study of the demands and information needs of the professionals in the field of disabilities in general, and mental retardation in particular, investigation of information seeking as well as information use patterns were also taken up as secondary and additional issues, as related to five demographic variables, namely age, sex, profession, educational status and length of experience. The study reveals several interesting facts:

Information Needs

There is an explicit and clear evidence for the need of LIS support in every situation, i.e. in teaching, research as well as service to the disabled and their rehabilitation. The volume and variety of information needs, institutional and material resources as well as the time in searching and consultation are also found to increase with increase in involvement in various activities, experience gained and qualifications acquired on the part of all the categories of professionals. However, professionals in the field of psychology and medical and related branches rank as the major groups. They frequent more number of libraries spending more time in literature searching and retrieval of information.

Knowledge of Sources and Tools

Information needs expressed by the users dictate certain requirements as necessary to be fulfilled both by the users and the providers of information. The professional specialists in various branches must not only know a wide range of sources and access mechanisms but also possess the skills to interact and retrieve needed information from all possible sources. This is not easily possible unless the organizations and the information systems
are completely prepare themselves to meet the needs and requirements. This calls for careful planning in terms of resources development and management to ensure availability of and access to needed services and products. It is seen that users’ awareness of sources and access tools vary with age, experience, professional, educational and managerial statuses. The large majority is found to lack awareness of sources and knowledge of search techniques. The poor shape of library and information units, the absence of technological applications coupled with financial and other constraints, obviously, are generally the reasons for the lack of users’ awareness. In comparison to other groups, psychologists are found to present themselves as the group with better awareness of sources and knowledge of search techniques.

**Information Services**

The different types of information services listed in the questionnaire, are not rendered totally in all the LI centers. Reference, photocopying, indexing/abstracting, newspaper clippings are found to exist in a few LI centers. Evidently, this points out to the lack of material and men to organize these services.

**Non-formal Communication**

In realizing the goals and objectives of the total system in improving the lot of the disabled, knowledge and competence of the specialist work force, ultimately, is of paramount importance. A competent LI support is indispensable. But this may, some times, be complemented by informal communication capabilities also. This is being so, the study sought to examine the interpersonal and other kinds of informal/non-documentary sources of information that is depended upon. It is found that oral/written interpersonal communication, group meetings, conferences, accidental/by chance means of coming to know do exist as in other areas. However, for completely effective communication, the formal
system should necessarily consider the informal means as well. But that is not in evidence in this case because the formal system itself has several constraints.

Professional Contribution

Professional contribution is a measure and an indicator of growth and enrichment of knowledge in every field, which usually results from careful reflection and analysis of one's work experience, efforts at solving problems, and research based on literature survey and review and also identification and execution of organized research work of greater value. While part of this research may generate, and in turn, use internal data/information, the other, may stem from published/external records of knowledge. The LI system obviously has to manage both the kinds. The study although merely sought to make statistical measures of professional contribution (applying the five variables), it is also found that the LI support and involvement is not conscientiously related. The obvious reasons are the lack of proper perspectives in LI planning.

Browsing/Reading

While there is no much evidence of LI support for research activities in general and contributions made by specialist professionals in particular, it is found that the psychology group (which is the smallest group) has fared better. This is due to the fact that this group comprises of highly qualified persons with adequate research background endowed with capacity for innovation (the support, possibly, coming also from outside the resources of the system).

Preferences of type of Document Sources

The type of document sources sought and relied upon seem to vary with the type of research activity influenced also by accessibility, language skills, level of expertise etc.
factors. Journal literature naturally finds a priority followed by monographs, conference papers, and other secondary sources like reviews etc. Non-formal sources also have their place. However, it is seen that the research projects warrant large-scale and continuous browsing and literature search.

Preferred Journals

The major field namely the disabilities and the specific sub-fields with in it like mental retardation are not exclusive, unitary and clearly bounded subjects. Therefore, instead of predetermining the periodical titles either wholly or partially falling within the fields, the instrument sought to identify the possible titles based on the knowledge of the respondents themselves. Thus a total of 77 titles emerged, out of which 5 are checked as the most preferred ones: American Journal on Mental Retardation, Exceptional Children, Mental Retardation, Indian Journal of Disabilities & Rehabilitation and Research, Indian Journal of Clinical Psychology which present a definite slant to mental retardation. This again points out to the fact that neither the LI system nor the users possess definite knowledge of right periodical sources.

