
UNIT 1 □ INFORMATION INSTITUTIONS : GROWTH AND DEVELOPMENT

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1.0 OBJECTIVES

Modern libraries are information centres above all. Since the industrial revolution the nature and scope of library services have been profusely changed and extended the growth of information centres and libraries in special subject fields. Whether one calls this change revolutionary or evolutionary hardly matters; what counts is the degree to which such change will affect the library's role as an institution in society. This unit presents you the nature of information institutions and depict their growth pattern. This unit will enable you to identify the different types of information institutions and their specific role in the dissemination of information to individuals, groups as well as institutions who might require information in different forms and formats. You will also have a scenario of the future in the changing context of information.

1.1 INTRODUCTION

It is an accepted biological fact that a growing organism alone will survive. Ranganathan's Fifth Law of Library Science—Library is a growing 'organism' implies

a system concept, 'growing' connotes a living system ever capable of forming new components with an automatic and self-adapting mechanism in a continuously changing environment and the 'Library' can be interpreted as part of the whole, or whole for the part. Indeed the statement envisions a dynamic institutional structure capable of meeting the challenges of modern information demands, caused by a self-propelling, multidimensional growth of information and knowledge. Interestingly, Ranganathan stresses on institutional infrastructure for information as later writers emphasise and confirm. Peter Drucker, for instance, acclaims "during the last fifty years, society in every developed country has become a society of institutions. Every major task, whether economic performance or health care, education or protection of environment, pursuit of new knowledge or defence, is today being entrusted to big organisations, designed for perpetuity and managed by their own managements. On the performance of these institutions, the performance of modern society—if not survival of each individual—increasingly depends". These two views imply the role of institutions in modern society. The role is of great significance as the modern society has entered the information age. here the majority of people are engaged in creating, gathering, storage, processing or distribution of information. Thus the modern society has become a society of institutions, entering into the information age. Institutions building assumes special importance and building has, in fact been receiving attention as a subject of study and research in its own right. With this major promise this unit attempts to :

- (a) describe minutely the growth pattern of institutions for knowledge and information;
- (b) sketch in some detail the present situation;
- (c) draw attention on the planned institution building with special reference to third world countries;
- (d) present a scenario of the future in the changing context of information.

1.2 KNOWLEDGE AND INFORMATION

There is difficulty in defining information. Information theory gives us some useful insights into the effects of information; one of the most useful of these is the concept of uncertainty. Uncertainty is almost a source of stress and every little reduction of this uncertainty is always preferable. If you have ever been at a social function of any kind you will note how the occasion starts with maximum uncertainty; the attends are unsure of what to say to each other then as they exchange information the uncertainty and tension gradually relax. At times it is difficult to differentiate knowledge from information. In general usage there would seem to be an ascending staircase from the elementary percept to an observed fact to its expression in a proposition giving information on the observed state of affairs. The observed fact

of the cat sitting on the mat becomes information when it becomes communicable to others. Yet, facts on their own do not constitute knowledge. To pursue our trivial example for the moment, a hypothesis about the biological necessity of the sedentary behaviour of cats on mats would bring the observed fact into a set of relationships with other like instances. This would make our singular observation more significant and perhaps contribute to the available sum of knowledge on cat like behaviour. In this way we think of knowledge as theoretical and more generalised and information as potential knowledge.

Daniel Bell observes, “Information is news, facts statistics, reports, legislation, tax-codes, judicial decisions, resolutions and the like and it is quite obvious that we have had ‘explosion’ of these not only with the multiplication of organisation but because all countries and the diverse world politics and the world-wide economy now come under our daily scrutiny in newspapers and television and in the pages of specialised magazines. Knowledge is interpretation in context, exegesis, relatedness and conceptualization, the forms of argument. The results of knowledge are theories; the effort to establish relevant relationship or connections between facts, data, and other information in some coherent form and to explain the reasons for these generalisations”. Institutions have been established to cope with both knowledge and information. A variety of institutions have sprung up. The development process needs the use and application of them.

1.3 ACTIVITIES OF INFORMATION INSTITUTIONS

The process of transfer of information/knowledge is usually seen as a chain of activities, the links being generator, editor, publisher of primary publications, indexing and abstracting, journal producers, libraries, documentation and information centres, on-line services, information companies and the end user. Institutions performing these activities may be broadly grouped into three categories as follows:

(a) Knowledge creating institutions, for example, research laboratories, R & D institutions, institutions of higher education and research attached to universities, etc;

(b) Knowledge/Information processing and disseminating institutions for example, journal and book publishers, statistical data organisations, S & T data centres and the like; and

(c) Institutions that collect, store, process, disseminate and service knowledge/information recorded in various forms.

It may be noted that over the years, there has been an increasing interaction and cooperation between all these institutions. With the application of fast developing

technology to information generation, processing, dissemination, distribution and use, many of these functions are getting blended, blurring the link elements of the information chain. At present, however, the different types of institutions mentioned above operate with their distinct identity. Here we are concerned with the second and third groups of institutions.

1.4 PATTERN OF GROWTH

Studies on Information institutions growth are scanty. A thorough and useful study has been done by Vincent Giuliano for the consulting firm Arthur D. Little. Giving an historical perspective of the information transfer pattern and the institutional framework, the study discusses three basic modes of information transfer, each corresponding to a different value system. The three modes are as follows :

(i) Disciplinary Information Transfer corresponding to the value of pure science, academic and basic research—called Era I

(ii) Mission Information Transfer corresponding to the value system of government sponsored missions (like AEC, NASA in the 1960s)—called Era II, and

(iii) Problem-Oriented Information Transfer corresponding to the value system of solving societal problem—called Era III

The principal characteristics and features of the three Eras are given below :

Era I : Disciplinary Information Transfer

The basic ethic associated with this Era-I is knowledge for knowledge. The institutions came into being primarily to support education, research and development. Information is generally disseminated through journals, monographs, seminars and meetings usually associated with academic and research institutions, learned societies, professional bodies and the like. Access to primary information is through indexing, abstracting and bibliographical publications. Institutions that facilitate access to documents are largely the academic and other institutional libraries. The user communities are the students, scholars, academicians research workers and others. Financial support to the system is through internal budgetary provisions, grants and government subsidies. These services are free. This traditional system has been continuing for a long time, notwithstanding the strains and stresses now being encountered by the different components of the system such as libraries and journal publishing.

