National Information Policies and Programmes

Seminar Papers

XXXVII All India Library Conference

IIT, Madras, December 4 - 7, 1991

Indian Library Association

Delhi 110 009

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FOREWORD

The Indian Library Association generaly holds All-India Library Conference along with its annual sessions in different parts of India each year. The need for an exclusive session devoted to 'National Information Policies and Programmes' as a topic of current interest was keenly felt. The large number of papers presented here is a clear indication of the professional urge felt all around.

It was encouraging to note that recently Government of India has set up an Implementation Cell in the Department of Culture, as a follow-up of the recommendation of the Empowered Committee which was in turn constituted as a sequel to the National Library and Information System Committee Report (Chairman: D.P. Chattopadhyaya; 1986). This has resulted in few significant programmes being enlisted by the Central Government in the Eigth Five Year Plan document (Rural Library and Information Centres, INFLIBNET, etc.).

Operational procedures in libraries are fast changing due to rapid introduction of computer technology. New vistas of resource sharing and library co-operation are opening up in India and are being accepted as feasible propositions. Exchange of bibliographical data between libraries is no longer a service available in other countries. It is because of these and other consequential factors that ILA has chosen this topic as the theme this year.

As you all know, the theme of the 58th IFLA General Conference to be held in India for the first time in August 1992 is also "Library and Information Policy Perspectives".

I hope the deliberations at this Conference, based on the papers presented will yield valuable results in shaping India's future library and information services being fully compatible wih international standards and supporting India's contribution to the global information transfer syndrome.

New Delhi
October 30, 1991.

Subhas C Biswas
President
Indian Library Association

PREFACE

During the last couple of years Indian libraries are coming under the impact of information technology. There has been a spurt of activities in many libraries using computers for house-keeping operations. Each library is developing in its own way in trying to change its mode of operation from manual to mechanised methods. Acquisition List, Computerised Catalogue, Serials Control, Information Retrieval, etc., are some of the common areas of interest to the libraries. Perhaps with a few exceptions, we do not have a fully automated library yet. Other areas which are catching the attention of librarians are: use of online services, CD-ROM databases, E-Mail, data communication facilities including satellite communication for networking and online searches, Fax etc. Plans have been formulated and feasibility studies undertaken for developing bibliographic networks at the national level, such as INFLIBNET and Biotechnology Network, and at the city level like DELNET for Delhi, CALIBNET for Calcutta, and MALIBNET for Madras. Some of the organisations are also using LAN. For Government information, NICNET has been in operation for some years, using satellite communication and linking more than 400 District Centres in the country.

For creating awareness and promoting the application of information technology in the libray and information field, ILA, IASLIC, SIS, NISSAT, UGC, INSDOC, DESIDOC, DRTC and similar organisations have been conducting a series of Workshops, Seminars, Conferences, etc. Training of the existing manpower requires highest priority. The Universities have to provide the necessary infrastructural facilities for introducing these new topics in their courses.

The present seminar is an attempt to take stock of the current activities in the application of information technology in our libraries and information centres. To give an impetus to this development, there is an urgent need for formulating national policies at various levels - national, regional, local and institutional. We must have plans and

programmes for developing information systems which are viable, affordable and efficient. The theme of the Seminar - National Information Policies and Programmes-is appropriate and timely.

The forthcoming IFLA Conference to be held in New Delhi in August 1992 has a similar theme. The present exercise will enable our participants to put across their ideas at the IFLA Conference effectively and project our own efforts in this area.

This is the first time that the ILA Conference has come to Madras. This has a special significance. Ranganathan's birth centenary celebrations have alreay started. It is at the Madras University Library that he did most of his fundamental work. He started the post-graduate training course in Library Science, and endowed the Sarada Ranganathan Chair in Library Science during the Centenary of the University. He was also the founder Secretary of the Madras Library Association. Many of his contributions in the areas of formulation of national information policy, library legislation, planning of national library systems, manpower development, resource-sharing, etc., are relevant today.

We have received 63 papers for presentation at the Seminar. They cover the activities of various agencies in the applicaion of information technology. There are about 20 invited papers and 40 contributed papers. The major areas covered are: National Information Policies; Information Resources and Services; Information Systems; Information Networks; Telecommunication Facilities; Manpower Development; and Impact of Information Technology. Some of the issues raised relate to:

- *Existing facilities and programmes*
- *New areas of thrust*
- *Constraints*
- *Future developments*

We hope that these issues in each area will be deliberated upon during the technical sessions and suitable guidelines and recommendations arrived at.

We acknowledge the services rendered by M/s P.N. Swamy, N.Jagadeesan, V. Selvaraj, G. Kumar, V.R. Ganesan, R. Muniasamy, T.Nagarajan, A. Paul Vincent and Libray Automation Project staff of the IIT Central Library for inputting the data and preparing camera-ready copy of the volume using DTP. We thank Sri.P.Sankaralingam for seeing the matter through the press and M/s Sudarsan Graphics for printing of the publication on a priority basis.

Editorial Committee

Free Information Transfer in National Information Policy

D. Rajyalakshmi*

Discusses the need for free access to information transfer; need for international and intra-national information transfer. Analyses the issues in international information transfer, transborder data flow and their impact on national policy making, broad consideration of areas to be covered in National Policy and implications in implementation of a national policy.

1 FREE ACCESS TO INFORMATION

The international information transfer can be defined as the process and systems that promotes the flow of information from creating nation or organization to other nations or organizations. This particularly includes the issue of trans-border data flow and the question of free access to information. Free access to infromation has two components: Information transfer, and information policy.

International information transfer involves the processes and systems that promote the flow of information from creating nation to other nations.

International information policy can be accomplished by those efforts by national governments and international organizations to develop official policy or law for transmission and receipt of information from outside national boraders. Great efforts have been made in dealing with problems of information transfer by many inter governmental organisations.[1].

2 AGENCIES THAT EFFECT TRANSFER OF INFORMATION

The role played by inter governmental organisations (IGO) over the last forty years in information transfer mechanisms is remarkable.

The free information transfer should exisit between three agencies:

1) Government to Government

2) Private to Government or Government to Private

3) Private to Private

All the branches of a government: legislative, executive, and judicial have a great role in making information policy; more specifically in making policies governing national security controls over information. Such controls are fre-

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quently exercised over technological data, data of sensitive military nature or information critical for trade considerations.

The government agencies most frequently involved in national security controls include departments of commerce (Export controls) Defence, (contract provisions) Energy (nuclear information) and State (immigration), the Central Intelligence Agency. Some classify information and impose other security restrictions, which limit the export of goods, information delay or prevent the issuance of patents, and attempt to censor communications of certain classes of citizens.

3 NEED FOR INTRA-NATIONAL AND INTER-NATIONAL INFORMATION TRANSFER FOR NATIONAL POLICY

Until very recently, information related issues have been of concern to a few inter governmental organizations. With the advent of sophisticated technology and international information transfer through it, some issues have become more complex. Primarily the national governments of developed world interested in the protection of their own information, were poised against the concerns of the governments of lesser developed nations for sharing of information for development. At the same time the developing nations feared that their own nascent information industries, particularly the communication media, would be overwhelmed by large multi national corporations (MNCs) of the developed nations.

With these concerns arose the issues of privacy, censorship, copyright, and patent protection, standards and most importantly progress and growth of democracy.

4 ISSUES IN INTERNATIONAL INFORMATION TRANSFER

Even though the international transfer of information is primarily related with the exchange between libraries and scientific societies, the establishment of UNESCO in 1945 and its library programmes , tranining programmes for developing countries, an emphatic stress existed on the importance of national library planning. UNESCO gave a long term leasdership in the area of international cooperation. Its work during 1945-1980 centered on the development of national library and information infrastructure . During these years UNESCO supported over 700 missions to developing nations to support variety of technical assistance, educational and planning efforts[2].

The National Information System (NATIS) as conceived by UNESCO in the late 70's emphasized the development of national library, archives, and documentation systems that would be integrated into one world- wide bibliographic and information system. In this it was estimated that each nation would develop its own plans for bibliographic control, standards, man power require-

ments, and national information policy. These plans would then be shared and coordinated within nations, regions, and evnetually in worldwide efforts.

The UNISIST conference in 1971, planned in Cooperation with the International Council of Scientific Unions (ICSU), was an effort to begin the construction of an international information system. UNISIST II Conference of 1979 established the necessity of developing national and international information policy to aid the building up of systems that would lead to the flow of appropriate information and technology to the developing nations.

5 TRASNBORDER DATA FLOW (TDF)

Trasnborder Data Flow has increasingly been a topic of concern since 1970's and has been discussed in numerous forums, including OECD, the UN, UNESCO; the World Adminstractive Radio conference and the International Telecommunication Union[3]. It is made possible by the convergence of computer and telecommunication technologies which has facilitated the transfer of machine readable information across national boundaries with unprecedented speed and efficiency. There has been an explosive growth in the electronic generation, transmission, processing and storage of all kinds.

The free flow of information is seen as a desirablle ideal bythose who reagrd access to information as a basic right essential for democracy and self determination, and by those who believe it can stimulate the world's economy to the advantage and benefit of all. Accurate information is a pre-condition for indentifying alternatives, reducing uncertainity about their implications, and facilitating their implementation. Thus information is a critical resource[4].

In practice, however, unregulated TDF comes into conflict with other principles impoortant to individuals, governments and nation states ; their rights to privacy, and their social, cultural and political integrity. The thrid world countries see an imbalance in their exchange of information with the developed world which work to their disadvantage, socially, economically and politically. For the third world, the "Free flow of information" is a one way street which functions solely to the advantage of industrialized nations.

Gassman has identified three overlapping stages in TDF[5]:

1) Privacy & Data Protection leading to Data Protection/privacy legislation.

2) Business communication and economic data emphasis on the technical, financial and legal conditions, surrounding the use of TDF; and

3) Trade in information services: influenced by the enormous growth of electronic information services.

The international treatment of data privacy is under consideration by a number of appropriate international bodies, and there have been comparative

studies of national legislations. The OECD has produced a set of guidelines on the protection of privacy and the TDF of personal information[6].

6 IMPACT ON NATIONAL POLICY

Modernization theory was the first significant proposal for addressing the needs of poor and developing countries; these countries were supposed to develop modern communications, information systems, and be able to create and receive the world's knowledge. By 60's it became evident that modernization theory was not working as presumed .From the view point of these nations it was clear that a patron/client relationship was clearly the case between the poor and the rich nations. This "depending theory" led to aggressive political action in United Nations by these countries, and they demanded a New International Economic Order (NIECO), that would recognize and redress this inherently unjust international system[7].

The New World Information and Communication Order (NWICO) concept came to dominate in the areas of communications and information policy. Essentially NWICO called for the same kind of drastic restructing of information and communication system as NIECO has for economic systems.

Observing that the developed nations controlled the international news, and communications systems, and were the possessors of valuable scientific and technical information needed for development, the lesser developed nations called for equity and reciprocity.

Supernant's[3] recent summary of these trends and issues is appropriately titled as "Global threats to Information". The threats, however, are two sided ones; the less developed nations feel that there must be a drastic restructuring of communications and information systems in their favour. The developed nations, principally led by transnational corporations that own the systems, have reacted very negatively to these issues, seeing them as attempts to licence, control, or restrict the free flow of information.

The IGO's information systems, most of which have been developed by developed and developing nations as members, have been very responsive to a veriety of different national problems. Neelameghan and Tocatlian[8] have pointed out that these systems also have greater legitimacy with the developing nations because of their formation under the auspices of U.N. These systems promise to have great influence on the development of information transfer and policy by giving decision makers, access to high quality information not otherwise affordable by the poor nations which lack the resources and infrastructure to develop their own systems, and by structuring the information needed by these nations in terms that are specific to the language and culture of these nations.

The best possible way out of this dilemma is to develop national information policy with the hope that it would give direction in helping to develop an international information policy[9].

7 AREAS TO BE COVERED IN NATIONAL POLICY

For the development of an Information Policy at national level, the problems of TDF may pose a number of issues such as :

1) Lack of data privacy,

2) Concentration of data processing power in developed nations, and

3) An imbalance in the distribution of information resources.

To cope up with these problem areas, the national policy should be supported by a number of issues like national and transnational data network connections, trnas-border data services especially processing and retrieval and registration agreements on information technology transfer. The development of online databases, specialised information services, and co-operative networks have their great impact in developing a National Information Policy.

Within our professional associations, we must now begin to take more than a passing interest in these issues and should try to realise following :

1) Appointment of standing committees on international relations. For each association, this committee should include representatives to IFLA, FID, UNESCO PGI as observers.

2) Increased participation and involvement by association representatives. (Representatives should be financially assisted for participation in all meetings of these organisations).

3) The establishment of professional associations of observer states with other IGO's working actively in the areas of international information transfer & policy such as ITU, IBI, WIPO; ISO, & the UN itself.

4) Membership should be offered at a significant discount to information specialists in IGO's located in the lesser developed nations.

5) Continue and intensify efforts within the nation for the development of a national policy.

6) The national information policy should be supported with a "gateway policy" to control the data traffic.

The Lacy report is important in the discussion of intellectual freedom, in that people must have access to information if there is going to be a free flow of ideas in a democratic society[10].

In this context three areas that must be considered are:

1) The appropriateness of controls over the covrage in broadcasting and electronic information delivery systems;

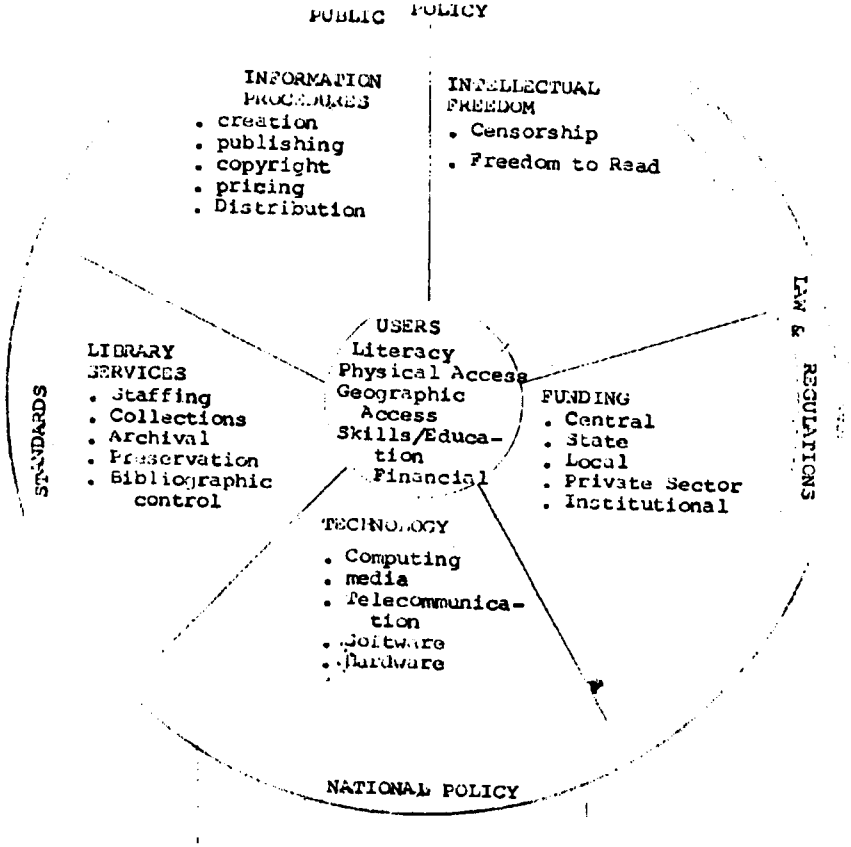
2) The physical, financial, educational, and technical barrier which technology based systems pose for citizens and

3) Distriibution of and access to government information[10].

The following diagram illustrates the complexity and interrelationships of areas that fall within the domain of access to information.

The following diagram illustrates the complexity and interrationships of areas that fall with in the domian of access to Information.

(Taken from ALA special committee report, 1988, p.4)



8 IMPLEMENTATION OF A NATIONAL POLICY

In making information policy and its implementation all the three branches of a government -legislative, executive and judicial have a great role. Establishment of free information transfer by developing communication networks; Indigenous data bases; communication channels between the government agencies, private sector; private and government; and government and private, forms the major areas of consideration for implementation of a national information policy.

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National Information Policy for India: Analysis

K. Vijayalakshmi*

Emphasises the need for the Union and State Governments to formulate a policy which ensure the optimum provision for information services to the different sections of society to satisfy their social, cultural, and information requirements. Covers some of the key elements of this policy, the emerging Indian information scene, and manpower development. Demands the need for some urgent areas of action. Examines some of these issues of national information policy for India.

1 INTRODUCTION

Accepting information as a vital resource to the development of the nation, the Union and State Governments should resolve a policy which ensures the optimum provision of library and information services to the different sections of people to satisfy their educational, cultural and information requirements. The national information policy has to be in line with other national policies.There is an urgent need to declare a national information policy and infromation systems constituting an integral part of National Five Year Plans. This paper assumes that sooner or later a national information policy will be framed and implemented.

2 NEED FOR A NATIONAL POLICY ON INFORMATION

Over the last few years information policy has resented itself as a powerful tool to aid the solution of many of the problems faced by a planned developing economy with emphasis on rural development. Today it is recognized that information as a vital resource, is a factor of production just as the conventional factors of production, viz., land, labour, capital and organization. The developed Western and developing Southern Society, it is said to be heading towards an information economy in which the information policy is preeminent and a source of innovation for the society. This is reflected in the economic sector by a shift from goods producing to service oriented industry dominated by scientific, managerial, professional and technocratic class. Ken Gilmore has developed a theoretical policy frame as applicable for developed and developing countries[1]. Thus for him information development does follow the same basic evolutionary pattern. This can be observed from a study of library development in the countries like Asia, Africa and South America. In India the professionals individually as well as collectively have been expressing their views about the need for a National Information Policy and its parameters[2].

---

* Library Assistant, Sri.Padmavathi Mahila Viswa Vidyalayam University College Library, Tirupati.

This issue has been discussed by various bodies such as IASLIC, ILA and SIS. ILA submitted a policy statement to the Government of India in 1985. Thus several documents are available on national policy in Library and Information Systems in India[3]. Among them the draft policy issued by Raja Rammohan Roy Library Foundation (RRLF) and Indian Library Association(ILA) policy statement have thrown much light on this vital policy. The Government subsequently set up a committee on National Policy on Library and Information System in 1985 which presented its final report in May 1986. In spite of all these efforts this report has elicited useful comments from the professionals. No attempt has been made to declare a National Information Policy except announcing some policy statemments[4]. However, some programmes were formulated in the Sixth Plan and more so in the Seventh Five Year Plan. There is an urgent need to declare a National Information Policy in the proposed Eighth Five Year Plan. Several seminars have drawn the attention of the planners on the need and content of such a policy[5]. The proposed National Information Policy to be useful, has to be flexible to facilitate any change in the national priorities, available resources, and user's needs and demands.

3 ELEMENTS OF A NATIONAL POLICY

The National Information Policy containing the following aspects may be considered as the main demands of such a policy:

31 National Information Commission may be set up by the Government of India. Policy making is a continous process which requires a permanent administrative structure. The first task of this Commission is to prepare a feasibility report on library cooperation and sharing of library and information resources such as infrastructure, comprehensive collection of documentary resources. Institutional resources and facilities such as knowledge creating institutions, collection, storing, processing and dissemination of institutional information, information handling facilities, both hardware and software facilities, micro-computer, reprographic and micro-graphics, electronic and optical information storage devices. The modern and highly sophisticated information system needs huge finances.

This Commission on the functional basis should formulate guidelines for grants to these services and the share of this amount in the present education budget.This has led to assess the market value of information and the price the user is prepared to pay for it. This is more likely to make user treat it a little seriously and prevent misuse of the servive. Further, developing countries need mutual cooperation more in science and technology as 75-80 percent of the scientific and technological data in the world is controlled by developed countries. The cooperation can be in utilising the knowledge, already created and stored in international data centres by developing economics. There is no dearth of such data centres in India. Among them out National Information System for Science and Technology, (NISSAT) National Social Science

Documentation Centre (NASSDC), National Museum, New Delhi, National Library, Calcutta, National Gallery of Modern Arts (for Arts and Humanities), Satellite - based government information networks (NICNET), Environmental Information System (ENVIS), National Resources Management System (NNRMS), National Resources Data Management System (NRDMS). Further some networks in operation are BANKNET, RAILNET, OILNET, STEELNET. INFLIBNET is being developed by U.G.C. The National Information Commission may act as a central node coordinating all these centres.

32 Manpower Planning and Development

Considering the magnitude of work, the complexities of existing standards in Universities, R&D libraries, and the professional education provided by the various departments of library and information science in the country, manpower planning and development has a crucial role. Thus efficient development of information policy and services requires not only information facilities but also specialized information personnel, who could apply modern management techniques to information services. Agrawal emphasizes the need for a centre for Advanced Study in Library and Information Science to guide and implement the new programme[6]. INFLIBNET elaborates the manpower requirements at various levels of the network. Malwad attempts to analyse the library personnel requirement in India, and points out the need for an efficient manpower planning and development for successful implementation of information policy which is vital for the national development[7]. The Human Resource Development Programmes (HRDP) contain information package, in-service training programmes, short term courses, seminars and workshops to be implemented effectively. This aspect has been well stated in various literature on manpower planning and development for library and information services.

33 Library Legislation and Regulation of Information Flow:

To meet effectively with the changing information needs of society, a national library act may be enacted and supplemented by model library legislation at the state level. The regulation of information flow has to tackle the malpractice in providing information and to cover the national and transnational and transborder flow based on world information order.

34 Information Technology and Information Policy:

Information revolution is indisputably caused by the unprecedented advances in technology. Computers, telecommunications and micrographics, reprographics and a variety of modern electronic tools have merged to shape the now familiar phrase known as "Information Technology". This advancement has made accessibility to world information and knowledge possible almost from any where in the globe. All these afford not only greater acces-

sibility but also entail greater use of information. Another very significant current trend observable in the present information system is the creation of problem oriented information systems and services which integrate scientific and technical (S&T) information. All these developoments in information technology have far reaching implications for national information policy[8]. The rapid and explosive rate of growth of information, undoubtedly create many problems for librarians, policy makers and users. An important and very healthy trend have been the recognition of the value of scientific and technical information in the Indian context. Pandit Nehru stated this in the Scientific Policy Resolution (SPR)long back. the Government of India has further realized the value of information as a basic input in development activity. In the Sixth Five Year Plan 1980-85 chapter (19) on S & T has for the first time stressed the need for harvesting information to support various activities relating to planning, policy making and executive functions. Similarly the Seventh Five Year Plan 1985-90 recognized the need for information[10]. Thus some programmes were initiated towards formulation of such a national information policy for India in the Sixth and Seventh Five Year Plans.

4 INDIAN SCENE

India among developing countries in the Asian region, has good libraries, documentation centres and specialized libraries attached to Universities, Government Departments, Research Centres and commercial undertakings (Public and Private). By now there are nearly 150 Universities including IITs, 150 Engineering Colleges and an equal number of medical colleges, 500 social science research institutes with good libraries and 1000 libraries attached to scientific establishments and around 600 government department maintaining libraries in India. Further, a chain of Public libraries.has been established all over the country. Discipline oriented information services in the science fields are being provided by BARC, DESIDOC, and various information centres of U.G.C. Planning Commission, and ISRO. A few science libraries provide computer based SDI and retrospective search services, using international data bases like INIS,AGRIS,POPINS,INDIS,INFOTERA, MEDLINE,NTIS,SCI and SSCI.In the mid eighties efforts have been made to set up institutions primarily ment to solve societal problems.Consequently several national information systems emerged on the information scene of India.

There must be coordination and cooperation in the implementaion of various related policies i.e. National Book Policy, National Education Policy and Scientific and Technology Policy to avoid duplication of efforts. The benefits from information resources and information requirements for national development whether generated internally or imported from abroad,should in national interest be available to all possible users. Thus the Union and State Governments should resolve a national information policy which ensures optimum provision

of library and information services to the users.

Some of the key issues that need to be addressed in formulation of National Information policy are:

1. The role of Government in creation and dissemination of information to the individuals.
2. The concept of public good and effect of information.
3. Application of new technology in information processing and transfer by adopting appropriate low cost software techniques.
4. Creation of National Commission for Information Systems and Library Services. It has to act as an apex body to formulate and execute the national policy.
5. An action plan to implement the INFLIBNET speedily and formulation of national information systems to meet the growing needs of the economy.

5 ACTION PLAN

A consensus has emerged which holds that there should be recommittment to rural development activities to benefit the poor in the rural areas. An analysis of the information requirements of rural development programmes identified several areas of action. The new programme requires greater information and better and newer information technologies to avoid mistakes and making new commitments. Several lapses in formulation and execution of rural development schemes at village level due to lack of necessary information have been found. An indepth analysis of information requirements made by the author has provided the much needed empirical evidences on the need for proper information and data base in formulation of development programmes at grass roots level[11].

The following are some of the urgent areas of action to develop a national information policy for India.

1. Avoiding definitional trap and make shift in accepting functional aspects of information policy. Information system should supply development related information to the users.
2. High level policy makers, administrators should be involved in the provision and use of information of latest importance for development and planning.
3. The quantity and quality of trained manpower in the formulation field should be raised and special attention to be given to the library staff in training to meet the development oriented information.
4. Eliminating the barriers to information flow by adopting new approaches to the methids of financing such services.

CONCLUSION

The national information policy for India should be announced sooner than later. There is an urgent need to achieve the benifits of information services by adopting new and latest information technology. The Union and State Governments should resolve a national information policy by creating necessary administrative machinery. India among the developing countries has good libraries and developed few informations systems. Thus information policy should make an attempt to develop the new information technology to achieve our social, economic and cultural goals. The emerging information scene in India and some of the empirical evidences emphasise the need for an indepth analysis of information requirements and services at grass roots level. Despite this, we have to put our ideas forward in the hope that those currently involved in designing information policy and systems may find them useful and so, incorporate them within the proposed information policy.

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National Information Policy for India

D. Rajeswari*

1 NEED FOR NATIONAL INFORMATION POLICY

National information policy means a set of decisions taken by a Government through the appropriate laws and regulations, to orient the harmonious development of the information transfer activities in order to satisfy the information needs of the country. National Information Policy must seek to ensure that the world's professional and specialized knowledge is made available fully and properly. The development and progress of any country mainly depends upon the planning and policies followed by the Government of that country. The policy may be towards social, economical, and scientific progress.

2 OBJECTIVES

The objectives of information policy' may be identified as:

1) To ensure co-ordinated growth of information structure with active participation of Government and private organizations;

2) To ensure all social groups to have access to timely, precise and reliable information at a reasonable cost;

3) To ensure maximum utilization of accumulated knowledge in science & technology and social science in order to achieve national objectives for the betterment of society and contributing to the development of world social order based on freedom, equality and justice.

3 NATIONAL INFORMATION POLICY FOR INDIA

There are about 1,000 libraries attached to scientific organisation, 500 social science research institutes, 170 University libraries and 600 Government departmental libraries. Besides these, a chain of public libraries have been established in the country. These provide general services like lending, consultation and reference. Some provide bibliographical, current awareness and reprographic services. Statistical Data Centre to store data produced by various ministries and departments had been proposed to be set up during the sixth five year plan. National Science Library, National Medical Library and Indian Agriculture Research Institute in addition to the National Library, Calcutta, are considered as National libraries. A few science libraries provide computer based SDI and retrospective search service using international data bases like CA Search, COMPENDEX, INSPEC and MEDLINE .

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Information is increasingly considered as a basic resource to be harnessed and used effectively for national development. In India, the last decade has been particularly noteworthy for the enlightened approach of the Government to develop an infrastructure for information to support all nation building activities. A national information policy must obviously be governed by the goals of social and economic policy prescribed in the directive principles of the constitution and also be harmonious with the other national policies formulated at various stages of our national development and properly detailed with the national plan.

4 FUNCTIONS OF NATIONAL INFORMATION SYSTEM AND POLICY FOR INDIA

1. To identify the present information requirements for users of all levels;
2. To forecast future requirements in the light of national development plans and policies;
3. To foster the building and utilization of national and international information resources needed to meet the present and future information requirements;
4. To maintain a broad data base to accommodate the totality of information needs of users;
5. To provide computer facilities for fast information access and retrieval;
6. To provide data and information services to users to meet their information requirements;
7. To improve co-ordination between existing national and international organizations and information systems exchange of publication;and
8. To develop and use efficient tools and techniques of document and information handling;

National Information policy must obviously be governed by the goals of social and economic policy and also be harmonious with the other national policies formulated at various stages of our national development.

5 FACTORS GOVERNING THE NATIONAL INFORMATION POLICY

There are several factors which govern the formulation of national information policy.

1. Users and their information requirements;
2. Information Resources;
3. Hardware/Software facilities:
4. Manpower development:

5. Organizational structure; and

6. Finance.

6 INTERNATIONAL COOPERATION

It would not be possible as well as economical to generate all the knowledge required for our development. The knowledge already created and stored in international data centres can be usefully utilized by the developing countries like ours. There is no dearth of such data centres. Already there are UNISIST/NATIS, AGRIS, INIS, POPINS, FID, IFLA etc., The cooperation can be extended to these by contributing national data and in return drawing upon their resources.

7 STANDARDIZATION

A good number of libraries and information centres are planning mechanization of their activities and services. Caution is needed in adopting standardized normative methods and tools in order to provide efficient services to the users and facilitate resources sharing at regional and international levels.

8 CONCLUSION

The paper suggests a few points for consideration at different levels. The Government appears to be keen on developing a sound information infrastructure as is indicated by the setting up of NISSAT, National Information Centre and liberal assistance provided to various national centres of information.

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The National Policy on Information for India

A.K. Baradol*

The present status of the national policy on library and information system in India describes the need for a national policy on information and its objectives. This paper explains the areas to be included in the policy on information viz. computerized databases, CD-ROM, on-line information networks, information technology etc., and suggests the linkage of the existing computerized databases and on-line information networks with the international databases.

1 INTRODUCTION

The library profession has been trying to get the national policy accepted by the Government since 1950's. There are policies on many related aspects like the education policy, the science policy and technology policy, etc. By accepting the policy on any subject the Government is expected to provide more funds for better services. This would bring better changes in the library scenario. Due to the joint efforts of many professional organizations, individuals and due to the pressure from many quarters, the Government of India appointed a committee to submit a report on the national policy on library and information system in October 1985. The committee has submitted the draft policy document on Library and Information System in May 1986. The Government of India is yet to take a decision on the acceptance of the national policy on library and information systems.

2 OBJECTIVES OF THE NATIONAL POLICY ON INFORMATION

The national policy on information has the following objectives:

1. To collect information appropriate to any scientific, technical and other development activities of the country;
2. To improve the existing information facilities in the country;
3. To take steps in the improvement of existing information technologies;
4. To link up the existing on-line information retrieval systems in the country;
5. To create information networks for different metropolitan cities in the country;
6. To encourage international co-operation in the use of information;
7. To augment the existing training facilities of information professionals

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in the universities in the country;

8. To encourage the use of information economically;and

9. To finance the information organizations and use.

3 DIFFERENT CHAPTERS IN THE POLICY ON INFORMATION

There is a substantial use of information technology in the information storage, processing and retrieval. It is sometimes not visible. Information technology is rapidly being used for information retrieval. Hence, there is an information technology revolution. The progress of any country can be measured by the strides it has made in information technology. If India does not use information technology in the information storage, processing and retrieval it's progress will be slow.

The information retrieval system must use the information technology. Electronic equipments, communication technology, optical storage, CD-ROM, computers etc. should be adopted wherever necessary. The policy on information should have the different chapters viz. computerized databases, CD-ROM, on-line information retrieval, information networks, E-mail and teleconferencing.

31 Computerized databases

A few special libraries in India have either created or are on the way to create the computerized data bases. Some industrial establishments and educational/research organizations are also developing the computerized databases. It is essential to have computerized databases in the different subject fields. Some existing databases like food, leather, drug, machine tools, textile, chemistry etc., can serve the needs of the country. An important task here is to link all these. An agency for the monitoring of the information retrieval systems has to be established and maintained. The Government should assist in the development of the software required for the purpose. Unless information processing is standardized it is difficult to expect good results specially when we are thinking of the use of information by people in different organizations/places. There should be a standardization in the descriptions/activities of information.

32 Compact Disk-Read Only Memory(CD-ROM)

The CD-ROM technology is a boon to the mass storage problem. There are large number of databases now available on CD-ROM. These are 4.75 inches in a diameter. Each CD-ROM can hold about 2,75,000 pages of printed matter with each page have 2000 characteristics. The Government should encourage the use of CD-ROMs by providing the required infrastructure like CD-ROM drive etc.

33 On-line Information Retrieval

Information sharing is essential for the country like ours. It should be practiced by all special and academic libraries and information centres. The on-line information retrieval services will help information sharing to a greater extent.

In India a few on-line information retrieval services are available. The National Aeronautical Laboratory(NAL), Bangalore started the on-line information retrieval service, using the European Space Agency's (ESA) Information Retrieval Service (ESA- IRS) at Frescati near Rome (Italy). This type of on-line information retrieval services should be established with the financial help of Government of India in the different research laboratories of Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR) and the Universities.

34 Information Networks

341 National Informatics Centre Networks and (NICNET)

NICNET is a satellite based communication network to process Government information. At present NICNET has established links with the district administrations in the country. The data shared by this network pertain to the irrigation, land population etc. Such information will be useful for many research projects, specially in Social Science subjects. This should be kept open for the use of the organizations which are in need of such information.

342 India-Network (I-Net)

The other network is India-Network (I-Net) started functioning recently. The I-Net is a venture started by the Department of Telecommunications (DOT), Government of India. To quote Pantulu, "It is the country's first packet switch Public Data Network (PSPDN)"[1]. The I-Net will provide switch data communication services on leased and dial-up lines. This should be lined with the other on-line information networks.

343 Delhi Library Network (DELNET) and Calcutta Library Network (CALIBNET)

The metropolitan library networks viz. the Delhi Library Network DELNET and Calcutta Library Network (CALIBNET) are being planned. Similar networks should be started in other cities.

344 Information and Library Network (INFLIBNET)

The Information and Library Network (INFLIBNET) of the University Grants Commission (U.G.C) which is recently started must be made fully operational. The services should be kept open for all those who need it. At present its aim is to cater to the needs of the academic community only.

35 Electronic mail (E-mail)

Electronic mail (E-mail) is a form of computer messaging. To quote Ramani, "Using the E-mail, a computer messaging, scientists across the country and around the world are coming closer and quicker"[2]. In E-mail, messages can be sent via telephone in the form of computer data from one institution to another. Such process of E-mail should be employed for quick communications.

36 Tele-conferencing

Teleconferencing is bringing different groups of people together for exchange of ideas/information. In this process the people need not be present physically in a place. Facilities would be made available for teleconferencing which will save the time and money required for attending conferences.

4 CONCLUSION

There is an unprecedented growth of information and users of information. There is also a growth in computer hardware and software, the magnetic and optical storage media, and communication techniques. Information Technology is used for all these techniques together. Information technology is available for adoption to information retrieval. Information storage, processing and retrieval in India should use information technology. The national policy on information should be accepted by the Government of India. Such a national policy will help the better use of information, the satisfactory development and progress of India.

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Towards A National Policy on Library and Information Systems

B.P. Barua*

This paper makes a brief survey of writings, reports and programmes relating to national library policy from 1944 to 1986. The ideas of Dr. S.R. Ranganathan was discussed in detail. Recommendations of Library Advisory Committee have been pinpointed. Steps taken by Government of India, particularly in the areas of general library services, have been specified. Reference has also been made to significant international developments during the period. It is an analysis of factors and circumstances leading to the constitution of a Committee on National Policy on Library and Information System by Government of India, and presentation of a report by the latter to the former in May 1986.

1 RANGANATHAN'S IDEAS

The need for an integrated library systems for India can be traced to the writings of Dr. S.R. Ranganathan as early as 1944. In his book "Post-War Reconstruction of Libraries in India", Ranganathan drew a pen-picture of the system. "The most numerous group in the library edifice of the land", said Ranganathan, "will be the public libraries - urban and rural - each district and each urban area with a population of not less than 50,000 forming the primary unit." Each primary unit should develop branches and delivery stations with the objective in view that nobody need to walk more than a mile to get his book supply. He recommended setting up of regional libraries in multilingual provinces and also in large unilingual provinces. A regional library should generally function as a reference library and co-ordinating library for the region. But the provincial central library should be the apex of the entire library system of the province. It would also function as a reservoir and reference library and a co-ordinating library for inter-library loan.[1]

11 National Central Library

Ranganathan also suggested that "Imperial Library", Calcutta might be recognised as National Central Library which should be a deposit library for receiving a copy of all Indian publications and also a copyright library for receiving a second copyright copy of any book published anywhere in India. It should not lend books to readers directly but do so to any primary library on the recommendation of the provincial central library. The proposed National Central Library would thus serve as the apex library of the Indian library

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systems. 'The library edifice of post-war India should be so planned that primary libraries are attached to regional centres, regional centres to provincial central libraries, these again to the national central library and this finally to the national central libraries of other countries and international library centres".[2]

12 Model Public Libraries Act

To give shape to his ideas Ranganathan drafted a Model Public Libraries Act in 1930 which was finally modified by him in 1972. His ideas influenced the Public Libraries Acts of several states including Tamil Nadu (1948), Andhra Pradesh (1960) and Karnataka (1965). Even the Model Union Public Libraries Bill (1966) of the erstwhile Ministry of Education adopted many features of Ranganathan's Model Union Public Libraries Act[3]

Ranganathan reiterated the characteristics of a National Central Library in his Library Development Plan. It would organise inter-library loan not only with Indian libraries but also with major international libraries. Departmental Libraries should be federated with National Central Library. It would produce National Bibliography with different periodicities such as weekly list, monthly bulletin, annual catalogue, decennial catalogue etc[4]

13 Union Public Libraries Act

In addition to public libraries acts, Ranganathan also suggested the enactment of a Union Libraries Act for developing a system of National Central Libraries. Ranganathan is reported to have submitted a memorandum along with a draft Union Library Bill to a committee of the Ministry of Education in 1948. This memorandum and draft bill was published by the University of Delhi in 1950 with a title "Library Development Plan: Thirty Years Programme for India". A modified version of the bill was published in the second edition of Ranganathan's Five Laws of Library Science in 1957. These also formed part of the seminar on Public Library System, 1972 and are also included in the book "Public Library System".

131 Features

The Model Union Library Act of Ranganathan has the following important features.

1. The Union Minister of Education shall be the National Library Authority.
2. He will promote and stimulate a state grids of public library system.
3. The system of National Central Libraries will include National Copyright Library. National Dormitory Library and systems of National Service Libraries, National Seafarers Libraries and National Contact Libraries.
4. There shall be a National Department of Libraries with necessary staff.

5. The Minister shall appoint the National Librarian for a period of 5 Years from among the librarians of National Service Libraries by rotation.

6. There shall be a National Committee of Librarians to discuss problems of common interest.

7. There shall be a National Library Committee, headed by the Minister of Education, to advise the National Library Authority on all matters arising under this Act.

8. There shall be a National Library Fund to be created out of government allocation, donations, contributions and other collections under the rules of the Act.

It is interesting to note that the All-India Seminar on Public Library System, 1972 in its final proposition did not include National Seafarers Libraries and National Contact Libraries in the System of National Central Libraries[5]

2 EARLY GOVERNMENT INITIATIVES

Following Independence the Government of India took a series of steps to improve library services in the country. The Imperial library services in the country. The Imperial Library, Calcutta was renamed as National Library, India by the National Library of India (change of Name) Act, 1948. Secondly, the Unesco sponsored Delhi Public Library was established in 1951 as a model public library. Thirdly, in order to promote documentation services for scientific and industrial research Indian National Scientific Documentation Centre (INSDOC) was established in 1952. Fourthly, financial assistance was given to the state governments under the "Scheme of Improvement of Library Services" to set up State Central Libraries and District Libraries during the first and second five year plans. Fifthly, in 1954 the Government of India enacted the Delivery of Books (Public Libraries) Act which was amended in 1956 to include newspapers also.

3 LIBRARY ADVISORY COMMITTEE REPORT

But the most important step was the setting up of an Advisory Committee for Libraries by the Ministry of Education in 1957 under the chairmanship of Shri K.P. Sinha, Director of Public Instruction, Bihar, to recommend suitable measures for the improvement of library services in the country. The Sinha Committee submitted its report in November 1958, and the report was first published in 1959. The important recommendations of the committee are:

1. Library service should be free to every citizen of India.

2. The library pattern in the country should consist of National Library, State Central Libraries, District Libraries, Block libraries and Panchayat Libraries.

3. Every state should have a state library consisting of two wings - the

State Central Library and the State Lending Library.

4. At the All-India level, there should be a National Central Library and three National Book Deposit Centres. The National Book Deposit Centres should be run by the Government of India under the National Central Library.

5. There should be an All-India Library Advisory Council with Union Education Minister as Chairman.

6. Library associations are essential to the development of library movement, and State Governments and the Government of India should encourage development of strong library associations.

7. Libraries should encourage the formation of **Mitra Mandals** (Friends of Library Societies) wherever possible.

8. Every state or region should have a centre (Dormitory Library) where books weeded out from the public libraries are sent.

9. Public libraries in the country should co-operate with one another as well as with subscription libraries, school libraries, college libraries, departmental and research libraries, university libraries etc. In places, where it may not be possible to run an independent public library, school libraries may serve the public after school hours.

10. State governments should accept the responsibility of public library service in their areas. The librarians of these libraries should be state government employees.

11. Courses for training of professional librarians should be organised by the universities, state governments or the National Central Library. No university should run semi-professional courses. They should be run by library associations or by state government through the State Library.

12. State governments should enact a comprehensive State Library Law which will provide for (a) free public library services, (b) a library cess of 6 paise on a rupee of property tax, (c) matching assistance by the state government to the local bodies.

13. Suitable existing subscription libraries should continue to receive aid from state governments. The existing subscription libraries should be encouraged to join the proposed free public library service in every state. New subscription libraries should not be given grants-in-aid. By the end of Sixth Plan the entire public library system should become free.

14. Government of India and state governments should have a 25- year Library Plan to raise the library structure which will do justice to the cultural and educational needs of the people.

15. The government of India should enact a library law incorporating (a) the right of every citizen to have free access to library as his fun-

damental right, (b) collating the various deposit sections under the Copyright Act, Delivery of Books Act and the Press and Registration of Books Act and making them subserve the needs of national library services, and (c) providing for financial assistance to state governments.[6]

On analysis of the recommendations it is evident that the library Advisory Committee accepted many ideas of Ranganathan, such as free and integrated library services, library legislation both for the State Governments and the Union Government, collection of library cess, constitution of Central Library Advisory Committee etc. But there is a difference of opinion on the nature of deposit law. Though Ranganathan favoured deposit of two copies of a publication in the National Library under the Copyright Act, he did not oppose the Delivery of Books Act; but he criticised the provision for compulsory deposit of four copies of a publication in four deposit libraries. It also appears that the Library Advisory Committee did not accept Ranganathan's far-sighted recommendation for National Library Systems. It rejected some of his ideas like National Seafarers Library, National Contact Library and National Librarian by rotation. As a sequel to the Report of the Library Advisory Committee, the Union Ministry of Education circulated a Model Public Libraries Bill in 1966.[7] Almost simultaneously, the Working Group on Libraries set up by the Planning Commission for the Fourth Five year Plan submitted a report including a Model Public Libraries Bill; but it has little significance for a national library policy.[8]

32 RRRLF

The next important step was the establishment of Raja Rammohun Roy Library Foundation in 1972 as an autonomous organisation under the Department of Culture, Government of India. One of the principal objectives of the Foundation is "to enunciate a national library policy and to work towards its adoption by the Central and State Governments".[9] This is the first explicit commitment of the government of India for adoption of a national library policy.

4 INTERNATIONAL DEVELOPMENTS

A new trend in the field of library and information services since 1960s is seen. We may cite some of the important developments here.

1. In the United Kingdom the British Government adopted a new Public Libraries and Museums Act in 1964 ensuring involvement of the government in the provision of library services by the local bodies. Another important landmark is the establishment of the British Library in 1972 by the amalgamation of several important libraries of England.

2. In the United States of America, the Federal Government set up, by an Act, a National Commission on Libraries and Information Science in 1970 on the recommendation of the National Advisory Commission on Libraries.

3. UNESCO gave a new thrust to the library and information sector in 1970s. It promoted World Science Information System (UNISIST) and National Information System (NATIS) and implemented them through the General Information Programme (PGI). The three major intergovernmental conferences viz. UNISIST I, NATIS and UNISIST II were organised in 1974 and 1979 respectively. It disseminated new ideas and policy matters through bulletins, monographs, manuals, handbooks, standards and guidelines, training manuals and packages, reports, seminar proceedings, project documents etc. In the context of national library and information policy mention may be made of the following important documents: (a) Information Policy Objectives, 1974 (b) Guidelines on the Planning of National Scientific and Technological Information Systems, 1975, (c) Planning National Information Structures for Documentation, Libraries and Archives: Outline of a General Policy, 1975, (d) Information Policy for Development: National and International Responsibilities, 1976, (e) Design and Planning of National Information Systems: A paper for Government Planners, 1976 etc[10]

4. International Federation of Library Associations and Institutions (IFLA), founded in 1929, stepped up its activities during this period. Its programmes of Universal Bibliographic Control, Universal Availability of Publications and International MARC received substantial support from UNESCO and generated wide interest in the library world.

5. The development of Global Information Systems (like International Nuclear Information System [INIS], Agricultural Information System [AGRIS] etc.) and of International Databases in subject fields offering on-line searches to users all over the world (such as Chemical Abstracts by Chemical Abstracts Service, U.S.A. MEDLARS by National Medical Library, U.S.A etc.) greatly contributed to the promotion of information infrastructure in many parts of the world.

All these developments in the international library and information arena have had considerable impact on the national scene.

5 NISSAT

The establishment of National Information System for Science and Technology (NISSAT) in 1977 was the first important step taken by the Department of Science and Technology, Government of India to develop a well-conceived library and information system for promoting research in science and technology.

6 PROFESSOR R.K. DAS GUPTA'S ADVOCACY

The National Library of India (Amendment) Act was passed in 1976. It provided for the creation of an autonomous National Library Board. Professor R.K. Das Gupta was appointed the first Director under the Act though the Act

has been kept under suspension. In 1977 he wrote to the Government of India urging the appointment of a National Library Advisory Commission to advise the government in respect of a national library policy and a national library system. According to Professor Das Gupta, " the National Library can function as a National Library proper, that is as a library for the serious investigator or a library of last resort only when there is a sound library system in the country. For a sound library system we need a library policy and that policy has to be enunciated by the Central Government." Since Professor Das Gupta's proposal found no response from the Government of India, he urged the Raja Rammohun Roy Library Foundation to take up the task in terms of the principal objectives of its Memorandum of Association.

61 RRRLF Initiative

Professor Das Gupta served as the Chairman of Raja Rammohun Roy Library Foundation from November 1979 to August 1981. At his instance R.R.R.L.F organised a series of lectures on different aspects of library services by eminent library scientists of the country during 1981. The lectures were published in the form of a book "Indian Libraries: Trends and Perspectives" by Orient Longman, Calcutta in 1985. The Foundation also took a memorable decision at its meeting held on 22nd May 1981, to draft a national library policy, and the Chairman was authorised to appoint a Working Group consisting of 3 to 5 persons having wide knowledge and experience in library administration or education. In pursuance of this decision Prof. R.K. Das Gupta, the then Chairman, appointed a Working Group consisting of the following persons.

1. Prof. R.K. Das Gupta - Chairman
2. Prof. P.B. Mangla
3. Shri S.C. Biswas
4. Prof. K.A. Isaac
5. Dr. B.P. Barua - Convener

No terms of reference was prescribed. The Working Group was only required to draft a national policy for the consideration of the Foundation. At its first meeting the Working Group decided the scope of the policy as follows:

a) The policy should be called "National Policy on Library and Information System" to avoid any confusion.

b) The policy should be comprehensive. It should include all categories of libraries - national, public, academic and special (including research, government departmental and manuscript libraries) but excluding museums and archives.

c) All aspects of librarianship viz. bibliographic control, library and

information science education, library legislation, library co-operation, information technology etc. should be covered in the national policy.

d) The policy should be action-oriented with clear-cut recommendations for linkages and co-ordination at various levels.

Dr. Barua was authorised to prepare a preliminary draft in consultation with some experts and scholars. On the basis of his report the Foundation prepared a draft policy statement on National Policy on Library and Information System and presented it to the Department of Culture, Government of India in July 1984.[11]

7 IASLIC and ILA CONFERENCE

Indian Association of Special Libraries and Information Centres (IASLIC) organised their 11th and 12th Conference on the themes relevant to national library and information policy. The theme of Eleventh IASLIC Conference held at Dharwar, Karnataka in 1977 was "Planning of National Information Network", and that of the Twelfth IASLIC Conference held at Roorkee in 1979 was "National Information Policy". Similarly, Indian Library Association (ILA) discussed the "National Library and Information Policy" at the 30th All India Library Conference held at Jaipur in 1984. Some of the papers contributed greatly to the crystallisation of ideas and thoughts on the projected national policy on library and information systems. On behalf of the Indian Library Association a draft policy statement was submitted to the Government of India in early 1985.[12]

8 PLANNING COMMISSION

Planning Commission brought out the Report of the Working Group on Modernisation of Library Services and Informatics for the Seventh Five Year Plan in 1984. The report is divided into two parts - the first part deals with library services and the second part outlines the informatics developmental activities. The document presents many ideas with particular reference to development of information technology and its application in library and information services in India.[13]

9 CONPOLIS

The Department of Culture, Government of India set up a Committee on National Policy on Library and Information System (CONPOLIS) on 7th October 1985 under the chairmanship of Professor D.P. Chattopadhyaya, Chairman, RRRLF. The Committee included some eminent library scientists and educationists of the country. They include Messers B.S. Kesavan, Ashin Das Gupta, Girija Kumar, T.S. Rajagopalan, K.A. Isaac, B. Anderson, P.B. Mangla, P.N. Kaula, Suseela Kumar, S.C. Biswas, V. Rajaraman, R.C. Tripathi, B.D. Nag Chowdhury, Ravinder Kumar and B.P. Barua (Member- secretary). CONPOLIS had the following terms of reference:

To consider the document 'National Policy on Library and Information System' prepared by the Raja Rammohun Roy Library Foundation in the context of an expanding library movement, disseminating information to neo-literates, illiterates, children and backward communities. The Committee may also consider a document on national policy prepared by the Indian Library Association.

a) To circulate these documents to relevant experts and institutions all over the country and obtain their reaction.

b) To arrange public discussions on the policy statement by way of holding seminars or by conducting interviews of selected people.

c) On the basis of its own discussions of the documents and on the basis of public reactions as determined through (b) and (c), the committee should prepare a final document for the consideration of the Government.

CONPOLIS held its first meeting on 9-10 December 1985 and the last meeting on 14-15 February 1986 in Calcutta. The members of the Committee toured different parts of the country jointly and severally to exchange views with cross sections of people. Comments were invited and received from several organisations, institutions and individuals. An interim report was submitted by the Chairman on 8th March 1986. It highlighted the role of libraries in the New Education Policy. The final report entitled "National Policy on Library and Information Systems - A Presentation" was submitted to the Minister of Human Resources Development on 30th May 1986.[14] The fate of the Conpolis Report is not known. It is learnt that an Empowered Committee set up by the Department of Culture examined the Report and submitted its comments in March 1988. However, the Government of India has not yet formally accepted the recommendations contained in the documents.

CONCLUSION

The adoption of a National Policy on Library and Information System will be the highest tribute paid to Dr. Ranganathan by the country in his birth centenary year.

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UNESCO Concept and Experience in the Formulation of National STI Policies

V. Montviloff*

The formulation and implementation of national information policies and plans is an important aspect of the activities of the General Information Programme of UNESCO (PGI). We worked in the field for a number of years and noted that the Member States were giving increased attention to the harmonization and coordination of the development and operation of national information systems and services. Every country is now seeking to develop information activities which respond better to their own national aspirations, and makes them more competitive on the world information market and less dependent on services from abroad. This interest emerged with the rapid growth of the information industry and its impact not only on the productivity of individual public or private enterprises and services but on the overall GNP as well.

In the industrialised countries public and private institutions are trying to formulate policies and design strategies to ease their access to the information sources and to gain as much profit as possible from whatever information they possess. These policies deal on the one hand, with establishment and improvement of the information systems themselves; and on the other or, with the operational implications of such systems (eg. questions like marketing ofinformation, information resource management, access to information, protection of information, trade, transdborder data flow, etc.).

At the same time one observes that the current fragmented approach in the formulation of information policies does not provide a sufficient institutional framework and often weakens the impact of information activities. This is even more evident in less industrialised countries which, in addition to having insufficient information services, do not provide the financial resources needed for their establishment; a situation which compels them to pay even more attention to the coordination of existing information services and to the harmonisation of their further development.This is the context in which the General Information Programme started, a few years ago, to encourage Unesco's Member States to devote more effort to the formulation of their national information policies.

Our concept is that national information policies are useful for the

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development and management of efficient information systems and services and facilitate the establishment of better partnerships in international cooperation and information resource sharing activities.

Hence, the approach we advocate, in PGI

- calls first of all, for the collection and maintenance of as accurate and as comprehensive information as possible of information activities in the country, including existing information on information related policies;
- secondly, it calls, on the basis of this information, for a design of a plan of action for the development of information activities;
- finally, the full integration of this plan into the national development plan.

Formulating this approach in a formal document makes easier its implementation because it can then serve as a guiding principle for all. It is usually drafted on the basis of concrete issues identified by the professionals concerned i.e. professionals working in the field of information or in fields closely linked to information such as informatics or communication . Once consolidated and endorsed by the appropriate government decisionmaking institutions, they are applied as an integral part of the overall national development plan.

For all these reasons, we encourage our Member States to hold national seminars with the aim of achieving two major objectives:

1. Identify the major information policy issues and formulate them in a systematic manner indicating what concrete steps need to be taken for their solution;
2. Establish a mechanism which will follow-up these policy issues through their endorsement into policies by the Government and will look after the application and enforcement of the latter in the national development plan. What is our experience so far? Our methodology is derived from the guidelines published by UNESCO as a result of an international symposium on the subject held in 1985, The use of these guidelines in the field for the past six years in some forty countries was recently embodied in a handbook published by UNESCO, which provides a precise step by step methodology for the formulation, implementation and operation of national information policies, and is addressed mainly to developing countries. Our application of this methodology is quite successful and led many Member States to issue government decrees, laws, regulations, etc.

We also came across some problems from which one can conclude that:

1. First, while the precise objectives of information policies may vary from place to place, the ultimate goal is more of less the same in all countries, namely, to serve national development, to provide the country with information resources, services and systems which are reliable, easy to use and accessible;

2. Secondly, the principal objectives in formulating and implementing a national policy in a developing country are:

   (a) to provide a legal basis for the development of information activities within the country (followed by a plan of action).

   (b) to provide an overall framework within which the responsibilities of the various national institutions are assigned;

   (c) to provide a national basis for the development of regional and international cooperation;

   (d) to obtain government financial support for the development of information activities.

3. Third, all countries are not equally ready for the formulation of such a policy; there are several reasons for this:

   (a) educational (some educational systems are more information-oriented than others)

   (b) economic (different types of economies; insufficient resources or infrastructures)

   (c) political (other priorities)

   (d) administrative (no leading agency)

   (e) professional (not the same level of interest)

   As a result the approach chosen will vary from country to country.

4. Fourth, the lack of data on the current situation regarding information resources and policies governing them is a common problem to all countries. There is an urgent need to assemble such data and statistics.

5. The concept of national information policy is understood differently in different countries:

   (a) for some it is a single national policy

   (b) for others it is a cluster of policies related directly to information activities but also to telecommunication, informatics, libraries and archives-

   (c) and for others, it is a sectoral policy, for example, covering STI only.

6. The issues which form the national information policy are also different:

   (a) some emphasize the development of physical and human infra-structure;

   (b) others look more into the political aspects - free flow of information, privacy of information;

   (c) others prefer to emphasize the economic aspect - information marketing, TDF.

prehensive policy. From the above we may conclude that the work that lies ahead is to sort out all these aspects, select those which apply most to the national situation, arrive at a consensus on the policy priorities which need to be retained and endorsed by the government in a formal statement and suggest a coordination mechanism for their implementation at the national level. The task may last long and not be easy to carry out; but if there is a will for a sustained effort, then experience has shown that, it is worth being undertaken.

Computer Based Information System for India

Vinod Kumar Grover*

ABSTRACT

The information explosion and the developments in information technology force us to develop a computer based Information System at national level. The Inter-Governmental Conference on Scientific and Technological Information for Development 1979 (UNISIST II) has also recommended for establishment of such information system. Unesco also has stressed the need for national policy on information.

In India we have certain constraints for a computer based information system such as lack of trained manpower, lack of proper, telecommunication facilities and uninterrupted power supply, lack of resources etc. There is also foreign exchange crunch for importing proper hardware.

Inspite of these problems building large computerised information system is becoming viable due to decrease in the cost of computers and recent developments in communication facilities. Number of information networks are offing and a few are in operation.

A powerful information grid at national level having links with local regional and state level information centres would be ideal in the Indian context. Proper resource sharing with the help of networks is desired.

The technology gap between India and developed countries should be narrowed. An awareness is to be brought among policymakers for adequate financing of information system. The library and information professionals will have to get advanced training in information technology and be conversant. With latest techniques in information storage and retrieval.

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Database Industry For India : An Agenda For Action

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This paper focuses on the need for developing a strong base for information industry in India to promote and accelerate the growth of database industry in India. Presents a global view of information industry market and the market for online/database industry. Emerging Indian scenario for the industry is reviewed and the infrastructural needs for promoting the database industry are discussed. The opportunities for the Indian database industry both in domestic and export market are presented. Based on these discussions the paper ventures to set a performance goal for the Indian database industry and defines broad strategies for success.

1 ONLINE AND DATABASE INDUSTRY

About 20 years ago, Louis Vagianos, a famous information consultant and regular contributor to Information Science Journal wrote his controversial article - "Information Science: a house built on a sand"(1). Today, the science of handling information supports an industry called ONLINE DATABASE INDUSTRY which is estimated at around Us$ 8.50 billion in current annual sales revenues **(See exhibit-1 and 1A).** At the current rupee-dollar conversion this works out to about Rs.21,250 crores. That is close to what the top 50 Indian companies in private sector collectively earned last year (in 1990) as their sales revenue. The industry claims to have more than 3 million direct users and a chain of beneficiaries.

This industry is only a segment of the Information Industry. The structural foundation for the industry is provided by the Information Technology (IT). The industry is growing stronger at an estimated 18%. If we add to its revenue a host of value-added services, generated based on the support of this industry, the figures could be more than double. Veronis, Suhler & Associates, a well known market research firm, in their forecast of revenue for datacommunication industry from business information services estimate the spending for business information by companies at US$ 25 billion in 1991 **(See exhibit-2).** The industry is growing at a rate over-taking all previously made forecasts. For instance, Frost & Sullivan another New York based market research firm known for their forecast studies, predicited in 1989 the number of publicly available databases at 4650 by 1993 (2). But today we already have more than 5500 databases reported by Martha Williams, the famous online industry consultant and the editor of the Directory of computer readable databases (3). If the

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information added to the recorded human knowledge is doubling every 7-years, the population of information products in terms of databases and services is doubling every 4-years.

11 Manpower Intensive

Over 100,000 people are estimated to be emplopyed in US alone in this business of gathering information, compiling and structuring it into databases and delivering through various electronic and print media, and consolidating and repackaging to create new and specialised databases and services. (This excludes people who generate information like scientists, professionals and millions of knowledge workers) The number is sure to grow with databases going more specialised. At the current trends and with emerging ITs that are likely to acclerate the growth further, we could safely forecast that by 2001, the Online database industry and the associated service sector will become a US$100 billion industry. That is more than twice the current budget of the Government of India! The number of people employed by then will be more than treble.

This forecast is more on the optimistic side compared to the forecasts made by several Market researchers. The emerging trends in technology that are leading to newer information products and applications, the new technologies like CDROM and multi-media which are bagging applications, and ISDN that allows better and faster communication for all types of information (text, moving images and sound) through a single channel clearly suggest that the future markets are likely to over-take any forecast made today based on past data and current trends alone. The question relevant to ask in this context is : How much of this can we in India exploit as our share? And, how do we prepare ourselves to address this market?

2 INFORMATION INDUSTRY

Information industry, of which online and database industry is only a segment, is relatively new. If we take the definition of the Information Industry Association which was started in 1969, - "the information industry is an industry group made up of companies and units of companies that produce and market tangible products and services that are chiefly informational in nature" (4). Though the industry is young, the concept of the exchange of information dates back to ancient times. This industry is a fore-runner of yesterday's publishing industry. This is not only evident in the membership of the Information Industry Association (USA), but also in the fact that a large number of online databases today find their origin in their corresponding print versions. The industry derives its strength of production and distribution from three technologies :

Electronic Publishing,

Computing technology for high volume storage and processing of data and text,

Data communication.

The industry is lead by the newspaper and magzine publishing companies like Reuters, UK, Knight-Ridder, USA (parent company of DIALOG), McGraw-Hill, USA, etc., followed by market research companies such as Dun & Bradstreet, USA, and supported by indexing and abstracting service publishers such as Chemical Abstracts Inc, USA, Excerpta Medica, Netherlands, Institute of Electrical Engineers (IEE), (UK who produce INSPEC database), etc.

The online and database industry largely constitute that segment of the information industry which delivers the information electronically and supports a range of value added services involved in repackaging and marketing the information.

3 INFORMATION AND TECHNOLOGY :

For the information industry, the focus is information. The technology facilitates the production and distribution process. Very significantly the technology even enhances the value of information. The technology offers the media alternatives to information for processing, packaging, and delivering to the end user. The technology allows the end-user a variety of choices. The user could decide on the delivery media. For instance, in online searching the user can decide to obtain the output (information) -

Online, displayed on screen, captured to disc and printed simultaneously at user end ; OR

Offline, received by mail printed on paper or recorded on tape / discs ; OR

Through electronic mail, transferred to user's mail box.

The technology lets the user to additionally process the data online or reprocess at his terminal. The end-user could further enhance the value of information by additional processing and by supplementing it with new data for re-distribution, subject to the copyright regulations.

The distinct feature of the information industry is that it takes the user as an integral part of its network to the extent that the user can also become a provider of the information. While the information ultimately stands out in its value to user, in its production and delivery process, it remains inseparable from the technology and the media. The information explosion, it appears, did not occur solely because of increase in information. Advances in the technology of transmitting and storing it are as much a factor. To quote Richard Saul Wurman from his recent book on Information Anxiety, - "We are affected as much by the flow as by the production of information" (5).

Though the technology was responsible for the accelerated growth of the information industry in west and particularly in US and UK, a major factor that provided the base for the growth was the availability of information resources which the technology could exploit. For instance, many of the well known and widely used online databases in Science and Technology like COMPENDEX (Engineering Index started in 1884) and, Chemical Abstracts (started in 1907), have their roots in a century old culture that considered collection and dissemination of information as an integral part of scientific research. When the mainframe entered the market during 60s, there were enough printed information resources that could get into these main frames as big files. When DIALOG was launched 20 years ago, they did not have to hunt for databases. The technology and information are racing together, resulting in new products, new applications and newer technologies chasing often the same information.

4 INDIAN SCENARIO

When INDONET and NICNET were launched, there was hardly any database to look for. The lack of databases was perhaps one of the reasons for INDONET's failure so far. One cannot help being critical in characterising the Indian scenario as putting the cart before the horse, as we did not take seriously the exercise of building an information base before the computers and communication infrastructure arrived. Let us look at the infrastructure scenario and the problems before us to develop the industry.

41 India and the global information market place

India is still absent in the global information market place as a database producing country. Among the 5500+ publicly available databases in the world, there is none from India to represent. A comforting fact is that Indian information is also covered by various international databases, though inadequately. Many international database producers are covering Indian information as a matter of their coverage policy. Following are some of the research findings that reflect India's stand in the international market place.

411 Science & Technology

In terms of India's contribution to scientific literature our situation may not be impressive but not entirely hopeless. A study for 1989 indicates widely varying degrees of coverage of Indian science and technology information as reflected below.

INDIAN INFORAMATION IN INTERNATIONAL DATABASES AS A PERCENTAGE OF GLOBAL INFORMATION, 1989

- AGRICULTURE	7.0%
- CHEMISTRY	2.0%
- ENGINEERING	3.2%
- GEO SCIENCES	0.5%
- MATHEMATICS	20.0%
- MEDICAL SCIENCES	1.4%
- PHYSICS	4.0%

Note: These figures are based on a study of core databases in the respective disciplines on DIALOG, USA.

However, a significant percentage of Indian contributions covered in international databases are reported through international journals. A study conducted in an international database on biomedical sciences called EXCERPTA MEDICA, which is known for its comprehensiveness in coverage, indicates that out of the total number of articles from Indian scientists covered in the database, more than 60% were those published in international journals. The database covers 4100 international journals. 34 Indian journals covered in this database account for less than 1%, contributing to around 0.5% of the total literature covered in the database. **Exhibit-4** is a brief statistical profile of this study.

Two significant factors emerge out of these studies:

(1) Coverage of Indian literature in international databases is highly inadequate.

(2) A large percentage of Indian science literature currently covered by international databases are those published in non-Indian journals.

This, and many other findings strongly suggests the need for a good Indian science and technology database of international quality that could be marketed internationally.

412 Business Information

The coverage of Indian business information in international databases is as much inadequate, but promising one, as the following reveals:

Only one news paper - Times of India - is covered from India in

one international database, Textline, by Reuters

PREDICAST, the largest international business database producer was not covering any Indian source until beginning this year. INFORMATICS, the Bangalore based Company to which this author belongs to, now sends Indian input to this database (about 8,000/- records per year) selected from 5 major Indian business magzines and newspapers. This constitutes less than 2% of the total database records added every year to one of the 11 databases of Predicasts. An Indian for database or the major sources of information for business and industry will be a mega file of not less than 100,000 records per year.

DUN & BRADSTREET, a reputed company database covers in its D&B International about 800 Indian companies in its total coverage of 200,000 companies in Asia, Africa and Japan.

KOMPASS ASIA, a recently launched database on DIALOG covers 18,700 Indian companies which constitute 8% of total number of companies covered in the database. The input was provided by a Delhi based Indian company, DATANET.

42 DATABASE ACTIVITIES IN INDIA

There is an increasing awareness and realisation of "the need for doing something" in this area, both in private and Government sectors. Several events and factors are contributing to this positive development creating the much needed urge. A quick and thorough research is needed to prepare a strategic plan at a national level to give this activity the shape of an industry that can compete in the international market. Following observations can throw some light into the current state of the activity in this area.

421 Government Sector

The database activity is as usual dominated by much noise in the Government sector which has contributed to build awareness. Hundreds of agencies in the Government have, during the past several years, spent substantial money in planning and initiating various database development programs. A quick memory read out can result in a listing of dozen agencies such as NIC, NISSAT, TIFAC, NMIS, INSDOC, BIO-INFORMATICS, NATIONAL SCIENCE INFORMATION CENTRE, DESIDOC, etc. A lot is reported in literature about their activities by these agencies themselves and others associated with them. There is a need for an independent research study by a third party on the pattern, impact and results of spending by these agencies.

A recently published directory by the Department of Science and Technology lists 89 databases and bi-product services. Though there are several ommissions in this, there are quite a few databases listed in this which can be developed as quality databases for domestic and international market. Most of

the databases covered are from the Government sector.

Among the public sector companies, CMC has been projecting leadership with still not many takers around for its proposals on database promotion. VSNL has made several public announcements to support the database production activities.

422 Private Sector

In the private sector too, sevaral companies have been working with specific product and market goals though market perceptions are rather nebulous. Several projects are on the drawing board of companies, some even being actively considered by the financial institutions.

Historically, ORG (The Operations Research Group), Ahmedabad, and the Centre for Monitoring Indian Economy, Bombay, have been around with products well received in the market research segment. The rest are dominated by trade and industry associations, and directory publishers whose activities can result in quite a few good databases for the market.

From the press, The Times of India is having ambitious plans which are not yet made public. It is an encouraging sign as elsewhere in the world, the press have played a key role in building Information Industry.

Yellow-Pages publishers have created a commercially viable segment. This is an opportunity area for better exploitation of new technologies, especially CD-ROMs and Multi Media.

CRISYL (Credit Rating Information Systems Ltd) is an encouraging beginning for financial information segment. CRISYL's joint venture partners from UK, EXTEL who have their databases on DIALOG, can offer CRISYL opportunities to take Indian company's information faster into global market place.

There are many in the race. A few even export. Their commitment to the industry and their success needs to be watched. As an IT dominated scenario is emerging, the private sector will play a major role in this industry.

423 International database access

The international database access and marketing is still dominated by Informatics, marketing the concept and DIALOG. VSNL's recent entry with EASYNET tie up has increased the awareness but has not contributed to the market build up. The area is saddled with untold Government restrictions, inadequate telecom infrastructure and inflation. With the result, the Indian market though fairly aware of the international databases has not gained much from it. The emerging database industry in India should look at international

databases as path finders to:

get product ideas

find partners for joint ventures in information business

develop working knowledge of the field, and

create an information culture in the country by promoting the usage of these databases.

* The emergence of CD-ROM technology is likely to change the scenario by brining in more international databases physically into the country.

43 Database production infrastructure

Database production is a painful, laborious and people intensive activity. Its infrastructural needs are much comparable to a production environment. In India, a majority of the database activity in the Government sector, is run more as projects, evidently lacking the kind of quality control and scheduling which the production systems demand.

The infrastructural levels are much dependent on the type of databases (how technical or general it is) and the size. There are databases which could be created with just one or two people and there are those which need hundreds of people. Irrespective of the size and type, a database production involves the following main functions. -

431 Production function :

This involves :

(1) Gathering information

(2) Selection

(3) Compilation and consolidation (abstracting in case of bibliographic database)

(4) Coding

(5) Structuring the compiled data into database format

(6) Data entry and editing

(7) Updating

(8) Quality control at all levels

(9) Maintenance

A production manual should be prepared as a must for each database production activity describing in steps the work flow and standards to be followed.

432 Access and distribution functions.

This is a commercial function of generating products and services out of the created databases and marketing and distributing them. This function itself may invólve substantial production activity. The database produced can be marketed -

through an online host

by publishing data as a series of print products

on floppy disks with or without a software to use it

by publishing ón CD-ROMs.

433 Infrastructure support

A good database production programme needs -

a scheduled and quality controlled production environment.

a good database production and management software (depending on the production needs) and associated computing hardware.

mechanism to continuously gather the information without interruptions.

regular updating facility.

A powerful retrieval software

trained people.

434 Manpower

Though we have a large pool of educated manpower in India, we simply do not have adequately trained manpower for database production activity. There is a danger of thinking database production as a data entry job which accounts for only a small portion of the database production cost. Trained manpower is needed for the functions involving selection, compilation, consolidation, coding and structuring the data. While this is a specific professional skill, depending on the technical level of the database, the manpower required may need to have a combination of technical knowledge of the subject of the database and professional knowledge of database production.

435 Software

There is no good database production software in India especially for building and managing very large databases. While initially, a commercially available software can be imported, as a long-term strategy, we need to develop our own general purpose database production and retrieval software for various computing environment.

44 Computer Communication Infrastructure

While in the west, there was already an information base when the computer communication industry appeared on the screen, just the reverse is happening in India. The computing infrastructure is relatively a happy scene as the computer culture is fast spreading with easy availability of hardware resources. The data communication infrastructure that followed reluctantly is still a nebulous scene. The first domestic public data network INET is just launched, that too in typical DoT style of putting the users off instead of encouraging them to use. How else can one explain the way DoT advertised INET launch like a tender notification asking the users to queue-in with the application, when the data communication is a facility that should be simply thrown open for any telephone user for the asking?.

441 Restrictive Barriers

The restrictive and monopolistic attitude of the Government in Telecom Sector is unlikely to strengthen this infrastructure as required by the information industry. Elsewhere in the world, access to 5500+ online databases and a host of other computing resources are provided by about 900 online hosts. These 900 online hosts receive the benefit of global connectivity by more than 100 international telecom networks and gateways, both public and privately owned. A lesson to draw from this scenario is that, the Indian government should open up the data communication infrastructure to competition which would result in more number of local networks and gateways within the country.

442 Communication Costs

Data communication cost is another major concern. While the carrier to network charges are based on the data- volume, and the circuit time sharing, the network to subscriber charges in the world are largely based on the connect-time. In India, the pattern that has emerged is that the subscriber should pay for the data and time for using the circuit. When GPSS, the first packet switching gateway for international computer- communication was introduced in India by VSNL, they perhaps followed the model of IPSS, UK, not only in naming the service but also in fixing the tariff. For example, if a subscriber accesses DIALOG from London through a data network like TELENET or DIALNET, he pays Rs 200-300/hour. If he accesses from India through GPSS he will have to pay Rs 240/hour **plus** average Rs 4/- per KB of data transmitted or received. This additional charge for data would increase the cost per hour to as much as Rs 800-1200 per hour and more if it is file transfer kind of usage. The costs are unlikely to decline unless the competition is conciously encouraged by policy makers.

5 OPPORTUNITIES FOR INDIA

Though the global market is dominated by US commanding nearly 60% of the market, the European, Far east and rest of the world (ROW) markets are catching up. A recent market research study reflects this shifting trend in regional growth **(exhibit -3)**. The ROW which currently enjoys more than 7% is projected to increase its share to 10% by 1996, which will be nearly US$2 billion. (Rs 5000 crore at today's Rupee value for dollar). The size of the current ROW market is estimated at US$ 0.5 billion (Rs 1250 crore). We need to have a closer look at this market for analysis. As we are almost at a zero base as far database & online industry is concerned, we have opportunity to develop not only the domestic market but also to have a respectable piece of international market.

51 Export Opporutnities

511 Online Business

In the database and online industry, online (and now CD-ROM included) is the marketing and distribution channel for information. It accounts for almost 60% of the industry revenue. Unlike, database production business, the online business is dominated by fewer companies. The 5500+ databases are produced by 2000 database publishers and distributed by 850 online hosts. A large majority of these hosts are also database producers who parallely make available their databases through major online hosts dominating the market. **Exhibit-5** gives a list of top 10 online hosts in the industry who together command more than 25% of the world market.

The opportunity for India in this business is limited by the restrictive scenario of telecom. However, the opportunities that could be pursued are:

(1) **Setting up value added gateway nodes in India in partnership with companies like DIALOG, (DIALNET node), TELEBASE (EASYNET node) etc.** This will provide an opportunity for Indian database producers to distribute and market their databases electronically. The existing data networks like NICNET and INDONET (after a face-lift) can play a major role in this direction, if only they are allowed to by-pass DoT and GPSS. By setting up gateway facility, India can also become a regional distributor for this region.

(2) **Providing R&D support for product development.** This is an intelligent task which the Indian Information Professionals are capable of. But, they need to be exposed to international databases, various online hosts, their systems and software features etc. As the online is moving closer to end-users, opportunities for newer and more user sensitive front-ends are emerging. Opportunities for several R&D contracts exists. Our capability needs to be marketed with them.

512 Database exports

(1) Database Production Support

The manpower costs in a database production industry is a major cost component and varies from 25 to 40%. The manpower costs in India being comparitively lower, providing database creation support is a potential growth area. The basic problems in this area are two fold.

> Producers are not prepared to risk the time-lag as most databases place a premium on currency. To be competitive, we have to be online with database producers to send the data. But Indian telecom rates compared to places like Phillipines, Barbados, Jamica, etc are so high that we cannot compete.
>
> Indian manpower lacks credibility in keeping with schedules. Timeliness being so critical we need to build confidence with the database producers about our credibility. The opportunity exists for large archival file creation, conversion, cleaning and updating etc as an off-shore activity.

With emphasis on quality and end-user needs, databases are restructured often and new databases are created out of strategic merger of two different databases. Several opportunities exist here.

(2) Exporting Indian databases

Indian data is in demand in the international market. The type of information that could be exported are:

> data on Indian companies, their true financial background and promoters capability.
>
> Information on Indian professionals.
>
> Indian scientific literature
>
> General information and trade news on Indian market.

The databases could be mounted on online hosts such as DIALOG in US, Europe and Japan. Alternatively, depending on the circulation, they could be distributed on CD-ROMs.

(3) Indian input to international databases:

This is another effective strategy and requires identification of the international databases whose producers would be interested in adding Indian information to their files. A few organisations including Informatics are currently working in this area.

(4) CD-ROM Publishing

CD-ROMs have become a low-cost media for high volume distribution

of text and graphic data. A large number of publishers are planning to put encyclopaedic volumes on CDs. This area provides an opportunity for full text conversion projects and associated pre-publishing activities demanded by the CD-ROM publishing market.

(5) **MultiMedia**

An estimate by IBM suggests that by 2000, there would be 800 million personal computers with MultiMedia interface(6). The success of MultiMedia technology largely rests on application development. This technology will support and encourage totally new breed of database such as -

> product catalogues with a sales executive introducing it to you coming on your PC screen
>
> a live encyclopedia of birds and animals with their animated movement, simulated sound and textual description of their natural history.

Special databases and application development for this area is a gold mine opportunity for export.

52 Domestic Market

Domestic market will be a relatively slow growth market. Since not much is done so far, opportunities exist for creating databases for every major industrial segment and subject discipline. In this area, one can conveniently draw parallels from the rest of the world. A close and constant review of the Directory of Online databases and study of new and specialised databases that are entering the global markets can be models for us to copy. Electronic distribution (Online) is still a limited opportunity and expected to grow depending on how INET behaves. As a rule, until the habit of using electronic information becomes a culture, the Indian database producers should initially look for their markets through print-products which are bi-products of database production activity.

The product ideas and market confidence can come from publishing industry (directory and News Paper publisher), Market Research Companies, Technical & Management Consultants who are able to recognise the information needs of clients, the library and information centers and, the big needs of the Government.

Sectorally, and in the order of market needs and prospects, the following sectors could be reviewed for opportunities.

(1) Money and commodity price market for real-time data. (this is telecom dependent).

(2) Market research and statistical data (including census).

(3) Financial and credit rating data on companies.

(4) Directories of various types.

(5) Legal information.

(6) Scientific, technical & Bibliographic information.

(7) General and consumers interest information. (yellow page type).

6 GOALS

61 Short-term

(1) Information industry should receive recognition as a productive sector of the economy.

(2) India should establish its presence in the international information market place.

(3) The industry being young in the world and an infant in India, the marketing goals need not be constrained by growth rate syndrome. In the author's considered opinion, the following market growth is achievable. We have the advantage of English language in our work culture and a large educated scientific manpower base for competing with Rest of the world for American and UK market, which will always constitute more than 60% of the global market until atleast end of this century. Hence, an ambitious growth plan being feasible, the following marketing goal is surely not unrealistic.

Segment	Year (Rs in crores)			
	1992-93	1993-94	1994-95	1995-96
Exports	25.00	100	200	500
(As % of of global market)	(0.1%)	(0.3%)	(0.5%)	(1.2%)
Domestic	-	100	150	300

62 Long-term Goal

(1) India should establish regional leadership by 2000, overtaking far east.

(2) India should aim at 5% of the world market share in the information business.

(3) The Industry should generate gainful employment for half-a- million people

7 STRATEGIES & PROGRAMS:

71 At the national level

(1) The Government should keep-off from the production segment of the industry. Database production should be completely in the industry sector, with Government's role limited to providing infrastructural and R&D support.

(2) The Government should "free" the telecom sector and allow the industry to set up its data network, either independent or in partnership with DoT organisations. NICNET which is the only fully operational data network in the country should be declared as a public data network.

(3) A large amount of information is created by Government through its various agencies which needs to be handled more efficiently. The Government should open this for public access. To facilitate this, the Government should enact a "Freedom of Information Act" to give the citizens the right of access to any information of public interest that the Government is responsible for generation.

(4) The Government in its trade policy should recognise the fact that information is technology dependent and can exist not only in the known print medium but also in various electronic and optical media of today and tomorrow. There should not be any restrictive barriers either policy or tariff, for "free" flow of information within and outside the country in any media.

72 At the industry level.

(1) The industry and Government should together focus on:

(a) building and promoting information culture in the country.

(b) creating manpower and infrastructural support for database production and export.

(2) Represent itself in all international industry fora and exhibits and promotion program.

(3) Initiate a thorough industry market research for identifying specific growth areas and regions, both in domestic and export market, and to draw an action plan for achieving the marketing goal.

(4) Look for international market as the prime support until the local market is developed.

(5) Initiate joint venture projects with multi-national companies in this business.

(6) To gain competitive edge, plan for investing in application development for futuristic areas such as:

(a) Full text databases

(b) CD-ROM Publishing and Multi-Media

(7) Develop an education & employment program for educated housewives who could be ideal manpower for database projects.

(8) Follow market-driven approach. Avoid the mistake of technology-driven approach to both product and market development. This caution is necessary as this industry is very sensitive to changes in technology.

(9) Create specialised databases which have niche market and considerable export potential or domestic need.

8 CONCLUSION

The successful nations and enterprises in future will be those that can make the best use of information. Effective strategies will be plotted by those who see the information and where other see data, and who can react quickly to surprises shown by "new information". This depends not so much on careful planning as on informed opportunism. In a competitive environment information is the diferential that determines success. If delivering that information can be made a more efficient task, the information industry can surely share the success of nations and business enterprises.

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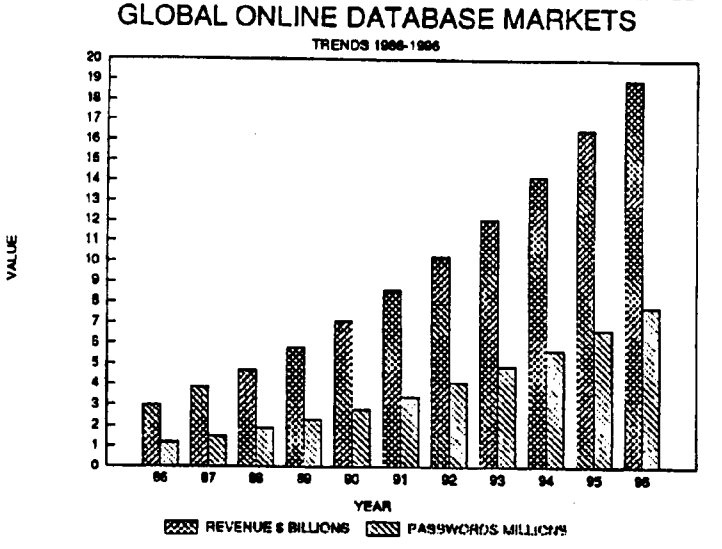
Exhibit - 1A

GLOBAL ONLINE MARKET, 1986-96

YEAR	REVENUE (IN BILLION)	PASSWORDS (LAKHS)
1986	3.00	12
1987	3.85	15
1988	4.70	19
1989	5.80	23
1990	7.10	29
1991	8.60	34
1992	10.25	41
1993	12.10	49
1994	14.20	57
1995	16.50	67
1996	19.00	78

Source : Online database markers : Research Studies by Market Intelligence Research Co Inc. USA, August 1990

Exhibit - 1B



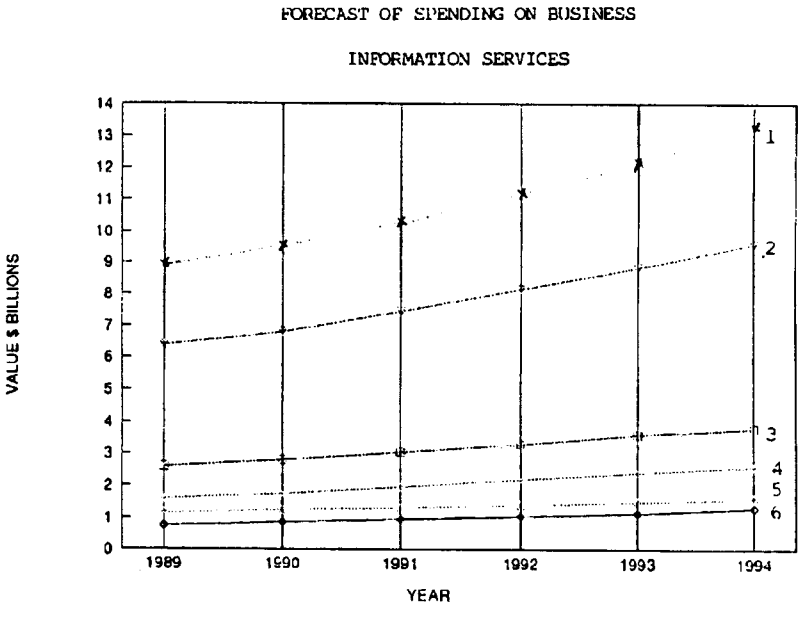
Source: Online Database Markets: Research Studies by Market Intelligence Research Co., Inc., USA, AUG. 1990.

Exhibit - 2A

FORECAST OF SPENDING ON BUSINESS INFORMATION SERVICES

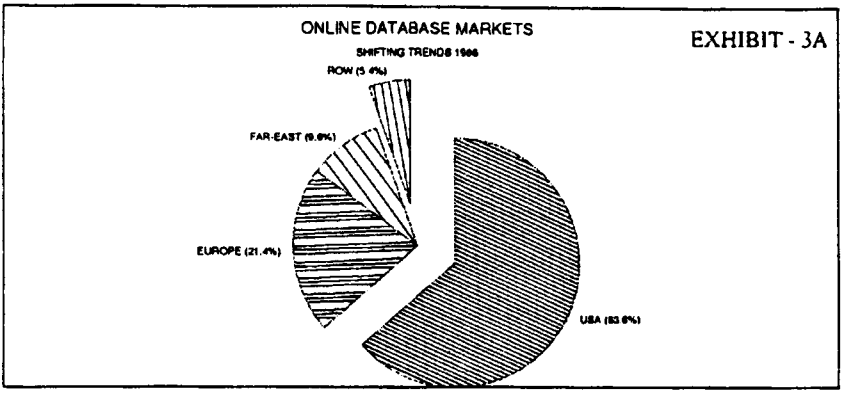
INFORMATION FOR ;			VALUES $ BILLIONS			
1 Marketing	8.9	9.55	10.3	11.2	12.15	13.3
2 Finance & Cr. Rating	6.4	6.8	7.45	8.15	8.85	9.6
3 Human Resources	2.6	2.8	3.05	3.30	3.6	3.8
4 Legal & Regulatory	1.6	1.75	1.95	2.2	2.4	2.6
5 General Business	1.15	1.25	1.3	1.4	1.5	1.6
6 Science & Technology	0.75	0.85	0.95	1.05	1.15	1.3
TOTAL	21.4	23.00	25.00	27.3	29.65	32.2

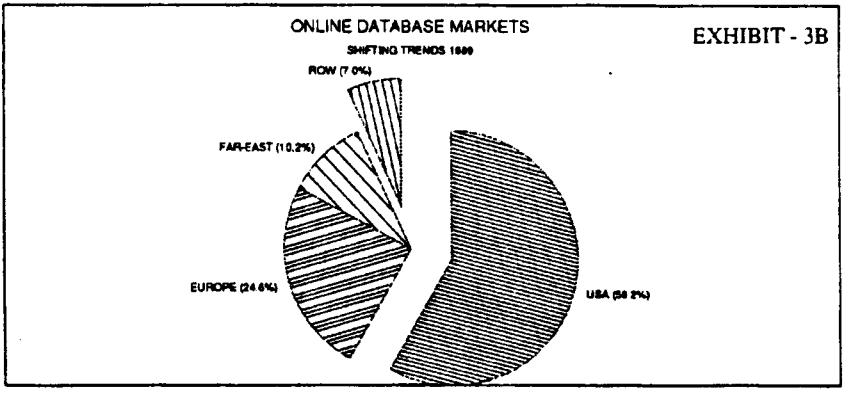
Exhibit - 2B

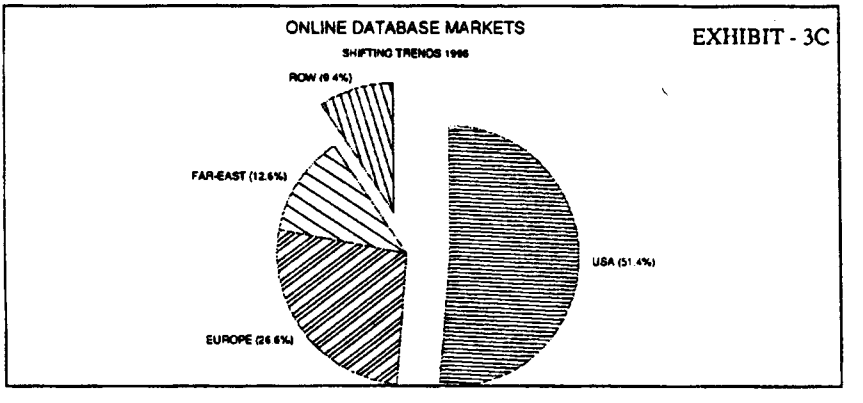


LEGEND: 1. Marketing, 2. Finance & CR. Rating, 3. Human Resources, 4. Legal & Regulatory, 5. General Business, 6. Science & Tech.

Source: Communication Industries Forecasts 1990







SOURCE : Research Studies On Online Database Market, Market Intelligence Research Company, Inc., USA. August 1990

Exhibit - 4

COVERAGE OF INDIAN BIOMEDICAL LITERATURE IN EXCERPTA MEDICA DATABASE

- Biomedical Journals	
(1) Covered by EXCERPTA MEDICA	4100
(2) Published from India and covered by EXCERPTA MEDICA	34
(3) Published from India but not covered by EXCERPTA MEDICA	308

- Articles covered in EXCERPTA MEDICA	1989	1990
(1) Total number from all 4100 Journals	3,09,575	3,85,467
(2) Published by Indian Scientists in foreign Journals	2,568	3,234
(3) Published by Indian Scientists in 34 Indian Journals	1,700	2,051

- Observations:

1. Excerpta Medica database which is international in coverage is covering less than 12% Indian Journals currently published.
2. In its total coverage of 4100 Journals, Indian Journals constitute less than 1%
3. The coverage of journal articles published by resident Indian scientists constitute around 1.4% of the total literature covered. Of this only about 0.5% was published in Indian journals.

Exhibit - 5

THE TOP GLOBAL PLAYERS IN ELECTRONIC INFORMATION

Company	Type of Information sold
REUTERS, UK	Commodities and securities quotes, news
KNIGHT RIDDERS (Parent	News, Video text, Financial Information and
Company of DIALOG),	General Information
DUN & BRADSTREET	Credit and miscellaneous business information
TELERATE	Commodities and securities quotes
QUOTRON	Securities quotes
TRW	Credit checks
MEAD	Legal and general business information
DIALOG Information Services	Business, Scientific technical and general
Inc. USA Business,	
McGRAW -	HILL Financial information
DOW JONES	Securities and general business information

Database Service for S&T Researches:Options and Strategies

T.B.Rajashekar*

1. ELECTRONIC DATABASES & INFORMATION ACCESSIBILITY

Electronic databases hold the key to improving information accessibility - the ease and quickness with which our scientific community can access results of world wide research. Beginning with the National Library of Medicine with its MEDLARS database system in 1960, the number and size of databases has grown dramatically, from about 20 in 1965 to more than 4200 in 1989. current estimates indicate that there are more than 6000 publicity available electronic databases accessible through an online vendor or batch processor as well as those available on CD-ROM, Magnetic tape, and diskette (a recent addition has been Current Contents on diskette).

Electronic databases can be categorized into various types - word oriented databases which include bibliographic databases (references to documents), full text databases and directory databases; factual and numerical databases (economic, scientific and technical) and pictorial databases.

Bibliographic and numerical databases have revolutionized the way S&T information is handled. Given the capability of computer and communication technologies to store, manipulate and transmit vast amounts of information at very high speeds and with great accuracy, it has been possible to condense the time element involved in the information dissemination process, thereby making more current information available to users than what comes through printed publications. Although they share the same purpose with their printed versions, electronic databases offer more complete, more intensive, more current, and more swifter responses.

The flow of information from print to database production and use is shown in Fig.1. an illustrative list of important S&T bibliographic databases is given in table -1.

If we have to narrow this gap in information accessibility of scientists in India and those in western countries, it is imperative that we provide at reasonable cost international level database services in key S&T areas within the country, and secondly, launch indigenous production of electronic databases.