Use of information sources/services

There is a clearly felt and expressed need and demand for making available all relevant categories of information sources, products and services covering the different subfields of the area of disabilities. Among the monographic publications, dictionaries and encyclopedias are found to be in greater demand. Besides, secondary periodicals are also found to be indispensable although the survey response, indicated only three titles viz., Psychological Abstracts, Exceptional Child Educational Resources, and Indian Psychological Abstracts, as the most preferred titles. There is also the general demand for reference, guidance, CAS and Newspaper clippings services including state-of-the-art, on-line retrie-
val, etc. However it is revealed that total systems' capacity in all these aspects is generally very very minimal.

**LI facilities**

The effectiveness of the disabilities welfare measures and administration depends on the efficacy of the LI support that is planned and organised. The survey reveals that the LI component is not able to meet nearly 60% of the needs of the users and the requirements of the overall system. In addition to what has been observed already, the survey reveals many inadequacies in terms of physical and bibliographic control of the materials, i.e. the poor status of organization and display, recording of data in catalogues and other tools, insufficient and less competent LI personnel resulting in absence of strategies for effective utilization of budgetary provisions, resources sharing, modernisation of operations to augment the system's capacity to meet information needs and requirements.

**Suggestions**

Disability, in general, is a matter of national and international concern for the welfare, i.e. mitigation and repairment of the disabilities so as to rehabilitate and integrate the disabled in the mainstream. Obviously, therefore, the Ministry of Welfare is entrusted with this task. Briefly, the task consists of processes as well as mechanisms of administration, education, training and research (planning & development of work force), and service. The administrative mechanism administers and monitors the whole task by planning, preparing schemes and programmes, costing and budgeting, and creating institutional facilities. Thus, through the institutional mechanisms, the required specialist workforce is developed applying appropriate strategies of education, research and training. The service mechanism consists of establishing service units to reach the ultimate target, i.e. the disabled population. Most of these service units are special schools especially caring for people with
visual, hearing and mental handicap or disabilities. These schools are mostly voluntary and private agencies which may receive financial aids from the Ministry of Welfare and other funding bodies. In addition to these agencies, many vocational rehabilitation centers at the district and regional levels also operate administered by the Ministry of Labour and Employment.

There are also other related programmes and schemes administered by health, education, etc., departments of the governments, to help the cause of disabilities in the country.

The LI component, both as a mechanism and process finds for itself a pivotal position in the administrative, educational and service segments. The LI system, perforce, needs to be designed to meet three different groups of personnel: planners, policy makers and executors; special educators and trainees; and special school teachers (educators). The first group requires socio-economic and other data needed for decision making and evolving plans and projects. The second group involved in teaching, learning and researching need library and information support for effective accomplishment. The third group consisting of teachers (trainees turned out from the training centers), similarly, need information to enhance their general awareness and update their skills in instruction.

The LI system in the overall context has its primary responsibility to reach a minimum level of requirements so as to be capable of handling the complex information needs and demands. While this is the major and immediate issue, it also has an imperative to provide appropriate resources and collections of material in all the special schools meant for the disabled who are being trained and taught in various skills. Since it can be treated as a local need and local effort, this component obviously has been excluded from the purview of this study.
The articulation of concern for rendering services to the disabled in any practical way, though existed for more than five decades, it was rather voluntary, passive and less concerted. The active involvement of the governments, during the past one or two decades, however began to add vigor and direction to these activities. The national policies relating to welfare, Labour and employment, education, health and other socio-economic development, with imports for rehabilitational and developmental measures for the disabled while creating specific institutional support have also slowly established additional facilities to augment and add to the activities. Thus a system of administration of activities are in the shaping. Reviews and reappraisals made from time to time however, have not greatly considered the need to re-orient the information component.

The empirical evidences summarized (based on the data analysis) and presented in the initial pages of this chapter have certain pointers. There is greatly felt over-all need to plan and strengthen the LI component as an essential support system.

This calls for a clearly articulated policy on LIS within the framework of the policy for training and rehabilitation of the disabled as a public welfare service.

The policy in the first instance, requires the planning and establishment of a National Disabilities Information Network (NADINET) for the country.