Era II : Mission-Oriented Information Transfer

The basic ethic behind the development of Era II is to '*organise to do a job*'. The mission-oriented information systems were developed during the 1950s and through

mid 1960s to provide support to agencies like NASA. Here the information transfer process is characterised by a need for coordinating and using knowledge simultaneously from variety of disciplines, as in the case of NASA mission where inputs of information from electronics, biology, medicine, aeronautics, chemistry, physics, etc. are required. Information is disseminated through primary publications like technical reports, besides journals and other traditional publications. Secondary services that provide access to primary information function are through varying degree of interpretative and abstracting tools. The technical information centres that offer these services, being part of the mission agencies, mostly governmental establishments, get their budgetary appropriations. The user communities consist of scientists, engineers and technologies and managers. The feed-back mechanism for controlling the system and using it to determine the needs for information or research are more or less similar to those of Era I, but the flow of information between the two systems has been unequal. While the mission-oriented system drawn heavily from discipline-oriented information system only limited reverse flow is provided through primary journals and some technical reports.

During this period, newsletters and trade journals, increasing in importance, have been reflecting that some of STI systems have a major economic value and that market-oriented information transfer mechanism has gained significance.

Era-III: Problem-Oriented Information Transfer

The basic ethic that paved the way for establishment of information organisations in Era III is solving 'societal problems'. Problem-oriented information systems have begun to emerge from the late sixties with growing thrust in the seventies. Systems that have emerged during this period represent a context in which information is utilised for societal problem-solving such as economic well-being, environmental protection, agricultural productivity, energy availability use, public health care/safety, and disaster prevention/control. The type and structure of systems that can handle Era III information, providing new products and services, have not yet been properly established, institutionalised or legitimised, but some possibilities are in the offing.

Users of the problem-oriented systems involve a variety of groups-elected officials and their staffs, bureaucrats and civil servants, businessman and industrialists, legal professionals and judiciary, scientists, engineers, technologists, consultants, media people and the general public.

Information brokers, consultants and intermediaries are the new types of institutions emerging to offer the specialised quality of service. Repackaged information, collected from a variety of sources with validated and authentic data, is the type of specific information service expected. STI infrastructure is historically de-signed for meeting

the information needs of scientists and technologists. Expanding the context of information usage to societal problem-solving brings in new problems of interpreting technical results to enable non-technical users to take responsible decisions.

Obviously, this type of information is available only at a price. Information industry, a private enterprise and highly market-oriented and taking risks to attend to the needs of consumers, has emerged.

Individual-Oriented or Customised Information Service

Toni Carbo Bearman, Executive Director of US National Commission on Libraries and Information Science is of the opinion that an Era IV Information Transfer is emerging, in which repackaging of products and services is being designed to meet the needs of individuals whether at home or in business and industry. Delivery of information to home-bound citizens and the packaging of information for the scientists in industry are just two examples of these services. Fee-based information services began to emerge. The most striking and significant development of information institutions in the 1970s and 1980s has been the growth of information industries. They are also known as Fee-based Information Services, Information On-demand Companies, Information Consultants Information Brokers, Intermediaries and the like. They sprang up in countries like the United States of America, U.K., France, Germany, the Netherlands, Austria, Spain, Belgium, Switzerland and Yugoslavia.

While the major organisations such as PREDICASTS, Arthur Little Co. Inc., Lockheed Information Services, Bibliographic Retrieval Service, New York Times Information Banks, etc. have been operating for a long time, many of the smaller set-up having flourished from the late seventies and grown in the eighties. The large firms are founded by people with background in journalism, law, business administration, etc. and are generally staffed by subject specialists. The medium sized firms are run by information specialists with background in library automation, information retrieval, system design and analysis, etc. The small commercial services are staffed by information specialists with or without advanced degrees in subject fields.

1.5 TYPES OF INFORMATION INSTITUTIONS

Amongst the different categories of information institutions the most popular ones are : Libraries, Documentation Centres, Information Analysis Centres, Data Centres, and others. Barring these traditional institutions many non-traditional (deinstitutionalised) information services have ensured lately. Some of the important types of information institutions are described below :

1.5.1 Libraries

Since the invention of printing from movable type in the middle of the fifteenth century, and more especially since the development of scientific periodical some 200 years later, formal channels of professional communication have been heavily based on printed documents. We tend to take this medium completely for granted. But can we necessarily assume that print on paper will always be the major vehicle for formal communication in science and other professional fields ? Will paper be as important in the information systems of the twenty first century ? Almost certainly not.

The experts who are predicting the demise of books and libraries have prominent credentials. Prominent among those who are predicting an end of books and libraries are : F. W. Lancaster and Vincent E. Giuliano. Landau described a “library in a desk”. Moreover, the system of Bush, Licklider and Landau assume that the user will have, literally at his fingertips, access to a large personal library and/or to a wide range of external bibliographic resources.

Libraries have undergone a major change in modern times. The history of progress in librarianship has been a story of successful integration of new technologies and new means of communication into existing programmes and services. Librarians have welcomed innovation and have, if anything, been sometimes overeager in the embrace of the new. Online catalogues are demonstrably superior to card and microform catalogues. Networked indexing and abstracting services are superior to their print forerunners. It goes without saying that modern libraries should have electronic circulation systems, acquisitions and serial control systems and should provide access to the world of digitized data and facts of all kinds—numeric, bibliographic, image-based and textual.

Looked at objectively, the relative roles of electronic communication and non-electronic communication become dear. Electronic methods are best for “house keeping” and for giving access to data and small, discrete packets of textual, numeric and visual information. People of the future will know only that which we preserve. This is a weighty responsibility and one that should be in the minds of all librarians. We do not advocate clinging to old things because they are old, nor do we advocate clinging to old things because they are old nor do we advocate discarding old things because they are old. The library of tomorrow must be one that retains not only the best of the past but also a sense of the history of libraries and of human communication. Without that, the library will be purely reactive, a thing of the moment, sometimes useful and sometimes not but never central to human society.

In summing up we describe thus—from oral narrative to the invention of writing : from myths, legends, stories and histories literally etched in stone, through medieval manuscripts to the printing press; from private communications between

individuals, through mass media broadcasting, to electronic telecommunications and information dissemination across networks of networks interconnected globally if not yet galactically : technological advancements have progressively enabled the spread of the word and words—the communication of human thought—ever more effectively from private to public through libraries.