This paper puts forward a few options and stragies in this direction

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Fig. 1 Electronic Information Path

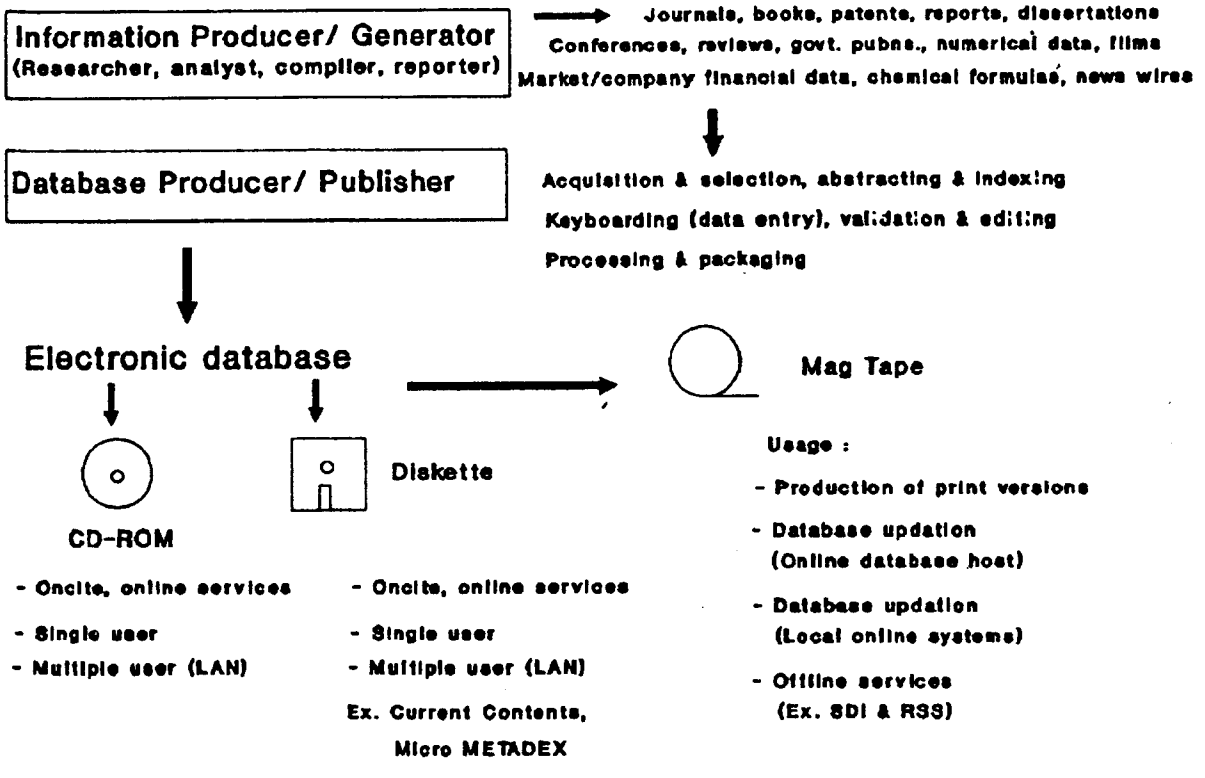


Table - 1. Some Key S&T Bibliographic Databases

Subject	DAtabase	Print Equivalent	Size (No.of Records)	Growth Rate (Year)
Chemistry	CA-SEARCH (1967)	Chemical Abstracts	9.5 M	0.7M
Life Sciences	BIOSIS PREVIEW 1969	Biological Abstracts	7.1 M	0.5 M
Physics Electrical Engineering, Electronics, Computers, Control, Inf.Tech.	INSPEC (1969)	Physics Abstracts E.E. Abstracts	4 M	0.3 M
Engineering	COMPENDEX PLUS (1970)	Engineering Index	2.6 M	–
Medicine	MEDLINE (1966)	Index Medicus	6.5 M	–
Mathematics	MATHSCI	Mathematical Reviews Current Mathematical Publications.	1.2 M	–
Geology	GEOREF (1785)	Bibliography & Index of Geology	1.5M	0.08 M
Metallurgy	METADEX (1966)	Metals Abstracts	0.8 M	–
Biotechnology	Biotechnology Abstracts(1982)	Biotechnology Abstracts	0.1 M	–
S&T	PASCAL (1973)	PASCAL Journals	3.3 M	–
Patents	World Patents Index (1963)	World Patents Index	5.1 M	–

(Source: DIALOG Database Catalogue, 1991)

2 IMPROVING INFORMATION ACCESSIBILITY: ALTERNATIVE OPTIONS AND STRATEGIES

For improving information accessibility in the country we need to consider two major database activities:

*Production and publication of databases within the country (What databases can and should be produced indigenously

*Utilization of existing international databases

(How best the already existing databases can be utilized

Alternative options and strategies for these two database activities is discussed in the following sections.

21 Database production and publication:

211 Database production alternatives

Database production is an expensive operation. Expenditures include staff, acquisition of publications, computer costs and keyboarding (data entry) for database production, validation, processing typesetting, printing and despatch for the printed products, and processing and despatch for the electronic products. Database production also include tasks such as maintenance of authority lists for authors, institutions, publishers, etc., thesauri and classification systems, cataloguing rules and formats etc. these costs increase each year not only because of inflation, but also because of the increase in the number of documents to indexed. Two types of databases can be produced, classified according to their coverage:

1. Databases of International coverage

2. Databases of National coverage

International databases strive to achieve comprehensiveness in coverage, mainly in terms of a wide variety of printed publications in major languages of the world. national databases concentrate on information generated within the country. This scope may sometimes be expanded to include information about the country, published outside.

There are mainly two alternative ways of producing bibliographic databases:

1. **Centralized input and centralized processing (C-I-C-P).** Here a central agency will take the complete responsibility for all the operations related to database production. Database utilization could be centralized for SDI and retrospective search services (batch operated) of decentralized, for online searching through telecommunication links, for retrospective searching.

2. **Decentralized input and centralized processing** (D-I-C-P). Here, a few identified agencies will capture the data from their collection to produce machine -readable - records. There will be understanding on the primary publications to be covered, information handling procedures (cataloguing, classification, indexing) etc. The decentralized data preparation can be facilitated through use of common software and hardware. An attractive proposition is to formulate relevant databases definition (including input worksheets) using a PC compatible software package like the mini micro version CDS/ISIS, and distribute these to the participating agencies for purpose of data preparation. This will not only ensure uniformity in data preparation but also exporting and importing of data in machine-readable form (on floppy diskettes or telecommunication) will be quite easy.

   This decentralized input will be received by a central agency which will undertake the responsibility for database production.

The primary requirement for producing databases at international level is to ensure adequate coverage of primary publications (eg. at least the core periodicals). This can perhaps be achieved by ensuring that the publication collection of the participating agencies, put together, will achieve this coverage.

212 Database Production Strategies

Because of the enormous costs involved in setting up and operating databases of international coverage, it is not desirable to duplicate the production of already available international databases, but to make best use of them.

a) International level database production: This should be limited to areas where no international databases currently exist and where good information facilities (like information centres) already exist within the country. We have some examples under NISSAT programme (eg. machine tools, leather science). However, for these databases to get international status we need to increase their coverage of primary publications, and improve data capturing, entry and processing procedures.

b) Information generated within the country: This is the area where major database production efforts should be made. National level libraries and information centres, covering different areas, should take the major responsibility in this. Several of these are already producing printed documentation lists/abstracts and information bulletins/journals. Efforts should now be to change over to electronic media.

An illustrative list of different agencies which can take up production of Indian databases in S&T areas is given below:

Publications and Information Directorate (P.I.D.) and INSDOC, New Delhi (Science & Technology)

DESIDOC and Indian Defence Science Academy (IDSA), New Delhi (Defense Science)

Indian Council for Medical Research and National Medical Library, New Delhi (Medicine)

DBT Biotechnology information centres (Biotechnology)

Dept. of Environmental ENVIS centres(Environmental Science)

In the Indian context, D-I-C-P mode of database production would be more appropriate, wherein two or more institutions, under a mutually agreed acquisitions programme will ensure coverage of major core journals, and provide the necessary input data in machine readable form to the database production centre. The salient features of this strategy is shown in fig. 2.

22 International Database Utilization

221 Database utilization alternatives:

As mentioned earlier, considering the enormous costs involved in setting up and operating databases of international coverage, it may not be feasible to produce such database in India. A better alternative, as shown for, example by countries like Australia, Koreas, Malaysia and several Latin American countries, is not to duplicate the production of already available international level databases but to make best use of them by employing suitable computer - communication technologies.

Bibliographic databases can be utilized for providing two major information services:

Selective Dissemination of Information (SDI) which regularly alerts a scientist which current research activities worldwide, and

Retrospective Search Services (RSS) which helps a scientist to,obtain information about research publications on specific topics, published in the previous years.

These service could be provided in batch or online mode. further there are two principal modes of using databases for providing these two services:

Database leasing

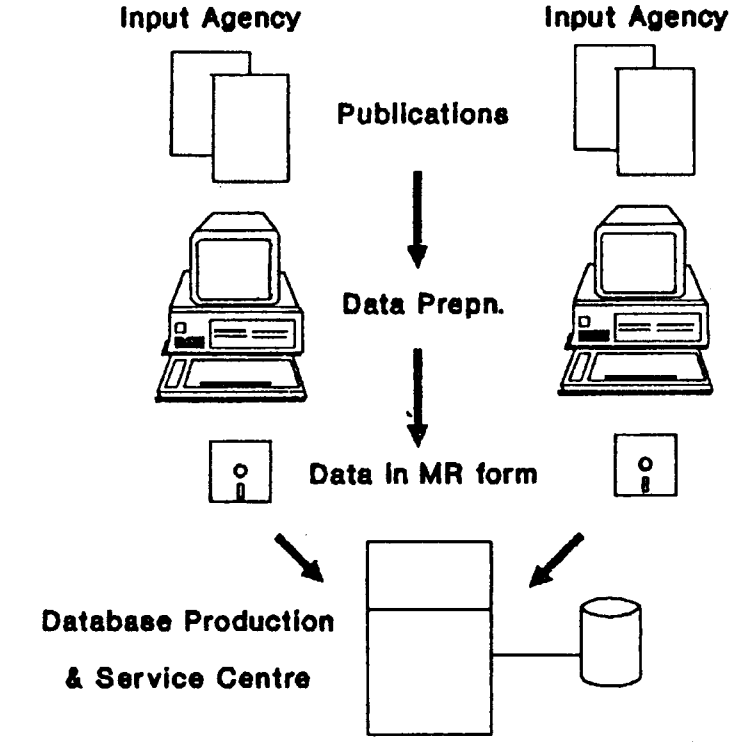
Online access

Alternative options and strategies for utilization of international databases in these two modes is discussed in the following sections.

2211 Database Utilization by leasing

Variety of information services, including SDI and RSS can be provided by leasing relevant databases from databases producers. for database leasing, an organization enters into a lease contract with the supplier, which is renewed

Fig. 2 Database Production - National/ International Distributed-Input-Centralised-Processing (DICP)



- Cooperative Acquisiition
- Distributed Data Prepn.
- Centralised Database Production
- Centralised Database Services

at regular intervals of time. The database updates can be received in the form of,

- magnetic tapes (Ex. BIOSIS, INSPEC, CA-SEARCH), or
- CD-ROM disks (Ex. MEDLINE, COMPENDEX), or
- floppy diskettes (Ex. Current Contents).

Each database update contains references to publications (with or without abstracts) that appeared during the latest week/ fortnight/month, etc. CD-ROM updates are usually cumulative, merging the contents of the previous updates for the year.

Databases leased on CD-ROMs and floppy diskettes offer the cheapest alternative for providing SDI and retrospective search services. However, there are a few limitations of these media which need to be considered here:

1. Only a fraction of the databases are available on CD-ROM and floppy diskettes.
2. Usage terms and conditions of CD-ROM/ floppy diskette databases are usually controlled by license agreements limiting their usage to the staff of the leasing institution. Provision of nationwide, offline information services from a central facility are now allowed by the supplier.
3. Technologies are only now emerging which provide scope for multi-user, remote access to CD-ROM databases.
4. Providing SDI services for a large user group is usually not supported by the software.
5. Utilization of CD-ROM databases is restricted to the features supported in the retrieval software. Since the file structures are proprietary in nature, scope for developing new applications is extremely limited.

However, if the issue at no.2 above is revolved, it would perhaps be economical to acquire CD-ROM databases at a few places and provide nationwide, offline retrospective search services instead of setting up such systems using database update tapes.

Magnetic tapes currently offer the widest scope for database utilization. Databases on magnetic tapes can be used for several purposes:

a) To set up an online database host:Such a host can be used through local terminals attached to the computer on which the database is mounted or through remote terminals linked to the host computer system by appropriate telecommunication lines. To set up an online host for 6 major databases (CA-SEARCH, BIOSIS,INSPEC, COMPENDEX, MATHSCI, GEOREF) for 5 years, will require a computer facility with suitable hardware and software that can handle 40 to 50 GB data, for multi user access (about 25 simultaneous user accesses) and facility for backing up, stand-by etc. software for online access will need to handle

user validation, search cost calculation, billing etc.

b) To provide offline SDI services: The major use of leased magnetic tapes has been to provide offline SDI services. Several institutions in India are already offering such services (see Table - 2 for details).

c) To setup an offline retrospective search service facility. With the existing disc storage capacities in 32/64 bit mini/super mini computers, it is possible to have several GBs of online storage. It would therefore be possible to build retrospective database files by cumulating data received on leased tapes for one or more years and back these up on high density tapes. The number of years can be limited to 3 or 5 years. Major fields of science and technology can be covered by leasing a few key databases. In such an environment queries will be processed in batch mode by loading appropriate databases backups.

An interesting possibility, which also provides scope for creation of retrospective database files, is the use of optical storage technologies like WORM (Write once read many) and erasable optical storage systems. Although the access time of these storage devices is slower than hard disc, they should be quite adequate for the offline RSS. These have the added advantage of portability, security, and quick mount/dismount capabilities. Currently these provide storage capacities of 600 MB per cartridge to several giga bytes, when multiple drives are chained.

Table- 2 SDI Services Using Database Tapes

Institution	Database(s) leased	Subject(s)
N.C.S.I.,	INSPEC	Physics
Indian Inst.of Sci.	BIOSIS	Biology
Bangalore	GEOREF	Earth Science
	MATHSCI	Mathematics
Steel Authority of India Ltd., Ranchi	METADEX	Metal Sciences
Central Food Technological Res. Inst. Mysore	FOSTIS	Food Science
Bhabha Atomic Research Centre, Bombay	INIS	Nuclear Physics
Indian Agricultural Research Instit., Delhi	AGRIS	Agriculture

2212 Database Utilization by Online Access to International Database Hosts:

In this mode, instead of leasing the database and processing it on a local computer, an user instead connects himself to database host from a terminal through the telecommunication network. The database hosts (also called as online hosts or online vendors) provide an online search system a computer programme using which the user interacts with the system to retrieve the information he hopes to find. The retrieved information may be printed "online on a printer attached to the computer through which the search is being made, or "offline" on the printer attached to the host computer system. Currently, 'DIALOG' a U.S. Online system, is the one being used by majority of the Indian users.

On line databases hosts provide both SDI and retrospective search services.

222 International Database utilization strategies: Lease or online Access?

Although online accessing of international databases is faster, this mode of database usage is not economical for providing SDI and RSS services to the R&D community in the country. For core disciplines like physics, chemistry, biology, engineering, medicine, etc., for which there will be a very large user group in the country which needs to be served and for which there are well established, comprehensive databases, it will be economical to provide nation wide information services such as SDI and RSS. It is ofcourse desirable that leasing of such databases should not be duplicated within the country.

The rationale supporting this recommendation is given in the following paragraphs.

Let us first consider provision of RSS by conducting online searches on databases host systems like DIALOG, BRS, STN, ESA/IRS, etc. Online search cost is usage sensitive and it includes three major components:- telecommunication, database connect hour and database output costs. For instance, a search retrieving 50 abstracts from a database like BIOSIS, INSPEC or COMPENDEX may cost about Rs.1,000, of which roughly Rs. 600 will be output cost, Rs. 200 database connect hour charge and Rs.200 domestic telecommunication cost. Online host charges (connect hour and output costs) have to be paid in hard currency, as majority of the online hosts are in U.S.A. and Europe.

An important point here is that there is substantial difference in the charges levied by the online hosts as compared to the lease and use charges levied by database suppliers. The tables given below for two major databases illustrates this point:

INSPEC Database (1990)

	Database producer charges (I.E.E., U.K.)	online host charges DIALOG, (U.S.A)
Connect hour charges (CH)	*L*36.00 (500 CHs) *L*9.00 (Subsequent (CHs)	$ 117.00
SDI	*L*16.20/Year/profile	$16.00/month/ profile +output charges
Hit charges	Nil for batch retrospective	$0.70/hit
Lease/set-free	*L*11,000.00	$1000.00

(Source: INSPEC 1990 catalogue and license agreement)

BIOSIS Database (1990)

	Database producer Charges (BIOSIS, U.S.A.)	Online host charges (DIALOG, U.S.A.)
Connect hour charges	$ 40.00	$ 87.00
SDI	$1.00/month/profile	$15.00/month/ profile
Hit charges	$0.25/hit	$0.59/hit
Lease/set-up fee	$15,000.00	$ 1000.00

(Source: BIOSIS 1990 catalogue and license agreement)

Further, there are attractive volume discounts given by the database suppliers, which are not passed onto low volume online database users.

This price difference between the database producers and the online hosts is true for almost all the databases which are available for online searching.

There is a marked increase in the number of online searches carried out from India since the past couple of years. A major influence has been the Gateway Packet Switch Service (GPSS) provided by Videsh Sanchar Nigam Lte. (VSNL) since 1989.

As the S&T community realize the usefulness of online searching, there will be greater demand for online searches. More and more foreign exchange will be required to pay the costs of these online searches.

Considering the more than 60% difference in the search charges levied by the database producer and the online host, there is scope for saving considerable foreign exchange by setting up databases in the country, at least for critical areas in science and technology.

Since development of international level databases is a very expensive option, it is advantageous first to concentrate on setting up of retrospective databases by database leasing. Perhaps, parallelly, experiments can be mounted, for identifying the problems associated with database production.

Further, since it is impossible to duplicate all internationally available databases, there is a need to concentrate on the core areas mentioned earlier. For other databases, searches can continue to be carried out on online database hosts.

Maximum benefit can be obtained by providing batch (or offline) retrospective literature search service. Search costs can be reduced by more than fifty percent of the charges currently levied by online database hosts. This is achieved by the following specific savings:

1. **Connect hour charges:** Since the service is operated in batch mode, there will be no need to pay the database connect hour charges.
2. **Hit charges:** These charges can be reduced by 1) transferring the database supplier charges with a small service overhead (in Rs.), to the user, 2) taking into account the volume discounts offered by the database suppliers.

Thus, instead of Rs.1000 for retrieving 50 abstracts from BIOSIS database on DIALOG, offline search on the retrospective databases is likely to cost less than Rs.500. If the service can be provided to a large number of users, the database lease fee can also be absorbed with a small increase in this cost.

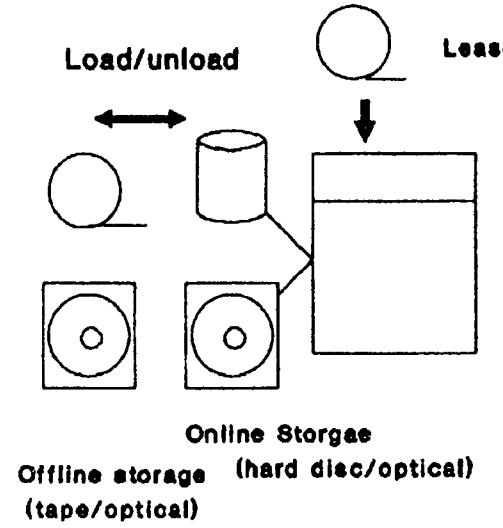
Similar rationale exists for provision of SDI services for the key S&T areas mentioned above, using leased databases, as against use of SDI services provided by online database hosts or those provided by database producers.

Turn-around time for processing user queries, often the major bottleneck in batch systems, can be brought down by using EMMS systems like e-mail and file transfer. User feedback and query tuning can also be speeded up using such methods. Techniques used by 'Info Servirs' which receive user queries, formulated in restricted syntax, as e-mail messages and automatically process and send the output as e-mail, can be developed easily drastically reducing the query processing time.

Salient features of international database usage strategies is shown in Fig. 3.

Fig. 3 Utilisation of International Databases

A) Key S&T Bibliographic & Numeric Databases



B) Non Key S&T Bibliographic & Numeric Databases

Online searches carried out on relevant international databases on database hosts, as currently being carried out.

3 POSSIBLE PLAYERS

Several agencies can play significant role in improving database services. Following is a non- exhaustive list of possible players and their roles:

1. Informatics and computer agencies like National Informatics Centre (NIC), Computer Maintenance corporation (CMC) and National centre for Software Technology (NCST) (Database production, database host services)
2. Datacom agencies like videsh Sanchar Nigam Ltd. (VSNL) and Dept. of Telecommunications (DOT) Database host and communication services)
3. Major academic and research institutions (Database production)
4. National level S&T information agencies like INSDOC, NISSAT Sectoral Information Centres, INFLIBNET, TIFACLINE, UGC National Centre for Science Information (NCSI), DESIDOC, National Medical Library, and National Science Library (Database production, database host services)
5. S&T and higher education agencies like Dept. of Science and Technology (DST), Dept. of Scientific and Industrial Research (DSIR), Dept of Biotechnology (DBT), Dept of Electronics (DOE, and University Grants Commission (UGC) (Promotion, financing, coordination, and monitoring).
6. Information and database service agencies in the private sector.

5 CONCLUSION : An Action Plan

So, what should be our strategy to improve information accessibility of scientists in the country? From a close study of the alternative options mentioned above, following action plan is suggested:

A) Set up an offline database host for maintaining, i) retrospective bibliographic databases in key S&T areas, and ii) key numerical databases in S&T areas, not already covered by agencies like BTIS, NICRYS, etc. These database should be created by leasing magnetic tapes of relevant international level databases. The major objective of such a database host will be to a) provide quick access to research information, at reasonable cost, to the R&D scientists in the country and b) reduce dependence on foreign online database hosts.

Services: Two major services to be provided are SDI (Selective Dissemination of Information) and Retrospective Search Services).

Mode and Terms of Service Provision: The services should be provided in offline manner. Relevant EMMS (Electronic Mailing and messaging Systems) should be taken advantage off for reducing the turn-around time for receiving queries and delivering the search outputs. Offline services have the advantage that the royalties associated with online

access need not be played to the database suppliers and telecommunication charges will be reduced. The services should be provided on a charge basis, to recover the royalty to,be paid to the database suppliers.

Suggested Bibliographical Databases:

a. INSPEC covering Physics, Electrical & Electronic engg., computer science, Control technology and Information Technology.

b. BIOSIS covering Biological and Life sciences.

c. CA-SEARCH covering chemistry.

d. GEOREF covering geology.

e. MATHSCI covering Mathematical sciences.

f. COMPENDEX covering Engineering

g. MEDLINE covering medicine.

h. METADEX covering metals, alloys and materials.

Suggested Numerical Databases:

a. EMIS covering Electronic materials.

b. NBS THERMO - Thermodynamic properties - organic and inorganic materials.

c. Metals datafile composition designation, specifications and properties of ferrous and non ferrous metals and alloys.

d. HAZARDLINE - Details of more than 10,000 hazardous substances.

Coverage: Considering the obsolescence rate of about 5 years for S&T literature, the bibliographic databases should always reflect the last 5 years and current year. Further, the database should reflect only information that is directly and immediately useful to S&T community. For instance, one man consider to retain only publications from a core list of journals or major languages or important document types.

B)Develop databases indigeneously. One can considert two types of databases :

i. National S&T database: This database should reflect the S&T publications from India. Immediately, the Indian Science Abstracts should be made available as a database, with gradual conversion of the earlier years data. the coverage of ISA may have to be enhanced to include all document types.

ii.International level databases: Areas in which there are no international databases and where good information facilities already exist within the country, production of databases of international coverage should be taken up. We have the following examples under NISSAT programme:

1. Textiles (ATIRA, Ahmedabad)'
2. Machine tools (CMTI, Bangalore)
3. Leather science (CLRI, Madras)

If these and other similar efforts have to get international status, there will be need to increase their coverage of primary publications and improve data capturing, entry and processing procedures.

Both these types of indigenous databases should be made available for offline SDI and Retrospective Search Services, on the lines of the database host mentioned above, perhaps at much reduced charges. A major advantage of indigenous database production efforts the reciprocation of information flow. It should also be possible to make these available internationally through foreign database hosts or from within the country using gateway facilities like GPSS.

Possible success in improving research information services to S&T community in the country lies in identifying the problems and shortcoming of ongoing and proposed database service projects and efforts, evolving solutions based on coordinated approach of concerned players in the game and in implementing the solutions in a mission mode at national level.

Information Resources in Electronic Media in India

Needs - Fulfillment - Gap

Abbas Ibrahim*

Abbas Ibrahim Shajahan**

The Information needs of Indian user community is studied in detail and it is classified into two major types as Scientific & Technical Information and Commercial Legal/Corporate Management Information. In the area of scientific and technical information, electronic media with adequate global coverage by international database producers, over the past two decades, are available/accessible in India also and meets most of the information needs of Indian scientific and technical community. However, information in electronic media in the areas of Indian commercial/legal/corporate management information is not available. The information agencies in India should come forward to fill this gap, as no foreign agency would have the commercial interest in such an exercise. Recommendations are made to the policy makers to complement the international scientific and technical information databases direct most of their time, energy and resources to build commercial/legal/corporate management information databases, which the Indian user community as well as the prospective international buyer communities of Indian goods and services are really lacking.

1 INTRODUCTION

The needs of the information user community in India, and that of the international users on India, and the availability of such information in the electronic media, is the demanding factor now. The availability of information in electronic media alone is considered for the sake of its several advantages over the conventional information media. In the capacity as information consultants to various types of corporate and R&D users in India and abroad over the past 3 years, recommendations are set out at the end of the this study to the policy makers in the apex information bodies in India and to the Government of India as a whole.

2 THE NEEDS

The information needs of the user community in India are listed below. This list may not be exhaustive. Each of the heading below can be split into

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several sub-groups. However, this listing is quite comprehensive for the objectives of this study.

21 Categories of Information Needs in Subject Areas

1. Medical and Biosciences Information
2. Chemistry and Chemical Engineering Information
3. Physics, Electronics and Computer Science Information
4. Other Sciences, Engineering and Technology Information
5. Agriculture and Food Science Information
6. Intellectual Property (Patents) Information
7. Social Sciences and Humanities Information
8. Encyclopaedia and General Reference Information

22 Categories of Information Needs Pertaining to India and other Countries

1. Company/Industry Commercial Information
2. News Information
3. Law Reference Information
4. Legal Case Citation Information
5. Gazettee Notifications and Government Regulations Reference information
6. Tenders and Government Procurement Information
7. Export and import policy information
8. Export and Import Statistical Information
9. Population Distribution Information
10. Market Surveys and Market related Information
11. Who's who and Professional Manpower Information
12. Company Directory Information
13. Products and Services Directory Information
14. Trade Names and Copyrights Information
15. Financial News and Stock Exchange Quote Information

3 BROAD CLASSIFICATION

The above list of information needs of the Indian user community can be classified and grouped in several ways according to one's requirement/s. We will classify the above list into only two categories namely scientific and technical information, and commercial/legal/corporate management information.

The chief criteria for this classification is in fact the geographic spread of the primary users of these information. The scientific and technical information is something that is universally common to all the users in the world. The commercial/legal/corporate management information is country specific, and is primarily used by the people of that specific country/region, in addition to possibility of such an information being useful the foreign corporate sector also, resulting in the promotion of Indian exports.

Among all the commercial/legal/corporate management information available in the world, the Indian user community is primarily interested in the commercial/legal/corporate management information related to India and to the same extent in such information related to other countries also.

4 PRESENT AVAILABILITY AND GAP

The availability to the Indian user community of the information listed earlier is analysed for each category. First let us consider the scientific and technical information. As pointed out earlier, the scientific and technical information is universal in nature and is commonly used by scientific and technical professionals all over the world. There are several international database producers in advanced countries like USA, UK, France, Japan and Germany, who have pioneered in the filed of scientific and technical information databases, over the past 15 years. Most of these databases are accessible by Indian users also through the database vendors like Dialog, BRS, STN, Datastar, Easynet, ORBIT etc, where from the user is able to access information on any specific topic of his interest. Most of these databases are also available to Indian user in the form of CD-ROM and magnetic tapes, which enable the user to have the entire databases, in India and retrieve information on any topic of his interest, without going in for any international telecommunication network; ofcourse this can be availed only when there is heavy utility only, since the cost of such CD-ROM databases are exhorbitant in thousands of U.S. dollars.

41 Scientific and Technical Information

In otherwords, the scientific and technical information, published from all parts of the world is made available in electronic media by the international database producers. By establishing an account with the appropriate database vendors abroad, and it is possible to access them through the telecommunication network facilities that have been well establishing by our DOT. In short, we would say that the needs of the scientific and technical information user community in India is almost met by international databases, including the Indian scientific activity. About 300 Indian S & T periodicals are being already covered in these international databases. Anyhow, when the targeted National Bibliographic control is achieved in the electronic media, then only, the total coverage of this S & T area can be claimed for Indian documents.

42 Commercial/Legal/Corporate Management Information

When we consider the availability of commercial/legal/corporate management information, we have to keep in mind the two sub groups within it viz, the Indian commercial /legal/corporate management information and the commercial/legal/corporate management information related to other countries. Under the category commercial/legal/corporate management information related to other countries, it can be said that the information relating to developed countries is available almost exhaustively in the databases produced in their respective countries. These commercial databases, as in the case of scientific and technical databases, are accessible to Indian users through the telecommunication network and hence may be treated as information available in electronic media. The commercial/legal/corporate management information related to developing countries is available to a very limited extent in the international databases to the extent they relate to the international business community. None of the developing countries have an exhaustive national database of commercial/legal/corporate management information. India is not an exemption to this.

When it comes to Indian commercial/legal/corporate management information in electronic media, as in the case of any other developing country, the situation is really pathetic, and both the Indian and international information users are left to grope in the dark. As mentioned about the developing countries, the Indian commercial/legal/corporate management information are available in the international databases to a very limited extent only. The international commercial databases producers are no where to be blamed for this situation, since they are operating within their well defined boundary and interest of their own business community. It would not be out of place, if we mention here that the information needs of Indian business community is not at all covered in the electronic media, which is a major handicap to the Indian industry, for taking shrewd and effective business decisions and for expanding their export operations. This is the major gap that should be filled to lift the Indian business community out of "groping in dark" state to a healthy competitive and progressive level, in this ONLINE AGE.

5 RECOMMENDED ACTIONS

It is beyond anybody's doubt or question that the information systems in India are trailing behind the advanced western world by more than 10-15 years. While formulating an information policy for India, at such a late stage, it would be quite unwise to start on the same steps as followed by these advanced countries, two decades ago. Now in India, primary importance should be given to filling the gap over any other requirement, taking into account the latest facilities available internationally and rightly owning it for India. Based on the above discussion on the needs and availability, we would like to make the

following recommendations to the information policy makers of India, to fill the gap and to improvise the information system in India. In the recommendations, it may be observed that priority is given for the gap filling activity first, over the actions needed to improvise the service for making it cost effective.

1. For the purpose of planning and fixing priorities, stop the act of duplicating in India the scientific and technical databases. that are already available internationally in a comprehensive manner covering more than 20-30 years of the past.

2. Establish a National Information System for Commerce (NISCOM) in the line of NISSAT, established for science and technology. The NISCOM may be initiated and sponsored by the Ministry of Commerce.

3. Channelise all the time/energy/resources available at the disposal of the newly proposed NISCOM, in building up exhaustively the commercial/legal/corporate management information databases for the use of Indian industries and their counter parts abroad.

4. Simultaneously encourage private sector to start the commercial/legal/corporate management information database production activities, by extending subsidies by the Ministry of Commerce.

5. Create a national marketing channel in India in public sector, for bringing all the international databases under public domain, so that any user can access the databases through the Indian national data networks like I-Net.

6. Encourage private sector by providing grants/subsidy to set up information marketing establishments (database vendors) to bring all the scientific and commercial databases under public domain, for competing with the public sector marketing channel. The marketing establishments shall also be offered concessional tariff on the telecommunication facilities required by them. The licensing or royalty fee payable in foreign exchange to the international database producers shall be readily approved in consideration of the speedy technology transfer, industrialisation, and export promotion objectives formulated for India.

7. Information professionals in India should take initiatives to complement the international scientific/commercial database producer's activities by coordinating with them to increase the coverage of information published in developing countries, especially in India.

8. As the commercial viability of producing and marketing a database greatly depends on the number of users for that database, in the initial running period, the private sector database producers and database vendors shall be provided with subsidiesed tariff for telecommunication charges, by the appropriate government agencies.

9. Lot of market promotion, awareness and training programmes are to be conducted at national levels, and at state capitals level by using all

types media in order to introduce the new online information concept among the needy user, since this is forming the required basic infrastructure for speeding up industrialization of India.

10. A National apex statutory body in the model of British Library System shall be created for India, to plan, organise, co- ordinate and execute the National Bibliographic Control (NBC) target for India, so that all database creation work in India can be regulated without any duplication.

11. At present there is no national consensus for a uniform information policy for India. NISSAT is for science and technology area only, and it cannot help to achieve NBC, which includes social sciences also. For bringing S&T part of the NBC in electronic media, even the ten year old NISSAT has failed. We have to initiate a fresh a new national information policy to cover S&T and social sciences, on an equal footing.

Information Services for Third World Countries with Special Refrecece to India

Alexander Abraham*

Explains various information services and impediments to the use of information services by developing countries. Briefly mentions the information services in India.

1 INTRODUCTION

The national bodies of developing countries have shown great interest in setting up libraries and information centres.

Information service is considered as a national responsibility. There is a great demand for better services from the users and a qualitative improvement in education. This has increased the responsibilities and opportunities for information services only. Unconventional systems of education are available to those who like to study outside the formal education. Therefore, information services to play have a vital role in educational activities. A constant flow of information helps to keep abreast with latest developments in one's field.

Many of the developing countries lack basic data for various information services and communication and other facilities to support a programme for the development of information services. Most of the developing countries are faced with high cost and inadequacy of telecommunication, postal and transport systems.

2 COMPLEXITY OF INFORMATION SERVICES

Information service is a service provided by any library or Information Centre drawing attention of the users to information in anticipation and on demand.In the modern age, handling and transfer of information are highly complex. The conventional methods of bibliographical control are not able to keep pace with this complex situation. New techniques have been evolved in processing and storing of information quickly and efficiently. This has helped in overcoming the information explosion and to provide relevant information to the users economically and in time. The latest developments in computer technology and telecommunication, including communication by microwave systems satellite,etc. have helped to introduce sophisticated techniques for information processing.

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3 IMPEDIMENTS IN THE USE OF AVAILABLE INFORMATION SERVICES

The developing countries face a number of impediments in accessing and using information. Due to lack of information whatever decision is taken are based on incomplete information. Most of the enquiries are unanswerable. This may be due to paucity of funds, documents, problems of space, and staff to compile and maintain necessary indexes and files. Resource sharing also becomes difficult in this context. Further there is less facility for cooperative stock building and operating clearing houses.

31 Rise in Price of Scientific Literature

The prices of scientific and technical literature published from commercial agencies show upward trends. These may be due to the growth in volume, development costs of some devices and due to global inflation. Manual information search has become time consuming, expensive, complicated and lengthy. The cost of national and commercial information services such as magnetic tape service, abstracting service, literature on microfiche, literature search services etc. are growing up. The rise is proportionately higher in poor countries. Many scientific and technical documents are becoming unobtainable due to their cost. So the scientific and technical information centres of all developing countries have to cut off the main sources through which they could obtain access to information.

32 Trading Barriers

The major obstacle t access to information by developing countries is the shortage of foreign exchange. The UNESCO Book coupon scheme was implemented to lesson these difficulties to some extent.

33 Geography

The transmission of information to distant places is costly and requires effective communication.

34 Language

Language is an obstacle to effective use of information services. Translation is a necessity and will add to the cost of world wide scientific information services.

35 Information pollution

The rapid growth rate of information is causing information pollution. Modern information transfer technology encourages the storage and retrieval of all sources of documents.

36 Duplication of Research

Unfortunately too much information may end in rehash. This is due to

irrelevant duplication of research due to lack of communication of information.

37 Inadequate Coverage

UNESCO has recognised the need to improve the coverage of new scientific information. An international coverage of information through abstract services could improve the accessibility of new scientific information organisations like UNESCO, WHO and other UN agencies are trying to implement a worldwide network of information with the help of computer and other transmission equipments.

38 Conference Proceedings

There is lack of any organised arrangement for dissemination of proceedings of scientific congresses and conventions. Various papers, printed documents and reports have a high value. But it is difficult to obtain a detailed bibliography of conference papers from the sponsors.

381 Time Lag

Abstracting service of published literature with modern technology helps to reduce the time lag in dissemination of information. Translation facilities are not keeping pace with the demands.

382 Software

Readymade programmes may not fit in with the user's purposes. It needs modifications. Today the developing nations have to look for programmes offered by the software vendors. Technical and market experiences are needed to establish computer systems and software.

4 MANPOWER PROBLEMS

Information services require highly competent personnel. Advanced countries use modern technological devices and management techniques to save labour costs. This is to be considered seriously in developing countries.

5 HOW TO SOLVE THE IMPEDIMENTS

Appropriate educational and training centre should be built up

in information handling and dissemination There should be proper facilities for exchange of computer Barriers such as customs regulations restricting movement of equipments, tapes and discs should be removed.The quality of data should be improved.

There should be appropriate means for exchange of technical informations, teaching materials and so on.

6 INFORMATION SERVICES IN INDIA

Details of a few institutions providing information services in India are given below:-

Central bodies like INSDOC, DESIDOC, Libraries and information centres of BARC, IARI, MNL, ISI and ICSSR etc.

Science government departments like Indian Meteorological Department, the Geological, Zoological, Botanical and Anthropological surveys of India and various research establishments and state government departments of Agriculture, Forestry, Public Health, Animal Health, Transportation etc. Academic institutions like centres of advanced teaching and training in Science and Technology like Universities, IISc, IITs,ISI etc. Private institutions and industrial establishments.

Many of the organisations render conventional services. It includes issue of additions list, subject bibliographies, list of special publications, documentation lists of current literature, current awareness list etc. Some institutions also provide selective dissemination of information services.

7 DEVELOPMENT OF COMPUTER - BASED INFORMATION SERVICES

The first attempt in this direction was made by INSDOC in 1964. INSDOC has made use of computer for data collection and processing for Union Catalogue of Scientific Periodicals.

BARC, Bombay has used computer for catalogue of technical reports. It functions as an input centre for INIS and develops information retrieval system for INIS data base.TIFR, Bombay has started a programme to prepare their library catalogue.IIT,Madras has designed programmes for a machine readable Open Public Access Catalogue.

8 NATIONAL INFORMATION SYSTEM FOR SCIENCE AND TECHNOLOGY

NISSAT was aimed to develop an integrated information system for the country. It came into existence in 1977. NISSAT is considered as a flexible system. It could function at several levels.

1 National Centres of information in Science and Technology

2 Regional information centres and branch information centres

3 Local information centres

NISSAT has planned to develop 15 branch information centres at various CSIR laboratories and other institutions in various subjects. Further NISSAT anticipates to establish move information centres for subjects which are not

already covered.

9 UGC PLAN FOR REGIONAL CENTRES

UGC is establishing a network of University Libraries (INFLIBNET)

10 CONCLUSION

The information requirements for the third world countries are special. The developing countries should not solely depend on imported technology. They should design and develop alternative systems. The technology should be well suited to the changing conditions and needs of the countries. A third world country should design a network in which individuals or groups of centres could generate and use information services.

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Interaction Between Institution and Industries:

Information Programmes and Service in K.R.E.C. Library

S Muddu Moolya*

M M Koganurmath**

Explains the organizational and functional infrastructure of information services to industries. The various steps taken by Karnataka Regional Engineering College (K.R.E.C) Library in planning information programmes and resource sharing service are explained.

1 INTRODUCTION

It is evident from the published literature that the explosion of technical information is like that of nuclear power. At the same time, the population of scientists and engineers in the developing countries like India has been increasing at rate of 2.5% which is higher that t#e rate of growth of world publications. To enable them to keep abreast of current developments in industry, information and communication systems should be managed and organised in a systematic way.

Information sought by engineers and technologists in industry is not merely to advance the general state of their knowledge in their respective subject fields, but to get sound engineering and technological answers to the extremely complex and difficult problems that lie at the front of their day to day work. This needs transfer of latest technological information to industries by the libraries in engineering and technical institutions.

2 OBJECTIVES

The main objectives are as follows:

1. To promote interaction between industries and technical institution;
2. To update the technological information;
3. To help the engineers and scientists in keeping abreast of current developments;
4. To exploit and utilize maximum the resources of technical information;and

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5. To re-orient technical education according to the needs of the industries.

K.R.E.C. Library has taken up this service for the benefit of industries in its neighbourhood as shown in the Fig.(1). It is proposed to provide computerised information services to the industries for their research projects. The service like current awareness services and selective dissemination of information will be provided.

3 LINKAGE OF INDUSTRIES AND INSTITUTIONS IN RESOURCE SHARING

Research activities are undertaken rigorously and vigorously in modern times. All the nations have entered a rat race to obtain superiority over each other in research, particularly in Science and Technology. In Science and Technology alone, the best available estimates indicate that there are now about 75,000 journals and that the number is steadily increasing at a compound rate in the range of 2 to 4 percent a year. This growth in number and size of documents has created many problems for libraries. Self sufficiency in libraries is not possible at all in such a state of affairs.

The Central and State Governments in our country are encouraging research and development programmes through technical institutes, R&D Centres etc. Scientists and research scholars are engaged on R & D in these institutions. But most of the research results are not made use of in practice because of lack of support by the industries. Many a time, industries are also not aware of such research activities which may be useful to them. So by interaction between institutions and industries: (i) the industries can improve their technology and (ii) the scientists will be encouraged to continue further research. It is, therefore, more advisable that interaction between institutions and industries are brought about in developing countries.

Karnataka Regional Engineering College Library is trying to bridge the gap between the institutions and industries. The various steps as programmed by Karnataka Regional Engineering College Library are shown in Fig.(2). Under this programme library links its resources with industries by three levels of linkages:-

(i) Up-stream linkage

(ii) Collateral linkage

(iii) Down-stream linkage

In the first step, it links its database with other National Institutions like I.I.Sc., I.I.Ts, INSDOC, R & D Institutions. This is possible by joining the National Network System.

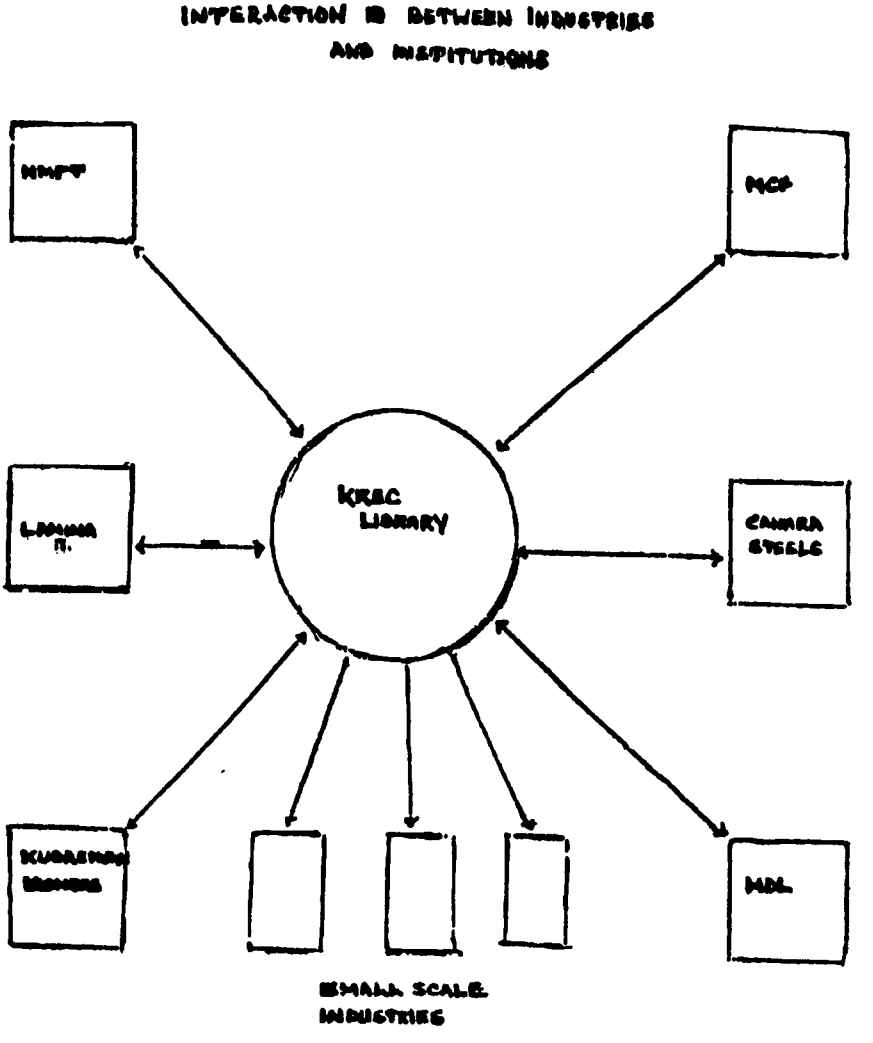

INTERACTION BETWEEN INDUSTRIES AND INSTITUTIONS
KREC LIBRARY
SMALL SCALE INDUSTRIES

Fig. (1)

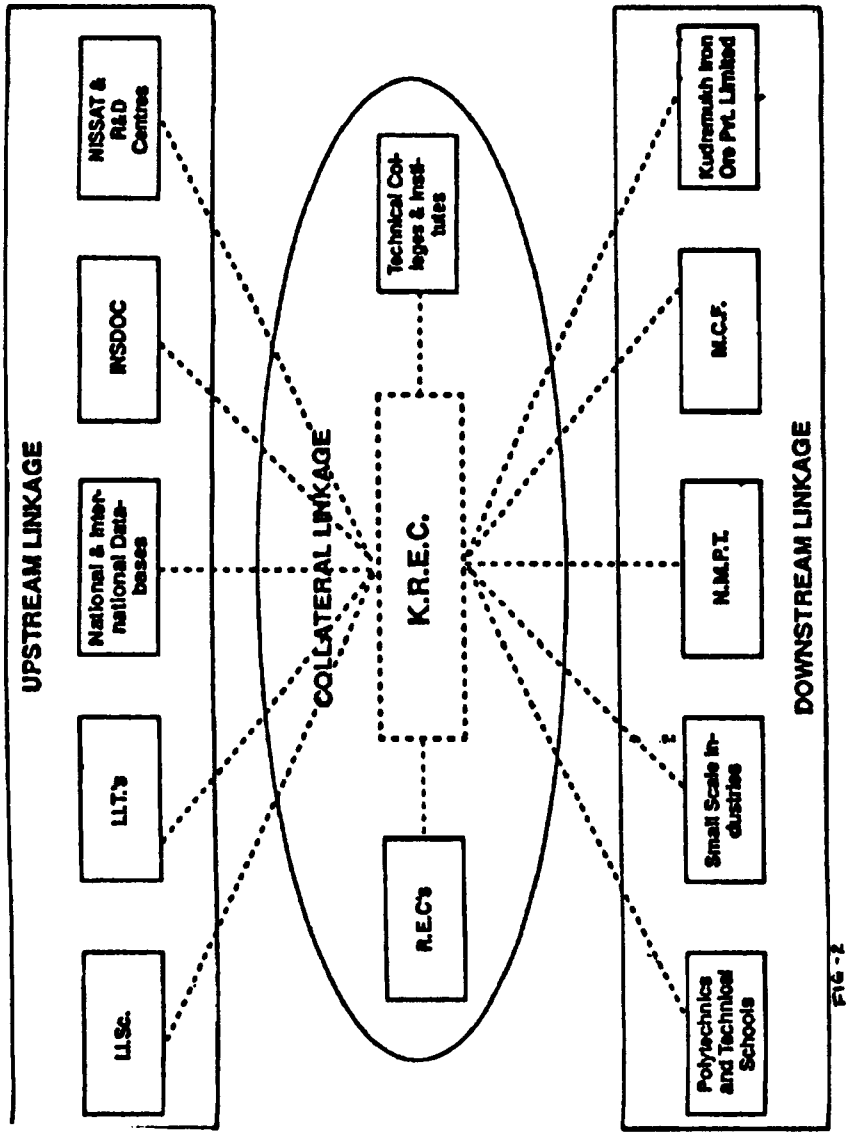

UPSTREAM LINKAGE
I.I.Sc.
L.I.T.'s
National & International Databases
INSDOC
NISSAT & R&D Centres
COLLATERAL LINKAGE
R.E.C's
K.R.E.C.
Technical Colleges & Institutes
DOWNSTREAM LINKAGE
Polytechnics and Technical Schools
Small Scale Industries
N.M.P.T.
M.C.F.
Kudremukh Iron Ore Pvt. Limited

FIG - 2

Under the second step, the library share its resources with other equal status institutions like R.E.C.'s Technical Colleges etc.

Under the third step, interaction between Industries and Institutions can be established through Karnataka Regional Engineering College Library. In this programme, all neighbouring industries like small scale industries at Baikampady, Mangalore, Chemical and Fertilizer Company, New Mangalore Port etc. get benefited and therefore the library can bridge the gap between the researchers and users of research. This enables the library to provide services like Selective Dissemination of Information, Current Awareness Services, Document Delivery Services etc.

4 CONCLUSION

The technical institute's library now serves as a learning resource centre. Proper attention must be given to inducting new technology in all aspects of information handling and transfer of information to industries. Providing information linkage among universities, technical institute libraries and industries by setting up local, regional and national networks are necessary for overall development of the country.

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3 **MUDDUMOOLYA (S).** *Planning and development of computer system for Karnataka Regional Engineering College Library. Mangalore University . M.Lib.Sci. 1991. (Unpublished)*

4 **TALAWAR (V G).** *Structural approach to collection development in technical institute. Workshop on collection development of libraries and use of engineering to literature in science technical institute, Surathkal 1986.*

National Policy for Agricultural Lib. in the Perspective of Inf. Base for Agricultural Lib.

Arun Kumar Chakraborty*

Stresses the need for building up a network of documentation and information services in the field of agriculture and allied areas. Delineates an information base for agricultural policy. Enumerates categories of information and data requirements, information collecting agencies, important documents as sources of information relating t agriculture. Mentions briefly what should be a national policy for agriculture.

1 Introduction

About 80 percent of India's population lives in villages and the information services which are being developed are aimed to serve the larger national goal of improving the quality of rural life. From the sixth five year plan, highest priority has been accorded to agriculture and rural development. Hence, the information services are also being planned to cater to these needs and the accent is towards information services and data about agriculture, rural based, cottage and small scale industries to serve rural areas.

The need for the formulation of a national policy on library and information system has been engaging the attention of the Indian library profession since the 1950's and Ranganathan's recommendations on the UGC Library Advisory Committee Report, 1958. It began to receive the active attention of Govt.of India in the early 1970's and it was the principal objective of the Raja Rammohan Roy Library Foundation established in 1972.

The National Information System for Science and Technology (NISSAT) was established in 1977 and library services in India began to expand rapidly. India also recognised the problems of scientific communication within the field of agriculture had reached serious proportions due to the phenomenal growth of agricultural literature in the world.

Objectives of National Policy

Library and information sources are vital for all sectors of national activity. The availability of information data, expeditiously and pinpointedly and exhaustively, supports all decision making process at all levels. Relevant information accelerates the pace of national development.

Information needs of the users in the country should be met by the establishment, maintains and development of different branches of agricultural

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subject libraries and national documentation/information centres.

Manuscripts are important treasures of agricultural subject and indispensable documents for indological research. An effective programme should be adopted for the conservation, documentation and exploitation of these valuable resources. There is a strong and urgent need for building up a national database for agricultural and related areas. The agricultural libraries should assist in this work. Efforts should be made to assure access to all significant Indian documents at home or abroad to Indian researchers.

2 INFORMATION BASE FOR AGRICULTURAL POLICY

21 Objectives

Enough availability of agricultural commodities to consumers at reasonable and stall prices, simultaneously protecting producers interest.

22 Policy

Short term, medium term and long term policies.

23 Approaches

Given the aim and time period different approaches to achieve the target (aim) are possible. eg. should food grains be stored or imported?

24 Data

Type of information depends on

a. Policy Period: (Short, Medium, Long term)

Rainfall, cropping patterns and prices, technology.

b. Approaches: (Inward or outward) buffer stocks import.

c. Supply/Demand sides.

25 Seekers

Policy makers in the Government; planner, researches, economics, scientists, sociologists, social anthropologists.

26 Government's Concern

a. Desired growth in agricultural production,

b. Structural changes within agricultural sector (employment wages, regional disparities, etc.)

c. Agrarian features (land ownership, operation, leaving in/out etc.)

27 Nature of Information

a. Value and composition of agricultural products over short, medium and long term.

b. Input output relations

c. Technology

d. Trade Flows: Volume and Composition

The other types of information required for various activities in agriculture and allied areas are as follows:

1. Data requirements (Annexure 1)

2. Information Collecting agencies (Annexure 2)

3. Important Documents and sources of information (Annexure 3)

4. Reliability of Information Sources (Annexure 4)

3 Manpower Development and Professional Status

In view of the rapidly expanding library and information services and the fast changing character of library and information sciences, the development of manpower in a planned manner becomes essential. High performance standards should be maintained by incorporating advancing information technology by universities and compatible institutions of library and information science.

Post-professional training courses may be undertaken by other appropriate agencies, but care must be taken to ensure uniformity and quality of such training all over the country.

In view of the challenging and dynamic situation in the profession, the Indian library and information professional must be given every facility to refresh his/her expertise, so as to keep abreast of advancing knowledge by a planned development of continuing education programmes in the field.

Accreditation agencies need to ensure t#e standard and the quality of the training imparted.

Library and information science professionals should be given the status and pay scales as well as academic status commensurate with their responsibilities with due regard to the fact that every library is an academic/research centre and has to function as such.

4 Modernization of Agricultural Library and Information Systems

In the context of advances in information technology modernization of library operations and services, will be the country's primary concern in increasingly productivity and efficiency, improving speed of delivery of science, optimum utilization of available resources and facilities and overall cost effectiveness.

To keep pace with advancing electronics, computer technology, telecommunication and reprography and micrography technology, all of which are needed for future library work, new systems compatible with Indian conditions must be developed.

Encouragement should be made to development of application software packages for library and information activities for use in indigenously manufactured computer systems.

Local Library and information networks has to be supported for practicing resource-sharing. These local library and information networks can be utilized for evolving national library and information network. Such developments will enable library and information centres to have local, regional and national inter-library cooperation, optimum utilization of present resources and facilities and resource sharing. Any user should have really access to documents/information awareness he/she is located. This will also contribute to overall cost effectiveness, as development of resources and facilities in individual libraries and information centres beyond a threshold limit will be attempted nationally.

Low cost copying services through provision of reporgraphy and micrography facilities should be available in major libraries so that document back-up could be provided.

Space problems for storing materials can be saved by the compaction of library and information material by increasingly resorting to acquisition of microform media, magnetic tapes, video discs, etc. whenever possible.

Development of application software packages for provision of information services in Indian languages for rural areas to serve neo-literates, post-literate students of open universities etc. as a supplement to national TV.network.

New techniques like videotext and teletext provide ample opportunities for disseminating information experimented, with a view to study their impact on the society and on the mechanism of their introduction.

5 NATIONAL AGRICULTURAL POLICY

A national agricultural policy is required for covering the following aspects.

1. Allocation of responsibilities to organizations for building up strong collection in agricultural fields.
2. Ensuring that there is in the country at least one accessible copy of every worthwhile scientific publication on agricultural subjects for use by the agricultural scientists.
3. Development of facilities for providing information services to all scientists, researchers who are dealing with agricultural science and related areas.
4. Establishment of a data bank for the agricultural statistical information.

5. Organisation of a national facility for supply of reprographic copies of documents on request.
6. Establishment and development of agricultural subject- oriented national information guides.
7. Establishment of national referral centre(s) to direct users existing information sources.
8. Preparation of national union catalogues of holdings of agricultural libraries.
9. Establishment of regional dormitories for sorting order material weeded out by service libraries.
10. Promoting the use of microfilms and microfiches of documentary.
11. Creation of information consciousness among users.
12. Undertaking periodical surveys for accessing information needs and uses in the country
13. Collaboration with national and international organizations engaged in information services.
14. Building up translation facilities in various languages
15. Building up adequate reprographic facilities in information handling
16. Building up of expertise and training facilities in information field for adequate number of persons in documentation, information sciences, communication, computer science, reprography and translation.
17. Building up adequate computer facilities for information handling
18. Ensuring that the service conditions of the information personnel are on par with those of scientific personnel.
19. Sponsoring conferences, symposia, seminars, workshops etc. in agricultural sciences.
20. Supporting information projects in agriculture and related areas.
21. Supporting research programme in agriculture and related areas

6 CONCLUSION

Isolation is the common and abiding factor as far as Indian agricultural libraries are concerned. To break this isolation the nation requires a national network within which will be accommodated libraries of different kinds of agricultural libraries and at different levels of the rural society to the modern city.

The establishment of such a network is very much necessary. In order that libraries and information centres should develop their resources in a

well-planned and coordinated manner, they should develop various programmes of mutual co-operation and resource sharing. This will lead not only to make the best utilization of their finances and other resources, but would also meet the varied and complicated information needs of their users in more effective manner.

The library should be linked with its community and this linkage can only become effective when the user is educated through regularly arranged programmes in the various kinds of services to be expected form the library. Such linkages should also assist the library in continuously increasing the utilization of its resources.

The user should be allowed free and unrestricted access to library resources as possible and in doing so losses of documents may occur. Such losses should be guarded against as best a library can. But ultimately the librarian should not be held responsible for the losses which could not be avoided.

There is a need for formulating standards for different areas such as staffing patterns, building and equipment, goals, techniques, hardware and software etc. and for that purpose recommends that necessary steps should be taken for formulate guidelines for different types of libraries and information centres.

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2 **Data Base of Indian Economy** *Vol.2 Role of sample surveys Stat. Publ. Society 1975.*

3 **KIRITCS S P** *A computerized information system for agricultural sector in the Indian Journal Agricultural Economics, Vol.32 (1), 1977.*

4 **SALUJA M R** *Indian official statistical system State Publ. Society. 1972.*

DATA REQUIREMENTS

1. Land utilization (GCA, NSA, Forests, Fallows)
2. Cropwise acreage : cereals, pulses, commercial, industrial etc.
3. Irrigation by sources (Tasks, ells, cereals etc.) (Net)
4. Irrigation by crops (Gross)
5. Multiple cropping
6. Seed variety wise crop acreage
7. Yields of crops
8. Production cropwise
9. Fertilizers and other agro-chemicals and organic manure.

10. High yielding variety seeds
11. Rainfall
12. Soil characteristics
13. Crop seasons: Khariff, Rabi, Peanuts, Perennial
14. Farm sizes and holdings
15. Land ownership and operation : tenancy and crop sharing
16. Mechanization : tractors, crushers, pumpsets etc.
17. Human labour : hired, family, labour
18. Animal labour : Bullocks, cattle's etc.
19. Investment : Public : dams, tasks, fertilizer, factories etc. Private: Wells, land reclamation etc.
20. Credit : banks, land lords, Marwaris etc.
21. Marketing facilities : transportation
22. Wages : Payments to labour
23. Prices : output prices, input prices
24. Cost and cultivation : different costs
25. Returns and farmers : value of products, bye-products and net profits, savings and duties.

INFORMATION COLLECTING AGENCIES

1. Directorate of Economics and Statistics. Ministry of Agriculture (MOA) Government of India (GOI), New Delhi.
2. Directorate/Bureau of Economics and Statistics, State Government (DBES)
3. District Statistical Offices and field staff of revenue departments
4. Central Statistical Organization (CSO), Ministry of Planning, GOI, New Delhi.
5. National Sample Survey Organization (NSSO), New Delhi.
6. National Council of Applied Economic Research (NCEAR), New Delhi.
7. Institute of Agricultural Research Statistics (IARS), New Delhi.
8. Indian Council of Agricultural Research (ICAR) New Delhi.
9. Reserve Bank of India (RBI), Bombay.
10. National Bank of Agriculture and Rural Development (NABARD), Bombay.
11. Agro-Economic Research Centres (AERC), at several centres.

12. Fertilizers Association of India, (FAI), New Delhi.
13. Programme Evaluation Organization (PEQ), Planning Commission, GOI, New Delhi.
14. Agricultural universities in India
15. Food and Agricultural Organization (FAO), Rome, Italy.
16. India Meteorological Department (IMD), New Delhi etc.

IMPORTANT DOCUMENTS AND SOURCES OF INFORMATION

1. Estimates of area and production of principal crops in India (DES)
2. Season and crop reports (DBES)
3. Statistical abstracts (CSO)
4. Indian agricultural in brief (MOA)
5. Agricultural situation in India (DES)
6. Fertilizer statistics (FAI)
7. Bulletin of food statistics (DES)
8. Sample fertilizer trials data of ISAR
9. All India rural debt and investment survey (RBI) (earlier known as rural credit survey)
10. Fertilizer use in agricultural holdings
11. India crop calendar, (DES), (Soils, seasons)
12. Rainfall data from IMD
13. Supply utilization accounts (FAO)
14. Farm harvest prices
15. Rainfall and cropping patterns, National commission on agriculture (NCS-1976), (MOA)
16. Report of the irrigation commission
17. Report of the NCA (1976), (MOA)
18. Agricultural productivity in eastern India, RBI (1984), (Assam, West Bengal, Bihar, Orissa)
19. Indian agricultural statistics : statewise, districtwise (DES)
20. Agricultural wages in India (DES)
21. Indian numbers of wholesale prices in India
22. Indian Livestock census (DES) etc.

RELIABILITY OF INFORMATION SOURCES

a. Production : For 27 forecast crops estimated by DES. At various stages

of growth, different estimates are released. Number of estimates are released. Number of estimates released differ form crop to crop.

i. ***Consistency*** : Production versus consumption estimates

ii. ***Reliability*** : Different estimates of yield, area and production put up be different sources : DES, NSS (SIE why), NSS (A.S. wing), different commodity boards (tea, coffee, rubber).

b. Fertilizers : FAI provides the data. Also the cross section surveys by NSSO and NCAER for two different years.

i. No inventory date with distributors and farmers.

ii. No cropwise application date

iii. No data on private transport form place to place

c. HYV : Field staff of state agricultural departments collect data. The actual basis for their estimation is not clear. It is roughly based on norms like seed/hectare and seed quantum sold. But for some crops (paddy, wheat etc.) seeds can be produced by farmers themselves.

d. Credit : RBI conducts periodical comprehensive surveys. Also commercial bank provide data on loans extended.

e. Yields : Crop cuffing experiments (surveys) provide yield estimates. Regarding inputs no data are collected straightaway from farmers. However, ISAR's crop improvement programme and national demonstration programme generated a large number of input-output data based on simple fertilizer trials (SET) on various types of land :

i. Data on non-cereal crop are relatively spare

ii. Water variable effect (quantum and timing of water on yield responses is not adequately captured in those trials.

iii Difficulty in deriving meaningful estimates of average responses : experimental conditions versus actual field conditions.

f. Rainfall : IMD provides monthly rainfall data in mm. collected from 35 meteorological observatories (sub-divisions) all over India. Data are available for more than 100 years.

g. Land Ownership and Operation: Several surveys exist (NSSO, RBI) at national and state levels. These are decennial cross surveys (FMS) of the MOA deal with only specific areas. Similarly studies by PEO and some universities deal with only specific areas.

i. Lack of uniform coverage : NSSO, RBI deal with a few aspects of the land distribution over the entire country. FMS etc. deal with many aspects of the farm economy but in a limited area.

ii Land Leased - in total is not equal to land leased out total.

iii Available only for a few selected years

h. Prices: Procurement, support, ration (ISSUE), wholesale, retail, harvest and so on. Some of them are set by Govt.(CACP) and some by market.

i. Public and Private Servants:

Public : Govt. records provide the data

Private : i Funded by loans from commercial banks can be obtained from bank's records

ii. Funded from own resources are not easily available. RBI surveys collect such data only once in a while and not on annual basis

j. Mechanization : Indian livestock census provides some details. Also RBI's credit surveys.

k. Soil : Indians crop calendar provides data for different districts in different states

l. Costs of Cultivation: Several Govt.bodies, autonomous institutions (ICAR, NCAER etc.) and individual researchers collected data through sample surveys for some crops in some states. These are two aggregation in nature and reliability to yet to be established.

National Science Library - Its Place in the S&T Information set up in the Country

A Joseph*

C M Ramani*

Examines the scope and objectives of the National Science Library. Traces its development. Examines its acquisition policy relating to monographs, conference proceedings, reports, theses and periodicals. Makes suggestions for strengthening its collections to meet the users' needs and to provide quick and efficient document backup service.

1 CONCEPT

A national library is a symbol of the country's heritage and it has a prestigious place in the history and cultural tradition of that country. But in the modern context of information explosion, it is impossible to cover the entire spectrum of all publications and functions. Therefore, the concept of a national library as a gigantic mono-lithic institution has undergone a sea change in the recent times. Instead of a national library, national library systems are talked of. Many countries have now established national agricultural libraries and medical libraries. Some countries have established national science libraries in addition to these specific subject libraries. National Library of Medicine and National Agriculture Library of USA. Canadian Institute for Scientific and Technical Information and Australian National Science and Technology Library are some examples.

2 INDIAN SCENE

The National Library founded in 1891, as elsewhere, emphasises on humanities and social sciences. However, the responsibility of building up separate scientific collection relevant to R&D activities fall on individual scientific societies and institutions. The institutional libraries like those of the Asiatic Society of Bengal, Indian Agricultural Research Institute, the Indian Institute of Science, Indian Association for Cultivations of Science, Geological, Botanical and Zoological Surveys of India hold rich collections. The quantum jump in the establishment of institutions which the various science agencies, universities, Institutes of Technology, Industrial undertaking witnessed in the post-independent India further strengthened the country's document collections. The number of institutions holding rich S&T collections is estimated to be over 1000. Though these collections are primarily and specifically to serve their respective

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* National Science Library, INSDOC, New Delhi. The opinions expressed in this paper are those of the authors and do not reflect any official policy.

institutional clientele, their place in a national information set up and their exploitations for the total national good cannot be ignored. Any plan for the national science library has, therefore,to take cognizance of this fact.

3 ESTABLISHMENT OF NATIONAL SCIENCE LIBRARY

The need to establish National Science Library (NSL) was emphasised in a number of conferences of special librarians, documentalists and information scientists including the Conference of Information Scientists held in Mysore in 1963. The Working Group on Dissemination of Science Information of the Fourth Plan of CSIR has also recommended the establishment of National Science Library. A panel on Scientific Information of National Committee of Science and Technology had recommended establishment of the National Science Library on the lines of the present British Library Document Supply Centre at Boston Spa, to offer a wide base for all Scientific Information activities. In the Science and Technology plan of the country, the project finds mention under the NISSAT program (Governing Body of CSIR 64th Meeting Proceedings). The proposal to establish National Science Library was approved by the Governing Body of CSIR in its 64th meeting in Oct. 1974. The Planning Commission has included the proposal in 1976-77 and the Finance Ministry cleared the proposal in Dec. 1977 (75th meeting of the GB of CSIR).

A nucleus of the NSL was formed in 1964 itself with the collection already built up by INSDOC. It was then housed in the National Physical Laboratory (NPL). This collection was shifted first to the PID-INSDOC building adjacent to NPL Campus, then to the Jawaharlal Nehru University (JNU) Campus, and finally moved into the new building of INSDOC in 1983.

31 Present Collection

The library's monograph collection is as follows:

Reference volumes	10,000
Indian books	7,000
Russian books	28,000
Foreign books (other than Russian)	14,000
University theses, conference proceedings, S&T reports, U.N.publications, etc.	6,000

The present intake of serials is 3,397 of which 1,546 are Indian and the remaining 1851 foreign. The total serials collection in NSL will be about 65,000 bound volumes.

4 OBJECTIVES OF THE NSL

The original intention was to establish NSL initially as a part of INSDOC to be later developed into a separate full-fledged institution under the CSIR.

The functions assigned to NSL initially were:

1. to build up a collection of materials as would be necessary for offering documentation services on a national scale;
2. to survey the holdings of scientific organisations in the country and supplement the lacunae in the collection by acquiring them;
3. to launch a cooperative acquisition programme of materials relevant to the national laboratories, locating the materials in the actual places of use but integrating the information through a national union catalogue;
4. to act as a centre of exhaustive information on documentation and library techniques:
5. to make special efforts to collect Indian Imprint in Science & Technology including in Indian languages;
6. to act as a dormitory for housing very old periodical runs;

The set objectives are fit for a library to be national in scope; but comprehensive as they are, these objectives will cost a huge sum in the present context. For example, objective No.2 and 3 despite being somewhat vague have a very heavy financial implication. Further, the history of cooperative programmes reveal that it will be futile to rely on these for any success. In any cooperative acquisition programme, it is necessary to subjugate one's own priority for the sake of common cause. This, no institution is prepared to do. Therefore, while sharing existing resources is a target one can work for, cooperative acquisition is a wild goose chase. Therefore it is pragmatic to have a limited number of objectives and NSL's acquisition policy should be tuned to achieving these.

5 ACQUISITION POLICY

Let us consider the policy to be followed by NSL in acquisition of the following types of material: 1) Monographs; 2) Conference Proceedings; 3) Reports; 4) Theses; 5) Periodicals.

51 Monographs

We may consider monographs in two parts: a) Indian monographs and b) foreign monographs.

a) Indian monographs

The essential objective of the NSL is to build up a comprehensive collec-

tion of all Indian monographs. So far the NSL has collected only 12,000 Indian monographs and reference volumes which cannot be said to be a comprehensive collection of Indian imprints. The NSL should acquire all Indian monographs of excellence and scholarly nature. It should strive to fulfill this by regularly contacting all the Indian publishers in the field of S&T. The priority of acquiring Indian monographs should be as follows:

1 Books by Indian authors published by Indian publishers;

2 Books by Indian and foreign authors published by foreign publishers in India, e.g. Prentice-Hall, Macmillan, John Wiley etc.;and

3 Books by Indian authors published abroad.

Attempts should be made by NSL to acquire all monographs published by national laboratories, public undertakings, R&D institutions, universities, etc.

The NSL should collect all reference books such as dictionaries,directories, yearbooks, handbooks, encyclopaedias, etc. published in the field of S&T.

It is necessary to explore the possibility of legal deposit legislation which can be invoked to build up a comprehensive Indian collection in NSL. Through this means, we will be able to save considerable amount of money.

b) Foreign monographs

The NSL has an excellent collection of foreign monographs and reference books. It should continue its policy of acquiring foreign monographs and reference books in areas of relevance to national institutions and R&D organizations. It should pay particular attention to the monographs in the field of library and information science, so that its policy of building up a strong collection in this area is satisfied and the objective of adequately supporting INSDOC for training, research and guidance in this area is also met. Thus, it will enable NSL to be a sectorial centre for Information Science Literature.

52 Conference Proceedings

The NSL has acquired 1,600 conference proceedings so far. This collection represents only a very small part of the conference proceedings published in India and abroad. The Index to Scientific and Technical Proceedings (ISTP) published by Institute of Scientific Information, Philadelphia estimates that about 10,000 conferences are held every year. The Index to Conference Proceedings acquired and brought out by British Library Document Supply Centre (BLDSC) lists about 18,000 conference proceedings annually. This brings to focus the enormity of the problem and the inevitability to limit the scope in collecting conference proceedings.

The NSL should strive to acquire all the proceedings of national, regional

and international conferences, held in India. It should selectively acquire conference proceedings from abroad. It should give priority to library and information science, thrust areas of the CSIR, technology missions, etc.

The agencies funding conferences in India should insist on an undertaking from the organisers that they would send a copy of the proceedings to the NSL.

53 Reports

One of the functions assigned to INSDOC at its inception in 1952 is to be a national repository for reports of scientific work of the nation, both published and unpublished.

India has a very strong infrastructure for S&T activities. There are over 2,000 S&T institutions. The scientific and technical reports generated from these institutions is well over 10,000. These include technical reports, progress reports, project completion reports, evaluation reports, investigation or analysis reports, etc. These contain very valuable information and would greatly help in innovation, technology development, technology transfer and in avoiding duplication in R&D efforts.

In addition to collecting and making them available from NSL as and when required, it is very important to issue a periodical covering recent acquisition of reports. This journal will provide current awareness as far as Indian report literature is concerned.

The collection of reports is a difficult task requiring a fairly large infrastructure and manpower. Moreover, the collection can be done comprehensively only through appropriate and suitable mandate from the government.

54 Theses

There are over 150 universities. The doctoral theses in pure Sciences and Engineering Sciences produced by these universities are another source of valuable information. Ideally, all these theses should be collected at one place. The National Science Library will be the best place. The University Grants Commission should help in achieving this. If, however, this is not immediately feasible, a current awareness bulletin should be started for announcing recently submitted theses.

55 Periodicals

The NSL receives almost all the Indian S&T periodicals. It should strive to identify the periodicals not received so far by it and procure them. Since the Indian periodicals received in NSL are the source for two important projects of INSDOC, viz. Indian Science Abstracts and Indian Serials Contents on Multi-Media, it should be NSL's endeavour to get all the Indian S&T periodicals.

At present, the intake of foreign serials is about 1,850 out of which only about 300 are received on subscription. The remaining 1,550 periodicals are received on exchange or gift basis.

The policy of acquisition of foreign periodicals should be determined basically by its usefulness for NSL users and for the document supply service of INSDOC. The NSL should strive to become an effective national resource centre for information services. If NSL can get about 4,000 - 4,500 journals of high use, the demand of document supply service of INSDOC can be fulfilled to the extent of 60% - 70% provided we have a back run of atleast 5 years. This is all the more necessary because the total number of foreign serials subscribed within the country has dwindled significantly over the last 10 years from a figure of 20,000 in 1980 to 12,000 in 1990. This has created a situation of increased interlending traffic in the country as well as a large proportion of demand going outside the country to places like BLDSC, progressively, the number of core journals subscribed by NSL should be increased so that the maximum percentage of document supply services orders can be satisfied locally. At present NSL satisfies only about 18-20% of document supply service orders of INSDOC. If the NSL becomes a national resource centre for information service, the document supply service orders of INSDOC will also show a significant increase and the service can be rendered quickly and efficiently reducing the response time to less than 2 weeks.

The NSL should acquire as many journals on CD-ROM as possible.

A thorough review of exchange agreements, within foreign institutions should be made in order that NSL gets only useful journals in foreign languages.

6 CONCLUSION

The Science Policy Resolution emphasises the vital role of science and technology in national development. The underlying principle is that knowledge/information contributes to generation of wealth. The infrastructures for the creation/generation of knowledge/information constitute the R&D establishments, educational institutions, etc. While the investments for the growth of these institutions have been taken care of, the investments in creation of information resources, namely books and periodicals, have not matched with the former. Had there been a clear cut S&T information policy for the country, it would have taken care atleast to a certain extent, that there is no mismatch between the growth of R & D institutions (which implies growth of R&D personnel) and the growth of library resources. The lack of proper investments in NSL is attributable to the absence of a guiding information policy. The earlier this situation is rectified, the better it would be for the country.

Networking of Libraries and Information Centres in India

Baman Parida*

Gives a brief account of the various Networks that are being developed in India using computer mediated communication facilities and of some Asian regional networks of interest to India.

1 Networks

In India the telecommunications scenario has brought radical changes for data and information network services. Several steps have been under taken to evolve systems that would offer voice data and video services through a mix satellite links, microwave links and fibre optic cables in high capacity range and satellite links, coaxial cables, radio links and wire lines in low capacity range. The future telecommunication scenario will be dominated by computers and microprocessors. However, several long range initiatives have been taken up by various organisations in India for data and information network services. The networks may be categorised as follows:

a) General networks service facilities: NICNET, INDONET, VIKRAM

b) Specialised networks: CALIBNET, DELNET, INFLIBNET, ERNET.VIDYANET, BTISNET, CSIRNET, DESINET.

2 COMMUNICATION NETWORKS

21 NICNET (National Informatics Centres Network)

This network was piloted by the National Informatics Centre, Planning Commission, Government of India, with a view to provide computing and communication infrastructure to aid planning and monitoring the schemes and decision making activities. Now its headquarters is a NEW DELHI and regional centres at PUNE, HYDERABAD and BHUBANESWAR. The state capitals have been connected with compatible computer systems of respective district headquarters. This network would facilitate flow of information among the four national/regional nodes, 32 stat/union territory nodes and 439 district nodes. At present, one satellite channel links the master and micro earth stations installed in all state and district centres. However, this network is being evolved solely as a management information systems to meet the needs of users in Government Departments and Agencies.

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22 Indonet

This is the first commercial computer network being evolved by the CMC Limited, Hyderabad. It is designed for intracity communication of data transmission. This network has adopted IBM's systems Network Architecture. In the first phase, its centres have been created at Calcutta, Bombay, Madras, Delhi and Hyderabad with the access points in the cities of Bangalore, Ahmedabad and Pune. It is expected its centres to grow to hundred within a year or two. It would operate as a STAR Network with control point at Delhi using packet switching technology for routing data from Central Station to other Centres. The Bombay node of INDONET has been connected to the international gateway of Videsh Sanchar Nigam Limited (VSML), thereby facilitating entry to Public Data Networks of other countries.

23 Vikram

It is the packed switched public data network piloted by the Department of Telecommunications, Govt. of India. This network would consist of 8 switching nodes and 12 remote access points with its Network Management Centre at Delhi. The nodes at Bombay, Calcutta, Delhi and Madras and other nodes and access points will be connected by telecommunication system. This network's transmission lines would be telecommunication channels and switching nodes or exchanges would perform the function of providing communication connection between calling subscriber and called subscriber. However, some experiments have already been under taken in the cities where VIKRAM centres are located.

All these three general data networks have taken steps in bibliographical applications. The NICNET cooperates with ICMR to offer on MEDLARS data bases and several others on CD-ROM and also with NISSAT to mount Chemical Abstracts data base. The INDONET is collaborating with INSDOC, New Delhi and the NISSAT centre at CMTI,Bangalore to create facilities for SDI and retrospective search.

Also it is planned to load NUCSSI data base on INDONET and NICNET for online search and retrieval services. The VIKRAM has already offered its infrastructure to NISSAT for pilot experimentation on library networking.

3 INFORMATION NETWORKS

31 BTISNET (Biotechnology Information Systems Network)

The Department of Biotechnology, Government of India is setting up 10 specialised information centres in genetic engineering animal cell culture and virology, plant tissue culture,photosynthesis and plant molecular biology, oncogenes, reproduction physiology, cell transformation, nucleic acid and protein sequences, immunology and bioprocess engineering. These 10 centres will be

linked through micro-earth stations. The user centres would have (PC/AT) Computer systems linked to the principal nodes.

BTISNET linking at present 9 microvax II computers at specialised centres like Distributed Information Centres (DICs) that form the base of the biotechnology information, on resources, databases in specialised subject areas and current development of biotechnology. To facilitate the access facility 14 terminal user centres are identified at various educational and R&D institutions having computer and data transmission systems. These centres will be linked to the nodes of DICs through the Department of Telecommunications' (DOT) Packet Switched Data Network facility. The entire system will be superimposed on the nation wide NICNET system taking advantage of powerful computing and the satellite communications facilities. Five of the Centres - New Delhi, Madurai, Bangalore, Hyderabad and Pune under this programme have already been linked through NICNET.

32 CALIBNET and DELNET

NISSAT has taken initiative for the development of these networks to ensure better utilisation of science and technology information resources through resource sharing.

CALIBNET is envisaged as a metropolitan network linking some 38 libraries in Calcutta metropolitan area. This network applications to be supported are: Electronic mail, file transfer, remote log-on and databases and document access. The functions to be automated by the participating libraries are: Cataloguing, serial control, acquisition and fund accounting, circulation and local user services. This networking would provide for global user services of current awareness, SDI, Union Catalogues, partial databases, and access to national and international networks. Also each participating library would collect, process and store information on local computers connected with one another through packet-switched network.On the same lines, the establishment of DELNET has been conceived for about 30 libraries in Delhi.

321 CALIBNET

CALIBNET would be in two phases. Phase-I of the network would include - Indian Association of Cultivation Science Central Glass and Ceramics Research Institute, Jadavpur University Central Library, Indian Institute of Chemical Biology, Institute of Radio Physics and Electronics, Journal Library of Calcutta University.

The INSDOC Regional Centre, Calcutta will act as the Network Services Centre and Regional Computer Centre would host the Union of databases. Thus the CALIBNET would moderate functional load of information centre management and take care of communication.

322 DELNET

The feasibility report on DELNET has been prepared by CMC and now efforts are being made to link some libraries in near future. The India International Centre with the support of NISSAT has been promoting the creation of DELNET for last two years. During this period maximum attention has been paid to the creation of databases and the training of library personnel in the library automation. The India International Centre and DESIDOC with the support of NISSAT organised a training course during August, 1990 in CDS/ISIS version 2.3. for DELNET participants. In order to standardise the creation of records of participating libraries, AACR2 rules have been recommended by the Committee on Standardization of DELNET.

33 CSIRNET

The Council of Scientific and Industrial Research of India had planned to set up a computer communication network for exchange of information among its 40 odd laboratories during the Eighth Plan (1990-95) and the NCST, Bombay has undertaken the feasibility study for the same. This network would help in organising indigenous online database services on different subjects like leather technology, food technology, natural products, chemistry, radio physics and medicinal plants. Apart from accessing international databases through NACIDs, efforts are also made to develop databases on the expertise and sophisticated instruments available in various CSIR centres.

34 DESINET

This is a proposed bibliographic information network for defence covering only unclassified and technical information. The users of this network would be scientific, research and defence personnel. The DESIDOC, Delhi would take the initiative in planning and implementing the DESINET which would also have links with other similar networks like NICNET for exchange of information.

35 Ernet

This is a Computer Network for academic and research community in India which started with 8 leading institutions in India such as the IITs (5), Indian Institute of Science, National Centre for Software Technology (NCST), and DOE. It aims at covering a number of scientific and industrial disciplines. The communication services offered by this network would include electronic mail, file transfer, remote log on, database access and bulletin board.

36 INFLIBNET

It is a computer communication network of university libraries and bibliographical information centres set up by UGC. This project is a major national effort to improve capability in information transfer and access that

provide support to scholarship, learning, research and academic persuits. It is a cooperative network and will contribute to pooling, sharing and optimisation of resources facilities and services of libraries and information centres of various universities, research and development institutions and natural organisations like CSIR, DRDO, ICMR, ICHR, AICTE, DOT, DOE, ICSSR etc.It is a major programme towards modernisation of libraries and information centres in India with application of computer and communication technologies. It is a multiple function/service network which would offer catalogue based services, database services, document supply services, collection development and communication based services.There will be a national centre for managing over seeing and coordinating the affairs of the network and four regional centres which will maintain regional union catalogues apart from databases on projects, institutions and specialists.At the sectoral level, U.G.C. information centres, NISSAT Sectoral Information Centres and other centres which perform national level functions and services in specific subjects/disciplines/missions would be included. The sectoral centres would acquire, create and access retrospective and current bibliographic databases and offer a variety of modern information services. End-users will be served locally through college/departmental/university/ R&D institutional information centres. In all there will be 150 university libraries, 50 post- graduate centres/autonomous colleges and 200 libraries of R & D institutions/centres of national importance outside the university system. Maintaining uniformity in techniques, procedures and methods among the participating libraries is a prerequisite of this network. Therefore, INFLIBNET will have its own standards based on existing national and international practices. It proposes a hybrid version of sattelite and terrestrial network communication system with a STAR configuration for interconnecting the nodes. It will operate at different levels national, regional, sectional and local as a versatile integrated library and information system.However, it is recommended that the INFLIBNET could be managed as one of the Technology Missions. Alternatively, it could be a registered society with a council and a Governing Body. It is to function as an independent organisation after initiation by the U.G.C. of India.

37 VIDYANET

VIDYANET is proposed as a communication/computer network to meet the needs of the scientists and research workers in the laboratories/institutions of national importance in the country. Its basic objective is to stimulate cooperative research day to day exchange of research information and the execution of joint projects and publications. It also intends to allow users to develop databases on specialised areas like biotechnology, super conductivity and supernova research.It will be designed to link up institutional computers (Cyber, VAX, DEC, etc.) via telecommunications lines and provide its users facilities like

transfer of files of any type data, programmes and documents, electronic mail, exchange of immediate messages, access to remote applications, data bases and libraries.In its first phase, it would like up about ten institutions such as, All India Institute of Medical Sciences, Indian Agricultural Research Institute, Indian Institute of Technology (IIT), Indian Statistical Institute and National Physical Laboratory in New Delhi and Bhaba Atomic Research Centre, Indian Institute of Geomagnetism, Indian Institute of Technology, National Centre for Software Technology and Tata Institute of Fundamental Research in Bombay. Subsequent phases of networking would cover leading institutions, in Ahmedabad, Bangalore, Bhopal, Calcutta and Madras.Moreover VIDYANET aims at providing rapid means of communication by linking computers at various institutes in India with similar networks like European Academic Research Network (EARNET) and BITNET through any international gateway such as Videsh Sanchar Nigam Limited (VSNL), Bombay.

4 ACCESS TO INTERNATIONAL DATA NETWORKS

41. International Chemical Information Network has been created with the assistance of UNESCO/PGI and in cooperation with UNIDO. It is planned as an international non-profit association of cooperating institutions and individual committed to international cooperation for promoting chemical information. Its Secretariat is now functioning at the International Centre for Chemical studies, Vegovas, Yugoslavia. At the first instance it has published the selected Annotated Bibliography in chemical information prepared by Y. Wolman of Hebrew University, Jersusalam.

42 Asian and Pacific Information Network for Medicinal and Aromatic plants (APINMAP)

The secretariat of this network is situated at Bangkok where its first management Board meeting was held in July 1987. Its second management board meeting was held at AIBA, Laguna (Philippines) in April, 1989. At the beginning it had eleven members including Australia, India, Pakistan, Philippines and other countries. Now its total membership has raised up to eighteen. APINMAP should serve as a model for further development of international cooperation in medicinal and aromatic plants. Now the computerised APINMAP, factual database has been organised with the following components: plant names, ethnomedocal uses, chemical constituents, biological activities and geographical distribution. A recommendation relating to information exchange and database management on medicinal plants stated that under APINMAP programme, UNIDO in collaboration with UNESCO and WHO should assist developing countries in the establishment of national information databases on the pharmaceutical industry including plant derived medicines and that subregional and regional data networks be established to collectively aid the developing countries. However, India should actively participate in this net-

work programme for setting up a database on medicinal plants using APINMAP a model.

43 ASTINET

Arab Scientific and Technical Information Network a sectoral network has been created within the frame work of AGRISNET (Arab Regional Information System Network) including Arab academic and scientific institutions.

44 STEPAN

Science and Technology Policy Asian Network has been established under the auspices of Unesco to support a more effective application of science and technology to planned development throughout Asia, by the Centre for Technology and Social Change, Australia. It will operate through national focal points designed by governments and will integrate senior government policy makers and researchers. Under this network, three programme areas have been identified for immediate action and one of them is development of targeted information and indicator systems. India has become a member country of this network.

45 RINSCA

Towards end of 1990 a joint meeting of the National coordinators for the Regional Informatics Network for South and Central Asia (RINSCA) and the Intergovernmental Informatics Programme (IIP) Focal points was held in New Delhi at Unesco Regional Office of Science and Technology for South and Central Asia (ROSTSCA). The meeting was attended by the National Coordinations from Afghanistan, Bangladesh, India, Iran, Mongolia, Maldives, Nepal, Pakistan, Sri Lanka and USSR. In the said meeting it was resolved to set up a Regional Informatics Network for South and Central Asia (RINSCA) and in cooperation with the Regional Informatics Network for South East Asia and the Pacific (RINSEAP) to evolve a lowcost Regional Informatics Network for Asia and the Pacific with Computer communication linkages and access to mutually agreed upon databases. Towards this end, specialised training programmes will be arranged for preparing the participating countries for a self reliant implementation, maintenance and utilisation of the network, create appropriate infrastructure for retrieval and dissemination of information from internationally available commercial databases and United Nations databases.

6 EASYNET

EASYNET is an intelligent gateway on knowledge gateway with a wide range of online databases and systems. It is a very thoughtful and intelligent solution. It acts as an electronic distributor intermediary to twelve online hosts like DIALOG, BRS,

HW Wilson, NEWSNET and others.EASYNET was developed by

Telebase Inc., U.S.A. founded in 1984. This project was sponsored by National Federation of Abstractings and Information Services (NFAIS). EASYNET is a patented technology. It is expressly provided for information access from over 1500 databases out of over 6000 databases around the world.EASYNET is now available to subscribers in Bombay, Bangalore, Hyderabad, Madras, Pune and New Delhi. Through the Videsh Sanchar Nigam Ltd., connections can be made by local telephone call to EASYNET. By adding 2 modems to one's personal computer phone system, plus communication, annual password and database charges, one can enjoy online user friendly access system. Therefore, the advantages of EASYNET can be summarised as follows:

1 Access to over 1500 databases with a single password

2 User friendly system and minimum training for operator

3 Simultaneous cross reference to many databases in single search

4 Rs.10/- per minute, concessional communication tariff

5 All payments in Indian rupees

6 Round the clock customer support and service.

Thus one can access through Desk Top PC to International Data Networks and Data bases through VSNL. Gateway Packet Switching Systems (GPSS) and EASYNET service. For further information one can call or write to Deputy General Manager (Marketing) V.S.N.L., Videsh Sanchar Bhaban, M.G. Road, Bombay- 400 001.

7 CONCLUSION

Keeping in view the information needs of the various researchers, research organisations, other special and business/commercial bodies some specialised networks covering the fields like steel, mines, banks, railways, airways, oceanography, tourism, etc. may be developed in India just to gain the benefits of modern information technology revolution. India has not yet growth to the desirable extent in computerised information infrastructure. A few Indian scientific and industrial research organisations are now experimenting with the application of information technology to ensure better utilisation of information resources through resource sharing and library networking. However, NISSAT has taken a very significant initiative for the development of various networks through the application of computers and communication technologies in order to bring the information support services available to the scientists and technologists in India at par with those available to their counterparts in the developed countries.

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Online Database: Some Basic Issues

Krushna C. Panda*

Provides an insight into how online databases brings numerous advantages than their printed counterparts. Highlights some of the basic issues relating to Online database which include its growth and development; conceptual framework; classification; steps involved; searching device; supporting technologies; merits and pitfalls from User's standpoint. Shows that the inherent limitations possessed by the conventional IR system and printed indexes can be minimised, if not eradicated by Online system. Puts together the results of some of the recent published studies on the various aspects of online databases.

1 INTRODUCTION

The library market place for reference services is a rapidly changing environment. Numerous technologies such as computer applications, Fax, CD-ROM, Electronic-Mail, Optical Scanning, Hypertext, Videotex, Teletex, and Online databases in multifarious forms and disciplines, have been introduced both in information processing and dissemination during the last decade.

Beginning with online access to databases, and progressing from menu-driven systems to access online databases, the library community is now ready to embrace the latest and most revolutionary technology for Libraries - CD-ROM (Miller, 1989, pp.21-32). This is the reason why, the thrill of a new technology blinds the Librarians and patrons to the content of the reference source the technology provides. (Tenopir, 1989, p.11).

2 ONLINE DATABASE : Growth & Development

Database emerged as a recognizable discipline in the mid -1960s. Through the 1970s it grew to be a major focus of data processing activity for many organisations. But with more and more data processing people exposed to it and expected to understand and use it, it became clear that there was a tremendous lack of understanding of the fundamental concepts of the subject. (Gillenson, 1985, p.27), public access to online databases was initiated in the early 1970s, when the National Library of Medicine, Mead Data Central, Dialog, and SDC initiated their search services. Online searching, at that time was rather an elitist activity and few librarians were active searchers.

Martha E.Williams, University of Illinois, who has been actively collecting data and publishing database Statistics since the early 1970s has stated that over the 14-year period from 1975 to 1989, the total number of database records

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has increased by a factor of 95.9 - from 52 million to 5 billion - and databases themselves have grown by a factor of 15.9 - from 301 to 4,786. (Marcaccio, 1990, p.VIII). In the late 1960s, there were only about a dozen, in 1975 there were 301, in 1983 there were about 1,800 - a respectable number from which searchers could make their selections. In 1988 there were 4,200 and now there are more than 4,500 databases. (Williams, 1989, p.xi). This clearly exhibits that by pace of time, the importance of online database as a vital source for information dissemination in library world has been recognised worldwide.

The interesting feature of Online database Industry is that, the size of the available collection of database is one, the number of producers is another, and the number of sites processing databases for customers is yet another. A study made by Williams further indicates that in 1975, the 301 publicly available databases were produced by 200 database producers and were processed (both in batch mode and online) by 105 organisations that services to the public. Similarly, in 1988 the 4,200 databases were produced by 1733 producers, and services were provided by approximately 750 processors. This represents significant growth for the industry and increased complexity for the searchers. The study further reveals that, over the same 10 year period usage increased from 780,000 connect hours to 3,020,000 hours, and the number of searches (one query against one database) increased from 2.7 million per year to 26.5 million per year. Similar is the case with regard to cost. In 1978, the expenditures for online database searching in library market were reportedly about $ 40 million. By 1983, they were $ 173 million and, by 1987 they were $ 386 million. (Williams, 1989, p.xi).

The growth of cost from the beginning to the end of the ten year period was nearly tenfold. Connect hours increased at a slower rate than did expenditures, presumably because of both baud rate and increase in price. The excellent study made by Martha E.Williams gives the audience a clear picture as to how and in what direction of online databases grown and developed in this Information World.

3 ONLINE DATABASE: A Conceptual Framework

Gillenson, succintly observes that the term "database" is a powerful concept which forms an ingenious solution to some vexing problems.The concept database "unfortunately tends to be a multifaceted and complex subject, which appears difficult when one attempts to swallow it one gulp. But database is approachable and understandable if one proceeds carefully, cautiously, and progressively step-by-step". (Gillenson, 1985, p.27).