The network warrants creation and maintenance of LI units at all levels and in all organizations, institutions and special schools. While the emphasis should be on creating large library and information centers of national importance in the major organizations, the other libraries in the two levels of rehabilitation centers and special schools may be organized to cater to the immediate needs.
In tune with this proposal, a set of minimum standards appropriate to the libraries, at the different levels need to be formulated. The policy obviously will have to stipulate in clear terms, the qualitative and quantitative measures to serve as yardsticks relating to all the aspects in the provision of LI services: objectives and functions, scope of coverage, finances, collections, staffing, physical and bibliographic control, services and products, physical facilities, etc.

Finance being the most essential element of inputs, the policy, while stipulating minimum standards should also indicate the basis as well as the sources from which to be tapped.

Next in importance, is the material, i.e., the collections. This also calls for formulation of standard for minimum collections and evolving of appropriate strategies for enrichment and development of collections in terms of both media and subject coverage.

Availability of adequate financial and material resources alone are not enough to achieve optimization of services unless the system also ensures proper staff. This naturally requires standards for staffing in terms of competencies in various specializations.

Likewise, physical and bibliographic control are also important factors which should receive due consideration. Identification and choice of bibliographic standards, appropriate levels of description and analysis and recording of data need to be spelt out in concert with the emerging national standards and also the systems’ requirements.

While the total LI policy that should stem from a carefully studied and listed inventory of requirements, the stipulations relating to services and products should receive proper clarities obtained through empirical studies, scrutiny and clear choices. The services and products obviously need to be oriented to education, research and development, planning,
decision making and management. All this may need a variety of services and products including descriptive and numerical data. In other words, the task consists of identifying various databases required in the system.

The physical facilities consist of basic needs in terms of building and space, organization and storage of material, suitable furniture including gadgets. The policy should spell these items as well. It is necessary because there is otherwise scope for ignoring such simple essentials.

Finally, it should be borne in mind that inadequacies, deficiencies and shortcomings in various ways will continue to persist and create impediments. Cooperation and resource sharing are the only means to offset these debilitating factors. Resource sharing implies networking and application of appropriate technologies: computer, satellite and telecommunication technologies. This being the final imperative, creation and development of a national system of disabilities information and network is suggested and a structural plan is also presented. This may be designated as the National Disabilities Information Network (NADINET).

National Disabilities Information Network (NADINET)

Based on the survey conducted, a National Disabilities Information Network (NADINET) is proposed. This is to facilitate sharing of resources between the major institutions in the country in the area of disabilities.

Objectives

A network, in the first instance, envisages a physical structure of links among the libraries/information centers (in any fashion) established by means of computer and telecommunication links. Automation is the fundamental pre requisite.
The immediately identifiable major objectives of the proposed network can be:

- Establishment of communication linkages at different levels among the LI centers of the major institutions within the system connected also to other LI center that operate outside the system;
- Ensuring of effective bibliographic control of the literature in the area;
- Facilitation and promotion of document delivery and inter library lending services; and
- Introducing a programme of cooperative acquisition of serials and other literature.

Network Planning

A system in a complex whole and envisages planned and organized efforts drawing upon the available resources and improving upon the same. In the first instance, it identifies all the institutional components that sustain the system. Further, it also takes into account all other components, more importantly, the human and technological resources on one side and the beneficiaries, their information needs and other system requirements, on the other hand. Thus a holistic perspective in terms of system’s scope, inputs, processes, mechanisms, expected outcomes, etc. is possible to obtain. Further, evolving of a system, especially, a national system has the advantage of being linked easily to international systems serving simultaneously as national feeder/support system as well.

The advantages that accrue are checking the drift and adhocism, elimination of wastage and duplication and effecting integration of internal/indigenous and external information/data, effective information transfer and optimization of output, and economy. Development of a system is particularly warranted in all these areas of knowledge which are complex, multi-dimensional and diffusive like disabilities.
The information system which is the concern here, being welfare oriented, calls for a consented national effort in knitting together a variety of activities, operations and services of several organizations and skilled groups and teams concerning the disabled and their rehabilitation. It is a permanent programme and is poised for a steady expansion and coverage. Knitting together all the variety of services and activities to be able to meet the future challenges and pressures that are certain to increase many folds is yet another important need that envisages networking.