We live in an ahistorical age. The little that is known about the past is not used to inform the actions of the present. The library of tomorrow must be one that retains not only the best of the past but also a sense of the history of libraries and of human communication. With a sense of history and the knowledge of enduring values and the continuity of our mission, the library can never be destroyed. Along with this sense of time future being contained in time present, there must be the acceptance of the challenge of innovation. It is neither the easiest of prescriptions nor the most fashionable, but libraries have to combine the past and the future in a rational and unsentimental manner.

1.5.2 Documentation Centres

Documentation activities of a country are very much interlinked with the research and developmental efforts of the country. Documentation centres are concerned with the dissemination of documentary information. Thus among the varied forms of organisation for collection and dissemination of information, documentation centres are quite important. Traditionally, libraries have been pursuing the basic function of collecting every kind of publications and holding them in readiness for use. After World War II, the impetus for provision of documentation and information services to specialist users has arisen, mainly due to exponential growth and complexities of information sources. Need began to be felt for analysing the contents of the holdings of libraries in finer details; whereas libraries of traditional type have not been undertaking such a task. The traditional library tools have become progressively less effective as the volume of materials grows and the requirements of individuals become more specialised. In a library, where the service is in terms of documents, those documents can be organised on the shelves in a linear manner along some logical sequence by means of appropriate notation, because each document is by itself a physical entity. But when the items of information contained in the documents are to be handled and served, no such straight-forward arrangement is possible, because the bits of information are by themselves no physical entities and are scattered in various sources. A different approach is called for in handling and serving the scattered items of information. Specialist libraries began to build up facilities for meeting the changing needs of scholarly clientele for intensive services. Later in time, documentation centres began to emerge towards the same prupose.

Nowadays, the term 'information centre' is commonly used, even though in a broad sense documentation centre and information centre may mean one and the same thing. In general, a documentation centre brings to the attention of the specialist users current and recent literature of value to them, sieves through information sources and indicates pinpointedly or with high precision the right kind of information, makes an exhaustive search of literature resources so as not to miss worthwhile information, and provides documentation and information services on demand and in anticipation. However, the functions that are assigned would vary from one documentation centre to the other. A local documentation centre has the sole function of providing information services for supporting the programmes and activities of its own institution.

The documentation centres at local levels and which are attached to individual R & D institutions business houses, industrial enterprises, etc. are established and administered by their parent institution. At the national level, it might be the responsibility of the appropriate government agency to establish and administer the national documentation/information centres.

There are varying patterns of organisation of documentation and information systems in different countries. In the past, examples of USA for decentralised structure, of USSR for centralised structure and of UK for a mixture of both the above, used to be mentioned. At present, the network concept is gaining currency. The trend is now to pool the resources, facilities and expertise of various information centres, for achieving maximum economy and productivity.

1.5.3 Information Analysis Centres

With the enormous growth of the primary scientific literature, the individual scientist or engineer is faced with the problem of its retrieval and evaluation, as most of the information remains hidden in published documents. Much information published in primary journals never catches the eye of the information seeker—similar is the case with a abstract journal. Their number and size have increased. Moreover, scientific research is fragmenting into narrowing specialization and is becoming more and more interdisciplinary in nature. The time lag between the primary publications and abstracts aggravates the problem further.

In a day-to-day working situation, the need for the reliable numerical values for physical properties continually arises. A potentially useful tool for the transfer of scientific and technical information exists in the information analysis centre. Such centres, as discussed in Weinberg Report, usually serving specific fields in which large amount of data exist and require critical evaluation, consist of one or more active specialists who (a) systematically collect, index and store information in a field, (b) analyse and evaluate this information and (c) make it available in a form and language keyed to the needs of specific groups of users. The potential benefits of

an information analysis centre can be put as—'the specialised centre acts as the retailer of information'.

An information analysis centre (IAC) has been defined as 'an organization which indexes, abstracts, translates, reviews, synthesizes, and evaluates information and/ or data in a clearly defined specialized field or pertaining to a specific mission, to provide definite users' groups with digested, repackaged or otherwise, organized pertinent information available in a useful convenient form, "relieving the user from the arduous task of mining the sand of literature for the new grains of gold".

The functions, products and services of IAC vary with needs of its user population. The key activities are analysis, interpretation, synthesis, evaluation and repackaging of information carried out by subject specialists, resulting in the production of new evaluated information—in the form of critical reviews, critical compilation of data, correlation of data, etc.

1.5.4 Data Centres

The modern society needs data for planning and development activity in every sphere, namely, policy making as well as in formulating plan of action. Data are collected from studies involving observation and surveys. In such form, the data are called 'raw data'. Raw data are not usable for decision making. These become usable after certain manipulations involving organisation and synthesis. There are different types of data such as Scientific data, Technical data, Techno-economic data, Socio-demographic data. Data collected from different sources by different methods need to be stored and made available to those who need it. For this purpose, proper institutional mechanisms have been developed. These are known as Data Centres.

Unesco defines data centre as an organisation handling quantitative numerical data. Such centres take the primary function of collecting, organising and disseminating data (mainly numerical) and also provide a measurement service and be in a position to advance relevant measurement techniques. The term data centre is used interchangeably to define a range of Information Centres, not all which are critically evaluating data. Data centres vary both in size and in scope. The scheme which will meet the initial aim of every Data Centre is to make available to the users a potential data obtained from various sources. The Data Centre includes three main components :

1. An organized data collection : the data base;
2. A connection with the data sources which feed the database; and
3. A contact with users who are expected to interact with the database with questions.

Many data centres have been established in India under the NISS AT programme. It may be noted in passing data centre and data banks are dissimilar only regarding

the subjects they deal and type of data they handle. Data Centres handle only numerical data and mostly for the science and technology dealing with physical and chemical properties. Data banks are multidisciplinary and handle all types of data particularly administrative, statistical, techno-economic, census and survey, and management that are produced by various institutions. Data Centre handles data themselves or literature about data whereas data bank handles only data.

1.5.5 Referral Centres and Clearing Houses

Referral Centres may be described as the “information desk” of the scientific and technical community. It does not provide technical details in answer to queries or furnish bibliographic assistance. It does not supply data or documents. It directs enquirers to an appropriate source for the information or data required. Referral may be to libraries and documentation centres, or to appropriate agencies and individuals. To achieve this a referral centre has certain basic tasks to perform. These are:

- (i) to inventory all significant information resources in different disciplines;
- (ii) to compile and publish directories of information resources;
- (iii) to analyse the operating relationships that exist in the information complex of various disciplines.