The term "database" is defined by many as "a collection of machine-readable records (often corresponding to a printed index) to be accessed through a computer". (Dialog Ref. Manual, 1988, p.G-3).In library parlance, however, on online bibliographic database is generally understood to mean, "a collection

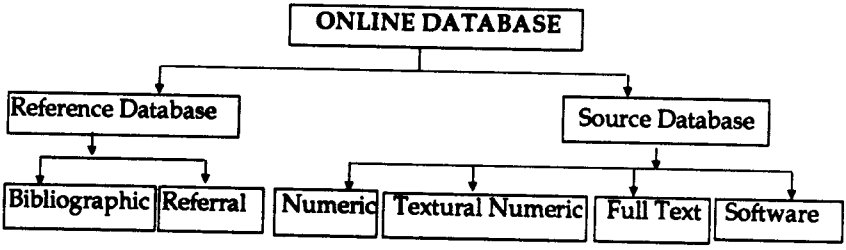
of records usually derived from machine readable versions of the principal abstracting and indexing journals held online in a rapid-access computer store". (Hall, 1977, p.10). Hall also aptly remarks that, online databases are the treasury to which online systems provide the key.

Thus, it can safely be deduced in all fairness, that databases are nothing but a collection of machine readable records accessed online. Hall's definition sounds a reality rather than a myth, as because, most machine readable/bibliographic databases owe their inception to an abstracting or indexing journal. Some databases and their printed equivalents are: (Rowley, 1980, p.50).

Database	Printed Equivalent
MEDLARS	Index medicus
INSPEC	Science abstracts
CHEMABS	Chemical abstracts
SCISEARCH	Science Citation Index
Sociological Abstracts	Sociological abstracts
ERIC	Resources in Education
COMPENDEX	Engineering Index
Psychological Abstracts	Psychological Abstracts

4 ONLINE DATABASE: CLASSIFICATION

Several authors have classified online databases in a fashion convenient to them. Databases can be classified according to the nature of content, they represent. One of the Directories of online databases classifies all databases into two broader groups, namely, (a) Reference database, and (b) Source database (Directory of Online Database, May 1989, p.7). For the sake of more convenience and clarity, the classification of databases is enumerated as under:



(a) Reference Databases: This database primarily refers or "points" users to another source (the source may be a document, an organisation, or an individual) for additional information or for the complete text (Directory of Online Databases, 1988, pp.VII-VIII).

This database has further been divided into two groups, namely, (i) bibliographic, and (ii) referral. **Bibliographic** databases contain citations, sometimes with abstracts of the printed literature, e.g. journal articles, reports, patents, dissertations, conference proceedings, books, or newspaper items. **Referral databases** contain references, sometimes with abstracts or summaries to non-published information. This database generally refers users to organisations, individuals, audio-visual materials and such other non-print media for further information.

(b) Source Databases: Source databases, on the otherhand contain original source data, the full-text of Original Source information or materials prepared specifically for electronic distribution. The sub-divisions of Source databases include, Numeric, Textual-numeric, Full Text, and Software. **(i) Numeric databases** contain original survey of statistical data (e.g. production or shipment statistics for a given product or industry) **(ii) Textual-numeric** databases are generally records that contain a number of data elements of fields some of which contain numeric data (e.g., databases with dictionary or handbook type data, typically of Chemical and Physical properties), **(iii) Full- text data**, on the otherhand, contain records of the complete text of an item, (e.g., a newspaper article, a court decision, etc.), while **(iv) Software databases** contain computer programmes that can be downloaded for use with local computers. Rowley, divided databases into three major categories (Rowley, 1980, p.49). They are:

- bibliographic databases;
- non-bibliographic databases; and
- catalogue record databases.

Josef L.Staud (1987, pp.308-309), on the otherhand, classified Online databases based on the type of information which is used in modelling the

Universe of Discourse. Staud's classification is as under:

Online database -

(1) Factual-type databases

(a) - Statistical databases
- Crude data
- Aggregated data
- Time Series data

(b) - Quasi Statistical Databases

(c) - "Textual Facts" Databases

(d) - "Formalism & Physical Model" Databases

(2) Text Databases
- Full-text databases
- Bibliographic Databases

(3) Integrated Databases.

Thus Staud's classification of online databases in current online retrieval into three main categories, namely, Factual, Text and Integrated seems to be highly complex, technical and exhaustive with emphasis on the type of information they contain.

Marcaccio's way of looking at databases is in terms of the recording medium utilized for distribution or access. Marcaccio categorised all the existing databases into seven groups basing upon the medium. The table (Marcaccio, 1990, p.xii) below shows the number and percentage of databases recorded on various type of media.

Table

Medium for Access or Distribution	1989 Number	(%)
Online	3524	(74)
Batch	999	(21)
CD-ROM	433	(9)
Diskette	478	(10)
Magnetic Tape	187	(16)
Paper (Publication)	1772	(37)
Microform	188	(4)
Number of Media categories: assigned to databases	8181	(171)

It may be mentioned that any single database may be available on several media or more than one medium. However, Marcaccio's study reflects a clear picture about the quantum of databases made available on each medium as of 1989.

5 ONLINE DATABASE : Why to Choose?

Now the question arises why to choose an Online database? When to choose? Answers to some of these questions have clearly been reflected in Tenopir's study. Online databases should be used to expand the coverage and scope of the reference collection. The most important reason is that online databases allow a library to access reference materials they would not otherwise have. Depending on the size and clientele, most Libraries today have print subscriptions to certain standard tools, such as Readers' Guide, Psychological Abstracts, Books in Print, etc. Study made by Tenopir further reveals that, out of 5000 publicly available databases today, nearly 1000 databases are only used online. The next important reason is that, Online provides access to source to which the library may not be able to afford in print such as Chemical Abstracts or Social Citation Index. (Tenopir, 1989, p.9).

Besides, online is often the most cost effective medium for materials used seldom because most online databases are pay-as-you-use basis. The advantage is that, the Library does not have to encumber the full price of a printed reference source that is hardly used by patrons only once a week, moth or year. When a

source is needed, it can be accessed online, often for as little as $ 5 to $ 15 for ready reference. Most of the authors have agreed that, online databases are a logical choice when currency is important. For example, Dialog updates certain databases every 15 minutes. The other benefit of choosing the online database is that complex questions that requires a combination of several factors can be answered quickly and easily online by an intermediary but would require a tedious and time consuming search in printed sources. For example, "I would like to know the contributions made by the Indian researchers during last 10 years about nuclear-energy? Can you help me to find an article I read last year or probably the year before in some journal that had a little something like, "Marketing of Library and Information Services". These are some of the complex questions which are hard to be readily answered by any other means.

6 ONLINE DATABASE : Steps

Before introduction of the online database system, the Library is required to consider certain basic issues which include; budgetary considerations; nature and category of clienteles to be served; basic objectives of the parent organisation; disciplines or subject areas to be covered in the database; availability of basic technological infrastructure, etc. However, assuming that databases are a good starting point, Combs and Moorhead have suggested a four-step process (Combs and Moorhead, Oct'90, p.15) while introducing online database system. These steps are:

- first, you decide which databases to use;
- then, you workout the search strategy or strategies;
- third, you review and edit your results;
- fourth, you produce some form of output to give to your client.

Brenda Gerrie, on the otherhand, stated that in conventional IR system, the process of interrogating a database involves four stages (Gerrie, 1983, p.85). They are:-

- first, a connection is established with a host computer via communication link, and access to a particular database/file is ordered;
- second, a search is instituted in a series of interactions involving requests and responses;
- Next, the results of the search are viewed and reviewed;
- finally, when the search is completed, the user either disconnects from the host computer or begins another search.

It seems that while suggesting steps, Combs and Moorhead have taken somewhat user's interest stand point into account. While the stages suggested by Gerrie seems to a pragmatic perspective involved while a user starts a search

online.

7 ONLINE DATABASE: The Users' Standpoint

Any new service or system is introduced in libraries and information centres to facilitate their readers. It is the users for whom the Library does exist, and as such, one of the vital components of Dr.Ranganathan's concept, Library is a trinity: viz., books, readers and staff. Therefore, study of users' attitudes towards a particular system or service or product and the way they look at, is very important for the Library administration.

A study made by Sanderson pertaining to end-user's of Online database searching on Dialog system suggests that, "the idea that some one can sit in front of a terminal or personal computer and search a system with no training is ludicrous". (Sanderson, Nov.1990, pp.64-69). However, she has stated further that though theoretically end-users can search Dialog through the DIALOG CORPORATE CONNECTION (DCC) without any formal training as DCC provides searchers access to the material in databases through a series of menus and prompts which make formal training unnecessary, but in reality, searching is not so easy as it seems to be.

Another study conducted by William Mischo, Mitsuko, and Linda Smith (Tenopir, 1989, pp.40-42) at the Engineering Library of University of Illinois at Urbana Champaign, USA discloses that between Oct.12, 1987 and March 31, 1988, over 440 database searches in 214 search sessions were conducted on six databases, namely, INSPEC,COMPENDEX,Magazine Index, Chemical Abstracts, and Current Contents. The study reveals that over 97% had a favourable or very-favourable overall attitude towards the system and over 88% were enthusiastic or very enthusiastic about online searching. Nearly 90% were reported to have been satisfied with their search and over 893% were said to have indicated that compared to printed Index, online searching is better. It is apparent from the above study that patrons are more and more interested and attracted toward searching the online databases rather than their counterpart printed indexes. The obvious reason is that online database allows the searcher to find out answers of complex questions in least possible time. Moreover, online searching connects the searcher directly to amazingly large remote databases on a particular subject.

8 ONLINE DATABASE : Search Process & Education

During last ten years, the Library Schools, particularly in USA, have recognised the vital role they play in educating online intermediaries, A survey made by Stephen P. Harter and Carol H. Fenichel in 1982 then revealed that 76% of Schools accredited by the ALA included online searching in their curriculum which gone higher in 1988 (Tenopir, 1989, p.11). Most of these courses primarily concentrate on the mechanics of "how to search" one or more online systems.

The developments that are changing online education in library schools include

- the introduction of new database formats, such as laser disk;
- the proliferation of online services and databases produced in different countries;
- the increasing role of the end-user searcher in addition to the intermediary searcher;
- the growth in the number of full-text databases; and
- the growing reliance on "Computer intermediary" software e.g. front ends, gateways, etc.)

91 Online Database: Professionals

Marquis mailed over 100,000 requests for biographical information to the people on the mailing lists of Online producers, Vendors, periodicals, online associations and online user groups. Marquis estimates that the actual size of the online industry to be between 25,000 and 45,000 people. Roughly, 6000 online searchers responded, providing their detail biographical information. Of the biographiees in the test file, only 32% hold a Masters degree in Library Science; 46% attended Library School. The study further revealed that 58% of the online professionals are women. The test file biographees came from 46 different countries, although the data collection method favoured the United States and other English -speaking countries (Tenopir, 1989, pp.5-6). It seems that women professionals are more interested for the online job than the men.

92 Online Database: Supporting Technologies

Since the mid 1960s, several streams of technologies and capabilities have come together to support the development and use of online database services. These technologies include (a) databases that are processed by publishers and other organisations in computer readable form; (b) powerful timesharing Computers that permit a very large number of users to carry on simultaneous interactions with the systems through terminals irrespective distance; (c) interactive computer programmes (software) that are increasingly efficient, powerful, and user-oriented; (d) rapid access storage devices that have continued to increase in capacity and reliability and, decline in per-character data storage costs; (e) Computer terminals and microcomputers that can transmit and receive at various speeds - including 30 characters per second (300 baud), 120 cps (1200 baud), 240 cps, (2400 baud), and 960 cps (9600 baud) - and are more compact, portable, and less expensive than ever before; (f) telecommunications networks that provides local access numbers in cities throughout the world for dialing into a remote computer at far less cost than that of dialing long distance (Directory of Online Databases, 1988, pp.VII-VIII).

93 Online Database: Subject, Language & Geography

The Cuadra/Elsevier online Database selection Directory states that as of April 1989, there were 2317 number of databases available in the field of Business and Economics alone which is said to be the highest number of databases among all other subjects. Similarly, English Language is said to be dominating in the database industry by having 2617 databases, which comes say 76.1% of the total databases. With regard to geographical coverages, US remains at apex by having 68 databases at its credit (May 1989, p.9-10).

94 Online Database: Merits

In this era technological revolution and information flood, it has been universally accepted by the library professionals that Online database search certainly brings many advantages when compared to their printed counterparts. Hall and Brown (1981, pp.xvi) have enumerated the following advantages of searching online databases:

- Indepth searches of computer held files can be carried out at a speed which no human can hole to match;
- the user is an active participant and can instantly adapt his request to the reality of what is actually in the reference - perhaps, very different from what he expects and also readily recover from errors of query formulation;
- databases can easily be researched, using new clues, whereas in manual searching the time available does not often permit full-searching;
- the user has easy access to an extremely wide range of indexes/databases, many of which, may not be available locally;
- databases searchable online often offer a far greater number of access points than the corresponding printed index;
- there is almost no need for irksom note-taking so typical of many conventional searches;

Batt (1988, pp.3-4), on the otherhand, while enumerating the merits of online database searching, laid emphasis on aspects like technical flexibility, convenience, saving time, and the nascent data it provides. The merits of online database searching as pointed out by Batt seems more pragmatic which include -

- techniques used in searching online makes complex topics relatively simple and fast to search (Among those are Boolean Logic, truncation, adjacency, controlled vocabulary, online thesauri, and access capabilities greater than that of manual tools;
- authors can be matched with either keywords or subjects;
- interactive nature of online searching allows searches to be improved,

based on feedback from results;

- online searches save time;
- many publications can be searched at one time;
- inter-disciplinary topics can be searched easily across a variety of databases;
- online searches are more timely than their print counterparts because, each database is updated online and available before the printed indexes are published;
- some databases are only available online and do not have printed counterparts;
- online databases provide sources that libraries cannot afford to own in printed format;
- most databases are available around the clock;
- searches can be saved, and updated or modified periodically;
- SDI services can be set-up where specific searches are automatically run at given intervals or when a selected file is updated.

It is inferred that both the studies made by Hall and Brown, and Brown, and Batt, have shared almost common views and agreed that, online database is easy to use, active, speed, greater access, time saving nascent, wide coverage, allows complex searches, interactive in nature, and brings many other advantages than their printed counterparts. The impact of online searching, however, clearly depends on who is carrying out the search and on the local circumstances. The study conducted by Hall (1977, p.10) on the value of online searching as seen by many users, discloses that users place great importance simply on the ability to save time and effort involved in conventional searching. The said study further indicates the value of online searching as "seen" by users broadly as under:

- save time and effort	over 80%
- check on completeness of known existing coverage of of query-field	over 80%
- discover or verify obscure references	over 60%
- become familiar with a new field	over 30%

From the above findings it is clear that most of the users prefer online databases on the ground that it saves time and effort as well as for its wide

coverage. Such a view also satisfies the Fourth Law of Library Science,"Save the time of the reader" as propounded by Dr.S.R. Ranganathan.

Online Database: Pitfalls

Inspite of its merits, online database is not free from criticism. Combs and Moorhead are of the opinion that, databases are often, but not always, a good place to start. Sometimes information clearly is not available online. The question may be too specific or narrow to interest a journalist, for instance, or the answer is only known by a few individuals who must be contacted and interviewed, Or the information may have been published before databases existed to index it,or it may be easier and cheaper to consult a directory or other resource at a library rather than electronically (Combs and Moorhead, Oct. 90, pp.15-18).

Batt, on the otherhand, has enumerated certain pitfalls, in terms of cost, lack of expertise, terminologies, and psychological imbalance. Batt's enumerations are as under: (Batt, 1988, p.4).

- some topics do not warrant the expense of an online search, particularly single concept queries that are adequately handled by printed Indices (if available);
- skills of intermediaries and end-users vary which can dramatically impede the success of a search. Some searchers maybe highly proficient in online searching but lack subject expertise. Some are experts in a discipline but lack effective searching skills.
- Online access is not cheap. Rising costs have to be weighed against the value of information and time saved;
- date limitations exist, for example, a given database may only be available for a few recent years;
- the computer cannot think for the searcher. The success of a search, therefore, depends completely on the terminology used and how it is manipulated;
- important findings often come from serendipity during manual searching;
- false-drops (inappropriate citations or information) are endemic to some computer searches;
- for some individuals, the concept of an intermediary to perform or help with a search online can be a psychological road block.

Tenopir, a known author on the subject, however, while describing the bottlenecks of searching online databases, lays much emphasis on lack of proficiency and awareness among the potential customers in conducting online searches. According to her, the end-users are not able to use the machines easily

and effectively because, the initial connection to an online host is often difficult and the hardware sales person is generally not qualified to offer much help. Software also creates problem. For the user, neither the communications software nor front-end software can yet be considered user-friendly. At the vendor's end, query languages are often cryptic, confusing, and inconsistent, especially to the.. frequent user. She stated further that, timesharing vendors, software companies, manufacturers, database producers, have over-promised what information can actually deliver. Intermediaries often have little experience with research, and the expectations that micro computers and access to online information in the work place would substantially increase productivity are yet to be realised. Moreover, costs are often too high for the casual user (Tenopir, 1989, p.16).

These are the factors why many professionals feel that using the manual sources in a library can still sometimes yield better results at a lower cost with less frustration.

95 Conclusion

Librarians and information scientists are confronted with a great deal of problems both in storage and retrieval of information to their clienteles on multifarious subject areas, particularly in this age of literature flood and technological revolution. It has also been admitted that the conventional IR system and printed indexes possess inherent limitations. Such limitations atleast can be minimised, if not eradicated, by introducing online database system in order to serve the patrons efficiently, effectively, and timely.

However, no online system is static. The technology, the desire of the patrons, and the structure of disciplines changes rapidly. A major concern involves planning what information to deliver and how best to deliver this information (Evans, 1989, pp.110-117). The challenge is to arrive at a reasonable and equitable selection of information sources available at no additional charge to users.

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Sources of Information in Veterinary and Animal Sciences in Bihar

B N Mishra*

1 INTRODUCTION

There is none biological organ in this Universe which is immortal. The biological sciences, particularly Medical and Veterinary Sciences, indicate. "It is no wonder how an organ dies. It is wonder how it survives". Man is a social animal and he is dealt by the Medical Scientists but the Veterinary Scientist deals only with the animals. The Veterinary Scientists can diagnosis animal diseases by seeing and examining the animals whereas the Medical Scientists can examine human belongs seeing, talking and advising the patients. The aim of the Medical and Veterinary Sciences is the same. The thinking and purpose are the same but the diagnosis and the native of patients differ with each other. In these circumstances, the information needs Veterinarians are more important and more challenging than those of Medical Scientists. No Scientist can work well in his work without the knowledge of latest literature. The library is the store house of their knowledge and literature. So, the task of the librarians are not less than any Medical and Veterinary Scientist. That is why the importance of the library is becoming hard day by day.For both the professionals, the kinds of information required are quite similar:

To facilitate disseminating accumulated information in the field of Biological Sciences (particularly Medical and Veterinary), various service systems are available at the national and international level. They are:

1. Bibliographies
2. Current Awareness Services (CAS)
3. Information Bulletins
4. Institutional Reports
5. Press Clippings
6. Scientific Publications - books, monographs, periodicals, technical reports etc.
7. Hotline Information Network Services (Global)
8. National Institutional Services
9. Other emerging and future facilities

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In addition to the above, materials such as audio-visual media films, radio, television etc. are available.

2 SOURCES OF INFORMATION IN VETERINARY AND ANIMAL SCIENCES IN BIHAR

In Bihar, there are two veterinary colleges. One is attached the Rajendra Agricultural University at Patna, and the other to the Birsa Agricultural University at Kanke, Ranchi. These two colleges have each a good library. Before the creation of the Rajendra Agricultural University and Birsa Agricultural University, these two colleges were working under the Department of Animal Husbandry, Government of Bihar. Naturally, the staffing pattern of these libraries was similar to departmental libraries of the State. The Bihar Veterinary College was established on 2nd April 1927 and the foundation stone was laid by Sir Henry Wheeler, the then Governor of Bihar and Orissa. Then it was called as the Bihar and Orissa Veterinary College. In the year 1936 after separation of Orissa from Bihar, this college was renamed as the Bihar Veterinary College, Patna, which has now completed sixty five years of glorious but at the same time a difficult existence previously, this college was affiliated to Patna, Bihar and Magadh University at one time or another for conducting the examinations. Since, February 1971 it has been a constituent college of the Rajendra Agricultural University. This college admits students from different parts of the country from Jammu and Kasmir to Assam and also from outside countries like Nepal, Bhutan, Afghanistan, Iran, Malaysia etc. This college provides UG and PG courses in eleven departments and Ph D programme in seven departments. The college has completed several research projects on animal sciences under grants from ICAR and other agencies.

At present, the library of the college has 25,000 books and bound periodicals. It also subscribes to 140 scientific periodicals 25 dailies - Indian as well as foreign origin, to keep the teachers, researchers and students well - informed. The following three important current awareness services have been provided regularly since 1980: (a) books received during the month; (b) periodicals received during the month; and (c) contents pages of periodicals received during the month.

The library has been operating a book bank scheme and a social welfare book scheme. The Social Welfare Scheme is operated on behalf of the Social Welfare Department of the Government of Bihar. In this scheme, books are made available to the members of the Scheduled Caste/Scheduled Tribes free of charge. The library provides Xerox facilities to the staff and students at the rate of Re 0.50 per page.

Veterinary and Animal Sciences Libraries in the state will be more useful if they can cooperate with the biosciences librarians in the state and with those

the at national level. The combined resources of these libraries will be available for the readers if a national network of information system us established and inter library cooperation is introduced.

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A Need for National Information Centre for Sugar and Allied Industries

N.S. Pathan.*

Examines the need for an information centre for sugar industry. Presents in brief the idea of setting up a NICSAI (National information Centre for Sugar and Allied Industries) and explains its utility to the industry. Appeals to the Government for supporting the creation of such a centre.

1 SUGAR AND ALLIED INDUSTRIES ANL THEIR INFORMATION NEED

Sugar industry in India is one of the oldest agro based industry in terms of investment and employment. It ranks second only to the textile industry. Its net value of production being over Rs.2000 crores and employing a direct a direct workforce of 3 lakhs.

The sugar industry has been playing a vital role in transforming the socio economic scenario of our rural areas by creating many training and educational facilities by establishing ancillary cottage industries and thus creating new job opportunities around nucleus sugar units. good monsoon during the past three or four years has given impetus to its further expansion and modernization.

The increasing sophistication in produce and technologies required not only modern manufacturing facilities but the related also well equipped information and documentation centres. today there is explosion of knowledge in sugar industry, as in any other industry. If real progress has to be achieved, it is important to keep pace with it. But this is beyond the means of a single industrial unit or even a group of such units. Here an effective system of information collection, storage and dissemination becomes important. the varied and complex nature of this industry incorporates such diverse elements as farmers and canegrowers on the one had and technologists and engineers on the other. the industry interacts closely with the Government as well as private bodies and employees. It caters to the needs of public distribution system as well as export markets.

In view of the above an effective information system becomes very essential for the sugar industry.

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2 NATIONAL CENTRE

In improving the efficiency and prosperity of sugar industry in face of many challenges and changes National Centre for SUGAR AND Allied Industries (NICSAI) can play an important role. The activities that can possible carried out by NICSAI and services it can offers to its users are given below:

* To develop collection of relevant sources of information in the field of sugar and allied industries.
* To complement and supplement the national document sources for sugar industry.
* To generate information relevant to specific areas, structure the information and make it available to interested users.
* To scan the information regularly to meet the individual client needs.
* To act as an active network node in which scientist and entrepreneurs get access to the information resources available in areas of their interest.
* To develop appropriate linkages with information systems and services in the country for sugar and allied industries.
* To disseminate information and technology generated for wider applications.

NICSAI will be assisted in achieving its set objectives by the Sectoral Information Centre (SIC). Establishment of such a centre will go along way in meeting the information needs of a particular discipline, mission or product. an SIC should coordinate its activities with the other relevant information centre in that particular field. thus, Sic has to be a part of national level research laboratory engaged in Research and Development work in the particular discipline, mission or product.

A schematic diagram of the structure of such a centre is presented in Fig.1.

21 Organizational Set up

The coordinating unit of NICSAI should be located at Vasantdada Sugar Institute, Pune. The NICSAI can possibly hooked up to the centres given below:

1. Vasantdada Sugar Institute, Pune - As coordination centre.
2. National Sugar Institute, Kanpur - Sugar Institute
3. National Federation of Cooperative Sugar Factories Ltd., New Delhi - Federation.
4. Sugar Technologists Association of India, New Delhi - Association
5. Indian Council of Agricultural Research, New Delhi - council

6. Sugarcane breeding Institute, Coimbatore - Sugarcane Institute.
7. Regional Agricultural Research Station, Anakapalle - Sugarcane Station.

The proposed sugarcane stations at Bethudhari (West Bengal and Kota (Rajasthan) can also be hooked upto Casantdada Sugar Institute, Pune once they come into existence. Proposed NICSAI Centre at V.S.I. and its national grids are presented in Fig. 2.

The NICSAI centre can be headed by Information Programme coordinator (IPC) for sugar and allied industries under the overall administrative control of the Director of Vasantdada Sugar Institute, Pune.

22 Proposed Activities of NICSAI

Besides normal library services NICSAI should offer a variety of computer based services such as Selective Dissemination of Information (SDI), Current Awareness Service (CAS) as well as complete range of microfilming services including copying of documents on 16mm, 35mm and microfiche formats and should also provide hard copies from these microforms.

221 Document Delivery Service

The NICSAI document delivery service can be backed by its comprehensive library holdings and supported by a network of collaborating libraries including those of National Sugar Institute, Kanpur; National Federation of Cooperative Sugar Factories Ltd., New Delhi, Sugar Technologists Association of India, New Delhi, and by the CAB International U.K. The services will include the supply of photocopies of most publications which are available at NICSAI Library. When the material is needed urgently, requests can be placed via electric mail, telex, fax or phone for delivery by courier or fax to most part of the country.

222 Dissemination of Information

By way of facilities builtup of the centre dissemination of information to users can be carried out. Documents in a variety of forms can be exchanged among the users in and around the country. The availability of national and international network would help in sharing the resources on a wider scale.

223 Information Retrieval

NICSAI library services will have an access to all the major related computer data bases that cater to the needs of sugar and allied industries. Example can be given of the major computer data bases of CAB Abstracts in agriculture and biosciences. Trained staff at the centre will undertake the searches including online searches. It will carry our every search as closely as possible to meet users requirement, in appropriate cases this may mean under-

taking an exhaustive search at other databases available to the centre. Setting of Selective Dissemination of Information (SDI) will automatically generate periodic listings or relevant new additions to the database.

23 Management of Information System

For the management of the information centre, certain basic concepts relating to information must be clarified viz. a) The content, quality and source of information b) The flow pattern of information. In respect of the former the characteristics of information need to be considered will be relevance, recency, usefullife, adequacy, accuracy, timeliness and specificity. Being an information centre of sugar industry. NICSAI has a centeralised system for storing all data and for processing, retrieving and transmitting them to various points of use. Such as centralization can be achieved successfully by means of computerization.

24 Utility of NICSAI

Knowledge in all facets of this industry is expanding by leaps and bounds. Every day some new technological innovations see the light of the day. For keeping a track of this development, a thorough understanding of any problem of Research and Development and Education a detailed survey of available literature is essential.

However, for individuals it is neither possible nor practicable to undertake such as gigantic task. Creation of a specialized database and documentation centre will cater to their needs and will save their time, money and efforts so that they can be used more fruitfully elsewhere in the industry. The users will get access to a clearly, understandable, comprehensive and yet selective coverage of the world technical, scientific and patent literature of their interest expeditiously. Thus, the centre will prove to be a great help to the industry for improving its efficiency and prosperity.

25 Location of NICSAI

Vasantdada Sugar Institute is ideally suited for creation of the proposed information centre. VSI is the only institution of its kind in the world where R & D, training, consultation and other extension activities related to all facets of sugar and allied industries are carried out under one roof in a coordinated manner. Its entire income comes from canegrowers. All the sugar factories in Maharashtra and neighboring states can be reached from VSI within 4 to 8 hours. Good infrastructural facilities are available which includes library, laboratory, experimental farms, workshop and ofcourse highly qualified and experienced Technical staff. The work is under way to hook up all cooperative sugar factories in Maharshtra to VSI through computer network.

Over a period of time VSI has developed a fine library collection consist-

ing of large number of books and journals in all disciplines related to sugar industry. Eminent scientific and technological institutions are situated in city of Pune. Moreover many machinery and equipment manufacturing units as well as maintenance workshops catering to the needs of sugar industry are also located in and around Pune. Establishment of information centre at Pune will thus be mutually beneficial.

3 INFORMATION CENTRES OF OTHER INDUSTRIES

Over the last 10 years or so the Government of India has through the agency of NISSAT (National Information Systems in Science and Technology) already established the following information centre for the benefits of textile, leather, chemical, food and pharmaceuticals industries.

1. National Information Centre for Leather and Allied Industries (NICLAI) at Central Leather Research Institute, Madras.
2. National Information Centre for Food Services and Technology (NIC-FOS) at Central Food Technology Research Institute, Mysore.
3. National Information Centre for Machine Tools and Production Engineering (NICMAP) at Central Machine Tools Institute, Bangalore.
4. National Information Centre for Drugs and Pharmaceuticals (NICDAP) at Central Drug Research Institute, Lucknow.
5. National Information Centre for Crystallogrphy (NICRYS) at the University of Madras, Madras.
6. National Information Centre for Chemistry and Chemical Technology (NICCHEM) at National Chemical Laboratory, Pune.

Sugar industry more than deserves to have its own specialized information centre considering a very high net value of its production and possibilities of further substantial improvement in it by modernization. The response of the industries to the centres listed above has been quite encouraging and similar experience can be expected from the sugar industry as well.

4 NEED FOR GOVERNMENT SUPPORT

41 NISSAT

Considering the importance of NICSAI the Government of India through the agency of NISSAT, (National Information Systems in Science and Technology) it should aid and support the proposed NISCAI generously. A beginning can be made by upgrading the existing library facilities at Vasantdada Sugar Institute, Pune and by improved access to documents particularly by means of introducing up to date microfilm reprographic and audio-visual techniques. Creation of a computer based integrated information system and various machine readable databases will be a welcome development.

42 ICAR

The ICAR (Indian Council of Agricultural Research) can extend support to the centre for developing computerized databases for various agricultural disciplines of interest to the sugar industry.

43 Sugar Development Fund (SDF)

This is another agency through which the Government of India can extend support to NICSAI. The SDF was created under the sugar cess ACT 1982, by which cess of Rs.14/- per quintal is being collected since December 1982 on the sugar produced in India. According to existing stipulations the funds can be utilized by the Government inter alia for making grants for R & D projects aimed at development of sugar industry. The proposed NICSAI very well fits to this category.

5 CONCLUSION

There is urgent need for setting up NICSAI (National Information Centre for Sugar and Allied Industries). Establishment of such a Centre will go a longway in meeting the information needs of the sugar and allied industries for production, End for a profitable and prosperous sugar industry in India.

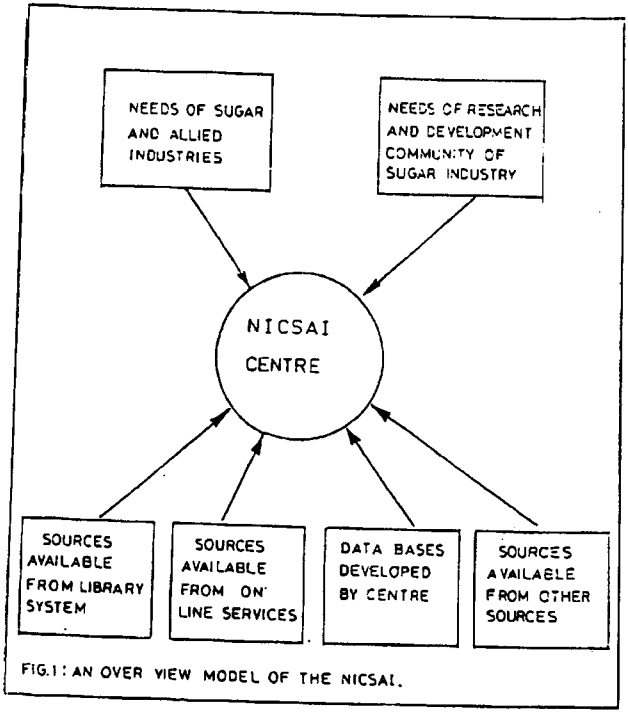


FIG.1 : AN OVER VIEW MODEL OF THE NICSAI.

FIG. 1

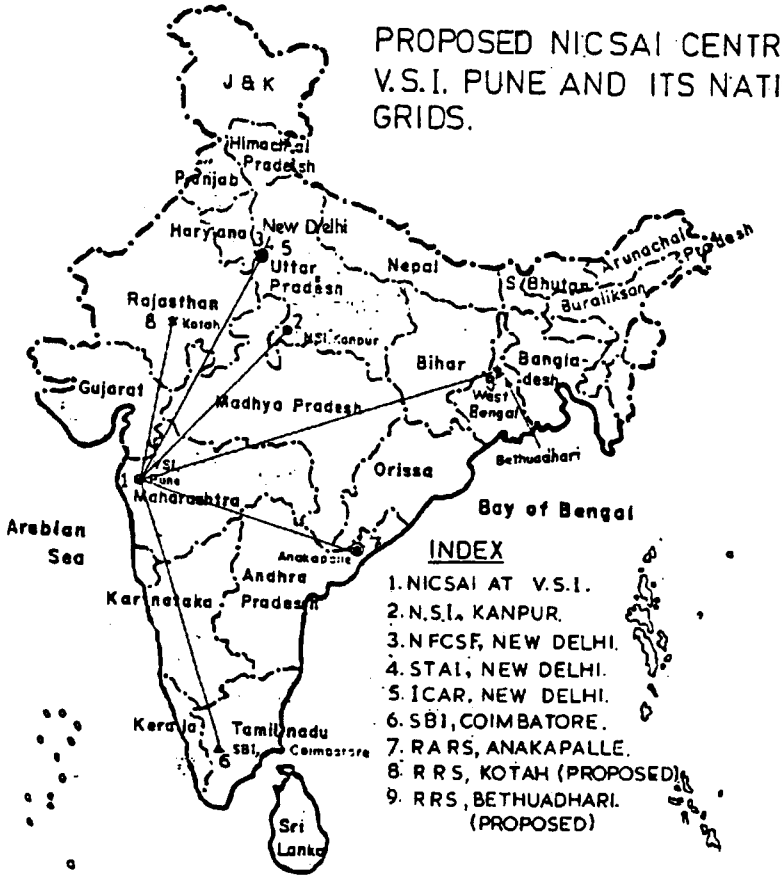

PROPOSED NICSAI CENTRE AT V.S.I. PUNE AND ITS NATIONAL GRIDS.
J & K
Himachal Pradesh
Punjab
Haryana
New Delhi
Uttar Pradesh
Nepal
Bhutan
Arunachal Pradesh
Buraliksan
Rajasthan
Kotah
N.S.I. Kanpur
Bihar
Bangladesh
West Bengal
Gujarat
Madhya Pradesh
Orissa
Bethuadhari
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4. STAI, NEW DELHI.
5. ICAR, NEW DELHI.
6. SBI, COIMBATORE.
7. RARS, ANAKAPALLE.
8. RRS, KOTAH (PROPOSED)
9. RRS, BETHUADHARI. (PROPOSED)

FIG. 2

Academic Library System and Development of INFLIBNET

V.M.BORKAR.*

Explains that an Academic Library System, with some modification, can make a success INFLIBNET because UGC is the vital force behind the Academic Library System also. The process of information communication is explained with a Network Structure, where academic library system is depicted as the centre.

1 INTRODUCTION

In modern age, no library can be self sufficient due to shrinking budgets and rising prices of library materials, equipment, and due to lack of adequate manpower and modern technology, etc. Therefore, network based resource sharing is an alternative to be considered.

2 ACADEMIC LIBRARY SYSTEM

The University Grants Commission (UGC) plays an important role in the development of higher education. UGC recognized the importance of college and university libraries and gave top priority for their development in the five year plans.

21 INFLIBNET

College libraries and university libraries play dominant role in academic library system, INFLIBNET (Information and Library Net Work) is the recent programme of UGC. In April 1988, the University Grants Commission constituted a committee under the Chairmanship of Professor Yash Pal to work out the details of Information and Library Network(INFLIBNET). This committee created an Inter-Agency Working Group with the following terms of reference.

1) To review the present scenario of library automation and computerised bibliographic information services in India, taking into account similar services/ experiences in some of the developed countries, with a view to proposing mechanism to establish a network of libraries in universities, colleges, special libraries and documentation centres in the country.

2) To identify the possible areas of cooperation for resource sharing and to minimise duplication in acquisition of books, serials, etc;

3) To propose a mechanism for using such a network for scientific communication among the research community in the country and abroad.

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4) To specify the objectives of the network at national, regional and unit level.

5) To suggest a suitable architecture for the network;

6) To define the areas of standardisation required in the Network and to suggest minimum level of standardisation for effective compatibility and participation in the three component areas of Network, viz., database, data communication and computer hardware and software;

7) To suggest:

(a) An action plan for implementation; and

(b) Management mechanism including financial and personnel requirements to maintain and sustain the network in short-term and long term; and

8) To prepare within three months a project report (PR) for developing a Network based on the above factors.

The report of this working group was published in December 1988. INFLIBNET was defined as a computer-communication network of University and R & D libraries of the country and bibliographical centres.

22 Salient Features of INFLIBNET

The salient features of INFLIBNET are

1)Establishing a network of catalogue based services, collection development and communication based services.

2) Establishing about 400 nodes for servicing

3) Establishing a National Centre for managing, overseeing and coordinating and four regional centres for maintaining union catalogues and data bases of projects, institutions and specialists.

4) Including the existing UGC, NISSAT and other sectoral information centres within the ambit of the project.

5) Creating a number of document resource centres for providing document delivery services.

6) Providing modern equipment and online access facilities for free flow of information.

7) Correcting about a million unique catalogue records of 179 university libraries into a common catalogue database in just two years with students' assistance.

8) Planning long - term, short term, regular and continuing professional training programmes for staff developments.

9) Establishing a registered society to manage the affairs of INFLIBNET.

3 RECOMMENDATIONS:

College libraries are being developed with the assistance of UGC. Hence, these libraries should serve as nodes in the network structure.

INFLIBNET expect cooperation from students for assistance in setting up INFLIBNET. But in practice, it is not possible to get assistance from students. Trained library staff from each college and university should be motivated to offer such assistance.

The INFLIBNET's plans for manpower development will definitely prove helpful. Each university library should involve itself in the process of manpower development.

Ultimately, everything and every success of mass project depends upon the finances available. The fate of INFLIBNET depends upon the financial support provided by the Government of India.

A outline of the academic library system as part of INFLIBNET is given below

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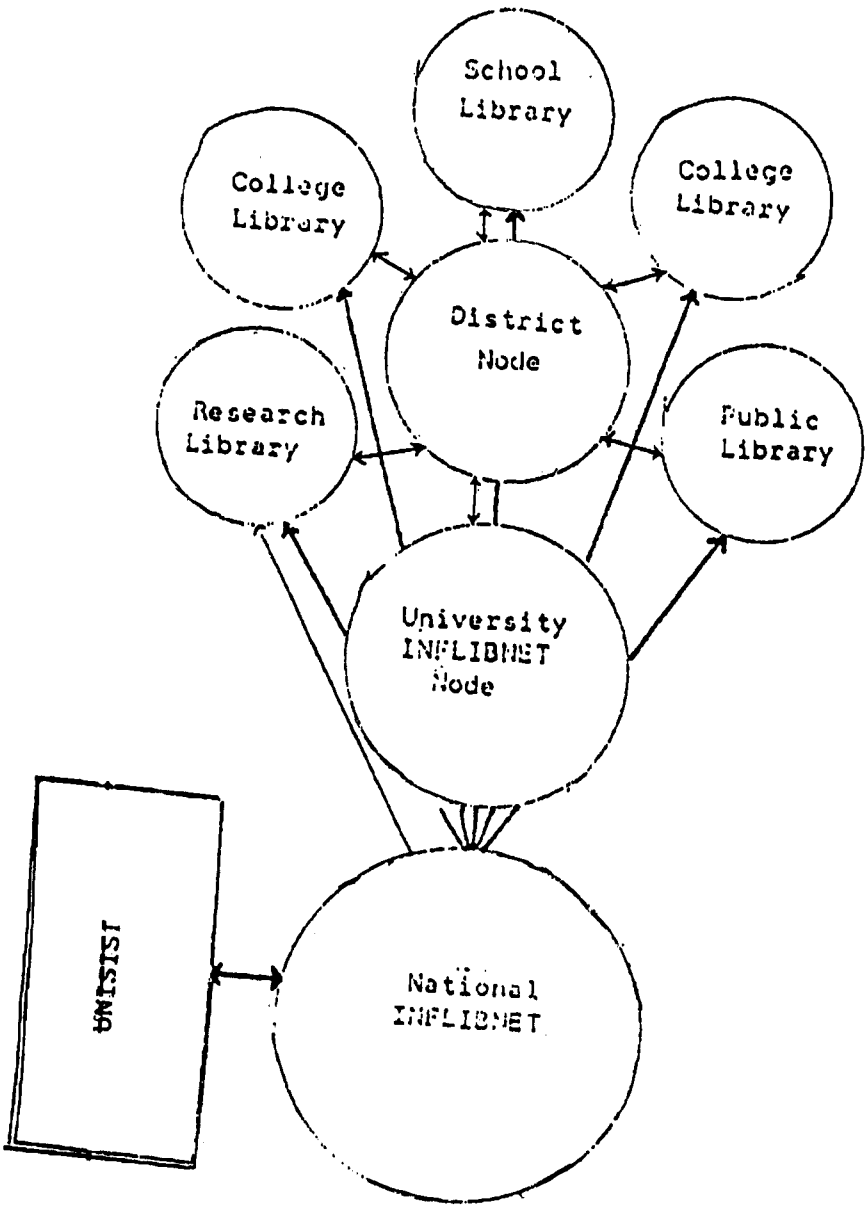
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Academic library system and its use for development of INFLIBNET.

Biotechnology Information System - A National Biotechnology Information Network

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J.R. Arora**

ABSTRACT

Recent exciting developing in biotechnology have resulted in intense R&D activities all over the world, in universities, research institutions, industrial research centres and in biotechnology based corporations. This has naturally resulted in an information explosion and increased information intensity in the form of research publications and patents. It is essential for a group conducting research in different areas of biotechnology and/of engaged in manufacturing activity to have ready access to an information base in order to capture relevant information from the vastness of knowledge development elsewhere, commercialization of R&D results, patents etc. at a short span of time.

In addition, the Planners and policy makers need analyzed information to dovetail S&T programmes in Biotechnology with national and socioeconomic planning activities. In order to satisfy the strong felt need of the research institutions, industries in the country for quick access to published material and world wide genetic resources and databanks, a broad based informatics support service was envisaged by the erstwhile National Biotechnology Board through a national informatics network system

The department of Biotechnology, during the 7th Five Year Plan, took over the control of the scheme as part of its infrastructural facilities to promote research and manufacturing activities in biotechnology.

This paper describes the objectives of the scheme, important achievements and futuristic areas of work in the development of techniques and tools for handling biotechnology information.

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Indian National Information Programme for Marine Science

M.P. Tapaswi*

Explains the steps to be taken for a better utilization and management of information resources available in institutions concerned with marine sciences in India. The role and the services and facilities of the NIO Library are described.

1 INTRODUCTION

India is one of the fortunate countries to have a long coastline. Waters of the Arabian Sea and the Bay of Bengal wash its shores on its west and east respectively. These waters of tropical belt, being highly productive, keep the country's living resource potential in the green. Over the last few years, non-living resources - minerals, oils and gas - also are being exploited at some places well confined to the Exclusive Economic Zone (EEZ). Availability of such consistent wealth be living or non-living, has undoubtedly made a considerable impact on the country's economy. This, in turn acted as a catalyst for the proliferation of number of institutions for research and developmental (R&D) activities and higher education in the field of marine science (as a part of human resources development) during the post - independence era. A detailed account of the history of these developmental activities have been documented in the form of comprehensive review[1]. As of now a sizable number of trained personnel in the field of science and technology (S&T)could be identified in the marine science discipline in India. So far, 86 institutions have been identified till to-date[2] situated mostly along the east and west coasts of India (figure .1), engaged in specific or multidisciplinary branches of marine sciences (table 1). This table does not take into account the large scale efforts in the field of exploration, preservation, canning and export of the marine (living) resources by the business house in the private sector.

Exchange of information amongst these institutions helps in bettering the expected output and in reducing the duplication of research efforts. In a way, information science as such has its' role to play to meet the above requirements. However, the procurement of the required major and subsidiary research material (dealing with the developmental activities) in the form of information is quite expensive.

The generation and dissemination of information is the principle scien

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tific aspect that one is confronted with today. In the developed nations this problem is not serious as they are the main sources of generation of information and they also exploit fully the latest technological advancements in communications systems available for dissemination purposes. While this is the situation in general, the field of marine sciences is no exception to this. It may not be very much our of the place to mention that the R & D studies in marine sciences occupy a special and unique status as far as expenditure are concerned. Logically so, is the marine science information component. In India, around 1 to 2 % of the total institutional budget is spent on information related activities. Considering the prevailing inflationary trend, this percentage has hardly any meaning. It affects the users of multidisciplinary institutions more as their store houses - the libraries - can not do justice for any singular discipline. Coming to the educational institutions, I reserve my comments as they need no further appraisal.

Over and above the problems of funding, the accessibility ad awareness of the available information would have their impact in contributing to the quality and quantity of research output. thus, funding and management of the available resources need consideration at this stage.

Funding, as we all know, for the development of a strong information base at any institutions depends on several external factors. The library and information professionals (LIP) have a significant role to play for better utilization of the available resources.

This paper attempts to address some of the steps proposed to carry out the task of better utilization and management of information in the marine based institutions in India. These include mainly:

1. Survey of available resources from the region,
2. publicizing the information available at the house to the prospective user(s)/organizations(s), and
3. development to network.

The final stage of the proposal deals with the service component. These various steps suggested, could be executed in the assigned order or simultaneously depending on the availability or trained personnel.

A case study has also been made following these steps. The results of which are highlighted to support the functional aspects of the said proposal.

2 PROPOSAL

21 Survey

Personal visits to user organizations in a way door-to-door complaining is proposed for information collection on the infrastructure, resources, skills and user communities. These visits also provide an opportunity for detailed discussions with the heads of different institutions as well as the LIP. and for identify-

ing contact persons for liaisoning. The advantages of closer cooperation among such centres, the mutual benefits that could be accrued as a result of sharing and exchange of resources, information, databases and expertise would then be spelt out. In addition this would also cultivate the utilization of available information resources at specified laboratories and finally lead to getting them admitted to the network - a next stage of this proposal.. This aspect would illuminate the needs for infrastructure development, training requirements, etc., at one or more centres. Modalities to meet such needs based on priorities identified could then be formulated to seek further support from user organizations of other funding agencies.

All the above efforts (groundwork) would strengthen the activities of the coordinating centre. the overall architecture of the system could then be well framed. The major institutions with their resources would act as nodal points, support mutually either on sharing/participating basis and extend the facilities (assist) to those with weaker information base.

22 Information Awareness Programme.

Based on the experience gained so far, the following are some of the significant points that need to be detailed to underline the importance of this stage:

1. Unawareness: Majority of the users express difficulty in getting exposure of the available, large marine science literature,
2. Information professionals: Inadequate availability of trained personnel to handle information dissemination and other relevant/ associated/affiliated tasks.
3. Modes of information dissemination using modern tools, and
4. Need to make users aware that the literature they publish could well be publicized through relevant data bases.

221 Modus operandi

While on the job of information collection through direct or indirect means, the personnel would pass on the handouts - brouchers, pamphlets, etc., projecting the strength of the collections, different services that NIO library could offer; lecture and demonstrate the utility of the data base searches. They would ascertain the information requirements of the prospective users and think on possible solutions. The users - who are in-a-way information generators - would also be informed about the importance of inclusion of their publications in the databases - national and international.

23 Network Development

The structural aspects of the network would be finalized after identifying the definite user organizations. The network formation would help in:

1. developing and maintaining union catalogues of documents available at all the centres under this framework;
2. promoting the use existing standards, modalities (techniques, designs, etc.) in the information handling;.
3. the use of contemporary technological advances: computer-based methods, microcomputers, database design, telecommunication/satellite networks, etc.;
4. developing and maintaining a national database of import to the national programmes and R&D in these areas;
5. making information services tailor made to user organizations;
6. sharing and utilizing resources at optimum level;
7. ensuring optimum capture of information on published/unpublished literature in various branches of study and its' input to databases-national and international; and
8. acting as a strong resourceful unit for international associations.

24 Services

There would be certainly and increasing demand for the services mainly in the form of literature search and document delivery after practicing first two stages of the proposal. The literature searches could be done on national and international data bases using - Compact Disc technologies or on-line facilities. On-line searches are again dependent on the availability of funds. The problem of document delivery is rather crucial. to make document delivery service effective, it would be necessary to develop contacts with other information centres of relevant discipline, spread all over the world to capture required and unavailable literature within this country. Even if free availability of documents may not always be possible, the cost of such facility on the basis of mutual cooperation would certainly be less than that of commercial services.

3 CASE STUDY

The library of the National Institute of Oceanography (NIO) is one of the largest libraries in the field of marine sciences in India housing a collection on all multidisciplinary areas of this subject. The overall growth is shown in figure 2. The increase in the collection of this library is three fold during the last fifteen years. In recent past, however, owing to the limited funds available, the acquisitions show a decreasing rate of growth. The collection is always being referred by various users. Over 10,000 annual borrowings by 400 users are recorded at the circulation counter of the library. One of the reasons for significant use of the collection by the in-house user community could be envisaged in the efforts made in: i) display of the latest acquisitions, and ii) circulation of new arrivals lists. The frequent short duration visits of the students and research scholars

from various Indian universities for literature survey, studies etc., to NIO library also reflect sufficiently on the collection and facilities offered.

31 Resource Sharing

To a limited extent the libraries of NIO and Goa University share their collections. This has helped in reducing the expenditures to the tune of Rs.75,000/- at each institution annually. Within the institute (including it's three regional centres), similar practice has contributed to a saving of Rs.1,00,000/-

32 Computerization

The library is equipped with modern tools for information dissemination like microcomputers handling national and international databases. The staff has been sufficiently trained, in India and abroad, in modern information handling techniques. Under the modernization programme, the library has also computerized some of its' housekeeping operations by developing software tuned to the local needs.

33 Awareness on Modern tools of information handling

When the library introduced the ASFA database on compact disc (CD-ROM), a series of demonstration programmes for the in house users were organized. Table 2 provides it's increasing use over the years. The success of this experiment underlines the need for launching an information awareness programme outside this institute to increase its utility to the maximum.

34 International Participation

341 Cooperative Information System

The library is also participating in the international information dissemination activities. With it's merits it has recently been recognized as the National Input centre for Aquatic Sciences and Fisheries Abstracts - a cooperative international information system's database, managed by mainly United National agencies like FAO, IOC, UNEP, etc., in the field of study with a designated role in capture and transfer of bibliographic data pertaining to marine science literature published in India.

342 Document Delivery

The library routinely supplies photocopies of the documents required by other institutions on receipt of requests since last many years. During 1990, the library has also gained an experience in document delivery at national and international level. The Inter-Governmental Oceanographic Commission of the United Nations' project: Regional cooperation in Scientific Information Exchange in Western Indian Ocean (RECOSCIX - WIO) at Kenya has recognized this library as the cooperating institution in providing the required literature.

The recent report of the project highlights the fact that during 1990, the major share 35% of their requests for copies of documents are met by NIO in shortest possible time and at nominal charges. While the rest was met by 17 other cooperating institutions.

343 Networking Efforts

During 1990, efforts were also made to organize a workshop, with a view to bring together LIP from various Indian institutions dealing with marine science studies, as one of the strategies to fulfill the aim envisaged i the above proposal. However, this exercise did not yield any encouraging results.

4 CONCLUSION

A scheme for collection and dissemination of information to various user organizations has been proposed considering the dwindling funding from the principle sources. The activities, on aspects of collection, handling and dissemination of information pertaining to marine sciences, covering this proposal have been put to practice at the laboratories of NIO with the limited staff members, trained in India and abroad. This exercise yielded satisfying results. Encouraged by the success of the experiment, a proposal has been submitted for consideration at the national level.

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Table 1. Type of organizations studying specific/all subjects in marine sciences in India

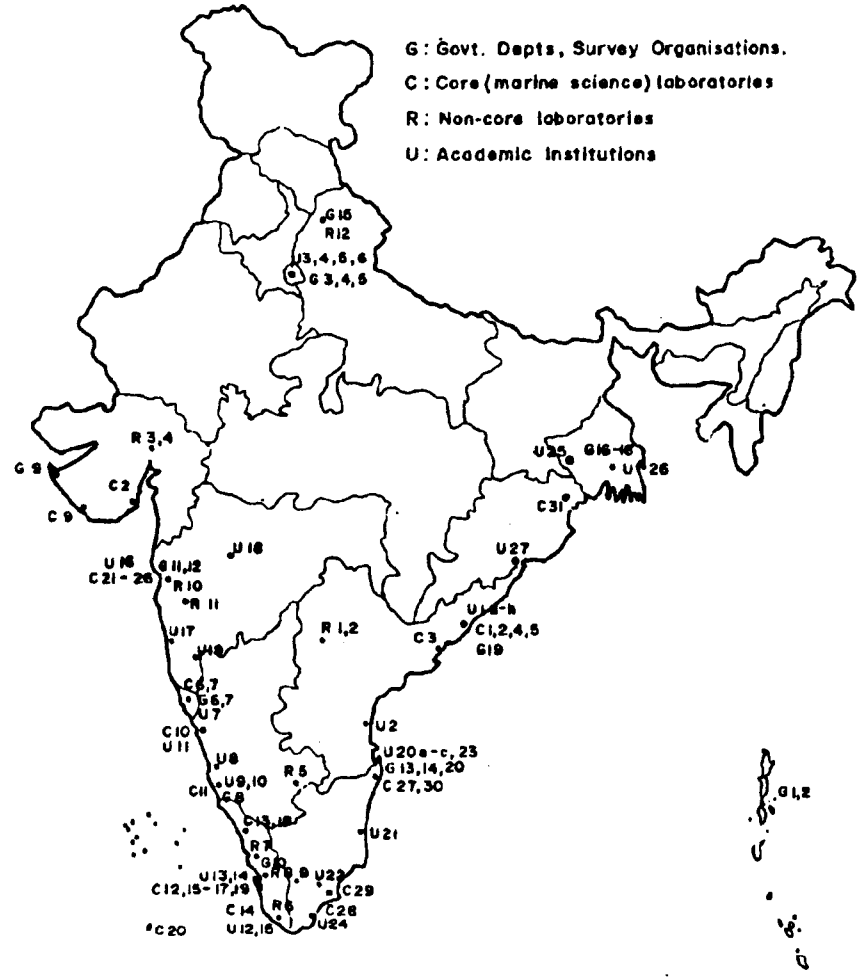
Type	Bio/Ecol	Fish	Chem	Phys	Geol/Geop	Tech/Engg	Gen
Govt	4	7		3	3	3	1
Main labs	7	20	5	5	2	2	
Auxiliary labs		1	1	2	4	2	3
Univ Dept.	22	10	7	6	9	4	

Table 2. Number of ASFA searches carried out since commissioning

Year	Number of NIO users	Searches for NIO users	Non-NIO users	Total
1988-89*	54	146	39	185
1989-90	47	421	142	563
1990-91	95	435	169	604

* = from 18 October 1988

FIGURE-1: LOCATION OF ORGANISATIONS IN INDIA DEALING WITH MARINE SCIENCE ASPECTS



LIST OF INSTITUTIONS IN FIGURE 1

Andamans

G1 Fsi, Port Blair
G2 Zsi, Port Blair

Andhra Pradesh

C1. Nio, Rc Waltair
C2 Cmfri, Rc Waltair
C3. Cift, Rc Kakinada
C4 Nstl, Waltair
C5. Cifnet, Waltair
C19 Gsi, Waltair
R1. Ngri, Hyderabad
R2. Nrsa, Hyderabad
U1. Andhra Univ., Waltair
U2. Svu, Kavali

Delhi

G3. Min. Agri Fish Div., N Delhi
G4 Dod, N.delhi
G5. Imd, N.delhi
U3. Jnu, N. Delhi
U4. Univ. Delhi, Delhi
U5. Iit, Delhi
U6. Jmi,n. Delhi

Goa

C6. Cift, Panaji
C7. Nio, Dona Paula
C6. Dir. Fish, Panaji
G7. Fsi, Margao
U7. Goa Uni, Bomboli

Gujarat

C8. Csmcri, Karwar
C11. Cmfri, Mangalore
G9. Gujarat Fish. Aduat Sci, Port Okha
R3. Prl, Ahmedabad
R4. Sac, Ahmedabad

Karnataka

10. Cmfri Karwar
C11. Cmfri, Mangalore
G8. Gsi, Mangalore
R5. Isro(nnrms) Bangalore
U8. Krec, Suratkal
U9. Fish. Col., Mangalore
U10. Mangalore Univ. Mangalore
U11 Karnataka Univ. Pg Centre Kodibag

Kerala

C12. Cmfri, Cochin
C13. Cmfri, Claicut
C14. Cmfri Cizhinjam
C15. Cift, Cochin
C16. Nio, Cochin
C19. Cifnet, Cochin
C18. Cift, Calicut
C19. Cifnet, Cochin
G10. Gsi, Cochin
R6. Cess, Trivandrum
R7. Idrb Trichur
R8. Cess, Cochin
R9. Gsi, Cochin
U12. Univ. Kerala Trivandrum
U13. Cochin Univ.., Cochin
U14. Kerala Agri Univ. Cochin
U15. Kerala Agri. Univ. Velanikkara

Lakshaweep

C20. Cmfri, Minicoy

Maharastra

C21. Cmfri, Bombay
C22. Nio, Bombay
C23. Cift, Bombay
C24. Ncml, Bombay
C25. Taraporewala Mar. Biol. Res. Stn, Bombay
C26.cife. Bombay
G11. Fsi, Bombay
G12. Ongc, Bombay
R10. Barc, Bombay
R11. Cwprs, Pune
U16. Inst Of Sci, Bombay
U17. Coll. Fish & Mar Biol. Res. Stn Ratnagiri
U18. Marathwada Univ. Aurangabad
U19. Kolhapur Univ., Klohapur

Orissa

C31. Cift, Sambalpur
U27. Berhampur Univ., Nerhampur

Tamil Nadu

C27. Ciba, Madras
C28. Cmfri, Tuticorin
C29. Cmfri, Mandapam
C30. Cmfri, Madras
G13. Fsi, Madras
G14. Zsi, Madras
G20. Bobp, Madras
U20. Cas Bot., Madras
U21. Cas Mar. Biol., Poro Novo
U22. M.k. Univ., Madurai
U23. Iit, Madras
U24. Tamil Nadu agric. Univ. Fish Col. Tuticorin

Uttarpradesh

G15. Naval Hydroger Office, Dehra Dun

R12. Kdmip (ongc), Dehra Dun

West Bengal

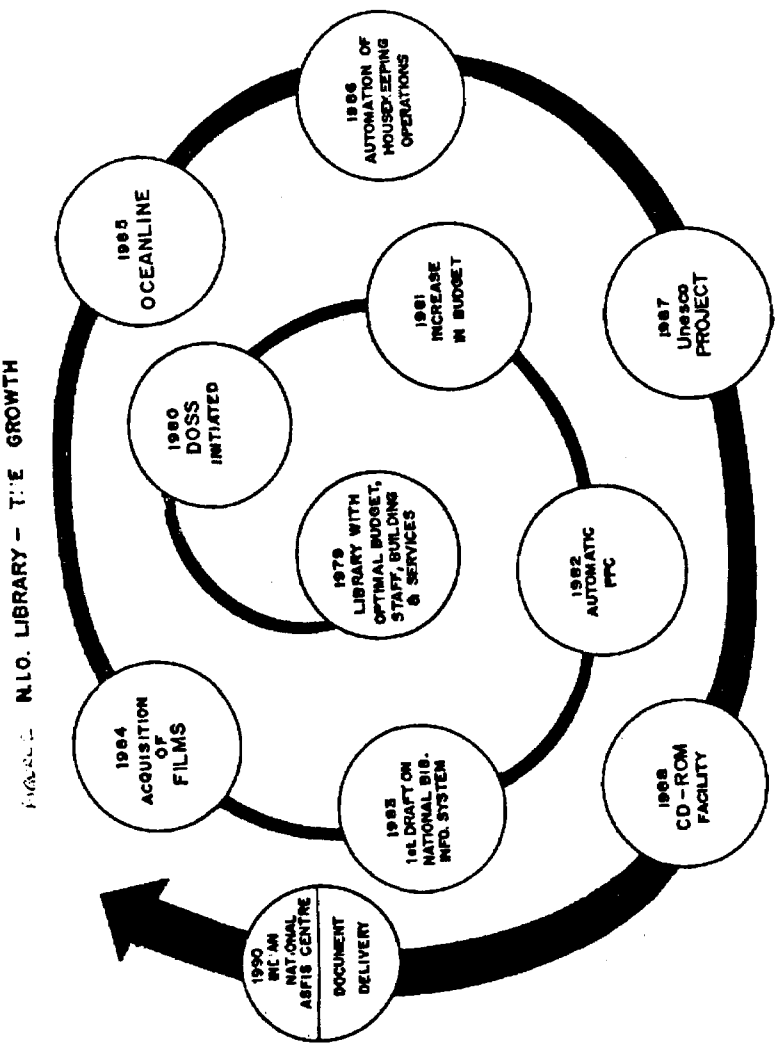
G16. Gsi, Calcutta

G17. Cpt Calcutta

G18. Zsi, Calcutta

U25. Iit Kharagpur

U26. Calcutta Univ., Calcutta.



Information policy perspctives for public library system

M A Gopinath.*

Public Library System (PLS) in India is still in the mould of the 19th century scholarshop. It has been slow to respond to the contemporary needs. Information policy perspectives have to be put into this. A case study for developing community information services in PLS is analysed. The inputs needed to be included into information policy perspectives are presented with details.

1 INFORMATION POLICY TOWARDS PLS

An important aspect of public library is that it should have goals and programmes to achieve a community information services. Rapid changes are occuring round the society: in modes of seeking information, the types of records of information, the more of education and research, and the variety of occupations - organized - as well unorganised - have to be taken care in developing public libraries in India. The current approach to public library should change from the 19th century role of public library was a traditional to gather information, organising them, and provide access to them. It is primarily focussed on the documents paused in the library. Even today, in Indian context these approaches have not been changed. If we continue in this moud only, the role of public library will go into dumps and relegated to secondary rate services. It is time for the library profession to assert, by identifying the information needs of our sociey, promote publications of a variety of information, make efforts to take into a library a balanced collection of documents, organise them and provide retrieval facilities to the stored information and keep all these operations open to receive changes and new structures. This is the sonnum bonum of the Five Laws of Library Science expanded by Ranganathan (2).

The following are the operations towards infomation policy:

1. To identify the information needs of society, based on the social goals, and collective approaches to solving problems;
2. To identify, priorities and promote publications on variety of media, the information needed by the society. There is need to interact to develop and promote good publication facilities, database facilities and continuous updates of them;
3. To identify, assess, collect good publications needed for community

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service to promote a balance in societal organisation and progress;

4. To identify, adopted and utilise variety of information storage and retrieval techniques to better and quicker access to information that is relevant to a seeker;and
5. To identify, prioritise and promote research in different fields of knowledge that can help to promote the role of public libraries to meet the changing societal aspects as mentioned in criteria 1 to 4.

We shall discuss further delineation in each of these aspects of information policy for PLS.

2 IDENTIFICATION

21 Information Needs

The information seeking and its expression in the form of needs are the results of a societal environment. Therefore, identification of this aspect is actually learning about situations and activities that people engage in and how people look for information. It is a key to knowing how to meet information needs and to plan services effectively to meet them. The major concern is how to identify ways to better meet the needs of multicultural society. The information needs' research has the potential to facilitate moving public librarians actively into a greater understanding of the problems or situations which require information and thus enable them to more effectively respond to actual societal needs. For example, the low-skilled persons, or craftsman who depend only on the job to learn and expertise, in it, hardly believe any other information can help them. Very often the society leaves them to mend themselves. This is a situation wherein the public libraries could watch and collect information and help unobstructively how they could improve their skills to meet in situation. Here is an opportunity of public library information can bigger the excellence in creativity of its community. Further, many times the local public policy issues gets distorted due to political rivalry. The public libraries should lbe able to reduce tension and move towards objectivity by skillfully protecting the required information. It can diffuse, it can remodel and it can bring the situtation to objective analysis by its timely identification of information needs of the society. Besides this, many questions of daily happenings can be answered such as the following:

1. Where is Jayaprakash Narayan Nagar, how to get there through to that place from the Malleswaram. The route for this in Bangalore City ?.
2. What is the telephone number for Deccan Herald and how to get it ?
3. Whether it is necessary to get a permit for starting news letter. If so, how and where to get it ?
4. Where to and how to obtain driving licence, particularly international driving licence ?

5. Which Government department to approach for approval to renovate the house ?
6. Which organisations run course on word processing/data processing training ?
7. Which banks in Bangalore are open on sundays for banking?
8. Where to and how to dump unwanted goods. ?
9. How to get authentic information about the recognition of primary/secondary schools for admission in Bangalore ?
10. What are the information sources that can give authentic data on Mandal land mandir issues. Do you have them?

These are many other aspects we may make a public library to answer. But for this system has to be geared with authentic sources of information, intelligent and motivated personnel to locate and answer, and also system to encourage such activities in a helpful manner.

3 PROMOTE PUBLICATIONS

The needs identification is of course the primary factor. But mere identification is not the end. We should have and sometimes create sources which can answer them. The bane of the problems lies here. In India, we have not yet developed good directories to meet local information needs. The business and industrial sector, which suffers the most is just begining to bring out general directories. The product-wise, manufacturer-wise, the cost/quality-wise, of industrial sectors have yet to see the light. The market promotion directories have yet to come up in a big way. There are, in fact, several directories of national nature, which give very general information. We do not have a comprehensive directory of R&D organisations, industrial promotion centres, etc. This certainly hampers and information services. But the public libraries should bring this kind or lacunae to the notice of entreprising publishers, institutions and governments.

Besides such development, the public libraries should develop a directory of their own, to meet the local information needs. A directory of medical doctors, their time to availability, their fees, and their speciality would help many critical situations. Similarly, a directory of building materials available in the vicinity for housing developments, roads etc help the activities to go on speedily. A directory of banks in the locality and their services in relation to saving and lending, specialised thrust area of the banks, the people to contact for investments and loan taking etc. can also be developed. Information on career choice, employment potential, job-apprentice training facilities are to be promoted. Such activities of the libraries may help entrepreneurs to develop better information facilities by themselves. Many times, the kind of services

include gathering materials in the form of borchures, address cards, and other profiles and organising them for timelyuse. One of the information users in a small Industries Service Institute was receiving many visiting cards from the entrepreneur. He used to keep if for immediate use and throw it away. But the type of enquiries he used to answer,later made him identify the value of visiting cards, he then began to file copies of them in several ways, by firm's name, by product/service name, by name of the contact (Proprietor, Manager) and soon his database began to grow and work well. Many of the community information services provided by the libraries may also be gathered from other institutions and social service organisations. These services may be governmental, community, neighbourhood and or voluntary organisations or institutions or they may be obtained through an individual. The public library can act as a coordinating agency and provide access to go through its existing network of strategically located agencies. Public library information and referral services should provide information and referral service for detailed facilities. A periodic conference of entrepreneurs of information industry may be organised is public libraries. In fact, one such organisation of exhibition of information and in small industries estate provided plenty of mutual contact and culminated in the development of an industrial centres library under PLS in Bangalore. Thus, information policy for better PLS should provide scope for this kind of meets of providers and potential receivers.

4 TOWARDS INFORMATION SERVICES

Information provided by the traditional reference service is vital to information seekers in a public library. It encourages personal contacts between library staff and the people. The latter may come from the Government departments, business firms, research institutions, professional bodies, social organisations, etc. However, reference service confines primarily to ready reference sources in the library. The information needed by the average citizens may not be usually available in library collections but can be found through resources outside the library.

The public Library has some strategic points in providing citizen's information services such as;

1. The public library is found to meet the information needs of citizens;
2. The public library has people with knowledge and skill for information retrieval;
3. The public library service the community in an impartial and helpful manner;
4. The resources of public library can be linked to provide back up services to currently sought information;
5. The location of the public library node, is generally in the hub of people

walking across for a variety of resons, such as marketing, shopping and entertainment, etc.;

6. The public libraries timings are beyond office hours say 8.00 a.m. to 8.00 p.m. This facilitates many persons to visit it at their leisure time;
7. A public library has a free atmosphere and the environment provides for helpful interaction. Its personality should be charismatic and encourage questions;and
8. A local public library can workk through its network and get the information required from other organisations.

For this purpose, the library should provide a computer aided information system. The information Policy for PLS should encourage and develop good computer-aided information system. Such systems can coordinate the human expertise towards achievement of goal. It can lead to the following type of activities:

1. To link speedily appropriate sources of information on several activities, missions and subjects;
2. To modulate the expression of information needs of users and connect them to information content of the documents available;
3. To make information readily available to users at the point of their work through network access;
4. To provide service with a customized gathering and presentation of the information to help solving of specific problems; and
5. To get feed backs on use of documents and identify pattern of utilisation of information service in different sectors.

These services are to be integrated into going through a variety of media and resources. Such a service may be called Integrated Information Service (IIS). It should provide as far as possible, complete information for decision-making or problem-solving situations. It may indicate alternatives and the pros and cons of these alternatives. IIS should specifically act on the follwoing:

1. Integrate internal (Institutionally - (PLS) Generated) information and external information;
2. Provide numerical and factual data as well as bibliographical data;
3. Provide a wide range of information services (such as Current awareness services, retrospective services,referral services, information analysis and repackaging, statistical processing, technology profiles, product and process information);
4. Present data and information in such forms and formats easily usable by the different categories of users served;and
5. Services should be provided in a manner friendly to information users.

In short, the information services provided should cover a wide range of services such as housing, employment, health and medical services, social welfare, education, legal aid, consumer's advice, educational facilities and their availability, career prospects, and local historical information. The information policy for better PLS should encourage and provide for the infrastructures needed for technological development in library and information systems.

5 INFORMATION PROCESSING

To develop better information services in public library a good adaptation of technology facilities is to be done. In particular, information technology applications in library and information work can be grouped into following operations and products:

1. Catalogue and catalogue production;
2. Indexing and production of indexes;
3. Union catalogue generation;
4. lists of additions and specific bibliographies;
5. Directory compilation and preparation;
6. Thesaurus construction;
7. Local Information Database creation;
8. Online access to remote databases;
9. Use of external databases on local computers;
10. Circulation of documents control;
11. Documents acquistion / books and reports;
12. Serials Control;
13. Computer-aided instruction;
14. Data communications and networking; and
15. Managing information service, computing, tabulation, simulation, graphics, statistics and reports.

These, indeed provide excellent physical help and also manipulative power. But to this, we must add person who are intelligent, service-minded, skillful in handling men and machine interactions. Here, I would like to quote Prof. Ranganathan **"An experienced reference librarian, assisted by an intelligent junior can at one and the same time survey the periodical publications"**. He could spot out much literature which, but for his efforts, might remain out of sight for months after publication. The reference librarian knows

the needs of the clientele far better than any other person."

"The toad beneath the harrow knows exactly where each pin point goes" says the poet.Similarly, the reference librarian knows exactly for what topics it is vain to send a reader to the stack-room, and, by inference in what subjects his library is week" (3). Thus, human reference librarian is a must for getting productive results from the technological information. Ranganathan further elaborates it: "A real 'live' reference service can only be created by a personel with special flair for locating, as if by a sense of scent, useful information in most unexpected quarters and disseminating it in a more useful way ..... To create a real 'live' reference service the reference librarian should have not only intimate acquaintance with printed matter and manuscripts but also with men steeped with information. In some cases the enquiry may have to be circulated to a number of specialists so that greatest possible measure of knowledge and experience can be brought into play. This applies to enquiries about itmes of knowledge too recent and too unsettled to be answered merely by reference to literature. For its efficient operation, such work demands, not merely knowledge of technicalities of subject, but also a wide knowledge of scientific and technical personnel all over the world" (4). Ranganathan emphasised the appropriate integration of human knowledge and skill with the intelligent capabilities of computer communication.

Speaking further on organising local capabilities for knowledge base for a community information service, Ranganathan said that even local libraries should adopt the same principle to exploit local talents effectively. The local library should have a list of the specialists residing within its area - particularly of the ripe old retired specialists who are too old to take regular service but whose mature experience and accumulated knowledge should not be allowed to run to waste. In most cases such experienced scholars will be very glad to place their knowledge at the service of the local library if they are approached in the proper way; for such congenial work iwll relieve them of their tedium. The community potential kfor reference service should be deligently tapped. It can be seen from this that the reference librarian has but little to do as a mere curator of books. He must be a man capable of making contacts and of maintaining good relations with scholars of eminence. (5)

The foregoing statements emphasize that the information policy for PLS should be a combination of the personal touch of a human being with the intelligent operation and cooperation of information technology. This is kind of dovetailing the best of human intellect and emotions with the best of the computer communication technology.

6 CHANGE AND MODULATION

Change occurs with a lapse of time. In the contemporary world change

has been occuring, rather rapidly and in several directions. There are changes in user perception and expectations in information seeking, there are changes in the variety of information sources emanating from different institutions and individuals, and there are changes in the infrastructural facilities that are being used to bring rapport with these two parameters. The approach so far is to meet the impact of these changes in the 'wait and see' type. But this approach leads to haphazard way of handling the situtations. The information policy should be framed to meet the situation and indicate that the PLS should adopt a planned and phased approach to newer technologies. The method of osmosis proposed by Ranganathan is to be adopted in handling changes. Sudden changes in infrastructure will create aberration and chaos among users, information personnel and the management. The procedure for this should be fashioned out in the information policy and implementation programme.

7 INFORMATION POLICY PERSPECTIVES: SOME INPUTS.

The information policy perspectives in relation to further developement of public libraries should cover the following aspects:

1. The information needs of the users of PLS: a kind of proactive approach should be followed. There should be research sponsored by the PLS to periodically assess the needs. This is necessary for instituting new information services, and remodelling or stopping of the existing services.
2. It should promote cooperation between variety of agencies, entrepreneurs in publishing and information industry, provide feed back on the information needs to create a variety of directories and databases needed for reference and information services.
3. It should promote adoption of information systems which can give delivery to the users preferabley to the point where working needs are there.
4. It should promote adoption of systems for information processing, organising, retrieval, modelling and displaying a variety of information to users. It should promote user friendliness.
5. It should promote adoption of technology and other changes in library and information systems in a gradual manner and use method of osmosis for this purpose.

8 CONCLUSION

The information policy perspective presented here is a derivative case study for developing community information services. Similar inputs can be derived for various components of information policy using normative and pragmatic approach.

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Information Needs of Small Scale Industries:

A Study Based on Industries at Bangalore

K M Peter*

Susy Peter*

Small Scale Industries provide employment to many and play an important role in nation's Socio-economic advancement and that technical information is a vital ingredient for the small scale industries to lean upon for solving many of its problems states that unlike the heavy industries, the information infrastructure of the small scale industries are rather very poor and their information needs are slightly different in nature.

1 INDUSTRIAL SETUP

Various types and varieties of factories are in existence and many more are being commissioned in Bangalore. These industrial establishments are engaged in producing consumable and non-consumable goods. The major fields of coverage of production are electronics, electrical, mechanical, medical food and pharmaceutical items. Heavy and large scale industries like BEL, ITI, BHEL group of factories, HAL, HMT etc. are some of the notable government undertakings. Under private sector, industrial establishments like MICO, Kirloskar Electric Company etc are there. Apart from these, large number of medium scale and small scale industries engaged in producing varied items are also in existence. Many of these small scale industrial establishments are functioning as auxiliary units to the heavy industries and some are producing goods directly for marketing to the public.

2 SMALL SCALE INDUSTRY

Based on the capital investment in plant and machinery the industrial units could be broadly classified into heavy, medium and small scale industries.

The Government of India has issued a press note on 19th March 1985 raising the investment limits in small scale industrial undertakings from 25 lakhs to 45 lakhs in plant and machinery. Keeping in view of the escalation in the cost of plant and machinery since then, government had been considering the question of upward revision of this investment limits. Accordingly the government had placed a statement in both House of Parliament on 31, May 1990 outlining certain policy measures to be adopted including enhancement of investment ceiling of small scale/ancillary industrial undertakings.

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A notification had been issued on 22nd April 1991 enhancing investment limits in fixed assets in plant and machinery. Accordingly it has been decided that in small scale industrial undertakings investment limit in fixed assets in plant and machinery had been increased from 35 lakhs 60 60. Apart from that a small scale industrial undertaking, if it exports atleast 30 percent of its annual production by the end of 3rd year from the date of its commencing production, then the investment limit in fixed assets in plant and machinery increased from 35 lakhs to 75 lakhs.

3 INFORMATION NEEDS OF INDUSTRIES

In modern times information for industries has gained great importance. Industry, being a very dynamic and complex system has to be managed on scientific lines for development in the face of competition and the tremendous technological changes and innovations that are taking place. management of industry requires recognition of economic psychological and sociological factors affecting it. It entails planning, directing, controlling, decision making, motivating, forecasting, undertaking operational research using variety of statistical techniques and so on so as to ensure productive and gainful operation.

Heavy industrial establishments like ITI, HMT,BEL, HAL, MICO, Kirloskar have got their own libraries and technical information service centres to collect the required information and disseminate it to the R&D units and information seekers. Whereas the small scale industries have neither the capability to maintain their own information units nor the infrastructure to collect the required information.

Proper information and guidance are required for the small scale industries for their establishments, functioning, regular supply of raw materials, production, marketing the products and diversification of the industries. To meet these information needs the government has established Small Industries Service Institute and a network of subunits in many of the major cities and towns. Apart from these, there are many other organizations which cater to the various information needs of the industries at different stages of its production. the appendix given will furnish the various stages/steps the small scale industries have to go through and their information needs at those various stages and the institutions to be contacted for the services.

4 ROLE OF INFORMATION CENTRE

Unlike the heavy industries, the information needs of the small scale industries are rather slightly different in nature. Whereas the former is more interested in acquiring the regular published information for their R&D activities, the latter is for acquiring information for their routine functional activities and solving problems related to the day-to-day production and marketing sides. The small industries information centre should collect infor-

mation for the possible queries and supply it on demand to the entrepreneurs. Apart from providing such information, they should render referral services also. These services will help the entrepreneurs, administrators and decision makers in taking suitable decisions in starting new industries and for their effective management, promotion of production and quality control, marketing goods and diversifying the production in the most profitable manner.

Annuxure 1

INSTITUTIONS TO BE CONTACTED FOR INFORMATION AT VARIOUS STAGES

Information Sought	Office to be contacted
A. Product Selection and assistance in preparation of project report/feasibility report.	1. Small Industries Service Institute, Rajajinagar, Bangalore - 560 044. 2. Br. Small Industries Service Institute, Mahabaleswar Building, Mallikatta Junction, Kadri, Mangalore - 3 3. Industrial Extension Centre, Indl.Estate, Yadavagiri, Mysore - 20 4. Small Industries Service Instt. Gokul road, Hubli - 30. 5. Br. Small Industries Service Institute C-1 Indl Estate Gulbarga. 6. Industrial Extension Centre, Udyam Bagh, Khanpur road, Belgaum. 7. Technical consultancy Service Orgn. of Karnataka, 14/3A Nrupathunga Road, Bangalore - 2 8. District Industries Centres of Respective districts. 9. National Small Industry Extension Training Institute Yusufguda, Hyderabad - 45.

	10. Karnataka State Electronics Dev. corporation Ltd., 30 Race Course Road, Bangalore - 1
	11. Central Machine tools Institute. Tumkur road Bangalore (For Machine Tools)
	12. Karnataka Kahadi & Village Industries Board, Miller Road, Bangalore and its district office (for Khadi & village Industries)
B. Obtaining Provisional/ permanent registration certificate	1. District Industries Centres where the unit is proposed to be setup.
	In Bangalore district the following office may be contact:
	a) For Bangalore Urban Dist: The General manager District Industries Centre 3rd Floor, VITC Bldg. Kasturna road, Cubbon park, Bangalore.
	b) For Bangalore Rural Dist.
	i) The Asst. Director, DIC Sub Division, Indl. Estate Doddaballapur, Karnataka.
	ii) The Asst Director DIC Sub Division Indl. Estate Ramanagaram, Karnataka.
C. Obtaining Corporation/Municpal/Panchayat licence	Respective Corporations/Municipalities/Panchayats where the unit is to be located.
D. Registration under the factories act	Chief Inspector of Factories and Boilers, 3, 1st Cross Gandhinagar, Bangalore -9
E. Obtaining developed plots for construction of factory	Karnataka Industrial Areas Development Board 14/3A Nrupathunga Road, Bangalore - 2
F. Obtaining sheds in the Industrial Estates.	Kartanaka Small Small Industries Development Corpn,Indl. Estate, Rajajinagar Bangalore 44 or its local office

G. Obtaining finance	1. Commercial Banks
	2. Industrial Cooperative Banks
	3. Karnataka State financial Corporation, Shankaranarayana Bldg. 25, M G Road, bangalore - 1
H. For obtaining water supply	Bangalore Water Supply and Sewerage Board, Cauvery Bhavan, Bangalore - 9 or connected municipality/Panchayat
I. For obtaining power connection	Karnataka Electricity Board Cauvery Bahvan, Bangalore - 9 or its local office
J. For procuring controlled raw - materials	The Joint Director (SSI) 14/3A, Nrupathunga Road Bangalore 2
K. For procuring imported raw - material/machinery components	The Joint Chief Controller of imports & Exports, Cauvery Bhavan Bangalore - 9
L. Obtaining machinery on hire purchase basis	Regional Office: National Small Industries corpn. Ltd. 615, Mount Road, Madras - 600 006
	The national Small Industries Corporation Ltd. G-2 Indl. Estate, Rajajinagar, Bangalore 4
M. Foreign Collaboration (where foreign know-how is required to be obtained from abroad)	1. The Foreign Investment Board, Min. of Indl. Development, Udyog Bhavan, New Delhi - 11
	2. Indian Investment Centre Jeevan Vihar Bidg. Parliament Street, New Delhi - 1
	3. Indian Investment Centre, Annasalai, T.N.K House, Madras
N. Technical know-how for new products/processes	
	1. The Asian & Pacific Centre for T-Ransfer of Technology, 49, Palace Road, PO Box 115, Bangalore - 52

	2. CSIR Polytechnology TRansfer Centre, 14/3, Nrupathunga Road, Bangalore - 2
	3. The National Research Development Corpn., Zamaroodpur Community Centre, Kailash Colony Extn, New Delhi - 48.
	4. Technical Know-how for Mini Cement plants - Cement Research Institute, K-10, South Extension - II, Ring Road, New Delhi - 49.
O. Obtaining ISI Certificate	Bureau of India Standards Nanak Bahvan, New Delhi.
	Regional Office: Bureau of Indian Standard Indl Estate, Peenya, Ist Stage, Tumkur Road, Bangalore - 58
P. Obtaining Patent Right	The Controller of Patents and Designs, 214 Lower Circular Road, Calcutta - 17
Q. Obtaining Trade Mark Regn.	1. Registrar of Trade Marks, New Marine Lines, Bombay - 1
	2. 9 Judge Jambulinga Mudaliar Road, Madras - 600 004
	3. All India Trade marks Agency 367, I Block, Jyanagar, Bangalore - 11
R. Obtaining marketing assistance, International Marketing	1. Director General of Supplies & disposals, Parliament Street, New Delhi - 1
	2. DGS & D, C/o the Director of Inspection, 185 Seshadripuram, Bangalore - 10 (Inspection for product approval)
	3. Karnataka State Small Industries Marketing Corpn. Ltd., VITC Bldg. Cubbon Park, I Floor, Kusturba Road, bangalore and its Regional Office at Mysore, Mangalore, Hubli, Gulbarga and Hassan.

4. The director, Stores Purchase Department, Public Utility Bldg. M G Road, Bangalore - 2

5. Karnataka Leather Industries Corporation, Mysugar Bldg. J C Road, bangalore - 2 (for leather products)

6. Sub-contract Exchange, SISI, Indl. Estage, Rajajinagar, Bangalore - 44

7. Visvesvaraya Indl. Trade Centre, Kasturba Road, Bangalore - 1

8. National small Industries Corpn. 615, Mount Road, Madras 6 and its Branch Office at G-2, Rajajinagar Indl. Estate, Bangalore -44.

S. Export Marketing

1. Export Promotion Cell, SISI, Bangalore - 44

2. Trade Development Authority Bank of Baroda Bldg. 15 parliament Street, New Delhi - 1

3. Trade Development Authority 1/4 Ulsoor Road, Bangalore - 42.

4. State Trading Corpn. of India 10-A Kasturba Road, Bangalore - 1

5. Export Credit GUARANTEE Corpn. 40/3, Kempegowda Road, Bangalore - 9

6. Export Inspection Agency Chember of commerce Bldg. K G Road, bangalore - 9

7. Export Promotion Council for Finished Leather & Leather manufacturers, P B No.198, 15/46 civil Lines, Kanpur 1

8. Engineering Export Promotion Council 14-1/3 Ezra Street, 3rd Floor, Calcutta - 1

9. Leather Export Promotion Council marble Hall, 3/8 Vepery High Road, Madras - 3

10. Marine Products Export Development Authority, 'World Trade Centre', M G Road, P B No. 708, Ernakulam South, Cochin

11. processed Foods Export Promotion Council 105 New Delhi House, 27 Barakamba Road, New Delhi -1.

12. Spices Export Promotion Council, World Trade Centre, M G Road, Erunakulam - 6

13. Cashew Export Promotion Council World Trade Centre, M G Road, Ernakulam - 6, Kerala State

T. Obtaining Testing facilities.

1. Chemical Laboratory of SISI, Bangalore- Testing of Samples of Chemicals products.

2. Glass & Ceramics Lab of SISI, Bangalore - Testing of Clay of find the suitability for manufacturing bricks tiles

3. Mechanical Workshop of SISI, Bangalore - Testing of Electric Motors.

4. Electrical Lab of SISI, bangalore - Testing of Electric Motors

5. KEONICS - Race Course Road, Bangalore - 1 for electronics testing facility

6. Regional Testing Centre, 65/1, GST Road Guindy, Madras - 32. a) Physical testing b) Metallography c) Metrology d) Non-destructive testing e) Photographic dark room X-ray

	7. Electronics Test & Development Centre, Ring Road, Peenya Bangalore - 58
	8. Central Power Research Institute, P.B. No.1242, bangalore - 560 012 for testing electrical appliances.
	9. Regional Agmark Laboratory, 38/1 West Park Road, Malleswaram, Bangalore - 3
	10. Controllerate of Inspection Electronics Min. of Defence, J C Nagar, Bangalore - 6
	11. Indian Institute of Science, Bangalore 12
	12. Central Machine Tool Instt. Tumkur Road, Bangalore.
	13. Hindustan Machine Tools limited Bangalore.
	14. Bharat Electronics Ltd. Bangalore.
	15. Forest Research Laboratory, Bangalore.
	16. Indian Space Research Institute, Bangalore.
	17. National Aeronautical laboratory, Bangalore.
	18. Electronic components Standardization organizations (LCSO), Min. of Defence, LRDE, DRDO Complex, jeevan Bhima nagar, Bangalore. for Quality approval and testing of electronic components.
U. Obtaining training	1. SISI, Bangalore. a) Trade oriented Courses b) Process Oriented Courses: Vitreous enamelling / electroplating. c) Blue Print Reading d) Adhoc sources
	2. Govt. Tool Room & Training Centre, Rajajinagar I E Bangalore - 44 (Tool & Die making)

3. Central Institute of plastic and engineering Tools, Guindy, Madras - 32.

4. Central Footwear Training Centre 65/1 GST Road, Madras - 32

5. Central tool room & Training Centre, Bonhoog Indl. Area, Calcutta - 35 (Tool Design & Tool making)

6. Central tool room A-5, Focal Point, Dhandari kalan Ludhiana 10 (Tool design and tool making)

7. SISI Extension Centre, E-45 Indl. Area, Jullunder - 144 004 (Hand tool designing)

8. C F T R I Mysore - 13 - Food products.

9. University of Agricultural Sciences Bangalore (Bakery Training)

10. Community Canning Centre, 108 Magadi Road, bangalore - 40 (Fruit Canning, Mfg. of Jams and Squashes)

11. Central Institute of Tool Design Balnagar, Hyderabad - 37

12. Foremen Training Institute, Tumkur Road, Indl. Suburb Bangalore - 22

13. Regional Vocational Training Instt. for Women, Hosur Road, Bangalore - 29.

14. National Dairy Research Institute Adugodi, Bangalore - 30 (for Dairy products)

15. Regional Design & Technical Development Centre, Design Wing, 8 Church Street, Bangalore - 1

16. Technical Wing, 32 Victoria Road, bangalore - 47, (for product Development and training on Handcraft products)

V. EDP sources & Management Courses	1. National Institute for Entrepreneur and small Business Development, NSIC - PDTC Campus, OKHAL Indl. Estate, New Delhi - 20
	2. Entrepreneur Development Instt of India, Ahmedabad - Gandhinagar Highway, Bhat Village, Bhat Post, Gujarat.
W. Pollution control Licence	Karnataka State Board for Prevention & Control of WAter Pollution, Public Utility Bldg. M G Road, Bangalore - 1.

MEDLARS Services in India

S.L. Chinnappa *

Naina Pandita **

Shravani Paul ***

S. Kumar ****.

Gives the scope of MEDLARS, MEDLINE, Online access to MEDLARS Database at NLM and NIC, available CD-ROM databases procedure for searching the databases training programming programmes and various catalogue of medical periodicals. Statistics for the services rendered by the MEDLARS Service Section at NIC.

1 INTRODUCTION

11 MEDLARS

MEDLARS, the Medical Literature Analysis and Retrieval System of the National Library of Medicine (NLM), Bethesda, USA comprises of a family of 28 biomedical databases which are international in source and content. NLM's collection of journals represents the world's most original and substantive literature taken from 73 countries and written in 30 languages.

The information contained in these 28 databases not only includes clinical aspects, but also, aspects such as public health, medical research, education and practice without regard to geographical boundaries. Articles on sophisticated research such as DNA replication, formal and continuing medical education, design of rural hospital or teaching of health in rural primary school, veterinary medicine and nursing are also included.

12. MEDLINE (MEDLARS Online)

MEDLINE (MEDLARS Online) is the world's leading bibliographic databases of medical information covering 3,500 journals from 1966 onwards. The most sought-after database in medicine, it contains the information found in Index Medicus, international Nursing Index, and Index to Dental Literature. Books and Monographs are not covered in MEDLINE.

The Bibliographic information contained in this database gives details including author names (upto 10), title, source, address of first author and

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abstract (Upto 400 words).

In addition to MEDLINE, specialized databases in the fields of Health Administration, Toxicology, Cancer, Population Studies, Medical Ethics, Gene Sequencing, etc together form the family of MEDLARS databases. Physicians Data Query System and TOXNET (a family of toxicology related information) are also available from NLM.

2 MEDLARS CENTRE IN INDIA

To facilitate access to the vast resources of knowledge, Indian Council of Medical Research (ICMR) and National informatics Centre reached a decision in 1985 to set up a MEDLARS centre in India. To set up such as centre, NLM looks for high standards in communication facilities, software availability, methodologies for timely dissemination of information and providing support facilities in the host country. Since NIC fulfilled all these criteria, a Memorandum of understanding was signed in 1987 to set up a MEDLARS Centre at NIC, New Delhi. The agreement was aimed at providing an easy and ready access to MEDLARS at NLM. NIC acts as a nodal agency for providing MEDLARS services in India and is the 17th MEDLARS centre in the world.

3 ONLINE ACCESS OF MEDLARS DATABASES FROM NLM

This Centre has been providing biomedical bibliographic information to doctors, clinicians, researches, and medical students in India from MEDLARS since 1987. The databases which were being accessed were MEDLINE and its back files (1986-66), POPLINE (Population Information ONLINE) and CANCERLINE (Cancer Information ONLINE). Access has now been extended to all databases of MEDLARS of which some important ones are AIDSLINE, AIDSDRUGS, AIDSTRIALS (all AIDS related information), TOXLINE (Toxicology Information ONLINE), HEALTH-PLAN (Health Planning and Management Information ONLINE), DENTALPROJ (Dental Projects Information ONLINE), SERLINE (Serials Information ONLINE), DOCLINE (Information of documents available at NLM), AVLINE (Audio-Visuals available at NLM, and also PDQ and TOXNET. All these 28 databases are being accessed from this Centre Through National Informatics Centre Network (NICNET)

NICNET is a satellite based network technology and the first integrated computer communications network established in a developing country. This data communications network is accessible via leased or dedicated lines, switched telephone network or satellite circuits providing a reliable and dependable communication system.

NICMAIL is an indigenously developed electronic mailing facility made available on NICNET with the NEC - S1000 system as the central node. This configuration allows messages to be transferred between sites via NEC-S1000.

Bibliographic information can be sent to users through NICMAIL to any state district office.

In the beginning the Centre was connected to NLM's host computer through a dial up modem which proved to be very expensive. In 1989 the Centre started accessing NLM's databases through the Gateway Packet Switching System (GPSS) located at the Videsh Sanchar Nigman Limited in Delhi through NICNET. This was a more cost effective and a highly reliable mode of connecting to international networks. Consequently the number of searches being conducted increased considerably (Tables 1 A and 1 B). Recently, the Centre has been connected to GPSS through a dedicated telephone line (which forms a dedicated system to the GPSS pad). this allows an uninterrupted access at any time to NLM, USA.