The proposed system, which could be designated as NADINET is envisaged to be a National Network to cater to the information needs concerning disabilities and rehabilitation useful for specialists as well as the beneficiaries (the disabled and public). This presupposes a preliminary study and planning similar to the ones that may have gone into the other national metropolitan etc. networks which are in the shaping. This means that a feasibility study needs to be undertaken which should necessarily has to be directed to obtain factual data of decision value concerning:

- Existing LI resources, their functions, etc.
- Various Libraries & information centers
- Functional units/departments within these LI centers
- Holdings (Size, composition, coverage etc.)
- Growth rate of collection
- User services (CA, SDI, Abstracting/Indexing, Reference, photocopying, translation, data service, literature search, circulation, ILL, referral etc.)
- Manpower (staff size and composition, competencies and specializations, etc.)
• Physical & bibliographical control (modes and mechanisms of acquisition, technical treatment including schemes of classification, catalogue codes, vocabularies, authority lists etc. employed)

• Inter-Library loans (volume and variety of demands in inter-library interactions etc.)

◳ Technology Choices

• Loosely or closely knit systems or as bibliographical utilities/resources or centralized/decentralized systems etc.

• nodal types (service node, dependent node, shared node, center node)

• network type (search service or customized service or service center networks, i.e. centralized/distributed communication networks).

◳ problem areas and measures

• new services/products

• economy in the cost of communications lines, network interfaces/ILL/E mail/interfaces, on line training, editing, word-processing, electronic conferencing etc.

◳ Design alternatives

• Options

◳ Functional requirements, files, databases etc.

• Local requirements (acquisition of books etc., subscription to serials, classification, descriptive cataloguing, circulation, user services etc.)

• network requirements (sharing of databases) creation of union catalogues and other CA databases, network thesaurus, authority database, access to international database etc.

• General requirements and standards
Network configuration

- costs, maintenance, expansion, access needs, volume of data and traffic, computer hardware and peripherals, communication hardware, software and operating systems, equipments, networking, phasing out the plan etc.

Maintenance and backup facilities

- hardware, software, modem/data link etc. failures and maintenance and backup facilities

Manpower planning

- manpower requirements for central network organization and the participating LI centers.

Implementation

- Phasing out the plan, identification of priorities of location and application modules and responsibilities, periodical reviewing and implementation etc.

Cost benefit studies

- investment and operating expenses and benefits.

The feasibility study to precede the proposed network project planning has to further consider an appropriate organizational structure (to bring together institutions, resources, personnel, services etc.) so as to include, besides the LI centers, all the administrative/financing/decision making bodies (various departments of the different ministries, educational institutions, clinics and hospitals, rehabilitation council/centers, etc.) and possible link up with other information systems and networks (such as HELLIS, INFLIBNET, NICNET and Documentation/information centers like the Institute of Health & Family
Welfare, ICMR, NIMHANS etc.). Particular emphasis, in the feasibility study must be made to draw up an inventory of services and products to meet the variety of records that may develop progressively.

Organizations in NADINET

Any plan for networking, in the first instance, involves stock taking of the existing facilities, i.e., organizations/institutions which may be usefully networked. As it obtains, the following bodies present themselves as the much and immediately important candidates for functional link-up.

National Institutions administered/controlled by the Ministry of Welfare

- 01. National Institute for the Mentally Handicapped (NIMH), Secunderabad.
- 03. National Institute for the Orthopaedically Handicapped (NIOH), Calcutta.
- 05. Institute for the Physically Handicapped (IPH), New Delhi.
- 06. National Institute for Rehabilitation, Training and Research (NIRTAR), Cuttack.

Other centrally sponsored bodies

- 01. Rehabilitation Technology Center (RTC), Delhi.
- 02. District Rehabilitation Centers (DRCs).
03. Special Employment Exchanges (SEEs).

04. Regional Rehabilitation Training Centers (RRTCs).

05. Vocational Rehabilitation Centers (VRCs).

State sponsored bodies

01. Directorates for the Welfare of Handicapped (in all the states).

The detailed description of the activities of the six national institutions (under Ministry of Welfare) is presented in Chapter IV. Here, a brief account of the activities/programmes of the other organisations to be brought into the proposed network are given.

01. Ministry of Welfare, Government of India (Delhi)

The Ministry of Welfare takes up and monitors the programmes which are directed to promote educational and economic interests of weaker sections scheduled cases, scheduled tribes, backward classes and minorities, covering 85% of the total population in the country.

Another important task of the Ministry is the welfare of the handicapped population of the country. In order to implement various programmes for the cause of the handicapped it has established six national institutions for different disabilities and district rehabilitation centers. It also provides grant-in- aids to the voluntary organizations.