Clearing Houses

The dictionary definition of a clearing house is a central agency for collection, classification, and distribution, specially of information. The definition would encompass all information centres and most special and conventional libraries. In the parlance of information scientists a clearing house is a relatively new word. For our purpose it is a depository of or documents with the additional mission of serving as a central agency for collection, classification, and distribution of information. It also includes such functions as collecting and maintaining records of research and development in the planning stage, in progress and completion. Sometimes, substantive questions about items in these records are referred to the source, and thus a clearing house may act as a referral centre also. The Smithsonian Institute’s Science Information Exchange serves as a clearing house of research in progress; the National Technical Information Service combines the functions of a document centre with those of a clearing house; and a referral centre; the National Referral Centre of the Library of Congress provides referral to experts within the field of an inquiry, it does not supply data or documents. For a number of years British Library Lending Division (BLLD) functioned as a Referral centre.

Most of the clearing houses have specialists and well developed collections. They have information gathering network to acquire documents in their subject area.

1.5.6 Non-traditional Information Organisations

We have given you some ideas about the range of information institutions which have been set up for meeting the information needs of the society. The 'library' as a formed concept remains a constant; in its actuality it is protean; everchanging, versatile, regularly taking on new forms in response to everchanging needs. However, no matter how flexible and adaptive it may be, the 'library' only exists as a library in the fullest sense when it is being used in accordance with its primary purpose and the capability that society designs into it. This traditional storehouse of knowledge has been caught in the successful integration of new technologies and new means of communication. While accepting that change will come continuously, it is imperative to preserve the basis of institutionalised service by accommodating the key aspects of the overall service. However, information service is no longer limited to traditional libraries and information centres. During the last few decades several phenomena have been developed—Information Broker, Invisible College, Information Filters and so on.

1.5.6.1 Information Broker

Information broker is in business for profit. It may be an individual or a firm. It uses a variety of sources including libraries and information centres to get answers for the client's requests. In developed countries including USA there are a number of brokerage firms in operation.

1.5.6.2 Invisible College

It is now well established that there exists, in any scientific community, a personal network of professionals, related through similar research interests, institutional ties, or former associations, who maintain a close association by informing each other of on going and planned research, asking for criticism of draft papers or reports, discussing current work in correspondence or at conferences, and possibly collaborating on various joint projects. The "invisible college", as described, for example, by D. Crane (*Invisible Colleges : Diffusion of knowledge in scientific communities*. Chicago, University of Chicago Press, 1972), is a personal network that tends to comprise an elite, influential, and cohesive group of workers engaged in research at the forefront of their field. The invisible colleges are extremely effective information networks, but participation is largely restricted to those who are leaders in a field.

According to D. J. de Solla Price, "There now exist dozens of what we call invisible colleges, each consisting of the few hundred persons who make up the international body of real leaders in their subjects. They are power groups, albeit often unwittingly,

and the more power they have the more they gain.” Then aim, to spread the good word with the minimum of delay, is entirely laudable, and of course as the most prominent workers in their various fields they do generate much of the significant new information.

1.5.6.3 Information Filters

The concept is concerned with personalised information delivery. Filters are third parties to the communication between users and sources. They should possess both the knowledge and the functionality to critically examine the information in the sources and forward the information they ‘judge’ as relevant to users. They are addressed only for a specific and relatively narrow class of users and sources. This is a new type of information service for which manual as well as automatic techniques can be used.

1.6 INDIAN SCENARIO

After independence for developing infra-structural facilities the government has been taking initiative in the organisation of effective information system and services. This led to the development of Libraries and Information institutions throughout the country. We have discussed in unit 1.3 the three eras in the pattern of growth of information institutions. That framework is reflected in Indian context. Institutions such as Libraries, Documentation and Information centres academic and professional levels, R & D institutions and laboratories, government agencies and quite a few public and private sector undertaking have been set up. Initially, all these institutions functioned in isolation. Later the situation has changed and there have been established linkages within some categories of institutions.

In Era II during 1950s and 1960s mission-oriented organisations like Atomic Energy Commission, Indian Space Research Organisation, Electronic Commission, and some came into being. Council of Scientific and Industrial Research, Indian Council of Agricultural Research, Indian Council of Medical Research, Defence Research & Development Organisation may also come under this group.

In Era III that is, from the 1970s Institutions like Small Enterprises National Documentation Centre, Documentation attached to National Health and Family Welfare that is, National Institute of Health & Family Welfare (NIH & FW) and a few others are problem solving type of institutions. Most of CSIR organisations on Food, Leather, Drugs, etc. began as problem oriented research. They required specialised information to support their research activities which led to specialised information centres.

In Public sector Central Machine Tool Institute, Steel Authority of India Ltd. (SAIL), BHEL and in private sector Tata Energy Research Institute, Bharat Electronic and others developed their information units to meet their technical information needs.

In 1980s the government started encouraging the modernisation of the information systems using modern technologies. As a result, National Information System for Science and Technology, Environmental Information System, Bio-Technology Information System, etc. were taken into consideration.

Networking and resources sharing activities are pursued in the development of information services. Projects such as Library and Information Network, Delhi Library Network, Bombay Library Network, Calcutta Library Network, have been taken up to develop in phases.

1.7 INSTITUTION BUILDING

“The strategies and approaches for institution building vary from country to country in accordance with their respective environments, requirements, priorities and the level of existing institutions. An institution should have set goals, objectives and criteria for priorities. It should have challenges and opportunities, carefully conceived roles, well defined tasks and clear sense of purpose. Its programmes should be symbolic of what stands for and its role in society, infused with societal values. It has a purpose, function and ability to service and serve clientele relevant to needs, and environment. (Y. Nayudamma). The effectiveness of these institutions may be judged by their contacts with users and their information needs in different contexts and contributing in full measure to the decision-making processes for economic, industrial and social development.

All types of institutions irrespective of subjects affiliation and activities contribute to the development process. But the development itself is a complex process; a continuous and transdisciplinary one, requiring multi-pronged task forces, cutting across vertical and horizontal structure, to achieve desired results. A concerted and coordinated endeavour is needed to build proper structures by government, industry, STSI institutions. This calls for a network of institutions allowing organised information flow from top to bottom and between coordinated and collateral levels.