4 ONLINE ACCESS TO MEDLARS DATABASE AT NIC

To allow direct access to Medicine by users in India, NIC acquired 5 years MEDLARS data on taps from NLM following an agreement between NIC and NLM, USA. Under this agreement NLM will provide MEDLARS data on tapes from 1986 onwards with monthly updates. Data from these tapes has been downloaded onto a Landmark 486 machine at NIC, New Delhi. This is a Unix System with a storage capacity of 9 GB. The 486 machine is connected to NICNET and the database can be accessed through NICNET nodes across the country. Users can visit any of the NIC state or district offices and access MEDLINE. Users can also access the database from certain select institutions through a dial up modem connected to the nearest NICNET micro earth station.

A Bibliographic Retrieval Software (BRS/SEARCH) package has been used to develop and access the database from the 486 machine. This package was selected because of it's interactive full text storage facility, and an easy to learn English based command structure. this package also provides for easy browsing, scanning, and in context printing/displaying facility in addition to efficient disk storage for text.

5 DATABASES ON COMPACT DISKS

Some of the MEDLARS database are available on Compact Discs. these databases have been acquired by the Centre to provide a back-up to the ONLINE access of the NLM's database. Searching these databases on CD-ROMs is relatively inexpensive and simpler as compared to online searching. Some of the MEDLARS databases available on CD-ROM are : MEDLINE, POPLINE, CANCERLINE, TOXLINE and HEALTH-PLAN. to access these databases a multi-user, multi disc CD-NET system was purchased to which several PC workstations have been connected through a local area network (LAN). This will allow several users to access these CD-ROMS simultaneously from any of the workstations. Users in an around Delhi can come and do their own searches

on this machine.

6 METHODOLOGIES OF SEARCHING MEDLARS DATABASES

Search requests are received by post, telex, telegram, telephone and through personal visits. A growing number of users are now sending their search requests from their state or District NIC offices through NICMAIL. Doctors send their requests in a standard format through NICMAIL and the information retrieved can also be transmitted back in the same mode. this ensures timely transfer of information for patient care/treatment, sometimes within an hour of receiving the request.

Each search request is analyzed carefully and search strategies/statements prepared using a controlled vocabulary. these statements are combined using Boolean Operators. The information retrieved from the databases is basically bibliographic in nature. The user is provided with citations including author, title, source, address of first author and abstract where ever available.

The information is mailed back to the user within a week of receiving the request. In case of lot of data being retrieved, a print out is obtained from NLM, USA which is mailed to NIC. Thereafter NIC mails these printouts to the users in India. This takes around two weeks. Along with the bibliographic information, a search evolution form is mailed to the user. By filling up these forms the user can send his/her opinion/comments etc indicating relevancy of the information provided, the time lag in receiving this information,etc.

7 USER AWARENESS PROGRAMMES/TRAINING PROGRAMMES

User Awareness programmes are being conducted across the country to create an awareness amongst the medical community about the existing MEDLARS Services at NIC (Table 2). These programmes have evoked a very good response from all over India. Medical students and professionals from even the remotest part the country are also utilizing the MEDLARS services provided by the centre.

Several training programmes are conducted every year by the Centre in the Fundamentals of MEDLARS Searching for doctors and medical librarians/information professionals. Participants are trained in searching methodologies to access the MEDLARS database at NIC using the BRS/SEARCH package. In addition they are trained in accessing CD-ROM databases.

8 UNION CATALOGUE

A database of the Catalogue of Biomedical Periodicals Subscribed to by Indian libraries has been created on the NEC s 1000 system at NIC. The objective of this database is to provide a document support facility to the existing bibli-

ographic literature retrieval services of this centre. INQ, a relational database management system has been used for developing this database. This database can be accessed through all NICNET nodes. Through this, users can locate journals of their interest in libraries of their choice. the journal information can be retrieved through journal title, journal code, or library code. The user has an option to restrict the libraries retrieved to a particular state or city in India. In addition this databases gives information about library holdings and details of missing/incomplete volumes.

9 CONCLUSION

The national Informatics Centre has successfully met all the commitments to provide biomedical information to users from MEDLARS and is committed to continue in its efforts towards strengthening the health care infrastructure in India through this

Table 1 A. Break Up of Search Requests

Year	No of Requests	Actual No. ofSearches Performed
1988	486	846
1989	970	1269
1990	1589	2316
1991 upto 30-10-1991	1867	2386
Total	4912	6817

Table 1 B State wise Break-up of Requestors

State/U.T	1988	1989	1990	1991
ANDAMAN 7 NICOBAR	-	-	2	-
ANDHRA PRADESH	31	37	57	118
ASSAM	-	-	14	17
BIHAR	11	24	61	100
CHANDIGARH	47	76	79	64
GOA	2	-	1	1
GUJARAT	5	42	64	58
HARAYANA	1	8	11	22
HIMACHAL PRADESH	1	-	3	-
JAMMU & KASHMIR	4	3	11	5
KARNATAKA	54	65	52	135
KERALA	2	10	34	31
MAHARASTRA	77	179	380	447
MADHYA PRADESH	16	22	43	33
MANIPUR	-	-	-	1
NAGALAND	-	-	-	1
NEW DELHI	126	270	376	410
ORISSA	8	42	55	26
PONDICHERRY	3	3	8	32
PUNJAB	14	30	52	49
RAJASTHAN	-	-	9	17
SIKKIM	-	-	-	9
TAMIL NADU	49	89	73	42
TRIPURA	-	-	-	2
UTTAR PRADESH	25	57	168	195
WEST BENGAL	10	12	36	50
	486	969	1589	1865
BHUTAN	-	-	-	1
NEPAL	-	1	-	-
EGYPT	-	-	-	1
TOTAL	*486	*970	*1589	*1867

*Where there are multiple/repeat requests from individuals it is counted as 'one' in the list.

Table 2. User Awareness Programmes Conducted during 1990-91

Place	Sponsored/Organized	No of participants
Pune	National Informatics Centre (Pune)	200
Chandigarh	Post - Graduate Institute of Medical education and Research (PGIMER)	150
Madras	Madras Medical College	200
Delhi	Neurobiology Course, all India Institute of Medical Sciences	40
Delhi	Neurological society of India	100
Delhi	International Workshop on environmental Carcinogens, all India Institute of Medical Sciences	50
Agartala	Special Secretary, Government of Tripura	200
Hyderabad	National informatics Centre Hyderabad	200
Gantok	Secretary, Health and Family Welfare, Sikkim	100
Bangalore	Bangalore Pediatrics Society	100
Pondicherry	National informatics Centre (Pondicherry) JIPMER and Govt. Medical college	150
Jaipur	National Informatics Centre, (Rajasthan)	50

National Agricultural Research Information System

P.C. Bose*

Gives the need and scope of the Agricultural Research Information Centre (ARIC) of ICAR and a proposal for setting up a National Agricultural Research Information System for India including a network (KRISHINET)

1 INTRODUCTION

In recent years there has been tremendous explosion of data and information particularly in the field of agricultural sciences and technology. There has been spurt in number of research institutions and State agricultural universities in the country. As a result it has become difficult for one organization to collect the data and information which is required by the policy makers, administrators and research scientists. Thus, the access to right information at right time has become very difficult. The other scientific departments of the Government of India have already started their planning to start Information Network in their respective sectors. Some of these projects are in the process of implementation and others are in the pipeline. The Indian Council of Agricultural Research (ICAR) has taken certain steps to computerize its information system, but not one time efforts have been made in this regard.

2 AGRICULTURAL RESEARCH INFORMATION CENTRE (ARIC)

The activities of the Agricultural Research Information Centre (ARIC) of ICAR was started in 1967 as a research project file unit on the model of the Current Research Information System (CRIS) of the United States, Department of Agriculture. The main objective of the Unit was to maintain information on status of current agricultural information in India through a system of research project files in which date relating to the initiation of a project to the end of the project were maintained and documented. Presently, the system maintain information on about 6000 projects in operation at the various institutions and centres of the Council. The main purpose of such system is to identify the research gaps with a view to improve the development of research methodology and transfer of technology, planning, identification, selection of projects, review and monitoring of research.

21 Adhoc Research Schemes

Besides, the Centre also maintains information of all adhoc research schemes (extra-mural) sanctioned by the Council from its Agricultural Produces

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* Indian Council of Agricultural Research,New Delhi.

Cess funds. The projects are running at various state agricultural universities and other organisations. There are about 70 All India Co-ordinated research projects in operation at different locations. The Council is also sanctioning projects from different foreign funding sources like US held Rupee Fund, ODA, SIDA, DANDIA, IDRC etc. under several billeteral agreements.

22 National Input Centre

The Centre being the National Input Centre for the International Information System on Agricultural Sciences and Technology (AGRIS), is creating a bibliographic database on research being published in Indian journals and other publications. The input is being sent to AGRIS Database in a machine readable format (Floppy diskettes). There is a necessity of developing a National Bibliographic database in agricultural sciences on the information generated within the country. This requires active participation of research Institutes and agricultural universities. Selective dissemination of Information services has to be strengthened and put on a sound basis so that the scientists of the Council and agricultural universities be in a position to improve the quality of research based on the exchange of the scientific literature.

The Centre is also the National Input Centre for Current Agricultural Research Information System (CARIS) of FAO. The Software used for the both the projects is Micro CDS/ISIS Ver 2.0 of UNESCO.

23 MIS

The Council being the major funding organization for agricultural research needs an efficient management information system for financial and budgetary control. The foreign data projects, educational and extension databases, the sales and distribution system of ICAR publication has to be fully computerized to create more useful and effective management.

A number of data bases has to be created with the help of the participating institutes by the ICAR Headquarters for developing a total MIS for ICAR.

24 Training and Manpower Development

Computers are being used at a very rapid speed in many fields of development. The agricultural research community will be also have to adopt computer technology for analysis of data captured and interpretation of such data. This will require a large number of person in agriculture who has to be exposed to computer technology at various levels. There is a need for giving computer appreciation courses at managerial level, computer programming techniques to system analysts and programmers and use of computer application to research workers and to provide training to administrative staff for office automation.

3 National Agricultural Research Information System

Since most of the information is scattered all over the country there is a need to develop a National Agricultural Research Information System (NARIS). The system will be fully computerised so that an efficient system of storage and retrieval could be organized through network (KRISHINET).

31 Objectives

The NARIS will be a computerized information network linking all the ICAR Research Institutions and State Agricultural Universitities. The main objectives are:

1. To function as an information base in each specially so that the policy makers, adminstriative and scientists have ready access to the computer based information on resources, data bases in special fields and to build up expertise in informatics;
2. A computer based information storage and retrieval system of database that collects structured information generated by the research institutions continously updated and makes the information available to the users;
3. To generate information relevant to specific areas, structured information into accessible and continually updated and make the information available to users;
4. An active network mode, in which scientists get access to the agricultural research community in the identified areas, and gets information in an inter-active mode;
5. To provide retrieval service either online or offline in the specialized area to give overall information support;
6. To provide communication link with international databanks like DIALOG for selective bibliographic information to the user scientists;
7. To develop software packages specific to users needs;
8. To conduct training courses in specialized areas periodically to meet the requirements of manpower development in the area and to promote awareness about the computerized storage and retrieval facilities among agricultural scientists and information scientists;
9. To develop suitable professional manpower of appropriate quality to establish, manage and sustain the NARIS; and;
10. To evolve standards and uniform guidelines in techniques, methods, procedures, hardwares and softwares, services in order to facilitate pooling assuring and exchanging resources and facilities towards optimization.

32 Computerization

The NARIS has to be developed by computerizing a number of items of

work which is being undertaken by the ICAR. The following areas can be identified:-

* Research Projects Management System.
* Information on research output in agriculture.
* Plan implementation and monitoring system.
* Sales and distribution system of ICAR Publications.
* Personnel database.
* Educational database.
* Agricultural extension database.
* Foreign visit report database.
* Foreign training information system.
* Parliament questions database.
* Budgetary control system.
* Financial management system.
* Foreign aided projects information system.
* Equipment database.

33 Hardware and Software Equipments

For successful implementation of NARIS it would be desirable to have a main frame computer system at the ICAR Headquarters which will act as host computer. this computer system can be connected to other computers located at the ICAR Institutes and State Agricultural Universities through NICNET. The system should be large enough to access and share resources of such a magnitude. The system should be capable of inter connecting users accessing data bases from the system itself as well as users in timesharing terminals. The system should have large disc storage capacity to store databases like AGRIS, CARIS, CABCD, AGRICOLA, CRIS and BIOSIS etc. The system should be flexible enough to attach terminals, work stations, CD-ROM drives etc. The system should also be capable of being connected to other large computer systems like the system installed at National Informatics Centre. This will help the NARIS to access date at district level from NICNET. this information and basic data on resources, inventory and land use planning will help the agricultural scientific community of information which is not hitherto available.

National Information Centre for Crystallography (NICRYS)

Manorama Srinath*

R. Ambuja**

Explains briefly the scope and activities of the National Information Centre for Crystallography Data (NICRYS), for using the Cambridge Structural Data Which is accessible through INDONET. Results of a study of the use of the database services by the scientists of the A.C. College of Technology are reported.

1 INTRODUCTION

The task of utilizing the available information effectively to meet the goals of the nation is of fundamental importance in developing countries such as ours, because the information sources are limited. Hence the promotion of National Information Policy which facilitates optimum utilization of nation's information resources should be a high priority programme in the national development plan.

2 NISSAT

The major objectives of NISSAT (National Information System in Science and Technology) have been directed to fulfill the above mentioned task. Provision of National Information services to meet the nation's present and future information requirements of the scientific community, has been listed as one of the major objectives of NISSAT. To achieve this objective a number of discipline, mission and product oriented Information centres are identified as Sectoral Centres under NISSAT programme.

3 NICRYS

In 1979, National Crystal Data Centre (NCDC) was started in the Department of Crystallography and Biophysics, University of Madras. In 1982, this was identified as National Information Centre for Crystallography (NICRYS) under NISSAT. It functions as a data service centre dealing with crystallographic data on organic and organometallic compounds. This is funded by NISSAT and receives an annual grant of two to three lakh rupees. UGC has also agreed to provide funds on a continuous basis.

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4 SERVICES PROVIDED BY NICRYS

NICRYS is the first data centre established in India which disseminates data obtained from the Cambridge Crystal Data Centre, United Kingdom in the form of computerized data tapes which are updated periodically. These tapes provide scientific data relating to organic structural crystallography and facilitate quick retrieval of information. Cambridge Structural Data Base (CSD) provides bibliographic and chemical text information relating to x-ray and neutron structural studies of organometallic compounds. Software for search, retrieval and display of information is an integral part of the complete CSD system.

Apart from CSD, NICRYS also provides information regarding other closely related disciplines such as inorganic structural data, powder data, crystal data, protein structural data, protein sequence data and nucleic acid sequence data etc.

41 Data files

Three major data files are maintained by the centre and they are the following:

1. **Bibliographic file**: This file facilities literature search on the basis of compound name, formula, author, journal, element, year of publication etc.
2. **Connectivity file**: Information can be retrieved on the basis of chemical structures from this file.
3. **Data file** :This file contains information regarding unit cell parameter, symmetry information, coordinates of atoms etc. and it contains more than 676 thousand entries.

5 NICRYS/CSD on INDONET

NICRYS/CSD has been made accessible on INDONET. INDONET is a powerful commercial network system established by CMC, which connects nine cities in India, namely Madras, Bombay, Delhi, Calcutta, Bangalore, Hyderabad, Visakapatnam, Pune and Ahmedabad. Users can have access to CSD through INDONET Via telephone network which can be established through STD.

51 News Letter

A quarterly News Letter is brought out by the Centre which provides information regarding the activities of Nicrys such as forthcoming conferences, books and publications etc. NICRYS Newsletter can be obtained free by writing to NICRYS.

Apart from this, pamphlets and Bulletins are also published which brief the activities of NICRYS.

6 Use of NICRYS SERVICES BY THE SCIENTISTS

It is understood that NICRYS services have been used by 265 scientists from about 65 institutions all over India. Approximately 4750 searches have been made so far. Scientists from various disciplines such as physics, chemistry, biology, material science, biochemistry and biophysics etc. have benefited by the services provided by NICRYS.

61 Use of NICRYS services by the scientists in A.C. College of Technology, Madras.

611 Survey

A short survey was undertaken to determine the extent of use of NICRYS services by the scientists of A.C. college of Technology, where NICRYS has been located .

612 Population surveyed

The faculty members and research scholars in the following disciplines were included as the sample population to be surveyed: Botany, Zoology, Chemistry Biochemistry, Biophysics and Crystallography. Data was collected from 50 respondents and due to their previous commitments the faculty members were unable to respond in time, hence more number of research scholars constitute the population surveyed.

613 Analysis

The analysis of the data collected revealed that most of the faculty in the campus were unaware of NICRYS services and those who used the services found them very useful for their research work. Among the 40 research scholars, 36 were not aware of NICRYS services. However, the research scholars from Botanical and Zoological sciences said that protein structural data and nucleic acid data will be useful for their research work, but they were unaware of such services.

7 RECOMMENDATIONS

The survey revealed that several research scholars are deprived of utilizing the services of NICRYS due to their lack of awareness. Hence, these services should be made more popular by publicising among the scientists in Tamil Nadu and all over India. Conducting workshops and demonstrations will prove to be more effective way of publicising NICRYS services.

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National Information Programme for College Libraries:A Crying Need

Naresh Boonlia.*

Critically evaluates the present state of college libraries in India. Discusses the underlying factors and their impacts. Also suggests the programmes which are essential.

1 INTRODUCTION

The large number of college libraries spread all over India enjoy privilege of being supported by the University Grants Commission that has placed college libraries very high in our academic library system. The importance of college libraries is accepted widely by every education commission and committee and by great educationists all the world over. But, the hard truth is that their role in our collegiate education is not adequately recognised and they get least priority in the administrative and academic set up.

2 THE PROBLEM

The real problem lies in the aforesaid mischievous phenomenon that, on the one hand college libraries are placed on a very high pedestal having been described repeatedly, invariably and eloquently as 'nerve centre of the institution,' apex of the entire academic life, 'temple of learning' and 'head and heart of the institution'. On the other hand, common experience presents a very gloomy picture of the college libraries and are treated in a very subordinate and suppressed manner which gives an impression as if these are useless accessories.This very dual treatment to the college libraries at the hands of the authorities lies at the root of the problem.

3 THE UNDERLUING FACTORS

At this juncture it is worthwhile to look into the factors which have lead to this diverse situation.

31 Attitude of the management

Most of the educational administrators did not have the opportunity of good library services during their student days. Hence they could not appreciate the desired services which the library professionals wanted to develop and make it functional, instead they expressed general apathy towards library developments and services.This lack of understanding has constantly kept these

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libraries in utter desperation. The situation has not changed today. As a result the college libraries are still held simply desirable, and not as an integral part of the organic function as a whole. They are deplorably behind times and have been designed in terms of functions quite different from the services now expected of them.The above phenomenon, nurtured due to misconception on the part of the authorities, has proved devastating for college libraries. Because, it has its own implications and many more dangers. And hence, we found that these libraries are not properly furnished and well equipped to attract the readers: old furniture, century-old pigeon hole like almirahs are provided to serve the purpose. In many colleges ceiling fans are not provided and if provided they are shifted to their departments very often.These libraries are not provided with proper staff both in quality and quantity. College library workers are mostly without any knowledge about the services expected to be rendered by them. The tradition is that the persons supposed to be unfit elsewhere are sent to the library. At times, any clerk or even an attendant is made incharge of the library.

32 Attitude of the teachers

Under these circumstances, the college library has to operate in an environment where educational administrators, teachers and students often fail to recognise the role of the library in relation to the educational objectives of the college. It is a said fact that educators have a sorry record of using the library as a teaching aid. Most of the teachers are either uninterested or not proficient in using the library for promoting the teaching and learning of their students.

As they are unable to estimate the importance of the library, they never appreciate and respect the laws and rules of the library. Hence, many more problems crop up and the librarian is always looked upon as inimical rather than contributive to deliver the goods.

It has affected the library collection also. Because, teachers who are supposed to be the subject experts almost know nothing about the latest developments and publications in their fields, as such they solely depend upon the bookseller's representatives who put the jackets of the books before them. And it is the only book selection tool prevalent in the college. Naturally, the collections lack quality, quantity, balance and up-to-dateness.

4 THE SOLUTION

We find that educational administrators and college teachers are the two sides of a coin and if we impress any one of them, the other is sure to follow the suit. Among the above two, the teacher can be impressed more easily because the library is considered to be the apex of the academic life.Hence, every effort made by the library to enrich his knowledge by communicating to him the latest developments in his field would gradually make him library oriented. To make this functional , following services should be provided:

1) Information about the recent publications in all the subjects should be furnished by the librarian to the teachers;

2) Information about the articles published in the various subject journals during a month should also be made available to him;and

3) Similarly, reading lists on the topics currently being taught by the teacher should also be made available to help him in his class-room teaching;

These are the services expected from a college librarian and can make the teachers and the students to look upon the librarian as a person to be reckoned gracefully.With the availability of such information, the task of the college librarian would also be very much simplified in selecting the books. It will not only help in building up good, up-to-date and useful collection but it will also help him to avoid unwanted and out dated reading material.

5 NEED TO DEVELOP A NATIONAL PROGRASMME

Library science is a subject, the study of which comprises of high ideals and prepares with ambition to serve the objectives of higher education, research and scholarship. In order to serve in such distinctive position, the library science students are given a thorough base in the theories and fundamentals of organisation of knowledge in libraries and as also how to serve it to the readers.

The services discussed in the above paragraphs are part and parcel of his duty. But it has been experienced that the present conditions already highlighted above such as, the limitations of the resources, the staff and the time make it a herculean task, rather almost impossible task, for a college librarian.

Moreover, there are more than 7,000 college libraries all over the country having common objectives and functions. The requirements of these libraries are almost the same because the subjects offered and the curriculum in the universities is more or less similar to a large extent with a few variations here and there, and as such the result of every such activity will produce the same information.

Hence, the compilation of the above suggested information with limited resources by few staff for the common object not advisable. Rather it would be mere repetition and multiplication of the same work which is a severe wastage of time, money and manpower accumulating to a big national loss. And it should be saved by developing a National Plan in the interest of library profession as well as for more than 7,000 college libraries. Inspite of so many agencies engaged in similar job i.e., compilation of information, one fails to understand why this aspect is being neglected so far.

6 WHO SHOULD DO IT

The University Grants Commission was constituted as early as 1953 as the apex body to look after and ensure proper and speedy development of higher education. The UGC has recognised the importance of libraries in achieving the objectives of higher education since its inception. According to R B Downs, "There is no better way to judge the quality of an educational institution than to look at its library. If the library is weak, the institution itself is mediocre; and as a corollary if the university or college has a strong library, there is every probability that the institution itself is outstanding. The better the library, the stronger faculty the college will be able to hold and the higher quality students it will draw".

It is a matter of great regret that the UGC had expressed general apathy towards college library developments and services and has confined its activities to financial grants only, and hence failed miserably to provide much needed leadership.

S I S Qadri is very right in assessing UGC as follows: "One wonders whether this commission all these years kept performing to the minimum of financial grants only merely because of the very styling it as University GRANTS Commission".

It is high time when the commission should come forward to think of developing a national plan for the college libraries in India. Because it is the only agency which should and which can make much headway in this direction.

7 CONCLUSION

In an editorial about the academic libraries in India, Dr Amrik Singh wrote, "Perhaps there is no part of the intellectual community in India which is more neglected than the library profession".

A century ago, T H Huxley, criticising the British educational system, said, "students work to pass, not to know, and the nature takes its revenge: they do pass and they don't know." Even by 1991 a country like India has not moved far from this position and one of the prominent contributory factors is that we have allowed the library profession to remain a weak sector of our higher education, and these libraries are still the weakest link in higher education.

However, the college librarians have an optimistic view of things, for their only solace is that a day will shortly dawn when:

1. the UGC will consider the COLLEGE LIBRARIES IMPROVEMENT PROGRAMME (CLIP) as an urgent necessity; and
2. a panel on college libraries will be constituted to help UGC develop a NATIONAL INFORMATION PROGRAMME for college libraries.

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National Information System for Small Scale Industries

S. Pandurangan*

The small scale sector has achieved phenomenal growth in recent years in India. The industrial policy has been modified from time to time in order to create congenial atmosphere for development and equitable distribution of small Industry in the country. Information is considered as the basic need for development and modernization of small industry but little emphasis has been placed on information in the policy framework. The information requirements of small scale industrial community are divergent in nature. In order to meet these divergent needs, all the information generated in various institutions coming under the umbrella of small scale industries has to be collected and organized by institutes such as Small Enterprises National Documentation Centre. Establishing a network and computerization will facilitate free flow of information to the grass root levels for use by the entrepreneurs and others.

1 SMALL SCALE INDUSTRIES IN INDIA

Small scale industries have emerged as a dynamic sector of the Indian economy. This sector has displayed an impressive growth in terms of employment, production and export. it accounts for about 35% of the total industrial production, 28% of the total export from the country and provides employment to 119 lakh persons.The number of registered small scale units is about 12.71 lakhs producing more than 5000 products, meeting the demand of mass consumption items in the country. The accelerated growth has indeed contributed to enriching the economic and social life of the country.

The small scale industry has been defined on the basis of investment in fixed assets in plant and machinery not exceeding Rs.60 lakhs. In the case of ancillary industries it has been indicated as 75 lakhs. The investment ceiling in respect of tiny units has been given as Rs.5 lakhs and located within the population limit of 50 thousand as per 1981 census.

2 INDUSTRIAL POLICY STATEMENT

The development of small scale industries is the responsibility of state governments. However, the Ministry of Industry through Small Industries Development Organization coordinates and formulates policies for development of this sector at the national level. Although the earlier policies of the government were not clear about small industry but the later ones placed considerable emphasis on this sector. The earliest policy of 1948 considered the

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cottage and small scale industries important and suitable for better utilization of local resources and skills for achieving self-sufficiency. The policy resolution of 1956 recognized the importance of industry (large, medium and small) and laid down directive principles for development of industries. The main thrust of 1977 policy was promotion of cottage and tiny sector. it is in this policy resolution that the concept of District Industries Centres came into being. The policy of 1980 attempted in bringing together the large, medium and small scale industries through the introduction of nucleus plants. The current policy of 1991 embarks on liberalization and grant of more facilities for the rapid development and modernization of the small scale industries. As an offshoot of these policies various projects and programmes have emerged from time to time of which the important are: Rural Industries Project, Industrial Estates Programme, Development of Backward Areas, Reservation of Products for small scale industries, District Industries Centres programme, Promotion of Nucleus Plants approach in backward areas through Zero industries concept, Self Employment Programmes, Modernization etc.

3 INFORMATION FOR INDUSTRY

Information is regarded as a vital input for the small scale industry but none of the policies described here have made any mention about this important resource. it is evident that the constant flow of information ensures healthy growth of the industry and also contribution in enhancing the profits and benefits. It is recognized that information categorized as scientific and technological information, natural resources data, and socio- economic data is essential for furthering productivity, development and innovation. Information is needed by planners, policy makers, managers, technologists, researchers, trainers, investors, consultants entrepreneurs as well as market as analysts and decision makers. The type of information they need is also of considerable diversity. It includes socio - economic data, information on current plans and projects, financial data, marketing data information on technologies, equipment, management practices, ongoing industrial and technological research, technology transfer and legislation. Such information which has to be recent and continuously updated has to be obtained from a large number of sources within the country at the central, state and district levels and even at the global level. The rapidly expanding volume of information presents problems of access and cost of acquisition to the ultimate user.

31 Problem of Access to Information

Inspite of the increasing number of organization and institution being set up for successful implementation of development programmes and exponential rate of generation of information seems to be an elusive commodity for, the average small entrepreneur. The entrepreneurs need, but seldom gets, reliable and timely information to make decision, solve everyday problems, improve methods, expand and diversify operations and adopt technological changes. Paradoxically, much of the information the entrepreneur seeks is often available

and exists in various government, developmental and regulatory agencies/departments, research and development institutions/laboratories including those for industry groups, financial institutions and investment centres, industry and trade associations, universities and institutes of technology, statistical and economic intelligence bodies and special information centres, libraries and data banks.

4 TYPES OF INFORMATION

The type of information required by the small scale industries can be grouped, by and large under the following headings:

1. Scope and prospects for industries: Items reserved for small industry sector, items having good prospects in the area, banned industries, items for subcontracting, import substitute items, products having export potential, items in short supply, items getting government priority, items successful in the country.

2. Location land and building: Location of growth centres, availability of land, availability of sheds in industrial estates, type of sheds, infrastructural facilities water, transport, communication, power, market, special facilities required, factory building, dimensions drawings layout, cost, rent and owning.

3. Machinery and equipment: Capacity, specification, description, models of machinery and equipment needed, local availability and importation, sources of supply and cost, capacity for spare time jobs, performance, availability of second hand machinery, hire purchase schemes, leasing out.

4. Raw materials: Composition and specifications for raw materials, standards, quality and quantity required, availability, quantity required, supply sources, cost.

5. Transportation: Transport facilities for raw materials and financial products.

6. Staff and labour: Availability of skilled labour, training institutions, personnel selection policies and methods, wage rates, labour laws, participation in management.

7. Finances: cost per month working capital requirements, total investment estimates, break even point, sources of finance, terms and conditions, seed capital facilities, government concessions and incentives, rates of interest, payment and repayment conditions.

8. Regulations and procedures: Industrial policy of Government, rules and regulations, procuring letter if intent, licenses and permits, sanction of sheds in Industrial estates, procurement of machinery, power connection, patents, trademarks registration, government incentives, import licensing policy, scarce

raw material procurement, financial assistance, national financing organizational loan procedure, obligations and terms and conditions on loans.

9. Market strategy: marketing channels, subcontracting, ancillary unit development, dealers performance, concession, shop in open market, publicity, distribution centres, bulk purchasing agencies, government stores purchase procedures.

10. Technological developments: Technological information is an integral part of, and an essential link in the technology transfer chain. It is necessary for the design, selection, installation and improvement of processes, materials equipment services and methods, and for the successful adaptation of foreign technology to local conditions and to stimulate indigenous technology. Exchange of technological information can among countries and also contribute to the strengthening of local capability.

41 Information Sources:

The information on these divergent aspects gets generated from the government and autonomous institutions falling under the core and peripheral areas of small industry. The description of the prominent institutions is presented here,

5 GOVERNMENT INSTITUTIONS

51 Small Industries Development Organization (SIDO):

SIDO under the Ministry of Industry functions as an apex body in formulating the policy and coordinating the institutional activities both at the central and state levels for implementing the programmes for development of small scale industries. It provides a comprehensive range of facilitate and services including consultancy in techno-economic, managerial, training common facility services common processing and testing facilities, tooling facilities and marketing assistance to small scale industries. It provides these services through a network of 27 small industries service institutes (mostly at state level), 31 branch institutes, 40 extension centres 4 regional testing centres, 3 product cum process development centres 2 central footwear training centres, 4 production centres and 20 field testing stations

52 State level Directories

Each state has a commissionorate of Industries with its branches in each district known as District Industries Centres for implementing the programmer at state and district levels. In 422 districts of the country, district industries centres have been established to assist the entrepreneur under one roof the technical guidance, project reports, credits and other essential information relating to small scale industry.

53 Other Institution

In each state the institution like small scale industries development corporations and technical consultancy organizations have also come into being for development of small scale industry.

54 National Small Industries Corporation (NSIC)

NSIC promotes small scale industries by providing supply of machinery on hire-purchase, enlistment of small scale units for participation in the government stores purchase programme, distribution of raw material, marketing of small industries products and extension of marketing assistance at institutional level. It also provides the facilities through its four proto type development training centres at New Delhi, Rajkot, Howrah and Madras.

55 Financial Institutions

A network of state financial corporations, National small industries corporation, State small industries corporations commercial banks, cooperative banks, regional rural banks, provide financial assistance to small scale industries. The recently created small Industries Development Bank of India (SIDBI) act as apex bank and extends assistance to small industries through various schemes.

56 Export Promotion councils

Export promotion councils for different products and commodity boards have been created to assist the small industry in export of their products.

57 Training Institutions

A number of training institutions at National level have been established to impart training to the small industry community. for example: national Institute of Small Industry Extension Training (NISIET) at Hyderabad, National Institute for Entrepreneurship and Small Business Development (NIESBUD) at Delhi, Central Institute of Tool Design, Hyderabad Central Institute of hand-tools, Jallandhar, Institute for Design of Electrical Measuring Instruments, Bomaby, integrated Training Centre, Karnal and other. Ad-hoc training programmes are offered by the state as well as local institutions as part of their activities.

58 Research and development centres:

The chain of laboratories under CSIR, universities and other research and development institutions, make available their research findings to,the industrial community. The standards formulated of Bureau of Indian Standards, the patents registered with the patent office, are also sources of technological developments.

In addition to these similar institutions in other countries and also the

institutions at regional and international levels are in service of small industry. Such institutions include UNIDO International Trade Centre, Intermediate Technology Development Group, World Bank, Volunteers in Technical Assistance, IDRC, OECD, ILO,and other similar bodies.

59 Information facilities

The broad spectrum of institutions coming under the umbrella of small scale industries continuously generate information and data in the form of publications. Such publications constitute valuable sources of information and the small industry community needs them for reference and use for taking gainful decisions. Small enterprise is really small and cannot effort to acquire, organize and retrieve the publications and information required by them as the information is expensive and needs technical skills to organize and retrieve. It is therefore beyond the scope of the small enterprise to venture for such a big task.

6 SENDOC

In order to extend the information facilities to entrepreneur, government of India has established Small Enterprises National Documentation Centre (SENDOC) at NISIET Hyderabad in 1970. SENDOC has created a broad base of information consisting of 50,000 books, 23,000 reports, and subscribing to 1,000 periodicals in the subjects relating to small industry. It has the specialized collection of 3,000 project profiles, 2,000 standards, 12,000 techno-economic survey reports, machinery catalogues, and other publications. the information has been organized on modern lines to provide easy access to the users a large databases on small scale industry has been created for use by the community of small scale industry. it offers both anticipatory and responsive information services. The anticipatory and responsive information services. The anticipatory includes publications of regular Journals, and adhoc publications.

61 Information System for Small Scale Industry

The ultimate object is to reach out with appropriate information required by the entrepreneurs so that they may use and benefit in their endeavors. But hardly any information reaches them. They are not aware of the availability of information and the right sources from which they can tap information the contact points for the entrepreneurs in most of the cases are DICs, SISIs and their extension, Directorates of Industries, financial Institutions. These centres do have information, but it is highly unorganized and scattered in the files. As a result of this, the entrepreneurs are not able to get holistic picture of information for their problems.

7 RECOMMENDATIONS

71 Information Grid

For smooth flow of information to the grassroots levels, an "Information Grid" has to established with SENDOC and SIDO as the models in the system.

SISIs, DICs, Directories of Industries NSIC research and development organizations, financial institutions and other promotional agencies have to be mashed into his Grid. The information has to,be a two-way process. the information and data generated at the District State and national level institutions should flow into SENDOC. Similarly the information and data from SIDO and its network should flow to SENDOC to,be processed, organized and disseminated.

72 Uniform Practice

SENDOC will also provide uniform practices for storing and handling information which would facilitate in easy exchange of Information and data among participating units in the Grid.

73 Contact Points

the promotional, developmental and extension agencies in the small scale and rural sectors are the primary contact points for,the entrepreneurs and these agencies should have well organized cells for disseminating information received from the information system.

74 Mass media

The mass communication media are not geared to the communication of information in an effective manner. Taking into account language, social and cultural aspects and accessibility to rural areas the system needs strengthening.

75 Computerization:

Computerization of information and establishing the network connecting all the institutions in the system is perhaps the right solution for easy flow of information which ultimately fulfills the objectives of making available the right information to these user groups.

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National Information System for the Humanities in India:A Proposal

Kanakachary M*

Gives the clear demarcation for the Humanities subjects.Stresses the value and scope of the Humanities in the present information age. Emphasizes the need and necessity of a National Information System for the Humanities in India(NISHI). Gives a design for a model and lists out the important activities of the proposed system.

1 DEMARCATION OF SUBJECTS

The term 'Humanities' is a blur and fuzzy. There is no clearcut and valid definition for the Humanities which is universally accepted. But, we know that the 'universe of knowledge' is broadly divided into three branches like Natural Sciences, Social Sciences and Humanities. There are different opinions on the subjects constituting the Humanities. In the educational curricula,sometimes the social sciences are clubbed with the Humanities and sometimes shown separately. In fact,the 'Humanities' is a soft area in which any subject related to the human culture, values and spirits can be accommodated. However after reviewing some of the important definitions and for the present purpose, the following subjects have been considered as 'Humanities'.

Philosophy

Religion

Literature(classical and modern)

Linguistics

History

Fine Arts

Art History

2 VALUE AND SCOPE OF THE HUMANITIES

Humanities is an important area of study which aims at understanding and appreciation of the values in human experience and culture. In the modern world,humanities are necessarily important because the efforts that are being put for the developent of the nation scientifically and technologically will be wasted without the Humanities.

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3 GROWTH OF HUMANITIES LITERATURE

There is a tremendous growth of literature in the field of Humanities on par with the Science and Social Sciences. Eugine Garfield, in his 'Arts & Humanities Citation Index' had right pointed out that the growth rate of Humanities literature is not less than the growth rate of Science literature throughout the world. The Bath University Study has also proved that the growth of literature in the Humanities is more than the growth of Social Sciences literature (Bath University). Even in our country, there is also rapid production of Humanities literature. There are nearly 400 Centres/Institutions/Libraries besides 180 Universities and more than 5000 Colleges which are functioning in the field of Humanities.90% of the Universities colleges have the Humanities departments/subjects in their educational programmes. There is huge increse of literature output in the Humanities disciplines.

If we look into the following tables as samples, we can have an idea of its growth rate of Humanities literature.

Table-I

Doctoral Dissertations accepted by Indian Universities for the period from1957-1970

Faculty	No.of dissertaions	percentage
Physical Sciences	8062	39.34
Humanities	5415	26.42
Biological Sciences	4197	20.48
Social Sciences	2819	13.76

The above table shows that approximately 60% of research is done in the field of Physical and Biological sciences followed by Humanities (26.42%). It clearly indicates that there is sufficient quantity of growth of literature production in the area of Humanities in India.(Bulletin of Higher Education)

Table 2

Number of Doctorate Degree awarded form 1983-84 to 1987-88

Faculty	1983-84	1984-85	1985-86	1986-87	1987-88
Arts	2678	2754	2886	2910	2993
Science	2890	2922	2838	2840	2842
Commerce	177	185	263	244	225
Education	187	239	219	212	205
Engg/Tech.	192	210	194	215	236
Medicine	59	70	61	77	93
Agriculture	648	576	627	592	557
Vet.Science	65	102	155	98	74
Law	8	25	34	43	51
Others	30	56	69	64	59
Total	6934	7139	7346	7295	7275

This table reveals that the faculty of Arts had the highest number of doctorate degrees awarded in 1985-86;1986-87 and 1987- 88 viz.2886, 2910 and 2933 followed by the faculty of Science 2838,2840 and 2842. Of course,some of the Social Science subjects are also included in the faculty of Arts,though there is no less growth of literature in the Humanities comparatively with that of Science and other subjects. It is also confusion that the nomenclature of the Science degrees are attached with M.Sc., but for the social science subjects the nomenclature is M.A.

Though there is more research output from the field of Humanities the U.G.C has not given a separate provision for the Humanities in respect of allocating funds for major and minor research projects in establishing Centres of Advanced Studies etc. (UGC Annual Report,1988-89). Even UGC failed to demarcate the subjects of Humanities. Always it clubs the Humanities with social sciences for all aspects.

After a long time, the UGC has realized the importance of the humanities and recognised the need for building up an Information Centre and proposed

to set up in one of the Universities on par with the Information Centres established for Science, at IISc,Bangalore and two for Social Sciences at SNDT Womens University, Bombay and M.S.University, Baroda respectively. But, the Centre for the Humanities has not yet materialised. It seems that the proposal has been withdrawn. Even when it is established, its services are meant for the scholars working in Universities and Colleges only, but nor for all the people who are working in different organisations/Institutions/Centres other than Universities and colleges.

Government of India has also not given any importance in building up of a sound infrastructure for the documentation and bibliographic control of the Humanities literature. Even in the recent 'Library & Information Policy' document, it was not mentioned about anything to set up an apex body at the national level for the Humanities on par with the ICAR, CSIR, ICMR, ICSSR etc.

4 PROBLEMS OF HUMANITIES SCHOLARS

As a result, there is neither a Council nor a Documentation Centre like INSDOC, SENDOC, DESIDOC, NASSDOC etc. But, there are thousands of students, research scholars, scholars, and laymen working in hundreds of organisations (both public and private) scattered throghout the country. A few of the important Institutions/Centres are listed below:

Central Institute of Indian Languages, Mysore.

Centre for Asian Documentation, Calcutta.

Central Institute of English & Foreign Language, Hyderabad.

Central Sahitya Akademi, New Delhi.

Central Sangeeth, Natak Akademies, New Delhi.

Indian Institute of Islamic Studies New Delhi.

Bhandarkar Oriental Research Institute, Pune.

Asiatic Societies of Bengal and Bombay etc,.

There is no coordination among these centres due to lack of a coordinating body/agency. The researchers, scholars and those interested in the areas of Humanities are facing problems in acquiring the required material in the absence of a National Information System in the field of Humanities. But, the Humanities Centres are producing a lot of material sporadically particularly secondary sources like indexes, abstracts, guidebooks, handouts, check lists, bibliographies and other documentation lists. There is lot of duplication too in the production of this type of literature, leading to wastage of money, manpower and valuable time, which directly or indirectly affecting on the nation.

5 PROPOSAL FOR NISHI

In view of the following important points there is a dire need and necessity to build up a National Information System for the Humanities in India(NISHI) for the documentation and bibliographic control of the Humanities :

1) it is due to high growth rate of Humanities literature;

2) to avoid the varied problems being faced by the user community of the Humanities field;

3) to avoid unnecessary, unwanted and unseen duplication of resources, money, energy and time being occurred;

4) to coordinate all the activities of the humanities centres/Institutions/ Libraries;

5) to have bibliographic control over the Humanities spectrum;

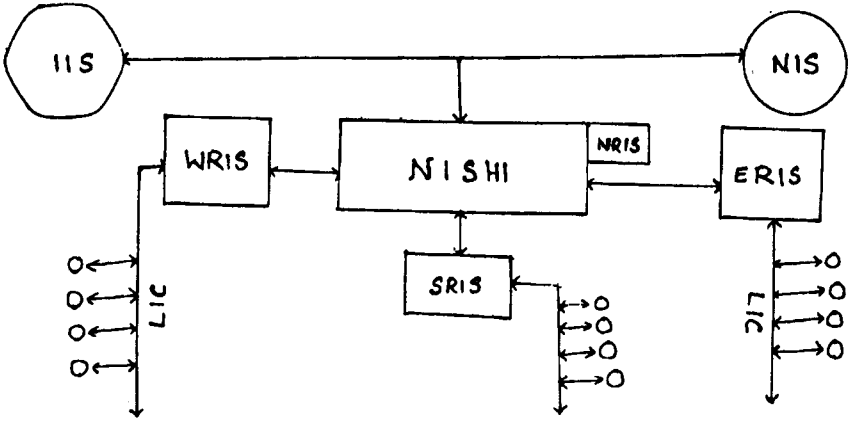
6) to give equal importance to the field of Humanities on par with sciences and social sciences;

7) to have resource-sharing and networking among the centres working in the field of Humanities and to have links with national and international databases and networking.

Therefore, an immediate decision has to be taken by the Government of India to appoint a Working Group consisting of Humanities librarians, Humanities centres Directors, Humanities scholars, Govt.representatives, System Designers and ILA & IASLIC Representatives to design an Information System/ Documentation Centre at the National level in the field of Humanities Which would work under a Council like CSIR and ICSSR. The financial & manpower requirements along with computer configuration will be worked out. For such a national apex body, several people particularly Humanities Librarians are discussing it in different seminars. IASLIC has formulated one SIG for Humanities Information separately and has been discussing various aspects for the last five years from the meeting at BHU, Varanasi in the year 1986 to the meeting at Mysore in the year 1990. Each and every time, they are strongly recommending for establishing a Documentation Centre at the national level in the field of Humanities with a Council in India. But, the proposal and the resolutions are lying on the papers only.

6 CONCEPUTAL DESIGN

Here, a conceputal model for the Information System at the national level is designed and proposed to set up in India.



NISHI	: National Information System for Humanities in India.
IIS	: International Information Systems.
NIS	: National Information Systems.
WRIS	: Western Regional Information System.
ERIS	: Eastern Regional Information System.
SERIS	: Southern Regional Information System.
LIC	: Local Information Centres.

The proposd NISHI is a 3- Tier system comprising of a main System to be located at New Delhi and four Regional Systems to located in Bombay for WRIS, Calcutta for ERIS and Hyderabad for SRIS respectively. For the north region, NRIS may be made a Wing in main NISHI only. The NISHI is linked up with suitable national and international networking systems. Since, NewDelhi is a central place where a number of research centres in the field of Humanities exist.The Indian Council of Philosophical Research may be made as NISHI and Indian Council of Historical Research may be made as NRIS. The Asiatic Societies of Bombay and Calcutta may be made as WRIS and ERIS respectively. The CIEFL, Hyderabad may be made SRIS. Nearly 50 centres may be upgraded

as Local Information Centres on the basis of reviewing their profiles. They feed the information to the regional systems which will ultimately transmit it to the NISHI and vice-versa. The translation services can be provided at the Regional Information Systems only of the languages of that particular region. For the translations in the foreign languages to Indian Languages and vice-versa can be done at the SRIS. Further details about the exact location points, financial implications, computer system design etc., are to be worked out thoroughly. Various activities to be taken by the this 3-Tire system are mentioned below:

1. Building up a collection of reference materials; collecting a) unpublished doctoral theses approved by Indian Universities and foreign theses on India; b) research reports if any undertaken by the Centres relates to Humanities working in India; c)Paper presented to different seminars/ conferences etc. on the topics related to Humanities in India; d) periodicals of research standard in Humanities.
2. Collection of manuscripts related to Humanities since the manuscripts are important for Humanities research and take up appropriate preservation procedures.
3. Providing duplicating and reprographic services.
4. Striving for bibliographic control over Humanities materials by bring out our various documents under the title 'Research Information Serious'.
5. Providing select bibliographies in request.
6. Proving inter-lending services to scholars
7. Providing bibliographical information about Indian publications in Humanities to international Information Systems.
8. Awarding study grants to scholars for working on their research topics at libraries of their interest in India.
9. Providing consultancy to Humanities institutions in setting up documentation and information centres.
10. Providing facilities for staff participation in professional seminars and conferences through contributing papers and taking active part in their deliberations; deputing staff to attend short refresher courses.
11. Processing project proposals for consideration by the Centres working on Humanities in India on documentation services and research information on documentation services and research information for financial assistance in the field of documentation
12. Conducting professional training courses under 'Continuing Education Programme'.
13. Entering into exchange arrangements with national and international organization for their publications on mutual understanding and

benefits.

14. Fixing of the prices for the publications of NISHI and supplying on payment/free of cost.

15. Participating in book exhibitions for sales promotion and undertaking sale of government of India publications to research institutes.

These activities/services can be divided among the National Information Systems, four Regional Information Systems and Local Information Centres according to the requirements and feasibility

CONCLUSION

Designing an information system at the national level in the developing countries like India is a difficult task. The constraints involved in it will be rather heavy. A careful planning and thorough knowledge over the subject and computer technology is necessary. The above design is a conceptual model. However,it would be useful to some extend in the design and development of a national information system for the Humanities. The financial implications, manpower requirements, activities/services are to be expected from NISHI are to be worked out. Anyhow, establishment of an Information System for the Humanities in India under a Council is essentially the responsibility of individuals, professionals and the government.

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National Information System : Standards

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Anita Bhatia*

Bureau of Indian Standards is the National Standards Body of India. It formulates National Standards with the cooperation of all interests concerned with the subject matter. It is also responsible for providing information, documentation and other services as well as promoting the concept of Standardization and use of Standards. A number of standards have been formulated covering various aspects of information systems like intellectual preparation of documents and their physical production, bibliographical records for information exchange in machine readable form, maintenance of documents as well as basic standards like terminology. Bureau of Indian Standards is also responsible for liason with International Organization for Standardization, which formulates International Standards.

1 INTRODUCTION

The Indian Standards Institution was registered as a Society under the Societies Regulation Act, 1860 in January 1947 to prepare and promote standards. The Indian Standards Institution Certification Marks Act, 1952 covered the operation of the Certification Marks Scheme. Though considerable progress had been made by ISI in its multifarious activities like standards formulation, certification, setting up laboratories and promotional activities, need was felt for:

a) providing recognition and status to the organization to enable it to discharge its functions effectively and efficiently towards acceptance and promotion of Indian Standards;

b) according priority to the functions in line with the national priorities;

c) making a provision in the enactment for introduction of mandatory certification in the public interest;

d) extending outside India services of the Bureau for inspection, testing and similar other purposes;

e) providing more stringent punishment against misuse of Standard Mark.

Keeping these factors in view, the Bureau of Indian Standards was established with effect from 1 April 1987 under the provision of the Bureau of Indian Standards Act, 1986. The Bureau took over the functions, assets and liabilities of the Indian Standards Institution.

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* Bureau of Indian Standards, New Delhi.

The Bureau is a corporate body consisting of members representing the Government, industry, scientific and research institutions and other relevant interests with Minister Incharge of the Central Ministry having administrative control of the Bureau as its President and Minister of State or a Deputy Minister, if any, as Vice-President. The Bureau is assisted in its functions by Executive Committee and the Secretary to the Government incharge of the Ministry or Department and Director General of the Bureau are ex-officio members. The Bureau is assisted in its functions by Executive Committee and the Advisory Committees dealing with finance, certification, standards formulation, laboratories and long-range planning.

Thus, the main functions of the Bureau can be grouped under standards formulation, certification marking and laboratory testing, promotional and international activities.

2 Formulation of Standards

For formulation of standards, BIS functions through many Technical committees, appointed by the following fifteen Division Councils - Food and Agricultural; Chemicals; Civil Engineering; Electro Technical; Heavy Mechanical Engineering; Light Mechanical Engineering; Electronics and Telecommunications; Petroleum, Coal and Related Products; Medical Equipment and Hospital Planning;Metallurgical Engineering; Production Engineering; River Valley; Management and Systems; Transport Engineering and Textiles - which are responsible for the work of standardization in their respective fields.

Standards on documentation, library, book production and graphic technology, etc. are formulated by the Technical Committees, Technical committees comprise experts representing different interests, such as manufacturers, purchasers, consumers, educational scientific and technical organisations, and governmental departments. These experts work in honorary capacity and evolve national standards by consensus of opinion. Draft standards have to pass through a number of stages before adoption as a national standards, including a stage where comments are invited by wide circulation.

BIS has already prepared about 15000 standards covering many fields and embracing different subjects. The formulation of standards is a time-consuming work. Minute details of various aspects have to be studied in the context of the latest technical and industrial developments, both at national and international level. It is estimated that the formulation of a standard takes on an average three years.

Although the procedure for the formulation of Indian Standards continues as before through the Division Councils and Sectional Committees, steps have been taken to speed up the process especially in high-tech areas. Where necessary, standards of other institutions in India or abroad will be adopted as

Indian Standards. This will lead to harmonization within the country on the hand, and speedy technology transfer on the other. The Standards Advisory Committee set up under the Act guides and directs these activities.

3 NEED FOR STANDARDS FOR INFORMATION SYSTEMS

The development and effective use of scientific knowledge depends on its communication to others. The explosion of knowledge is having a great impact on the organised systems for handling scientific and technical information. The volume of literature is growing so rapidly that no single scientist or engineer can be aware of more than a small portion of it, resulting in greater specialisation on the part of the technologists. It is also affected the traditional information services because of developments in the field of computers and telecommunications. These pose their own problems to the handlers of information. New services have also emerged in the shape of data bases and communication networks. Effective functioning of these services through efficient development of scientific information and documentation systems has, therefore, become indispensable. Standardization offers one of the most important and effective means of improving this scientific and technical communication system. It is in this very important field of publications and dissemination of scientific information that documentation and information standards play a decisive role. We need a universal practice in the presentation of bibliographical references in a scientific paper; presentation of articles in periodicals; title page of a book, abbreviation for scientific periodicals which are understood nationally and internationally; citation of documents; format for bibliographic information interchange on magnetic tape; formats of microforms, directories of libraries, information and documentation centres. This reflects the scope for standardization in library and documentation to streamline and unify practices.

There are many organisations at the international level which are concerned with the dissemination of scientific knowledge like UNESCO, International Federation of Documentation (FID), and International Organization for Standardization (ISO). ISO is the organisation working for international standards and standardization. At the national level, this responsibility is vested with the national standards bodies. In India, BIS formulates national standards in this area through Documentation and Information Sectional Committee, MSD 05, and Publications and Graphic Technology Sectional Committee, MSD 06.

5 SCOPE OF THE SECTIONAL COMMITTEES

MSD 05 formulates Indian Standards on abstracting, indexing, bibliographic references, cataloguing and classification, automated information handling systems, transliteration, book numbering, and other aspect relevant t processing and handling of documents. It is also responsible for coordinating at the national level, work relating to the corresponding international committees,

ISO/TC 46 Information and Documentation, ISO/TC 154 Documents and data elements in administration, commerce and industry/tourism and leisure, and ISO/TC 171 Micrographics and optical memories for document and image receiving storage and use.

MSD 06 formulates Indian Standards relating to book production, illustrations, printing processes, style manuals, binding and any other aspect relevant to publication and graphic technology. It also coordinates the work of ISO/TC 130 Graphic technology, at the national level.

6 REVIEW OF ACHIEVEMENTS IN STANDARDISATION OF LIBRARY AND INFORMATION WORK

The function of the information profession is t collect, store and retrieve information for use by readers. The accelerating growth of scientific, technical, social and economic information and the task of placing the wealth of information at the disposal of all users lead to the establishment of different systems and practices in library profession and documentation work. In 1948, Ranganathan examined the spheres of standardisation, its advantages, and the possibility of its extension to the repetitive elements in intellectual work of documentation.

Standards can improve the quality of information services and benefit the users of the systems. There BIS has identified the following areas of work on which standards can be formulated for information related activities:

1. Terminology and basic standard;
2. Intellectual preparation of documents;
3. Physical production of documents;
4. Reprography and reproduction;
5. Bibliographical records; and
6. Maintenance and management of document collection

61 Terminology and basic standards.

Terminology poses difficulties in the every increasing world wide exchange of information in the fields of science and technology, including library science, documentation and techniques and practices of data management. It is necessary to develop and standardise the terminology for easy communication of a given discipline, and important to unify the concepts at the international level for improved communications and the transfer of information. During the formulation of Indian Standards on terminology for information and related activities, BIS has attempted to follow this line of action.

62 Intellectual Preparation of Documents

Authors face problems in presenting written communication. Whereas

no group of rules or standards for writing can be fixed because the authors may not have identical problems in expressing the complex thought in logical and understandable sequences of words, it is possible to set guidelines to present the information. It is with this intention that BIS has formulated Indian Standards and guidelines for techniques of intellectual work.

63 Physical Production of Documents

Generally, the producers of documents, namely, the publishers, printers, book binders, type designers and illustration makers are tradition bound. BIS is helping the industry by formulating standards for standardizing and bringing uniformity in their work and practices.

64 Reprography and Reproduction of Documents

The reproduction of documents is an important technical process which assists documentalists in the transfer of information. In the libraries and information centres, the need for the reproduction of documents is apparent as the collection and distribution of the printed information is the primary function of information and documentation services. Though the techniques of reproduction largely belong to photography, the printing industry and the office equipment industry are also involved. Collectively, these practices are universally known as reprography. For a wide application of these reproduction techniques and new ones like micrographics, it is necessary to have standard practices.

65 Bibliographical Records

For locating a particular information, the librarians use reference and data books, textbooks, encyclopaedias, serials, monographs and reviews, research reports, conference reports, catalogues, standards and specifications, patents, these indexes and other forms of literature and sift the mass of information and finally retrieve relevant information of their interest. The art of finding facts from these sources can be simplified if a proper bibliographic record is available.

66 Maintenance and Management of Document Collection

Physical storage, handling and management of information implies that information in the form of books, periodicals, monographs, technical reports etc. housed properly. Also with the advent of new technology, the non printed material in the form of cassettes, tapes, discs, records, etc. are increasing. This material is also to be physically placed and properly stored. Hence, the planning of suitable buildings and furniture for the libraries and information centres is essential. The environments should not only be architecturally elegant but most practical. Whereas elegance can not be standardised, the essential elements or components of library building can be.

Normally, the procedures for management of libraries is a subject of inhouse standards. Therefore, however, are some common procedures to all libraries and information centres and these can be standardised at the national level and even at the international level. The areas include printed forms for library use and their application, organisation of library acquisition etc. Standards are also needed for library equipment, reprographic equipment, library stationery, physical preservation of documents, and handling safely of library collections.

Indian Standards formulated by MSD 05 and MSD 06 are listed in Appendix A.

7 INTERNATIONAL SCENE

At the international level, the Technical Committee 46 of the International Standards Organization deals with information and documentation. The scope of ISO/TC 46 includes standardization of practices relating to libraries, documentation and information centres, indexing and abstracting services, archives, information science and publishing. The Committee has twenty six participating member countries and thirty one observer member countries.

An International Standard is the result of an agreement between the member bodies of ISO. An International Standard may be used as such, or may be implemented through incorporation in national standards of different countries. A first important step towards an International Standard is the committee draft (CD) - a document circulated for study within the technical committee or sub- committee. This document must pass through a number of stages before it can be accepted as an International Standard. This procedure is designed to ensure that the final result is acceptable to as many countries as possible. When agreement is finally reached within the committee, the committee draft sent to the Central Secretariat for registration as a draft International Standard (DIS); the DIS is then circulated to all member bodies for voting. If 75% of the votes cast are in favour of the DIS, it is accepted for publication as an International Standard. Normally the fundamental technical issues are resolved at committee level; however, the member body voting procedure provides assurance that no important objections have been overlooked. ISO has published about 100 standards relating to documentation and information. To provide an easy means for referring to International Standards and in order to reach a wider audience, ISO has published a number of handbooks, each of which reproduces the full text of ISO standards in a given field. Handbook 1 - Documentation and Information, is a compilation of ISO standards connected with traditional and new disciplines in documentation, bibliography, linguistics and librarianship. Vocabularies, character sets, transliteration and romanization, bibliographic rules of all kinds including the abbreviation, presentation of periodicals and

contributions to them, indexes, title leaves, translation and references, presentation of theses and principles of filling, ISBN, ISSN and ISRC numbering, paper sizes, codes for country and currency names, layout of trade data elements, micrographics, microcopying and microfilming of all types of documents and photographic archives. This handbook as also individual ISO standards can be obtained through BIS.

8 DYNAMIC NATURE OF STANDARDS

Most standards require periodic revision. Several factors combine to render a standard out of date: technological evolution, new methods of materials, new quality and safety requirements. To take account of these factors, both ISO and BIS have established the general rule that all standards should be reviewed at intervals of not more than five years. On occasion it may be necessary to revise a standard earlier.

9 FURTHER DEVELOPMENT

Standards have a key role play in many areas of documentation and information work. An increasing reliance is now being placed on the electronic equipment, such as computer systems, through which information can be processed and communicated at high speed, and displaced on a screen or printed on paper almost instantaneously at the touch of a button. This progress is being studied for developing the standards at the international level and national level. Some subjects have been identified and the preliminary work has also been started in some other areas. New subjects on which work has been initiated in BIS include:

1. Data elements and data structure for computer readable data;
2. Guidelines for preparation of thesauruses;
3. Transliteration of Indian languages into Roman script;
4. Proforma for recording information on ongoing research projects at the institutional level and at the national level;
5. Recommendations for entries in a directory of periodicals;
6. Library forms and records;
7. Recommendations for number system of reports;and
8. Directories of libraries, information and documentation centres

10 CONCLUSION

Standards promote optimum overall economy in information handling and documentation. These must maintain a balance of user requirements on one hand, and the technical progress on the other hand. In addition to establishing new standards, it is important to examine the existing standards - to revise them as well as examine if they are suitable for similar purposes and processes in

fields other than those for which they are originally planned. For successful completion of this work and sustained development of our activities nationally and internationally, closer collaboration and deeper involvement of information scientists would be necessary not only by way of technical comments and suggestions but for preparation of these standards have to unify conflicting interests and view points and formulate documents which would be generally acceptable. The benefits of standardization can not effectively be felt unless all concerned in the work of information handling and processing, and decision making, play their part in using national standards to strengthen and simplify their operations and to make then smoother, more efficient and economical.

Appendix A

PUBLICATIONS AND GRAPHIC TECHNOLOGY

	Standards published	
1	IS 4:1963	Guide for layout periodicals (Revised)
2	IS 12:1988	Guide for drafting and presentation of Indian Standards (third revision)
3	IS 790:1987	Guidelines for preliminary pages of a book (first revision) (superseding IS 791:1956, IS 792:1964 and IS 794:1956)
4	IS 1250:1958	Proof corrections for printers and authors
5	IS 3050:1965	Code of practice for reinforced binding of library books and periodicals
6	IS 6290:1971	Guide for selection of type and page layout in textbooks
7	IS 6660:1972	Guide for illustrations in books
8	IS 7140:1971	Symbols and notations for correction of illustrations and illustration proofs

9	IS 7160(PT 1):1974	Guide for print area, margins and type sizes for textbooks:Part 1Textbooks in English	Jan 87
10	IS 7160(PT 2):1974	Guide for print area, margins and type sizes for textbooks:Part 2 Textbooks in Hindi	
	Jan 87		
11	IS 7160(PT 3):1974	Guide for print area, margins and type sizes for textbooks:Part 3 Textbooks in Malayalam	Jan 87
12	IS 7160(PT 4):1977	Guide for print area, margins and type sizes for textbooks:Part 4 Textbooks in Telugu	Jan 87
13	IS 7160(PT 5):1977	Guide for print area, margins and type sizes for textbooks:Part 5 Textbooks in Kannada	Jan 87
14	IS 7160(PT 6):1977	Guide for print area, margins and type sizes for textbooks:Part 6 Textbooks in Tamil	Jan 87
15	IS 7160(PT 7):1980	Guide for print area, margins and type sizes for textbooks:Part 7 Textbooks in Bengali	Jan 87
16	IS 7400:1974	Guide for preparation and production of textbooks	Jan 87
17	IS 8010(PT 1):1976	Guidelines for preparation of technical reports:Part 1 Research and development reports	Jan 87
18	IS 8010(PT 2):1982	Guidelines for preparation of technical reports:Part 2 Feasibility reports	
19	IS 8010(PT 3):1987	Guidelines for preparation of technical reports:Part 3 Industrial potential survey reports	
20	IS 9637:1980	Guidelines for presentation of information in technical manuals	
21	IS 11956:1987	Guidelines for the preparation of trade catalogues	
22	IS 11957:1987	Guidelines for contents list of periodicals	

23	IS 12000(PT 1):1987	Guide for paper spoilage and wastage for printing industry:Part 1 Sheetfed, letterpress and offset processes

DOCUMENTATION AND INFORMATION

	Standard Published	
1	IS 18:1988/ISO 4:1984	Documentation - Rules for the abbreviation of title words and titles of publications (second revision)
2	IS 382:1952	Practice for alphabetical arrangement
3	IS 795:1976	Guide for preparation of abstracts (first revision)
4	IS 796:1966	Glossary of cataloguing terms (first revision)
5	IS 1275:1976	Rules of making alphabetical indexes (first revision)
6	IS 1358:1967	Practice for layout of library catalogues code (first revision)
7	IS 2381:1978	Recommendations for bibliographical references: Essential and supplementary elements (first revision)
8	IS 2550:1963	Glossary of Classification terms
9	IS 3083:1985	Code of practice for the processing of microtransparencies (microfilms and microfiche) (silver halide) (first revision)
10	IS 3130:1985	Code of practice for handling and storage of microtransparencies (microfilm and microfiche) (silver halide) (second revision)
11	IS 4731:1968	Guide for preparation of manuscript of an article in a learned periodical

12	IS 6299:1971	Guide for handling, testing and storage of monochrome photographic prints	Dec 84
13	IS 6666:1972	Recommendations for frequency notation for periodical publications	
14	IS 7150:1974	Specification for library catalogue and abstract card	Dec 84
15	IS 7900:1976	Method for writing calendar dates in all numeric forms	
16	IS 8310:1977	Guide for standard book numbering	
17	IS 9400:1980	Guide for the preparation of bibliographic description sheet for technical reports	
18	IS 9450:1980	Guidelines for placement of images in roll microfilm	
19	IS 10101:1982	Guide for International Standard Serial Numbering (ISSN)	
20	IS 10200:1982	Specification for A6 size microfiche	
21	IS 10454:1983	Guidelines for presentation of translations	
22	IS 10455:1983	Guidelines for presentation of abstract sheets in serial publications	
23	IS 10456:1983	Specification for density of silver-gelatin type microforms	
24	IS 11370:1985	Guide for data elements and record format for computer based bibliographical data bases for bibliographic description of different kinds of documents	
25	IS 12879(PT 1):1990	Microfilming of technical drawings and other drawing office document:Part 1 Operating Procedures	
26	IS 12879(PT 2):1990	Microfilming of technical drawings and other drawing office documents:Part 2 Quality criteria and control	

27	IS 12879(PT 3):1990	Microfilming of technical drawings and other drawing office documents:Part 3 Unitized 35 mm microfilm carrier
28	IS 12940:1990	Documentation - Library Statistics - Guide

National Oceanographic Information System

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Ocean study in inherently interdisciplinary and therefore calls for a controlled and integrated approach for information generation, processing and decision making. In this context, Indian National Oceanographic Date Centre (INODC) of NIO has been recognized as a national facility to acquire, process, store and disseminate the oceanographic data pertaining to Arabian Sea, Bay of Bengal, Laccadive sea, Andaman & Nicobar sea and the Indian Ocean. At INODC, a National Information system for oceanographic studies is under development. Bibliographic information forms an integral part of oceanographic system as it is an essential component for data analysis and interpretation. Hence two major systems are considered under National Oceanographic Information System viz. 1. Date and Information system 2. Library and documentation system. The present status, organization and structure, role and functions of the above mentioned systems impact of information technology and outlook for the future are described.

1 INTRODUCTION

Exciting challenges lie ahead not only for the marine scientists but also for those involved in the management, banking and dissemination of data collected at sea. Progress in marine science depends not only on the ability of the oceanographer to collect, process and analyze his own data, but also to the extent to which he has access to date collected by other scientists in other laboratories both at home and abroad. And so computer based data management has become an essential component of modern oceanography.

Ocean study is inherently interdisciplinary and therefore calls for a controlled and integrated approach for information generation, processing and decision making. In this context, Indian National Oceanographic Data Centre (INODC) of the National Institute of Oceanography (NIO) has been recognized as a national facility to acquire, process, store and disseminate the oceanographic data pertaining to Arabian Sea, Bay of Bengal, Laccadive Sea, Andaman & Nicobar Sea and the Indian Ocean.

Expenditure on oceanographic research is very high. Despite the large amount of money and efforts in such data collection, the density in time and space of the available data from the oceans in general remains low. Data are valuable not only to the primary users, responsible for its original collection but

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also to a wide range of secondary users. Thus a centralized management of oceanographic data not only improves the availability of data to end-users but also ensures that the data are preserved for long- term use.

A feature of marine information which often makes if difficult to handle different types of data in a consistent fashion is the number of dimensions they occupy. For example, bathymetry can be considered as static and two dimensional, where as temperature and salinity are spatial and temporal (although the latter variation is reasonably periodic). Sampling distribution, resolution and frequency which in principle should be matched to the phenomena being investigated, also present problems in terms of data storage, manipulation and presentation. And hence processing, cataloguing and dissemination of spatial data is a major undertaking.

The complimentary constituent of the information system is library and documentation system which primarily includes bibliographic information by different modes. Since it is difficult for any body to keep abreast with latest work, the bibliographic system comes to aid in providing the necessary reference materials easily, quickly and a very low cost.

2 DATA AND INFORMATION SYSTEM

21 Objective

The main objective of the INODC, is to acquire, store, and disseminate entire spectrum of oceanographic data for meeting the needs of marine scientists and user communities. The data centre ensures that the user gets good quality and accurate data which can generate useful information.

22 Major Functions

The following functions are defined;

i. Acquisition of data & Information: INODC acquires data and information from 1) NIO scientists & Scientists from other national organizations 2) Government departments and 3) Data centres of other countries.

ii. Processing (coding & quality checking): The data and information acquired is reformatted, checked for its quality and accuracy wherever possible and compressed to suit computer aided storage system. This centre sorts out inventory level information and assigns INODC numbers to each station and cruise and does the computations for derived parameters wherever necessary.

iii. Storage (Database Management): The Centre stores inventory level information in Station Inventory Information System and actual data in Integrated File System for efficient data management.

iv. Preparation of data products: Inventories, atlases, charts, data reports, directories etc. are various data products that the INODC publishes.

v. Dissemination of Data: as per users demand, processed archived data is made available to end-users in suitable formats on magnetic media and paper prints.

23 Quantum of Data Holding

The INODC holds the data collected by NIO and other marine data generating organizations and also holds data collected during the International Indian Ocean Expedition. In addition. data from Institutes and DAta Centres of other countries are acquired. The following is the quantum and type of data available at the INODC.

Sr.No.	Discipline	Parameters	No.of stations for which data is available
1.	Physical Oceanography	(Nansen cast) Temp, Salinity STD/CTD, MBT, XBT, DBT wave, currents, and surface meteorological data.	24116
2.	Chemical Oceanography	O2 PO4, NO3, NO2, SiO3, pH, NH4, major chemical elements, trace metals and toxic elements.	23286
3.	Biology	Chlorophyll, productivity rate, Zooplankton and Benthos.	3640
4.	Geology	Grain size, sediment composition, sediment load, foraminifera and geochemistry.	2120
5.	Geophysical	Bathymetry, Gravity, Magnetics and Seismics.	125113(line Kms)

INODC's major area of interest is Indian Ocean in general and its two arms viz. the Bay of Bengal and the Arabian of the Exclusive Economic Zone of India which covers about 2.01 million km along India's coastline of 7517 km including that of Laccadive and Andaman & Nicobar coasts. The above mentioned stations are therefore spread over in these areas of the Indian Ocean.

3 OCEANOGRAPHIC DATA ORGANIZATION

INODC has designed, discipline-wise and parameter-wise data formats for systematic acquisition and dissemination of data. The Centre prefers to receive data in fully processed form, on magnetic media and in prescribed formats. However, Data received in raw form are converted to digital form before further processing.

For the purpose of management, oceanographic data is classified as,

1. Station data	:From a stationary research ship/platform
2. Underway data	:From a moving ship (geographical data)
3. Time Series data	:From moorings & drifting buoys
4. Satellite data	:Remote Sensing data

31 Data Treatment

The data submitted to INODC is reviewed to ensure that it is accurately described to characterize the data type and to determine if it is suitable for processing. Conversion into INODC formats is required if it is in raw form. Analog charts are screened for obvious errors or omissions and then digitized for computer storage.

The Data Centre, at present, does not have an absolute check on the accuracy. However, certain methods are employed to point out the coding errors and the suspected data. Quality control programs check for completion of mandatory fields, expected ranges for fields and similar items. The suspected or erroneous data are flagged and some data are even omitted if necessary. The data sets are assigned INODC reference numbers that the recorded in inventory data base. INODC identifies oceanographic information at four levels,

1. Inventory level information
2. Parameter level information
3. Documentation information
4. Actual numerical data

Inventory level information includes geographic location of the stations, cruise details and INODC number as reference key field. Parameter level information includes various parameters observed at each station along with their respective Report On Samples Observations Collected during Oceanographic Programs (ROSCOP) codes which are accepted Internationally. Data level information includes processed numerical data and INODC number as reference key field.

The inventory and parameter information is stored in Station Inventory Information System (SIIS) developed using "dBASE III PLUS" database package

available on PS/386 micro computer working under MS-DOS environment. Numerical data is stored in NORSK DATA (ND) 570 computer system adopting Integrated File System (IFS).

32 Database Management Systems

The Data centre has developed the following systems and subsystems for the management of various types of data

1) Station Inventory Information System (SIIS)

2) Integrated File System (IFS) for numerical data storage

3) Geophysical Data management system (GPDMS)

321 On-Line Oceanographic Station Inventory Information System (OSIIS)

Oceanographic inventory information of the data collected during RV Gaveshani and ORV Sagar Kanya cruises have been organized and structured using popular dBASE III PLUS data base package available on DCM PS/386 microcomputer and working under MS-DOS environment. Using dBASE command level programming language, software modules are developed additionally, to support build-in- capabilities of dBASE III, for developing a very user friendly online system.

The system developed, is capable of carrying out major functions such as

1) Systematic storage and management of data,

2) selection of inventory information as per user's demand, and

3) Preparation of catalogues and reports.

322 Integrated File System (IFS)

An Integrated File System (IFS) is designed for management of Oceanographic Data and Information. This system has three hierarchical level. The system basically provides the storage facility for all categories of oceanographic data. Each category has four levels. Levels 1 and 2 are assigned for inventory and documentation information which actual digital data is stored in 3rd level. Level 4 contains additional information related to some special types of data.

323 Geophysical Database Management System (GPDMS)

GPDMS is designed for the computerized storage and retrieval of marine geophysical data and information, GPDMS is subdivided into various databases depending upon disciplines such as navigation, bathymetry, magnetics and gravity.

Navigation database which contains Inventory level information along with assimilation and search modules exists on microcomputer (DCM PS/386 system) whereas the geophysical database resides on NORSK DATA 570 computer system.

GPDMS is a user friendly computer software system that a) processes underway marine geophysical data into a database with a common structured format b) provides inventory and data retrieval capabilities, and c) presents information in graphic form.

33 Databanks

Data available with INODC is checked for quality, sorted, indexed and preserved in flat file form in various data banks. The following data banks are currently available at the centre.

Sl.No.	Data Banks	Imp. Parameters	Records
1.	MBT	Temp., Bathy. (Mechanical)	1398
2.	XBT	Temp., Bathy.	931
3.	Nansen Cast	Depth, Temp., Salinity	1000
4.	Surface Meteorology	Temp., Wind speed, direction Pressure, cloud, sea state	2037
5.	Time Series Invt.	Current, Waves	
6.	Primary productivity	Pigments, Chlorophyll	316
7.	Zooplankton	Zooplankton	1642
8.	Zoobenthos	Zoobenthos	1500
9.	Nutrient & Oxygen	Nitrate, Nitrite, pH, Ammonia, Phosphate, Silicate	
10.	Geological (19 sub data banks)	Grain Size analysis, Coarse fraction, Petrography, water sample analysis etc.	

34 Data Dissemination

For dissemination purpose the date is divided into the following three categories:

1. **Open data:** Data collected from international waters i.e. beyond Exclusive Economic Zone.
2. **Restricted data:** Data collected within the Exclusive Economic Zone.
3. **Classified data:** Certain types of data depending upon the nature may be classified as sensitive and such data would not be available for exchange or dissemination purpose.

Open data and to some extent Restricted data are made available to users according to guide lines.

35 User Inquiries Handling

On-line Station Inventory Information System also provides and easy and user-friendly access for selecting inventory information as per users demand . Query handling system of OSIIS searches and sorts the required information depending upon users specification (geographic area, depth, season etc.) and stores it in a new data base. Selected inventory level information is correlated with corresponding data sets with the aid of unique INODC numbers and required data is retrieved.

The data is disseminated in the form of hard copies (Printout) or magnetic media (tapes and floppies). The data can also be supplied/exchanged in internationally accepted General format (GF- 3), if user requires.

The INODC/NIO provides the guidelines for dissemination of oceanographic data through a booklet "Guidelines for the Distribution and Exchange of Samples and Data", which also contains a specimen of the request form. In spite of the charges mentioned in the guidelines, the INODC/NIO is taking a liberal view. The centre, nevertheless, prefers to exchange data.

36 Oceanographic Data Products

The following products have so far been brought out.

1. **Inventory reports (total 10 nos):** Stations and cruises inventories have been published in nine reports. These reports contain the inventory information of R.V. Gaveshani (1976 - 88), ORV Sagar Kanya (1983 - 88), Sagar Sampada (1985 - 86) and R.V. Samudra Manthan 1983 -86). One inventory report pertains to 13 geophysical cruises and 6480 fixes of R.V. Gaveshani for the year 1983 to 1988.
2. **Data reports:** Following data reports have been prepared from data collected onboard RV Gaveshani, ORV Sagar Kanya.

Data Reports:

a) Mechanical Bathythermograph Data Reports.

b) Surface Meteorological Data Reports.

c) Nansen Case Data Reports

d) Chemical Data Reports

e) Zooplankton Biomass Data Reports.

37 OCEANOGRAPHIC ATLAS:

Three oceanographic atlases have been prepared. Oceanographic atlas of EEZ of India incorporates physical, chemical and biological data collected during 1976-80 and shows the general annual distribution at different depths. the atlas of mechanical Bathythermograph data gives composite plots of seasonal variation of tempareture profiles drawn against depth, in each square degree grid. The Geophysical Atlas of Eastern Arabian Sea displays Bathymetry, Magnetics and Gravity data as contour maps, anomaly maps, profiles and 3-d sea bottom topography plots.

4 LIBRARY AND DOCUMENTATION SYSTEM

literature on one hand establishes the credibility of the scientific results and is considered to be most powerful media of communication among the scientists and on other hand, it is extensively referred during data analysis and interpretation.

41 Present status

With increasing oceanographic research activity enormous primary literature like books, periodicals, theses, research reports, conference proceedings, patents and standards etc, are being published in variety of forms making an individual unable to keep track of all relevant information. The secondary literature in the form of bibliography, abstracting and indexing services, current awareness services, etc. comes to rescue as they are designed to direct the potential readers to the items of their interest.

Primary and Secondary literature available in N.I.O. library is as follows,

Book including back volumes of journals over	20,000
Technical reports	5,600
Journals currently subscribed Including 20 (Indian journals)	148
Other collection	
Patents over	300

Microfilms	500
Films (16 mm)	40
Loose reprints/photocopies	several thousands

42 Role and functions of bibliographic information system

1. Acquisition of published literature through document procurements, document exchanges etc.
2. Provide on demand or in anticipation information to the users about the publication, especially microdocuments in their field of specialization through reference services, referral services,current awareness, retrospective literature searches etc.
3. Supporting activity including infrastructure, software developments, surveys and studies and documents delivery.
4. Organization and Structure of data bases.

With the advancement and introduction of computer technology into this field, secondary literature is stored in data bases which are now accessible on-line. The latest trend in the advances in computer technology could be seen in the introduction of the Compact Disk - Read Only Memory (CD - ROM) for creating data base. Two major bibliographic databases are being used at NIO library.

43 Local Data base OCEANLINE

Local data base called 'Oceanline', using Computerized Documentation Service/Integrated Set of Information Systems (CDS/ISIS) software, a popular relational bibliographic data base has been established. This Local data base aimed mainly to store catalogue of books available at NIO library and marine science literature published in India, which is eventually passed on to load on ASFA. More than 400 references are added to the Oceanline every fortnight. Presently over 8000 records have been added and the work is being continued. Data base is equipped with necessary software for searching bibliographic information through selected key-word.

44 Computerized information retrieval services using ASFA CD-ROM data base:

Aquatic Sciences and Fisheries Abstracts (ASFA) is an abstracting and indexing service covering the world's literature on the science, technology and management of marine and freshwater resources and environments. As NIO is acting as national ASFA partner, the ASFA data base, available on compact disk for the period from 1982 till data, is procured and installed in NIO library in collaboration with UNESCO. The compact disk named Compact Cambridge ASFA, contains bibliographic information about relevant papers from over 5000 core and non-core serial publications, forms the major part of data base, apart

from books, reports, conference proceedings etc. Roughly 37,000 articles are notified every year and now data base has more than 1,60,000 records with abstracts, pooled from various input centres the world over.

The record contains various searchable fields such as author, author affiliation, corporate author, title, source, text and abstract language, subject, classification number, environmental regime, conference title, other identification numbers and classification index. A common facility to display/print/download the search results exists. With these facilities the required information is being retrieved within shortest possible time. Being national ASFA partner, NIO has added over 800 bibliographic references to the ASFA data base during 1990 (input of the first year). Quarterly updates of ASFA CD-ROM data base are available in the library.

In addition to above two data bases, bibliographic on-line search facility on international data base through DIALOG is arranged at the Institute as and when required. Day to day library functions such as 1. Document ordering, 2. Circulation control, 3. Library catalogue, 4. Accessioning, 5. Book card printing, and 6. New arrivals of bulletins are also computerized for easy and smooth functioning of library.

5 FUTURE PLANS

In years too come, it is proposed to take up the following activities in a comprehensive manner.

1. Development of menu driven on-line facility for oceanographic data retrievals.
2. Development and implementation of Marine Remote Sensing Information System (MARSIS)
3. Development of Marine Information System.
4. Preparation of Comprehensive Ocean atlas for Indian Sea.
5. Existing databases are to be linked with NICNET or SCIENCE NET for on-line data/information access.

Need for a national Information System for Social Sciences

S .D . Vyas.*

Discusses a proposal for a National Information System of Social Sciences. Explain the objectives, functions and a need of National Social Library, sectoral centres and opening few regional centres with more administrative and financial powers. Suggests co-operation with INFLIBNET and other information systems at regional and international level.

1 INTRODUCTION

Social science research became important and gained grounds in India after 1947. Today India is among the world's first seven nations in monographs, books, journals and serials production in the field of social sciences. Proliferation of world social science knowledge could be measured from the fact that in 1820, number of serials in the social sciences was only 22 which rose to 3490 serials in 1970s. In India there was not much research in social sciences till 30 years ago. In 1968, 266 doctoral degrees in social sciences were awarded. It is estimated now that 1000 doctoral degrees are awarded every year.

Social science research gained importance because of the formulation of the government policies. In the absence of National Information System for Social Science (NISSS) much of research is leading to duplication as one does not know what others are doing. Researchers felt that had they known earlier about research already done in the same area, perhaps it would have made a lot of difference in their research.

There is heavy investment now in social science research. Enormous literature in the form of reports, journals, articles and other information carriers and increased vocabularies have led to the growth of social science literature. In early 1960s the UN had realized its mistake in failing to record information relevant to social science research. It was estimated that 60% documents containing vital social information were not available for use. It was a peculiarity of social science research that one time solution to a problem does not guarantee solution for ever. Therefore new answers are always sought[1].

11 Use of Social Science Information

Social science information is useful to:

(1) educational purposes, i.e., teaching and research

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(2) solution purposes, i.e., formulation of policies at individual group, corporation, national and international levels[2].

12 Users of Social Science Information

The following are the main users of social science information:

(1) Policy makers

(2) Planners of socio-economic development projects

(3) Managers of development projects

(4) Researchers and teachers

(5) Financiers

(6) Communicators

(7) Personnel concerned with information analysis to support those who are involved in the above work[3].

2 NEED FOR NATIONAL INFORMATION SYSTEM

Our government had realized that there is a need to "encode, record, reproduce and disseminate information" as expressed in its document on evolving a National Information Policy and that a documentation centre or a library cannot provide information services single handed[4]. Information is considered as a 'national resource'. The collected information has to be analysed and repackaged in the form of indexes, abstracts, etc. in computerized information format.

NASSDOC (National Social Science Documentation Centre) of the ICSSR has completed the ground work by compiling bibliographies, checklists, union lists, union catalogues since its inception. It had compiled an index of 240 journals, upto 1970 of retrospective literature. Hence ICSSR/NASSDOC deserves to be given powers to launch National Information System for Social Sciences (NISSS)[5].

When NISSAT(National Information System of Science and Technology) was launched in 1977, there was an impression that it would include social sciences also, but it did not. Launching of NISSS was going slow. NISSAT had established five sectoral centres in the first ten years of its existence. The need of NISSS was strongly felt after 1980 when it was realized that NISSAT was not covering social sciences.

3 NISSS: A PROPOSAL

To establish a NISSS it needs a social and political will of the Government of India. Under proposed NISSS, NASSDOC will be a focal point to develop national network which shall provide precise as well as exhaustive information at the minimum cost to the users. ICSSR shall maintain a separate office, set up

groups and expert units to care different divisions of the system. There shall be an advisory committee which will guide the system.

31 Objectives

The following shall be the objectives of NISSS as expressed in the Draft proposal:

(a)to meet the future needs of the social science scholars, researchers and common users of social science information;

(b)to seek optimum utilization of existing social science information;

(c)to promote national and international co-operation such as exchange of social science information;

(d)to support and encourage the development and innovation in information science communication; and

(e)to support and promote research and development in the application of information technology[6].

32 Functions

Once NISSS comes into operation it will cater to the needs of information requirements of social science scholars and researchers. It shall co-ordinate with other information systems, and exchange information with regional and international systems. NISSS shall set up sectoral information centres based on the priorities of the government. NISSS should propose to develop specialised subjects centres of social science which are covered by the ICSSR. NISSS should also provide social science information to state central libraries and state information centres.

33 National Social Science Library (NSSL)

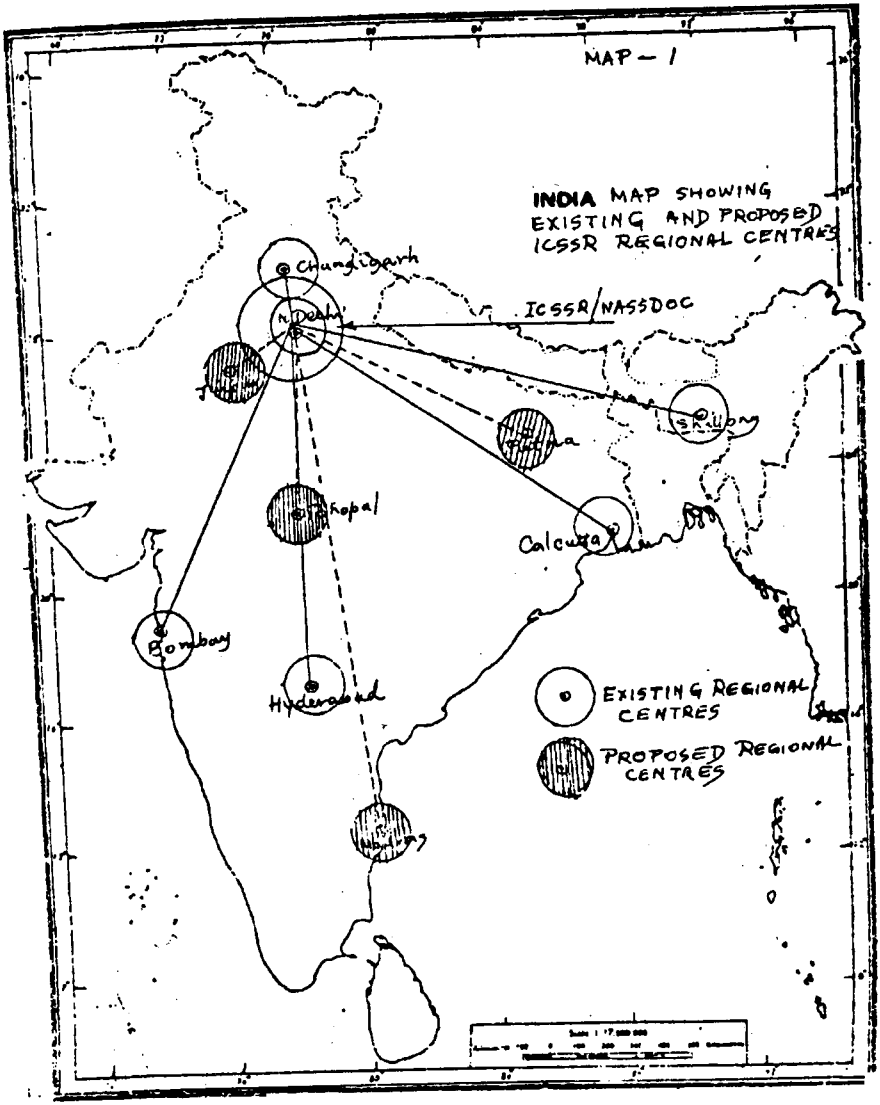
NSSL shall be developed initially as an institutional project in separate institutions with in the ICSSR. It shall augment national collections of social sciences, and assess the information resources available in the country to fill gaps. NSSL would procure one copy of each document published in the country.

34 Regional Centres

Under the NISSS plan, the regional centres shall be directly administered and financed. Besides six existing regional centres, the NISSS should also be prepared to include four more regional centres located at geographically convenient places. These places are Jaipur, Bhopal, Patna and Madras (See the Map).

35 Sectoral Centres

Sectoral Centres shall be vital links in NISSS. These shall be developed where suitable research facilities which are discipline oriented are available.


MAP – 1
INDIA MAP SHOWING EXISTING AND PROPOSED ICSSR REGIONAL CENTRES
Chandigarh
ICSSR/NASSDOC
Bhopal
Calcutta
Bombay
Hyderabad
EXISTING REGIONAL CENTRES
PROPOSED REGIONAL CENTRES

Those centres shall provide subject expertise and shall be looked after by subject specialists. It will develop information sources and services and become a part of the grid. Such centres shall be major priority areas of national relevance like rural development, manpower planning, urbanization, fiscal policy study, development studies, international studies, economic planning and development, foreign trade, etc. It is suggested that the proposed NISSS should also set up sectoral centres based on social science subjects as defined by the ICSSR. MAP

Sectoral centres shall procure published and unpublished literature, obtain group profile related to the field, evaluate and systematize information and then transfer the information to users. (See the figure which shows the input and output functions of NISSS).

4 INFLIBNET (INFORMATION LIBRARY NETWORK)

It has been observed that the social science research has flourished and got encouragement in the university system more than social science research institutions. Hence development of higher education libraries is directly related to the development of social science libraries. INFLIBNET as a university library network will co-operate and co-ordinate with the proposed NISSS.

5 INTERNATIONAL AND REGIONAL INFORMATION SYSTEM

Development Science Information System (DEVSIS 1975) and Asia-Public Information Network in Social Sciences (APINESS) are social science information systems at international and at regional level respectively. They cooperate with national information system of different countries. They should help in developing new information centres and clearing houses and improving bibliographical control. NASSDOC shall do the following:

(a) mail NASSDOC information publications

(b) compile directory of APINESS participants

(c) provide professorial training course [7].

6 SUB-REGIONAL SYSTEM

A sub-regional information network emerged for SAARC countries is called a DEVINSA (Development Information Network for SAARC countries). It has been created at Marga Institute at Colombo a few years ago. This information network is meant for the seven South Asian countries. Jawaharlal Nehru University Library is the focal point which collects and contributes bibliographical information both printed and mimeographed on social sciences including science technology.

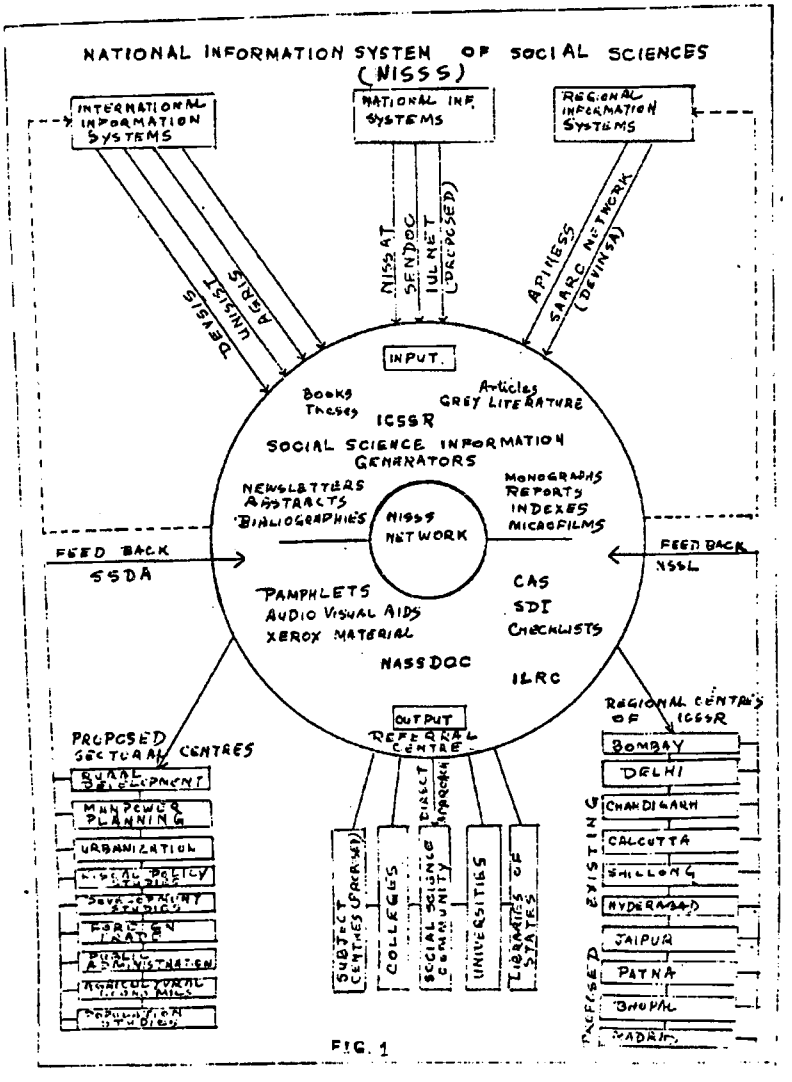

NATIONAL INFORMATION SYSTEM OF SOCIAL SCIENCES
(NISSS)
INTERNATIONAL INFORMATION SYSTEMS
NATIONAL INF. SYSTEMS
REGIONAL INFORMATION SYSTEMS
DESIDOC
UNESIST
ASRIS
NISSAT
SENDOC
IULNET
(PROPOSED)
APINESS
SAARC NETWORK
(DEVINSA)
INPUT
Books
Theses
Articles
GREY LITERATURE
ICSSR
SOCIAL SCIENCE INFORMATION GENERATORS
NEWSLETTERS
ABSTRACTS
BIBLIOGRAPHIES
NISSS NETWORK
MONOGRAPHS
REPORTS
INDEXES
MICROFILMS
FEED BACK
SSDA
FEED BACK
NSSL
PAMPHLETS
AUDIO VISUAL AIDS
XEROX MATERIAL
CAS
SDI
CHECKLISTS
NASSDOC
ILRC
OUTPUT
REFERRAL CENTRE
PROPOSED SECTORAL CENTRES
RURAL DEVELOPMENT
MANPOWER PLANNING
URBANIZATION
SOCIAL POLICY STUDIES
SOCIAL SCIENCE COMMUNITY SYNOPSIS
FOREIGN TRADE
PUBLIC ADMINISTRATION
AGRICULTURAL STUDIES
POPULATION STUDIES
SUBJECT CENTRES (PROPOSED)
COLLEGES
SOCIAL SCIENCE COMMUNITY
UNIVERSITIES
LIBRARIES OF STATES
REGIONAL CENTRES OF ICSSR
EXISTING
BOMBAY
DELHI
CHANDIGARH
CALCUTTA
SHILLONG
HYDERABAD
JAIPUR
PATNA
BHOPAL
MADRAS
PROPOSED

FIG. 1

7 CONCLUSION

NISSS should take steps to achieve full bibliographical control of social science literqture, (the literature that the social scientists).National information system should promote resource sharing among existing information centres and not to create new centres. We have to see whether there is any duplication of efforts between INFLIBNET and NISSS plans. NISSS should ensure that the users receive the essential information relevant to their needs.