The National institutions include NIVH, NIOH, NIRTAR, AYJNIHH, NIMH, IPH besides the National Institute of Social Defense, Delhi which carries out programmes concerning to Drug abuse prevention, Welfare of the aged and street children etc., by providing specific grants to NGO’s and encouraging state governments and local bodies.
In addition to six national institutions setup for welfare of disabled persons, the Ministry has also under it one public sector undertaking namely Artificial Limbs Manufacturing Corporation (ALIMCO) and three Government companies namely National Scheduled Castes and Schedules Tribes Finance and Development Corporation (NSFDC), National Backward Classes Finance and Development Corporation (NBCFDC), and National Minorities Development and Finance Corporation (NMDFC) and one Cooperative Marketing Development Federation of India Limited (TRIFED).

The information generated in the Ministry of Welfare is considered to be very significant and useful to the Government institutions, voluntary organizations, parents of disabled persons and general public as it relates to schemes, concessions, programmes and policies of the Union Government concerning to the disabilities. The crucial information will be of great value to the disabled persons and their families which need to be disseminated from time to time to the effected people.

The concessions and facilities offered by the Government to the disabled persons include travel concession by road, rail and air, provision of scholarships, integrated education for the disabled provision of aids and appliances free of cost/at the subsidised rates, reservation of posts, financial facilities under self-employment schemes, postage concessions, conveyance allowance, income tax exemption, priority in allotment of houses etc. (Ministry of Welfare, 1995) ¹

02. Rehabilitation Technology Center (Government of India, Delhi)

It was setup in 1987 by the Ministry of Welfare with the following two main objectives:

- a) to provide technical and scientific support in matters related to aids/appliances for all types of disabilities.
b) to compile and document information on aids/appliances particulars of fabricators and R & D institutions engaged in designing and developing such appliances in the country.

Today, there are many organizations in the Government and private sector engaged in designing and developing aids/appliances such as mobility aids (wheel chairs, tri-cycles etc.), crutches, artificial limbs, visual aids etc., that are useful for the disabled persons. The information on the design and fabrication aspects of these aids considered to be significant to the professionals, parents, NGOs and other agencies engaged in imparting vocation training and rehabilitation of the disabled people.

It is estimated that about 280 organizations engaged in the design, fabrication and distribution of aids/appliances for different types of disabilities. A study carried out by the Rehabilitation Technology Center (1990) has revealed that the suppliers and fabricators are better distributed all over the country as compared to agencies in the areas of visual and hearing handicaps.

03. District Rehabilitation Centers (DRC's)

Presently, eleven district rehabilitation centers are working in different parts of the country. The major objectives of the DRCs are given below (District Rehabilitation Center, 1988).

- a) to desire suitable delivery systems to reach the entire population in the area.

- b) to promote cost effective technology.

- c) to develop appropriate training programmes for development of the new types of manpower evolved by the center.
d) to restructure the present jobs in order to minimize the manpower utilized for delivery of the services.

e) to create awareness among general public.

f) to arrange for early detection, prevention and physical restoration.

g) to provide vocational guidance and placement services.

The information generated in the DRC is considered to be vital in rehabilitation of handicapped persons (DRC, 1988)³

04. Special Employment Exchanges (SEE's)

Rehabilitation of handicapped is an important activity taken up by the Government at the central and state levels. The Ministry of Welfare, Government of India has setup 23 special employment exchanges and 55 special cells at different parts of the country. The basic objective of the scheme is to help the disabled persons in getting gainful employment. The scheme is implemented through the State Governments/Union Territories.

The total number of disabled persons in the live register of these employment exchanges as on June 1992 were 3,18,973 and the total number of placements made through these exchanges as on December, 1992 in 48,896 (Ministry of Welfare, 1995)¹.

The information relating to placements of persons with different disabilities in the central/state government organizations, is of immense value to the policy makers and administrators which facilitates guidances in planning appropriate rehabilitation schemes to the disabled persons.
05. Regional Rehabilitation Training Centers (RRTCs)

Under DRC Scheme four Regional Rehabilitation Training Centers have been established in 1985, at Bombay, Madras, Calcutta, and Lucknow.

The main features of the RRTC's are:

- a) training of village level functionaries
- b) training of DRC professionals
- c) orientation and training of State Government officials
- d) conducting research, in service delivery and low cost aids to the handicapped persons.

Apart from developing training material and manuals for field use, they also produce awareness material such as folders, posters, audio-visuals, films etc.