Western models available to the third World countries must be examined in the context of the requirements of countries concerned and adopted or adapted only if they could ensure results. Information institution building is a complex process involving men, materials, machinery and money and will have to be managed effectively for obtaining optimum results. Clear perspective and farsightedness, determining appropriate goals and objectives, fixing targets for outputs, careful planning with guidelines of policies, criteria for priorities and efficient execution, organisation and management—all these are essential elements in institution building.

1.8 FUTURE SCENARIO

The shape of things to come in the twentyfirst century has been predicted by a number of writers of the industrially advanced countries. Alvin Toffler, for example, observes that the info-society of the future will commence a new civilization which will restructure education, redefine scientific research and completely reorganise the media of communication. The Third Wave civilization will rest on intensive, de-massified media, feeding extremely diverse and often highly personalised imagery into and out of mid-stream of the society. (Toffler) He sees deinstitutionalisation, in this third wave civilization which will be characteristic of individualistic services. He predicts total change from the present industrial society, institution building getting a back seat.

Daniel Bell does not envisage deinstitutionalisation in his post-industrial society. Communication and knowledge being the strategic resource and transforming agents of the post-industrial society, will pose economic-political problems, one structural and the other intellectual the structural problem will raise the issue of centralisation versus decentralisation what kind of techno-organisation is best designed to be efficient, meet consumer use-industrial, commercial, financial, scientific, library and information-and remain flexible enough to allow for continuing technological development. This has always been a controversial issue and may continue to be so. In fact, political organisational pattern may set the tune for the type of other organisations. The second policy problem is intellectual which is concerned with information policy, particularly the dissemination of scientific and technical information.

Lancaster predicts disembodiment of the library in paperless society. The new institution for information will be consultancy organisation, equipped with machines of various kinds, connected to remote data bases and banks on-line and offer consumer-oriented services based on needs. The Variation in the institution will be in the nature of services they offer and their scale of operations. More networks, consortia and systems may be conceived.

In India the impact of information technology is felt in the field of mass communication. How our institutions disseminating information will shape will largely depend on professional initiatives. It is not just moving into the machine age, but putting knowledge and information to work.

1.9 SUMMARY

This unit presents an overview of importance of institutions in modern society. It stresses the significance of Information Institutions to the present society, a

historical bespectacled of the growth and development of Information Institutions with special reference to India. It has highlighted the importance of non-traditional Information Institutions. This unit has discussed the Indian Scenario stressing growth pattern of Information Institutions. Institution building is a highly complex process. The Institution should set goals, objectives and criteria for fixing priorities. It glimpses the shape of things to come in the twenty first century. Developed countries have set their own models. India has felt the impact of information technology in different fields specially in communication. It is the duty of the information professionals in India to set the country in the pursuit of innovations to remodel our Information Institutions.

1.10 EXERCISE

1. Discuss the type of Information Institutions.
2. State the functions of Referral Centre.
3. How would you organise a Data Centre?
4. Describe the growth and development of Information Institutions in India.
5. 'Information Institution building is a complex process'—Discuss.

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UNIT 2 □ INFORMATION CENTRES

Structure

- 2.0 Objectives
- 2.1 Introduction
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2.0 OBJECTIVES

An information centre is an agency that provides right information to the right person in a usable form and on time. This unit will give you an understanding of

- (a) the role of information centre
- (b) the need for information centre
- (c) the types of information centre
- (d) planning of information centre
- (e) services of information centre
- (f) national and international information centres

2.1 INTRODUCTION

The operation of a special library or information centre takes place in a highly competitive environment. It is one of the characteristics of organisational dynamics that resources rarely if ever approach the level of demand for them. If librarians are to retain their share, or perhaps do a little better than that, they must understand the dynamics of the organisation in which their competition for funds takes place.

There are no cut and dried rules as to the best placement of the information centre. Factors such as perceptions, personality and the interest can have more influence than the rank and status of the individual to whom you report.

The information centre should try to clearly define its role and how it fits into the parent organisation. Special libraries or information centres within a business or company are very different than other types of libraries. Special libraries share some common traits. In his book H. White identifies the significant characteristics of special libraries and information centres :

- emphasis on providing information
- nontraditional setting
- a limited body of users
- limited subject scope
- small collections
- the need to establish usefulness
- relationship to organizational mission
- management that is not library oriented
- the impact of organizational policies
- working under time pressure
- libraries that take on user's burden
- specialised and internal materials
- restricted access
- entrepreneurial activities

The information exists to support and enhance the mission of the organization in which it is housed. In information centre the emphasis is on the provision of information contained in the documents, rather than the documents themselves.

In 1946 John Crerar Library of Chicago laid the foundation of information centre. This library used to offer the industry various kinds of information services from newly formed department Research Information Service.

It is worth to note that specialist libraries began to build up facilities for meeting the changing needs of scholarly clientele for intensive services. Later in time, documentation centres, either in supra or juxta or infra position to their companion libraries, began to emerge towards the same purpose. Nowadays, the term 'information centre' is more commonly used, even though in a broad sense documentation centre and information centre may mean the one and the same thing. The distinction is somewhat artificial. Strictly speaking, information centres ought to undertake information and supply evaluated data and information, whereas documentation centres may be satisfied with the function of contents analysis of documentary sources towards pointing out to the existence of raw information.

2.2 DEFINITION

Information services units in organizations have been usually referred to as Information Centres or Information Departments. The emphasis in the case of these centres is towards provision of information contained in the documents, rather than the documents themselves which is the main consideration of the traditional libraries. Some, however, have referred to the information centres as ‘Specialist Libraries’ since the emphasis was on a collection of nascent micro-documents with service to specialist readers. The functions, products, and services of information centres vary in detail, depending on the informational requirements of the user population, but are, on the whole, similar. The general sequence of operations and possible products/services is given below: ?

Activities	Services/Products
Selection and Collection of documents	Bibliographies, Current Awareness Services
Indexing & Abstracting	Indexed bibliographies, Abstracting Bulletins, Custom Searches
Extraction	Digests, Extracts; Descriptive Reviews/state-of-the-art report, Trend Report, compilations (unevaluated)
Evaluation	Critical Review of Area, critical compilation of Data, criteria for Experimentation, Recommendations, Solutions to (immediate) problems, Correlation of Data, Prediction of properties

In the above diagrammatic representation of activities and products, the amount of intellectual activity involved in the preparation of products increases as one proceeds from bibliography to data correlation. It may also be noted that each activity and product forms the input for subsequent activities and products. While the activities of selection, collection constitute the domain of traditional libraries which are document oriented, activities of indexing, abstracting, and extraction in addition to selection and collection, are common to information centres in general. But, the evaluative activity is the exclusive domain of of ‘Information Analysis Centres—now redesignated as ‘Information Consolidation Units.’