It is hoped that the Planning Commission will include NISSS in Eight Five Year Plan to strengthen social science research and information requirements of social scientists of the country.

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Need for National Information Programme for Small Scale Industries in India

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B.Pratapa Reddy*

1 INTRODUCTION

Small Scale Industries have great potentialities both for adding to the wealth of the country through increased industrial production and for providing enormous employment opportunities.

Great emphasis has been laid on the development of small scale industries in the five-year plans. Small Scale Industries are the only way through which massive development of industries can be achieved. for a developing country like India, the growth of small scale industries which provide larger employment with less investment and facilitate wider distribution of welath mobilising local resources, skills, savings. is indeed a powerfu; stimultant for the overall economic progress of the country.

Though there is substantial improvement in the outlay, the small scale sector is not achieving the expected turnover. This is because of lack of proper information on various aspects. The clientele of these small scale units– entrepreneurs, skilled and unskilled artisans require information on different aspects such as funding agencies, subsidies given by different givernments market potentiality, latest processing methods and techniques. The information about all these aspects would enable the entrepreneurs to maintain and run the units on sound lines. Further the information would also enable them to instal their industries in the latest mould so that they can work in harmony with the changing demands of the society.

2 NEED FOR INFORMATION AND INFORMATION POLICIES:

Information is an intangible entity. It is a national resource. Information plays a significant role in all human activities. Technologically our society is becoming very complex. As society becomes more complex, the need for increased information also increases. More efficient and effective use of information will result in greater national development. Such a national development entials National Information Policy.

The Implementation of National Information policy results in a National Information system. Such systems need to be developed at international, na-

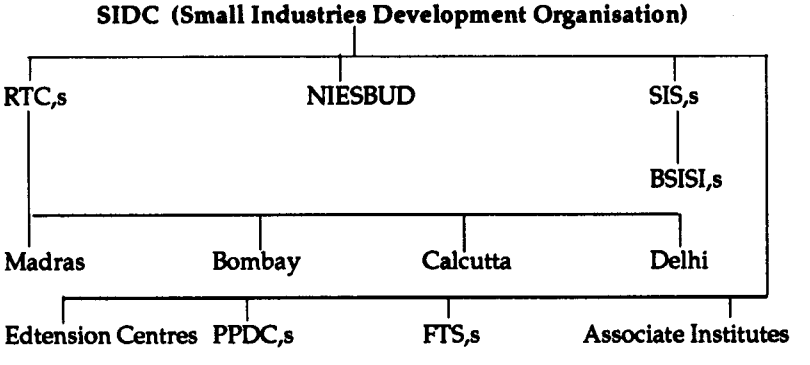
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tional and regional levels. Infact, resoure sharing leading to complex information systems is the inevitable out-growth of social and economic necessity. INIS, AGRIS at International level, OCLC, INFLIBNET at the national level serve as basic examples of such information systems.

3 ORGANIZATIONAL STRUCTURE OF SMALL SCALE INDUSTRIES IN INDIA.

The Small Scale Industries Development Organisation (SIDO) is the sponsoring body in the field of small scale Industrial sector. National Institute for Entrepreneurship and Small Business Development (NIESBUD) is the major organ of this system. There are 4 regional Testing Centres, 422 District Industries centres (DICs), 95 Small Industries Service Institutes (SISIs) 3 process-cum-product development centres(PPDCs) 17 Field-testing Stations (FTSs), 4 production centres, 2 Central Foorwear Training centres and a host if associate institutes like SENDOC. The following is the schematic representation of the organisational setup of small industries in India.



RTC,s :	Regional Testing Centres
NIESBUD:	National Institute for Entrepreneurship and Small Business Development
SISI,s:	Small Industries Service Institutes.
PPDC,s:	Process-cum product Development Centres.
FTS,s:	Field - Testing Stations

The following table indicates the main thrust laid by the governemnt in improving the small scale industrial sector during the plan - period

TOTAL OUTLAY DURING THE PLAN PERIOD FOR SMALL SCALE INDUSTRIES

Plan period Amount	(Rs.in Crores)
First Plan (1951 - 56)	5.20
Second Plan (1956-61)	56.00
Third Plan (1961-66)	113.06
Annual Plan (1966-69)	53.58
Fourth Plan (1969-74)	96.19
Fifth Plan (1974-79)	221.74
Annual Plan (1979-80)	104.81
Sixth Plan (1980-85)	616.10
Seventh Plan (1985-90)	1120.51

Sources: a) Table 12.3 of the Sixth Plan Document

b) Table 4.3 page 104 of the Seventh Plan Document Vol.II.

4 INFORMATION PROBLEMS IN SMALL SCALE INDUSTRIES

SIDO is the apex body which, to a large extent, is catering to the information needs of the smallscale indsutries in the country. It disseminates information on Government policies and programmes, concessions and facilities available to the existing and prospective entrepreneurs. It also publishes the monthly journal 'Laghu Udyog Samachar' in Englsih and Hindi. A Manual on procedures for small scame industries was published in 1987 which indeed is a valuable reference tool for Small Scale Industries. SIDO also participatesa in International Exhibitions and Trade Fairs assimilating and disseminating technical information in important areas.

The National Institute for Entrepreheurship and Small Business Development (NIESBUD) was established in New Delhi in July, 1983. The Institute organises and conducts traning programmes for motivators, trainers and entrepreneurs and also coordinates, training activities of various institutions and agencies. it also undertake documentation and research in the field of entrepreneurship. Further, it conducts seminars, workshops and conferences for officers. This Institute has wealth of information in its library. Certain of the associate institutes like SENDOC are widely known for their information serices to, the development of small scale indsutries.

Yet there is a vital needs to establish a national Information system for

small scale industries with the objectives of coordinating the activites of various information centres in the field of small Scale Industries. Further, there is a need to strengthen the activities of Information centres at state, regional and district levels. Such as national sytem would help in providing pinpointed, exhaustive and expeditious information service to the various organs in the small scale sector.

5 NATIONAL INFORMATION SYSTEM FOR SMALL SCALE INDSUTRIES (NISSSI)

A National Information system for Small Scale Industries can really play a dynamic role in providing the required information support to a variety of activities in the field of SSI sector to achieve productivity in the work. this unit whould keep the following objectives in mind:

1. To achieve coordination and cooperation among the existing information centres in the field.
2. To develop a system which will enable easy flow of information between them.
3. To provide easy access to the user community to the vast resources in different libraries.
4. To keep track of central and state Government schemes that are launched from time to time.
5. To eliminate redundancy in research and development works.
6. To promote and encourage projects and services to a majority of information centres.
7. To create an environment which paves the way for the integra; growth of small scale industries in the country, reinforced by growth in large scale industries as envisaged by the Industrial policy announcement of 23rd July, 1980.
8. To act as a link between the job potential of various industries and manpower (skilled and unskilled) among the unemployed youth.

6 NISSSI: FUNCTIONS

In order to achieve the above objectives, the NISSSI should build up a sound database which contains data relating to the nature scope of informatikn services being provided by SIDO and its allied units. It should provide data relating to employment, fixed investment, input, output and exports of various units. It should also prepare union catalogues consolidating the available documentary sources in all libraries. It should hold seminars and conferences to discuss professional problems and find solutions. The NISSSI should serve as a referral centre. The Information centres are to be classified according to the area of jurisdiction - national, regional and district level. The national wing

sponsored by the central government should coordinate the information centres at various levels and maximise the use of documentary sources.

7 CONCLUSION

Establishing the National Information system involves huge expenditure, manpower and technology resources. It also entaits Standardization in all the activities and hardware and software acquisition relating to such activities. Necessary steps should be taken to organise the system at the grass root level and create necessary infrastructure and awareness before embarking upon computerization, off-line and on-line Information systems. Though SIDO undertook a census of small scale industrial units in 1973-74, nothing concrete has been done to establish an integrated information system at the national level. Establishing such a system, no doubt, will pay rich dividends in information dissemination relating to the small scale industry.

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New challenges to the public library system in Tamil Nadu.

R.K. Seethapathy*

B. Ramesh Babu*

Highlights the significance of an effective Public Library System(PLS). Enumerates the various factors that demand a change in the existing PLS in Tamil Nadu (TN). Presents an overview of the PLS in Tamil Nadu.Describes the challenges to develop the existing PLS in Tamil Nadu such as application of information technology, impact of distance education programmes, creation of networks, mobilisation of financial resources, manpower development, bibliographic organisation, legislative measures, etc.

1 INTRODUCTION

Effective public library service is a basic input for the social, political, cultural, economic, scientific and technological development of any country in general and democratic country in particular. Once upon a time, it is used to be thought that a library would be enough to sustain a PLS. The PLS in a state would be strong depending upon the quantum of revenue the Government would be willing to divert . It would be a idealistic situation, if the public libraries are made a part of the Government network. No state can aspire to have a worthy PLS, unless full support and necessary infra structural facilities are made available by the Government. The role of a public library as a repository of cultural heritage of a community cannot be denied. However, in view of the trends in information services and impact of information technology on libraries, it is necessary to invite the attention of the authorities concerned to the need for a change in the concept of PLS.

2 SCOPE

An attempt has been made to present an overview of the public library system in Tamil Nadu and keeping in view of the factors and challenges that necessitates a change in the existing system, a few guidelines are suggested as a broad based policy for an effective PLS in Tamil Nadu. These guidelines would pave the way to meet the challenges of the PLS in Tamil Nadu.

3 FACTORS FOR CONSIDERATION

The following factors necessitate a change in public library system in Tamil Nadu:

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1. National Adult Educatiuon Programme (NAEP) implementation in an intensive way.
2. National Literacy Mission.
3. Emergence of Distance Education (DE) Programmes under the New Educational Policy of Govt. of India.
4. Impact of Information Technology.
5. New dimensions in Library and Information Services.
6. Eight point programmes of the Govt. of Tamil Nadu, Dept. of Public Libraries towards the overall library development, such as;
   a) To acquire free site for every library in Tamil Nadu;
   b) To enrol every educated person as a member of the library;
   c) To fulfil the basic requirements of libraries such as furniture, electrical fittings, etc through public donation;
   d) To open part-time libraries at the rate of one to each Library;
   e) To get books, dailies and periodicals through public donation to every library;
   f) To enrol members to every library and develop every library movement;
   g) To house every library in its own building by the end of the 20th Century; and
   h) To give every library for adoption by bank or business house for substained development.
7. Trends towards networks creation and effective utilisation like MALIBNET, etc.

4 PUBLIC LIBRARY SYSTEM IN TAMIL NADU: STATE OF THE ART

The Madras Public Library Act, 1948 came into effect from 1.4.1950, with the objective to provide an effective and sound public library services through a network of PLS in the State.

41 Types of Libraries

The present set up of PLS in Tamil Nadu is an follows:-

State Central Library (Connemara Public Library)	1
District Central Libraries	18
Branch Libraries	1530
Mobile Libraries	9
Part-time Libraries	826
	2384

42 Services

The following services are provided by the public libraries in Tamil Nadu.

(a) Mobile library service

(b) Home delivery service

(c) Library service for children

(d) Library service for prisoners in jails

(e) Library service for police personnel

(f) Library service for estate workers and remote settlers on the hills

(g) Hospital library service

(h) Rural library service

(i) "Out-reach" or part-time library service

(j) Library services for students

(k) Library service for research scholars and competitors for various services.

5 CHALLENGES TO CREATE NEW PLS IN TAMIL NADU

51 Information support for distance education.

With the emergence of Distance Education (DE), the library collections relating to various DE Courses, learning materials/study materials and reference books as recommended by Distance Education Institutions are to be built up. For this purpose a few DCLs may be selected as focal centres for building collections on these lines. The public libraries can also procure the syllabi,question papers pertaining to non- formal education and may be kept as reference materials for the use of the students.

Since it is not possible by Distance Education institutions to open study centres at many places due to administrative and lack of infrastructural facilities, a few DCLs for various regions may be selected and designated as Distance education Study centres.The public libraries may also establish a close contact with the existing study centres for the benefit of students.

The existing mobile libraries are to be strengthened with adequate library collections, as majority of DE learners are residing in rural areas.

The key role of public libraries as chief sustaining agencies of DE should be recognised and they should be adequately equipped with the relevent resources for the purpose.

52 Mobilisation of Financial Resources

The public library authorities have to take necessary steps to mobilise the financial resources. Firstly, the present rate of library cess has to be enhanced and necessary amendment may be made in the Tamil Nadu Public Libraries Act. Secondly, they can also raise some financial assistance from the non-formal educational institutions. Some percentage of fees collected from the students, shall be transferred to the public libraries department. Thirdly, they can also raise additional funds by motivating philanthropists.

53 Revision of Tamil Nadu Public Libraries Act

The Tamil Nadu Public Libraries Act has not been revised since its implementation. It is hightime to appoint a review committee. Such a committee may be entrusted with a task to study the other similar Acts and Model Public Library Act as proposed by Dr. V. Venkatappaiah (ILA Bulletin, 26(3), 1991), for the improvement of the present system in Tamil Nadu.

54 Creation and development of Network system

The concept of resouce sharing has to be duly recognised to build a library and information network by interlinking major libraries in Tamil Nadu. It is laudable to note that during Oct. 1991 DPL and INSDOC, Madras region jointly organised a meeting to go into the details for the creation of a regional network namely MALIBNET for automation anbd networking of libraries in Madras.

55 Application of Information Technology(IT)

The application of Information Technology has a greater impact in the services of PLS. The existing system has to be strengthened and modernised with new innovations in the field of Information Technology. The introduction of computers and automation of library operations, the use of electronic media, gadgets, better reprographic facilites, etc. would pave the way towards an effective PLS in Tamil Nadu.

56 Manpower development

Keeping in view of the trends in Library and Information Science and Services, the suitable manpower has to be developed. For this purpose, the staff working currently may be trained by deputing them for inservice training/refresher courses/orientation courses/short-term courses, etc. being organised by the Government, professional library organisations, etc. In this connection, the specialised institutions like INSDOC, DRTC, and similar such bodies may be approached for the said task.

57 Establishment of Regional Libraries

The concept of Regional Libraries which are purely reference and research libraries managed by the Govt. as being developed in Andhra Pradesh,

may be thought in Tamil Nadu also. Similar libraries for various regions in the State may be established.

58 Streamlining of the publication of INB Tamil fascicule

Bibliographic organisation is one of the important activities of the state PLS. The task of publishing Tamil fascicule of INB may be taken up by the Connemara Public Library (SCL), Madras. As a matter of fact it is seen from the records that the total number of titles received at the National Library, Calcutta is more when compared to other recipient libraries as per the provision of Delivery of Books Act. In such a situation, the object of bibliographic control of Tamil Books will not be fully achieved by mere publication of Tamil Nadu State Bibligraphy. Hence, the Government should take necessary steps for the effective implementation of Delivery of Books Act in toto with proper coordination between other recipient libraries in the Country.

591 Establishment of Public Technical Libraries (PTL)

Though the public libraries in the State provides services to the cross section of the society, yet the needs of medium and small scale industries are not met by the existing set up of public libraries in the State. Therefore, it is suggested that in the PLS, a few libraries which are situated near industrial estates and other places may be designated as Public Techbnical Libraries. These may be developed on the lines of Tamil Nadu State Technical Information Centre, located at Guindy Industrial Estate, Madras.

592 Upgradation of Connemara Public Library

The SCL, namely Connemara Public Library, may be upgraded on the lines of Delhi Public Library, which serves as a model public library for big cities of India as well as South East Asia. For this purpose UNESCO may be approached for technical and financial assistance. The experience and expertise gained by the Delhi Public Library can be availed in the task of upgrading Connemara Public Library Services.

6 CONCLUSION

The public library is a product of modern democracy. The

public library service has to become competitive. To serve the people better we need a stronger and broad based PLS for Tamil Nadu. It is hoped that the Department of Public Libraries, Govt.of Tamil Nadu would adopt modern organisation and administrative, innovative methods, tools and techniques, etc. for the provision of an effective and sound library services to the people of the state.

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Online Information System for Industrial Growth: Need for a Policy

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S. Kaliyan***

ABSTRACT

Streams of technologies contributing to the development and use of online database services include: Computer readable databases; Time sharing computers; Interactive computer programmes; Rapid access storage devices; Computer terminals or microcomputer and telecommunication networks.

A database is an organized collection of information, stored in machine readable form for easy retrieval. There are two types of databases - Reference databases and full-text databases. Again references databases may be bibliographic or directory type. Types of indexing in databases may be numeric indexing or alpha numeric indexing. Databases can also be categorized by their subject coverage, types of material etc. A database record is one unit of structural information, which may further be broken into several fields and subfields.

The term "Online" refers to the arrangements in which the user is in direct communication into the computer and information is searched. The query entered through the terminal gets converted to the analog mode and travels through telecommunication lines and gets reconverted into digital mode . Apart from a suitable microcomputer one needs communication software to set the terminal into a dialogue mode with the host computer. A password for using data network facility (GPSS) and another one for loging on to host computer are essential for online connection search aids and manuals are required for forming search strategy and using appropriate comments.

Steps involved in on-line search include logon procedure, search negotiation result manipulation and log off procedure. The costs include connect hour charges (database + telecommunication) and print/output charges. Online system have many application such as information retrieval, online cataloguing online indexing, online ordering of documents, SDI building one's own information files etc., Advantages of online systems among many include accessibility to a wide range of

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databases active participation of users, number of access points, manipulation of results in various wages, ability to conduct many searches simultaneously, output in desired media etc. There are some disadvantages like high cost, user relevance, etc.There is a need to train the manpower to be able to interact with users as well the online system.

Patent Information System: Present Status and Future Plans

P.P. Paranjpe*

Explains the nature, scope and use of patent specifications as an important source for industrial information, technology transfer, and identification of technology trends. Gives an account of the activities of the Patent Information System in India, its present services, and its plan for modernization through computerization.

1 INTRODUCTION

The term 'Patent' refers to the exclusive right of the Patentee to work his invention. Grant of patent enables him to exclude others from working the invention without his consent. The patent grant is for a limited period and it is conferred only on complete disclosure of the invention to the general public. This aspect, namely, 'disclosure of invention' is the compensation for the society whereas the monopoly secured for the limited period is the reward of the inventor.

The Patent Office which is responsible for proceedings under the patent Act, disseminates the information contained in the patent documents by way of publication of relevant notices in the Gazette of India, Part III Section 2 and also by printing, publishing and distributing the patent specifications. In all the countries, where patent system works, the respective Patent Offices discharge this obligation.

The general public is thus assured of technological information which stimulates further inventive activity. This activity leads to better products which in term are patented. This sets in a chain reaction which ensures growth of research and development activities and consequent industrial development.

2 PATENT SPECIFICATIONS AS A SOURCE OF TECHNOLOGICAL INFORMATION

Patent specification contains complete disclosure of patented invention. An invention in this context represents a technical and industrially usable solution to a problem. It may be a new problem or a new solution to an old problem. Whatever may be its nature, it represents a successful attempt in advancement of technology which can be exploited industrially and hence has commercial value. Its use enables production of-

(a) new products;

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or

(b) old products more efficiently and economically;

or

(c) improved products to suit public demand, need, taste and preferences;

21 Advances of Patent Specification

Patent Specification has many advantages over other conventional sources of technological information some of which are enumerated in the following paragraphs:-

211 Earliest Publication

Novelty being the prime consideration for grant of a patent, a patent specification is invariably the first published document which discloses an invention. Progressively more number of countries now have opted for early publication of patent specifications.

212 Uniform Structure

Being a document which has to stand the test of law, a standardized format has been developed over the years, in which patent documents from almost all the countries are presented. Once familiarity is gained, access to precise desired information from patent specification is easy.

213 Complete Document

A patent specification establishes novelty of the invention as well as the inventive ingenuity. Hence, it recites the history of the technology field and in relation to these technological developments or prior art, describes the invention sought to be patented, clearly bringing out the disadvantages of prior art and advantages of the invention. It not only ascertains the inventions proper and method of working the same but also contains several examples including the best example known to the applicant for patent. it recites all possible variations and also various applications of the invention. In short, it forms one of the most complete document for the man in the art.

214 Unique Source

An investigation made by USPTO had revealed that 70% of technology disclosed in US patents from 1967 to 1972 had not been disclosed in non patent literature. The conclusion is therefore obvious.

215 Easy to Access

Patent specification bears classification symbols allotted by the Patent Office. Each classification symbol (National or international classification) represents a unique technology field. Using these classification symbols access to

patents relevant for a given technology field is easy and almost always complete. Obtaining profile of an industrial field is therefore possible.

216 Widest Coverage

Patent documents are a single store house of technological information. Patents are granted in almost every branch of technology, from relatively simple to most sophisticated. Therefore, for information on any technological field it is sufficient to scan patent documents as a primary step in information acquisition.

22 Potential Uses in Industry

While embarking on industrial ventures it is desirable to examine the patent position in respect thereof in order to avoid possible infringement suits. Same is true for decisions regarding marketing policies. It is essential to keep a watch on known competitors' activities or to identify possible competitors. Both these aims can be fulfilled through use of patent information.

221 R & D in Industries

Patent documents reflect successful solution to technical problems and hence identification of areas amenable for R & D is possible. The industry strives to better its product, to reduce the cost of production and to bring in the market novel products, through R & D efforts. Patent Information provides a proper perspective and dues for such efforts.

222 Managers of Industry

For decision making in respect of transfer of technology; procurement policy regarding raw materials and equipments; marketing policy etc. survey of patent literature is indispensible. Patent document has been recognized as one of the best vehicles for transfer of technology. The buyer, aware of patents in a given technology field exactly knows what he is buying and will have an upto-date information on alternative technologies available. In short, a survey of patent literature will make his position much stronger during negotiation.

3 PATENT INFORMATION SCENE IN INDIA

India as most other countries is plagued by lack of awareness in respect of patent system in general and utility of patent information in particular. Even those who are aware of the value of patent information, shy away from the same for two reasons (1) fear of legal complication and (2) lack of awareness regarding sources of patent information in India.

31 Fear of legal Complications

It is felt by many that use of patent information may lead to some legal complications. This fear is mostly unwarranted for the following reasons.

a) Patents have geographical jurisdiction. A patent granted in USA can not be enforced in India. An invention disclosed in a foreign patent specification can be used in India provided no Indian Patent exists for the said invention.

b) Patents are valid for a limited term. A patent is enforceable only during its term. This term is limited in time. The term of an Indian patent expect for food and drug patents is 14 years from the date of patent. For food and drug patents the term is seven years from the date of patent or five years from the date of dealing whichever is shorter.

c) Patent may cease even during its term. Non payment of renewal fees during the term of a patent may cause the same cease. Such ceased patent can be restored only within a specified time. No monopoly accrues in respects of a patent which is eased.

d) Patents can be exploited even during their term. Use of patented invention for the purposes specified in the patent act does not cause infringement of patent rights. For example patented invention can be used for research and development and for imparting education.

e) Patented technology can be exploited. Exploitation of patented technology is possible under various provisions of the patent act. Provisions such as licences of right and compulsory licensing make it much easier to use patented technology. Unfortunately these provisions have not been adequately used in India.

32 Patent Information sources in India

As far as Indian patents are concerned, Patents Office Calcutta and its branches at Delhi, Madras, and Bombay are the most reliable sources of patent information. Because of its limited number and easy availability of accession tools such as subject matter index, applicant name index and patent office journals etc. accessing Indian patent information is easy. Gazette of India Part III Section 2 and printed Indian patent specifications are cheapest source of patent information on Indian patents. CSIR patent unit New Delhi also offers patent information services in respect of Indian patent on a limited scale.

4 NEED FOR PATENT INFORMATION SYSTEM

Indian patents represent a numerically negligible part of the total patent documentation. Of the estimated 30 million patent documents published the worldover, Indian patents from about 0.05%. It has been estimated that less than 0.1% of the inventions patented in the world have, valid corresponding Indian patent. It is essential therefore that this vast storehouse of technological information which can be exploited to achieve technology development and industrial growth is made available to the potential users in India. The office of the Patent Information System established at Nagpur in 1980 attempts to fulfill this need.

The Patent Information System is not simply a library, holding collection of documents and retrieval tools. It has to be understood that inspite of all the advantage of a patent specification, retrieval of relevant patent information from patent documents requires expertise in handling patents. Analysis of a patent document is a skill which can be gained only through specialized training and experience. Fortunately PIS, Nagpur has this core of such professionals and hopes to build up a stronger base during the modernization which is in the offing. If patent information retrieval is attempted (May be by inexperienced and uninitiated) without proper experience and training the results can not be satisfactory. Even though computerized information retrieval methods may be used the intellectual analysis of patent documents has not been replaced till today by mechanical modes of information retrieval.

5 ACTIVITIES OF OFFICE OF THE PATENT INFORMATION SYSTEM

Since its inception, in 1980, the organization has been active in the field of patent information. To this date, three stages of development of the organization can be identified (1) 1980-1983: Acquisition of patent documents and information tools to access the patent information contained therein; (2) 1984-1991: Initiation of patent information services (3) 1992 onwards: Modernization of activities of patent information system.

51 Collection of Patent Documents

Identifying that patent specification is the document which contains the technological information, the Office of the Patent Information System set out to acquire collection of patent documents. A conscious decision was taken to buy patents which fulfill two conditions (1) Patents of Industrialized countries only (2) Patents in English language only. The obvious choice was patents of USA, UK and Australia. In addition to the above, patents published under the ageis of European Patent Office (EPO) were also procured as they represent about 60% of patents granted in the thirteen European Countries which together have established EPO. The total patent documents of EPO form a mix of three languages i.e. English, French and German. Patents of some other countries such as USSR, Netherlands, GDR and Japan are also available. It may be seen that some countries such as FRG, France have been excluded. However, these ommissions may not have considerable impact on the actual needs of the users because of the phenomenon of 'Patent Family'. For the same invention patents are secured separately in different countries where protection is sought. Such countries publish the invention in due course. Thus, more than one patent document which describes identical invention result. these documents constitute a family. Mostly it is a sufficient to locate only one member of patent family for a given invention. Such location is possible through use of priority data. In any case PIS is now a position to procure any patent document which

is not in its own ready stock.

In certain cases an English language Patent may not be available or may not even exist. The customer in such cases may wish to procure the patent in non English language. Abstracts of patents often help to decide whether it is indeed worth procuring full text of a document in non English language and then to spend money on getting it translated. Abstracts also help in scanning to locate relevant patents. Hence, access to English language abstracts of patents was considered invaluable. Keeping this in mind Office of the Patent Information System, Nagpur opted for procurement of English language altering bulletins of M/s. Derwent Inc., from 1981 onwards.

The Japanese patent Abstracts in English, of Japanese unexamined applications for patents, are also received from Japan.

52 Information Retrieval Tools

Any meaningful dissemination of patent information demands quick access to documents. The chief information tools used at PIS are EPO Patent Information Services. These services have manipulated the bibliographic data of more than 15 million patent documents and present it in various formats on computer output on microfiche (COM). Each service uses a given key term as sorting key and depending on the user interest the relevant document(s) can be located using appropriate service.

EPO service report following bibliographic data for patents.

1) Country of Publication
2) Kind of Document
3) Document Number
4) Date of publication
5) Number of application
6) Application date
7) International Patent Classification
8) Country of priority
9) Priority Number
10) Date of Priority
11) Name of the Inventor
12) Name of the applicant
13) Title of Invention

6 PATENT INFORMATION SERVICES (1984 -1991)

Although beginning 1982 patent information services in the form of a representative publication called Patent Information Part 'A' and Part 'B' was initiated, so also patent copy supply service; the real beginning of patent information service was made in 1984 when customized services were initiated. In the beginning, only bibliographic search services were provided. These services as of to-day are:

61 Cumulative Bibliographic Search Service

This service provides bibliographic data of patents retrieved using one or more of the following key terms as search terms:-

1) Technology field as identified by International patents Classifications Symbol (2) Applicant name (3) Inventor Name.

62 SDI Bibliographic Search Service

Whereas the cumulative bibliographic search service is a retrospective search, the SDI (Selective Dissemination of Patent Information) bibliographic search service is a current awareness service specially provided on customer request on on-going basis.

63 Document Location Service

This service has been used mainly to identify English language family members for patents which themselves are in a non English language

The service also covers the request for bibliographic date of a given patent (identified by patent number provided by the customer) as well as identification of patent number if other bibliographic data is known.

64 Patent Copy Service

Patent Information System has excellent facilities to obtain copies of patent specification/abstracts in paper form from original paper or microform document.

65 Publication Services

A journal "Patent Information; Patent Index" rendering Patent Altering Service is being published. It provides patent numbers and titles of latest published patent documents of USA, UK and India, classified in eight prescribed sections under the International Patent Classification System.

7 Modernization Of Activities Of Patent Information System

The modernization of activities of PIS, Nagpur is to be undertaken to cover three aspects (1) Broadening search services (2) Awareness efforts (3) Modernization of storage and retrieval.

71 Broadening of Search Services

During the second stage of development of the organization experience was gained in respect of needs of the users and various ways in which these needs would be satisfied.

With the recruitment of qualified, technical officers it becomes progressively possible to analyse the user requirement indepth and provide highly specific information. For example, against a querry for a specific chemical compound, the customer does not have to be satisfied now with only a list of patents for compound belonging to that broad class of compounds. It is now possible to analyse each patent document and report only those patents which relate to that specific compound. That is to say number of 'hits' in PIS, search report is now reaching a high level and the 'noise' has become minimum. The number of 'misses' is also progressively declining as more experience is gained in International Patent Classification and regarding the various approaches used by different Patent Offices which allotting IPC symbols to their documents.

With this background PIS, Nagpur now offers a broad spectrum of search services such as (1) Infringement searches (2) Novelty searches (3) Problem oriented searches, and (4) State of the art searches.

72 Awareness Efforts

It was soon realized that if the wealth of information available at PIS, Nagpur is to exploited, potential users have to be identified and educated. They must be convinced by concrete examples of utility of patents. Beginning January 1992, PIS proposes to take up extensive user surveys and follow this up by conducting a series of training programmes/workshops dealing with use of patent information.

73 Modernization of Storage and Retrieval of Information

Until the demand for patent information is low, one may be satisfied with manual mode of searching. However, now that a decision has been taken to reach a broad spectrum of users there is no alternative but to evaluate various options to modernize storage and retrieval of patent information.

The modernization plan begins with rethinking on document collection and culminates in computerization of the activities.

It has been decided to. procure patent documents in computer readable form such as CD-ROM wherever possible. This would enable selective access to the patent document directly. In cases where this is not possible emphasis will be on collection in microform.

74 Online Access

By the end of 1992 access from PIS, Nagpur will be possible 'on line' to

overseas data bases specializing in patent date. Access to INPADOC bibliographic data modified according to requirements of PIS, Nagpur will also be possible in co-operation with National Informatics Centre, New Delhi. Thus armed with the computer readable patent document; computer readable information retrieval tools and suitable software for interrogation of computer readable data bases, modernization of activities of PIS will become a reality in near future. It is hoped that with availability of the tools, the technically qualified specially trained and experienced personnel PIS will be able to satisfy all patent information needs of the users. PIS, Nagpur thus hopes to take a quantum jump to fulfill its aim of assuming complete responsibility of dissemination of meaningful patent information in India.

Present Status of Social Science Information Infrastructure in India with Particular reference to NASSDOC

Abida Vajahat *

Rama Tejpal **

Sudha Gambhir ***

Importance of Social Sciences, role of ICSSR - NASSDOC in the development of dissemination of information in the field of Social Sciences is discussed. Explains the present and future programmes and role of NASSDOC in developing National Information System in Social Sciences.

1 STATUS OF SOCIAL SCIENCE RESEARCH IN INDIA

With the phenomenal increase in the teaching and research centres as well as activities in Social Sciences, there has been a corresponding increase also in the volume of documents, journals etc. This is precisely the reason why the Government and other public and private sector organisations have come to realise the paramount need to promote economic development and social change in the country and, therefore, Social Science as a discipline of study and research have already been recognised since Independence. Side by side, there has also been significant change in the structure of the subjects of social science because of inter-disciplinary and multi-disciplinary research in these fields. All these developments also underline the need for proper and adequate storage of information for the purpose of dissemination of information in the best possible manner.

In the post-independence period there has been a gradual evolution of bibliographical information centres and systems. At the national level, there are INSDOC, DESIDOC, National Information Centre, UGC Information Centres, BARC Library and Information Services Division, ICAR Agricultural Research Information Centre, National Documentation Centre for Health and Family Welfare. Small Enterprises National Documentation Centre(SENDOC) and NISSAT Sectoral Centres. In the field of social sciences there are NASSDOC, Centre for Rural Documentation in Hyderabad and a few others. In addition, there exist a number of specialised subject information centres/libraries attached to R & D and other institutions and industrial undertakings. Of them, the important may be in the range of 800 - 1000[11].

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2 ICSSR

The Indian Council of Social Science Research was set up by Government of India in April 1969. The Council has set up in collaboration with respective state governments six regional centres as part of its programme of decentralising administration and broad basing social science research at Bombay, Calcutta, Chandigarh, Delhi, Hyderabad and Shillong.

21 Programmes and Activities:

From the very beginning, ICSSR was able to bring about a great deal of dynamism in the development of social sciences in India, especially in motivating scholars to adopt innovative approaches to research in the areas of national relevance. Over the years, the ICSSR built up a wide-ranging programme-based research enterprises at the individual, institutional, regional and national levels.

In this endeavor, importance was given to developing methodologies of inter-disciplinary nature towards a new policy and perspective on social sciences. The supportive programme of assisting and bringing out publications of various kinds has helped to disseminate research results widely.

The ICSSR provides an institutional base for social scientists to interact mutually and to convey their views on topics of national importance to policy makers in the government through it. It has thus played a significant role in regard to policy formulation and implementation, educating public opinion and changing social and individual behavior.

3 DOCUMENTATION CENTRE

Social Science Documentation Centre was set up in 1970 (renamed as National Social Science Documentation Centre in 1986) to function within the framework of the organizational policies of the ICSSR and also to work and provide services as National Information System in Social Sciences(NISSS)

The infrastructure set up under NISSS programme consists of:

- Resource Centres;
- Collections;
- Technical Processing;
- Services;
- Management;
- Data compatibility and standardization (Common documentation tools);
- Governance;
- Financial Support; and
- Dormitories for storing less used material deposited/gifted by participat-

ing libraries.

31 NISSS Network

NASSDOC is substantially holding all resources which are utilised by all other members. This network includes one National Centre, Regional Centres, Sectoral System other specialised services.

If we make a complete survey of the existing activities of NASSDOC we find that there is already in existence a kind of National Information System, we have only to set it up in an organised shape or network. This network would be a Star Network structure (Kent).

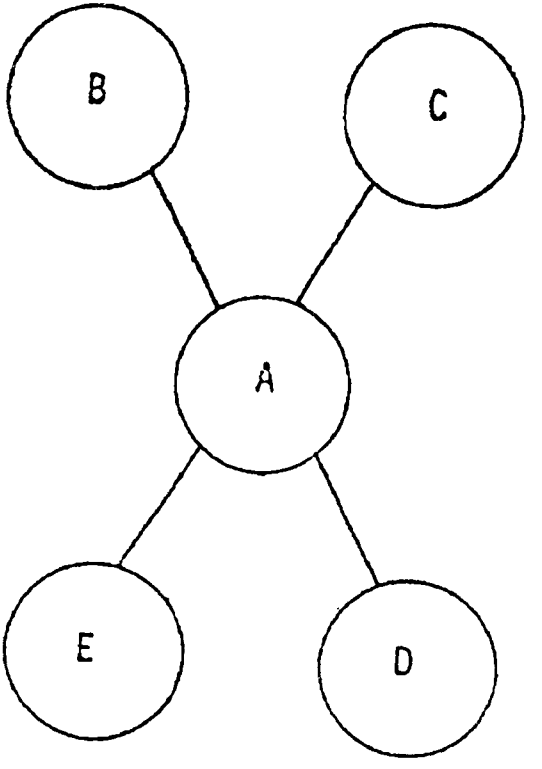


Figure 1: Star network structure (from Kent)
The network member (A) holds all resources, with all other members (B-E) utilising these resources.

The star network entails one network member holding substantially all resources, with all other members utilising these resources. Figure 1 gives an idea of the configuration[2].

National centre would conduct, organise and provide information at national level in the field of social science. The following centres would constitute the national centres of information.

1. NASSDOC (Existing)
2. National Social Science Library (Proposed)
3. Social Science Data Archives (Existing)[3].

32 Role of NASSDOC in Developing National Information System:

Keeping in view the ultimate aim of NISSS, NASSDOC is developing national information infrastructure in the field of social sciences as INSDOC is in the field of Natural Sciences by supporting research and scholarly pursuits. To fulfill this aim the major activities are as follows:

321 Collection Development:

NASSDOC has a large collection of publications on social science. This collection specializes in research methodology, research project reports and micro-film collection, etc. NASSDOC also coordinates acquisition of documents at national level. Following is the acquisition policy of NASSDOC:

1. Acquisition of current Indian/Foreign journals and procurement of foreign journals in exchange.
2. Filling up the gaps in existing collection of journals.
3. Foreign bibliographic databases in machine readable form will be acquired for providing SDI services.
4. Acquisition of unpublished material like papers of conference/seminar/workshops/research project reports/doctoral dissertations/working papers, etc. (NASSDOC keeps the doctoral dissertations in English and Hindi language. Likewise, other regional centres in India also maintain copies of these dissertations).

322 Document Copy Supply Services

NASSDOC provides duplicating and reprographic services in providing important documents to the research scholars. It also provides inter-library loan services.

323 Union Catalogues

NASSDOC completed the Union Catalogue project work in April 1970 and the project work consists of 32 volumes. Union Catalogue of Delhi is being

updated for the period 1971-1990. Union list of periodicals in Delhi Libraries had been updated in 1989 and is now being continuously updated through micro-computer. To update data regarding availability of back files of newspapers in Delhi libraries, which earlier formed part of Union Catalogue of Social Science Periodicals - Delhi Libraries. It is proposed:

a) to computerise the data already collected;

b) to update the data from the year 1970;

c) to include the Journals in humanities from the libraries specialising in humanities prior to 1970; and

d) to create a centralised data base of National Union Catalogue of Periodicals/Serials in Social Sciences and Humanities.

It will help in providing information about the availability of journals, promote resource-sharing among the libraries, facilitate quick document/library services, help in assessing the number of journals brought out in various disciplines, help in formulating cooperative subscription policy, which may help in maximising the use of limited resources.

324 Current Awareness Service

To provide current awareness service regarding latest document released in the field of social sciences and humanities:-

NASSDOC has also taken steps to bring out Indian Social Science Abstracts to provide not only bibliographical control of domestic output but also to act as a feeder for Indian literature. It has started abstracting unpublished Ph.D Dissertations and research project reports. The sectoral centres would take care of bibliographical control of unpublished literature.

325 SDI Services

To facilitate research in social science, indexing and abstracting services in the form of magnetic tapes are available. NASSDOC also provide them in this regard computer service based on the work done by SDI. Certain publications brought out in mimeograph form are: Acquisition Update (Biannual) Conference Alert (Q) Social Science Research Index (Annual), etc.

326 Bibliographical Services

Bibliographical Services provided by NASSDOC play an important role in helping the research scholars to complete the research work quickly in the field of social sciences. Besides providing short bibliographies on request, it also brings out compilation under NASSDOC Research Information Series, such as bibliographic reprints in different disciplines like Banks and Banking, Children, Commerce, Education, Industry, Labour and Labouring Classes, and so on.

NASSDOC publishes serials also e.g., Acquisition Update, Apiness Newsletter, Conference Alert, etc.

327 Indexing

'Indian Education Index (1947-78)' Index to Indian Periodicals: Sociology and Psychology (1986-1970)' has been brought out under the Project entitled Retrospective Indexing of Indian Social Science Periodicals'. Index related to Indian periodicals in the discipline of Political Science is under process.

328 Training Programme

NASSDOC undertakes Library and Information Sciences courses from time to time.

329 Inter-Library Resources Centre

ILRC was set up in 1975, inviting local libraries to deposit their non-current, infrequently used but important for research i.e., serials/periodicals/government reports, etc.

4 FUTURE PLANS

The major thrust during 1990-91 will be on the following

1. Strengthening of bibliographical services.
2. Strengthening of document delivery services.
3. Efforts will be made to reorganize the ILRC
4. A Central Abstracting Service Scheme is proposed to be undertaken. Under this, abstracts of periodicals literature in social sciences in English language will be done on payment basis.
5. The National Information System for Social Sciences (NISSS) will be further strengthened.
6. The Asian Pacific Information Network on Social Sciences (APISSS) will be strengthened by NASSDOC as a focal point.
7. The major social science libraries and documentation centres in the region will be linked-up closely to facilitate exchange of knowledge and to encourage development of new information centres and clearing houses.
8. As regards Area Study Bibliographies and Language Bibliographies efforts will be made to include the states and languages, so far not covered.
9. The work relating to indexing of journals in regional languages will be carried out in cooperation with ICSSR Regional Centres.

5 NATIONAL SOCIAL SCIENCE LIBRARY (NSSL)

The development of NSSL is closely linked to the programmes and activities of NASSDOC. The main responsibilities of NSSL are

1. To build a comprehensive world collection of social science material by way of supplementing the National collections.
2. To maintain a good collection of reference publications in the field of social sciences to enable carrying out of the bibliographical tasks.
3. To maintain a comprehensive collection of Indian material in social sciences including theses, government publications, reports, etc.
4. To offer consultation, reference and inter-Library loan service as well as reprography services.
5. To maintain up-to-date national union catalogue of social science material in machine-readable form for promoting use of material as well as for following cooperative acquisition policy.
6. To maintain dormitories for storing older material weeded out by service libraries [4].

6 REGIONAL SYSTEM

The ICSSR has already established regional centres in Bombay, Hyderabad, Calcutta, New Delhi, Shillong and Chandigarh. The main objectives of Regional Centres are

1. To survey the information resources of the region and to organise their mobilisation for meeting the information demand of the region.
2. To establish, maintain, up-to-date and publish regional union catalogue of literature resources.
3. To establish a strong reprographic unit and to serve the region with reprographic copies of information sources. To procure, on request, documents within and outside the region.
4. To build and maintain a good collection of reference material for the benefit of scholars.
5. To collect and build a good social science literature in the regional languages.
6. To provide referral services to the users in the region.[5].

7 SECTORAL INFORMATION SYSTEM

The sectoral system would consist of the leading centre chosen for the purpose as well as all other information centres, belonging to discipline/objectives. They will together form a grid of their own and will take care of development of information resources as well as services in a holistic manner. The sectoral information system is to provide the following information services

1. Specialised current indexing and abstracting services including SDI
2. Subject bibliographies
3. Subject union catalogues
4. Information retrieval on subjects
5. Collection and dissemination of technical and socio-economic information
6. Translation and document supply
7. Preparation of surveys, state-of-the-art reports, forecasting reports, techno-economic and management information[6].

The sectoral centres will provide specialised services with a good amount of subject competence and they will be manned mostly by subject specialists framed in information work.

71 Management Setup:

It is proposed to set up an Advisory Body for proper planning and formulating action of NISSS. This Advisory Body will consist of academicians and experts on computerised information work.

8 ROLE OF INFORMATION TECHNOLOGY:

Recent developments in the use of computers for the storage and retrieval of information and in use of telecommunication networks and packet switching services to transmit data over long distances, now offer exciting possibilities to improve information services. "Every reader his book", "Every book its reader" and "Save the time of the reader", such are three of the basic laws laid down several decades ago by Ranganathan. Since those days, the means of handling information have changed dramatically yet the basic principles underlying a library service remain unchanged. If information technology can be properly harnessed, then the prospects for the future are promising. By appreciating the pitfalls inherent in the new technological age, a sure and safe path can be trodden towards the goal of access to information for all [7].

9 INTERNATIONAL SCENARIO

Computer application in library and information field has helped not only in improving services and operations of libraries for a better performance, libraries are able to evolve effective computer networks, towards optimum utilisation of resources and facilities.

International programmes like UNISIST/UNESCO, Universal Availability of publications (UAP) and Universal Access to Information (UAI) of IFLA and a few other have helped in promotion and coordination of information services throughout the world. IDRC, Canada, EEC, Brussels and similar others have helped developing countries to strengthen their information infrastruc-

ture. Global information system, characterised by decentralised input, centralised processing and decentralised distribution, such as INIS, AGRIS and DEVSIS have been evolved towards universal bibliographic control and dissemination of literature. International information networks/centres such as Lockheed/DIALOG, SDC/ orbit and ESA/IRS hold 100 or more database in several disciplines and offer online services to users throughout the world. Communication networks like TELENET and ESANET offer communication facilities to international information centres that offer database services. Towards promoting cooperative endeavors, regional networks like ASTINFO, RINSCA and SEAMIC and others have come about. These are all useful international efforts in transborder flow of information and in diffusion of knowledge throughout the world[8].

10 ASIA-PACIFIC INFORMATION NETWORK

At a meeting of ASSREC and Unesco held at Bangkok in 1986 Asia-Pacific Information Network in Social Sciences (APINESS) was launched. NASSDOC is the national nodal point for the Network.

Activities under APINESS framework include

1) Bringing out APINESS Newsletter at its own cost;

2) to include participating National Contact points in NASSDOC mailing list for Research Information Series;

3) to extend training facilities in the area of documentation to other countries of the region;and

4) to distribute literature received from abroad [9].

Publications published under APINESS programmes include

1) India 2000 : An Annotated Bibliography (Completed):

2) Selective Inventory of Information Services (Completed)

3) Updating of data relating to countries in the Asia/pacific region for world Directory of Social Science Research Institutions and

4) APINESS Newsletter (on going)

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Public Administration Information System

Suresh Kumar*

Explains the objectives, functions, manpower deployment and the financial outlay for setting up a National Information Centre in Public Administration.

1 PUBLIC ADMINISTRATION

The subject of public administration to be recognised as a discipline is not very old. Public administration is becoming a field of practice based on applied sciences. Public administration, relatively a modern discipline, is notoriously difficult to define accurately and concisely. As an aspect of government activity, public administration has been co-existing with every political system as the active part of the government for the fulfillment of the objectives set by the political decision makers. In general it means decision making, planning the work to be done and formulating objectives and goals.

Field of public administration possesses many of the characteristics of an academic discipline. Though it is being increasingly practiced, yet it is not exactly a profession nor precisely a discipline. Certainly public administration relies upon the contributing discipline of economics, political science, sociology, psychology, philosophy, history, mathematics and fields such as computer science, architecture, law, business administration, education and industrial relations.

2 INFORMATION SYSTEM

According to Harrod's "Librarian's Glossary on Librarianship'" "Information system is an organised procedure for collecting, processing, storing and retrieving information to satisfy a variety of users needs."

A system implies an organisation with a promotional and coordinating role and has specified purposes and functions executed through many subsystems. It may comprise of various functional units working independently or composed of various other units. Definitely a system has a definite function irrespective of time and environment.

Information by its very nature may be simple, complex, quantitative. It needs further analysis by the information specialists who try to measure its intensiveness, and express it in one form or the other, through any communication media to satisfy the demands of the user. The answer to the query called

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for is generally supposed to be available in recorded form. A good information system's sole aim is to provide the recorded information precisely and promptly as and when it is sought.

An information dissemination centre is an operational unit actually performing certain tasks for the handling of various units of the system. These units have definitely some relation with one or the other unit, from acquisition to processing of document, its documentation (indexing and abstracting and press clipping) to reference, current awareness unit and selective dissemination of information to inter library cooperation. But the actual need arises to evolve a functional media to operate these services effectively and precisely. The functional units can function effectively only when it has the cooperation of other units like service units and projects units. There should be definite precise framed policies and programmes of each unit at the time of its establishment.

3 NATIONAL INFORMATION CENTRE IN PUBLIC ADMINISTRATION

In order to achieve the best possible results in the field of Public Administration it is suggested that IIPA Library which already has the necessary infrastructure and other facilities built over the past 36 years, may be identified and upgraded as a National Information Centre in Public Administration.

The objectives and functions of various units, and their financial part during the plan period are discussed.

31 OBJECTIVES

The foremost and primary objective of the proposed centre is to disseminate information in the field of Public Administration with a view to pool together the nationwide information resources to all those clientele whosoever are interested or might be interested in seeking information. It is to improve its access and enhance its availability for better dissemination of information. To achieve the above stated objectives, the following targets are proposed:

a) To promote the exchange of information, experience and expertise in the field of public administration;

b) To equip the centre with the latest developments in the field;

c) To computerise various service units of the centre following uniform practices to have a quick access to all the service units;

d) To evolve standard practices in information handling;

e) To develop a uniform policy for the acquisition of information and their bibliographical control;

f) To promote and strengthen the spirit of true cooperation amongst public administration information centres through their

proper coordination; and

g) To promote the application of modern information technology products and practices specially telecommunication, audio-visual aids for the promotion of information handling.

32 IIPA LIBRARY

The origin of the Institute can be traced to a survey of public administration in India conducted in 1953, by Dean Paul H. Appleby, Consultant in Public Administration, Ford Foundation, which suggested, "Government sponsorship of the establishment of an institute of public administration for India to provide a national, informal focussing of attention on public administration". The institute was registered under the societies registration act XXI of 1860 on 13th March 1954 and its library was established in March 1955. The library was formally inaugurated on 15th January, 1956 by Shri Govind Ballabh Pant, Minister of Home Affairs, Government of India.

33 SERVICES OF NICPA

The main aim of the centre is to organise its services to serve all those whosoever are interested at the local level, national level and international level. To meet these requirements the services have been classified into three units i.e. (1)Functional Units (2) Service Units (3) Project Units

321 FUNCTIONAL UNITS

1. Identification of information centres already established at the local level, national level and international level;
2. Facility to access bibliographical databases in public administration and its allied disciplines;
3. Record of all available case studies in the area of public administration to be identified and made available for ready reference;
4. To organise seminars, workshops to acquaint clientele with developments in the field of public administration;
5. Procure all the published bibliographies in the field;
6. Identification and procurement of all the theses published/accepted by various universities in the field of public administration and its allied fields;
7. Computerized methods of storage of information and use of information technology products like microfilm, microfiche, compact disc etc. This will necessitate training for the centre's staff;and
8. For the press clippings purpose all the newspapers of interest on the subject will be scanned, clipped and arranged under broad identified subject headings and fed into the computer for its fast retrieval.

322 SERVICE UNITS

1. Improvements will be carried out in the institute's quarterly indexing and abstracting service, viz., "Documentation in Public Administration Services" by giving annotations and abstracts to extend this service to a larger user community.
2. Bibliographies on a variety of topics relevant to public administration are to be compiled on demand as well as on adhoc to be included in the regular activities of the centre.
3. Document supply service will provide full text on loan or a reprographic copy to its clientele at a reasonable cost .
4. Refer the enquirer to the appropriate source/agency/institution etc. from where to obtain the needed information.
5. Centralized inter-library resources centre is to be created so that the user find it comfortable to find all the desired material at one place.
6. Selective Dissemination of Information service mainly a computer based service will be provided to the individuals and to groups.
7. Advisory services to cooperating information centres in the area of public administration is to be incorporated as an activity and also survey of existing services for their proper evaluation and improvement.
8. Conventional translation services may be carried out through selected panel of translators. Translation may not necessarily be from foreign language only but may also be from Indian regional languages to English/Hindi and vice-versa.
9. There is always a shortage of space in almost all the well established libraries. To meet the requirements of shortage of space, Inter-Library Resources Centre in the area is to be created so that the less used material, old editions, old publications, extra copies forms part of repository collection.

323 PROJECT UNITS

1. Compilation of public administration thesaurus to meet the needs of key terms for indexing and processing of materials is to be a great help for the staff as well as user community for retrieval purpose.
2. Compilation of union list of periodicals in the field of public administration and its allied disciplines for the participating information centres.
3. Preparation of standards for the uniformity of services.
4. Preparation of a manual giving details of services of each unit.
5. Directories of important persons in the field, important happenings and of all the participating organizations will be taken care by this unit and is supposed to be a on going activity.

6. A newsletter giving information about the latest development in the field, important activities of the centre and its participating organizations are to be incorporated.

7. A comprehensive data base especially of statistical nature on the areas of interest to user will be organised to provide readymade information on areas of interest to the users.

8. Identification of libraries already established in the area with objectives of: (1) Cooperative acquisition of books and periodicals to promote resource sharing (2) Specialization of each subject or area. However, bibliographical control should remain as part of activity of the centre.

OPERATIONAL CHART OF NICPA

FUNCTIONAL UNITS	SERVICE UNITS	PROJECT UNITS
Acquisition	Documentation	Thesaurus Compilation
Theses Collection	Translation	Directory Compilation
Processing	Reference and Referral	Union Lists Compilation
Training	Inter-Library Resources Centre	Publication
Computer	Literature Search Bibliography	Research
Case Study	Reprography	Data Bank Creation
	SDI and Current Awareness Service	Resource Sharing
	Press Clippings	

4 FINANCIAL PROJECTIONS

It is estimated that an additional amount of Rs.91 lakh will be needed to strengthen the following units:

41 Document

The collection development activity will be actively pursued and a sum of Rs.7 lakhs will be required to fill up the gaps and update public administration literature.

42 CD-ROM/Databases

All these are computer based library services and will need augmenting to the tune of Rs9 lakhs.

43 Equipment and Machinery

It is envisaged that new equipments and machinery to augment or to replace the existing stock will need a sum of Rs.5 lakhs.

44 Computer Hardware and Software Package

In the event of computerization all the operations of the library and its centres and on line terminals expanded and further workstations with LAN (Local Area Network), facilities have to be provided. For this new software will have to be purchased. All these work will need Rs.15 lakhs.

45 Library Building Annexes

Shortage of space for the collection has led to congestion. The need for additional space can be met by constructing one additional floor above the library. This will need Rs.30 lakhs and will give an additional 8,000 sq ft. floor area.

46 Library Lighting and Electrical Installation

Acquisition of new equipments/computers etc. will need improved electrification. Modern electrical gadgets including library lighting is estimated to cost Rs.4 lakhs.

47 Air Conditioning (Partial)

All computer had disc storage will require full air conditioning. This will require Rs.8 lakhs.

48 Consumable Items

All computer consumable items will require a sum of Rs.1 lakh annually.

49 Training (HRD)

Towards professional development of library staff, training to keep them abreast of development in modern techniques of information retrieval and technology is very necessary. The staff have to periodically undergo refresher/training programmes/workshops both in Indian and abroad. This will require a sum of Rs.1 lakh.

410 Salaries of Additional Staff

Once the centre starts functioning it will require additional staff. This will require an expenditure Rs.9 lakhs.

5 CONCLUSION

The system will be geared to the information needs of the disciplines for

which it has been established. All operational efforts in the working of NICPA are primarily aimed at providing information for user satisfaction. Dissemination of information to the users is the most vital component in the whole system for providing the user satisfaction. It is hoped that when the system is fully operational it will meet the information needs of its user community. For the proper functioning of the system the funds are required as calculated above. For provision of funds help of Department of Personnel, University Grants Commission, donations and special assistance from various national and international funding agencies, may be sought.

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Public Library System: A Modern Outlook on its Principles and Practice

R. Raman Nair*

1 INTRODUCTION

Public library is an institution which offers to people free access to information. Unesco Manifesto for Public Libraries proclaims public library as an institution which is the principal means whereby the record of man's thoughts and ideas and the expression of his creative imagination are made freely available to all[1]. The manifesto also states that it should be an institution; established under the clear mandate of law, maintained wholly from public fund, offering all its services free of cost and open for free and equal use by all members of the community irrespective of their age, sex, religion, language status or level of education.

11 Definition of PLS

Even though public library services existed from very ancient times Public Library System (PLS) is a recent concept. According to Ranganathan PLS means an integrated nation-wide network of public libraries giving free library and information service to one and all of the citizens - literate or illiterate, rich or poor, rural or urban [2].

12 The Need of PLS

Many global forces have made PLS and its free information service the most important requisite for life in the modern world. The development of the sociological thought has shattered all the social barriers and forced the society to move towards a socialistic pattern. It implied equal right to all for free public library and information service. It has to be free and supported by legislation. The developments in political thought progress of science, and industrialization have made it essential to keep one and all of the citizens furnished with latest ideas and knowledge through PLS which is equally accessible to everyone for their information requirements.

The two instruments which supplement the work of education to this end are on the one hand PLS with resultant dissemination of information and on the other information designed for the popularization of different fields of knowledge which is provided through books, journals and audio-visual media.

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2 THE ROLE OF PLS

The explosive growth of knowledge and the direct relation of information to developments in all walks of human life have elevated PLS which is to give free access to information for all as the most important system in people's life and progress. Recent studies on PLS assign to it important roles in the fields of nation's political, social and economic development, education, information, culture and leisure. There is no other substitute to PLS.

21 Adjustment to Change

The speed at which the advances in science and technology is occurring at present has broadened the scope and elevated the level of PLS in modern civilization. This fast development in science and technology has caused new socio-cultural pattern to emerge with turbulent changes in goals, pursuits and priorities in all facets of life of man on earth. Change is not a new phenomenon. We have been witnessing it from time immemorial. But now we are in a phase of exploding change - with personal life being torn apart the existing social order crumbling, and fantastic new way of life emerging on the horizon - asking the very largest questions about our future; is not merely a matter of intellectual curiosity [4].

It is a matter of survival. It gives new dimension to PLS in this new environment.

22 Maintaining Democracy

We are striving to attain a socialistic pattern of democracy. PLS is an essential requirement for achieving and maintaining democracy. In a democracy the sovereign power is distributed equally among one and all the voters. But the day to day affairs of the government which is very complex in a large country like India can not be discharged by each one of the voters. Therefore, it is impossible for each voter to take a hand directly in the administration of the affairs of the State, in virtue of his small share of the sovereign power of the country. Each voter has to exercise this residual sovereignty in a very effective way if democracy is to be safe. He should exercise this power by watching whether the policy of the government is on right lines, whether the promises of the Legislators and the Ministers made at the time of election are being faithfully carried out, and by stepping along with other voters at the right moment and by endeavoring to set right the wrong. These form the inalienable right as well as duty of each citizen.

221 Need for unbiased information

The exercise of these rights and the performance of these duties should be based on the knowledge of facts and ideas. Thomas Jefferson has rightly remarked that 'the people of a country would never consent the destruction of

their liberties if they were informed and nothing would do more good towards keeping them informed than the establishment and maintenance of a PLS. So in its own interest democracy is obliged to provide free and extensive information service to the people through PLS.

23 Economic Development

The economic development also requires support of PLS. Population pressure has already gone beyond powers of the natural and near natural resources to feed, clothe and house all people. So there is need for intelligent conservation of all available resources by everybody, maximising the production of natural and near natural commodities by intensive cultivation and the transformation of non-consumable raw materials into beneficial commodities through technology of ever increasing sophistication. These requires continuous dissemination of latest scientific ideas and knowledge among one and all the people. As the Sangham classic Tirukkural says; the wealth of all wealth is the wealth of human resources[5]. This makes PLS the primary responsibility of the State.

24 Social well being

Library and information service is a social necessity[6]. PLS is an essential support to the steady development of social well-being. PLS should be the nucleus from which every development in a community radiates and gets irradicated. Public libraries should be the social a nd intellectual centres of each locality. PLS is to be the communities cultural deposit; for all its literary remains and a medium for transmission of the distinctive culture of the community and for historical research.

PLS has a great role to play in social education to prepare people for social adjustment. It also offers materials and services to the public to understand the social phenomena and thus live a successful social life and avoid social evils. PLS provides opportunities to the people to understand social diseases and learn to control them.

25 Education of the Masses

PLS only can foster and provide means for self-development of the individual or group at whatever the stage of education; closing the gap between the individual and recorded knowledge[7]. PLS is a necessity for the preservation of universal literacy and the elimination of educational waste.

26 Use of Science and Technology

The dominating feature of the contemporary world is the intense cultivation of science on a large scale and its application at meet common man's requirements. It is only through scientific approach and method and use of scientific knowledge that reasonable material and cultural amenities and ser-

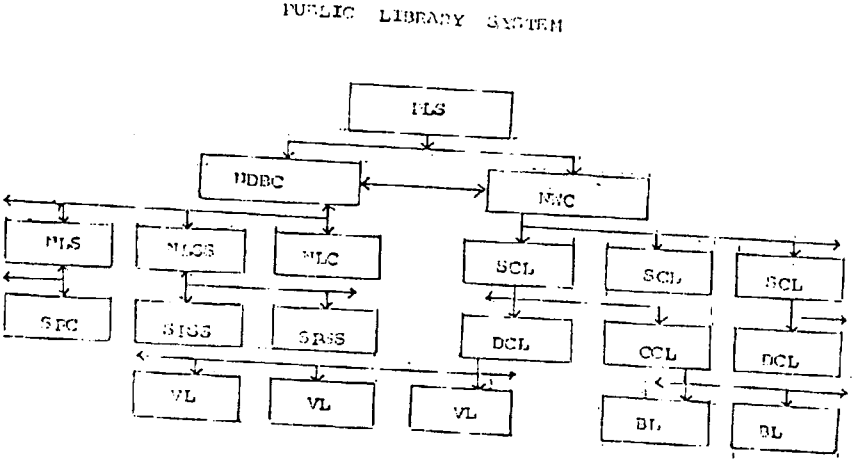
vices can be provided for every member of the community and it is out of the recognition of this possibility, that the idea of the welfare state has grown. PLS has to offer the people materials and services that will help them to prosper in their respective fields of work. It has to help the people to get along in the present day world where inventions and discoveries are flooding everyday impelling man to have continuous education for professional maturity.

27 Culture

PLS helps the cultural development in more than one way. It can promote a keener participation, enjoyment and appreciation of all arts. It can play a vital role in collecting and preserving the cultural heritage of the locality and making it readily available to the people to enrich their cultural awareness. It attempts to reduce the cultural lag- the time taken for the innovation to become integrated into society.

3 DEVELOPMENT OF PLS CONCEPT

Earlier public libraries were considered as independent single units under the Government. The concept of PLS, as distinct from unitary libraries was presented in the Model Library Act by Ranganathan at the First All Asia Educational Conference held in Banares in 1930. This concept emphasises that PLS at different levels viz., State, City, District along with lower service units should be so interlinked as to form part of a system or network. Such a PLS can be compared with a large irrigation system. It needs a hand-work with a costly dam.



BL Branch Libraries, Tier 1

CCL City Central Library, Tier 2

DCL District Central Library, Tier 2

NDBC National Data Base Central

NLC National Copyright Collection

NLS National Science Library

NLSS National Social Science Library

NWC PLS network coordination

PLS Public Library System

SCL State Central Library, Tier 3

SPC Special Libraries Science

SPSS Special Libraries Social Science

VL Village Libraries, Tier 1.

and a large number of distributaries and sub-distributaries through which water can reach every bit of land . The traditional independent libraries on the other hand, resemble more the wells and tanks which have served mankind for ages, but they have limited and dwindling use in modern times.

31 Possibilities of PLS

Thus new concept of PLS offers infinite possibilities:

1. 'PLS' is a co-operative and organic structure in which every unit however small is rich as the whole system.
2. PLS has larger funds which allow for a balanced and even development of its services over large areas irrespective of local variations or imbalances in financial support.
3. PLS is comparatively more economical, and
4. PLS can provide library services more efficiently and effectively because it can permit introduction of library services based on modern concepts of services and approved standards.

32 Support for Indian thought

The principles behind PLS enunciated by Ranganathan have been reiterated by UNESCO in its Public Library Manifesto. It declares that organized cooperation between libraries is essential so that total national resources should be fully used and should be at the service of the people. In 1950 in his report submitted to the Union Government of India, Ranganathan again stressed that public library development should be planned on the basis of

library systems rather than on unitary basis[9].

The First International Seminar organized by Unesco on public libraries has stated that library legislation should provide for the inter-lending of books between libraries so that the book resources of the whole territory shall be available to all[10].

The United States has emphasized in the standards for public libraries published in 1967 the importance of the systems concept. The standards contain the concept that every individual has a right to benefit from the record of what is known whether he lives in a big city, a suburban community, a small town, an unincorporated area or a rural district and the structure of such service should provide a flexible, operative library network effectively linking the libraries of the State and the Nation.

33 Right to all information

Ranganathan suggested in 1959 in his library development plan for Kerala, the pooling of the resources of Legislature Library, Government Secretariat Library, and some other big specialized collections to make them useful to the people through PLS. Unesco and several other international agencies such as IFLA and FID have accepted the concept of National Information Systems (NATIS) which pools the information resources of all types of libraries so that they become available to all the people in a country.

34 Recent Trends

Government of India has entrusted Raja Ram Mohan Roy Foundation the work of formulating a national policy for PLS. In 1984 the Foundation submitted a draft policy[11]. In 1985 ILA also submitted another draft policy. So the Government set up a committee under the Chairmanship of P.P. Chattopadhyaya for considering these drafts and for the formulation of a final document on National Library and Information Policy; and it submitted its report in May 1986 which again brought to the forefront the suggestions given by Ranganathan from 1950 onwards. The committee has stressed that establishing, maintaining and strengthening free public library service in the country and enabling them to work as a system is the most important task before the Government[12].

It recommended that all libraries in the state should form part of a PLS network extending from the community library of the village through intermediary levels to the district and to the State Central Library. The State PLS network should eventually be connected with the national level network.

4 PLAN FOR PLS IN INDIA

A four tier integrated PLS was suggested by Ranganathan for India. According to it the State-wide grid of public libraries in each constituent state will together form a nation-wide grid of public libraries. In the following

pattern which is based on Ranganathan's plan the formation and maintenance of the first three tiers are to be looked after by the State. Tier four lies within the jurisdiction of the Union Government.

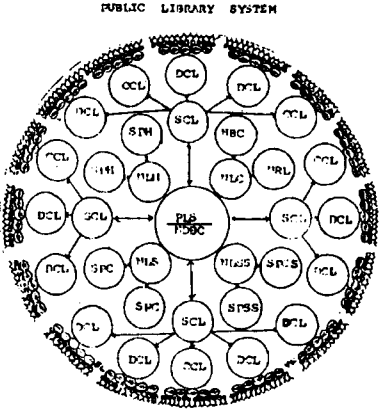
In the illustration given below the outer circle is the people

and the Central Circle is the National Focal point of PLS which controls the whole of information resources and between them comes the four circles; tiers connecting people and their information.

41 Closest service point

The village libraries and branch libraries in cities forms the first tier of the PLS which is closest to the people and which has as its only purpose the providing of book and information service to a small population cluster of not more than about 5000 people. Its permanent collection will be very small mostly made up of essential reference books. Books for satisfying users requirements that goes beyond the powers of its collection will be supplied to it from the next tier. Light reading materials also will be periodically circulated to it from the next tier. Its collection should be about 25000 books and it should have a small but purpose oriented building of its own.

10.4



BL Branch Libraries, Tier 1
CCL City Central Library, Tier 2
DCL District Central Library, Tier 2
NBC National Bibliographical Centre
NDBC National Data Base Centre
NLC National Copyright Collection
NLH National Humanities Library
NLS National Science Library
NSSS National Social Science Library
NRL National Reference Library
NWC PLS network coordination
PLS Public Library System
SCL State Central Library, Tier 3
SPC Special Libraries Science
SPH Special Libraries Humanities
SPSS Special Libraries Social Sciences
VL Village Libraries, Tier 1.

42 District and City Centres

They form the second tier of the system. They will have the functions of purchasing, processing and circulating books to the village and branch libraries and may also serve the people of its locality directly as a service library. They should support the lower level service points in their short range and long range reference service. They should have a collection of about two lakhs books and a sufficiently large building.

It is always advisable for the District Offices of the State Public Relations Department, and District Information Centres of the NIC which provides informatics services to government departments etc. to work in the District Central Library building or in its same campus. This can avoid a lot of duplication of work and resultant waste of resources. By co-operation with these departments PLS also will become highly efficient and effective.

43 State Central Library

It will be the service library cum coordinating centre at tier three of PLS and will have jurisdiction over a constituent State. For lending to any service library in the State it should purchase and keep a stock of reference books, micro documents, equipments etc. which are either too costly for the service libraries of lower tiers or are infrequently in demand in such libraries. It may also do centralized purchasing and processing of books, prepare bibliographies and reading lists for use of the service libraries in the State either on demand or in anticipation. It will normally be the copyright collection in the State. It will be accessible to all throughout the State through any library of PLS.

44 National Library

PLS should have provision to integrate the grid of the public libraries of different constituent states in the country in to a single grid of nationwide public libraries. This requirement introduces the national libraries at tier four.

The time has already come when a single national library would become too unwidely for efficient organization and service. Therefore national library should be a group of national libraries the organizations and services of which are to be coordinated from a central base. These institutions should be divided into two groups, one giving importance to preservation aspect and the other to service aspect. In the first group will come national copyright library, etc. which will preserve books deposited under Copyright Act, Delivery of Books and Newspapers Act, etc.

Of the second group in this tier, that is of national service libraries each will be restricted to specified subject area such as natural sciences, humanities, social sciences, etc. All research and specialized libraries on subject areas covered by these national service libraries will function under their leadership

and coordination. In this type of PLS it becomes possible that each of this special collection can be built up as the most complete and reliable collection on the subject of its specialization. By the centralized coordination at national level of all these special collections and by establishing a data base at the centre from where information regarding all the collections in the country will become available, PLS will get control over the whole information resource available in the country[13]. Extensive coverage, quality and efficiency becomes possible for PLS with minimum resources.

5 NEED FOR PLS LEGISLATION

It is an accepted fact that PLS cannot be established and maintained in any country without a properly planned and framed library legislation. With the growing emphasis on the development of national level PLS following the realization that local library services needed to be supplemented with resources from outside the local area there has been a steady interest in library legislation concerning regional, metropolitan, state and multi-states PLS.

6 UNIFORM PATTERN FOR STATES

The establishment of PLS in India requires the support of a Union Act for PLS. To enable a national system, PLS in all states which are to be its component units in a federal country like India should have a uniform pattern. Without that these components can not be organized into a coherent whole. So far being co-ordinated at the national level it is essential that the Union Government should enforce by the provisions of a Union Act for PLS uniform pattern for PLS in all states. A Model Act for state PLS also should be framed for adoption by the states. This is essential to eliminate waste of energy, money and materials.

7 CONCLUSION

Government should give high priority to PLS and for its legislation because in these days PLS is to be a highly specialised system for the people to have access to information easyily and freely. PLS is potentially a means of establishing some measure of equal access to and redistribution of the wealth of information[14]. How freely and how equally citizens have access to knowledge determines how equally they can share in the governing of our society and in the work and rewards of our economy[15].

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Public Library System, A Necessity for the Success of Democracy:

With special reference to India

Th. Khomdon Singh*

Democracy is the most popular form of government. Its success is totally dependent on the people's understanding. To make people understand, the right dose of information is required. Public library system is therefore, the righteous institution for giving the right information to the right people at the right time. To make the Indian democracy successful a National Programme for Public Libraries is required.

1 INTRODUCTION

Library is the store house of knowledge. Knowledge is the sum total of facts, intelligence, thought, information etc. Knowledge earned by education is the most ideal. To make himself an up-to-date citizen a man has to educate himself throughout his life. Public library is the only institution which can give life long self education to one and all citizens of the country without any distinction of caste, creed, sex, age and physique.

There is a great similarity between the concepts of public library and democracy. In democracy every citizen is equally sovereign and has the same right of education. Similarly in the public library every citizen is free to see and consult the refined thought of the Priests, Philosophers, Poets, Scientists and so on, collected in the forms of documents.

2 PUBLIC LIBRARY SYSTEM

Orderly arrangement of entities or ideas is a system. The concept of the 'Public Library System' encompasses every kind of public libraries such as state, city, district, branch, village and so on. Every library in the system are inter-dependent. There is a necessity for a public library system for the following reasons:

"(a) it is a co-operative and organic structure in which every unit however, small, is as rich as the whole system;

(b) it has larger funds which allows for a balanced and even development of public library service over larger areas, irrespective of local variations or imbalances in financial support;

(c) it is comparatively more economical; and

(d) it can provide library services more efficiently and effectively because

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it can permit introduction of library services based on modern concepts of services and approved standards"[1].

Emphasizing the need of public library system, Ranganathan says: "Public library system is the only possible neutral agency to give unbiased political, economical and industrial information to enable the voters to form their own judgement in helping the progress of the country and keeping vigilance over the performance of the Government"[2].

Unity is strength. If the units in the system are coordinated the whole public library system will be powerful and will bring economical, efficiency and overall development of public libraries in the state. The moment a public library system is formed, the so called library networking will come automatically. In that case every unit through the State Central Library which is the apex of the state library system will get information from National and International sources by means of communication media. Now a days with the introduction of space satellite, information can be availed from distant sources in seconds. Today, there are so many worldwide information systems like VINITI, NISSAT, UNISIST, ISORID, INIS, MEDLINE, AGRIS, NICNET, etc.

In the present century many people are talking about the information explosion. It is nothing else but a jumble of information. If the information is properly set and made available to the users there will be no question of explosion. In a very simple example the whole air around us has the capacity to transmit radio and television waves but if we don't have a radio and a T.V. set,we cannot avail of any such facilities. In the same way, if we don't have a system of public library, we will not be able to give the necessary library services to the general mass. A public library system has to give all the possible library facilities to all the communities it serves. Library co- operation and resource sharing amongst the libraries in the system is quite necessary. Well organised public library system not only ensures resource sharing amongst the libraries but also enables library co-operation with other libraries which is beyond the system in the form of inter-library loan.

3 NECESSITY OF PUBLIC LIBRARY FOR THE SUCCESS OF DEMOCRACY

There are various forms of government in the world. Out of them democracy is the most popular form of government. Even USSR the biggest communist bloc in the world has recently oriented towards the democratization of their government. There are many factors for the success of democracy. Amongst them mention may be made of the public library because of its similarities in the definitions, objectives and functions with the democracy.

The term democracy derived from the Greek words "Demos"- the people and "Kratos"- power. All forms of government in general and democratic form

of government in particular aims at the education of every citizen of the country irrespective of the place of birth, caste, creed, sex and age. Democracy as defined by Abraham Lincoln is a 'government of the people, by the people and for the people'. As such no democracy without the education of the people will be successful. Similarly no education will also be successful without library. The dictum of democracy that in justice, liberty, equality and fraternity may be achieved only when there is a web of public library set up covering both rural and urban areas.

In the democratic form of government every citizen has the same right to the access of knowledge and information. This is nothing else but the goal of the public library. Gopal Rao Ekbote rightly says: "In a democracy every one enjoys sovereignty and if democracy is to be a participatory democracy then it becomes inevitable that every one should be educated and informed about what is going on around him. It is only then that he will be able to exercise his franchise wisely and effectively play his role in all developmental activities of the nation. Reading will free a citizen of his narrow attitude and outlook. Education is an effective media to transfer the social ethos on desired lines and improve the economic lot of the people. Science and technology is making rapid advance and if the people do not keep pace with such advancement they will be left behind in the technological and economic field. Reading on a wide range opens one's windows to outside of the nation and also to the whole world of knowledge"[4].

The success of democracy may be measured by the rate of literacy, standard of living, mutual understanding and co-operation amongst the citizens. For this democratization of education with well equipped and well organised libraries are essential.

India is a democratic country. It has a large illiterate electorates. India's democracy is yet to be matured by giving proper education to one and all. Public library is the only institution which can guide and educate the whole society throughout the life. Public library is attributed with all the qualities of disseminating knowledge and information to the masses. Knowledge should be freely distributed to one and all, is one of the most important principles of democracy.

4 CONCLUSION

In the seventh Schedule of the Indian Constitution the Public Library Service is included as entry No.12 of the State list. Therefore, the provision of the public library service is the responsibility of the State Government. From the untiring efforts of the people and forwardness of the governments; so far only seven states viz: (1) Tamil Nadu, (2)Andhra Pradesh, (3) Karnataka, (4) Maharashtra, (5) West Bengal, (6) Kerala and (7) Haryana could enact Public Libraries Acts in their respective states. Though Manipur Public Libraries Bill

was passed as early as 1st August 1988 it has not become an Act as yet. In the remaining states and Union territories also the progress is at snail's pace.

In order to ripen the fruit of public library system and to make the Indian democracy successful the Central Government should take up a National Programme for the Public Libraries and should initiate the states and union territories to enact Public Libraries Acts of their own.

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Delnet: A Brief Introduction

H K Kaul*

1. INTRODUCTION

In Delhi, the libraries have been growing very fast in number and size during the last four decades. They cater to specialized and general clientele and are of various types which include institutional libraries, research libraries, government libraries of the universities, colleges and schools. During the recent years cumulative information has been increasing very fast and with it the increase in the demands of the users. It has been noticed that in this era of information explosion the libraries in India are generally ill-equipped to handle and retrieve information effectively. The financial resources and the spaces for housing library collections are limited in almost all of the libraries. The option lift with the forward looking librarians has been to promote the sharing of resources by automation and networking.

In January 1988, the India International Centre organized a panel discussion on "Sharing of resources in Delhi libraries:importance of automation and networking was highlighted by many of the senior librarians and information scientists working in Delhi libraries to tackle this problem. I was asked to be the Convener of DELNET and to promote it with the assistance of NISSAT. The financial support for DELNET was promised by Dr. A.Lahiri, Director of NISSAT.

2. PREREQUISITES FOR PARTICIPATION.

Soon after this meeting, I wrote to various heads of institutions in Delhi inviting them to allow their libraries to join DELNET. They were informed that:

1. The participating libraries would have to posses a micro-computer such as a PC-AT or a super micro computer depending upon the collection and services offered by each library;
2. Each library would have to have a printer;
3. a standard input format for bibliographical information storage and transfer would be given to each participating library;
4. A communication software would be provided to them; and
5. Training would be given to staff in the use of the hardware, software and the development of their specialized databases.

In response to this letter, eighteen big and small libraries of the following

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institutions came forward to join DELNET and agreed to take the necessary steps:

1. All India Institute of Medical Sciences
2. Central Secretariat Library
3. Centre for Policy Research
4. Council for Scientific and Industrial Research
5. Department of Science and Technology
6. Indian International Centre
7. Indian Agricultural Statistics Research Institute
8. Indian Institute of Mass Communication
9. Jawaharlal Nehru University
10. Management Development Institute
11. National Book Trust
12. National Council of Educational Research and Training
13. National Institute of Health and Family Welfare
14. Sahitya Akademi
15. Indian Agricultural Research Institute
16. Raja Rammohan Roy National Resources Centre
17. Indian Institute of Islamic Studies
18. National Social Science Documentation Centre

3 ACTIONS INITIATED

While confirming their participation, we informed them that DELNET may be registered as a separate body, and, so long as that was done it would remain as a project of the India International Centre. The participating libraries were also informed that once DELNET was registered as a separate body they would be required to pay admission fee and institutional membership fee to DELNET.

It was considered that in order to make DELNET functional, to begin with, training of library staff was very essential. Keeping this in view training courses on computer applications for DELNET participants were organized by the India International Centre with the financial assistance of NISSAT. NISSAT not only assisted the course financially but its officers took keen interest in lecturing and conducting practicals during the courses and the workshops. The courses were held at IIC and DESIDOC.

Simultaneously, NISSAT commissioned CMC Ltd. to undertake the

preparation of a Feasibility Study Report of DELNET as CMC Ltd. had already prepared one for CALIBNET.

A Coordination Committee with Dr. S. Varadarajan, former DG CSIR and Secretary, DSIR as its Chairman and I as its Member Secretary was constituted by NISSAT in order to guide and assist NISSAT and CMC Ltd. in the preparation of the report and evaluation of its findings.

The members of the Coordination Committee include:

Mr. S.C.Biswas, former Director, CSL;

Dr. S.S.Murthy, Director, DESIDOC;

Dr. K.S.Tyagi, Director NASSDOC;

Ms. Poonam Sharma,MRC/ICMR;

Prof. B.Guha, Retd. Prof.(BHU);

Mr. A. Joseph, Scientist, NSL/INSDOC;

Mr. P.C.Bose, Scientist, ICAR-ARIC;

Prof. Krishan Kumar, Delhi University;

Dr. J.R.Arora, Head, Comp.Services, IIT;

Mr. R.C.Wadhwa, Scientist, SAC;

Mr. D.Datta, Addl. Director, NIC;

Mr. A.K.Sdarkar, Telecom. Res.Centre;

Dr. A.Kundu, JNU;

Mr. A.K.Chattopadhyay, Inf. Scientist, Ranbaxy;

Dr. A.Chakraborty, Director, Planning Commission

Dr. D.K.Biswas, Advisor, DOE

and the representatives of

Mahanagar Telephone Nigam Ltd. (1)

University Grants commission (1)

CMC Limited (1)

NISSAT (1)

4 ACHIEVEMENTS

The achievements of DELNET during the last three years could be listed as follows:

1. The feasibility study report was completed and evaluated. Thirty five libraries were included in the survey for the purpose of the report. The efforts are being made to implement it in various phases. 'O Phase'

was added to it in order to establish E-mail.

2. Three Training Programmes were organized in the use of CDS/ISIS software.

3. Efforts were made to promote the creation of databases in the DELNET libraries. Experts were sent to the libraries to solve the day to day problems.

4. Regular meetings were organized of the librarians and computer specialists to discuss mutual problems and the areas of cooperation.

5. Standardization Committee of DELNET met several times to prepare the guidelines for standardization of DELNET databases. The Standardization Committee decided that standardization should take place in the following areas:

   1. Communication format for interchange of bibliographic data;

   2. Input/output format;

   3. Bibliographic description: Mandatory and optional data elements;

   4. Classification scheme and subject headings;

   5. Thesaurus;

   6. Authority files;

   7. Language coverage and transliteration of India language scripts into Roman script;

   8. Forms of headings;

   9. Identification numbers, codes and abbreviations;

   10. Data input for abstracting and indexing; and

   11. Search command language.

a) It was felt that the standardization in case of classification schemes, subject headings and thesaurus given above under items 4 & 5 would not necessitate application of standards in the beginning. It was noted that the classification schemes generally in use in the Indian libraries were Colon Classification, Universal Decimal Classification and Dewey Decimal classification and it would be almost impossible to impose a standard classification scheme on all libraries uniformly. As was revealed by Dr. Frederick Kilgore, Managing Director of OCLC, 80% of the requests received by them were either by author or by title and the Committee felt that a similar pattern of requests may emerge in DELNET also. Out of the remaining 20% requests, about 15% would be by subject headings. As such, for 5% requests by class numbers, either a participating library could search by all three classification numbers or it could pass on such requests to DELNET Central Office for necessary action. It was, therefore,considered that it would not be necessary to impose a standard classification scheme on the participat-

ing libraries.

b) With regard to the standardization of subject headings and the creation of thesaurus for DELNET the committee was of the view that a couple of existing standard subject heading lists or thesauri in each major discipline such as social sciences, humanities, and science and technology could be used by the participating libraries. It was noted that a thesaurus for DELNET would eventually get created.

c) The committee decided that to begin with the libraries with more than 20,000 books in stock should be considered for membership of DELNET, but for the use of E-mail all libraries that were having a PC-AT or an XT in the libraries and direct telephone lines or zero dialing facilities would form the outer ring on DELNET libraries.

6. DELNET also established Consultative Committee on Rationalization of Periodicals in Delhi Libraries. The Consultative Committee saved the foreign exchange worth Rs. 18 lakhs through its deliberations in the last quarter of 1990 in the fields of physical science, medical sciences and agricultural sciences. It is hoped that in the years to come through sharing of periodical resources DELNET would be able to save more foreign exchange for the country. In 1991, courier service is being started among those libraries that are participating in the sharing of resources.

7. Under the DELNET scheme of projects, Jawaharlal Nehru University library was given the project to compile a union catalogue of current periodicals acquisitions in DElhi libraries. The work has been completed on the project and it is hoped that it would facilitate the rationalization of periodicals among DELNET libraries.

8. The India International Centre took several projects to assess the creation of databases using CDS/ISIS and CCF and also to find out the most economical approach for creating bibliographic databases. The following approaches were considered for this project:

Approach I : Conversion of data from the books on the shelves taking into account the essential fields including descriptors;

Approach II : Conversion of data from the books on the shelves taking into account the essential fields but without descriptors;

Approach III : Time involved in the creation of descriptors and their inputting into the computer;

Approach IV : Conversion of data taken from the classified catalogue, which has call number, author, title and accession number directly without filling in of input sheets;

Approach V : Completion of the missing data in Approach IV above by locating books, filling it in the print out, and inputting of the data;

Approach VI : Conversion of the catalogue of bound periodicals direct

from the existing catalogue without descriptors;

Approach VII : Completion of missing information and descriptors for bound periodicals and inputting them into PC;

Approach VIII : Conversion of data of the reference books from the shelves with completion of the essential fields;

Approach IX : Conversion of the data taken from the accession register; and

Approach X : Completion of the missing data in Approach IX above by locating books and filling in of the details in the print out and inputting of the remaining data.

The following table reveals the minimum cost involved in converting a bibliographic entry into machine readable form:

LOWEST COST PER ENTRY

	A. WITH BIBLIOGRAPHER, DATA INPUT ASSTT. AND COST OF PROJECT DIRECTOR'S TIME SPENT		B. WITHOUT THE COST OF PROJECT DIRECTOR'S TIME SPENT	
	Actuals(Rs)	Standard(Rs)	Actuals(Rs)	Standard(Rs)
Books	9.21	8.98.	7.20.	7.02
Reference books	9.87	9.15	7.72	7.15
Periodicals	18.07		14.04	

Through the above analysis we find that the approach no.1 (collection of data directly from the books on the shelves has been the best approach in terms of cost effectiveness and collection of necessary and sufficient data. And balancing of jobs for approach no.1 was best achieved with the help of two Bibliographers and one Data Input Assistant.

The Standard cost per entry with the involvement of Project Director was found to be Rs. 8.98 and without his involvement it was Rs. 7.02.

9. In 1991, DELNET has begun its operation with the inauguration of E-mail. So far the following libraries are using E-mail facility:

1. All India Institute of Medical Sciences
2. Department of Science and Technology
3. India International Centre
4. National Physical Laboratory
5. NASSDOC.

The following libraries are being added by the end of 1991.

1. National Institute of Health and Family Welfare
2. Publication and Information Directorate
3. Bureau of Indian Standards
4. Central Road Research Institute
5. Central Secretariat Library
6. Sahitya Akademi
7. Department of Electronics
8. Planning commission
9. Research Information System
10. Tata Energy Research Institute
11. Indira Gandhi National Open University
12. Indira Gandhi National Centre for Arts
13. University of Delhi
14. National Institute of Educational Planning and Administration
15. Parliament Library
16. Ratan Tata Library
17. Indian Institute of Mass Communication
18. National Council of Cement and Building Materials
19. National Institute of Science, Technology and Development Studies
20. Council of Scientific and Industrial Research
21. Indian Agricultural Research Institute
22. National Medical Library
23. Indian Institute of Technology
24. Indian National Scientific documentation Centre
25. Defence Social Science Document Centre
26. Jawaharlal Nehru University

27. Indian Institute of Public Administration

The purpose of E-mail under 'O phase' has been to promote library mailing, inter-library requests, distribution of questionnaires, activisation of professional contacts and demonstration of file transfers with a broder view of getting DELNET later connected to national and international databases and networks.

E-mail is being promoted among DELNET libraries as NISSAT is providing free of charge modems and E-mail software to the participating libraries. X-400 E-mail software is being provided by the Department of Electronics. It has been made clear that DELNET will emerge as a cooperative network incorporating all the disciplines - Science and Technology, Social Sciences and humanities - in its orbit. And, each library will be contributing towards the purchase of hardware for its use and the creation of DELNET databases.

With the operation of E-mail the standardization of the bibliographic databases that are being created in different libraries in Delhi would become manageable. Without maintaining adequate standards it would rather be impossible to merge the databases into a single DELNET database. We therefore, hope that as the work on Phase 1 begins, not only would the library staff become more conversant with the technology and use of E-mail and networking but also the central database of DELNET would be created librarians and scholars of Delhi but also by the librarians ad scholars of the country and the world in general.

5 CONCLUSION

Let me conclude by noting that it took us nearly three years in promoting the creation of bibliographic databases of some recognizable size in DELNET libraries, for without these databases neither could DELNET be made operational, not could the E-mail become effective. it was essential to see that a network of this nature linked the libraries that were automated and not the ones that were continuing their manual operations. We hope that the efforts made by NISSAT and DELNET in the initial stages will result in ensuring a positive growth of DELNET in the coming years.

Establishment of information and library network :a critical appraisal

S.S.Pawar*

G.S.Thakar**

Neelam Sharma***

Examines the scope and objectives of INFLIBNET and the problems of be faced in the implementation of the programme.

1 INTRODUCTION

Modern research is interdisciplinary in approach, goal oriented in character and is undertaken by specialists of various disciplines participating like a team work. Process of scientific research is unending. It is obligatory on the part of these researchers to make publically known the results of research work done by them. The main reason is to avoid wastage of time, energy ,money,material and duplication. Knowledge when published becomes information. A research worker should be aware of how much knowledge of a particular problem has progressed at least that knowledge which has already been published.

In modern days, libraries and information centres are like departmental store houses of knowledge where readymade information when required can be made available in a shortest possible time.Modern readers are not ordinary, they are specialists/experts in various disciplines. In India there has been exponential growth of universities,research and development organisations, teachers,research scholars since independence. In 1987,15 central Govt.Ministries, having 172 research organisations,179 universities,deemed to be universities, 380 central government and public undertakings and 814 privately managed industrial houses were actively engaged in the research and development programmes in their own field of work. In 1977-78 universities in India produced 4425 Ph.D's which rose to 7346 in 1986-87. There were 39964 professors, readers and lectures in the universities in 1980 -81. The number increased to 54973. There were 1,94,095 in 1988-89.

2 INFLIBNET-Inter agency working group report

In order to provide the latest information to these scholarly persons and inter agency working group prepared a huge project report for the establishment

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of and information and library net- work project. When completed, it will be a major national effort to improve capability of information transfer and access that provide support to these who are actively engaged in academic and research pursuits in the universities, R & D organisations and various government departments,public undertaking etc. The need for such a huge project was felt due to various reasons. It has been estimated that approximately Rs.150/- crores are being spent on the subscription to scientific and current journals and acquisition of latest books by various university libraries in the country annually. Every library cannot be self sufficient. Limited services are being rendered by these libraries to its users. To avoid duplication of books and journals which are becoming very costly day by day, need has been felt to have a co- operative venture towards resource sharing.

3 INFLIBNET LAY OUT PLAN

It will operate at national, regional,sectoral and local levels covering the whole country. Functions and services to be provided at different levels are described below:

31 National centre

To manage, relevant overseas information and coordinate /the affairs of all libraries, who will participate in the INFLIBNET project; and

32 Regional centres

To maintain union catalogs of all the participating libraries of the concerned region.

100 Document resource centres in all regions

For document delivery service and exchange of available information etc.among the participating libraries.