06. Vocational Rehabilitation Centers (VRC's)

Vocational training and employment constitutes an important component of the rehabilitation programme. The ultimate aim of medical, social and educational rehabilitation is to attain socio-economic independence so that the person with disability can lead his/her life with a sense of dignity. Vocational rehabilitation is a process that enables people with disability to secure employment suitable to the nature and needs of the handicapped individual.

Under the Ministry of Labour & Employment two Vocational Rehabilitation Centers were established in 1968 at Bombay and Hyderabad for assessing the educational, psychological needs of the handicapped persons. Currently, there are 17 Vocational Rehabilitation Centers are working in the country (Ministry of Labour & Employment, 1994)⁴.
The vocational training and employment activities of the center are carried out by 4 divisions.

Functioning of each VRC is supported by a Medical Board, which evaluates functional work acceptance of the client and suggests remedial and curative measures wherever necessary. The Board also gives certificates which enables people with disability to avail concessions and benefits given by the Government.

It is the responsibility of VRC to orient suitable training so as to improve the employment chances of a person with disability. Typically, vocational training is provided in five types of trades, viz.,

- (a) adjustment training;
- (b) in-plant training;
- (c) apprenticeship training;
- (d) institutional training; and,
- (e) skill training.

The evaluation division of the VRC is responsible for undertaking adjustment training which normally does not exceed a period of three months. This training is undertaken at the VRC itself or in the industry which is likely to offer employment to the handicapped person. The content and purpose of the training are kept flexible taking into account the needs and employment opportunities of the handicapped individuals. After mastering work behaviour requirements of the job, in-plant training given either at the VRC itself or at the industrial employment site. The curriculum content of in-plant training is arranged by keeping in view the applicant's functional capacity and scope for subsequent employ-
merit. On completion of the in-plant training, the trainee is subjected to a trade test. Those who pass the trade test are given a certificate.

Each VRC has a skill training workshop which provides vocational training to those people with disability who are not eligible for ITI courses. This non-formal skill training prepares people with disability to seek employment in industrial trades as per the employment opportunities available in the local area. Being the ultimate aim of the Government and Non-government agencies is to integrate the handicapped persons in the society through placement of disabled persons in the appropriate jobs, the information generated in VRC’s would be of immense value to the policies makers, administrators and other agencies working in the field.

Structure of NADINET

It is proposed that the secretariat of the NADINET may be located at the Ministry of Welfare, Delhi. This as the National focal point (NFP) at Delhi is to function as the clearing house also for information about all activities and services. (Figure - 17 shows the diagrammatic representation of the network).

The secretariat of the focal point links and monitors the functions and operations of the six national institutions (the major units) as the institutional/Information resources concerning the specific disabilities. This, therefore, ensures consolidation and pooling of all information including the LI sectors. The four Regional Rehabilitation Training Centers (RRTCs) (Madras, Bombay, Delhi and Calcutta) which render disability services are to be developed as the Regional Clearing Centres (RCCs) forming componential part of the network linked to the national focal point. These regional centers, since command financial and other resources including infrastructural facilities are better suited to function as agencies to disseminate information to meet demands at the regional levels. The link up
of the NFP with the National Institutions is to be the two way flow of information so that institutions not only interact among themselves but also interact simultaneously with the NFP. The link up between the NFP and RRTCs is to be set each RRTC and the NFP only. Among themselves, there may be no need for any interconnection, because these centers receive information packages from the NFP and merely act as caterers/disseminators. The NIs regularly process and communicate information to the NFP which in turn reprocesses to suit the actual information needs of the user population who are served by the RCCs, The RCC's can function through a further nodal point set up one for each state covered by it. For example, the southern Regional clearing center at Madras, besides rendering information service to Tamilnadu can outreach Kerala, Andhra Pradesh, Goa, Pondicherry and Karnataka States also through State nodal points at the respective state capital. The NFP, further will also have linkages with other government agencies functioning under other ministries. Important among them are:

- Rehabilitation Technology Center (New Delhi)
- District Rehabilitation Centers (about 11 located at the district headquarters)
- Vocational Rehabilitation Centers (about 17 centres working in the country)
- Special Employment Exchanges (about 23 Exchanges situated at the State capitals)
- Ministry of Health & Family Welfare (New Delhi)
- Ministry of Education (New Delhi)
- Ministry of Census (New Delhi)
- Ministry of Labour (New Delhi)
However, these bodies/organizations may not form integral part of the network. They may remain as loose ends which are informally interactive with through phone, fax, E-mail, post, etc.