2.3 NEED FOR INFORMATION CENTRES

Generally, Information Centres began as 'Unplanned' libraries through accumulation of books, periodicals and other records. Over a period of time they grew and became unmanageable and unproductive. It was at this time that the people concerned tended to look seriously for the establishment of a formal mechanism which would take care of the growing collection so that it could generate the needed information services to the clientele. Some of causes indicative of the need for the establishment of an Information Centre are as follows :

Perception that funds were being wasted in the purchase of multiple copies of books and periodicals because of lack of centralization and control.

Large and extensive collection of materials scattered in offices or store rooms. When they took up considerable and still did not yield the desired item when it is demanded.

A flood of mail announcing new publications, information services and databases that nobody had time or inclination to screen to determine those of interest.

An awareness by organizational professionals, from contact with others by professional gatherings, that they were not keeping with their development in their fields. This was particularly unsettling for researchers, but it was also disturbing for business executives if they suspected that there were things others knew and they did not. Professionals (or organisations) were spending a great deal of time in the attempt to track down needed information, including trips to other libraries and information centres.

An important decision had to be delayed because needed information was not found out.

Evidence of duplicated effort, with a resulting waste of time and money, because the results of earlier work were not known properly.

Another fact is that the present day Information Centres have largely been due to the interest and effort of numerous sponsoring agencies belonging to both the private and public sectors. Thus a need has arisen for justifying the establishment of new Information Centres to the satisfaction of sponsoring agencies. In other cases, the parent organisations needed to be convinced for the establishment of Information Centres as units of their organisations.

Justification for establishment of Information Centres can also be discussed in relation to :

- (a) Objectives of the parent institution;
- (b) Expressed or established user need;
- (c) problem area;
- (d) Elaboration of the subject to be covered; and
- (e) Proliferation of literature

2.3.1 Objectives of Parent Institution

Study of the existing operating Information Centres reveals that almost all of them—whether they be discipline-oriented, mission-oriented or census bureau type—are, generally located in one parent institution they may be sponsored by and supported by other organisations. Further the activities of the Information Centres seem to be in conformity with the objectives of the respective parent institutions. So it would be quite in the fitness of things to assume that the institutions and their users having realised the importance and value of information for their activities have established the respective Information Centres.

2.3.2 Expressed or Established User Need

The need for an Information Centre in a particular field would become obvious if we examine the features of the World of Information. Features are : (a) accelerated growth of information, increasing rate of obsolescence, (b) wide variation in quality and reliability, (c) Interdisciplinary nature of information; scatter/seepage of information (d) wide range of standards and modes of presentation of idea, (e) pertinent information published in documents with restricted circulation, (f) multiplicity of languages, (g) too many documents. Information Centres have limited funds and space.

The overabundance of information has made many a research scientist to create new information rather than search through existing documents. Recognising the need for information, many information systems systematically identify, collect, store and disseminate information to the users and their needs. This is largely because information presented is not oriented or structured according their specific needs.

2.3.3 Problem Areas

In some of the problem areas like Biodeterioration, Pollution, Nuclear. Safety, and the like where existing knowledge and experience are scattered over several disciplines and where the literature/information is spread over a variety of sources, it becomes problematic for researches, policy-makers and managers to have access to information. In other words, the inter-disciplinary nature of information in such problem areas poses difficulties requiring the establishment of Information Centres.

2.3.4 Proliferation of Literature on the Subject

Some of the factors which have influenced the character and increased the current pace of scientific and technological activities are as follows :

- (i) Exponential growth of publications,
- (ii) Rapid fragmentation of knowledge;
- (iii) Interdisciplinary nature of scientific research
- (iv) Increasingly effective technological capabilities;

The information explosion coupled with information “pollution” has created problems to users needing information. This applies especially to new, peripheral and interdisciplinary fields. One of the solutions of overcoming these hardly is to set up an Information Centre whose task will be to organise, coordinate and institutionalise the information compression and evaluation activities in the subject field concerned.

2.4 TYPES OF INFORMATION CENTRES (IC)

Information Centres can be classified in many types. Let us have a brief discription of various types :

By Level of Service

- (a) Local IC serving a well-defined, comparatively small clientele
- (b) State or Regional IC serving a less well-defined or less homogeneous, but comparatively a larger clientele e.g. SAARC Documentation Centre,
- (c) National Information Centre serving an even more heterogeneous, but comparatively much larger clientele, e.g. NISCAIR (National Institute of Science Communication and Information Resources)

By Range of Subject-Coverage

- (a) Information service covering fairly well-defined homogeneous subject or group of subjects with a comparatively small seepage of information—e.g. Food technology, Leather technology.
- (b) Information service covering a fainy well-defined homogeneous subject or group of subjects with a comparatively greater seepage of information, e.g. Instrumentation, Production Engineering, Agriculture.
- (e) Information service covering a wide range of subject, e.g. Physical Sciences, Medical Sciences, Behavioural Sciences.

By Orientation of Service in terms of Clientele

- (a) Research and Development Personnel
- (b) Research personnel, production and Industrial personnel
- (c) Government
- (d) Public
- (e) Combination of (a) to (d)

By Variety of Services Provided

- (a) Current Awareness Services

- (b) Abstracting and Digest Services
- (c) Product Information Service
- (d) Data Bank, etc.

By **Type of Material**

- (a) Patents
- (b) Standards
- (c) Engineering Drawings
- (d) Audio-Visual material

By **Sponsorship**

- (a) Government—Central, State, etc.
- (b) Semi-Government
- (c) Autonomous body
- (d) Private
- (e) International, etc.

2.5 ORGANISATION OF INFORMATION CENTRES

The different patterns of organisation of Information Centres depend on the volume of information handled, level Information Centres and status of the Information Centres within an organisation and the type of users to be served. Local level Information Centres are attached to parent institutions which organise and administer the centres. At the national level it is the responsibility of the appropriate government agencies to organise and administer the centres.

The work of Information centres may be organised on a functional basis and their operations may be organised into three areas of activity.

2.5.1 Areas of Activity

1. Management and Administrative Services : These include developing and implementing policies and standards consistent with an organisation's objectives.