33 UGC Information

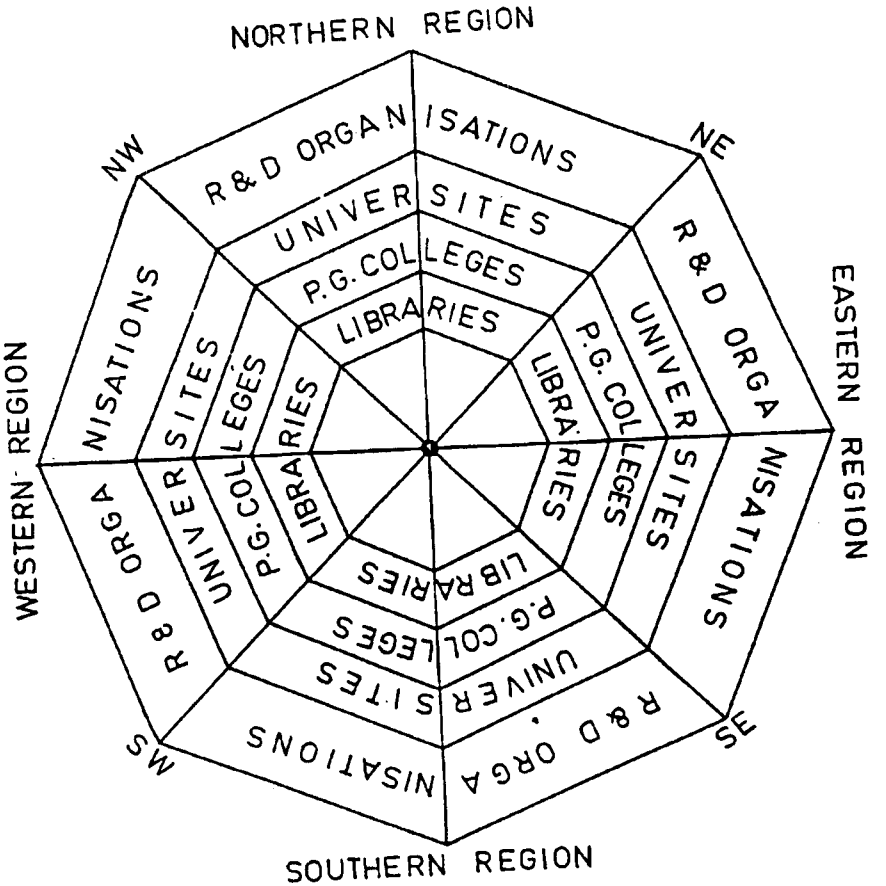
Centres are providing specialised services in various subjects. These centres are at Bangalore, Baroda and Bombay.

To provide up-to-date indexing and abstracting services in the given field.

1. **Bangalore:** Physics, Bio-Sciences, Chemistry, Mathematics, Earth Sciences.
2. **Baroda:** Economics, Political Science, Education, Sociology.
3. **Bombay:** Sociology, Gujarati, Women Studies, Home Science, Library & Inf.Sc., Special Education.

There will be 400 ground terminals at 150 university libraries;200 research and development organisation libraries and 50 post-graduate autonomous college libraries. Nissat will be lined at National Level and Sectoral level information centres. Covering 200 R & D Institutes,170 University Libraries

and 500 college Libraries,100 University and R&D Institute libraries will work as Document Resource Centres (See fig)



4 IMPLEMENTATION OF INFLIBNET

The project is to be implemented in two phases. In the 1st phase (April 1990 to March 1992), it will st Rs.55,16,4500.00 and in the 2nd phase(April 1992 to March 1994),the project will cost Rs.955,20,000.00. It will operate at different levels, national and regional sectoral and local. The National information centre will be managing overseas and co-ordinating the affairs of the network. It will use a hybrid version of satellite and territorial networking as its communication system.

41 Budget Expenditure

Total expenditure is to provided by Govt. of India to INFLIBNET to establish and run the network programme. It will cost the country about Rs.1506845000.00 which includes non-recurring and recurring expenditures.

Non-recurring	Rs.1,50,68,45,000.00
Recurring	Rs.47,67,63,000.00

42 Expenditure heads

1.Communication systems	Rs.29.3900.00
2. Computer system	Rs. 46,40,00,000.00
3.Infrastructure	Rs. 17,80,00,000.00
4.Data collection	Rs.04,42,82,000.00
5.Building	Rs.01,78,00,000.00
6.Personel	Rs.1,96,61,30,000.00
7.Maintenance	Rs.1,80,90,000.00
8.Document collection	
Contingencies	Rs. 1,31,35,000.00
Total	Rs. 1,50,68,45,000.00

5 CRITICAL APPRAISAL

We live in the technology driven world where knowledge is exploding like volcano lava which flows in all directions. Telecommunication technology has removed geographical language and distance barriers. Nations of the world are like various communities living in a global village. We plan in a big way and are least concerned about the problems at the grassroot level to be forced. Most of the libraries and information centre attached to R&D institutes are located in urban areas. Very few library services are available for the people residing in the far-flung areas. We have not provided library services to the rural masses

living in the distant areas due to the illiteracy, poverty, backwardness.

Information seekers are the most important component of any information system. In modern society, every one needs information irrespective of his educational standard. Information users can be divided into the following groups:

a) **Highly educated group:** This group includes expertise scholars engaged in the research work viz. Doctors, Ph.D scholars space scientist, technologist, engineers university faculty staff engaged in teaching in different faculties, lawyers, etc.

b) **Educated group:** engaged in teaching in schools, colleges ,bureaucrats, officials working in government offices and private organisations, business executives.

c) Semi-literate, neo-literate group

d) Illiterates- people residing in urban as well as in rural areas of India.

We cannot provide information service to these categories of information. Unless behaviour studies of seekers/users are undertaken to assess the needs of information users, the task will be incomplete. Here the information seekers to be covered under INFLIBNET will be mostly researchers, faculty members, experts in various subjects who are engaged in the pursuit of new knowledge in the universities, R&D organisations, etc. A big segment of the society has not been covered under this project which includes 3rd and 4th category of information centres are located in the urban areas and the people residing beyond the four walls of the cities are not getting library facilities.

6 RETROSPECTIVE CONVERSION OF RECORDS

Most of the university libraries in India are having big collections even few university libraries have crossed 10 lack mark in their stock. The libraries, are not following one scheme of classification for technical processing. Therefore when there is no uniformity in the technical processing i.e. classification and cataloguing then uniformity cannot be maintained. Special libraries of R&D follow Universal Decimal Classification scheme where as, few are following Colon Classification scheme and Dewey Decimal Classification scheme. It is not possible to reclassify all the available library stock. Retrospective conversion of records will be a gigantic task. This is a big drawback in the INFLIBNET project.

7 DOCUMENT PROCUREMENT AND RESOURCE SHARING

Document procurement i.e. centralised acquisition of books, journals and other reading material can not be undertaken for the participating libraries. Such a scheme is a failure at the local level. Take the case of Chandigarh where more than 50 different types of big and small libraries are providing services to their users. These libraries include Punjab university library, PGT,CSIO,Technical

teachers training institute, Microbial technology, State council of science and technology, public and various govt. departments libraries. Most of the big libraries are spending nearly 90 lakh rupees on the subscription to current scientific journals. Even costly journals mostly some abstracting and indexing are being subscribed by these libraries.

8 COMPUTERISATION OF PARTICIPATING LIBRARIES

Professionals working in these libraries need thorough training in the use of computers in the libraries. In service, training is necessary for every professional. All though computers have been introduced in the libraries for housekeeping jobs like preparation of subscriptions, balance sheet of funds used , balance available, monthly additions, listing of library membership, etc. but still manual jobs are being done by the professionals like accessioning, bill processing, technical processing, preparation of catalogue cards etc. We need air-conditioning for libraries where computers are to be installed. We need programmers in the libraries for developing integrated library system keeping in view the needs of different libraries. Computer culture is not new in various universities but its use in libraries is a new one. Computer awarness should be developed among the users also. For example, Punjab university library was the first library in this area where computer was installed in 1987 but its use is still restricted to in house library jobs only. We are not providing services to the user with the help of computers due to various measures.

9 INFLIBNET AND INDEPENDENT LIBRARY BUILDINGS

Except University library most of the libraries in R&D organisation, post-graduate colleges do not have their independent library building. INFLIBNET is a time bound project and if separate buildings are needed for the participating libraries it will take lot of time which will be a great hurdle as far as the success of the project is concerned.

10 INFLIBNET AND LIBRARY SERVICES

Various services are to be provided by the participating libraries at various levels (as given in table No.1)

Referral services is possible in the university libraries. Most of the university libraries are having departmental libraries where documents and new issues of journals are transferred. Referral service is possible when the circulation services are discontinued and the department libraries are given the job of issuing books in the concerned department and one copy of each document is kept in the central library. Journals are kept for use in the central building. It is not possible to discontinue this practice of circulation services in the university libraries. There are many problems as far as photostat services are concerned. Library services depend upon the behavior of our library users. Therefore,

before the start of the project, user studies should have been conducted at various levels.

11 INFLIBNET AND EQUAL REGIONAL REPRESENTATION

We cannot say that out of the 200 R&D organisation libraries,50 from each region will be participating or out of 150 university libraries each region will share 37 libraries. Therefore, it is not possible to successfully implement the INFLIBNET programme. Users needs differ from university to university viz. agricultural universities, general universities, IIT,etc. Success depends upon the uniformity of needs.

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INFLIBNET

P.Kamaiah*

Points out the need for national information policy. Brings out the need for National Information system to achieve optimum results in the use of information. Describes the genesis and growth of INFLIBNET. Deals with the follow up action taken by the UGC. Discusses the problems faced by INFLIBNET. Offers suggestions for the effective implementation of the objectives of INFLIBNET as envisaged by the body.

1 INTRODUCTION

The need for coordinating and upgrading the existing library and information systems and initiating new programmes relevant to our national needs has been very much realised by our country. For achieving concrete results in this direction, a library and information policy is essential.

The following will be the main aims of the Library and Information Policy:

1) To foster, promote and sustain, by all appropriate means, the organisation, availability and use of information in all sectors of national activity;

2) To take steps for mobilising and upgrading the existing library and information systems and services and initiating new programmes relevant to our national needs, taking advantage of the latest advances in information technology;

3) To encourage and initiate, with all possible speed, programmes for the training of library and information personnel, on a scale and of a calibre adequate to provide the library and information services and to recognise their work as an important component of the quality and level of such services;

4) To set up adequate monitoring mechanisms for ensuring rapid development of library and information facilities and services for meeting the information needs of all sectors and levels of the national economy;

5) To encourage individual initiative for the acquisition and dissemination of knowledge, and for the discovery of new knowledge in and atmosphere of intellectual freedom;

6) In general, to secure for the people of the country all the benefits that can accrue from the acquisition and application of knowledge; and

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7) To preserve and make known the nation's cultural heritage in its multiple forms.

Strictly speaking, a national information system is comprised of:

1. The different groups of information producers and users;
2. All communication facilities, publishers of journals and documents, organizers of congresses.etc;
3. All information units, whether independent or members of specialized networks;
4. All information systems in the strict sense(series of products and services, the techniques employed to produce them).
5. All personnel specialized on scientific and technical information;
6. All the technical equipment used in communication processes(reprographic equipment, information processing devices, telecommunication equipment, etc.);
7. The financial resources allocated to these activities.
8. Machinery for the coordination and direction of the foregoing components;
9. Clearly, national information systems are complex, wide- ranging and diversified. Their structures vary enormously from country to country, since they deal with many different processes and embrace a great variety of relationships between the individuals, groups and institutions of which they are composed;
10. The institutional structure of all national information systems includes: a) governing bodies, who formulate policies and programmes; b) co-ordination bodies, who supervise implementation; and c) executive bodies through which the system functions (information units for the most part).

Keeping these in view, the Govt. of India has launched a programme known as INFLIBNET in the year 1988.

2 INFLIBNET-GENESIS

In April 1988, the UGC constituted a committee under the Chairmanship of Professor Yashpal to work out the details of a University Library Networking system. This committee created an Inter- agency working group with the following objectives:

1. To review the present scenario of library automation and computerised bibliographic services in India;
2. To identify the possible areas of cooperation for resources sharing and to minimise duplication in the acquisition of books;
3. To propose a mechanism for using such a network for scientific com-

munication among the research community in the country and abroad;

4. To specify the objectives of the Network at National, Regional and unit levels;
5. To suggest a suitable architecture for the network.
6. To define areas of standardisation required for the network and to suggest minimum level of standardisation for effective compatibility and participation in the three areas of the network viz., database, data communication and computer hardware and software;
7. To suggest an action plan for implementation and management mechanism including financial and personnel requirements to maintain and sustain the network for realizing short-term and long-term objectives; and
8. To prepare within 3 months a project report for developing a network based on the above factors.

The report of this group was published in 1988 and it contains a project proposal for the establishment and development of Information and Library Network (INFLIBNET).

This report contains a detailed programme of INFLIBNET.

INFLIBNET is a cooperative network and will contribute to pooling, sharing and optimisation of resources, facilities and services of libraries in the university system and R & D institutions

The total cost, as envisaged by the Inter-Agency Working Group report of 1988, is Rs.150 crores in establishing the ful-fledged

library network covering all universities. The network is expected to support 400 libraries and information centres.

The INFLIBNET programme has already started. The initial programme with investment of Rs.25 crores has been worked out for a period of four years during the Eighth Plan. It is planned to identify and modernise 45 university libraries, provide assistance to ten document resource centres and five R & D Sectoral Information Centres. These nodes and the three already operational UGC national information centres will be linked via satellite.

As against the estimated target of Rs.150 crores, the UGC has drastically cut the amount to Rs.25 crores. The number of nodes has also been reduced to sixty. It is anticipated that "implementing the INFLIBNET in the first four years will set the pace for transforming the library scenario of the country towards modernisation.

3 Follow up action by the UGC

In a letter dated, 15th May, 1991, addressed to the Vice Chancellors, the UGC Chairman, has pointed out the follow up action taken by the UGC in implementing INFLIBNET, as follows:

1. Shri.Promod Kumar has been appointed as the Director of the Programme;
2. It is planned to modernize 45 university libraries, provide assistance to 10 document resource centres and 5 R & D sectoral information centres;
3. These selected libraries are required to computerise and automatic their service and instal roof-top terminals to provide satellite access; and
4. A 'focal person' is to be nominated from each of these Universities (i.e. 45) for further coordination of INFLIBNET activities;

The Chairman also emphasizes, the need of INFLIBNET as follows: "The researcher, designer and facility, in any institution is handicapped due to the paucity of resources and services offered by the libraries.The Ph.D theses produced by the research students every year are seldom available to others who want to work in the same area. A whole lot of data exists in the some place or the other, but is not accessible to those who are not in the proximity where the data resides. INFLIBNET is a computer communications network for linking libraries and information centres in the universities. It contributes to pooling, sharing and optimisation of resources in the University system".

4 CRISIS IN INFORMATION STORAGE AND RETRIEVAL

The resources of the libraries are becoming inadequate day by day due to the exponential rate of growth of literature, inflationary trends of reading materials and growth of users for information and documents.

4 1 Growth of users.

There is a growth in the number of users who are in need of information. Consequently, there is proportionate growth in the number of institutions providing information. There are 130 universities, 16 deemed universities and 5482 colleges, 11 institutions of national importance in the country. These institutions enroll 3.5 million students for Graduate, Post - Graduate and Research degrees and diplomas and employ 228 thousand teachers for teaching and research. This enormous growth has serious implications on the dissemination of information with prevailing limitations on acquisition of books and periodicals by the universities and R & D departments.

All these factors emphasize the need for a cooperative network at national level. Further, the improvements in information technology will make the functioning of such networks feasible and useful.

5 SUGGESTIONS

In the light of report of the Inter-Agency Working Group and also the follow up action taken by the UGC, the following suggestions may be considered for successful implementation of the INFLIBNET:

1. The allocation of Rs.150 crores is not adequate to implement the programmes earmarked in the report in view of the Gulf crisis and devaluation of the rupee. Therefore, the allocation may be increased by 50% for successful implementation of INFLIBNET;
2. The necessary infrastructure such as computerisation and automation and installation of roof-top terminal to provide satellite access should be taken up by the U G C itself for all participating libraries. This achieves uniformity and speeds up the implementation;
3. The UGC should reconsider its decision and take up 400 nodes as envisaged by interagency working instead of limiting it to 60 as to achieve nation wide networking;
4. In order to implement the INFLIBNET programme in its true spirit, the total programme may be completed in the 8th Plan period itself instead of spreading it to the Ninth Plan. The UGC should take steps to divert a part of UGC Book Grants allocated under Eighth Plan to all universities and R & D departments towards INFLIBNET;
5. The UGC should undertake training programme for the existing personnel representing each university/ R&D organisations to cope up with the latest technology required for proper mechanisation of the system;
6. All the librarians/ university librarians and R & D libraries shall be 'focal persons', ex-officio, to coordinate INFLIBNET programme.

7 CONCLUSION

In the light of the above discussions, it is evident that INFLIBNET is a panacea for all the inherent problems that are being faced by country in information storage and retrieval at the higher educational level, provided the UGC takes all necessary measures consolidating the views of Information scientists and vice chancellors and directors of R & D departments.

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Information and Library Network (INFLIBNET)

O P Arora*

Information and library network (INFLIBNET) is a nationwide computer communication network linking libraries, the academic and the research communities. In view of limited resources available during Eighth Five Year Plan, the work has been scaled down and the network has been started with reduced number of nodes (60-80), which will be expanded to cover all the universities/ institutions (400 nodes) in the 9th five year plan. All the participating nodes in the network will have requisite computer and communication hardware/software for library automation and networking respectively. Existing library staff will be trained in the field of automation and computerisation of libraries.

1 INTRODUCTION

The country is spending roughly Rs.500 crores a years on acquiring new library resources out of which Rs.150-200 crores is spent on acquisition of foreign journals. Researchers, designers and the faculty in these institutions and the services offered by the libraries. Even the reasonably good libraries are finding it difficult to keep up the subscription and be able to get all the books which they need due to 15 to 18% increase in cost on an average per year. At the same time there is substantial duplication in the holdings of literature resources. Lot of information pertaining to research work in the universities viz. synopsis of thousands of Ph.D. theses produced every year are seldom available to those who are not in the proximity and a few scholars living in the remote areas feel mentally isolated. It is neither feasible nor possible to fund all libraries to be self sufficient. Considering that, we do not have enough and what we have is not available to a large majority of our academic and scientific community. University Grants Commission has started the Information and Library Network(INFLIBNET) Programme for networking of university libraries, R&D institutions and Information centres so as to share the limited resources towards optimum utilization and to avoid duplication in the holding to the extend possible.

2 INFORMATION AND LIBRARY NETWORK (INFLIBNET)

INFLIBNET is a Computer-communication network linking libraries, academics and research community across the country.

- It is a major national effort to improve information transfer and access capabilities.

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* INFLIBNET PROGRAMME (UGC),Ahmedabad.

- It is a co-operative network and will contribute to pooling, sharing, optimization of resources, facilities and services of participating libraries and information centres.

- It is a major programme towards modernization of libraries and information centres in the country with the application of computer, and communication technology.

The participants in the network will include universities/ institutions of higher learning covering all disciplines, R&D institutions and national organizations in the country which are like CSIR, ICAR, ICMR, DRDO, ICSSR, ICNR, AICTE, DAE, DOT, DOE, Indira Gandhi National Centre for Arts, etc.

21 Network information nodes

The network will cover following information nodes

- Regional centres

- University libraries

- College/Department libraries

- Sectoral information centres

- Document resource centres

The function of these nodes have been briefly outlined.

211 Regional Centres (RC)

Four Regional Centres are proposed one in each region (North, South, East and West) to cover the whole country. RC may be located at one of the university library in the region which has a rich collection. Each of the RCs will be responsible for development of union catalogue of all the four regions. It provides redundancy and facilitates nation wide operation. Union catalogue will be generated and continuously updated online by aggregating the information upward from a departmental to university library which in turn will pass on the information to the RC concerned. The centre will provide catalogue based services, union catalogue of books, serials and non-book material and data base of projects, institutions, specialists etc.

212 Sectoral Information Centres (SIC)

These centres will be based on subject specialisation such as Science and Technology, Engineering, Social Science, Arts, Humanities, etc., and will have a rich collection of materials in their area of specialisation. SIC will provide service at national level. The participating SIC may be further strengthened.

213 University Libraries

All the university libraries (UL) will participate in the network. These are

categorised as large, small and medium based on holdings, readership and other relevant factors . Each UL will maintain a comprehensive computerized catalogue of monographs, serials and non-book materials held in the university which include its central and departmental libraries; and libraries of affilia ted/constituents colleges. The functional responsibilities of these UL include retrospective data conversion;catalogue and non-bibliographic data capturing and sending updates to RC.

214 Colleges and Department libraries

These libraries will maintain their own library catalogue of monographs, serials and non-book materials and will feed catalogue information of existing holdings as well as new addition to UL

215 Document Resource Centres(DRC)

These centres will provide document delivery service to all the nodes through FAX and non-FAX. Each DRC will have rich collection of material. Some of the existing UL, SIC and institutions may be designated as DRC depending upon the strength of their collection.

22 Services

The library and information service functions, which are to be supported by INFLIBNET include:

-Catalogue search

-Bibliographic database search and access

-Union catalogue of books, serials and non-book material.

-Databases of projects, institutions and specialists.

-Referral service.

-Document delivery(FAX/Non-FAX)

-Electronic mail

-Inter library loan request

-Computer conferencing

-Bulletin board

The list is not exhaustive and other services might be included as the network grows.

23 Information system hierarchy

The major information nodes viz., RC,SIC,UL and DRC will be connected through satellite. All the communication nodes are alike and the coverage is

independent of their locations. The hierarchy therefore, is independent of communication structure and is based on information storage handling and access. The hierarchy is figure1.

The catalogue search in the overall system hierarchy is such that a user could first find out from his\her college\department library, whether the required book of interest is available or not. If not, as a next step, search is made in the UL and finally in its RC through the union catalogue of its own region and other regions.

The college/department libraries and UL will have direct access to Sectoral Information Centres for non-bibliographic services and for local and external database on the specialised subjects.

For document delivery service through FAX and Non-Fax, the university or R&D institution libraries will make a request directly to one of the Document Resource Centres which will ensure delivery of the literature requested either through FAX or by mailing a xerox copy.

24 INFLIBNET Traffic

Detailed traffic analysis using data received from users has been carried out to arrive at the total throughput required from the network is given in (1)

241 Non-Fax traffic throughput requirements

Total Non-Fax Traffic per day: 108 M Bytes

Assuming 25 percent traffic to be cleared in peak hour

Total Non-Fax Traffic: 27 M Bytes/Hour or 60 KBPS

242 FAX throughput requirement

Total Fax Traffic per day: ^)) M Bytes

Assuming 50% of traffic is cleared by post and 50% by the network.

Fax Traffic on network: 300 M Bytes/day.

Assuming the whole traffic is cleared uniformly in 12 hours.

Fax Traffic on network : 55 K Bits/sec.

3 COMMUNICATION SYSTEM

A Satellite-based system is crucial for the networking because of -
Country wide coverage including remote area

-Modular and easy growth

-Reliable network performance

-High availability

-Simple to operate, monitor and control

-Flexibility of network configuration

-Higher data rate feasibility

_Feasibility of broadcast applications like teleconferencing and computer conferencing

-DAMA capability in voice

-Cost effective network design

-Elimination of 'lastmile' problem through roof-top earth station

-Use of indigenously available technology to the extent possible.

Considering the connectivity requirements, a Hybrid network which combines the advantage of both the satellite and terrestrial base systems has been considered for INFLIBNET. The network connectivities are as follows:

- The majority of nodes at the levels of RC,UL, SIC and DRC are connected through the satellite link.
- Centres like college/departmental libraries located at a close distance in the same city can be connected through a Local Area Network(LAN),dial-in telephone line or a leased line
- For the cities where more than one university and R&D institutions exist, LAN can be used with atleast one satellite node.

31 System Description

INFLIBNET is a dedicated network with large number of nodes and a central point for coordination and control. The network is created by using many low cost small User Terminal(UT) at these nodes and a large antenna/high power transmitter at the central station (Hub). The UT are connected via satellite to the Hub constituting a star network. Hub provides centralised switching functions and can also be used as a gateway to other networks. The communication network is shown in figure 2.User Terminal uses a 2.5 m dish antenna and accepts data at 9.6 KBPS(information rate). Rate 1/2 coding (FEC) is used to minimise satellite power requirements and to facilitate operation with small antenna. The Hub uses large antenna (6.1-11m) and accepts data at 9.6 KBPS(information rate) coded rate 1/2. The network control and management centre (NCMC) provide network configuration and control, online monitoring of all nodes, performance review, accounting and billing, etc.

4 NETWORK IMPLEMENTATION

The original plan for the INFLIBNET was to support 400 nodes comprising RC,UL,SIC and DRC with the estimated cost of Rs 150 crores(1988), Which includes augmentation of the present UL in terms of their automation,establishment and upgradation of various research centres. Considering the limited

resources available during the 8th plan, the INFLIBNET Programme has been started with the reduced number of (60-80) nodes in the initial plan at an estimated cost 1995. There is no change in the basic philosophy of evolving an effective information transfer mechanism and it is ensured that all types of node(RC,UL,SIC,DRC,etc) get implemented. The thrust in the initial plan is to link the most deprived and remote universities to the institutions with the rich collection and latest information. The network will be expanded to cover all the 400 nodes during the 9th five year plan period.

41 Initial Plan

The initial plan will be implemented in two phases: Phase-0 and Phase-1;Phase-0 spans from April,1991 to March,1993 covering 15 nodes where as phase-1 spans over April 1993-March 1995 covering additional 45-65 nodes. Table-1 gives the number of different types of nodes to be established under different phases of the plan. Some of the nodes will have overlapping role viz. UL may act as a RC,SIC or DRC. In view of tight schedule, a temporary hub facility is being set up at Ahmedabad in phase-0 with the help and equipment from Space Applications Centre,ISRO.Where as in phase-1 a permanent hub facility using 7.5-11 m antenna will be established. Major efforts are to use the indigenous equipment as far as possible. In this connection, dialogues have been initiated with the industries for the procurement of User Terminals and Request For Proposal is being sent. A national centre is being set up at Ahmedabad which will be responsible for managing,monitoring and coordinating the activities and services of the network.

Table - 1

ESTABLISHMENT OF NODES

Node Type	Original Plan	NODES TO BE ESTABLISHED Initial Plan 8th Plan		Full-fledged Network 9th Plan Period
		Phase-0	Phase-1	
Regional Centre	4	1	1	2
Uni.libraries(ul)	170	8	37	125
Ugc Inf. Centres	3	2	1	--
Doc Resource Centre	100	2	8	90
R&d Centres/sectoral Information Centres	240	2	3	235
Central Hub & Ncmc	1	1 (temporary)	1 (permanent)	---
Ground Station (nodes)	400	15	45	340

National Centres	1	1	–	–

SOME OF THE NODES WILL HAVE OVERLAPPING ROLES.

5 PARTICIPATION IN INFLIBNET

The library can participate in the network by sharing its resources acquiring the shareable resources, providing a suitable and adequate bibliographical tools to permit access, adhering to the standards prescribed and creating an appropriate infrastructure with library automation and reprographic facilities etc.

Expert Committee has been set for the identification and selection of 60-80 nodes for participation in INFLIBNET in the initial plan. Priority is being given to the remote/ deprived libraries, which will have access to the institutions with rich collection and latest information. The emphasis is on equity along with efficiency. The libraries selected for participation will have requisite computer and communication hardware/software for computerisation of library/information resources and networking respectively. An expert committee has been set for identification and procurement of computer system. The system hardware/software specifications/interfaces are standardized to meet the networking requirements.

51 Training Programme

It is proposed to improve the existing library staff by providing training in the field of automation and computerisation of libraries. This will be an ongoing activity and a training cell is being established in the INFLIBNET programme. The training programme comprise:

-Seminars in various regions of the country for librarians. The first seminar will be held at Ahmedabad in September 1991.

-Practical demonstrations.

-Training courses for the executives and operational staff. The faculty will be drawn from INSDOC,IISc,IITs, NISSAT,SNDT,Gujarat Vidyapeeth etc. The first batch for the training courses is scheduled for December 1991.

-Distribution of video taped lectures to the users.

6 CONCLUSION

The original report on INFLIBNET envisaged establishment and development of a nationwide computer communication network for modernization and linking of universities, R&D institutions and information centres, during eighth plan period. In view of limited resources, it has been planned to scale down the work as indicated in the Initial Plan. The implementation of this

plan has already started, which will go a long way in vitalizing the information transfer scenario in the country with minimum investment. At the end of four years period, a network of 60-80 nodes with a hub station will get established along with all its elements as proposed in the original plan. Since the scheme conceived is modular in nature, it will be possible to enhance the capability of this network to cover the entire country in the Ninth Plan Period.

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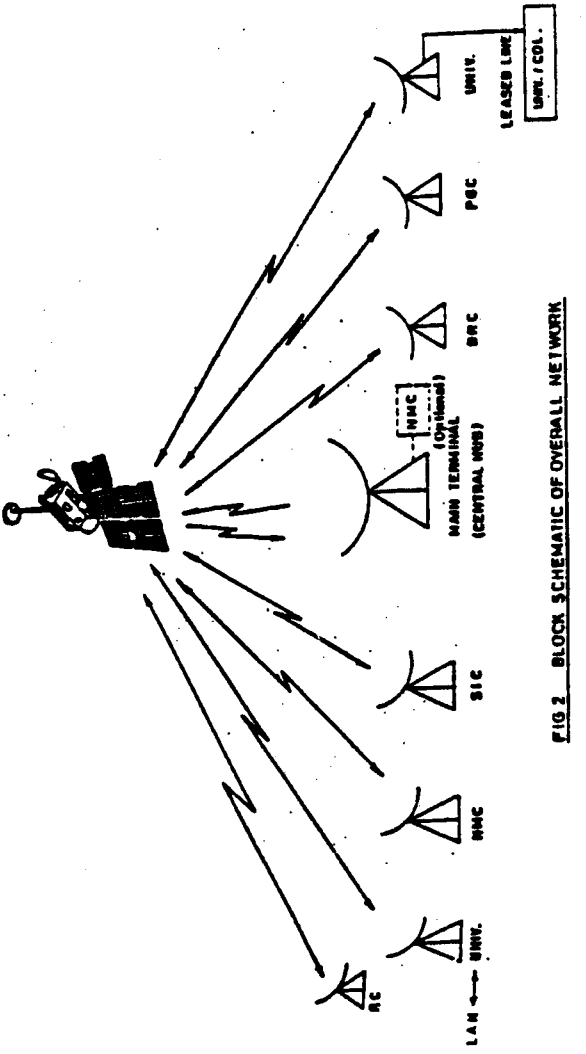


FIG 2 BLOCK SCHEMATIC OF OVERALL NETWORK

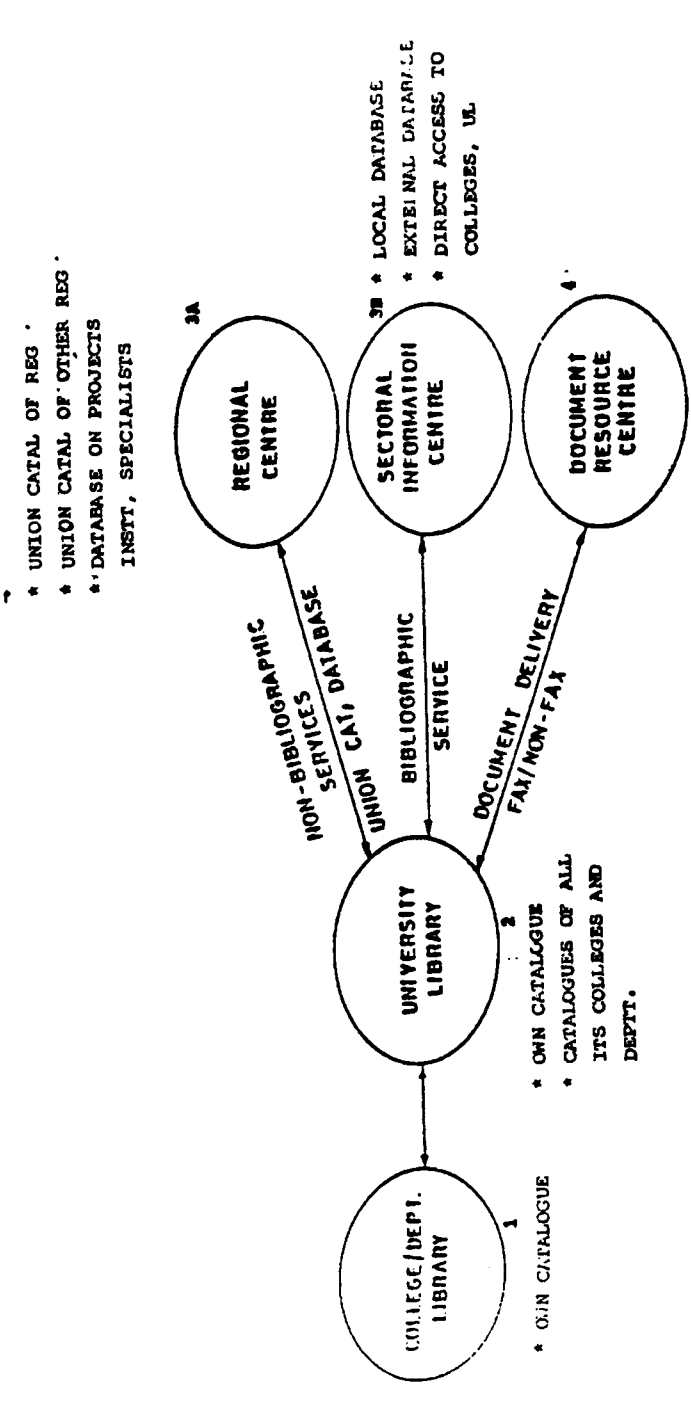


FIG-1. INFORMATION SYSTEM HIERARCHY

National Information Networks: National Information Systems

S K Sharma *

Vinod Kumar **

INFLIBNET is a cooperative network and will contribute to pooling sharing and optimization of resources facilities and services of Libraries and information centres in the University system as well as the Research Institutions. It is a major programme for modernization of Libraries and information centres in the country with application of modern technologies of information dissimination.

1 INTRODUCTION

Libraries particularly those of Universities and research organizations which are repositories of latest knowledge can play a significant role in disseminating information among scientists and technologists. Considering the large size of our country and the enormous output of information each year in different States of the country, it is desirable that proper statewise infrastructure, based upon sectorial resources network system, should be developed in India which ultimately may be linked with the national and international networks of industrialized countries.

2 INFLIBNET

In India the Information and Library Network (INFLIBNET) is being setup by the University Grants Commission to serve the long felt needs of academic community. INFLIBNET is a large and dispresed setup of Universities, Institutions and Laboratories in the country. It is a computer communication network of Libraries and bibliographical information centres. It is a major national effort to improve capability in information transfer and access, that provides support to scholorship learning, research and academic pursuits. All the institutes of higher learning, research and development institutions and national organizations like CSIR, ICAR, DRDO, ICMR, ICSSR, ICHR, AICTE, DAE, DOJ, DOE, Indira Gandhi National Centre for Arts etc. are participating in the INFLIBNET.

INFLIBNET is a cooperative network and will contribute to pooling,

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sharing and optimization of resoures, facilities and services of Libraries and information centres in the University system as well as the Research Institutions. The major programme towards modernization of Libraries and Information Centres in the country with application of modern technologies of information dissimination.

It will provide catalogue services database services, documentation services, and communication services.

3 LEVELS OF OPERATION

This system operates at different levels i.e. National, Regional, Sectrol and Local. The participating Libraries having comman fields of specialization and interests operate at the lower levels, the designated operating centre called as database at the upper level and the state centre at the appex serves as databank. The operating centre in the sector would utilize the resources held in the participating libraries, acquire, store and make available those titles not held in the collection of any library. The state centre would coordinate the activities of sectorial operating centres as well as link them with National and International networks.

The catalogue of Libraries will be aggregated, down to top i.e. college/department to University Library and regional centre. End users will be served mainly at local level. There will be a National centre for managing and coordinating the affairs of the network and four regional centres (North, East, West and South) which will maintain union catalogue of holdings of Libraries in the regions and database of projects, institutions and specialists.

4 INFORMATION TRANSMISSION

A rapid developments in telecommunications technology over the past twenty years have been an essential component in the growth of computer based library systems such as the use of centralized cataloguing services and online search services. The comparatively cheap and easy way by which large collection of bibliographic data on variety of computer systems throughout the world can be accessed from a terminal would not be possible without such developments.

The communication system will have a central hub and 400 ground terminals at 100 University Libraries, 50 Autonomous Colleges/PG Centres, 200 others comprising Research and Development Insitutions, Document Resources Centrs and Sectoral Information Centres, to be interconnected via satellite link.

5 RECORDS TRANSFER OF RETROSPECTIVE RESOURCES

For catalogue based activities like shared catalogues and union catalogues about 9 million unique catalogue records of retrospective collection of 170 University Libraries have to be converted into a common catalogue

database by a prescribed standard practice. A part of the work will be attempted by matching the catalogue records with those available from down-loaded imported types/catalogues such as LC-MARC, OCLC and WLN of USA. The ultimate aim is that the University Libraries will have a unified catalogue in a machine readable from :

In the implementation of the programme the following steps are taken:

1) Establishment of a National centre and four regional centre.

2) Continuing the existing three UGC information centres.

3) Linking NISSAT, INSDOC and other Sectoral/National level centres.

4) Linking atleast 200 R&D institutions as network participants.

5) Supporting and introducting automation in 170 University Libraries and 500 College Libraries.

6 SERVICES OF INFLIBNET

It will provide a computer based online information storage and retrieval service. It is flexible enough to handle the information retrieval work of small academic Libraries or 'Library' collections of non-literary material.

The following facilities will be provided :

a) It allows a Librarian to store and retrieve short bibliographic records of monographs, items within collections and serials, and descriptive or analytical entries.

b) It allows a Librarian to store keyword strings and by interrogation of simple rotated string subject indexes, retrieve the full entries to which they were annexed.

c) It allows catalogue access by author, title, standard book number or UDC or equivalent subject code.

d) It provides users with microform catalogues and 'rotated string' subject indexes for browsing.

e) It provides simple current awareness and selective dissimination reports based on stored user profiles.

f) Maintenance and presentation of an appropriate thesaurus for keyword control.

g) Interface routines to accept external bibliographic material in international exchange (MARC) format.

7 NETWORK SERVICES

It is a cooperative network and resource development and utilization with a view to organise library services at macro level with an economical cost for maximum benefit. The benefits that can accrue from a library network get

maximised as the number of services on the network increases.

INFLIBNET is a Multiple function/service network. It provide following services:

a) **Catalogue Based Services**: Shared, union and online catalogue of books, serials and non-book materials. Production of catalogue card, book, magnetic tape/floppy, optical (CD-ROM) and COM form.

b) **Documentation Services:** Selection, acquisition, classification, cataloguing of document and provides the document to user by inter Library loan, by Photocopy by fax/non fax, also provides the current awareness services; selective dissimination of information and retrospective services.

7 INFLIBNET CENTRES LOCATION

The National centre including the INFLIBNET communication control centres will be located in Delhi. To start with the National centre may start operating from Jawaharlal Nehru University, New Delhi, which has also been recommended for locating the regional centre for North.

In each geographical region the regional centre will be noused in an University Library in that region. However the regional centre should be an autonomous body and eventually shifted to a seperate building of its own. The working group of INFLIBNET has concluded that the following four institutiton be recommended for locating the regional centre:

1. North: Jawaharlal Nehru University, New Delhi.

2. South: Indian Institute of Science, Bangalore.

3. East: Jadavpur University, Calcutta.

4. West: University of Poona.

UGC Information centre and other sectoral information centres will continue to operate from their existing locations.

National Information System and Network In India

Prem Lata Katyal *

Sudha Gambhir **

Nag Jayotsna Rao ***

Defines the concept of Information System. Highlights the activities of some of the National Information Systems i.e. NICNET, INDONET, CALIBNET, DELNET,SIRNET, INFLIBNET.

1 INFORMATION SYSTEMS

Information system is to be regarded as a concept. It implies a promotional and coordinating role and a systems approach. On the other hand, information centre is an operational unit, actually performing certain tasks for provision of information services.

During last three decades, a number of special libraries, documentation centres and information centres have come up in our country. When they began to be established they did not have any plan of coordination. They require to be upgraded/strengthened to be able to meet growing complex needs of information and in the context of advances in information technology. Uniformity in techniques, methods, practices, etc has to be aimed at towards facilitating exchange of information between different components. In order to achieve all these, planning of information systems, around existing infrastructure is now being attempted. The action programe in this regard envisages interlinking and coordinating a large number of subsets of sources, services and centres into versatile, articulated and integrated informations systems. A trend in this direction has already been set in during the Fifth and Sixth Five Year Plan periods, by evolving a few national information systems. A more concrete shape to the concept of information system is emerging now.

The development of computer communication network is an important technological advancement of the modern age, which uses the telecommunication facilities for data transmission. The computer network aims at resource sharing and in achieving economy in hardware, software and manpower. The scenario of telecommunications in India is expected to change radically in the

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near future. The activities of some of the National Information Systems working for Networking are described below.

2 NICNET

The development of the NICNET network was piloted by the National Information Centre in 1975. The network consists of a national centre (NIC at Delhi) regional centres at Pune, Bhubaneswar and Hyderabad and about 400 centres in state capitals and district headquarters. The national and regional centres have already installed very large mainframes (NEC-S-1000/10). The state capitals and district headquarters will have interactive microterminal. While NICNET is primarily intended to promote computer-assisted decision making through better management information support, library and information centres can also take advantage of the network by establishing linkages for carrying bibliographical information across the country.

3 INDONET

The INDONET is the first commercial computer based network commissioned by Computer Maintenance Corporation Ltd (CMC), Hyderabad. It comprises a network of computers located in many cities and connected by data communication links.

The user will have access to the network through terminals located at CMC computer centre or through terminals located remotely and connected to the local computer system through voice grade P&T lines at a speed of 300-1200 bps, the access points being in the cities of Bangalore, Ahmedabad and Pune.

It would operate as a STAR Network with control point at Delhi, using rooftops 3m earth stations and packet-switching technology for routing of data from central station to other INDONET centres. Besides the IBM protocol, the network will also utilize x.25. for intra-city transmission, a novel cost effective, reliable and faster (9600 bps) digital packet radio scheme has been innovated. The Bombay node of INDONET has been connected to the international gateway of Videsh Sanchar Nigam Limited, thereby facilitating entry to public date networks of other countries.

4 CALIBNET

NISSAT took the initiative for the development of this network to ensure better utilization of S&T information resources. CALIBNET is envisaged as a metropolitan network linking 38 libraries in the Calcutta metropolitan area. The network system has the facility of using a single file of records by which individual library can reduce its cost significantly, through sharing of storage and access. In a network system, by adding the records generated/acquired by a number of libraries, a single library has only to add its records to the database and can reduce substantially its cost and the size of the database may be

increased to a great extent. Within individual libraries, the functions to be automated are cataloguing, serials control acquisition and fund accounting, circulation and local user services.

CALIBNET demonstrates on-line and off-line retrieval of information, on-line edition and checking of reference, input of new records. The user may use the CALIBNET terminals to have access to databases in real time using and software. This will facilitate users to retrieve information from MARC and STIS database files and have information output either on-line to local VDU or Printers of off-line for printing and despatch to users on the next day. CALIBNET presupposes subject type searching. The retrieval system will allow searching by index terms, and MARC types/CD-ROMS will be exploited for information services to the users.

The networking provides for global user services of current awareness, SDI, union catalogues, partial databases, and access to national and international networks. Each participant would collect, process and hold information on local computers, connected with one another through X.25 packet-switched network. Standardization may be based on UNIX operating system.

5 DELNET

The India International Centre with the support of NISSAT has been promoting the creation of DELNET for the last three years. So after maximum attention has been paid to the creation of databases and the training of library personnel in the library automation. In the creation of records some DELNET libraries have been progressing. The committee on Standardization of DELNET was set up and recommended the uniformiting in the creation of bibliographic records by the participating libraries. Apart from this DELNET aims at :

(a) To promote sharing of resources by inter-library loan among the libraries in Delhi through computerised networking for maximum use of resources and better facilities for researchers and users.

(b) To assist member libraries in cataloguing of books, serials, non-book materials and catalogue production.

(c) To coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible.

(d) To establish referral centre to monitor and/or facilitate catalogue search and maintain a central on-line union catalogue of books, serials and non-book materials of all participating libraries.

(e) To develop a specialist bibliographic database of books, serials and non-book materials for search and access.

(f) To develop a database of projects specialists and institutions.

(g) To possess and maintain electronic and mechanical equipments, for

fast communication of information and delivery of electronic mail.

(h) To coordinate with other regional, national and all international networks for exchange of information and documents for the use of libraries and users.

(i) To undertake, facilitate and provide for the publication of newsletter, and/or journal devoted to networking and sharing of resources.

(j) It was decided to divide the networking activities into the following three phrases:

Phase I : Creation of databases at local centres; and exchange of floppies.

Phase II : Linking of these databases by physical (telephone) links.

Phase III : Creation of network database collection of all databases to be accessed by all.

For the participants of DELNET India International Centre and DESIDOC with the support of NISSAT organised training course'- 'CDS/ISIS Version 2.3' : During 8 to 21 August, 1990 at New Delhi.

Special emphasis were given to :

- Designing non-bibliographic databases;
- Integrated databases;
- New utilities;
- Information retrieval techniques;
- New features in display formatting;
- Linking of records;
- PASCAL interface programes for SDI, data validation, thesaurus construction and maintenance etc. of CDS/ISIS.
- Database exchange and interconversion of records.

6 SIRNET

SIRNET, an acronym for the Scientific and Industrial Research Network is a computer communication network for the CSIR laboratories. At present SIRNET has only one mail node and a number of user nodes. Every mail node in a network is named and the present SIRNET mail mode is known as csird signifying the CSIR mail node in Delhi physically located at INSDOC, New Delhi. It is connected to a larger network ERNET (Education and Research Network) set up by the DOE with financial assistance from UNDP. ERNET in turn is connected to the international network UUNET (Unix User Network) through which other international networks like BITNER, CSNET and JANET are accessible. In addition to acting as intra- city node for Delhi based CSIR laboratories and inter-city node for the other CSIR laboratories, csird also acts

as a gateway to ERNET and through ERNET TO international networks. Any subscriber on this node is able to reach out to all the CSIR laboratories/institutions on SIRNET and to anyone who has as electronic mail address on an international data communication networks like, UUNET, BITNET, CSNET, etc. These networks together span all major countries - USA, Canada, UK, and other European countries, Australia and Japan.

7 INFLIBNET

INFLIBNET is to be a cooperative computer-communication network for linking libraries and information centres in universities, deemed universities, institutions of national importance, UGC information centres, R & D institutions and colleges. The main objectives of INFLIBNET are :

a) to evolve a national network, interconnecting various libraries and information centres in the country and to improve capability in information handling and service;

b) to provide reliable access to document collection of libraries by creating on-line union catalogue of monographs, serials and non-book materials (manuscripts, audio-visuals, computer media, etc.) in various libraries in India;

c) to provide better access to worthwhile bibliographic information sources, with citations and abstracts, such as periodical articles, conference papers, reprints, technical reports, standards and specification, patent, monographs etc. through indigenously created database of the Sectoral Information Centres of NISSAT and UGC Information Centres and such others and by establishing gateways for online accessing of international databases held by international information networks and centres;

d) to optimise information resource utilization through shared cataloguing, inter-library loan service, catalogue production, collection development and avoiding duplication in acquisition to the extent possible;

e) to implement computerization of operations and services in the libraries and information centres of the country, following a uniform standard;

f) to facilitate scientific communication amongst scientists, engineers, researchers, social scientists, academics, faculties and students through electronic mail, bulletin board, file transfer, computer/audio/video conferencing etc.

g) to create database of projects, institutions and specialists, for providing online information service;

h) to evolve standards and uniform guideline in technique, methods, procedures, hardwares and softwares, service and so on and promote adoption in actual practice by all libraries, in order to facilitate

pooling, sharing and exchanging resources and facilities towards optimisation.

INFLIBNET proposes a hybrid version of satellite and terrestrial network communication system with a star configuration for interconnectivity of the nodes. Inbound carrier to the central hub would be through satellite and use the slotted aloha technique, while outbound carrier from the central hub to the nodes would use satellite and time division multiple access (TDMA). Interconnection of nodes in a city, if there are many, is through a LAN. The networking protocol for INFLIBNET would be similar to the HDLC protocols.

8 BIBLIOGRAPHIC APPLICATIONS IN GENERAL DATA NETWORKS :

NICNET, INDONET and VIKRAM have displayed interest in the field of bibliographic applications. NIC is working with ICMR to offer services to MEDLARS database and several others on CD-ROM. NISSAT is working with NICNET to mount Chemical abstracts database. Both NICNET and INDONET have undertaken an exercise to put the NUCSSI database online. Apart from this INDONET is collaborating with INSDOC and the NISSAT centre at CMTI, Bangalore to create facilities for SDI and retrospective search services on COMPENDEX.

The NICNET has been created specially to cater to management information systems required by government. By and large, bibliographic information is in public domain.

Cost would be the major factor in network utilization in NICNET. The entire lot of equipment is owned by NIC and placed at customer's premises at NIC's cost. The cost of connect time is subsidized. In comparison INDONET costs are likely to be higher.

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NELIBNET, A Promise of Prospect for North-East India: an Outline

Ramansu Lahiri*

Krishnan Subramaniam**

It has been felt that an online network system in the north-eastern region is a prime necessity to cope with the overall development of the region. Therefore, the proposition is to have an online network system titled as the North-Eastern Region Library and Information Network (NELIBNET) connecting all the documentation centres, university libraries, college, special and research libraries in academic institutions in the states, the state central and district libraries and other information centres in the states. The Network could be under a central body, which could be designed and set up on the lines of INFLIBNET. The Network may be set up in each of states in the region and linked with the Regional Network system. The linkage between NELIBNET and INFLIBNET would be an ultimate target. The proposal outlined below has been taken up by the Manipur University with various agencies for their support for implementation.

1 INTRODUCTION

Libraries in the academic institutions have fundamental role to play the development of higher education. To enable our academia to meet the demands of higher education and to help them keep abreast of the newer developments in their fields of specializations, it is essential to have well stocked libraries. In this age of high technology, new books and research journals in science, technology and other fields are flooding the international markets. To keep pace with the developing trends in the field of education/ research, the universities have to procure a vast range of books which happen to be expensive and also subscribe to international journals.

To meet the growing requirements of our researchers and scholars and to provide effective information service, library automation is essential. The manual system is cumbersome, updating tedious and providing accurate subject access has become difficult and time consuming. Computer processing overcomes most of these rigors and can generate records as per individual requirements. More importantly the documents/records from different establishments/laboratories can be integrated to provide faster and accurate access to the contents and singular requirements. This would ensure effective pursuit of national policies on economic, technological and social development.

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Three factors are dominant in counselling the automation in libraries; i) environment; ii) users; iii) library professionals. Environment has been moulded by wide spread adoption of new information storage devices and access creased competition and changing consumer needs and demands. The users are no longer in the position to spend hours at the library looking for documents that may or may not contain a required data or information. The role o library professionals have changed to that of an active communicator and networker of data and information from a passive introverted role and drudgery.

In order to take full, meaningful advantage of modern technology and to bring real benefits to the professionals and users, automation of library and information system has become the prime necessity for any library.

2 LIBRARY SYSTEM IN THE NORTH-EASTERN REGION

The state of affairs pertaining to library and information service is far from satisfactory in this region. Most of the libraries are in improvised conditions. The library and information system and networking requires immediate modernization and adoption of latest techniques.

The geographical situation of the states in the region also denies easy access to the users not only to the libraries in the rest of the country but even to the institutional libraries in the states. In the absence of advancement in information, computer and communication technologies in the region, the libraries in the region have fallen short of their expected image of an institution for diffusion of knowledge and information and have failed to support the community, institution and or the organization to the full extent. Unless the widening gap in utilization of information and knowledge is reduced, there is a danger of continued unrest and the community would not only fail to make any meaningful contribution to the development of the region and the nation but would add to the frustration of the people and increase the insurgent activities in the region.

3 LIBRARY AUTOMATION- A BACKDROP

3 1 The Government of India, as early as in 1958, recognized the important role the libraries could play in the nation building and set out the following directions in its scientific policy resolution:

To encourage individual initiative for the acquisition and dissemination of knowledge, in an atmosphere of academic freedom;...and, in general, to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge...

32 The Technology Policy Statement (1983) has made an explicit mention of establishing technology information base, towards availability of an efficient system of collection and analysis of relevant technological information.

33 The National Policy on Education (1986) has called for the library movement in the country and also for improved library facilities. The policy proposes to:

> establish networking arrangements of selected institutions from all parts of the country by linking them together through a computer data network with terminals for each to enable sharing of information, data banks, library and computation resources, consultancy and consultation and generally promotion of inter- action between researchers and academics ;
>
> ensure access to information and source material essential for research, a network of regional libraries as a common servicing facility will be established. These libraries will be equipped with modern facilities for information storage, retrieval reprography, etc.

34 The national information policy has recognized information as indispensable for the functioning of a true democracy where people have to be kept informed about current affairs and broad affairs.

35 The Government of India realizing the significant role the libraries could play in initiating new programs relevant, by taking advantage of the latest advances in information technology, to the national needs and in supporting expeditious decision making at all levels, has set out its National Policy on Library and Information System(1986). The policy aims to achieve fuller development of the Libraries to provide information services.

36 The University Grants Commission's firm conviction that a library and information network is very much needed in the country, led the Commission to study in depth the essentials and to bring out and ambitious plan of establishment of an Information and Library Network (INFLIBNET).

4 NORTH-EASTERN REGION AND AUTOMATION

In the field of automation of libraries in the region, much is yet to be achieved. Networking of libraries is still an idea in this region.

41 As early as in 1981, the North-Eastern Council recognized the need for networking of information system. The regional computer centre, Calcutta, which conducted a study for the Northeastern council reported:

> " ....the computational facilities available in the region were not adequate to meet the current needs and were having limited capacity. As a result not much of data processing activity can be carried out and the growth in the areas of agriculture, power, mines and minerals, irrigation, transport, forestry, education and manpower development have been affected in the absence o modern data storage, processing and retrieval facilities".

They had recommended augmentation of the microprocessor based sys-

tem and a central system with terminal support to all the states to meet their requirements.

42 Distinguished library scientists and experts are of the opinion that:

- a North-eastern regional library and information system be created at the regional level upgrading and strengthening the existing facilities in the regional documentation and information centre of NEC.
- financial and other support be extended to the library and information centres for automatic bibliographical operations and services by concerned agencies and departments; and
- a scheme be evolved for greater cooperation and greater coordination among the Universities and specialized libraries of region

43 In 1987, at the National Seminar on Futurology, organized by the Department of Science and Technology at Manipur University, the scene of documentation and information service in the forthcoming decades was discussed and a network of information services was visualized. The Manipur University at the Conference of the vice-chancellors, education secretaries, etc, of all the states in the region in February 1989, convened by the north- eastern council to discuss the developments in the library and information system in the north-eastern region suggested a proposal for setting up of a computer networking through online, connecting all the documentation centres of the universities in the Region using the services of the digital micro wave system.

44 The Indian Library Association, Delhi, also has come forward to patronize the idea. In its recent National Conference at Jodhpur University, a paper regarding the feasibility of introducing network in the region was presented and discussed.

5 RESOURCE SHARING: THE TARGET

Resource sharing and cooperation are based on the assumption that academic libraries can no longer afford to be self sufficient- they can not purchase all materials required to meet the needs of their curricula and related faculty research. There are always demands for more publications. For research and development, scholarship, learning, etc, the procurement of latest qualitative knowledge can not be stopped. Resource sharing, therefore, is essential.As it has been experienced by the developing countries, the resource sharing can help to:

- develop cooperation in acquisition among the regional University libraries
- share the holdings of each other
- increase the interdependency among them
- open up the scope of the researchers to consult an increased number of

reading materials available at the member-libraries

- avoid duplicate purchasing
- ensure collection of special subject oriented material and service
- establish efficient communication systems
- prepare union catalogues covering the holdings of all regional libraries
- develop information marketing mechanism through cooperation and controlling the quality of collection

6 PROPOSAL FOR A NETWORK

In the backdrop of the above discussion it has been felt that an online network system in the north-eastern region is a prime necessity to cope with the overall development of the region. At this stage, the core facets of the NELIBNET program may be outlined as given below:

61 1DOCUMENTATION CENTRES: INFORMATION SERVICE POINTS

Documentation centres on the campuses of all the universities in the region be established to:

- act as the information service points ;
- be the responsible agents for scanning, indexing, abstracting and disseminating information from current periodicals available in the libraries;
- prepare union catalogues sharing the resources of all libraries
- be an instrument of constant interaction and cooperation among all the libraries sharing their own resources;
- procure and supply the materials ;
- act as the depository centres of all valuable documents and information available in their respective localities;
- eliminate geographical barriers;

62 MAIN/SUB CENTRES: AN OUTLINE

The following centres could be established for networking of library and information system in the region:

1) Cenrtal Body at the centre of the North-eastern Council, Shillong;

2) Main centres at all the universities in the states;

3) Sub centres at all the State Central and District Libraries; and all the academic institutions in all the seven states.

The central body, at the north-eastern council's secretariat at Shillong, would be responsible for the smooth functioning of all the centres and would coordinate with all the centres, the state Government and the end-users.

The main centres will be the service points for the end-users of the state and also entertain the requests from other centres in the region by providing fax copy, hard copy and other library services, like abstracting, current awareness service, union catalogue, interlibrary loan, etc. The sub centres would prepare the catalogue, provide for other usual library services and serve the end-users mainly at the local level. The networking of the first phase, the main centres could be established. The second phase may cover the college/ special libraries and the third phase the district libraries. The functions of the centres could be the same, with necessary adaptations to suit the regional requirement, as envisaged in the University Grants Commission's INFLIBNET proposal. The Programme of Action on National Policy of Education also emphasizes the importance of networking, collaboration, linkages and has discussed in detail the role and functions of networking systems. These centres could be later linked with the INFLIBNET and other library networking systems of the nation.

The centres would require assistance for equipments (computers, modern fax, microfilm units, copiers, etc.), personnel, etc. The requirements are given briefly in the annexure.

7 CONCLUSION

The proposed centres, i.e. university libraries are manned and managed by skilled professional staff. The implementation of the project would therefore, face little difficulty and would be of great benefit to the institutions as well as for the region. The regional network system connected with other state network systems would enable the storage, processing and retrieval of information available in all the universities and other libraries and research institutions of the region.

It is opined that the NELIBNET would be an immediate answer to many of the problems of the region and to pave way for the overall and expeditious development of the region, as has been visualized by many a social scientists.

EPILOGUE

The Manipur University has taken up the establishment of NELIBNET with all seriousness. It has been in correspondence with the north-eastern council enlisting their financial and administrative support and with the INFLIBNET for its technical support and to treat the NELIBNET as its extension. The university is also in correspondence with the British Council/ British High Commission about this. It is heartening that the British Council has offered to train the nodal persons at British Networking Centres and also to extend all possible assistance. Professor Yash Pal, Chairman, INFLIBNET and Dr Pramod Kumar, Director, INFLIBNET have welcomed the idea and have suggested that the NELIBNET should be in harmony with INFLIBNET especially with reference to the hardware part of the system. Dr Pramod Kumar has suggested to

reconsider the suggestion of having micro wave digital links and to opt for satellite links. The micro wave system was suggested for two reasons. First, because a system exclusively for north- eastern region was thought of; and second, at the suggestion of the Divisional Engineer, Satellite Earth Station, Imphal, who advised to opt for micro wave system as the entire north-eastern region is better linked through micro wave and that it might be more cost effective and easily accessible. The authors are giving a second thought, and are in consultation with communication experts to come out with a blue print for a viable network system.

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ANNEXURE

REQUIREMENTS OF NELIBNET CENTRES

1. EQUIPMENT FOR THE MAIN CENTRES AND THE CENTRAL BODY

a) Computer with 32 bit processor; 64k each memory or multiple processor;8MB ram; 3 x 300 mb wincheter; 60 mb CTD; 1 console VDU and keyboard with 2 additional terminals; communication controllers; printer; Unix operating system/DOS with standard language compliers, UNIFY, FOCUS, ORACLE, GKS, CAD/CAM, LAN/RAN/WAN/,CD-ROM, DTP, MOUSE, DIGITIZER, IMAGE SCANER, LAZER PRINTER, etc.

b) Communication network accessories (modern, fax, microwave lines - to be hired from the Department of Telecommunications, etc)

c) Microfilm units,

d) Copiers, etc;

e) Software.

2. PERSONNEL AND RECURRING EXPENDITURE

a) Personnel: Documentation officer-1 Xerox/Microfilm operators-2 Programmer/ Computer operators-1 Office assistants/typists- 3.

b) Contingencies and maintenance

c) Research materials

3. EQUIPMENTS FOR SUB CENTRES

a) PC AT 486 with VDU, keyboards, printers; MODEM/FAX; other accessories.

b)Personnel

Professional assistant-1; Office assistant-1; Computer operator- 1;and Library attendant-1

Contingencies and maintenance

NICNET (National Informatics Centre Network)

Jyotirmaya Panigrahi *

Gives the scope and objectives of NICNET, the facilities and services available through it, and its future plans.

1 INTRODUCTION

We are now moving towards an information society. In such a society, information becomes a key factor. The new needs and demands for information today stem largely from its widesp[read use for socio-economic development. A wide spectrum of use of information is also seen in relation to legislation, policy formulation, economic planning, decision making, regulation, conflict resolution, crisis management etc. Conventional and traditional insitutitions are not adequate to meet these expanding demands for information. Naturally, a variety of new information networks are, springing up.

The National Informatics Centre (NIC) was set up by the Government of India for developing appropriate information systems to facilitate the planning and decision making process in the ministries/departments of the central and state governments in the country. NICNET (National Informatics Centre Network), established by NIC, is based on satellite technology. This network will enable information flow and distribution of information storage. It will also help central and state governments departments to draw plans for efficient utilisation of resources, thus ensuring uniform socio-economic developmental activities throughout the country. This is the first integrated computer communications network with efficient software and hightly trained manpower, established in a developing country.

2 OBJECTIVES OF NICNET

The main objectives of the NICNET are :

1. Development of necessary information systems in various sectors of the economy for interactive use.
2. Promotion of informatics at State and National level.
3. Development of monitoring and management methodology for the effective implementation of the projects.
4. Improvement of the analysis capacity and presentation of statistics

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utilised for regional planning.

5. Development of modelling and forecasting techniques that are required for optimal planning for economic development.
6. Establishment of computer network with necessary communication equipments for easy access of information across the nation and ensuring optimal use of resources.
7. Development of communication software required for developing governmental informatics network.
8. Development of systems for providing information retrieval on patents, technologial developments, production technologies, scientific activities etc., which are required for rapid industrial growth.
9. To become a focal point for on-line accessing of international databases. To evolve and to establish facilities for accessing these databases in the most economical manner.
10. Evolving and establishing new network techniques for efficient and economical information service in the government.
11. Development of new methods of investigation and analysis for the improvement of micro-level planning.
12. Development of local expertise in the field of computer-cum-graphical processing of data and micro-level methods of analysis.
13. To evolve standards for data collection, compilation and dissemination, with the cooperation of related agencies at district, state and central levels.
14. To create a dedicated training school with branches in all parts of the country for extensive training/retraining of existing personnel and users.
15. Research and development in the areas mentioned above and creation of necessary infrastructure to develop, operate and maintain the systems.

3 NETWORK DESCRIPTION

In the first phase, NICNET comprised intra-city network connecting computers and interactive terminals with a CYBER 170/730 sytem. The facilities that such a network could offer was demonstrated during the Asian Games of 1982 and the Non-Aligned Meet (NAM) held in New Delhi in 1984.

In the second phase, NIC installed one very large dual processor computer (NEC S-1000 Model 20D) at New Delhi and three very large computer (NEC S-1000 Model 10), one each at Bhubaneswar, Pune and Hyderabad. To facilitate local processing and also store the state information systems at each of the state capitals and union territories, NIC has installed super minicomputers. For capturing the data at the generating points, PC AT/386 model computers

have been nstalled in most of the district headquarters. In NICNET, National Informatics Centre has used satellite transmission technology consisting of two components, a master earth station of 13 m antenna and a roof-top upstation having an antenna 2-1/2' x 4' size. The roof-top antenna is being manufactured in the country by the Indian Telephone Industries, Bangalore in collaboration with equatorial communications, Inc. of USA as a joint project.

The architecture of NICNET is a stat-type of configuration, with a central host at Delhi, which is connected to three other computers in Bhubaneswar, Hyderabad and Pune, and also to the micro earth stations installed in about 250 districts centres. In a star-type network like NICNET, supposing one micro earth stations desires to communicate with another, it sends the data to the central station via the satellite. Transmission of data from one micro earth station to another involves two hop transactions through the central host at Delhi- one for receiving the data from the originating micro earth station and another for transmitting the data to the designated micro earth station both via the satellite. However, within Delhi, if a micro earth station desires to send data to the central host, it means only one hop transaction.

The network was commissioned in November, 1987. More than 250 micro earth stations are operating today in all parts of the country. The network has also been tested using special software, developed by NIC, to transmit facsimile. The performance has been excellent. All transmissions have been done at 1200 bps. NICNET provides a reliable and dependable data communication to the government agencies at the place of work. It has introduced new methods of reliable exchange of information that are quite new in this country, at a low-cost, for low-duty cycle applications.

4 SERVICES AND APPLICATIONS

41 Services

Several types of services are being provided through this network. Presently, NICNET is concerned with only government departments and public sector organizations for data transmission. NICNET services are not available at present for the business community or for any other private use. Department of Telecommunications (DOT) is setting up another network - Remote Area Business Message Network (RABMN), which is similar to NICNET and its facilities would be made available to the business houses also. One of the main services of NICNET is the value added 'Electronic Mail'. It enables all users to transmit and receive mail. this mail service has been custom-designed taking into consideration the network architecture and operation environment. It provides an individual service with certain privacy measures. In addition to this, it provides broadcasting and bulletin services. In the bulletin services it will provide personnel, employment and transport information especially for NIC

officers to plan their visits to the headquarters. The transport bulletin service will contain reservation availability for all the trains from Delhi.

NIC has conducted a successful experiment on fax transmission between Delhi and Bombay through NICNET. Using an electronic scanner, one can scan page of text, and with a fax card inside a PC or PC/AT, one can transmit the whole text through the fax service in a matter of seconds. This service can gradually be extended to cover other locations in the country.

42 Bibliographic Applications

Bibliographics application for biomedical information is available on this network.

Medical information is the key to frontline medical research and to the modernisation of medical practice. In 1986, NIC established a centre called ICMRNIC centre, for biomedical information, in collaboration with the Indian Council of Medical Research (ICMR). It is a constituent part of NIC. The centre was set up with the broad objective of evolving a method for information acquisition, storage, retrieval and dissemination from international databases. Access to international biomedical databases will avoid unnecessary duplication in research and other scientific efforts, provide vital information for patient care and bring about improvement in health service programmes. For obtaining access to the databases of the National Library of Medicine (NLM), USA, National Informatics Centre signed a Memorandum of understanding with National Library of Medicine, in 1987. This has facilitated the establishment of the Medical Literature Analysis and Retrieval System (MEDLARS) in India by NIC. India is one of the 18 countries in the world and the only one in the South-East Asian region receiving MEDLARS information.

43 MEDLARS Operations in India

The ICMR-NIC centre, located at the National Informatics Centre, is providing services to users in India from April, 1988 from MEDLINE and POPLINE databases. Information booklets and search forms were mailed to the deans, librarians of medical colleges, directors and research workers at biomedical institutes throughout the country. Users were advised to forward the requests through their librarians on heads of departments. The search forms received at the centre are analysed and search strategy prepared according to the 'ONLINE' manual of NLM. Searches are performed interactively and the information received is down- loaded into a hard disk or floppy and printed copies are mailed to the respective users. The whole process takes five days, but the centre can provide immediate information (within 24 hours) to users when required, by transmitting information via NICNET.

5 FUTURE PLANS

NIC is planning to have its data communication satellite called NICSAT with a capacity of connecting upto 10,000 upstations in the KA-band (25 GHz). This, combined with the diminishing cost of earth stations, will enable even a medium sized library in the country to acquire this technology. After meeting the informatis requirement of the government down to block development, there will be sufficient excess terminals available for other users. The library community should make a strong case for reserving sufficient terminals for the use of the proposed satellite system.

The beams of the NICNET earth station at Delhi can reach up to Singapore and Indonesia in the East and to Germany in the West. A link between NICNET and Singapore was successfully tried in the recent past. NIC is looking into the installation of earth stations for connecting Indian Embassies abroad for communication network through the Ministry of External Affairs. Similarly, earch stations can be installed at information centres such as that of European Space Agency (ESA) at Frascati, Italy for accessing their databases.

NICNET is trying to interconnect with other wide area networks of the world like TYMNET & TELENET in the near future.

A database on patents which is availabe at National Informatis Centre will also be made available through this network for the laboratories of Defence, CSIR etc. and for other user organization.

On-line searching by connecting National Library of Medicine, USA, is not very cost-effectiv, if a large number of users' needs have to be fulfilled. For making MEDLARS information available to the users in India, the least expensive method would be by acquiring the tapes and using them on the mainframe computer system and disseminating via NICNET. In order to be at part with other international partners of NLM in dissemination of information qualitatively and quantitatively, the Indian centre is in the process of acquiring suitable software and trained manpower for operating the databases.

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Pica Information Network: A Case Study

R L Sehgal*

1 WHAT IS PICA?

Pica is a cooperative non-profit organisation for promoting the efficiency of the Dutch library and information system as a whole.Optimal access to information for the benefit of end-users is its primary object.Started on 1969, it has developed step by step many services and activities for resource sharing and users satisfaction.

11 Pica-Systems

Libraries can use systems on the central Pica computer, systems on a local computer and programmes developed especially for personal computers.

2 NETWORK

The Pica network consists of leased datacom-lines, Datanet-1 lines and dial-up-or telepad-connections. As of the beginning of 1990 this network forms part of the network that is managed by SURFnet. All network connections are fully in accordance with the X25- protocol. Pica is actively involved in the development of OSI_protocols for library applications, particularly the Virtual Terminal Protocol, the search-retrieve-update protocol and the Interlibrary Loan protocol.

Furthermore,Pica actively participates in projects for (inter)national networking, such as the ROBIN- project in the region Rotterdam and the EEC-project for ILL.

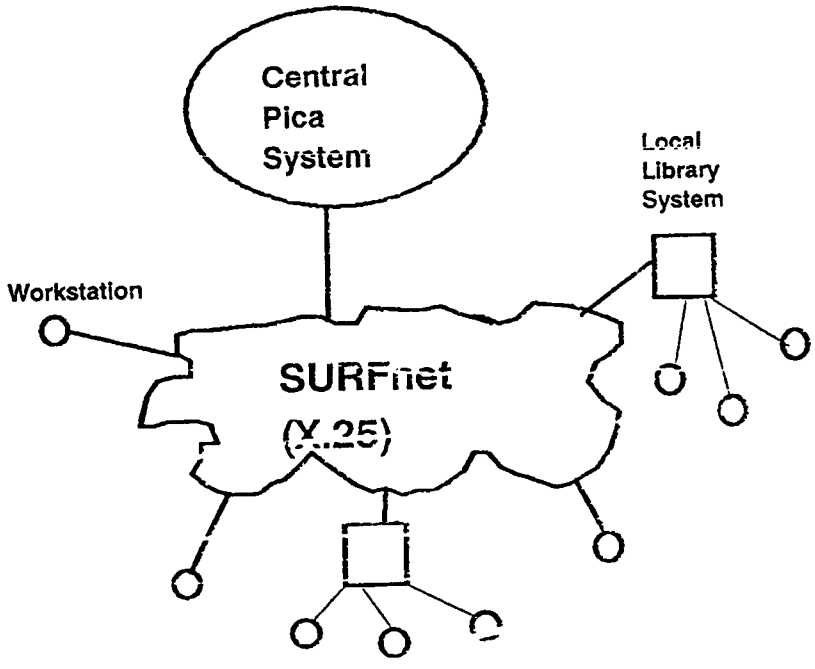
21 Open Library Network

Pica is developing the Open Library Network. This concept offers users,the possibility to access any computer in the network from every workstation. It will be possible to search the central Pica-database and the files of all in the same workstation; besides it will be possible with one press of the button, to reserve, order or transmit the found information.

The most important feature of Pica is its resource-sharing facilities for the participating institutions. This concerns not only the bibliographic resources, but also the documents (themselves), the information services and the financial means. All the Pica participating institutions profit by the resulting efficiency-improvement and cost-reduction.

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The concept of cooperation is the 'leitmotiv' in all Pica's services, activities and contacts.

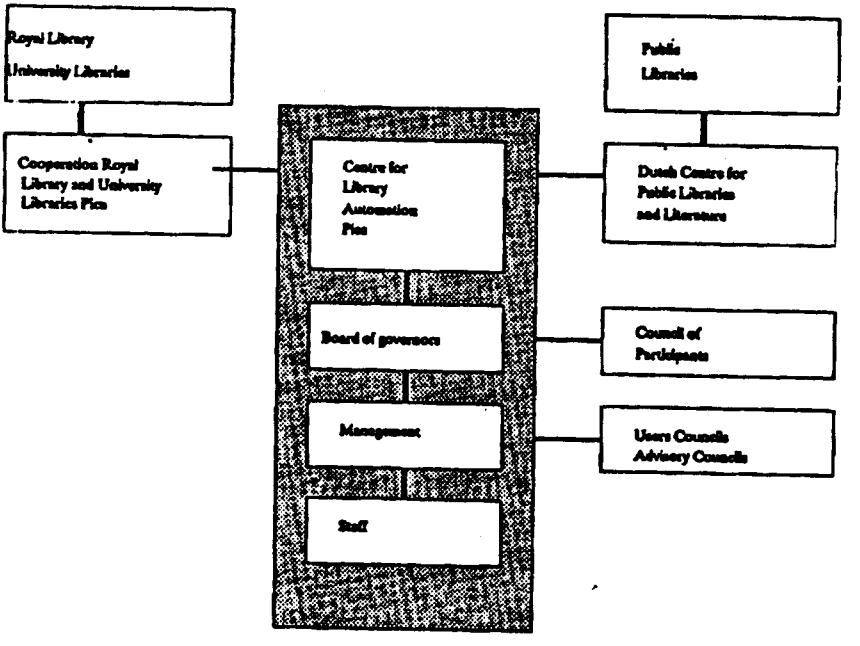
Cooperation through shared cataloguing: participating libraries retrieve information from the central shared database, but on the other hand they also contribute to its building. One-way communication(retrieval only) is out of the question.

Cooperation through well defined programmes aimed at professional cooperation, regarding the conversion of the catalogue and retrospective cataloguing, registration and collection analysis, subject headings, the Dutch Basic Classification System.

Cooperation with other organizations, such as the Royal Library for ILL and electronic document delivery,FOBID to draft Rules for Title Description, SURFNET B.V. for the development and management of the datacom-and information facilities, and with international organization like the ISO, for instance.

Cooperation in the field of research on new applications or new media like scanning methods, automatic loan and use of CD-ROM. A publication is catalogued only once in the central database and subsequently made available for general use.

At the moment, the central Pica database contains approximately six million title descriptions of books, audio-visual media, music, etc.



Interlibrary Loan System: The Interlibrary Loan System has been developed to facilitate the interlibrary loan of books and periodicals between organizations in the Netherlands. All information from the Dutch union catalogues is available via this system. This information always includes owner and holding-information, which enables the user to process the loan-request, as well as the corresponding administration, quickly and efficiently.

Online Retrieval System: By means of the Online Retrieval System users can search documentary databases containing references to documents in contributing libraries. In a number of cases, abstracts and descriptors are added to these references.

Pica3: Pica is developing a new generation of central Pica-Systems called Pica3. The main feature of these systems is a far-reaching integration through the use of one standardized user-interface and through the use of the extra facilities of a PC as local workstation, thus adding local PC-functions to the already available central functionality.

22 Systems on a local computer:

Local Library Systems: The Pica Local Library System consists of standard hardware (Micro Vax-computers by Digital) and software developed by Pica- consisting of four modules. The Pica Local Library System was developed for libraries owning a collection from approximately 500,000 items. It can be accessed by a number of terminals varying from ten to many hundreds.

The Local Library System include an Online Public Access Catalogue, an Acquisitions Administration System with a Subscriptions Registration System, a Loan System, facilitates for word processing and facilities for the processing and retrieval of community information.

The Minister of Education and the Minister of Welfare, Health and Cultural Affairs together appoint an independent President of Pica. Other members of the board of Pica are the Director of the Royal Library, four members by order of the Cooperation Pica and three members on behalf of the public libraries.

Every organization participating in Pica is represented in the Council of Participants and in several users' councils. These councils evaluate the Pica-systems and submit proposals for improvement and further development.

3 USER SUPPORT

31 Instruction

Pica regularly organises introductory courses for cataloguing, ILL and ORS-systems, as well as a general introduction to Pica's systems.

Users of the local systems, particularly the acquisitions and loan systems are instructed on site. The systems-manager is instructed separately, also on site. Further more, courses and instructions are organized on an ad-hoc basis if there is sufficient interest.

32 Manuals

Seperate manuals for all systems are available. For the cataloguing system, an extensive set of rules have been drawn up closely resembling the FOBID-rules for cataloguing. These rules enable the user to edit title-descriptions in the shared cataloguing system or to add new titles to the shared database.

33 By phone

Support by telephone is available for technical and professional problems.

34 Personal support

Every library participating in the shared cataloguing system has his own

contact person in the Pica organization who personally supervises installation and testing of new systems on a new site. After installation this same person is in touch to discuss experiences and to solve possible problems.

35 Pica in numbers

Online Shared Cataloguing System

Size central databases(titles) 6.000.000

Over 1.000 wrokstations are connected via:

*leased lines

*Datanet 1 and/or SURFNET (Dutch package switeching network)

*dial - up connections

Participating libraries:

Online Shared Cataloguing System: 100

Online Retrieval System: 150

Interlibrary Loan System: 250

Average daily number of transactions: 125.000

Average weekly opening hours: 70

Percentage of availability: 99%

Number of catalogued publications: on a yearly basis: 1.250.000

Average percentage of hits: 82%

Number ILL requests on a yearly basis: 360.000

Number of Online Retrieval databases: 21

Number of Searches in the Online Retrieval System on a yearly basis: 60.000

Local Systems

Number of local systems installed: 16

Number of Micro-OPC Software installed: 75

Security and Privacy in A Network Environment

A Tejomurty*

Kaushik Bose **

Discusses the concept of security and privacy in a network environment various factors related to designing security measures. Stresses the need to take precautionary measures to check the unauthorized access and routing the information illegally. Highlights various preventive measures like authorization schemes,message authentication,identifying terminal user, closed user group etc. Finally, discusses cryptography and concludes that in near future various specific systems will be developed to deal with the problem.

1 INTRODUCTION

Information network has changed enormously over the past decade. Earlier it was an exotic research tool used only by a new specialists. But,now it has become an essential tool for users in business,government, and universities. World wide electronic mail is daily reality for millions of people. Today, a large section of society wants access to the intelligent, machines situated in different locations via networks, whch creates formidable problems in network management. In fact, with Transborder Data Flows(TDF), Governments are finding it difficult to control the flow of sensitive information like intelligence, development plans, and defence. Today, problems like 'unauthorized access','computer blackmail' pose a serious threat to the privacy of nations because many countries have got such telematics technology which could simply break into data networks and reveal the national secrets of other countries.

2 WHAT IS SECRUITY AND PRIVACY?

A network is often shared by some kind of users for whom security is of little or no importance and users for whom it is vital. Sometimes it is shared by users who are highly responsile with urgent business and others who are irresponsible and likly to try anything ie. to steal or damage the stored information. That is why security and privacy have become so important today. Many people from different places want to have access to computer network systems. This has eventually caused a catastrophy by damaging hardware failure of the software or misuse of the data and programmes stored in host computer. The

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term'security' refers to the protection of data against accidental or intentional disclosure to unauthorized persons or to unauthorized modifications or destructions. On the other hand,'privacy' refers to the rights of individuals and organisations to determine for themselves when how and to what extent information is to be transmitted to others.

3 PROBLEMS RANGE FROM SIMPLE TO VERY COMPLEX

In the early days, when corporations and universities had a single computer centre, achieving security was easy. All the organisation had to was to put a guard at the door to the computer room. The guard made sure that no one removed any tales,disks or cards from the room unless explicit authorized to do so."With the advent of networking the situation has changed radically. No one can manually police the movement of millions of bits of data daily between the computers in a networks. Moreover, organisations have no way of being sure that their data are not secretly copied by wiretap or other means on the way to their proper destinations. Wire tapping is more common than most people realize. Worst of all, when satellite links are being employed on the transmission path the data are available to anyone who wants to go to the trouble of erecting an antenna to listen"(1). Actually there is a wide diversity of different types of security exposure but most of them are related to computer centre and are independent of networks.

4 FACTORS IN DESIGNING SECURITY MEASURES

There are many essential facture which should be kept in mind while designing security measures. Security itself is a highly complex subject because there are so many different aspects related to it which are primarily of interest to communication engineers and others responsible for network design and implementation. There are three types of security procedures which should be taken into consideration(2):

1.Protecting data from being read by unauthorized persons;

2.Verifying the sender of each message; and

3.Making it possible for users to send signed documents electronically.

5 LAYERS OF PROTECTION

The essence of network security control lies in the technical design of the network and computer systems."This is a hard truth without tight controls in the hardware and software no other precaution can make the system secure"(3). A systems designer may design a tightly controlled system. However, the fact is that it is not sufficient by itself. Moreover, many types of protection are needed, which are interrelated. A typical network security can be represented by a layer diagram shown in figure 1.

The layer of technical control is surrounded by that of physical security

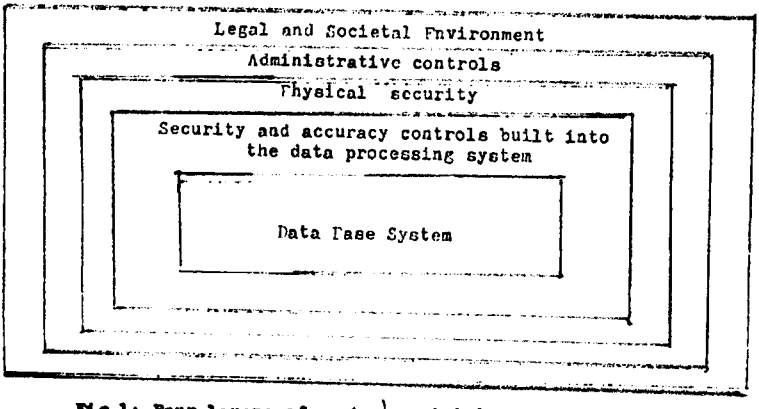


Fig 1: Four layers of control needed for database security and privacy.

which includes guards, alarms and other means of preventing unauthorized access and also includes fire protection, protection of stored datafiles and so forth. The next layer is that of administrative control which ensures that the system is used correctly.It is very essential that the programmers and data processing staff must be controlled so that they cannot misuse the system. At the same time programme testing procedures must be enforced,and unnecessary experiment should be avoided as far as possible. The very next layer, that is the physical security greatly affects the transmission and systems safeguards. The adminstrative procedures are very much related to the system design,especially with a real time or terminal-based system. Perhaps the most problematic layer is the outermost layer. The increasing influence of society necessitates a legal framework to prevent access to classified information to unauthorized persons by considering the 'economic information' and also national security which may loosen their dominance over other countries. Today, a large number of legal framework of data protection laws is beginning to emerge in some countries which have a tremendous impact on the flow of information in an network(4).

6 PRECAUTION TO AVOID OR TO MINIMISE THE PROBLEM

Different precautionary measures are taken to avoid or to minimise the problem. They are as follows:

1. Minimise the probablity: A major part of fire precautions are preventive and this is very important. The embezzelers should be discouraged from the beginning.

2. Minimise the damage:An intruder who succeeds in bypassing the physical or programmed controls that were intended to keep him out, should be taken to task rigorously and the possibility of destruction be restricted.

3. Design a method of recovering from the damage: It is possible to reconstruct vital records or whole files if they become accidentally or deliberately damaged or lost.If an unauthorised person obtains a security code or a file of network passwords , it should be changed quickly so that they are of no use to him.Hence, recovery procedures are vital to the overall plan. At the same time it is very necessary to lock out unauthorized network users and prevent wiretapping or recording of data transmitted.

7 PREVENTIVE MEASURES

71 AUTHORIZATION SCHEMES

Authorization schemes vary from being very simple to highly complex. One of the simplest schemes is that the user uses a key in a password which he/she only should know. If it is an acceptable password for the programme or file in question only then he/she should be allowed to proceed.

Restrictions can be placed on the relationships betwen six different entities on a network,viz.,the users, the terminals or input/output devices that are used, the network nodes such as host computers or terminal cluster controllers,the application programmes,the data sets on elements of data,and the volume such as tapes or disks on which the data are recorded. An alarm may be used to bring attention to any suspected violation.

In security classification, levels, types of entities are classified - such as CONFIDENTIAL,SECRET,and so on. If a user is not security cleared for SECRET information,he/she is not permitted to use a terminal classified as SECRET work,or in other words, not to be permitted to use any programme,data or volume classified SECRET. In that case SECRET data may not be transmitted to an unclassified terminal. If a volume is not labelled SECRET, then secret data may not be written on it.Finally the system may use time locks where access is permitted only at certain times of day.

72 IDENTIFYING THE TERMINAL USER

With some users of networks it is necessary to identify positively the persons at the terminal. Until he/she is identified, he/she is not permitted to have access to any sensitive data or make any modification to the files. There are three methods followed to identify a person.

1. By physical characteristics: By verifying a person's finger print or voice print, the authorized person can be recognised.

2. By something carried:A terminal user can carry a badge, card or key.

User may insert the badge into a terminal badge reader or the key into the terminal itself. Magnetically encoded cards like credit cards are used for this purpose.

3. By something memorised: The terminal user can memorise a password or answer a prearranged set of questions. Techniques of this type require no special hardware. Moreover,they are least expensive of the three and under many circumstances they can be made reasonably secure if applied intelligently. However it has one disadvantage, that it can be lost.

73 MESSAGE AUTHENTICATION

In message autentication scheme the sender and receiver put unique pseudo random numbers on the messages. At the same time both of them have same set of numbers. The receiving software compares the number on the receiving message with what it expects and takes necessary action if it is not identical.

74CLOSED USER GROUPS

Some transport networks including those using CCITT X.25 standard, employ the concept of closed user groups. Closed user groups are nothing but a defined set of user machines or processes.They can communicate with one another,but can have no communication with machines or processes outside the group which ensures that a person at a terminal outside the group cannot use the network.

8 CRYPTOGRAPHY

Cryptography has a long colourful history. Historically, three groups of people have used and contributed to the art of cryptography viz., the military,the diplomatic corps, and lovers. It is the safest way with reasonable assurance that the transmitted data have not been read,copied or tampered before they are transmitted and deciphered after transmission. Actually cryptography is fight between the person who enciphers and the person who tries to crack the code. Cryptology is not widely used in a general data network environment. It is only used in some transmission which needs protection. They are as follows:

1. Electronic fund transfer
2. Military and intelligence information
3. Diplomatic communication
4. Data of value to competition, development plans, details of unannounced products and classified research etc.

81 THE NETWORK SECURITY OFFICER

The security of information as a corporate resource requires a person to

monitor the security measures and to take proper decision. That is why the designation of security officer came into existence. In a network environment there may be several security officers, each of them associated with each host computer or associated with each corporate division. In a system where terminals are scattered in different locations, there should be persons responsible for security in each of these locations wher sensitive data is handled.

82 CONCLUSION

With the advent of sophisticated electronic information technologies there is a tremendous transition taking place in network security environment.In all the countries where the information is recognised as vital, this area has made a tremendous advance in recent years. Large Informatics Corporations like IBM,Burroughs,Digital(All USA),ICL(UK),Fujitsu(Japan) are spending heavily in this area to keep their dominance. In future many specific systems may be developed in this area which will ensure network security in a better way.

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Data Communication Facilities in India

I.K. Agrawal*

Describer the salient features, functioning of and access to Gateway Packet Switching System (GPSS) of the Videsh Sanchar Nigam. Gives the main features of the various Networks in operation in India - GPSS, INDONET, NICNET, I-NET - covering networking topology, standards, terminal equipment, categories of access, facilities offered, and tariff. Explains other specialized information networks: BTISNET, CALIBNET, DELNET, CSIR-NET, DESINET, ERNET, INFLIBNET, VIDYANET - some of which are still in the planning stage.

1 INTRODUCTION

Access, communication and transmission of information are the key elements without which information dissemination cannot be achieved. these functions are carried out by various information networks and services all over the world. Of late, they are appearing on the scene in India and also there are a few now under operations.

Telecommunication Networks forms an integral part of online access to databases. they provide local access numbers in cities/areas throughout the world for dialing into a remote computer.

In India, Department of Telecommunications (D.O.T.), a Government of India, department (D.O.T.), under Ministry of Communications, is responsible for providing and maintaining national telecommunications facilities. While Videsh Sanchar Nigam Limited (V.S.N.L.), a Government of India Enterprise, under Ministry of Communications is responsible for providing and maintaining International Telecommunication facilities. Both the organizations operates in close cooperation to meet the telecommunication requirements of Indian subscribers.

Until 1986, for international data communication, i.e. for text communication, the easiest way of transmission was by telex. International Subscriber Dialed Telex (IXSD) service is available from India to almost all parts of the world. The only drawback of this telex service is its speed limitation, which is 50 bauds or 66 words per minute. This was the method of Information access to International On-line databases, an innovative Bangalore based Company, M/s. Informatics (India) Pvt.Ltd. was adopting when International Subscriber Dialed (I.S.D.) Telephone facilities were not introduced from India to most of the other countries.

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* Dy. GENERAL MANAGER (MKTG) Videsh Samchar Nigam LTD.

Since, International Subscriber Dialed (ISD) is made available to 210 countries/territories of the world, it is possible to meet data communication requirements of varied nature including On- line database access, through Public Switched Telephone Network

(PSTN). In the national network, ISD access is now available to subscribers of more than 1200 cities/areas in India. International Facsimile or data transfer or database access via the PSTN is possible with the provision of modems approved by the Telecom Engineering Centre. (T.E.C.), New Delhi.

During 1988, Videsh Sanchar Nigam Limited has introduced the Gateway Packet Switching System (GPSS) from its Bombay gateway office for data communication between Computers and data terminals all over the world. In the absence of National Packet Switching System (I-NET), VSNL in New Delhi, Calcutta, Madras, Bangalore, Hyderabad, Pune, Ahmedabad and also at Software Technology, Parks (S.T.P.'s) at Pune, Bangalore, Trivandrum and Bhubaneswar to provide synchronous/asynchronous access to G.P.S.S. Bombay.

During early 1991, D.O.T. has commissioned Remote Area Business Message Network (RABMN). This network has been engineered primarily for users located in remote areas for stable and reliable data communications.

Just recently, during October, 1991 National Packet Switching Network, I-NET Phase -I is commissioned by D.O.T. paving the way for highly reliable, cost efficient and flexible means of data transfer and accessing of information nationally.

I-NET alongwith GPSS will provide perfect solution to varied types of National as well as international data communication requirements and put value added telecommunications Networks/services in India on rapid growth path.

In addition to above certain specialized networks such INDONET, NICNET, etc. are already in operation meeting specific data communication requirements. Other specialized networks are under various stages of commissioning to meet specific requirements.

2 PACKET SWITCHED DATA NETWORK

Packet switched data networks are the backbone of today's information needs, interconnecting millions if computers and data terminals worldwide. They facilitate smooth and error-free transfer of data for electronic mail, electronic funds transfer, airline reservations, information retrieval applications, software development, intra-company communications, etc. The list of applications is endless.

Packet Switched data networks are expressly provided for data transmission and are generally used for interactive data communications requirements such as accessing corporate mainframes, public and private databases and electronic mail systems.

The use of Packet Switching overcomes the need for speed and protocol compatibility with the distant end computer and modem. The network also provides inherent error detection and correction, affording an easy to use and highly reliable data communication service.

Apart from the above advantages over PSTN mode of data communications, Packet Switching makes the best possible use of Network resources thereby offering cost effectiveness. PSTN have been based on circuit switching, where an exclusive physical line exists for the duration of the call. This can be an inefficient use of resources, as the line has to be paid for even when no information is being transmitted.

21 Packet - Switching Technology

Packetising involves digitizing, coding and formatting the information. The information transmitted on a packet-switched network is broken into small segments and control information is added to it forming so called 'packets'. The packet of information is than enveloped by other control bits to form a 'frame'. the frame including the packet is then transmitted through the network.

3 GATEWAY PACKET SWITCHING SYSTEM (G.P.S.S)

31 Networking with Information Technology

GPSS is supported by a dedicated computer-switching system based on packet-switching technology. It uses error detection and retransmission techniques to minimize transmission errors and optimize the use of system resources to achieve high network efficiently. GPSS conforms to the international standards and supports X.3, X.25, X.28, X.29 and X.75 recommendations of the Consultative Committee on International Telegraphy and Telephony (CCITT).

32 Configuration

GPSS comprises the following main components (Figure-1)

*Packet - switching exchange(PSE)

*Packet assembler/disassembler (PAD); and

*Network control centre (NCC).

Figure - 1 G.P.S.S. Configuration

The PSEs are the main switching centres with a personal computer performing a multiplexing function for a small number of users. The PAD is a translation facility provided at the PSEs or data terminal equipment (DTE) to

access GPSS. The PAD do not change the data message in any way but it only assembles the characters into packets and vice versa. The NCC is the heart of the network where the supervision, control and management functions of the network are performed.