A large number of National Documentation Centers like Neurosciences Information center (NIMHANS), Bangalore; National Documentation Center of Health & Family Welfare, Delhi; Documentation & CLF division of NCERT, Delhi; ICMR Documentation Center, Delhi; NIPCCD Documentation Centre, Delhi and others, most of them located in Delhi can also be informally linked up so that the major components of the proposed NADINET requiring any information or help from any of the national documentation centres, can receive through NFP and even recipricate. As a further suggestion it can be said that one of the six national information centres can have arrangements made to access (on line) international database like ERIC, MEDLARS, Disability Abstracts, etc. for the total system.

Role of the LI units in the system

The National Focal Point (NFP) at the Ministry of Welfare shall monitor the activities and functions of all the centers of the network.

The six national institutions concerned with different disabilities have to develop and maintain bibliographical data concerning diagnostics, therapeutics, technical know-how, innovative and instructional technologies, aids and appliances as well as current research. (internal as well as external). Data formats, lexicographic tools/standards have to be appropriately selected and decided. Each of the National Information Centers (NIs) should input bibliographic details of all the relevant literature in the concerned field from all types of print/non-print materials available in the respective libraries. The national institutions are also responsible for planned acquisition and collections development, and
maintenance of distributed databases, and being inter-linked can facilitate communication between them. The regional clearing centres (RRTCs) each connected with the NFP serve as information outlets for the region and function as conventional agencies, the service extended through the state nodal points. The national focal point (at the Ministry) will have no database (centralized) maintained. The interaction is confined mainly among the NIs. However, it will maintain a database of information on government policies, concessions, facilities, and plans and programmes, concerning the disabilities to which NIs, RRTCs (RCCs) and State nodal points will have direct access. The Regional clearing centre shall build up its own database comprising information generated within the centre. Further, it shall be responsible for collecting and disseminating appropriate information required by the state nodal points and local agencies. Queries received from the state nodal points and local nodal points/agencies will be processed by the Regional clearing centers and information to respond to these queries will be collected from the NIs and transmitted (mostly in the conventional forms). The NFP shall also collect information from other government agencies such as VRCs, DRCs, departments of health, education, census, etc. and make the same available in its database.

**Network Structures**

The NFP and the national institutions be linked through a Wide Area Network (computer based). Two possible structures for computer connectivity are STAR network and MESH network.
In the Star network, there is a computer in the central station and all other points are connected through the centre. A reaches B through CS. So is the case with all the participating agencies. This system is suitable for dedicated networks and large number of users. Here if the central system fails, the entire network becomes non-operational.

In the case of Mesh Network all nodal points are directly inter connected. In this case, each node is independent. Even if one of the nodes fail, the rest are operational.

For the purpose of interconnection of various organizations in NADINET, Mesh mode is suggested. The star mode calls for centralization of all information in digitized form, collected from various agencies. This might take a long time. Instead, each organization will continue to carry out its work as of now, with added responsibility of sharing and cooperation with each other.

The NFP, the national institutions and the regional clearing centres will have computer systems installed to be linked up to each other:

The minimum communication infrastructure for NFP and NIs is as follows:

- A Mini computer running on UNIX operating system;
- 1 Giga byte hard disk;
- CD-ROM Drive;
• Colour Monitor;
• Telephone;
• Modem & Printer;
• Software for file transfer facilities;
• E-Mail facility; and
• RDBMS (Relational Database Management Software) for database development and searching.

The following infrastructure may be needed by the Regional Clearing Centres:

• PC-AT 486 (66 MHz);
• 500 MB hard disk;
• Telephone, Modem and a printer;
• Software for file transfer; and
• E-Mail facility

The actual linking of computers can be achieved in one of the following ways:

1. Using existing PSTN telephone lines.
2. Using INET of Department of Telephones.
3. Having dedicated terrestrial leased data circuits.
4. Having dedicated leased data circuits based on satellite system.

Using telephone system is the easiest to start off. The only additional requirements, in addition to a computer in each place, are a modem and a phone. However Inter city
transactions over the phone line for long hours is very costly as one has to pay to DoT at
STD rates for the phone usage.

Providing dedicated leased data lines (either terrestrial or satellite based) among the
various institutions is desirable but it is very costly in terms of establishing the links. For
example a leased data link from Hyderabad to Delhi may cost around Rs.9.00 lakhs.
Therefore, this is not suggested.