2. Internal Operating Services : The selection of materials viz. books, periodicals, reports, patents, conference proceedings should reflect the suggestion of users and specialists of the Information centres. Classification, Cataloguing, indexing operations are professional jobs and should be done by specialist staff. Analysis, synthesis and summarisation of information by literature search are important areas of internal operation.

3. External Users Services

The chief service is circulation. Information Centre staff should cautiously circulate

the documents to the authorised clientele. The Information Centres provide many more services to the external users.

2.6 SERVICES OF INFORMATION CENTRES

The IC cannot offer unlimited services. It must select and prioritize which service and level of service that it will offer to user groups. The Information Centre has three basic functions :

Acquisition
Organisation
and dissemination

1. Traditional user services : can vary, based on the organization's needs, but core services that every information centre generally provides at a minimum level are :

interlibrary loan/document delivery
reference and on-line database searching (if feasible)
photocopying
current awareness services

These services are not very cutting edge, but they have become traditional for a reason, there is a need.

Acquisitions, serials control, circulation management, indexing and inventory control, are generally considered to be 'technical' services rather than user services.

2. Reference and online database searching : The most requested service of the information centre will be probably be information retrieval. In his book E. Mount notes that

"One of the distinguishing characteristics of special libraries/information centres is their readiness and skills in locating information for their uses, often under difficult circumstances.

A retrieval service tends to consist of a wide variety of research or reference questions which range from a quick answer to long, drawn out literature searches or projects which can last for months. Mount describes various types of retrieval services:

quick answer— can be answered with a single fact
longer searches— require more than a few facts; require several hours or days.
Literature surveys— more comprehensive and exhaustive in coverage of a subject topic and will take weeks.
Identification of citations— verify incomplete bibliographic information.
Interlibrary loans— obtain items not held in the collection.

A variety of resources can be used to answer the information requests, including print sources, such as reference books, electronic resources such as an index on CD-ROM; the information centre's on-line catalogue (if it is available), on-line

resources, including the Internet and on-line database and of course, using the phone.

The most critical step of the information retrieval process is what is known as the reference interview. How the information specialist will find the answer is not as important as having a clear understanding of the request. What is the purpose of the information? Understanding why the information is needed can be helpful to the information specialist in determining where to look. A trained information specialist knows how to determine the 'real question.' The information specialist can discuss the request and suggest that the user limits or broadens the search better to suit his/her needs. G.T. Griffin suggests some basic questions :

What is the geographic scope of the inquiry?

What time period is appropriate?

What is the budget for this project/request?

What is the deadline for this inquiry?

A request may involve checking a variety of resources or the answer may be found easily in a reference book. The information specialist needs to be familiar with what resources are available and what would be the most efficient and cost effective way to retrieve the information. Know your print and electronic collection and the scope of your database access.

3. Delivery of information : The information can be delivered in person or via interoffice mail. A facsimile machine is an important delivery tool and should be accessible. Electronic mail is becoming a very popular way to deliver information.

4. Document retrieval: The information specialist will be asked to obtain copies of documents, articles and books for users. The information centre will need a means of obtaining copies of documents if the information cannot be accessed in a full text source internally.

5. Current Awareness : The information centre should devote significant efforts to current awareness service. In essence, current awareness services allow a large number of users to be made aware of the contents of large number of publications—something for which many may not normally have the inclination or time.

The adage the right information to the right person at the right time in the right format and the right quality never rings more true than when it is applied to dissemination services. Current awareness services can be both computerised and manual. Current awareness services can involve altering users to new information centre materials. Many information centres publish information or library bulletins. These bulletins often take the form of a new acquisitions list and include new books, serial subscriptions, reports and serial materials. Sometime you can incorporate an acquisitions list into another newsletter. Other bulletins may take the form of a newsletter and include information about new services, new electronic resources, etc.

Types of current awareness services :

Journal article photocopies, journal article lists, newsletters, abstract bulletions, including short summaries of journal, acquisition newsletters listing new information sources, journal circulation available, patents and standard bulletins, bulletins containing information about forthcoming, tailored news of individuals-selective dissemination of information, press cutting service, data on a particular subject of common interest, report writing and summarizing information, electronic delivery of journal articles, end-user searching putting research and information tools onto users desk.

6. End user searching : The philosophy of most corporate information centres differs from that of an academic, public or school library. In corporate information centres, the information specialist locates the answer to the user's information request and delivers the answer, either as a raw data or as packaged information to the user. The information specialist does not point to the shelves or the on-line catalogue when a user makes a request, unless the end user searching is accepted. Many information centres make their online catalogue, CD-ROM products, the Internet and commercial online services available to their users. In these instances, the information centre also provides training on searching these resources.

7. Bibliography preparation : A request for a more formal search may include the preparations of a bibliography. Mount recommends that several factors should be considered before starting and agreed upon by the information specialist and the user. This includes the audience for which it is to be written, range of publication dates, formats to be included (books, journals articles, technical reports, audiovisual materials, patents, meeting abstracts, web sites), other aspects such as whether the information specialist will provide annotations, arrangement of citations, (by auther, subject, date, material type), and the required duedate should also be discussed.

8. Coordinating translations : Many information centres obtain translations for organizations. If the organisation has locations around the world or subscribes to foreign language publications, the need for the translation of a document, from or into another language will arise. Make sure the translation is necessary. Understand the user's time, expectation and need.

9. Library instruction : Besides training for end-user searching, the information specialist will be performing user instruction in the form of orientation to the information centre. Most organizations have their employers participate in a new staff orientation.

Other instruction will include point of use instruction on using reference sources and equipment in the information centre.

10. Abstracting and analysis : Some organizations have a need for prepared abstracts summarizing information presented in journals or gathered in a search., Many users like the information specialist to conduct a search, read the documents and prepare a summary of the literature. The information specialist may be asked to gather

information on market or industry. Requests such as these can result in a large volume of relevant information. Someone has to digest the information, analyse and synthesise and then summarise it before it can be used for decision making.

2.7 PLANNING AN INFORMATION CENTRE

R. D. Stueart and B. B. Moran in their text on library and information centre management has defined planning as ‘the process of getting and organization from where it is to where it wants to be in a given period of time by setting it on a predetermined course of action.’ Much of an information centre’s effectiveness derives from anticipatory future direction and preparing to meet information needs before they arise.