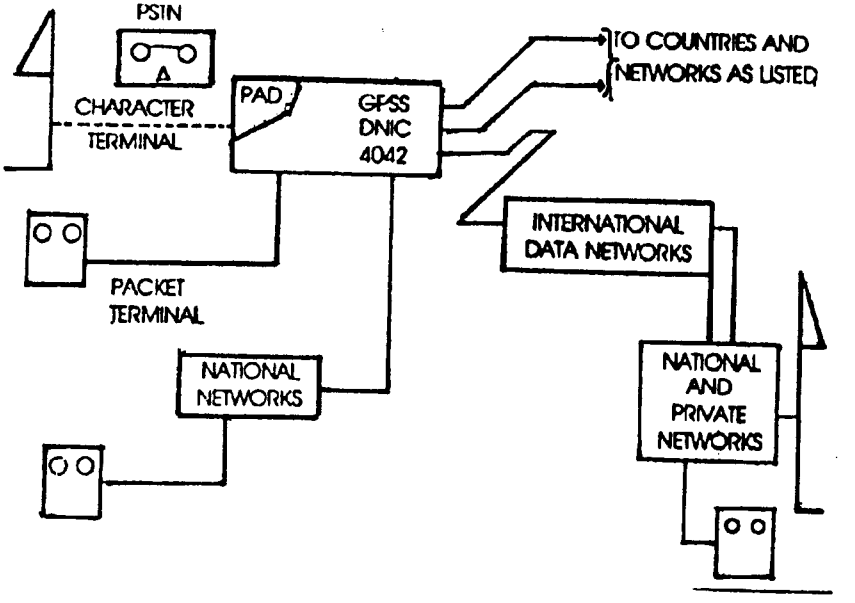


Figure - 1 G.P.S.S. Configuration

33 Data Terminal Equipment

GPSS supports two main types of DTE, namely, synchronous (packet) mode X.25 DTE and asynchronous (character) mode X.28 DTE.

Synchronous mode DTE comprises generally host computers and intelligent terminals and will be able to operate at 2400, 4800 and 9600 bps at present. 64 kbps is also being planned. These DTE will be able to work directly with GPSS as they confirm to X.25 interface protocol.

Asynchronous mode DTE comprises typically visual display units (VDUs) operating at 300, 600, 1200 and 2400 bps.

34 Transaction Types

GPSS can support all types of data transactions generally classified as the following

*Short duration enquiry type applications, for example, credit card verification, travel and hotel reservations;

*Medium duration interactive databases access applications; and

*Long duration batch mode applications.

35 Access to GPSS

GPSS is accessed by the following three methods:

* Dedicated access using voice grade circuits operating at speeds of 300, 600, 2400, 4800 and 9600 bps.

* Dial-up access over the PSTN operating at speeds of 300, 600, 1200 and 2400 bps.

* Telex access.

Modems would be required to enable data transfer over these voice grade analog circuits. The modems will be provided at the data terminal end as well as at the exchange end. Access to GPSS is either in character mode or packet-switching mode as shown in table 1.

Table 1. Access to GPSS

Terminal	Transmission	Speed	Protocol	Access
Character mode	Start/stop (full duplex)	300 to 2400 bps	X.28	PSTN or dedicated access using V22/V22 BIS modem
Packet mode	HDLC (full duplex)	2400 to 9600 bps	X.25	Dedicated access using V29 modem

36 Terminal Address Scheme

Each subscriber DTE is assigned a Terminal Number in accordance with CCITT X-121 recommendation. As per this scheme, the terminal number comprises of 14 digits as follows:

4042 XXXXXXXXXX

The first three digits constitute the data country code (DCC) and the first four digits (i.e. including DCC) constitute the data network identification code (DNIC). DCC and DNIC are different for different countries and different networks. DCC for India is 404 and DNIC for GPSS, Bombay is 4042. Table 2 shows DNICs (which include DCCs) for INDONET of CMC Ltd., I-NET of the Department of Telecommunications, and NICNET of the National Informatics Centre along with a few networks of other countries.

Table 2. DNICs of some networks

Country	network	DNIC	Country	Network	DNIC
India	GPSS	4042	Sweden	NEWTELEPAK	2402
	INDONET	4043		TELEPAK	2405
	NICNET	4044			
	I-NET	4041	Switzerland	TELEPAC	2284
Italy	ITAPAC	2222	UK	IPSS	2341
				PSS	2342
Netherlands	DATANET	2041	USA	TYMNET	3106
				ELENET	3110
Singapore	TELEPAC	5252	West Germany	DATEX.P	2624

37 Tariff for International Destinations

There are two types of changes applicable for the access of GPSS, (a) connection charge of Rs. 4.00 per minute, and (b) a traffic charge of Rs.2.00 per ten segments of 640 characters. For example, the transmission of a message containing 9000 characters at 1200 bps will take one minute and the charges will be Rs.34.00. Transmission of the same message via telex would cost Rs.576.00, which means communication via GPSS is 16 to 17 times cheaper (at present rates). In comparison to Data Communications via P.S.T.N., G.P.S.S. is approximately fifty percent cheaper.

4 I-NET

41 Networking with I-NET

The working offers facilities for interlinking terminals and computers through packet switches located in important cities of the country. Subscribers of this network can make International data calls to other networks abroad. This facility is provided through the Gateway Packet Switching System of VSNL at Bombay. Subscribers can also get connected to subscribers of Remote Areas Business Message Network (R.A.B.M.N.) of Department of Telecommunication (Figure-2).

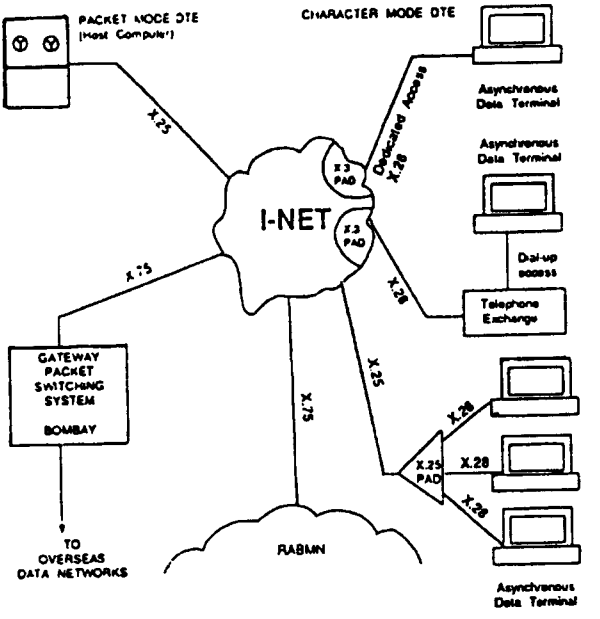


Figure - 2 I-NET Configuration

42 Topology

In first phase, I-NET is planned with nodes at 8 locations, viz. Delhi, Bombay, Calcutta, Madras, Bangalore, Hyderabad, Pune and Ahmedabad. These would be connected through high speed (9.6 kbps and 64 kbps) data links.

43 Standards

I-NET supports CCITT standard interfaces/protocols X.3, X.28, X.29, X.25 and X.75.

44 Terminal Equipment

Two types of subscribers-end Data Terminal Equipment (DTE) supported by I-NET:

* Synchronous or Packet Mode DTE.

* Asynchronous or Character Mode DTE.

45 Categories of access

Access (connection) to I-NET is possible in the following different ways (Table - 3):

*Using DEDICATED leased lines for asynchronous (X.28) or synchronous

(X.25) connection with standard Modems/Drivers.

*Using DIAL-UP connections fir asynchronous (X.28) connection with 'PSTN' modems. Access is permitted through a confidential user access code called NETWORK USER IDENTIFICATION (NUI).

Table - 3 Categories of Accesses

Types of access	Mode of Operation	Speeds Available
Dial up	X.28 Asynchronous	300 bps 1200/75 bps 1200 bps 2400 bps
Leased	X.28 Asynchronous	300 bps 1200 bps 2400 bps 4800 bps
Leased	X.25 Synchronous	2400 bps 4800 bps 9600 bps

46 Facilities

I-NET offers the following facilities which give numerous benefits to its users and can be used for several new applications.

***REVERSE CHARGING**

Reverse charging enables the calls to be charged to the called subscriber provided he has accepted this at the call set up time.

*** Closed User Group (CUG)**

The closed user group facility enables a set of users located anywhere in the network to form a closed user group by way of which neither other subscribers belonging to this group will be permitted by the network to call these

users nor the group can communicate with other users who are not members of the group. This provides virtually a private network capability within the public network.

*** Permanent Virtual Circuit(PVC)**

For a subscriber who has a need to communicate regularly with another subscriber, continuous connection between two parties can be established with PVC which functions similar to a local leased circuit connection.

***Fast Select**

Small messages can be transmitted instantly in one packet, i.e. call set up packet itself. This is useful for applications such as credit card system etc.

47 Tariff

The I-NET tariff comprises of the following elements:

1. Advance Rentals
2. Rentals of Port, Line, Modem and Facilities.
3. Usage - call duration, volume.
4. Installation and testing
5. Security deposits for modems.

Call duration and Volume charges are as under:

(A) Call duration (per mts.)

	Synchronous X.25	Asynchronous X.28 (Leased)	Asynchronous X.28 (Dial-up)
National	Rs.0.75	Re.1 (Min.Rs.2)	Re.1 (Min.Rs.2)
Fast select call (Nat)	Re.0.25/call	N.A	N.A
International Call	Rs.4	Rs.4	Rs.4

(B) Volume Charges

Min. Vol. charges (bi-monthly)*		32K seg.	12 K seg.	4 K seg.
Local	0800-1900 hrs.	Rs. 20/=	Rs.20/=	Rs.20/=
	1900 -0800 hrs.	Rs.10/=	Rs.10/=	Rs.10/=
National	0800-1900 hrs.	Rs.50/=	Rs.50/=	Rs.50/=
	1900-0800 hrs.	Rs.25/=	Rs.25/=	Rs.25/=
International	0000-2400 hrs	Rs.200/=	Rs.200/=	Rs.200/=

*Charges at day time rates for national calls.

5 REMOTE AREA BUSINESS MESSAGE NETWORK (R.A.B.M.N.)

51 Configuration-

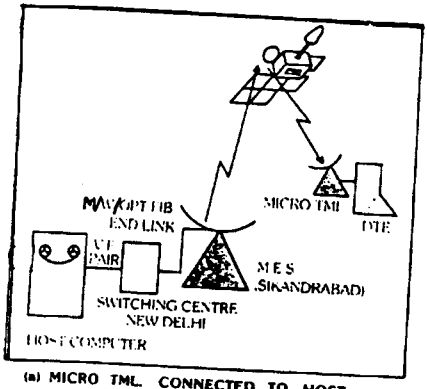
The network consists of three components:

a. A large size master earth station (hub) incorporating a central packet switch.

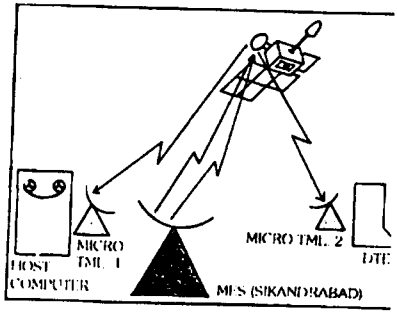
b. Satellite Transponder

c. Remotely located micro earth stations (also called very small aperture terminal - VSAT)

The system concept is shown is figure -3



(a) MICRO TML CONNECTED TO HOST COMPUTER AT DELHI



(b) MICRO TML CONNECTED TO ANOTHER MICRO TML HAVING HOST COMPUTER

FIG. 3 SYSTEM CONCEPT

52 Service offered by RABMN

The network offers the following services for the subscriber.

a. Interactive data communication for speeds upto 1200 bps.

b. Facsimile service.

c. Access to the public telex network.

d. Access to I-NET.

e. Access to GPSS.

If a subscriber wants to procure only one micro earth terminal at a remote location it would provide him access to the public telex/data network.

These services offered by RABMN have the standard advantages of high availability, reliability and efficiency normally associated with satellite communications.

53 Protocols supported by RABMN

A variety of user protocols as given below can be supported by the network;-

Host Computer	Protocol
IBM	SDLC
IBM	PARS FINANCIAL
HONEYWELL/DATA	GENERAL X.25
IBM	S-2000
BURROUGHS	BURR POLL/SELECT
TANDEM	IBM 3270 Bisynch
IBM	PARS
DATA GENERAL	ASYNC/X.25
PERKINS ELMER	ASYNC

6 NICNET

The development of the network was piloted by the National Informatics Centre, Planning Commission, Government of India. The primary objective of the network is to provide computing and communication infrastructure to aid planning and monitoring of schemes and decision-making activities in the government.

In the first phase, NICNET comprised intra-city network connecting

computers and interactive terminals with a Cyber 170/730 system.

In the second phase, NICNET acquired four NEC-1000 systems for Headquarters at New Delhi, and regional centres at Pune, Hyderabad and Bhubaneshwar. Super mini ND-550, minis, super micros and LAN clusters are being installed in state capitals. The state capitals are connected with the IBM PC/AT compatible systems of respective district headquarters.

The network would apply spread spectrum multiple access techniques and use C-200 series micro search stations installed in all state and district centres (model C-201 transmitting at 9600 bps and receiving at 1200 bps and model C-250 transmitting at 9600 bps and receiving upto 9600 bps) with master earth station equatorial MC-200 located in New Delhi.

The network facilities flow of information among the four national/regional nodes, 32 state/union territory nodes and 439 district nodes.

7 INDONET

Indonet is the first Indian commercial computer network evolved by the CMC Limited, Hyderabad. In its first phase, the network is consist of three IBM 4361 computers at Calcutta, Bombay and Madras, PDP 11/44 at Delhi and ROB 1055 at Hyderabad with access points in the cities of Bangalore, Ahmedabad and Pune, The network has adopted IBM's Systems Network Architecture and uses dedicated lines of 2400/4800 bps. For intra-city communication, data transmission speed of 1200 bps is possible.

In its second phase, the number of INDONET centres is expected to grow to 100. It would operate as a STAR network with control point at Delhi, using rooftop 3 m earth stations and packet switching technology for routing of data from central station to other INDONET centres. At this stage, the transmission speed would be 64 k bps. Besides the IBM protocol, the network will also utilize X.25. For intra-city transmission, a novel cost- effective, reliable and faster (9600 bps digital packet radio scheme has been innovated. The Bombay node of INDONET has been connected to the international Gateway Packet Switching System of Videsh Sanchar Nigam Limited, thereby facilitating entry of Public Data Networks of other countries.

8 OTHER SPECIALIZED INFORMATION NETWORKS.

81 BTISNET

The Department of Biotechnology, Government of India, has ten specialized information centres, in genetic, engineering, cell culture and virology, plant tissue culture, photosynthesis and plant molecular biology, oncogenes, reproduction physiology, cell transformation, nucleic acid and protein sequences, immunology and bio-process engineering. The Micro VAX-II computers of

these ten centres will be linked through micro earth stations using X.25 protocol. So far, 23 user centres have been identified, and these would have PC/AT systems linked to the principal nodes. The entire system would piggy-back on NICNET to take advantage of its communication facilities and computing power.

82 CALIBNET and DELNET

NISSAT to initiative for the development of these networks to ensure better utiliZATION OF S&T information resources available in libraries through resource sharing, a moderate functional load of information centre management and to take care of motivational factors to a large extent by better means of communication.

CALIBNET is envisaged as a metropolitan network linking some 38 libraries in the Calcutta metropolitan area. The applications to be supported are: electronic mail, file transfer, remote log-on and database and document access.

With individual libraries, the functions to be automated are cataloguing, serials control, acquisition and fund accounting, circulation and local user services. The networking provides for global user services (covering all the members of the user libraries) of current awareness, SDI, union catalogues, partial databases, and access to national and international networks.

Each participant library would collect, process and hold information on local computers which are connected with one another through X.25 packet-switched network. One of the network participants - network service centre - will be responsible for global (i.e. within the network) user service and also act as the network control centre. Standardization may be based on UNIX operating system.

On line similar lines, the establishment of DELNET has been conceived for about 30 libraries in Delhi.

83 CSIRNET

CSIR is planning to set up a computer communication network (CSIR-NET) for exchange of information among its 40 and odd laboratories. The project can be taken up in the Eighth Plan (1990- 95).

The CSIRNET will help organizing indigenous online database services on such subjects, as leather technology, food technology, natural products, chemistry, radio physics and medicinal plants. It will provide a bulletin board and set up teleconferencing facilities through the network apart from facilitating flow of routine administrative and financial information and exchange of library resources. Apart from accessing international databases through NACIDs, efforts are also under way to develop databases on the expertise and sophisti-

cated instruments available in the various CSIR units which would be of interest of users outside it also.

84 DESINET

DESINET is a proposed bibliographic information network for Defence, covering only unclassified scientific and technical information. The users of DESINET would be scientific, research and Defence personnel from the Department of Defence, Department of Defence R&D, and Department of Defence Production & Supplies.

The Defence bibliographic information network will also have close links with other similar networks like NICNET for exchange of information on mutually agreed terms.

85 ERNET

ERNET is a computer network for a academic and research community in India. Starting with eight leading institutions - the IITs (5) IISc, NCST and DOE - ERNET aims to reach hundreds of academic/research institutions covering a number of science and engineering disciplines. Campus-wide LANs (conforming to IEEE 802.3 standard) are set up a backbone satellite-based wide area network(WAN) is implemented.

The network will provide the services of electronic mail, file transfer, remote log-on, databases access, bulletin board, etc. Access protocol for WAN will be X.25 and with other networks through X.75 protocol.

86 INFLIBNET

INFLIBNET is a major national effort to improve information transfer and access, as a support to scholarship, learning, research and academic pursuits. It will link up institutions of higher learning covering all disciplines, R&D institutions and national organizations like CSIR, ICAR, DRDO, ICMR, ICSSR, etc.

It will be a multiple function/service network in the sense that it will also offer catalogue-based services, database services, document supply services, collection and development and communication-based services.

There will be a national centre for managing, overseeing and coordinating the network administration and four regional centres which will maintain regional union catalogues apart from databases on projects, institutions and specialists.

At the sectoral level, UGC's Information Centres and NISSAT Sectoral Centres or those performing national level functions/services in specific subjects/disciplines/missions will be included. End-users will be served locally through the information centres of the respective colleges, departments,

universities or R&D institutions. In all, there will be 150 university libraries, 50 post-graduate centres/autonomous colleges, and 200 libraries of R&D institutions/centres of national importance outside the university system.

INFLIBNET proposes a hybrid version of satellite and terrestrial network communication system with a star configuration for interconnectivity of the nodes. Inbound carrier to the central hub will be through satellite and use the 'slotted aloha' technique; while outbound carrier from the central hub to the nodes will use satellite and time division multiple access (TDMA). Interconnecting nodes in a city, if they are many, is through a LAN. The networking protocol for INFLIBNET will be similar to the HDLC protocols.

The INFLIBNET project is proposed to be taken up during the Eighth Five Year Plan (1990-95).

87 VIDYANET

VIDYANET is a proposed dedicated communication/computer network to meet the needs of scientists and research workers in the laboratories/institutions of excellence in the country. Expected to be fully operational in three years, the first phase of VIDYANET will link up about ten institutions such as All India Institute of Medical Sciences, Indian Agricultural Research Institute, IITs, Indian Statistical Institute, and National Physical Laboratory in New Delhi and Bhaba Atomic Research Centre, Indian Institute if Geomagnetism, National Centre for Software Technology, and Tata Institute if Fundamental Research in Bombay. Subsequent phases of networking will cover leading institutions in Ahmedabad, Bangalore, Bhopal, Calcutta and Madras.

It aims to link up institutional computers (Cyber, VAX, DEC, etc.) via telecommunication lines and provide its users facilities like transfer of files of any type - data, programs and documents - electronic mail, exchange of immediate messages, access to remote applications, databases and libraries.

A major VIDYANET objective is to stimulate cooperative research, day-to-day exchange of research information and to execute joint projects and publications. It also intends to allow users to develop databases on specialized areas like bio-technology, superconductivity and supernova research. Besides this, the network aims at providing rapid means of communication by linking computers at various institutions in India and abroad with similar networks like EARN (European Academic Research Network, Geneva) and BITNET through a gateway.

88 In addition to above, some other specialized Telecommunications networks such as Bank Net, BHEL-Net. Oil Net, SAIL-NET are in various stages of operation/implementation in India.

9 CONCLUSION

Commissioning of National and International data communication networks will provide a fast and reliable telecommunication link or highway for transmitting information, the invaluable commodity so essential for accelerating the decision making process and improvement of service quality.

Department of Telecommunications (D.O.T.) and VSNL have respectively planned to expand the capacity of their existing Packet Switching systems to meet the growing data communications requirements from over 1000 Indian cities.

With the expansion of Packet Switching networks, there would be spurt in growth of private value added networks/services to meet specialized data communication requirements of various sections of the society.

It would be highly advantages to plan value added networks/services based on these public networks to optimize the resource utilization.

In order to accelerate the growth of specialized value added networks and services, it would be highly appropriate to treat these networks/services as private carriers and offer them attractive telecommunication tariff.

National Information Networks:indonet

R N Basu*

INDONET is the first computer communication network in India operational since March,1986,set up with the objective of providing facilities for distributed data processing, software export,making computer power available to people at large, etc. Computers are located in three cities and are interlinked using terrestrial lines in phased I. Six additional cities can access the networks. Intra-city communication between customer and INDONET nodes can either be through leased lines, dial up access using PSTN or packet radio techniques. An international gateway is available on the network for accessing databases abroad and software export applications. In phase II,higher speed data transmission and powerful computers will significantly expand services provided by the network to include access to public databases on INDONET computers, advanced espensive scientific and application software packages and various other networking applications.

1 INTRODUCTION

The computer and software industry,which has been termed as the most dynamic segment of the electronics industry, has witnessed a tremendous growth in the last 10-15 years. This is due to the fact that more and more organisations around the world are trying to increase efficiency and productivity through state-of-the-art usage of information technology.

Corporate productivity,effeciency and decision making increased significantly when the immense power of the computer to sort, store retrieve and present information in a cognitive manner was coupled to telecommunication links. With the aid of this technology, people and organisations had access to data and information for their multi-farious needs on a global scale. However, as we are all aware, in the developing countries there is a scarity of financial resources for making available these sophisticated facilities and services on a nation wide basis. At the same time, ther are many demands on the limited resources available.

It is,therefore,essential that in developing countries there is a conscious effort to optimise the use of scarce resources, so that contemporary sophisticated technology can be made available to as large a cross section of the society as possible.

2 EVOLUTION OF NETWORKING IN INDIA

India has often been called'the land of paradoxes'. With a population of 785 million spread over 3.3 million sq.km. of land,there is a tremendous variety

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* CMC Limited, New Delhi.

in the life style of people. Here one finds a rapidly growing industrial base co-existing alongside a population that is highly concentrated in the rural areas where a large number of people still live below the poverty line. This country which has successfully launched its own satellite and developed its own nuclear power plants has pockets where even an everyday object such as an automobile is non-existent.

With a per catita income of $200 and an industial growth rare of 8% over the previous year one would expect a total absence of sophisticated technology. However, the overall G.D.P. of $150 billion provides a sufficient capital base for it to develop significantly in the 'High Tech' industrial infrastructure. India is ranked 9th in the world in terms of scientific and technical manpower in research and development and this has helped it to be at par, if not ahead, of many other countries in areas that are considered 'Frontiers of Technology'.

21 The Indian Scenario

Computers have come to India in a big way only in the past 10 years. The initial 'resistance to change' and the fear that their introduction would further increase the unemployment problem, because it was felt that machines may replace human beings in offices, have been overcome through a better understanding of the technology. Thus, now that the benefits of information technology are being felt in the country, corporate & government bodies have started to use ths technology to improve the efficiency of their operations. In fact, telecommunication have been identified as one of the thrust areas by the government with the belief that improvement in this service will have a catalytic effect on all spheres of the country's economy.

Till around 1976 there were only about 400 computer installations all over India and these 3rd generation Computers were used mainly for scientific or educational purposes. There were a couple of computer manufacturing companies and a handful of organisations in the services sector but the masses were not affected nor interested in this field.

It was around this time that the Government took the decision to introduce the "Foreign Exchange Regulation Act" which decreed that multinational companies operating in India should either include Indian capital to the extent of 60% or operate in a purely export oriented manner. IBM decided to close down its operations in India. As most of the data processing equipment in India consisted of IBM Unit Record Machines and older computer systems such as the IBM 1401 this drastic decision threw the computer industry in to a turmoil. However, it was, in a sense, this setback which provided the initial impetus for the growth of the indigenous computer industry. From that time onwards there has been almost no looking back and today the entire range of systems starting from the small IBM - PC compatibles to large systems like CDC Cyber & ICL Series 39 are being manufactured in India by over 50-60 companies. A large

number of service organisations today provide software, maintenance and data services for local customers and exports.

22 The Need for Computer Networking

India's size, both in terms of population and geographical area, and variety of its economic activities necessitaties an efficient communication infrastructure. The postal system, which has been in operation remarkably well for over 100 years, and the rail and road transport were no answer, telephone and telegraph, while in wide use, required drastic upgradation and augmentation. In mass communication, emphasis was being shifted from radio to television which again required communication channels across the length and breadth of the country. In addition to this, the advantage of computer networking for remote access and file sharing was becoming well known.

It was with this in mind that a number of development oriented programmes utilising the potential of I.T in Health, Rural Development, Education, Administrative Services etc. were initiated by the government. Local manufacturing industry and service sector also became aware of the vast possibility of using this technology.

3 INDONET

Networking activity in India was pioneered through INDONET, India's first data communications and computer network installed and commissioned in 1986 by CMC Limited (CMC), a Government of India Enterorise.CMC is the largest IT company in the country and is committed to the use of computers and modern communication technology in the core sector of the industrial infrastructure.

As far back as 1982, realising that there was a need to optimise the use of the costly computer resources that were being imported into the country,CMC conceived of INDONET as a national network. The goals of this network were-

* Distributed Data processing facility
* Computer service bureau consultancy
* Promotion of advanced networking technologies
* Providing computer power to users across the country
* Public database services
* Software export

31 First Phase

The first phase of INDONET, as is operational today has 3 IBM 4361 computers at Bombay, Calcutta and Madras as the backbone of the network. Additional access facilities are available at Delhi, Hyderabad, Ahmedabad,

Pune, Vizag and Bangalore. Inter-city lines operate at 2400/4800 bps. Intra-city communications between CMC's customers and INDONET nodes are possible either through leased lines, dial up access using telephone lines or through digital packet radio techniaues. At present, in keeping with its commitment of providing a larger number of people with scarce and expensive software and hardware, INDONET provides the following facilities:

a) ACME

ACME is CMC's latest product in messaging systems. It uses advanced store- and-forward messaging techniques in order to give the user the convenience of a personal mailbox. ACME offers the following:

- automatic information on pending inward messages
- tickler facility to remind the user regarding important meetings and follow-up jobs
- provides round-the-clock access to messages,files with added facility to edit and save
- automatic acknowledgment facility

b) File transfer

INDONET offers computer-to-computer data interchange facility. This software is very popular amongst users in the corporate category. The files can be moved across geographically spread locations with ease and speed. And all this could be done from the terminals or PCs available on the users desk.

c)Distributed Data Processing-Expertise

Distributed online applications have been developed on INDONET. This allows the offices in the branches to update the corporate database as and when the event (transaction) occurs. This allows the corporate office (or the organisations headquarters) to have up-to -date information. This application is currently being used on the network and has proved to be successful for usage by organisations which have geographically dispersed offices.

d)Special Purpose Software

INDONET provides access to the follwing software packges on the network.

- **FOCUS** : A fourth generational Hierarchial Database package
- **MPSX** : Consists of programs to handle linear programming related problems
- **FEAST** : Structure analysis package for civil/mechanical engineering
- **CICS** : A powerful tool for developing TP applications

- DL/I: Hierarchical database management package
- SQL : Relational Database management package that can provide interactive query/report writing facilities on databases

e)International Gateway

An international gateway has been commissioned at Bombay via the packet switch of the overseas Communication Services, VSNL. This gateway facility allows INDONET users' access to international computer networks. Thus,users can have world wide access to:

- Trade/Business information
- Stock exchange information
- Scientific/Technical databases

This services is very useful for scientists, engineers, academicians and the entire business community who can have access to world wide up to date information via Indonet and can also use the gateway to transfer their software tousers abroad.

f)Database access

Apart from the access to international databases provided by Indonet through the International Gateway,INDONET users can also access databases hosted on INdONET itself. At present, there are two databases hosted on the computer network, namely CMIE(Centre for Monitoring Indian Economy), a database on financial performance of over 2000 organisations in India and 'NICRYS', a scientific data base on crystrollagraphy. There are plans to host additional databases on the network.

The applications mentioned above are used by over 100 customer organisations in India. In fact, INDONET's customer list reads like a corporate WHO's-WHO.

CMC has also developed special applications for customers which are hosted on the network. Some of the more important applications are:

a) The Online Real-Time reservation system of the Welcomgroup Chain of Hotels through which anybody can reserve/cancel or get in formation on rooms in any hotel of the chain from any other hotel or any one of the other specified locations.

b) 'TOURNET' a tourism information database,commissioned by the Department of Tourism, Government of India has also been tested on the network and is planned to be omplemented early next year.

c) A major function of CMC is to provide hardware maintenance services to over 700 machine installations in India. The complexity of machines types, spare parts, socking data,purchase and import procedures dis-

tribution problem etc. are of enormous magnitude.OLPICS - online parts inventorycontrol system operation on INDONET permits the company to manage the maintenance support at a high level of system avaialbility.

d) CMC's corporate management information system comprising finance,personnel,projects,marketing and message/E-Mail enebles a widely distributed data base to be managed in a most contemporary manner.

32 Future Plans

INDONET has been operational for over six years now. Over this period the usage pattern has changed from purely Data Centre/Data processing jobs to networking/database applications. This has also been a period where CMC has been able to develop substantial experise in networking and communications. In fact it is no exaggeration to say that CMC has ushered into India the 'networking culcutre' and slowly but surely organisations in the country are recognising and raping the benefits of computer networks.

However, as this is the country's first public access data network the users have faced a number of problems. These short-comings have been addressed in the future plans of Indonet. Some of the more significant activities planned for the network are described in the following paragraphs.

321Enhancement of the network

Currently the computers at the network nodes are handling a variety of jobs like batch production and remote computing, software development,database access on line applications networking software etc. Bunching of all the above on a single system results in a very low through put and poor response time on the network. In order to improve the response time as well as to provide additional computing power to the network,CMC plans to add two more mainframes to the existing network, the first of which will be transaction oriented machine which will greatly help in improving the performance of online as well as providing substantial power for additional online applications. This mainframe is expected to be operational on the network by early next year.The second computer proposed to be added to the network is a computing intensive or number crunching machine which will be of invaluable help for developing software and processing R&D kinds of appplications on the network.

322 Compatibility with computers of different makes

INDONETis currently using the Systems Networking Architecture(SNA) which is protocol proprietary to IBM. This means that other computers which are not compatible with this protocol are unable to link up to the network.

CMC plans to move away from all proprietary protocols and will shortly be converting to X.25, an international standard which is not manufacturer spectific. This would mean that different machines of different makes utilising this international standard will be able to "talk" to each other and will be able to share or exchange data in a manner which is transparent to the users.

Providing additional data bases and software tools on the network-These services require a large storage and fast response computer system on the network. This is currently not available on the network. However with the inclusion of the new mainframes on the network there will be sufficient space and computing power to provide these features.

323 Data communication speed, reliablity and coverage

Currently CMC is using leased terrestrial voice grade lines for communication within the network. However,this results in very slow data transfer speeds of 2400/4800 bps on intercity lines and

1200/2400 bps on intracity lines. Moreover,the present uptime for the communication links is roughly around 75% These conditions are grossly inadequate for the networking environment.

In addition to the above currently users can access the network locally from nine locations only. For accessing the network from other locations the user have to utilise STD lines. This is costly ,inefficient, slow and often results in data loss.For the network to be really effective,it should have access points from almost any part of the country.With this in mind,it is proposed that INDONET's inter-city communications will be via satellite.It will operate as a STAR network with the hub at Delhi and roof top antennae at the other INDONET centers and remote locations. This will ensure that the communication will be fast, reliable and error free.

4 CONCLUSION

India has been able to achieve a moderate degree of success in making computer networks operational. The plans being drawn up are highly ambitions and are aimed at catching up with more advanced countries; through bold applications of modern technology and indigenous know how and depend on local industry for both hardware & software. What remains to be seen is the benefit Indians can derive in employing these facilities in omproving their socio-economic conditions.

ANNEXURE A

1HARDWARE

	MADRAS	BOMBAY	CULCUTTA
CPU	IBM 4361 GROUP5	IBM 4361 GROUP 5	IBM 4361 GROUP 5
MEMORY	12 MB	12 MB	12 MB
DISKS	4GB	4GB	4GB
TAPES	2X1600/6250 BPI 1X800/1600 BPI	2X1600/6250BPI	2X1600/6250 BPI
Printer	1200 BPI	1200 LPM	1200 LPM
Protocol Controller	1 (7171)	1	1
Communication Controller	(3705)		

There are 230 terminals spread over 11 Indonet locations from wher they can access any one of the above three systems. The terminals are connected through Radio Modems ,Dial- up and leased lines of DOT.

ANNEXURE B

COMMUNICATION LINES

The following inter-city 17 lines are presently operational:

1.New Delhi(JV) -Bombay
2.New Delhi(M.Bagh) -Bombay
3.New Delhi(Basant Lok) -Bombay
4.New Delhi(Basant Lok) -Madras
5.New Delhi(Basant Lok) -Culcutta
6.Bombay - Hyderabad
7.Bombay -Secunderabad

8.Bombay -Pune
9.Bombay -Ahmedabad
10.Bombay -Caulcutta
11.Bombay -Madras
12.Madras -Calcutta
13.Madras -Hyderabad
14.Madras -Hyderabad
15.Madras -Visakhapatnam
16.Madras -Bangalore
17.Madras -Bangalore

Evolution of Library and Information Science Professionals in Karnataka

M K Mohandas*

K C Shet**

Gives data regarding manpower development in Karnataka State for the last five years. Projects the manpower requirement for the beginning of the 21st century. Proposes a three-tier structure for imparting computer education for library professionals.

1 INTRODUCTION

In Karnataka State Library and Information Science education is offered at various levels as follows:

a) Certificate course:	By Department of Public Library
	By Private Institutes
b) Diploma courses :	Only by Government institutions
c) Graduate and Post Graduate Courses:	At University level.

2 PLACEMENT OPPORTUNITIES OF LIBRARY PROFESSIONALS IN KARNATAKA

A study of placement statistics of library professionals in Karnataka have suggests the following.

The required number of the library professionals of Karnataka state:

As on 31.5.1989, in Karnataka there are 2978 public libraries [2]. It is estimated that there are 600 colleges and other institutional libraries in the state [3]. By the turn of the century it is likely to be doubled i.e., 7200 professionals approximately (considered with an assumption of average one professional of library science per library)[[3]. In other words, ten per cent growth rate demand forecast (360 library professionals) has been made. As against this the present production is:

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B.L.I.Sc./M.L.I.Sc.,:	160
Diploma/Certificate :	100
	260

There is a likelihood of shortage of 100 persons / professionals per annum in Karnataka. However, to meet the demand, there is a wide spread recruitment of non-professionals in the library activities. This situation is not influencing healthy development in library science in Karnataka.

Moreover, Government of Karnataka did not fill up any vacancies in the libraries for the last three to five years. Hence the apparent shortage is an illusion.

In order to over come this, certificate courses of one year duration must be augmented in the State.

3 COMPUTER BASED LIBRARY SCIENCE DEVELOPMENT

Due to the impact of computer technology, it is now imperative to deal with computers for all issues related to Library and Information Science. Thus we propose three tier structure of introducing computers in library education in the following manner.

3-TIER STRUCTURE;

(a) Diploma/Certificate courses (Post SSLC/SSC courses)

(b) Graduate Courses: (B.Lib.Sc./B.Lib.I.Sc.)

(c) Post Graduate Courses: M.Lib.Sc/M.L.I.Sc.

The following subjects should be integrated in the existing curricula of Library and Information Science.

(a) Diploma/Certificate Courses:

Essential: Data Processing using Computer

Electives: (i) Word Processing, (ii) DBASE III Plus/DBASE IV (iii) Cobol

(b) Graduate Courses:

Essential : (i) Data Processing, (ii) Computer Organisation

Electives : (i) Programming Languages, (ii) System Analysis and design, (iii) Library Packages.

(c) Post Graduate Courses:

Essential: (i) Automation of Library, (ii) Information Processing.

Electives: (i) Programming Languages, (ii) Computer structure, (iii) System Analysis and Design, (iv) Evaluation of Library Packages, (v) Selec-

tion of Hardware.

There is no two opinion about usage of computers to be integrated in all the levels of library activities. Accordingly every library professional must be trained in the use of computers. Today the library profession is in transient phase in catching up with the computer technology. The proper match takes place only when

a) sufficient fund allocation to the library automation is made,

b) library professional must develop a good knowledge of computers.

The UGC has recommended to set up the INFLIBNET to the Government of India recently. When such a network becomes operational, Library and Information Science professionals should not loose time to grab the opportunity. They should accelerate the process of automation in all the libraries. It will be appropriate to rename the existing title of "Library" in the educational and research institutions into "Library and Information Centre".

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TABLE 1. UNIVERSITY LEVEL PRODUCTION

Name of University	Year	B.Lib.Sc. Students		M.L.I.Sc. Students	
		Admitted	Passed	Admitted	Passed
Karnataka Uty. Dharwad	1984-85	36	23	5	4
	1985-86	34	20	9	9
	1986-87	47	32	8	7
	1987-88	46	45	10	10
	1989-89	48	47	10	9
Mangalore Uniy Mangalore	1984-85	11	13		
	1985-86	15	10		
	1986-87	14	15	No course	
	1987-88	13	11		
	1989-89	14	14		
Mysore Uniy Mysore	1984-85	25	22	13	9
	1985-86	24	18	13	9
	1986-87	24	13	12	12
	1987-88			11	11
	1989-89				
Bangalore Uniy Bangalore	1984-85	25	17	8	8
	1985-86	25	20	10	6
	1986-87	46	28	10	4
	1987-88	22	15	8	8
	1989-89	22	11	8	7
Gulburga Uniy Gulburga		n.a.			

TABLE 2. DIPLOMA & CERTIFICATE LEVEL PRODUCTION

Name of Polytechnics	Year	Diploma course		Certificate course	
		Students Admitted	Passed	Students Admitted	Passed
Src Govt.institute Of Middle Management,B'lore	1983-84	8	-		
	1984-85	25	-		
	1985-86	21	7	No course	
	1986-87	10	20		
	1987-88	12	18		
	1989-89	30	7		
Govt.women's Polytechnic Hassan	1983-84	18			
	1984-85		18	No course	
Academy Of General Education Manipal	1986-87			12	12
	1987-88	No course		12	12
	1988-89			12	12
Govt.women's Polytechnic Mangalore	1984-85	16	13		
	1985-86	23	17	No course	
	1986-87	34	10		
	1987-88	31	18		
	1988-89	30	27		
Govt.women's Polytechnic Bangalore	1984-85				
	1985-86				
	1986-87		No course		
	1987-88				
	1988-89				

National Information Policy for Manpower Development: A Conceptual Framework

Shalini Rewadikar*

Explains the aims of National Information Policy and the importance of Manpower as a vital resource for achieving these aims. Brings out the interdependence of manpower development on organisational environment. Stresses the need for preparing professionals for assuming the dynamic role in the information dominated society with latest information technology, computers and communication systems. Indicates the changing roles of the professionals in the information infrastructure of India.

1 INTRODUCTION

There is universal recognition of the importance of information as a resource. As the awareness is growing in developing countries as well, policy makers at national level should ensure that the professional and specialised knowledge is fully and properly used in guiding social and economic development. Any policy on the development of information services should be part of a nation's scientific , technical and socio-economic policy.

11 Objectives of Information Policy

A National Information Policy aims to achieve and:-

1. Ensure optimum utilization of accumulated knowledge in science, technology, economics and social sciences for the betterment of their society.
2. Ensure availability of adequate information for decisions for Government and private enterprises.
3. Focus the attention of Government and private enterprise on problems of information and its use.
4. Provide information services relevant to present needs together with capability for developing services to meet the future needs of generators, processors, disseminators, and users of information.
5. Promote national and international co-operation on the exchange of information and expertise.

12 Policy Making Process

The Unesco Handbook for Information System and Services describes the process of policy making as below:

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PROCESS OF POLICY-MAKING involves;

a) Initiation of Policy Development

b) Review of existing policies

c) Analysis of existing policies

d) Recommendation regarding new and revised policies

e) The process of formulating policies & schedule of suggested list of priorities

f) Preparation of policy manual

g) Dissemination of policy

h) Securing Periodic Policy review.

2 HUMAN RESOURCES DEVELOPMENT (HRD)

Human Resources can be developed by various investments. These can be formal education, on-the-job-training; exhaustive job- market information and health and welfare scheme. However education is the key factor in the development of human resource. Education provides the largest proportion of needed persons and formulates necessary professional, occupational skills and attitudes.

Thus manpower means the quantitative and qualitative human assets of people in a society. We are literally interpreting the term to mean "Power of Man" both in the terms of size and talents and level of education as Margerett Slater puts it.

21 Need for Manpower Development

Need for constant and continuous development of human resource arises as libraries and information centres all over the world are undergoing and incorporating changes, particularly the technological changes . The Professionals working in L/I system cannot remain indifferent to these developments.

Harvard-Williams states that "We are living in an exciting profession, where changes can motivate us to future change and where we to a large degree can control its direction, provided we are aware of the world developments in education, communication, and information dominated society. That means a great deal more than libraries".

The developed societies have necessary cultural and psychological ability to respond to innovations particularly the technological change. The developing countries (societies) require added efforts to develop the necessary abilities, attitudes and skills.

Human-resource is generally considered to have unlimited potential but many of their abilities go waste in an organisation or a system.

Therefore manpower development concerns itself with how to achieve and tap the optimum capacities of persons, so that they can translate the objectives of the information programmes as planned at National level.

22 Information Handling for HRD

The human resource development therefore should aim;

1) To develop professionals for assuming the role and responsibility of providing effective transfer of information to users in a changing subject field.

2) To develop scientific outlook and awareness of their responsibility in the dynamic developments taking place in the information science field.

3) To develop sensitivity to overall background and developments of information users in the concerned organisation.

4) To impart knowledge, skills and attitudes to L & I personnel which would contribute to development programmes, through effective information handling technique.

23 Organisational Environment

a) Any enquiry in Human resource development will depend on the organisational structure of the Information system or Library system in which the personnel are employed.

A well developed human resource is ineffective in an organisation which is not well organised. Effective and efficient performance depends on the environmental factors. Organisations comprise of interdependent variables of task, technology, structure and people. Out of which people are the most important. It is the quality of skills and knowledge which determines to a large extent the quality of the information services provided by the personnel.

b) Interdependence of organisation on education

Similarly there is dependence of organisation on education for the supply of general and professional knowledge and general mental attitudes. But the managerial skills are developed according to the system's or organisation's environment on-the-job.

24 Economic Aspects of Manpower Development

However Human resource development increases in response to incentives and is influenced by many monetary and non-monetary cues. But at the same time it should again be emphasised that education is the major source of supply of necessary knowledge and skills. As such the L/IS education should stand the efficiency criterion. There is need for continuous reassessment of priorities in a changing field. There is tendency to continue what has been done,

regardless of changing circumstances. "If this tendency goes unchecked there is danger of producing personnel who would be obsolete for tomorrow's job market "as Harvard - Williams points out.

25 Manpower Planning for Education

ManPower Planning is done:

i) In order to alert and gear the education sector and achieving the desired goal. This needs comprehensive surveys and forecast of patterns of future skill developments.

ii) Estimates of survey are acceptable basis for educational planning.

iii) Since individuals cannot foresee future educational requirements, organisation, Government and leaders in the profession will have to take the responsibility, to gear the requisite changes.

25 Manpower Programmes

These are determined by the nature of power groups involved in the development of these programmes and also constraints exercised by other groups having political or economic power.

Any Policy statement to be effective should spell out the various manpower development related decisions , their goals, the financial, political, judicial aspects involved in these are also important consideration that should guide Information Policy.

3 ASPECTS OF INFORMATION POLICY

Management and development of information system and programmes for decision making at governmental and private organisation is a process by which knowledge, talents and energies of people are directed towards efficient functioning of an information system. The necessary resources are allocated to achieve these objectives. To manage L & I centres, needs exercise of judgement and control in planning, implementation and adjustment of activities, to achieve the desired objective. Managerial attitudes need to be developed irrespective of the size of Information system or services.

31 Policy Decision

Policy decisions have four important aspects which rest around; 1. Collection of material; 2. Services & access to material, 3. Staff resources; and 4. Management consideration.

Out of the above four the staff resources and manpower development in general are pertinent to our discussion.

4 MANPOWER POLICY

The important considerations of any manpower policy for the profession

rests around development, maintenance and utilization of actual and potential number of the work force:

a) Redefining the categories of personnel needed and boundaries of the profession.

b) Ensuring continuous supply of trained talent and retraining them in the profession.

c) Improving the L/I system's mechanics of Job market.

For this purpose the co-operation and co-ordination of all the decision-making units is essential. The decision-making units in the manpower related programmes are :

1) Individuals who decide to take up the necessary education, general and professional, at given salary levels within a geographic area. They work for income, prestige and status of the job, and opportunity the job offers for self actualization.

2) Associations give strength and solidarity to their members and develop the profession, control services offered to users and also try to control work environment.

Unions try to protect members from arbitrary decision, decide contractual rules and minimise risks (Associations also take increasing interests in union activities these days).

3) L/IS educational institutions try to provide necessary skills and knowledge for managing L/I systems and centres and create necessary attitudes & values towards profession.

4) Organisations try to survive in a competitive world and produce leaders for the profession along with promotion, Of the organisation's objectives; by way of providing expeditious and efficient, services to users at least cost and offer development programmes for employees.

5) Government and management of L/I Centres try to promote best use of L/I systems and centres. These try to generate the climate of growth. They also try to project and promote employee's welfare i.e. the professionals, semi professionals as well as unskilled workers.

The Government regulates contractual arrangement between management and institutions & provides necessary resources.

5 REDEFINING BOUNDARIES OF PROFESSION

Information work and science as a professional discipline is concerned with the accumulation, storage and transfer of recorded knowledge. While goal of education for this work is to produce persons of general competence in the theories and techniques associated with information, the professional also acquires certain attitudes, exhibits willingness to serve the communities and has

the courage to defend the professional convictions with tenacity.

The functions of the information specialists have increased and revised in two respects: (i) Deeper knowledge and understanding of terms, language and findings of science, technology even for the traditional methods of subject cataloguing and document Indexing in any special field; (2) new proficiency is needed in disciplines like linguistics, systems science, the computing sciences, the psychology of information processing as these contribute to more sophisticated methods of information analysis and retrieval.

51 The Boundaries of Profession

The boundaries of profession have changed and moved from the preservation function i.e. Archives to the use of documents i.e. Library Services. The deeper and microlevel of depth subject analysis for user's services, have also undergone changes, from Bibliography making to Documentation and now to information science, techniques and technology.

There is diversity of nomenclature applied for L/I professionals but the Unesco handbooks advocates, functional approach and specifies the following categories:

a. Information educators;

b. Information Researcher;

c. Information Manager;

d. Information Analysts;

e. Information Distributors;

f. Information Support personnel.

Any policy to be successful, will need to specify and spell out these aspects of categorising their capabilities and skills, their status and role in development of staff skills and attitudes.

Professionalisation is an important aspect in any policy matter.

6 ROLE OF PROFESSIONAL ASSOCIATIONS, GOVERNMENT AGENCIES

Role of professional associations, Government agencies is very important in ensuring continuous education.

A manpower policy tries to ensure continuous supply of trained talent and retaining them in the profession.

Due to rapid changes training & retraining should also be continuous process in any profession. Development of manpower can be made by curriculum development and implementations through formal and informal

methods. The education should be need based.

61 METHODS OF CONTINUOUS EDUCATION

Conference, workshops, seminars, Special courses, short course, special assignments, technique and problem oriented solution sessions for a day or two. Intensive courses say for "Thesaurus" building are various ways to update the knowledge and acquire skills for the developing field.

The Government agencies are best sponsors besides the professionals associations and educational channels which are agencies of the Government besides private organisations sponsorship.

These channels i.e. Professional Associations try to create:-

1. Professional solidarity at all levels:
2. Provide information of the activities:
3. To make professionals aware of the new techniques;
4. To stimulate the continuing education of professionals;
5. To examine local difficulties;
6. To encourage training of staff development of managers as well as semi-professionals;

7 IMPROVEMENT OF L/I SYSTEM'S MECHANICS OF JOB MARKET

A good staff recruitment policy aims at better matching of skills to job contents. Selecting good personnel requires a personnel policy and practices which will recruit the staff, develop the required knowledge and skill needed in L/I centres and system. Maintain that level of performance and also make the personnel like the organisation and continue to work there. This ensures utilization of optimum capacities of personnel and help them by providing opportunities for self-actualization. This promotes job satisfaction and promote the fulfillment of the objectives of setting up a modern communication based costly information systems in a nation. Job-analysis, job description and employee background will match and clarify the position vis-a-vis the co-worker, equipment, procedures related facts and also specify the code of ethics.

71 Need for Improving Mechanics of Job Market

The market mechanism fails to work even under relatively full employment conditions. Therefore, human resource in general is used at less than optimum level for lack of information, poor mobility, discrimination and lack of motivation. Manpower policy influences the operation of the job market for purpose of improving current and future economic status of individuals.

Manpower studies are meant to avoid avoidable mistakes in the supply of work force and for improving on the human resources by various educational and job information measures.

8 INFORMATION SCENE IN INDIA

The role of all decision making units in man power related programmes is vital.

The units are individuals, Associations, L/IS education system, Government agencies, organisation etc. Unless and until all the decision makers co-operate in co-ordinated way to achieve their individual goals within the common; National-Socio Economic goal of development; these cannot achieve the optimum benefits offered by various decision makers. The information policy should therefore spell out the policy for manpower development.

India is trying to provide information and knowledge useful for daily needs of the society in health, hygiene, occupational skills, agriculture etc. Massive access to information through increased, technology transfer for information system. Centres and education, needs better communication system.

81 Communication Revolution

India is poised for communication revolution by way of introducing laser-beam through fibre optics. This is a radical departure from electric, electronic communication, which transmits words, data, pictures from places, miles apart, without any noise, which other systems have. India has 15 per cent growth of Information services per year which is a great strain on the existing transmission capacities which are overcrowding the urban cable ways. Wave lengths are running short for carrying broadcasts for microwave and satellite links. Optical fiberglass provides a cost effective solution, to these problems. The impact of this method will be dramatic and will revolutionise our communication system.

82 Computers

Computer hardware and software costs are decreasing. Mini computers and terminals are steadily growing and storage capacity is increasing at less costs. Database systems are made available in larger proportion through national and international co- operation and networks. There is increased international bibliographic control & dissemination of information.

91 Role Expectation from the Professionals

In this revolutionised atmosphere the majority of school, college, university, libraries are still following the traditional methods and services. The academic and public libraries are service points to majority of the population. The professionals assume and expect the same custodian role of static linear

contact between user and documents, while the role expected from the new profession is a dynamic one where they are able to enter and move in the communication channels and networks at any point in any direction. They are expected to assume a role of feeding forward in the creative process and pin-point and lacunae in the existing knowledge and creative process. A catalyst role is expected of transferring Information from research to its application. L/I professionals should update through manpower development methods to be media experts as well as counsellers, with greater emphasis on user's environments.

92 CONCLUSION

The National Information Policy is an integrated whole and should cover manpower policy for development of the staff to assume the challenging roles of information manager at all levels.

The human resources development agenda should therefore be reflected in the national information policy the following aspects of manpower development should be spelt out in any policy statement framed for L/I system.

The L/I human resources agenda should be reflected in the national information policy when spelling out the manpower development aspects.

- More matching of men and skills;
- Expansion of specialised L/I Manpower;
- More diffusion of benefits of automation and communication and education at all levels including Public L/I system;
- Reduction and elimination of underemployment (i.e. frustration) arising out of delegation of subprofessional duties to professionals, less than desired utilisation of the capacities of staff by the L/I system;
- Development of L/I centres and system on standardised conditions of services and work-environment, irrespective of geographical areas;
- Increased training, development facilities on-the-job;
- Rapid growth of employment;
- Increased and efficient placement mechanism;
- Equal and equitable status of L/I professionals;
- Increased integration of L/I centres & systems at all levels in the nation, and also integration of all formal / informal learning process i.e. continuing education facilities;
- Fair and progressive career ladders in L&I centres & system;
- Better professional and peer group evaluation of professional work;
- Protection through equitable legislation, statues, rules, etc. from arbitrary

decisions of all managements;

- Better work - hygiene;and
- Better opportunities for self-actualization.

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National Policy Perspective for Library and Information Science Education

P S G Kumar*

Briefly describes the contribution of UGC in evolving a policy perspective towards LIS education. Describes the efforts of IATLIS in this direction in early 1980's. Discusses the efforts of RRR Library Foundation and ILA towards a National Policy on Library and Information System. Gives a draft policy towards LIS education that can go into the overall National Policy. The draft policy highlights the formation of a Standing Committee on LIS Education and Training; Indian Council of Library and Information Science (ICLIS); and National Institute for Library and Information Science (NILIS), with National Information Centre for Library and Information Science (NICLIS).

1 EFFORTS TOWARDS A POLICY

11 Role of UGC

There was no written document laying down certain norms and prescribed standards or projecting a policy, etc., till 1958. A policy on library science education was partially covered by the UGC Library Committee headed by Ranganathan in 1957. A Committee on Library Science was specially appointed by the UGC in 1961 again under the Chairmanship of Ranganathan. This Committee in its report laid down for the first time in the country a detailed pattern for Library and Information Science education. The report published by the UGC entitled Library Science in Indian Universities (1965) stated the objective, levels of courses, teacher and taught ratio, course content, examination, etc. The UGC Panel on Library and Information Science held on 17 and 18 December 1979 redrafted the original report of the Ranganathan Committee and made suggestions with regard to the faculty, qualification for teachers, space requirements, budget, etc, in addition to the course content.

12 Efforts of IATLIS

The Executive Council of IATLIS held on 2 Jan. 1982 at Banares appointed a Committee to draft a "National Policy for LIS Education" under the Chairmanship of P N Kaula, its President with Messrs G D Bhargava, S R Gunjal, Noorul Hasan Khan, Krishan Kumar, P K Mahapatra, K S Raghavan, M Bavakutty, S P Sood and

P S G Kumar, the then Secretary of IATLIS, organised an "All India

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Seminar on National Policy for Library and Information Science Education from 23-26 September 1983 with the sponsorship of the UGC at the Department of Library and Information Science, Nagpur University, Nagpur. Around 40 delegates from all over India participated in the seminar. The following areas were covered in various sessions:

Need for a national policy;

Levels of training and agencies that should handle;

Bibliographic organisation and control in LIS;

Policy for research and training; and

Monitoring evaluation and standardisation.

Thirteen resolutions pertaining to over all national LIS education policy; accreditation; certificate course in library science, correspondence and open university courses, two year MLISc programme; internship; standards; cooperation between library schools and libraries; need for Indian Council of Library and Information Science (ICLIS); National Institute for Library and Information Science (NILIS); 'clearing house' on LIS Education and Training material; inservice training and facilities for research in library and information science; and need for manpower studies were passed.

2 OVERALL NATIONAL POLICY

The Raja Rammohun Roy Library Foundation and Indian Library Association brought out separate drafts on national library and information policy in 1985. Both these drafts touched upon library and information science education.

21 RRRLF Policy Document

The RRRLF Policy document, clause 2b mention as follows:

"To cope with the new developments in library and information service a suitable strategy for manpower development has to be devised. A uniform pattern and standard of library training and education should be followed in all parts of the country. While universities will continue to provide training in higher librarianship, shorter courses be uniformly adopted and introduced for semi-professionals and other library functionaries including even part-time paid or voluntary library staff, and such courses may be conducted by well established organisations or library associations under the supervision of the state government. Research and specialised courses in Library and Information Science will be organised not only by the universities but also by the leading research and library promotional organisations (like National Library, INSDOC, DRTC, RRRLF, etc.). Continuing education or inservice training facilities should be recognised as essential part of manpower development programme in library and information sector".

22 Indian Library Association

Indian Library Association in its draft policy desired for the establishment of a National Council of Education and Research in Library and Information Science under Manpower Development. It mentions:

"7.1 Library Education

Keeping in view the ideal of "libraries for all" and the need for adopting the latest technology, the manpower requirements in terms of training, research and development need to be matched and accordingly, present programmes of education in library and information science call for a periodic review.

7.4 National Centre

In order to promote various education and research activities of high academic standards, a National Centre for Education and Research in Library and Information Science be established on the pattern of National Council of Educational Research and Training."

23 CONPOLIS of Ministry of Human Resource Development

On receiving the drafts, the Government of India set-up a Committee on National Policy on Library and Information System (CONPOLIS) in October 1985 under the Chairmanship of Prof D P Chattopadhyaya with Dr B P Barua as the Member-Secretary. After a series of seminars, symposia and meetings, the committee submitted its report to Government entitled "National Policy on Library and Information System - A presentation" on 30 May 1986. Thereafter, the Government of India set-up an Empowered Committee again under the Chairmanship of Professor D P Chattopadhyaya to assess the policy document and draw-up an action plan. The Empowered Committee submitted its report in March 1988. Though the report has not yet been formally released for public use, it is said that the Empowered Committee reiterate the statement of CONPOLIS on manpower development. Following is the extract on manpower development and professional status from CONPOLIS Report:

National Policy on Library and Information System - A Presentation May 1986.

7.1 In view of the rapidly expanding library and information services and the fast changing character of library and information science, the development of manpower in a planned manner becomes essential. The Indian librarian and information scientist in particular will face the difficult task of carrying the literacy drive on the one hand and dealing with the technological revolution on the other.

7.2 The library and information science courses run by the universities and comparable institutions at the post graduate level should continue to maintain the high standards that have been reached and improve

their quality, in particular by the incorporation of advancing information technology.

7.3 Paraprofessional training courses maybe undertaken by other appropriate agencies, but care must be taken to ensure uniformity and quality of such training all over the country.

7.4 In view of the challenging and dynamic situation in the profession, the Indian library and information professional must be given every facility to refresh his\her expertise, so as to keep abreast of advancing knowledge by a planned development of continuing education programmes in the field.

7.5 Considering the fact that library and information science courses tend to proliferate, introducing on occasions a dilution of standards, there should be an accreditation agency to ensure the standard and the quality of the training imparted.

7.6 The national need of furthering higher education and research in library and information science may be undertaken by a National Centre to be undertaken by a National Centre to be established for the purpose.

7.7 Library and Information Science professionals should be given the status and pay scales as well as academic facilities commensurate with their responsibilities with due regard to the fact that every library is an academic\ research centre and has to function as such.

7.8 The Government of India should recognise the need for the creation of an All India Library Service and implement the plan when feasible. The creation of such a service will strengthen the national network of library and information systems.

On looking at the recommendations of the CONPOLIS, one can realise that LIS education was not comprehended properly. It needs further substantiation and detailing.

3 OTHER DEVELOPMENTS

ILA,CSC on Library and Information Science (E & T)

The Central Sectional Committee on Library and Information Science (E & T) of Indian Library Association organised a workshop on "Norms, Guidelines and Standards for Library and Information Science Education" on 31 July 1991 in Nagpur. The Chairman of the CSC on library and information science Dr P S G Kumar prepared a working document of 84 pages which covered a brief history of education for library and information science in India, present educational frame work, admission criteria, enrolment, medium of instruction, course contents, structure of papers, research, working hours, teaching methods, teaching aids, teaching staff, library, workshop, physical facilities, accreditation, standards for evaluation of library schools, etc. These were

further discussed at XXXV All India Library Conference held at Pune in 1989.

31 IATLIS Seminar on Standards in LIS Education

The IX National Seminar of IATLIS held at Visakhapatnam from August 1991 also discussed in detail the problems and procedure for accreditation.

4 DRAFT POLICY FOR LIS EDUCATION

Presuming that the Government of India will approve the action- plan submitted by the Chattopadhyaya Committee and will adopt a 'National Policy for Library and Information System' very soon, It is suggested here-under a policy segment pertaining to LIS education and manpower planning for incorporation in the overall National Library and Information Policy.

41 Standing Committee on LIS Education and Training

The National Commission on Library and Information Service (NCLIS) shall have a standing committee on LIS educational and training.

411 Constitution

The standing committee shall have the following members:

a. A nominee of the NCLIS (who shall act as the Chairman);

b. Chairman of the Indian Council of Library and Information Science (ICLIS) (Details of which will be discussed later);

c. Director of National Institute of Library and Information Science (NILIS);

d. A representative of the University Grants Commission (not below the rank of Deputy Secretary, generally the one concerned with libraries and library and information science education; or Chairman of its panel on library and information science.

e. Four teachers nominated by NCLIS (one of whom shall be a teacher at certificate level);

f. Three librarians (one each representing an academic, public and a special library) nominated by the NCLIS;

g. A representative of INFLIBNET;

h. A representative of NISSAT;

i. A nominee of Indian Association of Teachers of Library and Information Science (IATLIS); and

j. A nominee of Indian Library Association.

412 Functions

a) The Standing Committee (SC)shall meet not less than two times in a financial year.

b) It shall-

1. Prepare and submit an annual report on the state of LIS education, training and research in India for consideration of NICLIS (which may form the annual report of NICLIS);
2. Review the working of ICLIS and NILIS;
3. Study the state of education and researching university schools and other specialised institutions, certificate level courses, polytechnic course, courses at +2 and +3 levels, etc.
4. Explore areas of cooperation among the schools and various agencies concerned with LIS education;
5. Suggest integrated approach and planning among agencies concerned with LIS education.;
6. Prepare policies for LIS education from time to time for the consideration of the Government;
7. Laydown a set of broad guidelines to ensure compatibility in the approach to the designing of course, running training programme, formulating research proposals, etc .

42 Indian Council of Library and Information Science (ICLIS)

The Government of India should establish Indian Council of Library and Information Science through an Act of the Parliament on the lines of ICAR, ICSSR, ICMR, ICHR, etc.

The composition and structure of the Council may be drawn on the lines of similar existing councils in other disciplines.

421 Functions

The Council shall perform the following functions:

1. Maintain a roster of library schools and libraries in India;
2. Fund research programmes;
3. Award fellowship and scholarships;
4. Publish directories, inventories, rosters, etc.,;
5. Act as an accreditating agency;
6. Support scientific conferences; seminars, workshops,etc;
7. Establish standards for library equipment, practices, formats, networks, etc;
8. Finance for production of teaching material and teaching aids;
9. Suggest levels of courses, curriculum, admission requirements, examination system, etc; and

10. provide grants for strengthening LIS schools in acquiring new technology and run special programmes.

43 National Institute for Library and Information Science (NILIS)

NILIS should be established by ICLIS in order to achieve excellence in LIS education. It should mainly carryout the functions of training, research and advisory service. Following is a detailed list of functions to be performed by NILIS:

1. Conduct advanced level courses (post masters courses);
2. Provide facilities for research in library and information science;
3. Organise teacher training programmes;
4. Refresher courses for practitioners;
5. Carry consultancy services;
6. Run courses in research methodology;
7. Preparation of teaching aids; etc.

44 National Information Centre for Library and Information Science (NICLIS)

Most of the library schools in India are starving for want of suitable and timely literature. If there is a 'National Information Centre', it can not only help library schools and professionals with right information at the right time, but also contribute to overall national economy.

NICLIS may be established in organic relation with (NILIS) or any LIS school in the country which has a sound infrastructure.

441 Objects

The objects of the centre can be grouped into two, viz., short-term objects, and long term objects.

1. Short term objects

Aim at establishing and providing the following units at the earliest.

a.Documentation Centre

To collect, store, organise, retrieve and disseminate documents on library and information science from national and international sources. These include collection of all important:

i.Printed books;

ii.Journals (a comprehensive collection of core journals in L & IS and allied subjects)

iii.Dissertations (MLIS, M.Phil and Ph D submitted to various Indian and foreign universities);

iv. Committee\Commission reports (of various countries on library and information science and services);

v.Conference proceedings, seminar papers, etc.

vi. Library standards;

vii Annual reports of important libraries;

viii. Directories of libraries, library personnel, etc and

ix. Audio visual material on libraries and library science.

b.Clearing house

To collect teaching and training materials; maintain a collection of these aids; announce and distribute these aids on request. These include: reading lists, syllabi, course bibliographies, course outlines, notes developed by faculty members, test problems, lecture notes, teaching aids, etc.

c.Teaching material unit

To collect, produce, duplicate and distribute teaching aids. These include; taped lectures, group discussions, case recordings, phone-records of lectures, diagrams, charts, over- head transparencies, slides, films, video programmes, tape slide programmes, multi media packages, etc.

d. Data unit

To collect, collate, update and provide data. The data services include: libraries, library services, library schools, library personnel, library collections, associations, furniture and equipment, book trade, suppliers of library materials, plans of library buildings, etc.

e.Services

Plan and provide various services to meet the following information needs of users. These comprehend:

i. Current awareness services like current titles, abstracting\indexing services, equipment alert service,etc;

ii.Selective dissemination of Information (SDI) services;

iii. Bibliographic services including retrospective searches;

iv. Reference service;

v. Referral service;

vi. Document delivery;

vii. Translation, etc.

f.Products

To prepare and provide products on a regular basis such as:

Title alert service, state of art reports, news bulletin, ongoing research reports union catalogues of serials, periodicals, conference notifications and grey literature bulletins, etc.

2.Longterm Objects

In addition to the immediate objects mentioned earlier, the centre also aims at the following long term objects:

1. Short term and continuing education programmes; 2.consultancy service; and 3.exchange and interaction with other international\national organisations; etc.

442 Organisational structure

The work of the centre may be organised into the following units:

document centre, clearing house, teaching material, data division, services division and products division.

The library of NICLIS should serve as a model library. It should have a museum of physical bibliography showing specimen of all those that goes into the making of a book.

5 ROLE OF GOVERNMENT

The primary role of the Government is to formulate a National Commission of Library and Information Science and then create an Indian Council of Library and Information Science. The rest will be taken care of by these two organisations.

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Need for New Breed of Information Professionals

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Rapid development of technology witnessed a changing emphasis in the role of information and its management. This changing emphasis necessitates the information professionals to be exposed to the new technologies. Further this necessitates library schools to restructure their curriculum to meet the future needs of the libraries and information centres. This paper analyses the need for new breed of information professionals.

1 INTRODUCTION

Increasing rate of innovation has resulted in substantial transformation of library structure. To-day libraries face an era of turbulent change. The great challenge is to cope with high speed change subject to frequent alterations. Unless librarrians learn to manage these changes they will find it difficult to survive in to-day's conceptive business.

1) The emerging information environment and information conscious society.

2) The information volume and emerging methods of making information in general.

3) Information transfer in specific activity areas, such as education, medicine, business and management.

Manpower constitutes an essential component of all development plans or programmes. It is essentially required for organizing and developing an infrastructure of library and information services in our country. The library schools are expected to play a vital role in their training programme:

- to meet the existing requirements for manpower
- to provide necessary orientation and specialization which can be helpful to develop the manpower on modern lines during the foreseeable future.

Information profession was under serious threat and that if nothing was done to change the trends - it could be deemed to disappear for ever.[1]

In the year 2000, with a world wide communications network available which will provide universal rapid access to knowledge, the information scientist and the librarian will be gone the way of the brontosaurus [2].

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The days of librarian and information officer as we know them are numbered. The emphasis is on AS WE KNOW THEM and the argument is "CHANGE OR BE CHANGED!" [3].

Over the years there have been dire predictions that computerization would spell the total end of library and information work. What has in fact happened is that the boundaries between the roles of libraries, information scientist and computer specialist have become more fluid and less distinct. The career opportunities have widened, not diminished and information technology has an increasingly valuable contribution to make to the work of the organization.

2 PRESENT POSITION

Basically, the role of librarian has not changed through the decades - retrieving information and providing the same for the right person at the right time. From decade to decade only this objective has been pursued but the technique of retrieving information and providing the same have changed. Outstanding characteristics of the professionals through the centuries have been a willingness to provide the information and an intellectual curiosity about its utility. Another characteristic associated is the ability to assess the views of the users. Reasons which may account for the failure are many, but the most important one will be the lack of utilization of modern technologies. Library services are to be organized and properly operated, taking advantage of the technological developments. Until recently it was enough to acquire the ability to manage complex queries, and to provide information. To-day this is not sufficient. Librarians must know how to manage and interact with complex information systems consisting of computer networks. For a profession like ours, which has constantly to interact with society and technological environment, it is essential to review periodically its performance, status and to foresee the environmental changes so that those changes can be appropriately responded to. It is important to perceive the changes that may come about in the nature and scope of services provided to users. It is also essential to gear up ourselves to meet those changes and challenges.

The human resources that are being invested in making new knowledge readily accessible are disproportionately small compared to those invested in generating it. The net result is that new knowledge is not being absorbed into the culture as readily as it is being generated, and some of the value of that knowledge is lost, not being readily accessible to the people who need it. The essential task is distilling new knowledge from the literature and restructuring it for efficient dissemination. The emerging need necessitates that something must be done. The evolution of newer technologies, necessitates a substantial grounding for professionals, to which specialized knowledge could be added

during the professional careers. It is clear that without up-to-date technological knowledge it is impossible to deal with information explosion.

Hallmark of a profession is a commitment to valuable service which has two facets; one is the satisfaction of the serving society and the other is a professional's pride. The abilities and professional competence of those who comprise the majority and professional men and women must be sufficient to command the respect of those whom they serve.

3 NEED FOR NEW BREED

In the present era of economic imbalance and escalating competition, the professional winners will be those who seize and exploit technology as a strategic weapon. The new paragon is an executive who can envision a future and inspire colleagues to join in building the library for the future. No doubt transformation period is the period of structural crisis and a time of confusion about the direction of change.

Now a days the chief competition for the library professionals are the professionals from management and computers. To-day computer professionals are intruding into library profession. Technological advances in recent years have not only eliminated time and other barriers, but also changed the way of many professionals in their operations.

4 NEW TRENDS IN MANAGEMENT

"What will the information profession look like in future years and will there be one?". The doubt gets further strengthened by the successful transformation in management from scientific management era to system and structure era. It is not yet possible to blue print the managerial style of the future. But it is possible to analyze some of the forces that will shape it. Management of the future is a combination of functionally related computerized sub-system and skilled people who will perform the functions. In a complex, unpredictable and rapidly changing world, the organization that recognizes, utilizes and appreciates the pioneering spirit of the information age will succeed. Intelligence and innovations are both, the products and processes of information age .

5 GOLD COLLAR WORKER

The new brain power worker, called as Gold Collar Worker going to overtake white-collar workers, are those people who work with their brains, not their backs. These people are creative and independent and often know more about their jobs than their managers do . Their work will be challenging, not repetitious and occurs in an uncertain environment in which results are rarely predictable or quantifiable. Gold collar workers will be responsible for making all functions from finance, management and data processing to research and development, marketing and organization effectiveness. Gold Collar workers

are a new breed of workers who demand new kind of management intelligence, independent and innovative. These employees are incredibly valuable. They are distinct from their less skilled white-collar counter- parts, as they are from blue-collar laborers.

The new leadership style termed as THINKOVATION (THINKing + innOVATION) (4) is one of the most significant advancements expected in the next decade. If these new breed of workers intrude into the library profession, then the statement "Library profession: will there be one?" will become true.

6 CONCLUSION

To "Save the library profession from ruin" it is essential to reorganize our library schools. The library school should not direct their energies exclusively to traditional, current library needs and practices; they must in addition play a role of an innovator by proposing new developments, investigating the old, re-examining the accepted, experimenting with the untried and in sum serve as leaders in the field. "Implicit in all of this is the acceptance by those responsible for professional education of a wider responsibility than merely producing practitioners for the situation as it is at present : a professional school must also identify future professional trends and needs and prepare practitioners to meet them.(5)

The library schools must educate the profession in such a way that the professionals are in a position to face the technological strategies such as

1. How to protect a technological lead?
2. How to integrate technological strategies with libraries?
3. How will new technology affect the library profession?
4. How to speed up the implementation of this technology?
5. How to motivate and manage as high-tech personnels?

The pace of change is so fast that unless we keep our sight, on tomorrow, it is not possible to keep in touch with today. Therefore it is necessary to resolve to make concerted and dedicated efforts to prepare ourselves for the future. It is needless to say that the profession itself would be the biggest beneficiary in maintaining professional excellence. On the other hand, a failure on this front may threaten the survival of the profession in the long run. It is necessary to put in our best endeavours in discharging our responsibilities to justify the confidence reposed in the profession.

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NISSAT Manpower Development Programmes: awareness among librarians

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The potential utilisation of National information resources depends on the knowledge and skill of the personnel who are responsible for information handling to a great extent. To meet the complicated needs of present information society, a number of educational and training programmes are offered under NISSAT Programme for Library Professionals. Presents the findings of a survey which was conducted mainly to determine the extent of awareness of Manpower development programmes among the Library Professionals.

1 INTRODUCTION

The significant role played by information in the development of socio-cultural and economic environment of the developed and developing countries has been highly emphasised in the present information age.

The effective utilisation of national information for the development of a strong nation depends on the knowledge and skill of the professionals who handle the information. The Library professional no longer remains as a traditional librarian, who just establishes a contact between the users and the documents. The complicated information requirements of the present information society demand expertise, knowledge and competence in information handling among the Library professionals. As the traditional library methods failed to cope up with the increasingly complicated needs of the present information society, an urgent need has been felt for training the library personnel for effective information handling. This need has led to the inclusion of Manpower development programmes as one of the major objectives of NISSAT.

2 NISSAT

The Government of India set up a National Information System for Science and Technology (NISSAT) in 1977 with the following objectives:

1) Provision of National Information Service to meet the needs of information users.

2) Optimum utilisation of existing information services and systems and the development of new services and systems.

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3) Promotion of national and international co-operation for exchange of information.

4) Development of facilities for education and training in information science and technology and in communication, to provide qualified manpower.

5) Encouragement for active participation in research , development and innovation in Information Science and Communication to increase the efficiency of information services.

Promotion of research, development and innovations in information technology.

3 PROGRAMMES ON MANPOWER DEVELOPMENT AND INFORMATION TECHNOLOGY

Number of training programmes and workshops were conducted for Manpower Development in Information Technology under NISSAT to fulfill the above objectives. Various, National, Sectoral and Regional Centres such as, INSDOC, DRTC, DESIDOC, SIET, CSIR and BARC, etc. were identified for conducting training courses and workshops. The objective of these courses is to provide the library professionals, an overall view of the process involved in information handling and to equip them with the ability to perform such kind of work as abstracting,preparation of digests, state-of-the-art and trend reports, and computer information handling etc. Apart from these, a number of workshops and training courses have been conducted for computer application in information handling. A few such programmes are listed below:-

1) Course on Computer Application, Dec. to Jan., 1989-90, INSDOC, New Delhi.

2) Advanced Course on CDS/ISIS for DELNET participants, Dec. 1989, DESIDOC, New Delhi.

3) South Asian Regional Seminar and Workshop on Data Storage, Retrieval and Dissemination in Sciences with particular reference to Chemical and Molecular Bio-sciences at NICRYS, March, 1988, Madras University, Madras.

4) Advanced Training and Users Group Meeting on CDS/ISIS.

5) National Workshop on Common Communication Format, Feb.- March, 1990, NISSAT and ILA, New Delhi.

4 SURVEY

Apart from the above mentioned programmes , a number of similar programmes are conducted by various institutions. But to what extent the library professionals are aware of such programmes? This question has led to this survey, which was made to probe the following two major objectives:-

1) To determine to what extent the library professionals are aware of Manpower development and information technology programmes.

2) To assess how many of the library professionals are benefited by such programmes.

This study has included four types of libraries namely University Libraries, College Libraries, Public Libraries and Technical Libraries in Pondicherry and Madras City.

Library professionals in all levels, in the four types of library systems, which are mentioned under the scope of this study, have been included as sample.

Method of data collection:- A questionnaire was designed (Annexure 1) to collect data from the library professionals. Efforts were made to collect data personally from 50 professionals in Pondicherry and 50 in Madras City. But only 50 responded.Particularly, the response from Public Libraries and Technical Libraries was very low.

Table-1

Percentage of Population Surveyed

Type of Libraries	Percentage of sample
University Libraries	40
College Libraries	30
Public Libraries	14
Technical Libraries	16

Majority of the respondents were reluctant to fill up the questionnaire for reasons which vary from personal to official.

5 ANALYSIS

An analysis of the data collected is:-

Table-2

Percentage of Library professionals who attended Workshops and Seminars

Workshops and Seminars conducted under NISSAT Programmes	Percentage of Library Professionals
1) Workshops and seminars on Manpower Development	14
2) Workshops on ComputerApplication in Information handling and on CCF	34

It is evident from the table 2 that only a very small percentage of library professionals attended Seminars on Manpower Development and less than 40% of the professionals attended workshop on information technology. Very few persons attended more than one workshop and most of those programmes were not conducted under NISSAT. The reasons for not attending the seminar vary. For example, nearly 50% of the respondents who did not attend these programmes said, they were not able to attend because permission was not granted. Others said, that they could not attend due to their family problems and other personal reasons. Of those who availed of the programmes, two thirds were males and one third were females.

Table-3

Library professionals who are not aware of the Workshops and Seminars in various types of libraries

Types of Libraries	Percentage
University Libraries	56
College Libraries	66
Public Libraries	14
Technical Libraries	10

More than 50% of the sample included in this study answered negatively when they were asked whether they were aware of the programmes conducted

under NISSAT.

Table-4

Percentage of Library Professionals who are not aware of the Programmes in the two States

State	Percentage of Library Professionals who are not aware of NISSAT
Madras	44
Pondicherry	56

The awareness among the professionals seems to be less in Pondicherry than in Madras and the reason might be that professionals in Madras show more interest in knowing about such programmes.

6 INFERENCES

The following are the inferences :

1) Though the library professionals are aware of the programmes, they are unable to attend due to the fact that they were not permitted by their authorities.

2) Most of the college libraries have not installed computer due to lack of finance, hence the authorities may be reluctant to depute their staff for programmes of information technology.

3) The awareness of such programmes was found to be less among the professionals and the reasons may be the following:

a) The information regarding such programmes may not have been circulated among the professionals properly.

b) The professionals may lack motivation. This may be partly due to the lack of opportunities in applying such technical knowledge practically in their work environment.

c) Most of the professionals are preoccupied with their daily responsibilities and duties and they do not give much importance to such programmes.

7 RECOMMENDATIONS

The successful implementation of NISSAT programmes depends on popularising them among more professionals and motivating them to attend such programmes. This needs, a co-operative effort on the part of library

professionals, library authorities and the Government. The library officials should be instructed by the Government bodies concerned with libraries, to depute their staff to such programmes. This practice has already been adopted by government technical libraries. Similarly, UGC should urge the library authorities of academic libraries to depute their staff to such programmes.

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ANNEXURE-1

QUESTIONNAIRE

1. Serial Number	:
2. Name of the Institution	:
3. Sex: Male/Female	:
4. Age	:
5. Qualification	:
6. Designation	:
7. Nature of Job	:
8. Year of Experience	:
9. Are you aware that numberof Manpower development programmes are conductedunder NISSAT programme	: Yes / No
10. Have you attended any workshops or training courses in computerapplication in Library & Information Science?	: Yes / No
11. If yes, please specify the details	:
12. If you have attended more than one workshop or training programme, please specify all the details	:
13. If you answer is "No", to to the 10th item please mention the reasons	:
14. Have you attended any workshops or seminars on Manpower development	: Yes / No
15. If yes, please specify the details	:
16. If your answer is "no"please mention the reason	:

Evolution of Library and Information Science Professionals in Karnataka

M K Mohandas*

K C Shet**

Gives data regarding manpower development in Karnataka State for the last five years. Projects the manpower requirement for the beginning of the 21st century. Proposes a three-tier structure for imparting computer education for library professionals.

1 INTRODUCTION

In Karnataka State Library and Information Science education is offered at various levels as follows:

a) Certificate course:	By Department of Public Library
	By Private Institutes
b) Diploma courses :	Only by Government institutions
c) Graduate and Post Graduate Courses:	At University level.

2 PLACEMENT OPPORTUNITIES OF LIBRARY PROFESSIONALS IN KARNATAKA

A study of placement statistics of library professionals in Karnataka have suggests the following.

The required number of the library professionals of Karnataka state:

As on 31.5.1989, in Karnataka there are 2978 public libraries [2]. It is estimated that there are 600 colleges and other institutional libraries in the state [3]. By the turn of the century it is likely to be doubled i.e., 7200 professionals approximately (considered with an assumption of average one professional of library science per library)[[3]. In other words, ten per cent growth rate demand forecast (360 library professionals) has been made. As against this the present production is:

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B.L.I.Sc./M.L.I.Sc.,:	160
Diploma/Certificate :	100
	260

There is a likelihood of shortage of 100 persons / professionals per annum in Karnataka. However, to meet the demand, there is a wide spread recruitment of non-professionals in the library activities. This situation is not influencing healthy development in library science in Karnataka.

Moreover, Government of Karnataka did not fill up any vacancies in the libraries for the last three to five years. Hence the apparent shortage is an illusion.

In order to over come this, certificate courses of one year duration must be augmented in the State.

3 COMPUTER BASED LIBRARY SCIENCE DEVELOPMENT

Due to the impact of computer technology, it is now imperative to deal with computers for all issues related to Library and Information Science. Thus we propose three tier structure of introducing computers in library education in the following manner.

3-TIER STRUCTURE;

(a) Diploma/Certificate courses (Post SSLC/SSC courses)

(b) Graduate Courses: (B.Lib.Sc./B.Lib.I.Sc.)

(c) Post Graduate Courses: M.Lib.Sc/M.L.I.Sc.

The following subjects should be integrated in the existing curricula of Library and Information Science.

(a) Diploma/Certificate Courses:

Essential: Data Processing using Computer

Electives: (i) Word Processing, (ii) DBASE III Plus/DBASE IV (iii) Cobol

(b) Graduate Courses:

Essential : (i) Data Processing, (ii) Computer Organisation

Electives : (i) Programming Languages, (ii) System Analysis and design, (iii) Library Packages.

(c) Post Graduate Courses:

Essential: (i) Automation of Library, (ii) Information Processing.

Electives: (i) Programming Languages, (ii) Computer structure, (iii) System Analysis and Design, (iv) Evaluation of Library Packages, (v) Selec-

tion of Hardware.

There is no two opinion about usage of computers to be integrated in all the levels of library activities. Accordingly every library professional must be trained in the use of computers. Today the library profession is in transient phase in catching up with the computer technology. The proper match takes place only when

a) sufficient fund allocation to the library automation is made,

b) library professional must develop a good knowledge of computers.

The UGC has recommended to set up the INFLIBNET to the Government of India recently. When such a network becomes operational, Library and Information Science professionals should not loose time to grab the opportunity. They should accelerate the process of automation in all the libraries. It will be appropriate to rename the existing title of "Library" in the educational and research institutions into "Library and Information Centre".

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TABLE 1. UNIVERSITY LEVEL PRODUCTION

Name of University	Year	B.Lib.Sc. Students		M.L.I.Sc. Students	
		Admitted	Passed	Admitted	Passed
Karnataka Uty. Dharwad	1984-85	36	23	5	4
	1985-86	34	20	9	9
	1986-87	47	32	8	7
	1987-88	46	45	10	10
	1989-89	48	47	10	9
Mangalore Uniy Mangalore	1984-85	11	13		
	1985-86	15	10		
	1986-87	14	15	No course	
	1987-88	13	11		
	1989-89	14	14		
Mysore Uniy Mysore	1984-85	25	22	13	9
	1985-86	24	18	13	9
	1986-87	24	13	12	12
	1987-88			11	11
	1989-89				
Bangalore Uniy Bangalore	1984-85	25	17	8	8
	1985-86	25	20	10	6
	1986-87	46	28	10	4
	1987-88	22	15	8	8
	1989-89	22	11	8	7
Gulburga Uniy Gulburga		n.a.			

TABLE 2. DIPLOMA & CERTIFICATE LEVEL PRODUCTION

Name of Polytechnics	Year	Diploma course		Certificate course	
		Students Admitted	Passed	Students Admitted	Passed
Src Govt.institute Of Middle Management,B'lore	1983-84	8	-		
	1984-85	25	-		
	1985-86	21	7	No course	
	1986-87	10	20		
	1987-88	12	18		
	1989-89	30	7		
Govt.women's Polytechnic Hassan	1983-84	18			
	1984-85		18	No course	
Academy Of General Education Manipal	1986-87			12	12
	1987-88	No course		12	12
	1988-89			12	12
Govt.women's Polytechnic Mangalore	1984-85	16	13		
	1985-86	23	17	No course	
	1986-87	34	10		
	1987-88	31	18		
	1988-89	30	27		
Govt.women's Polytechnic Bangalore	1984-85				
	1985-86				
	1986-87		No course		
	1987-88				
	1988-89				

National Information Policy for Manpower Development: A Conceptual Framework

Shalini Rewadikar*

Explains the aims of National Information Policy and the importance of Manpower as a vital resource for achieving these aims. Brings out the interdependence of manpower development on organisational environment. Stresses the need for preparing professionals for assuming the dynamic role in the information dominated society with latest information technology, computers and communication systems. Indicates the changing roles of the professionals in the information infrastructure of India.

1 INTRODUCTION

There is universal recognition of the importance of information as a resource. As the awareness is growing in developing countries as well, policy makers at national level should ensure that the professional and specialised knowledge is fully and properly used in guiding social and economic development. Any policy on the development of information services should be part of a nation's scientific , technical and socio-economic policy.

11 Objectives of Information Policy

A National Information Policy aims to achieve and:-

1. Ensure optimum utilization of accumulated knowledge in science, technology, economics and social sciences for the betterment of their society.
2. Ensure availability of adequate information for decisions for Government and private enterprises.
3. Focus the attention of Government and private enterprise on problems of information and its use.
4. Provide information services relevant to present needs together with capability for developing services to meet the future needs of generators, processors, disseminators, and users of information.
5. Promote national and international co-operation on the exchange of information and expertise.

12 Policy Making Process

The Unesco Handbook for Information System and Services describes the process of policy making as below:

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PROCESS OF POLICY-MAKING involves;

a) Initiation of Policy Development

b) Review of existing policies

c) Analysis of existing policies

d) Recommendation regarding new and revised policies

e) The process of formulating policies & schedule of suggested list of priorities

f) Preparation of policy manual

g) Dissemination of policy

h) Securing Periodic Policy review.

2 HUMAN RESOURCES DEVELOPMENT (HRD)

Human Resources can be developed by various investments. These can be formal education, on-the-job-training; exhaustive job- market information and health and welfare scheme. However education is the key factor in the development of human resource. Education provides the largest proportion of needed persons and formulates necessary professional, occupational skills and attitudes.

Thus manpower means the quantitative and qualitative human assets of people in a society. We are literally interpreting the term to mean "Power of Man" both in the terms of size and talents and level of education as Margerett Slater puts it.

21 Need for Manpower Development

Need for constant and continuous development of human resource arises as libraries and information centres all over the world are undergoing and incorporating changes, particularly the technological changes . The Professionals working in L/I system cannot remain indifferent to these developments.

Harvard-Williams states that "We are living in an exciting profession, where changes can motivate us to future change and where we to a large degree can control its direction, provided we are aware of the world developments in education, communication, and information dominated society. That means a great deal more than libraries".

The developed societies have necessary cultural and psychological ability to respond to innovations particularly the technological change. The developing countries (societies) require added efforts to develop the necessary abilities, attitudes and skills.

Human-resource is generally considered to have unlimited potential but many of their abilities go waste in an organisation or a system.

Therefore manpower development concerns itself with how to achieve and tap the optimum capacities of persons, so that they can translate the objectives of the information programmes as planned at National level.

22 Information Handling for HRD

The human resource development therefore should aim;

1) To develop professionals for assuming the role and responsibility of providing effective transfer of information to users in a changing subject field.

2) To develop scientific outlook and awareness of their responsibility in the dynamic developments taking place in the information science field.

3) To develop sensitivity to overall background and developments of information users in the concerned organisation.

4) To impart knowledge, skills and attitudes to L & I personnel which would contribute to development programmes, through effective information handling technique.

23 Organisational Environment

a) Any enquiry in Human resource development will depend on the organisational structure of the Information system or Library system in which the personnel are employed.

A well developed human resource is ineffective in an organisation which is not well organised. Effective and efficient performance depends on the environmental factors. Organisations comprise of interdependent variables of task, technology, structure and people. Out of which people are the most important. It is the quality of skills and knowledge which determines to a large extent the quality of the information services provided by the personnel.

b) Interdependence of organisation on education

Similarly there is dependence of organisation on education for the supply of general and professional knowledge and general mental attitudes. But the managerial skills are developed according to the system's or organisation's environment on-the-job.

24 Economic Aspects of Manpower Development

However Human resource development increases in response to incentives and is influenced by many monetary and non-monetary cues. But at the same time it should again be emphasised that education is the major source of supply of necessary knowledge and skills. As such the L/IS education should stand the efficiency criterion. There is need for continuous reassessment of priorities in a changing field. There is tendency to continue what has been done,

regardless of changing circumstances. "If this tendency goes unchecked there is danger of producing personnel who would be obsolete for tomorrow's job market "as Harvard - Williams points out.

25 Manpower Planning for Education

ManPower Planning is done:

i) In order to alert and gear the education sector and achieving the desired goal. This needs comprehensive surveys and forecast of patterns of future skill developments.

ii) Estimates of survey are acceptable basis for educational planning.

iii) Since individuals cannot foresee future educational requirements, organisation, Government and leaders in the profession will have to take the responsibility, to gear the requisite changes.

25 Manpower Programmes

These are determined by the nature of power groups involved in the development of these programmes and also constraints exercised by other groups having political or economic power.

Any Policy statement to be effective should spell out the various manpower development related decisions , their goals, the financial, political, judicial aspects involved in these are also important consideration that should guide Information Policy.

3 ASPECTS OF INFORMATION POLICY

Management and development of information system and programmes for decision making at governmental and private organisation is a process by which knowledge, talents and energies of people are directed towards efficient functioning of an information system. The necessary resources are allocated to achieve these objectives. To manage L & I centres, needs exercise of judgement and control in planning, implementation and adjustment of activities, to achieve the desired objective. Managerial attitudes need to be developed irrespective of the size of Information system or services.

31 Policy Decision

Policy decisions have four important aspects which rest around; 1. Collection of material; 2. Services & access to material, 3. Staff resources; and 4. Management consideration.

Out of the above four the staff resources and manpower development in general are pertinent to our discussion.

4 MANPOWER POLICY

The important considerations of any manpower policy for the profession

rests around development, maintenance and utilization of actual and potential number of the work force:

a) Redefining the categories of personnel needed and boundaries of the profession.

b) Ensuring continuous supply of trained talent and retraining them in the profession.

c) Improving the L/I system's mechanics of Job market.

For this purpose the co-operation and co-ordination of all the decision-making units is essential. The decision-making units in the manpower related programmes are :

1) Individuals who decide to take up the necessary education, general and professional, at given salary levels within a geographic area. They work for income, prestige and status of the job, and opportunity the job offers for self actualization.

2) Associations give strength and solidarity to their members and develop the profession, control services offered to users and also try to control work environment.

Unions try to protect members from arbitrary decision, decide contractual rules and minimise risks (Associations also take increasing interests in union activities these days).

3) L/IS educational institutions try to provide necessary skills and knowledge for managing L/I systems and centres and create necessary attitudes & values towards profession.

4) Organisations try to survive in a competitive world and produce leaders for the profession along with promotion, Of the organisation's objectives; by way of providing expeditious and efficient, services to users at least cost and offer development programmes for employees.

5) Government and management of L/I Centres try to promote best use of L/I systems and centres. These try to generate the climate of growth. They also try to project and promote employee's welfare i.e. the professionals, semi professionals as well as unskilled workers.

The Government regulates contractual arrangement between management and institutions & provides necessary resources.

5 REDEFINING BOUNDARIES OF PROFESSION

Information work and science as a professional discipline is concerned with the accumulation, storage and transfer of recorded knowledge. While goal of education for this work is to produce persons of general competence in the theories and techniques associated with information, the professional also acquires certain attitudes, exhibits willingness to serve the communities and has

the courage to defend the professional convictions with tenacity.

The functions of the information specialists have increased and revised in two respects: (i) Deeper knowledge and understanding of terms, language and findings of science, technology even for the traditional methods of subject cataloguing and document Indexing in any special field; (2) new proficiency is needed in disciplines like linguistics, systems science, the computing sciences, the psychology of information processing as these contribute to more sophisticated methods of information analysis and retrieval.

51 The Boundaries of Profession

The boundaries of profession have changed and moved from the preservation function i.e. Archives to the use of documents i.e. Library Services. The deeper and microlevel of depth subject analysis for user's services, have also undergone changes, from Bibliography making to Documentation and now to information science, techniques and technology.

There is diversity of nomenclature applied for L/I professionals but the Unesco handbooks advocates, functional approach and specifies the following categories:

a. Information educators;

b. Information Researcher;

c. Information Manager;

d. Information Analysts;

e. Information Distributors;

f. Information Support personnel.

Any policy to be successful, will need to specify and spell out these aspects of categorising their capabilities and skills, their status and role in development of staff skills and attitudes.

Professionalisation is an important aspect in any policy matter.

6 ROLE OF PROFESSIONAL ASSOCIATIONS, GOVERNMENT AGENCIES

Role of professional associations, Government agencies is very important in ensuring continuous education.

A manpower policy tries to ensure continuous supply of trained talent and retaining them in the profession.

Due to rapid changes training & retraining should also be continuous process in any profession. Development of manpower can be made by curriculum development and implementations through formal and informal

methods. The education should be need based.

61 METHODS OF CONTINUOUS EDUCATION

Conference, workshops, seminars, Special courses, short course, special assignments, technique and problem oriented solution sessions for a day or two. Intensive courses say for "Thesaurus" building are various ways to update the knowledge and acquire skills for the developing field.

The Government agencies are best sponsors besides the professionals associations and educational channels which are agencies of the Government besides private organisations sponsorship.