INET, however, on the other hand is a feasible alternative. INET is a packet Switched
Data Networking facility available from Department of Telecommunications. All the six
national institutions and the NFP should obtain leased line INET (X.25) connection from
DoT. There is a facility called closed user group in INET which can be availed of, easily.

INET

INET is a packed switched network based on X.25, X.28 and X.75 protocols. The data
network facility is offered by Department of Telcom and is available in Bombay, Delhi,
Calcutta, Bangalore, Madras, Ahmadabad, Pune and Hyderabad. X.25 leased line facility
is needed for interactive connectivity. End users of the network can reach the network,
even though they do not have INET connection. They need to have only a phone, Modem
and PC plus communication software. The costs are very reasonable and cheap.

It is suggested that each node sets up a Bulletin Board System on its computer and all
the BBSs are linked through INET. The Bulletin Board System (BBS) is a miniature form
of an on-line system for a cost-effective distribution of information in electronic format. It
supports interactive communication between users and also allows to leave messages for
other users in some BBS. General applications of BBS include Electronic Mail, software
A BBS is ideally suitable for simple effective and reliable networking at reasonable cost. Localized electronic mail among subscribers to the BBS, special interest forums, facilities for transfer of files from one BBS to another are all possible. Even in the case of an institute offering of its on-line public access catalog for on-line searching, this facility can be extended to BBS users through a facility called "DOORS" in the BBS software. When internet connectivity becomes easily available and affordable in India, BBS can be enhanced to provide internet connectivity also. Moreover several BBS systems can be effectively and efficiently inter-linked without much problem.

The infrastructural requirements for BBS at each node are described below:

- a) Personal computer.
- b) Modem.
- c) Telephone line.
- d) BBS software.

The system requires initially just a single operator to maintain the system who will receive the information from the other participating centers, edit it and add to the BBS.

All BBS software do not support all kinds of modems, however, certain modems like Hayes and US Robotics modems support all types of software. It is suggested that industry standard modem be selected (i.e., Hayes, AT commands, MNP protocol, etc.) which support maximum protocols.

There are many BBS software packages available in the market, however appropriate package should be selected based on three main criteria, viz., user needs, software facilities, and software quality.
It is suggested that the BBS software 'PC Board' can be used by the participating centers of the network. This user-friendly package is inexpensive and supports from 2 to 65,535 users. It includes other modules such as an Internet/UUCP Gateway, a Fido Mailer QWK Mail support, database file access, Multi-channel CHAT, Local/Network and Dial in/remote logins and support both intelligent and non-intelligent multi-port hardware with port speeds up to 1,15,200 bps. (Ramaiah, 1995).

Similarly NFP and the national documentation centers may be linked up, but using only local telephone lines. The BBS operating at NFP will collect information from the Documentation Centers by subscribing to any of the existing services be it on-line, CD-ROM or E-Mail facility.

Another, parallel method by which the ties could be strengthened is the acquisition of Electronic Mail facility in each of the nodes of the network from service providers like ERNET and NICNET. An E-Mail connection from ERNET, automatically connects an institution to 500 + other institutions in India, besides offering connectivity to Internet also. Similarly, an E-mail facility from National Informatics Centre, New Delhi provides connectivity to 600 + district level government agencies in addition to connectivity to internet also. Thereby the reach of the users of the NADINET will increase tremendously.

As far as connectivity to INTERNET is concerned, (in addition to E-mail as suggested above) the NFP/NI could obtain Internet connectivity from Videsh Sanchar Nigam Limited in its Delhi office.
Internet

It is a conglomeration of variety of networks worldwide was setup by the National Science Foundation (NSF) of the United States in the year 1969. More than 30,000 regional and local networks worldwide are interconnected with this super high way, and a new one joins the Internet every 30 minutes. Today, Internet has over 5 million hosts in its fold (Chitinis, 1995)\textsuperscript{6}.

Internet facilitates its users to send electronic mail and participate in on-line discussions. It connects Universities, Federal and State Government agencies, professional associations, research organizations, commercial firms etc. Internet operates at a speed of 45 mbps on most of the segments and at 100 mbps on some segments. Internet's Electronic Newsstand offers excerpts from nearly 200 magazines along with a way to subscribe on-line.

One central agency (NFP or NI) could search Internet sources and make results available via the BBS network suggested above, thereby vast library resources of the world could be offered to all the institutions easily.

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