These channels i.e. Professional Associations try to create:-

1. Professional solidarity at all levels:
2. Provide information of the activities:
3. To make professionals aware of the new techniques;
4. To stimulate the continuing education of professionals;
5. To examine local difficulties;
6. To encourage training of staff development of managers as well as semi-professionals;

7 IMPROVEMENT OF L/I SYSTEM'S MECHANICS OF JOB MARKET

A good staff recruitment policy aims at better matching of skills to job contents. Selecting good personnel requires a personnel policy and practices which will recruit the staff, develop the required knowledge and skill needed in L/I centres and system. Maintain that level of performance and also make the personnel like the organisation and continue to work there. This ensures utilization of optimum capacities of personnel and help them by providing opportunities for self-actualization. This promotes job satisfaction and promote the fulfillment of the objectives of setting up a modern communication based costly information systems in a nation. Job-analysis, job description and employee background will match and clarify the position vis-a-vis the co-worker, equipment, procedures related facts and also specify the code of ethics.

71 Need for Improving Mechanics of Job Market

The market mechanism fails to work even under relatively full employment conditions. Therefore, human resource in general is used at less than optimum level for lack of information, poor mobility, discrimination and lack of motivation. Manpower policy influences the operation of the job market for purpose of improving current and future economic status of individuals.

Manpower studies are meant to avoid avoidable mistakes in the supply of work force and for improving on the human resources by various educational and job information measures.

8 INFORMATION SCENE IN INDIA

The role of all decision making units in man power related programmes is vital.

The units are individuals, Associations, L/IS education system, Government agencies, organisation etc. Unless and until all the decision makers co-operate in co-ordinated way to achieve their individual goals within the common; National-Socio Economic goal of development; these cannot achieve the optimum benefits offered by various decision makers. The information policy should therefore spell out the policy for manpower development.

India is trying to provide information and knowledge useful for daily needs of the society in health, hygiene, occupational skills, agriculture etc. Massive access to information through increased, technology transfer for information system. Centres and education, needs better communication system.

81 Communication Revolution

India is poised for communication revolution by way of introducing laser-beam through fibre optics. This is a radical departure from electric, electronic communication, which transmits words, data, pictures from places, miles apart, without any noise, which other systems have. India has 15 per cent growth of Information services per year which is a great strain on the existing transmission capacities which are overcrowding the urban cable ways. Wave lengths are running short for carrying broadcasts for microwave and satellite links. Optical fiberglass provides a cost effective solution, to these problems. The impact of this method will be dramatic and will revolutionise our communication system.

82 Computers

Computer hardware and software costs are decreasing. Mini computers and terminals are steadily growing and storage capacity is increasing at less costs. Database systems are made available in larger proportion through national and international co- operation and networks. There is increased international bibliographic control & dissemination of information.

91 Role Expectation from the Professionals

In this revolutionised atmosphere the majority of school, college, university, libraries are still following the traditional methods and services. The academic and public libraries are service points to majority of the population. The professionals assume and expect the same custodian role of static linear

contact between user and documents, while the role expected from the new profession is a dynamic one where they are able to enter and move in the communication channels and networks at any point in any direction. They are expected to assume a role of feeding forward in the creative process and pin-point and lacunae in the existing knowledge and creative process. A catalyst role is expected of transferring Information from research to its application. L/I professionals should update through manpower development methods to be media experts as well as counsellers, with greater emphasis on user's environments.

92 CONCLUSION

The National Information Policy is an integrated whole and should cover manpower policy for development of the staff to assume the challenging roles of information manager at all levels.

The human resources development agenda should therefore be reflected in the national information policy the following aspects of manpower development should be spelt out in any policy statement framed for L/I system.

The L/I human resources agenda should be reflected in the national information policy when spelling out the manpower development aspects.

- More matching of men and skills;
- Expansion of specialised L/I Manpower;
- More diffusion of benefits of automation and communication and education at all levels including Public L/I system;
- Reduction and elimination of underemployment (i.e. frustration) arising out of delegation of subprofessional duties to professionals, less than desired utilisation of the capacities of staff by the L/I system;
- Development of L/I centres and system on standardised conditions of services and work-environment, irrespective of geographical areas;
- Increased training, development facilities on-the-job;
- Rapid growth of employment;
- Increased and efficient placement mechanism;
- Equal and equitable status of L/I professionals;
- Increased integration of L/I centres & systems at all levels in the nation, and also integration of all formal / informal learning process i.e. continuing education facilities;
- Fair and progressive career ladders in L&I centres & system;
- Better professional and peer group evaluation of professional work;
- Protection through equitable legislation, statues, rules, etc. from arbitrary

decisions of all managements;

- Better work - hygiene;and
- Better opportunities for self-actualization.

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National Policy Perspective for Library and Information Science Education

P S G Kumar*

Briefly describes the contribution of UGC in evolving a policy perspective towards LIS education. Describes the efforts of IATLIS in this direction in early 1980's. Discusses the efforts of RRR Library Foundation and ILA towards a National Policy on Library and Information System. Gives a draft policy towards LIS education that can go into the overall National Policy. The draft policy highlights the formation of a Standing Committee on LIS Education and Training; Indian Council of Library and Information Science (ICLIS); and National Institute for Library and Information Science (NILIS), with National Information Centre for Library and Information Science (NICLIS).

1 EFFORTS TOWARDS A POLICY

11 Role of UGC

There was no written document laying down certain norms and prescribed standards or projecting a policy, etc., till 1958. A policy on library science education was partially covered by the UGC Library Committee headed by Ranganathan in 1957. A Committee on Library Science was specially appointed by the UGC in 1961 again under the Chairmanship of Ranganathan. This Committee in its report laid down for the first time in the country a detailed pattern for Library and Information Science education. The report published by the UGC entitled Library Science in Indian Universities (1965) stated the objective, levels of courses, teacher and taught ratio, course content, examination, etc. The UGC Panel on Library and Information Science held on 17 and 18 December 1979 redrafted the original report of the Ranganathan Committee and made suggestions with regard to the faculty, qualification for teachers, space requirements, budget, etc, in addition to the course content.

12 Efforts of IATLIS

The Executive Council of IATLIS held on 2 Jan. 1982 at Banares appointed a Committee to draft a "National Policy for LIS Education" under the Chairmanship of P N Kaula, its President with Messrs G D Bhargava, S R Gunjal, Noorul Hasan Khan, Krishan Kumar, P K Mahapatra, K S Raghavan, M Bavakutty, S P Sood and

P S G Kumar, the then Secretary of IATLIS, organised an "All India

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Seminar on National Policy for Library and Information Science Education from 23-26 September 1983 with the sponsorship of the UGC at the Department of Library and Information Science, Nagpur University, Nagpur. Around 40 delegates from all over India participated in the seminar. The following areas were covered in various sessions:

Need for a national policy;

Levels of training and agencies that should handle;

Bibliographic organisation and control in LIS;

Policy for research and training; and

Monitoring evaluation and standardisation.

Thirteen resolutions pertaining to over all national LIS education policy; accreditation; certificate course in library science, correspondence and open university courses, two year MLISc programme; internship; standards; cooperation between library schools and libraries; need for Indian Council of Library and Information Science (ICLIS); National Institute for Library and Information Science (NILIS); 'clearing house' on LIS Education and Training material; inservice training and facilities for research in library and information science; and need for manpower studies were passed.

2 OVERALL NATIONAL POLICY

The Raja Rammohun Roy Library Foundation and Indian Library Association brought out separate drafts on national library and information policy in 1985. Both these drafts touched upon library and information science education.

21 RRRLF Policy Document

The RRRLF Policy document, clause 2b mention as follows:

"To cope with the new developments in library and information service a suitable strategy for manpower development has to be devised. A uniform pattern and standard of library training and education should be followed in all parts of the country. While universities will continue to provide training in higher librarianship, shorter courses be uniformly adopted and introduced for semi-professionals and other library functionaries including even part-time paid or voluntary library staff, and such courses may be conducted by well established organisations or library associations under the supervision of the state government. Research and specialised courses in Library and Information Science will be organised not only by the universities but also by the leading research and library promotional organisations (like National Library, INSDOC, DRTC, RRRLF, etc.). Continuing education or inservice training facilities should be recognised as essential part of manpower development programme in library and information sector".

22 Indian Library Association

Indian Library Association in its draft policy desired for the establishment of a National Council of Education and Research in Library and Information Science under Manpower Development. It mentions:

"7.1 Library Education

Keeping in view the ideal of "libraries for all" and the need for adopting the latest technology, the manpower requirements in terms of training, research and development need to be matched and accordingly, present programmes of education in library and information science call for a periodic review.

7.4 National Centre

In order to promote various education and research activities of high academic standards, a National Centre for Education and Research in Library and Information Science be established on the pattern of National Council of Educational Research and Training."

23 CONPOLIS of Ministry of Human Resource Development

On receiving the drafts, the Government of India set-up a Committee on National Policy on Library and Information System (CONPOLIS) in October 1985 under the Chairmanship of Prof D P Chattopadhyaya with Dr B P Barua as the Member-Secretary. After a series of seminars, symposia and meetings, the committee submitted its report to Government entitled "National Policy on Library and Information System - A presentation" on 30 May 1986. Thereafter, the Government of India set-up an Empowered Committee again under the Chairmanship of Professor D P Chattopadhyaya to assess the policy document and draw-up an action plan. The Empowered Committee submitted its report in March 1988. Though the report has not yet been formally released for public use, it is said that the Empowered Committee reiterate the statement of CONPOLIS on manpower development. Following is the extract on manpower development and professional status from CONPOLIS Report:

National Policy on Library and Information System - A Presentation May 1986.

7.1 In view of the rapidly expanding library and information services and the fast changing character of library and information science, the development of manpower in a planned manner becomes essential. The Indian librarian and information scientist in particular will face the difficult task of carrying the literacy drive on the one hand and dealing with the technological revolution on the other.

7.2 The library and information science courses run by the universities and comparable institutions at the post graduate level should continue to maintain the high standards that have been reached and improve

their quality, in particular by the incorporation of advancing information technology.

7.3 Paraprofessional training courses maybe undertaken by other appropriate agencies, but care must be taken to ensure uniformity and quality of such training all over the country.

7.4 In view of the challenging and dynamic situation in the profession, the Indian library and information professional must be given every facility to refresh his\her expertise, so as to keep abreast of advancing knowledge by a planned development of continuing education programmes in the field.

7.5 Considering the fact that library and information science courses tend to proliferate, introducing on occasions a dilution of standards, there should be an accreditation agency to ensure the standard and the quality of the training imparted.

7.6 The national need of furthering higher education and research in library and information science may be undertaken by a National Centre to be undertaken by a National Centre to be established for the purpose.

7.7 Library and Information Science professionals should be given the status and pay scales as well as academic facilities commensurate with their responsibilities with due regard to the fact that every library is an academic\ research centre and has to function as such.

7.8 The Government of India should recognise the need for the creation of an All India Library Service and implement the plan when feasible. The creation of such a service will strengthen the national network of library and information systems.

On looking at the recommendations of the CONPOLIS, one can realise that LIS education was not comprehended properly. It needs further substantiation and detailing.

3 OTHER DEVELOPMENTS

ILA,CSC on Library and Information Science (E & T)

The Central Sectional Committee on Library and Information Science (E & T) of Indian Library Association organised a workshop on "Norms, Guidelines and Standards for Library and Information Science Education" on 31 July 1991 in Nagpur. The Chairman of the CSC on library and information science Dr P S G Kumar prepared a working document of 84 pages which covered a brief history of education for library and information science in India, present educational frame work, admission criteria, enrolment, medium of instruction, course contents, structure of papers, research, working hours, teaching methods, teaching aids, teaching staff, library, workshop, physical facilities, accreditation, standards for evaluation of library schools, etc. These were

further discussed at XXXV All India Library Conference held at Pune in 1989.

31 IATLIS Seminar on Standards in LIS Education

The IX National Seminar of IATLIS held at Visakhapatnam from August 1991 also discussed in detail the problems and procedure for accreditation.

4 DRAFT POLICY FOR LIS EDUCATION

Presuming that the Government of India will approve the action- plan submitted by the Chattopadhyaya Committee and will adopt a 'National Policy for Library and Information System' very soon, It is suggested here-under a policy segment pertaining to LIS education and manpower planning for incorporation in the overall National Library and Information Policy.

41 Standing Committee on LIS Education and Training

The National Commission on Library and Information Service (NCLIS) shall have a standing committee on LIS educational and training.

411 Constitution

The standing committee shall have the following members:

a. A nominee of the NCLIS (who shall act as the Chairman);

b. Chairman of the Indian Council of Library and Information Science (ICLIS) (Details of which will be discussed later);

c. Director of National Institute of Library and Information Science (NILIS);

d. A representative of the University Grants Commission (not below the rank of Deputy Secretary, generally the one concerned with libraries and library and information science education; or Chairman of its panel on library and information science.

e. Four teachers nominated by NCLIS (one of whom shall be a teacher at certificate level);

f. Three librarians (one each representing an academic, public and a special library) nominated by the NCLIS;

g. A representative of INFLIBNET;

h. A representative of NISSAT;

i. A nominee of Indian Association of Teachers of Library and Information Science (IATLIS); and

j. A nominee of Indian Library Association.

412 Functions

a) The Standing Committee (SC)shall meet not less than two times in a financial year.

b) It shall-

1. Prepare and submit an annual report on the state of LIS education, training and research in India for consideration of NICLIS (which may form the annual report of NICLIS);
2. Review the working of ICLIS and NILIS;
3. Study the state of education and researching university schools and other specialised institutions, certificate level courses, polytechnic course, courses at +2 and +3 levels, etc.
4. Explore areas of cooperation among the schools and various agencies concerned with LIS education;
5. Suggest integrated approach and planning among agencies concerned with LIS education.;
6. Prepare policies for LIS education from time to time for the consideration of the Government;
7. Laydown a set of broad guidelines to ensure compatibility in the approach to the designing of course, running training programme, formulating research proposals, etc .

42 Indian Council of Library and Information Science (ICLIS)

The Government of India should establish Indian Council of Library and Information Science through an Act of the Parliament on the lines of ICAR, ICSSR, ICMR, ICHR, etc.

The composition and structure of the Council may be drawn on the lines of similar existing councils in other disciplines.

421 Functions

The Council shall perform the following functions:

1. Maintain a roster of library schools and libraries in India;
2. Fund research programmes;
3. Award fellowship and scholarships;
4. Publish directories, inventories, rosters, etc.,;
5. Act as an accreditating agency;
6. Support scientific conferences; seminars, workshops,etc;
7. Establish standards for library equipment, practices, formats, networks, etc;
8. Finance for production of teaching material and teaching aids;
9. Suggest levels of courses, curriculum, admission requirements, examination system, etc; and

10. provide grants for strengthening LIS schools in acquiring new technology and run special programmes.

43 National Institute for Library and Information Science (NILIS)

NILIS should be established by ICLIS in order to achieve excellence in LIS education. It should mainly carryout the functions of training, research and advisory service. Following is a detailed list of functions to be performed by NILIS:

1. Conduct advanced level courses (post masters courses);
2. Provide facilities for research in library and information science;
3. Organise teacher training programmes;
4. Refresher courses for practitioners;
5. Carry consultancy services;
6. Run courses in research methodology;
7. Preparation of teaching aids; etc.

44 National Information Centre for Library and Information Science (NICLIS)

Most of the library schools in India are starving for want of suitable and timely literature. If there is a 'National Information Centre', it can not only help library schools and professionals with right information at the right time, but also contribute to overall national economy.

NICLIS may be established in organic relation with (NILIS) or any LIS school in the country which has a sound infrastructure.

441 Objects

The objects of the centre can be grouped into two, viz., short-term objects, and long term objects.

1. Short term objects

Aim at establishing and providing the following units at the earliest.

a.Documentation Centre

To collect, store, organise, retrieve and disseminate documents on library and information science from national and international sources. These include collection of all important:

i.Printed books;

ii.Journals (a comprehensive collection of core journals in L & IS and allied subjects)

iii.Dissertations (MLIS, M.Phil and Ph D submitted to various Indian and foreign universities);

iv. Committee\Commission reports (of various countries on library and information science and services);

v.Conference proceedings, seminar papers, etc.

vi. Library standards;

vii Annual reports of important libraries;

viii. Directories of libraries, library personnel, etc and

ix. Audio visual material on libraries and library science.

b.Clearing house

To collect teaching and training materials; maintain a collection of these aids; announce and distribute these aids on request. These include: reading lists, syllabi, course bibliographies, course outlines, notes developed by faculty members, test problems, lecture notes, teaching aids, etc.

c.Teaching material unit

To collect, produce, duplicate and distribute teaching aids. These include; taped lectures, group discussions, case recordings, phone-records of lectures, diagrams, charts, over- head transparencies, slides, films, video programmes, tape slide programmes, multi media packages, etc.

d. Data unit

To collect, collate, update and provide data. The data services include: libraries, library services, library schools, library personnel, library collections, associations, furniture and equipment, book trade, suppliers of library materials, plans of library buildings, etc.

e.Services

Plan and provide various services to meet the following information needs of users. These comprehend:

i. Current awareness services like current titles, abstracting\indexing services, equipment alert service,etc;

ii.Selective dissemination of Information (SDI) services;

iii. Bibliographic services including retrospective searches;

iv. Reference service;

v. Referral service;

vi. Document delivery;

vii. Translation, etc.

f.Products

To prepare and provide products on a regular basis such as:

Title alert service, state of art reports, news bulletin, ongoing research reports union catalogues of serials, periodicals, conference notifications and grey literature bulletins, etc.

2.Longterm Objects

In addition to the immediate objects mentioned earlier, the centre also aims at the following long term objects:

1. Short term and continuing education programmes; 2.consultancy service; and 3.exchange and interaction with other international\national organisations; etc.

442 Organisational structure

The work of the centre may be organised into the following units:

document centre, clearing house, teaching material, data division, services division and products division.

The library of NICLIS should serve as a model library. It should have a museum of physical bibliography showing specimen of all those that goes into the making of a book.

5 ROLE OF GOVERNMENT

The primary role of the Government is to formulate a National Commission of Library and Information Science and then create an Indian Council of Library and Information Science. The rest will be taken care of by these two organisations.

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Need for New Breed of Information Professionals

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Rapid development of technology witnessed a changing emphasis in the role of information and its management. This changing emphasis necessitates the information professionals to be exposed to the new technologies. Further this necessitates library schools to restructure their curriculum to meet the future needs of the libraries and information centres. This paper analyses the need for new breed of information professionals.

1 INTRODUCTION

Increasing rate of innovation has resulted in substantial transformation of library structure. To-day libraries face an era of turbulent change. The great challenge is to cope with high speed change subject to frequent alterations. Unless librarrians learn to manage these changes they will find it difficult to survive in to-day's conceptive business.

1) The emerging information environment and information conscious society.

2) The information volume and emerging methods of making information in general.

3) Information transfer in specific activity areas, such as education, medicine, business and management.

Manpower constitutes an essential component of all development plans or programmes. It is essentially required for organizing and developing an infrastructure of library and information services in our country. The library schools are expected to play a vital role in their training programme:

- to meet the existing requirements for manpower
- to provide necessary orientation and specialization which can be helpful to develop the manpower on modern lines during the foreseeable future.

Information profession was under serious threat and that if nothing was done to change the trends - it could be deemed to disappear for ever.[1]

In the year 2000, with a world wide communications network available which will provide universal rapid access to knowledge, the information scientist and the librarian will be gone the way of the brontosaurus [2].

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The days of librarian and information officer as we know them are numbered. The emphasis is on AS WE KNOW THEM and the argument is "CHANGE OR BE CHANGED!" [3].

Over the years there have been dire predictions that computerization would spell the total end of library and information work. What has in fact happened is that the boundaries between the roles of libraries, information scientist and computer specialist have become more fluid and less distinct. The career opportunities have widened, not diminished and information technology has an increasingly valuable contribution to make to the work of the organization.

2 PRESENT POSITION

Basically, the role of librarian has not changed through the decades - retrieving information and providing the same for the right person at the right time. From decade to decade only this objective has been pursued but the technique of retrieving information and providing the same have changed. Outstanding characteristics of the professionals through the centuries have been a willingness to provide the information and an intellectual curiosity about its utility. Another characteristic associated is the ability to assess the views of the users. Reasons which may account for the failure are many, but the most important one will be the lack of utilization of modern technologies. Library services are to be organized and properly operated, taking advantage of the technological developments. Until recently it was enough to acquire the ability to manage complex queries, and to provide information. To-day this is not sufficient. Librarians must know how to manage and interact with complex information systems consisting of computer networks. For a profession like ours, which has constantly to interact with society and technological environment, it is essential to review periodically its performance, status and to foresee the environmental changes so that those changes can be appropriately responded to. It is important to perceive the changes that may come about in the nature and scope of services provided to users. It is also essential to gear up ourselves to meet those changes and challenges.

The human resources that are being invested in making new knowledge readily accessible are disproportionately small compared to those invested in generating it. The net result is that new knowledge is not being absorbed into the culture as readily as it is being generated, and some of the value of that knowledge is lost, not being readily accessible to the people who need it. The essential task is distilling new knowledge from the literature and restructuring it for efficient dissemination. The emerging need necessitates that something must be done. The evolution of newer technologies, necessitates a substantial grounding for professionals, to which specialized knowledge could be added

during the professional careers. It is clear that without up-to-date technological knowledge it is impossible to deal with information explosion.

Hallmark of a profession is a commitment to valuable service which has two facets; one is the satisfaction of the serving society and the other is a professional's pride. The abilities and professional competence of those who comprise the majority and professional men and women must be sufficient to command the respect of those whom they serve.

3 NEED FOR NEW BREED

In the present era of economic imbalance and escalating competition, the professional winners will be those who seize and exploit technology as a strategic weapon. The new paragon is an executive who can envision a future and inspire colleagues to join in building the library for the future. No doubt transformation period is the period of structural crisis and a time of confusion about the direction of change.

Now a days the chief competition for the library professionals are the professionals from management and computers. To-day computer professionals are intruding into library profession. Technological advances in recent years have not only eliminated time and other barriers, but also changed the way of many professionals in their operations.

4 NEW TRENDS IN MANAGEMENT

"What will the information profession look like in future years and will there be one?". The doubt gets further strengthened by the successful transformation in management from scientific management era to system and structure era. It is not yet possible to blue print the managerial style of the future. But it is possible to analyze some of the forces that will shape it. Management of the future is a combination of functionally related computerized sub-system and skilled people who will perform the functions. In a complex, unpredictable and rapidly changing world, the organization that recognizes, utilizes and appreciates the pioneering spirit of the information age will succeed. Intelligence and innovations are both, the products and processes of information age .

5 GOLD COLLAR WORKER

The new brain power worker, called as Gold Collar Worker going to overtake white-collar workers, are those people who work with their brains, not their backs. These people are creative and independent and often know more about their jobs than their managers do . Their work will be challenging, not repetitious and occurs in an uncertain environment in which results are rarely predictable or quantifiable. Gold collar workers will be responsible for making all functions from finance, management and data processing to research and development, marketing and organization effectiveness. Gold Collar workers

are a new breed of workers who demand new kind of management intelligence, independent and innovative. These employees are incredibly valuable. They are distinct from their less skilled white-collar counter- parts, as they are from blue-collar laborers.

The new leadership style termed as THINKOVATION (THINKing + innOVATION) (4) is one of the most significant advancements expected in the next decade. If these new breed of workers intrude into the library profession, then the statement "Library profession: will there be one?" will become true.

6 CONCLUSION

To "Save the library profession from ruin" it is essential to reorganize our library schools. The library school should not direct their energies exclusively to traditional, current library needs and practices; they must in addition play a role of an innovator by proposing new developments, investigating the old, re-examining the accepted, experimenting with the untried and in sum serve as leaders in the field. "Implicit in all of this is the acceptance by those responsible for professional education of a wider responsibility than merely producing practitioners for the situation as it is at present : a professional school must also identify future professional trends and needs and prepare practitioners to meet them.(5)

The library schools must educate the profession in such a way that the professionals are in a position to face the technological strategies such as

1. How to protect a technological lead?
2. How to integrate technological strategies with libraries?
3. How will new technology affect the library profession?
4. How to speed up the implementation of this technology?
5. How to motivate and manage as high-tech personnels?

The pace of change is so fast that unless we keep our sight, on tomorrow, it is not possible to keep in touch with today. Therefore it is necessary to resolve to make concerted and dedicated efforts to prepare ourselves for the future. It is needless to say that the profession itself would be the biggest beneficiary in maintaining professional excellence. On the other hand, a failure on this front may threaten the survival of the profession in the long run. It is necessary to put in our best endeavours in discharging our responsibilities to justify the confidence reposed in the profession.

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NISSAT Manpower Development Programmes: awareness among librarians

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The potential utilisation of National information resources depends on the knowledge and skill of the personnel who are responsible for information handling to a great extent. To meet the complicated needs of present information society, a number of educational and training programmes are offered under NISSAT Programme for Library Professionals. Presents the findings of a survey which was conducted mainly to determine the extent of awareness of Manpower development programmes among the Library Professionals.

1 INTRODUCTION

The significant role played by information in the development of socio-cultural and economic environment of the developed and developing countries has been highly emphasised in the present information age.

The effective utilisation of national information for the development of a strong nation depends on the knowledge and skill of the professionals who handle the information. The Library professional no longer remains as a traditional librarian, who just establishes a contact between the users and the documents. The complicated information requirements of the present information society demand expertise, knowledge and competence in information handling among the Library professionals. As the traditional library methods failed to cope up with the increasingly complicated needs of the present information society, an urgent need has been felt for training the library personnel for effective information handling. This need has led to the inclusion of Manpower development programmes as one of the major objectives of NISSAT.

2 NISSAT

The Government of India set up a National Information System for Science and Technology (NISSAT) in 1977 with the following objectives:

1) Provision of National Information Service to meet the needs of information users.

2) Optimum utilisation of existing information services and systems and the development of new services and systems.

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3) Promotion of national and international co-operation for exchange of information.

4) Development of facilities for education and training in information science and technology and in communication, to provide qualified manpower.

5) Encouragement for active participation in research , development and innovation in Information Science and Communication to increase the efficiency of information services.

Promotion of research, development and innovations in information technology.

3 PROGRAMMES ON MANPOWER DEVELOPMENT AND INFORMATION TECHNOLOGY

Number of training programmes and workshops were conducted for Manpower Development in Information Technology under NISSAT to fulfill the above objectives. Various, National, Sectoral and Regional Centres such as, INSDOC, DRTC, DESIDOC, SIET, CSIR and BARC, etc. were identified for conducting training courses and workshops. The objective of these courses is to provide the library professionals, an overall view of the process involved in information handling and to equip them with the ability to perform such kind of work as abstracting,preparation of digests, state-of-the-art and trend reports, and computer information handling etc. Apart from these, a number of workshops and training courses have been conducted for computer application in information handling. A few such programmes are listed below:-

1) Course on Computer Application, Dec. to Jan., 1989-90, INSDOC, New Delhi.

2) Advanced Course on CDS/ISIS for DELNET participants, Dec. 1989, DESIDOC, New Delhi.

3) South Asian Regional Seminar and Workshop on Data Storage, Retrieval and Dissemination in Sciences with particular reference to Chemical and Molecular Bio-sciences at NICRYS, March, 1988, Madras University, Madras.

4) Advanced Training and Users Group Meeting on CDS/ISIS.

5) National Workshop on Common Communication Format, Feb.- March, 1990, NISSAT and ILA, New Delhi.

4 SURVEY

Apart from the above mentioned programmes , a number of similar programmes are conducted by various institutions. But to what extent the library professionals are aware of such programmes? This question has led to this survey, which was made to probe the following two major objectives:-

1) To determine to what extent the library professionals are aware of Manpower development and information technology programmes.

2) To assess how many of the library professionals are benefited by such programmes.

This study has included four types of libraries namely University Libraries, College Libraries, Public Libraries and Technical Libraries in Pondicherry and Madras City.

Library professionals in all levels, in the four types of library systems, which are mentioned under the scope of this study, have been included as sample.

Method of data collection:- A questionnaire was designed (Annexure 1) to collect data from the library professionals. Efforts were made to collect data personally from 50 professionals in Pondicherry and 50 in Madras City. But only 50 responded.Particularly, the response from Public Libraries and Technical Libraries was very low.

Table-1

Percentage of Population Surveyed

Type of Libraries	Percentage of sample
University Libraries	40
College Libraries	30
Public Libraries	14
Technical Libraries	16

Majority of the respondents were reluctant to fill up the questionnaire for reasons which vary from personal to official.

5 ANALYSIS

An analysis of the data collected is:-

Table-2

Percentage of Library professionals who attended Workshops and Seminars

Workshops and Seminars conducted under NISSAT Programmes	Percentage of Library Professionals
1) Workshops and seminars on Manpower Development	14
2) Workshops on ComputerApplication in Information handling and on CCF	34

It is evident from the table 2 that only a very small percentage of library professionals attended Seminars on Manpower Development and less than 40% of the professionals attended workshop on information technology. Very few persons attended more than one workshop and most of those programmes were not conducted under NISSAT. The reasons for not attending the seminar vary. For example, nearly 50% of the respondents who did not attend these programmes said, they were not able to attend because permission was not granted. Others said, that they could not attend due to their family problems and other personal reasons. Of those who availed of the programmes, two thirds were males and one third were females.

Table-3

Library professionals who are not aware of the Workshops and Seminars in various types of libraries

Types of Libraries	Percentage
University Libraries	56
College Libraries	66
Public Libraries	14
Technical Libraries	10

More than 50% of the sample included in this study answered negatively when they were asked whether they were aware of the programmes conducted

under NISSAT.

Table-4

Percentage of Library Professionals who are not aware of the Programmes in the two States

State	Percentage of Library Professionals who are not aware of NISSAT
Madras	44
Pondicherry	56

The awareness among the professionals seems to be less in Pondicherry than in Madras and the reason might be that professionals in Madras show more interest in knowing about such programmes.

6 INFERENCES

The following are the inferences :

1) Though the library professionals are aware of the programmes, they are unable to attend due to the fact that they were not permitted by their authorities.

2) Most of the college libraries have not installed computer due to lack of finance, hence the authorities may be reluctant to depute their staff for programmes of information technology.

3) The awareness of such programmes was found to be less among the professionals and the reasons may be the following:

a) The information regarding such programmes may not have been circulated among the professionals properly.

b) The professionals may lack motivation. This may be partly due to the lack of opportunities in applying such technical knowledge practically in their work environment.

c) Most of the professionals are preoccupied with their daily responsibilities and duties and they do not give much importance to such programmes.

7 RECOMMENDATIONS

The successful implementation of NISSAT programmes depends on popularising them among more professionals and motivating them to attend such programmes. This needs, a co-operative effort on the part of library

professionals, library authorities and the Government. The library officials should be instructed by the Government bodies concerned with libraries, to depute their staff to such programmes. This practice has already been adopted by government technical libraries. Similarly, UGC should urge the library authorities of academic libraries to depute their staff to such programmes.

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ANNEXURE-1

QUESTIONNAIRE

1. Serial Number	:
2. Name of the Institution	:
3. Sex: Male/Female	:
4. Age	:
5. Qualification	:
6. Designation	:
7. Nature of Job	:
8. Year of Experience	:
9. Are you aware that numberof Manpower development programmes are conductedunder NISSAT programme	: Yes / No
10. Have you attended any workshops or training courses in computerapplication in Library & Information Science?	: Yes / No
11. If yes, please specify the details	:
12. If you have attended more than one workshop or training programme, please specify all the details	:
13. If you answer is "No", to to the 10th item please mention the reasons	:
14. Have you attended any workshops or seminars on Manpower development	: Yes / No
15. If yes, please specify the details	:
16. If your answer is "no"please mention the reason	:

Acquiring CD-ROM Technology for Libraries

Vinod Kanwar*

Deals with various aspects of CD-ROM technology and its acquisition in libraries. Briefly explains the storage media and the need for acquiring new optical storage devices especially CD- ROM technology. The selection of CD-ROM products to be acquired is made keeping in view the user's needs, the cost of the products and the funds available. Highlights the advantages and limitations of the CD-ROM technology as applicable to the libraries, the equipment needed for the system, its availability, the cost and its future prospects.

1 INTRODUCTION

Optical technology has opened up a new method of data storage and retrieval for libraries. CD-ROM (Compact Disc-Read Only Memory) is a branch in the optical disc family tree. It is the most exciting technological development to affect information specialists since the advent of online systems in the early 1970s. CD- ROMs employ the same technology that is used with the commercially sold audio compact discs. The basic difference lies in the fact that CD-ROMs are formatted for data instead of the sound. The libraries are moving rapidly towards adopting the newest form of electronic publishing CD-ROM technology.

11 What is CD-ROM?

Compact Disc Read Only Memory is a plastic disc 4.72 inches in diameter with a storage capacity of over 500 megabytes which is roughly equal to 250,000 page of text, or 1500 floppy discs or 50 hard discs (1). CD-ROM is an optically based medium used for storage of data. Through a mastering process, data are encoded on an optical disc, later, the data are read back using a CD-ROM drive. Normally a CD-ROM product consists of the database, which resides on the CD-ROM, and the software, which instructs the computer how to access the information, usually distributed on a floppy disc. As the name indicates data on CD-ROMs cannot be erased, added to, or edited.

According to Saviers (4) the key feature of the CD-ROM medium, which have attracted great attention are:

- it has a large storage capacity;
- it is used in a computer-based information delivery system;
- it provides a read only medium and

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- it can be mass-produced economically.

CD-ROM was launched at just the right time, in 1984 at the peak of the microcomputer revolution. Till data several products have been developed and are available in the market.

2 EQUIPMENT

Hardware requirements include a microcomputer, CD-ROM player, printer and possibly a modem for those CD-ROM products with online computability, such as Dialog On Disc or WILSONONDISC.

21 Microcomputer

A review of the promotional literature on various CD-ROM products indicates that IBM/PC is the most frequently recommended microcomputer, with the XT and AT models preferred.

22 CD-ROM Drive

Hitachi, Phillips, Sony, Toshiba and many others are now shipping CD-ROM drives.

23 Printer and Modem

The primary consideration in printer selection is durability. The printers will be used directly by patrons, so an inexpensive dot matrix printer with an easy to operate control is recommended. Since it is likely that more and more CD-ROM products will have an online interface, a modem may be desirable.

24 Compatibility

Just as various brands of microcomputers and CD-ROM players are not compatible, the same is true for printers, modem and telecommunication software. It is necessary for one to select the pieces which have ability to fit.

3 ADVANTAGES

Information distribution appears to be the main application for CD-ROM at the moment. This new technology offers several distinct advantages over other information retrieval systems.

a) Libraries can provide unlimited access for a fixed annual cost. The patrons can use this database frequently without extra charge.

b) Patrons may obtain printed search result; this saves substantial time since patrons no longer need to copy citations by hand.

c) Patrons will have access to more precise search techniques. Many CD-ROM products allow for Boolean and keyword searching, along with the ability to limit searches by specific criteria. This will allow for faster and more efficient location of needed information.

d) Patrons can use CD-ROM products without staff assistance. This not

only saves the time of staff, but it can allow patrons spontaneous access to CD-ROM data base.

e) Retrieval speed is faster than that of traditional indexes. CD-ROM technology can allow patrons to pinpoint needed information much faster than with a print or COM index.

f) This technology could decrease the demand for simple online literature searches.

g) Highly trained staff would have to spend less time conducting easy computerized searches. This might free staff for more complex searches and other professional duties.

h) It can be used to train both patrons and staff in information retrieval techniques. Depending on which CD-ROM data bases are purchased, they may also prove useful as ready reference tools or bibliographic instruction aids.

4 LIMITATIONS

a) Current technology allows for use by only one person at a time, although this may soon be changed. Traditional print indexes allow a number of patrons to access different volumes simultaneously.

b) CD-ROM products require a substantial investment in equipment. Such equipment also require maintenance at an additional cost.

c) CD-ROM workstations are not as portable as volume of print index. Thus the use of CD-ROM products may be confined to specified locations where equipment can be located (electrical outlets, etc.)

d) Subscription to indexes on CD-ROM is relatively expensive, frequently more than that for the print versions.

e) Some patrons will require staff assistance, even with the most user-friendly of the CD-ROM products. Some patrons are still vary of computers and prefer using the traditional print indexes.

f) CD-ROM workstations will require frequent paper replacement, i.e. staff will regularly be called upon to load paper into the printer when the supply becomes low.

5 SELECTION OF CD-ROM FOR LIBRARIES

A library will want to acquire only those CD-ROM products best suited to its unique information needs. Selection of CD-ROM product will depend in large part on the instructional and research needs of the library community. To provide patrons with a successful search experience via CD-ROM technology should be the goal of library.

In this case, the acquisition policy would be to purchase only user friendly products with broad subject coverage, then ensure that most of the materials cited were owned by the library.

The library should acquire only those products which are not already available in the library in print format.

The library should purchase those products which can be integrated directly into the curriculum.

There are currently over 40 CD-ROM products of potential interest to academic libraries.

Index	Vendor	Date	Annual Subscription	Update frequency
Books in print Plus;	Bowker Electronic Publishing, N.Y.	Current	$795	Quarterly
Ulrich's plus		-do-	$295	-do-
Chemical Abstracts	Digital Equipment Corp.CD-ROM Pub. Dedford	1980	$1195	-do-
ERIC	Dialog Information Services	1981 (1966-80 on 2 other discs)	$1950 $3450 (for threediscs)	-do-
LISA	Silver Platter Information	1967	$995	Annually
Life Sciences	Cambridge Scientific Abstracts	8/84	$3150	Quarterly

(taken in parts from Gatten, et al, 1987).

There are some basic features that a librarian can look for when considering acquiring publications on CD-ROM. These features are size of database, updating requirements and price.

The most important factor in determining if a database is suitable for a CD system is size. Databases larger than 300 to 500 megabytes must be distilled into subsets for compact disc distribution. Tailored subsets for individual libraries are precluded by the high cost of the master disc, so a subset will have to be created that many libraries will use.

Libraries will continue to be a major market for CD-ROM products whether these products are specifically aimed at librarians or not.

CD-ROM allows libraries to overcome a number of problems. The obvious one is the limited amount of storage space but it can also contribute to the efficiency and security of libraries.

CDs with large capacity and low cost of production, have capabilities not achievable now with other technology. It is clear that they can perform some storage and retrieval functions better than mainframe or telecommunication system or desktop pcs with floppy discs. In addition, cataloguing, acquisitions and even public access catalogues can be based efficiently on CD systems.

6 COST OF CD-ROM PRODUCTS

Pricing of CD-ROM products cover a broad range. Factors affecting price include the update cycle, general availability of the information, perceived value to users, links to hardcopy, features of software, pricing of competitive products and the hardware included.

The majority of products are priced below US $ 5000. Library products typically fall in the two categories of price ranging from US $ 1000 to $ 500, including reader[5]. The most highly priced product is updated weekly. Production costs continue to be relatively high but the price of the product is not dictated solely by its frequency of update. It also reflects the suppliers view of the value of this product to his customers.

The cost of CD information system are low. Although producing a master disc costs several thousand dollars, production of injection-moulded copies from the master is $ 10 to $20 each or less[1]

7 MARKET POTENTIAL

As a distribution medium, CD-ROM compares well with other media. Apart from capacity, its greatest advantage is the ability to produce mass multiple copies very cheaply. The CD products have not replaced their other information products, but are complementary to them. Each of the media has its own niche. Paper requires no technology for access to the information. Online distribution has the potential for continuous updating. Microform can be produced in-house, rather than mastering outside the organisation. Erasable CD has a great potential for both online and microform.

CD-ROM is also a storage technology with the advantage of large capacity. According to Peniston [3] Phillips survey found that 25% of the managers planned to use CD-ROM for archival or library use. LISA has already recovered its development costs after a year. There is a great potential for the increased growth rate for CD-ROMs. The technology is maturing with increasing compatibility between the various systems available. Disadvantages in the technology are being overcome by the technical developments, such as double speed drives, and WORM. Prices of the hardware are falling, although not for the product development costs. CD-ROM as a young information medium still has some way to go in market penetration.

8 FUTURE OF CD-ROM PRODUCTS AND TECHNOLOGY

81 Products

The trends in CD-ROM products point to a number of directions. End-user-oriented products will begin to predominate both in number and in delivered services. The emphasis in use of CD-ROM will be less on its mass storage capacity as an archive. The space will be used to make the products more flexible and adaptable to the user's requirements. This will include software to manipulate the retrieval data.

There is likely to be a rapid reduction in product prices. The lowering of price will be made possible by a drop in premastering costs and reproduction costs. It will also be influenced by the economics of sale as the market for CD-ROM products grows. As more publishers produce more products on CD-ROM for the same market, prices will become an important competitive issue and prices will fall sharply.

82 Technology

One of the limitations of the CD-ROM is its lack of sufficient capacity to handle really large databases on a single disc. Great advances have been made with techniques for compressing data so that it can occupy one-fifth or less of the space it would require in uncompressed form. This increased capacity will make CD-ROM attractive for many more applications.

Most products come with their own retrieval software integrated into the product. This means that only one product can be used at a time. This problem can be solved by standardizing the retrieval software. This approach is being taken with the consumer-orientated version of the technology being promoted by Phillips in the form of CD-Interactive (CD-I). What is required is the placement of processing power in the reader itself. This would allow a different retrieval software to be loaded in each drive and to be accessed via the PC alternatively and quickly via a suitable multi-drive interface. Several companies have developed drive stacks to allow all the discs to be stored centrally.

In the near future, there will be lot of improvements in the design of CD system. The following CDs will be available. WORM (Write Once Read Many); DRAW (Direct Read After Write), where there is user workspace on the optical disc itself; CD-PROM (Programmable); and CD-I (CD-Interactive) which will handle music, speech, still pictures, graphics, computer programmes and computer data. Further in the future are erasable optical discs that can be used as floppies now, but with many times the storage capacity.

9 CONCLUSION

At the initial stage of introducing optical technology, libraries and information centres may face various problems, such as selecting hardware,

software, and staff training. These can be overcome by careful planning and assistance from international bodies. Nevertheless, as it looks now, the electronic and optical technologies have a great potential for libraries and information centres in providing up-to-date information to the scientists and researchers in developing countries.

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CD-ROM Technology For Library And Information Retrieval Applications

A Kottai*

Discusses CD-ROM technology for library and information retrieval applications, CD-ROM - based systems configuration, on line Vs CD-ROM, advantages and applications and future trends.

1 INTRODUCTION

As we know, abstracting and indexing services have been produced in printed form in computerized form for batch searching, and later for online searching; some database producers have also published sections of their databases on floppy discs for searching on the user's PC. The latest form in which some databases are appearing is in compact Disc-Read Only Memory (CD-ROM). These small 4.72" discs can store upto 600 megabytes of information (or 200,000 pages of text). This capacity gives the database producers the ability, in some cases, to put the whole of an online database on one of these discs; and larger databases can be divided up over two or more discs if necessary.

2 CD-ROM BASED INFORMATION RETRIEVAL SYSTEM

11 System Configuration

A CD-ROM based system consists of the following sub-systems:

1. Micro computer
2. CD-ROM drive
3. Interface card
4. CD-ROM database
5. Software

111 Micro computer

* IBM/PC or any true compatible system with MS DOS/PC DOS operating system and any standard parallel printer can be used;
* A minimum RAM size of 640 KB is required for most systems;
* Atleast one floppy disk drive of either 5.1/4" or 3-1/2" diskette will be required to load and install the software, Hard disk is recommended;
* Several micro computers including Apple macintosh are compatible with different drives. However, not all micro computers are compatible with

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* Informatics India PVT,LTD.,Bangalore.

all types of drives;

* The IBM- PC range of machines or any compatible system is recommended since most drives, disks and software available in the market are compatible with IBM PC; and

* A colour monitor is recommended since CD-ROM search softwares use windows and highlight features in colour, we will recommend a PC/AT configuration with IBM/RAM and colour monitor.

112 Optical disk drive

Drive is a device on which CD-ROM discs (databases) are mounted for searching. The drive has a laser directed reading mechanism to read the disc.

1121 Multiple drive system

A set of drives can be inter-connected, all of which can be accessed from a single computer terminal. This is called DAISY CHAINING and is useful if your database comes in multiple discs (MEDLINE, INSPEC, BIOSIS for example covers multiple discs).

1122 Jute-box drives

If you have single drive and several discs, instead of using a multiple drive system, you can buy a Juke-box type system where a Jute-box holds several discs and can automatically mount the desired disc onto your drive.

1123 Multi-user system

In this environment one or more drives can be simultaneously accessed by several user terminals like in case of on-line. This is a latest development.

113 Interface card

This card acts as an independent interface between the microcomputer and disk drives. The card is usually supplied with the drive of the supplier.

114 CD-ROM database

The CD-ROM is an optical storage medium for high volume information storage. Most of the public domain databases currently made available on a disk. Not all disks are compatible to all drives. While ordering for the database you must tell the supplier which drive you have or you intend to buy. The manufacturer will make available the disk compatible to your drive.

115 Software

Software is usually supplied by the suppliers of the disk (database) and is proprietary in nature. Two types of software required:

1. Search software to search and retrieve information from the database;

2. Drive software, to install CD-ROM drive. This software establishes the communication between your drive and search software supplied by the database supplier. Each database producers supplies his own drive software, which is again different for different type of drives; and
3. Microsoft has came out with a new drive software called MSCDEX which stands for MS-DOS CD-ROM Extensions. If you use MSCDEX Software your PC can be interfaced with any CD-ROM drive since most drive manufacturers are providing MSCDEX version of their drive.

12 Installation

Installing CD-ROM system involves interfacing the optical drive and microcomputer. The manual provided by your drive/database supplier gives installation procedure step-by-step.Alternatively, you can seem the assistance of the supplier. The basic installation procedures are as follows:

a) Inserting the interface card in the microcomputer system;

b) Installing the drive using set up software; and

c) Installing the search software for running the databases.

13 Training

The training needs are minimal. Most database suppliers provide a built-in tutorial for self learning. However, it is important to know and get well trained in understanding the content and structure of the database. Half-a-day training programme is adequate to gain familiarity with the system and one or two databases.

14 Documentation

The CD-ROM databases supplier gives an user manual with the discs. The manual is generally sufficient to understand and gain familiarity with the supplier and its software. For each database, the database producer separately provides search aids, such as thesaurus, list of journals covered, subject classification followed, etc. These documentations are essential to master searching a given database.

3 CD-ROM AND FUTURE TRENDS

The CD-ROM technology will have strong effects in future among Library and Information professionals. It is a very progressive field of research. This technology incorporates text, graphics, digital audio and still frame etc. The following are the future trends:

* The diversity and growth of titles in high usage databases;
* more PC's equipped with CD-ROM drives;
* prices lowered for CD-ROM drives;
* CD-ROM software interfaces enhanced;

* continued impact on the way information is delivered; and

* increased user acceptance.

21 CD-ROM Industry Growth

The following table gives CD-ROM industry growth rates:

Year	Readers	Revenue	Titles
198	728,800	$ 83.3 million	390
1988	1,71,000	$381 million	628
1989	3,45,000	$571 million	1418
1990	5,00,000	$ 1 billion	2700
1991	1 million	$ 2 billion	4000

Source: DIALOG Information Company

This includes in-house and entertainment titles shipped in calendar year.

3 ADVANTAGES AND APPLICATIONS

31 Advantages

* It does away with the necessity to pay telecommunications charges to access remote online systems, and the connect time charges levied by those systems; by-passing telecommunication problems could be quite a significant advantage;

* It gives the searcher all the power of the retrieval software of major online systems. This software is normally included on the disc with the database;

* It gives unlimited access for one annual subscription, thereby simplifying costings and also eliminates financial pressures while searching;

* It has a large storage capacity, durability, and low cost of reproduction;

* It can help to introduce more people, particularly end- users, to computerized literature searching; and

* It can combine text, graphics, audio and moving images.

32 Disadvantages

* The cost of the databases. As with printed abstracts and indexes, an annual subscription would normally be returned for each database on CD-ROM; thus would have important consequences for the financing of information retrieval in the library / information centre:

* The number of sources available is much less in CD-ROM form. It would

be more economical to search infrequently used databases online rather than to subscribe to the CD-ROM database;

* CD-ROM creates logistical problems, access is limited to one person per CD installation; this could be remedied in the future multi user system, but response time could be severally affected;

* Currency of CD-ROM products is not as good as the online version; it falls between the online and printed products.

* Lack of compatibility of equipment and software; the problem of standardization is being sorted out;

* Other possible disadvantages are: Slower response time than on-line for more complex searches; all features available online are always available on the CD-ROM; lack of standard retrieval software compels searchers to learn different systems.

33 Library Applications

Library market is being so much flooded with titles in the last few years. Several directories are now being published offered like books-in-print, CD-ROM in-PRINT, ULRICH International Periodical Directory, has become an annual publishing feature. Library applications today include

1. Collection building
2. Cataloguing
3. Public Access Catalogue
4. Indexing and Abstracting.

331 Collection Building

Several reference books are being planned for publishing nd a few have already been published on CD-ROM, offering cost advantages in buying. Examples:

Title	Cost in	
	Print	CD-ROM
Kirk & Othmer Encyclopadia of Chemical Technology (28 Vol.) by Dinzon On Disc	$7000	1500
Grothier Encyclopedia	$ 650	395

* Books in-print plus, a CD-ROM version offers its quarterly updated discs, forth-coming titles also. The software permits generating lists by any combination of authors, titles, publication, subjects etc., and allows printing purchase order directly on a selected vendor;

* Ulrich's plus has the same software as books-in-print lus;

* These disks offer 1.5 million bibliographic records each and allows online ordering on selected vendors;

* McGraw-Hill, Pergamon, and Wiley have started releasing their reference, titles on CD-ROM;

* Micro-soft bookshelf is a Library of ten reference works stored on a single CD-ROM disc. It includes American Heritage Dictionary, Rogets Thesaurus, World Almanao, Bartlet's Familiar Quotations, US Zip Code Directory, Chicago Style Manual, etc. etc.

With CD-ROM publishing activity going vigorous, CD-ROM is emerging as a successful collection building alternative for budget starved Libraries.

332 Cataloguing

This is a matter exciting application area that has entered library profession's environment.

* Library Corporation's first introduction of Bibliophile, containing full English language collection of LC records made a beginning in CD-ROM based cataloguing and retrospective conversion.

* Today there are several systems offering bibliographic recordings of LC plus other ..... and university library collections for efficient retrospective conversions and local cataloguing. Their products include:

* LASERQUEST by General Research Corporation

* BIBLIOFILE by Library Corporation

* LASER CAT by New England Library network

* OCLC's CAT CD-450

* BNB (British National Bibliography)

Libraries are increasingly using CD based system for retrospective conversion, as it is proving to be economical.

333 Public Access Catalog (PAC)

There is an increasing switch-over from online catalogue to PAC as they are found to be

* Economical to produce

* Easy to distribute within a campus or shared Library network

* It can be accessed online in a LAN environment

* It can also be integrated with online circulation control

* Far cheaper in terms of hardware and software investents.

The complete collection of all Indian University Libraries can be brought out as PAC very economically with the currently available technology.

334 Indexing and Abstracting

Bibliographic databases were the first to appear on CD-ROM. Today most of the major databases appear on CD-ROM which include, MEDLINE (medicine), BIOSIS (biological abstracts), INSPEC, COMPENDEX (Computerized Engineering index), P[SYCLIT (psychological abstracts), SOCIOFILE, MATHFILE, CAB, AGRIS, AGRICOLA, etc. Many titles are published more than one publisher. Example: MEDLINE and NTIS are published by both DIALOG and Silver Platter.

CD-ROM publishers like DIALOG, and HW Wilson, who are also in on-line business are offering a combination package of access to CD-ROM for back files and access to on-line for current years and every current updates.

4 ONLINE vs CD-ROM

When CD-ROM indicated its market success, researchers forecast the decline in online. The two media became targets of speculative comparison. While there was an initial decline in the usage of online by academic market, it was nowhere near threatening the online industry. Both online and CD-ROM are electronic media for information delivery with different delivery and cost mechanisms. In library environment with CD-ROM databases becoming available, online usage will surely decline in some segments. Following is a comparison of online and CD-ROM advantages.

ONLINE	CD-ROM
- Access Technology	- Storage Technology
- Magnetic Storage	- Optical Storage
- 4500 + Databases	- 400 + Databases
- Share the Databases	- Own/lease the Databases
- Pay as you use	- Pay before you use
- More you use, more you pay	- More you use,Less you pay
- Prepared Searching	- Casual Searching
- Fast Searching	- Slow Searching
- Multiple File Searching	- Single File Searching
- Fast & Real- Time Updating	- Slow updating
- Main-Frame/Super - mini - based	- PC Based
- Search, Get & Pay	- Pay, Get & Search

5 CD-ROM AND INFORMATICS

Informatics has been market leader for CD-ROM drives and Databases in India. A partial list of CD-ROM installations is given in Annexure-1. We are supplying the world famous Hitachi drives. We are the official agents in India for DIALOG who are the world leaders in oline information industry and CD-ROM databases.

51 How Informatics Can Help You?

* We advise on the selection of system;
* We provide installation and training support;
* We can be your consultants for a turn-key set up and implementation of CD-ROM based INformation retrieval system.

6 GOOD NEWS AND BAD NEWS ABOUT CD-ROM

61 The Good News

The import of CD-ROM is exempted from customs duty in ndia.

62 The Bad News

Exemption is applicable to UGC only. Not even to all the universities, as all universities are not administrative subsets of UGC in legal terms. Why only UGC? why not all universities and colleges, why not all ICMR, ICAR, and CSIR Labs? Why not DBT, DST, DAE, funded institutions? After all they are all Govt. agencies set up to serve the public interest. Sooner or later all of them will qualify for exemptions with UGC procedure. A concerned beaurocrat in Government has to be convinced in writing to issue a general circular.

7 CONCLUSION

It is too early to say, what impact CD-ROM will have on Indian library and information environment. It would seem that, in relation to online searching, CD-ROM products would only be viable if heavy use was made of that source. In practice, searchers would make use of both Online searching and CD-ROM searching. Most people seem to agree that it is online 'and' CD- ROM, rather than Online 'versus" CD-ROM. This raises still important issues for the managers of library and information services.

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3. **WILLIAMS (Martha).** *CD-ROM poses threat to online industry. (CD-DATA Report. 5, 7; May 1989).*

ANNEXURE 1

A PARTIAL LIST OF OUR CD-ROM DRIVE INSTALLATIONS

S.NO.	NAME OF THE ORGANIZATIONS	PLACE
1	Aeronautical Development Agency (ADA),	Bangalore
2	Aligarh Muslim University,	Aligarh
3	All India Institute of Medical Sciences,	New Delhi
4	Anna University (Centre for Biotechnology),	Madras
5	Anna University (Central Library),	Madras
6	Assam Agricultural University,	Jorhat
7	Banaras Hindu University,	Varanasi
8	Bharath Heavy Electricals Ltd.,(BHEL),	Hyderabad
9	Bose Institute,	Calcutta
10	Centre for Development Advanced Computing (CDAC),	Bangalore
11	Central Food Technological Research Institute (CFTRI),	Mysore
12	Central Machine Tools Institute (CMTI),	Bangalore
13	Central Water & Power Research Station, Pune	
14	Central Drug Research Institute, Lucknow	
15	Central Institute for Fresh Water Agriculture,	Bhubaneswar
16	Dept. of Biotechnology, Govt. of India,	New Delhi
17	Defence Scientific Information and Documentation Centre (DESIDOC),	New Delhi
18	Documentation Research and Training Centre (DRTC),	Bangalore
19	Indira Gandhi Centre for Atomic Research,	Kalpakkam
20	Inspectroate of Factories and Boilers,	Goa
21	Indian Institute of Technology (IIT),	New Delhi
22	Indian Veterinary Research Institute,	Itanagar
23	Indian Institute of Management (IIM),	Calcutta
24	Indian Space Research Organisation (ISRO),	Trivandrum
25	Madras Medical College,	Madras
26	Madras Refineries Ltd.,	Madras
27	M.S. University of Baroda,	Baroda
28	National Aeronautical Laboratory (NAL),	Bangalore
29	National Institute of Immunology (NII),	New Delhi
30	National Dairy Research Institute,	Karnal
31	National Environmental Engineering Institute,	Nagpur
32	National Institute of Oceanography (NIO),	Goa
33	Solid State Physics Laboratory (SSPL),	New Delhi
34	Tamilnadu Agricultural University,	Coimbatore
35	Tamilnadu Veterinary and Animal Sciences University,	Madras
36	Tata Memorial Centre (TMC),	Bombay
37	TATA UNISYS,	Bangalore

Information Management With CD-ROM Technology

R.Vengan*

Describes what is CD-ROM and its geneology, storage capacity, publishing system. Advantages and disadvantages of CD- ROM are illustrated. CD-ROM vs online and CD-ROM networking technology are outlined. Suggestions are made for CD-ROM Publications in India.

1 INTRODUCTION

Due to exponential growth of information and information sources, the print media is becoming obsolete and the persons who are retrieving the required information are also becoming obsolete. The storage media for information are fast changing in a fascinating manner: from print media to film media; microfilm/fiche to magnetic media; magnetic storage media to electronic media; electronic devices to optical media. Optical media to what next? is the question for the researchers.

PRINT MEDIA (Papers, metal sheets other hard materials)

↓

FILM MEDIA (Microfilm microfiche etc)

↓

MAGNETIC MEDIA (Magnetic tapes, drums, etc.,)

↓

ELECTRONIC MEDIA (Floppy, hard discs, microchips, etc)

↓

OPTICAL MEDIA (CD-ROM videodisc, CD-WORM, CD-I, etc.)

↓

WHAT NEXT?

Compact Discs (CDs) are one part of the electronic information industry. Other sectors comprise of computer software publishing, online services, videotex, optical discs (other than CD-ROM), audiotex and hand-held electronic books.

All types of optical disc stored information in the form of pits on the surface of the disc, are read by a laser beam. Videodiscs, the earlier type, store

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information in analogue form using pits of varying length. CD-ROM and derivatives, however, store information in digital form using pits of identical length. This is an important distinction - as a digital medium CD-ROMs use the language of computing, the "language of today and tomorrow".

Now, the optical media is videly used for compact storage and speedy dissemination of information in text, audio, video form to the needy around the world. The potentiality of this powerful medium can be taped by the journilists for mass communication of data, information and news.

2 WHAT IS CD-ROM?

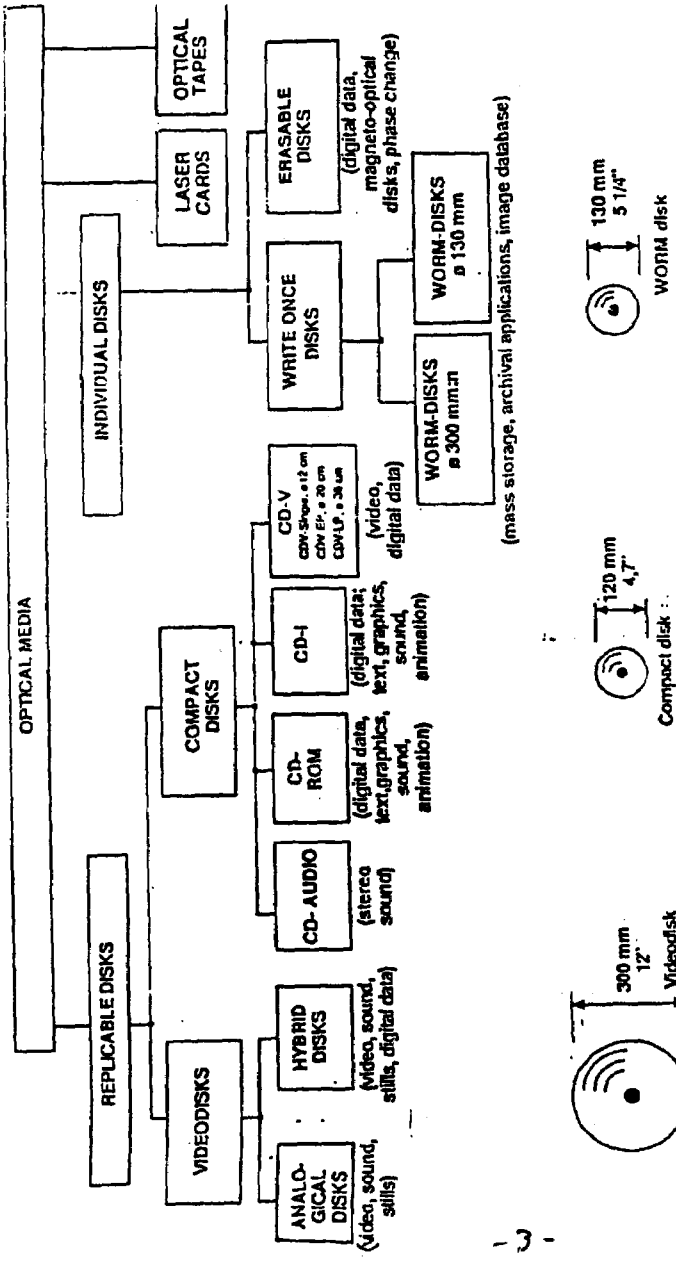
- CD-ROM is an acronym that stands for Compact Disc Read Only Memory.
- CD-ROM is an optical disc of 120 mm diameter and a hole of 15mm at the centre.
- Thickness is 1.2 mm and is made as per ISO 9660 Standard.
- The disc is made of a tough plastic substance material, called polycarbonate
- It is a pre-recorded disc. Data is recorded using laser beam by a special electronic publishing process.
- User can only read the disc, but CANNOT write on it, nor can erase anything written on it. Hence the term READ ONLY MEMORY (ROM).
- Laser beam is used for both recording and reading data from CD-ROM
- For information professionals (like librarians, information scientists, reprographic scientists, publishers, journalists, etc.), CD-ROM is a high density, compact storage and publishing media similar to microforms, but more dynamic than the latter.
- It is in a computer - readable form It can be read only by using a computer and an appropriate software

21 CD-ROM Geneology

CD-ROM is a member of optical disc family. The other members of the family consists of WORM (Wrote Once Read Many) and erasable type. The varied combinations of audio, digital and video formats have further led to different products in the Compact Disc family used for music recording (CDs), Video- Audio recording (CDI), etc. Fig.1 illustrates the geneology of optical discs.

22 CD-ROM: Storage Capacity

The disc is recorded on one side only. Each disc can store approx. 600 mega bytes of information equivalent to:



- 3 -

Fig1: CD-ROM Geneology

- 75 minutes of music
- 3,00,000 pages of text (A4 size)
- 1500 floppy disks (5.25")
- 18,000 pages of computer graphics
- 9,000 pages of graphics and 8 bit sterio audio
- 1800 digitized images
- 4500 hours of digitized voice
- an entire text of 20 volumes of encyclopeadia.

The storage life of CD-ROM is estimated to be between 10-50 years depending on the quality of recording and the disc material used.

23 CD-ROM Production

Three basic stages of CD-ROM production are:

1. ***Database managament*** (i.e. data selection, data conversion, database structuring and data directory creation).
2. ***Premastering*** (i.e. physical blocking of data in CD-ROM format on tape).
3. ***Mastering and replication*** (i.e. cutting of master disc and pressing of replicate discs).

24 CD-ROM Publishing Systems & Costs

CD-ROM Publishing Technology has already moved from high cost Main-frame based systems to personal computer based systems. The first complete PC based CD-ROM publishing system was introduced by Meridian Data Inc.,USA. It is called CD Publisher, a product developed as an in-house publishing systems for Corporations.

CD publishing is now reaching desk-top level. Pre-mastering is an activity that is completely software based and can be handled in-house by any organisation in a PC environment with access to pre-mastering software.

Mastering can also be done in-house by using systems like CD- MASTER of Meridian, which can be used for mastering and limited replications.

Mass scale replications are currently done by companies with large plants, like Philips-Dupont. Cost of CD-ROM Publishing is rapidly declining. Once the data is available on magnetic medium, which is a pre-requisite for any electronic publishing, it is very inexpensive to produce CD-ROM. Following is an idea of current costing in US market (for 100 to 500 MB data):

Pre-mastering - US $ 1500 - 2000

Mastering	- US $ 1000
Replication	- US $ 2 - 10 per disc

Several CD-ROM developing companies today offer the services required at various level, including complete project handling.

25 CD-ROM System

The following components constitute a CD-ROM system.

1. ***Information Source:*** The CD-ROM disc is an optical disc on which the desired database is stored along with index details by the CD-ROM Publisher. The database is structured, mastered and coded by the publisher as a proprietory process. This disc is the information source component of the CD-ROM system. It is generally of 12 cm diameter and can store 600 +MB of data.

2. ***CD-ROM Drive:*** Another component of the CD-ROM system is the CD-ROM Drive which loads and runs the disc. It has a built in laser beam device which scans and reads the CD-ROM disc. Philips, Sony and Hitachi are the leading manufacturers of CD-ROM drive.

3. ***Computer:*** A personal computer with a minimum RAM size of 640 KB or higher with a monitor, a floppy drive (5-1/4" or 3-1/2"), hard disc and a printer forms another component of the CD-ROM system.

4. ***Disc Control Card:*** It is an interface hardware supplied with disc drive but should be inserted in the PC as part of system installation. This card establishes the required intelligence link between the PC to search and the CD-ROM disc to read. This device is also a proprietory item.

5. ***Software:*** A retrieval software written specially for accessing data on CD-ROM disc is a proprietory product of the CD-ROM publisher. The software may come separately on a floppy disc or it may be inbuilt in the CD-ROM disc.

6. ***Humanware:*** System person who operates the CD-ROM system. The drives, discs and the software should be compatible to each other and should work with the operating system of the computer which is normally the MS-DOS.

3 CD-ROM : ITS DEMAND

CD-ROM technology has its roots in video-disc technology of 1950s. It evolved from compact discs (CDs) used as a music disc in early 1970s.

The number of titles published every year in CD-ROM since the first title published in 1985, has been crossing all estimated forecasts. The following data illustrates the facts:

Year	:1985	1986	1987	1988	1989	1990	1991
No. of Titles	:1	42	120	200	600	140	10,000
							(forecast)

The sale and use of CD-ROM drives worldwide is in great demand as shown by the following data:

1988	1,71,000
1989	5,41,000
1990	10,00,000
1991	15,00,000 (forecast).

Even the literature on CD-ROM has been increasing rapidly. They are published in journals of varied discipline. According to a bibliometric study conducted by PT Nicholls, 1925 articles were published in 1988 alone. The same study confirms that 1119 articles were published in 312 journals. Table 1 lists articles abstracted in LISA (Library and Information Science Abstracts) alone since 1980.

Year	No. of articles	Year	No. of articles
1980	nil	1985	42
1981	nil	1986	153
1982	1	1987	265
1993	3	1988	293
1984	3	1989	459

Table 1 : CD-ROM Literature Indexed in LISA

4 CD-ROM : ADVANTAGES

The advantages of CD-ROM in information storage and retrieval are:

41 Permanent storage:

- it cannot be erased, scratched or mutilated like a book

42 High density storage:

- can record as much as or more than 3,00,000 pages of information

43 Duraibilty:

- There is no wear and tear since the drive head does not touch the plate when scanned for retrieval. The drive head will not crash. Shelf life is

more than 30 years.

44 Portability:

- physical portability is possible. It can be mailed in a cover.
- data recorded on it can be easily portable or transferred to any other medium such as paper, magnetic disc, etc. through PC.

45 Low cost:

- production cost is volume based like in the case of a book. If 1000 discs are produced, this medium becomes cheaper than printed book (e.g. Kirk & Othmer Encyclopaedia of Chemical Technology $4400 in print, $ 895 in CD-ROM).

46 Unlimited use:

- In a local environment, paying a fixed fee, many people can use the single disc-resource sharing.

47 Data Protection:

- The surface on which data is stored is protected by a transparent plastic coating. Dust cannot reach the data area. Data cannot be physically touched. Data is protected even from mishandling of disc, electrical fluctuation etc.

48 Personal computer based:

- Main frame or super mini computers are being used for processing and handling high density storage of 600 MB., But CD-ROM can be accessed by PC which means savings in hardware cost. More persons can use CD-ROM because they already own PCs.

49 No telecommunication:

- Telecommunication links are not required for CD-ROM use, hence it is a good alternative to online search of distant databases for third world countries.

410 Ideal for library storage:

- Reduced shelf space, maintenance cost, and high data security makes the medium ideal for archival storge. In libraries for public access catalogue this is becoming an acceptable medium.

411 Networking and data exchange:

- With CD-ROM, one has the added option of interfacing and exchanging data with other nodes as part of a computer network such as a local area network (LAN).

412 As mass media:

- Present developments in CD technology makes possible to store and disseminate text, video and audio matters together to millions of persons in need.

5 CD-ROM: NEGATIVE ASPECTS

1. Hardware - software compatibility and interchangability is still a problem. All drives cannot read all type of discs.
2. 600 Mega Byte, though looks impressive for encyclopaedic storage, is not adequate enough for very large files like INSPEC, CA, BIOSIS, etc.
3. Update frequencies are few and delayed. Hence time critical data cannot be served on this medium.
4. Facilities like multiple file searching, cross tabing is still difficult.
5. Medium is very slow, but improvements are on the anvil.
6. Cost of CD-ROM is fluctuating.

6 CD-ROM: APPLICATIONS

Databases published on CD-ROM can be divided into Referral and Full Text databases. Figures from 1988 statistics indicated the following breakdown:

	Referral	Full Text
Europe	50%	37%
USA	50%	15%

The major categories of CD-ROM are as follows:

Bibliographic	Exemplified by BNB, Bookbank and in the USA, Bowkers and Library of Congress put their database on CD-ROM, OCLC cat CD-ROM.
Financial	Many online databases are now available on CD-ROM giving corporate information on companies. Most of them are very expensive - 5,000 - 13,000.
Professional	A group in which medicine is strongly represented by Medline and about 65 other medical databases. Legal sectors are represented by Lexis and Justis. Information sector by LISA and ERIC.
Maps	Over 40 CD-ROM titles, prominent among these was MundoCart CD containing maps of a entire world.
Software	Over 30 titles contained software. Typical was Alde Corousel containing 11,000 programs for $ 20.
Encyclopaedia	Encyclopaedias were a "natural" for CD-ROM and there is great potential for multimedia.

Graphic Collections	CD-ROM is being used for clip-art collections of graphics (e.g. the Alde Clip Art file contains 70,000 images priced 150) and photographic collections
Archival Stores	There are a number of important in-house collections on CD-ROM and growing interest in news databases.

61 CD-ROM Products/Titles

To-day more than 1,522 CD-ROM titles are available in the market. About 1,800 companies involved in CD-ROM business. Some of the CD-ROM products are listed in Annexure1

62 Multimedia Application

CD-I (Compact Disc Interactive) is being talked about more actively as superior, but high cost medium for multi-media application, such as storing high resolution graphics and moving pictures, with sound and data on one single compact disc. It is expected to overcome the limitations of CD-ROM for storage of moving images and still pictures.

CD-V (Compact Disc Video) is also known by acronym DVI (Digital Video Interactive). IBM recently announced its committment to this technology, the industry is developing it as msulti-media vehicle for all types of information in education and entertainment.

Fig 2 gives the spectrum of CD-ROM applications.

7 CD-ROM : NETWORKING

To start with CD-ROM drives play single disc and single user only can use the system for information search and retrieval. But now CD networking is possible. The first CD Network was developed by Maridian Data Inc. USA and today there are several companies which offer networking solution to CD-ROM connectivity.

CD-Networking makes provision to share CD-ROM-based information across a multi-user environment by integrating CD-ROM drives into a Standard Local Area Network (LAN).

8 CD-ROM vs ONLINE

	Online	CD-ROM
1.	Publishers of general reference works online are no longer in direct touch with their customers - they have to work through online hosts	CD-ROM puts the publisher "back in the driving seat" dealingdirectly with customers and able to dictate the software requirements
2.	Online in Europe is a 2 billion market but 50% was represented by real time services mainly in the financial sector	It is good in off-line mode. Batch processing
3.	The historical information online sector was slow growing due to lack of user friendliness, un-reliability and the cost of use	User friendly. Depending on the retrieval software
4.	It was inefficient that several days training were needed before proper use could be made of an online database (or) online needed trained middlemen searchers for effective use	Also needs training, but com-paratively easy since the index pattern and the retrieval software-are proprietory items for a particular product
5.	Costs of online is high	Comparatively not so high
6.	A typical online service used one type of search/retrieval software to cover a range of probably enor-mous databases Not so flexible in search of all types of databases	CD-ROM search/retrival software to cover a smaller number of databases. So easy to use

7.	There is a pressure on time when using online. So no encouragement for browsing. Hence recall value is low.	Lack of pressure on time when using CD-ROM which encouraged browsing. Hence recall value is high.
8.	Archival value is questionable	Archival value is more and ensured
9.	Multimedia is now not possible	"Multimedia"is possible.This is the current research problem.

9. CD-ROM vs MICROFILM

	Microform	CD-ROM
1	Microforms will prove useful for at least another 50 years because they provide certain advantages not provided by other media.	Optical media will replace microforms in certain applications but not in every case.
2	Life of Microform is about 50 years.	Life of CD-ROM is 10-30 years.
3	Archival standards are available	No archival standard yet to exists for CD-ROM Media
4	Silver gelatin microfilms (manufactured with ANSI standard) can be expected to retain their optical quality for at least 300 years.	Searching and oxidation can render CD-ROMs unusable within weeks of receipt.
5.	Microform is not for high compact storage, but it can Photographically record either exact or graphics with a resoultion quality equivalent to 600 dpi.	CD-ROM is more compact storage medium than microfilm in ASCII encoded text format but only marginally more compact in high resolution image storage mode.
6.	Mocrofilm images are not machine searchable and require serial searching techniques. This hampers optimum retrieval and access	With good indexing and software, the data on a CD-ROM are highly accessable using conventional on-line searching technology.

7.	Mocroform installations are generally stand-alone notes.	With CD-ROM one has the added option of interfacing and exchanging data with other nodes as part of a computer network such as LAN.
8.	Microform based document storage and retrieval system hardware will cost less than a complete CD-ROM system's hardware. Camera: $4000, Processor: $4000, Reader - prints: $5000, CAR facilities: $10,000	CD-ROM System cost more. replication hardware & Software alone cost $100,000. Mastering (ASCII) 0.6/per page. PC: $4000, Scanner: $3000, Drive:$6000, Laserprinter: $5000, Displayunit:$5000, Extended Eacho memory: $1000, Software:$5000, (Total: $ 30,000)
9.	Microfilm will continue to be used in the future for applications requiring compact high-quality storage and retrieval of both text and graphics with economical low volume publishing and where rapid random searching and browsing are not priorities.	CD-ROM will be employed were many copies are needed and where compact document storage and retrieval must he married with computer searching and retrieval CD-ROMS. It may not he appropriate for applications where archieval quality and economic graphic image display are primary concerns.

10 CD-ROM IN INDIA

The awareness of the CD technology is fast catching up like it happened with online. This medium is most suited for Indian conditions since our telecommunication system for high speed and high quality data transfer is the costliest and the least reliable.

In India, many leading government and private organisations have acquired CD-ROM systems for information search and retrieval. Some of them are: DESIDOC, Delhi; NISSAT, New Delhi, DRTC, NCSI, Informatics India (P) Ltd., Bangalore.

NICDROM (National Information Centre for CD-ROM) was started at NAL by NISSAT (National Information System for Science and Technology), DSIR, Govt. of India for promoting the use of CD- ROMs in the country and also to act as a co-ordinating centre for making aware of the CD-ROM Technology to the likely users.

CD publishing has yet to start in India, but there exists tremendous

potential for CD-ROM publications in our country. The following databases may be produced on CD-ROM.

1. India National Bibliography
2. Indian Science Abstracts
3. Indian Leather Literature
4. Indian Medical Literature
5. Indian Agriculture Literature
6. Wealth of India, CSIR.

11 CONCLUSION

The advent of the digital compact disc was greeted by most book publishers as an ultimate achievement in a publishing art and a step towards development in electronic publishing.

"Multimedia" is the combination of text, pictures, video and audio. It has been experienced by the publishers of Grolier Encyclopaedia on CD-ROM. The database for Grolier was electronically compiled and capable of outputting on all three formats. The trend of multimedia is picking up to boost publishing industry.

Yet another development in CD publishing is the introduction of "Photo Compact Discs". Photo CD is the result of a joint project of Kodak in conjunction with Philips and Sun Microsystems. The pictures are recorded at far higher resolution than normal television pictures and they can be played back on the television with the new Kodak "Photo CD" players. Photo CDs will also be playable on personal computers equipped with CD-ROM or CD-XA drives and on CD-I players.

Like many fascinating developments and amazing break throughs in communication and electronics, the CD-ROM is another fascinating device for information storage and retrieval.

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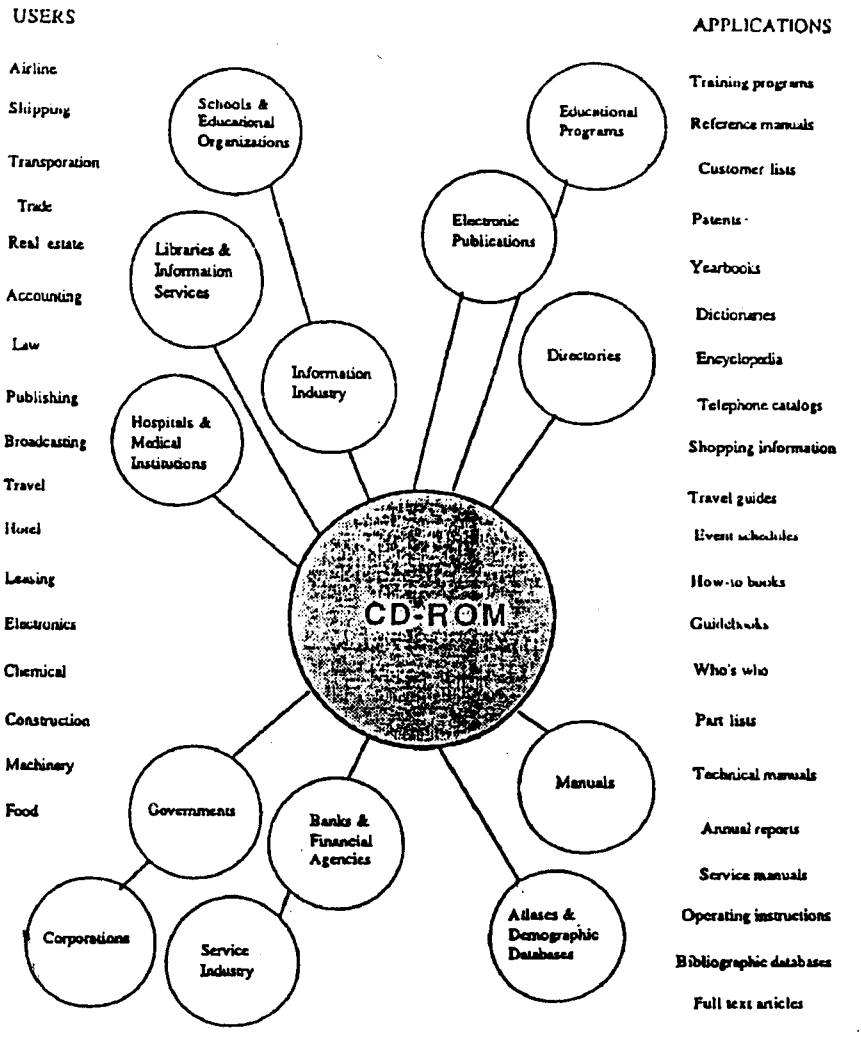


Fig 2: Spectrum of CD-ROM applications

ANNEXURE 1

S.No.	CD-ROM product	Subject coverage	Producer/Publisher
		Referral Type Databases	
1.	UK-CD	6,00,000 records taken from British Books in Print and Conf. Proc. Index.	British Library,U.K.
2.	EMBASE on CD-ROM	Excerpta Medica database	Elsevier Publisher,North Holland
3.	EiDisc (one year Subsn. $ 1,687)	Engineering Lit. Contents/ Conf. Proc. Titles3000 titles	Engg. Infn. Inc., New York
4.	BNI on CD-ROM (1991 Subsn. $ 1,850)	British News Paper Index (The Times, Financial Times, Independent, etc.)	Research Publications Ltd., U.K.
5.	BA, on CD-ROM$ 9,155) (1991 Subsn.	Biological Abstracts 10,000 serial coverage	BIOSIS, USA
6.	BA/RRM on CD-ROM (1991 Subsn.$ 4,665)	Biological Abstracts / RRM (Reports, Reviews, Meetings) 2,60,000 references	BIOSIS, USA

7.	NTIS on CD-ROM	Citations&full abstracts (1983-87)	Silver Platters Infn. Inc., USA
8.	Super Tech. Abs. Plus on CD-ROM	High-tech abstracts 35,000 records	Bowker Electronic-Publishers,New York, USA
9.	Enviro/Energyline on CD-ROM	Environment and Energy Abstracts Plus 2,00,000 Abstracts	Bowker Electronic Publishers, New York, USA
10.	Sci.TECH Plus on CD-ROM ($ 995)	Sci-Tech citations from both books in print and Ulrich's International Per iodical Directory	Bowker Electronic Publishers, New York, USA
11.	DIALOG on Disc	References in DIALOG	Dialog Information Services, USA
12.	Science Citation Index on CD-ROM	Periodical articles from 3,100 journals	ISI, USA
13.	Social Sci. Citatation Index on CD-ROM	Periodical articlesfrom 2,400 journals	ISI, USA
14.	INSPEC on Disc ($7500)	INSPEC Abstracts 4,200 Periodicals 1000 Conf. Proc.,3.75 million records	UMI, USA

15.	FSTA on Disc	Food Sci. & Tech. abstracts 1800 pls, 3,80,000 entries	Silver Platters Infn., Inc. USA
16.	LISA	Lib. & Inf. Sci. Abstracts 81,000 citations 550 journals	Silver Platters Infn.,Inc.,USA
17.	BOOK BANK on on Disc	Book catalogue 4,80,000n entries	WHITAKER's
18.	MEDLINE on Disc	Medical Literature 3,200 periodicals	Silver Platters Infn.Inc., UK.
19.	Cancer-CD	Cancer Abstracts	Silver Platters Infn.Inc. UK.
20.	NTIS on disc	NTIS Report Abstracts	Silver Platters Infn.Inc. UK
21.	POEM FINDER on Disc	Index for 2,70,000 Poems	Roth Publishing Inc., U.S.A.
22.	WILSON Disc	Wilson Business Abstracts 1,30,000 Abstracts	H.W.Wilson Company, U.S.A.
23.	MAS on CD-ROM (Subn. $ 399)	Magnetic Article Summaries 1,20,000 abstracts added	EBSCO Subscriptions Services, Canada-

FULL TEXT DATABASES

24.	Patent History on CD-ROM	U.S. Patents (17 yrs)	Research Publications Ltd., U.K.
25.	DISCLOSURE on CD-ROM	Financial & Corporate Inf. on more than 10,000 United States Public Companies	USA
26.	CD-ROM Publication (1991 Subsn. 1,500)	Molecular Structures in Biology, 500 mal. strctures	OUP and IBM, U.K.
27.	CD-ROM R&D (Subsn. 2,000)	World Research Database 20,000 Res. Orgrs.in 150 countries	Microinfo and Longman, U.K.
28.	CD-ROM NEWS (Subsn. 700	The Guardian 1991 issues	Chadwyck - Healey, UK
29.	Pro Quest on Disc	Five News Papers full text on CD-ROM	UMI, UK
30.	Gale Global Access	CD-ROM database of Gale's 13 Vol. Ency. of Assns.	Gale Research Inc., U.K.
31.	OEC on disc	Oxford English Dictionary	Bowker Electronic Publishers, NY, U.S.A.

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Proposed Infrastructure and Facilities for the Development of Information Industry in India

I K Agrawal*

The world market for online or electronic information services is growing at the rate of 20 to 30 per cent a year and is undergoing far reaching changes. Modern information is increasingly considered to be an important economic resource. Even more people will be considered with the production, distribution and processing of information in the transition to the "Information Society".

We are not on the threshold of revolutionary changes in our economic and social life, largely occasioned by the rapid advances in information technology. It will have impact on our banks, our offices, our homes, our libraries, our science and technology activities, and so on. It is going to have a tremendous impact on social fabrics in every society because it will have an impact on the organisations, business, government, administration, rural as well as urban activities. When we look at various activities in India, we find that information will have to be used to meet our basic needs, specially for the 250 million people who are below the poverty line.

However, in India, development of Online Information Industry is facing many impediments. Commercial exploitation of Online Information Industry is not being considered as a viable venture in near future.

This paper enlists the problems envisaged in the development and commercial exploitation of Information Industry. It also proposes infrastructure and services to meet all round requirements of various of various information seeker groups. Strategies required to be adopted to make the venture a commercial viable in next one to two years as well as ensuring rapid development of Information Industry as a whole, are also proposed.

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The Impact of Information Technologies in Increasing Information Access in Developing Countries

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The need to exploit information technologies for increasing the efficiency of information dissemination process is stressed. A birds-eye-view of the emerging technologies that can be fruitfully used for increasing access to information in the library and information centres of the developing world is provided in order to have a broad guideline for library and information policy formulation for India. The need for integrating planning of library and information activities as part of the planning of the communication sector as a whole is also pointed out. Suggests that libraries of the developing countries such as India, as a policy, should concentrate more on rapidly developing technologies for better information access.

The past two decades have witnessed an unprecedented proliferation of technologies related to the process of information dissemination. These technologies, mainly concerned with the transmission of information are now converging into technologies used for storage, processing and reproduction of information. Computers, video cassette recorders, laser printers, xerox copiers, etc. are a few among them. The integration of computer and communication technologies in meaningful combination provides tremendous potentialities for information transfer process in our library and information sector.

1 COMPUTER AND ALLIED TECHNOLOGIES

The widespread use of computer technology has made dramatic developments in the information transmission process in every field of human endeavour during the recent past. Highly sophisticated information services ranging from elaborate abstracting and indexing services to computerised data bases in almost all scientific disciplines are in wide use all over the world. The information contained in the form of printed abstracting services and journals are now available in machine readable form. The availability of databases in machine readable form and the easy access to these through telecommunication network has revolutionized our information seeking habits and the way we run our library and information activities.

11 Local Area Networking

The new technology of Local Area Networking (LAN) has also emerged allowing a range of devices from micro-computer to mainframes to be interconnected. The LAN typically comprises low- cost cabling connecting computing devices in a building or office environment and enabling these to communicate

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with one another and to share resources such as printers and magnetic disc storage systems.

The future library system could be a LAN with micro-computer and shared printers and file storage, and link with any point in the network will give direct access to national and international databases.

2 COMPUTER AND TELECOMMUNICATION TECHNOLOGIES

Recent developments in the use of computer in the telecommunication networks throughout the developing world to transmit data over long distances offer exciting possibilities for increasing the efficiency of library and information activities in the developing countries.

In the recent past, the telecommunication technology has advanced to the point where international communication is technically possible from and to any point on the globe. In practice, of course, there are serious limitations for the developing countries that require long-range planning to overcome them.

21 Data Broadcasting

Very Small Aperture Terminals (VSATs) or "micro earth stations" which can cheaply transmit and receive data now make it possible for wire service information to be disseminated to virtually any location, including rural areas lacking telecommunication infrastructure. They may be powered by photo voltaic or portable generators. Reuters uses this technology to send wire service copy to Latin America. In Hongkong, the World Broadcast Service sends wire service copy to Intelstat's' Indian Ocean satellite which covers 80 per cent of the world population.

22 Remote Access to Databases

The computer aided telecommunication facilities enable the library and information centres to provide information from any data centre cutting across geographical boundaries. As a result, several national and international networks have become available for data transmission. These computer networks make available a large number of on-line databases to the users of any library at a single point. For example, agricultural researchers in India can gain easy access to the databases available at FAO, Rome or National Agricultural Library, U.S.A.

23 Videotext and Teletext

Videotext or view data is an interactive system for transmitting text or graphics stored in computer databases via ordinary telephone line on a television screen. It is a simple to use low cost information system catering to large number of users.

Teletext is non-interactive form of videotext.

24 Facsimile

Facsimile systems transmit text or data or pictures, but they do not provide hard copies. It enables a page of text or graphics to be scanned and transmitted via satellite links to remote locations. Facsimile is developing rapidly as an information transmission system.

3 ELECTRONIC PUBLISHING

Information technology now offers new opportunities to developing countries to prepare high quality publications as a means of information dissemination without the need to use expensive commercial printing services. The capability of microcomputer to create graphics make it possible to produce newsletters and other printed materials without bothering about time-consuming and laborious type-setting. This is an invaluable facility that any library or information centre can make use of in creating information materials from them,with less cost and speed.

The combination of computer software and laser printer, on the one hand, allows us to produce good quality simple documents whereas the sophisticated Desk Top Publishing (DTP) can be used to prepare high quality publications including text, graphics and illustrations.

In short, information technology provides ample scope for developing countries to generate new publishing outlets for their scientific work at affordable cost.

31 Printing Technology

The invention and subsequent rapid development of laser printing has been the most exciting and important new component of information technology for speedier information transfer and dissemination process. In combination with suitable software and word processors it allows the users to produce high quality publication at low costs and provides the facility to integrate normal text with graphics such as digitised images, graphs, bar charts and so on.

An important extension of this again is the relatively recent emergence of DTP which provides more extensive and sophisticated features than conventional word processing systems enabling the production of documents of good quality.

4 OPTICAL STORAGE

Laser technology has also opened the way to possibly the most exciting new medium for information storage and dissemination, the optical storage. Among them the Compact Disk-Read Only Memory (CD-ROM) has emerged as the most efficient and cost effective. Using basically the same technology as

applied to audio compact disk, CD-ROM provides the capability to create and distribute very large databases at low cost for use on micro- computers.

The CD-ROM technology provides the best potential for enabling the developing countries to obtain access to large scientific databases which are otherwise available only in the printed form or through commercial vendors providing online retrieval services.

CD-ROM has significant advantages; the hardware is simple to use and relatively cheap; the software is designed for ease of use requiring minimal training; the cost of use are predictable etc. All these aspects are in direct contrast to the use of on-line system which are designed for use by trained information professionals. On the contrary, CD-ROM can be made available directly to the end users without having the telecommunication network or trained manpower.

5 EXPERT SYSTEMS

Expert system has also the most potential to deliver information and knowledge to the information seekers. These has been an increasing number of initiatives directed at using Expert Systems for solving difficult problems in many fields of human endeavour. Expert Systems allow the knowledge contained in them to be transferred directly to the user who needs the information.

Expert Systems are special class of software applicable to wide range of problems and providing the means of using the computer to transfer the knowledge of experts to the end user. In a typical environment the distilled knowledge of the expert is stored as a knowledge base and it is associated with rules for interpreting the knowledge and applying it to the problem situations. The user communicates with the Expert Systems through a question/answer dialogue which can be tailored to particular requirements and environments.

The development of Expert Systems coupled with the increasing availability of low cost computers provides new potential for dissemination of expert knowledge in a digestible form direct to the information users. The technique is now extensively used in many desperate areas like medical diagnosis, commercial accounting and increasingly in agricultural research, extension and farming.

6 CHALLENGE FOR PLANNERS IN DEVELOPING COUNTRIES

The combination of these information technologies provide powerful new opportunities to the library and information users of the developing world. Developed countries have easy and cost effective access to library and information services since the emergence of computer technology.

The most predominant challenge for a developing country in the plan-

ning of policies in the information is to integrate the process of planning for the entire communication sector including telecommunication, broadcasting and new information technologies. Simultaneously, there is a need for evolving coordination in developing policies on the use of new technologies. In order to accelerate the process of development of the country; the new information technology should be integrated with the national development planning as a whole. Any country striving for opening new vistas for resource development certainly requires improved telecommunication facilities, at the very outset.

In the developed world, the scope and size of the database increase continuously so that information in virtually every scientific discipline is now available to everyone having the resources to access it whereas the present situation in the developing world is quite different.

The early hope and assumption was that the improved international telecommunication system, as a natural consequence, would bring the information resources to the users in the developing world. But in practice,many of these countries do not yet have reliable communication facilities. However, the micro-computer based information technology is providing a real break through in improving the existing information services in the developing countries.

But, undoubtedly there are certain constraints

- shortage of skilled manpower
- lack of well developed information infrastructure
- lack of awareness of value of information among the senior level policy makers etc.

There will also be difficulty in terms of expenses in acquiring and maintaining the needed hardware, software and database. Consequently, one cannot expect any dramatic change overnight; but a steady progressive improvement will be inevitable.

7 THE FUTURE

In the years to come, due to the availability of more powerful micro-computers and development of information technologies the process of information dissemination through the library and information centres in the developing world will be speedier and efficient. The users can have easy access to the most current information by interacting with the CD-ROM database of the world literature or having links with the online networks. They also could create and manage local databases for their own research using a database management system and integrating information extracted from external databases.

The expert systems available in the library and information centres will be used for solving the problems and recommending corrective measures based

on the best available scientific knowledge and taking into account the local environment.

While there are barriers for the developing countries, the potential for using advanced information technology is undeniable and will undoubtedly open up new vistas for the transfer of scientific information.

Certainly the role of information technology is to improve the overall efficiency of library and information services in catering to the information needs of the users. The basic concept in the use of information technology is nothing but to free the librarians from routine jobs. The time thus saved could be used for more intellectual involvement in meeting the users information needs. The librarian's role will thus transform into a mediator in the transfer of information who can edit, assess and provide analytical and evaluative information input for research. The increasing use of information technology will involve more initial capital investment, but in the long run it will pay dividend in the form of saving in manpower, space and improvement in the efficiency of services.

The real significance of the information technology is that it will allow information to be delivered directly to the users to a large extend by passing the need for sophisticated information infrastructure which do not exist and which are difficult to sustain in many developing countries like India.

In this age of information, easy access to information is an essential prerequisite for the development of the country and hence the third world countries like India should make earnest efforts to concentrate more on developing and using new technologies that provide better access to information.

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