Establish priorities. You will not be able to work on the entire plan at once. Some tasks must be done before others can be achieved and some are just more important than others. Create deadlines for completion or milestones or landmarks for smaller goals needed to achieve larger projects. Other essential elements of a plan include a clear picture of products/services provided, critical success factors, strategy funding and recommendations. Planning is a continuous process. Reviewing and evaluating the development phase should be done for any modification. V. J. Feinman in her article, outlines the five-step strategic planning process :

situations and environmental analysis, development of organizational direction, formulation of strategic plan, implementation of plan, and strategic control, feedback, evaluation.

2.8 EXAMPLES OF INFORMATION CENTRES

Although the terms ‘information specialist’, ‘information centre’ and ‘organization’ are used, they should be interpreted to mean any type of librarian or information professional, any type of library or information centre, and any type of organization or company-profit or non-profit. We cite here some international and national information centres.

2.8.1 International

1. The Topography of Terror Foundation—International Documentation and Encounter Centre : The centre is located in the centre of Berlin, near the Potsdamer Platz. The centre was originated from an exhibition in 1987. (the 750 th anniversary of Berlin) to document and explain the repressed history of this region during National Socialism. The documentation centre provides information about National Socialism. Serveral exhibitions, audio tours on the site, seminars, a library, a photo archive and

a multimedia encyclopedia about the National Socialism have been organised. All departments of the documentation centre are interlinked over one mask and one thesaurus. For example, if searching for information about Joseph Goebbels the searcher will get a listing of all sources which contain information about Goebbels. This listing shows links to the library, the document and photoarchives.

2. Ipsen International: Ipsen International is part of a world-wide organization, the Ipsen Beaufour group, with a reputation of being one of the most innovative pharmaceutical companies in Europe. Currently there are more than twenty three subsidiaries operating in over thirteen countries. Ipsen International has its non-laboratory R & D functions centralized in the UK; these are the exploratory development, clinical research and regulatory affairs departments.

The service is growing quickly and is looking at new avenues of information provision such as competitor intelligence, knowledge management and daily news update.

3. Centre National de la Recherche Scientifique (CNRS): The National Centre for Scientific Research was established in Paris in 1939. The Scientific and Technical Documentation Centre of CNRS was created in 1940. The documentation centre provides one of the world's major scientific and technical information services. It abstracts and indexes all relevant worldwide journal literature and stores the results in computer-readable PASCAL-M and PASCAL-S databases which are used to produce more than 75 topical bibliographic bulletins. The PASCAL-M database is a multi-disciplinary file providing comprehensive coverage of the world's scientific and technical literature. The PASCAL-S database comprises 12 specialised subject files maintained in cooperation with outside organisations. It provides exhaustive coverage in the following areas : information science, energy, metallurgy, welding, building and public works, earth sciences, food industries, biotechnology, invertebrate zoology, agronomy, and tropical medicine. The documentation centre offers SDI and magnetic type services from PASCAL databases. PASCAL stands for **Programme Applique de la Selection et a la Compilation Automatique de la Literature.**

Since 1984 the documentation centre publishes four new service of bibliographic bulletins which replace **Bulletin Signaletique Series : PASCAL SIGMA, 2. PASCAL THEMA, 3. PASCAL FOLIO, 4. PASCAL EXPLORE.**

2.8.2 National

Many national information centres like NISCAIR, NASSDOC, DESIDOC, SENDOC, BARC and others have been organised to perform at national level.

(i) National Institute of Science Communication and Information Resources (NISCAIR)

NISCAIR has been formed on 30 September 2002 with the merger of National Institute of Science Communication (NISCOM) and Indian National Scientific Documentation Centre (INSDOC). The core activity of NISCAIR will be to collect, store, published and disseminate S & T information through a mix of traditional and modern means which will benefit different segments of society. To provide communication links among members of the research community, NISCAIR publishes 19 research journals (including one in Hindi) and two abstracting journals of international repute, covering all the major disciplines of Science & Technology. The Institute publishes three popular science magazines : Science Reporter (English, monthly), Vigyan Pragati (Hindi, monthly) and Science Ki Duniya (Urdu, Quarterly). NISCAIR has also published 60 popular science books in English under different series. It brings out CSIR News (fortnightly) and its Hindi version, CSIR Samachar (monthly). NISCAIR has also other publications and activities like consultancy services.

(ii) National Social Sciences Documentation Centre (NASSDOC). The National Social Sciences Documentation Centre, renamed so in 1985, was created in 1970 by the Indian Council for Social Science Research, New Delhi. It has been playing an active role by building up a comprehensive collection of different categories of documents such as doctoral dissertations, serial publications; abstracting, reprography and translation services; and by compiling union catalogues. NASSDOC has several publications including Union List of 'Social Science Publications' 4 vols, 'Union Catalogue of Social Science Serials', 32 vols., 'Mahatma Gandhi Bibliography (English and various Indian languages). Its current awareness publications include 'Acquisition Update' (monthly), 'Conference Alert' (quarterly) and 'Samajik Vigyan Samachar' (monthly, Hindi).

NASSDOC has been actively participating in Unesco's Asia—Pacific Information Network in Social Sciences (APIESS) programme since its inception as the National Contact Point.

(iii) Defence Science Information and Documentation Centre (DESIDOC). Formerly known as Scientific Information Bureau (SIB) established in 1958 in R & D organisation of the Ministry of Defence, it was formed in 1967 in Delhi to function as scientific information and documentation centre to cater to the information needs of R & D Headquarters and R & D establishment since 1970. DESIDOC has been functioning in the DRDO (Defence Research and Development Organisation) of the Government of India as a central agency to collect scientific and technical information from various published and unpublished sources, process it in different usable forms and disseminate the same to about 40 DRDO laboratories and other establishments of the Ministry of Defence.

The publications of DESIDOC include **Defence Science Journal** (quarterly) **R & D Digest** (bi-monthly), **R & D Bulletin** (quarterly) **Popular Science and Technology** (half-yearly) and **DESIDOC Bulletin** (monthly).

(iv) The Small Enterprises National Documentation Centre (SENDOC)

SENDOC was established in 1971 at the Small Industry Extension Training (SIET) Institute, now National Institute of Small Industry Extension Training, Hyderabad. It provides small scale industries with technological and managerial information. The centre collects and organises information on all aspects of small industry development. It brings out a number of bulletins and adhoc publications of interest to small industries. It conducts both for national and international-participants training courses. Besides, it offers technical enquiry services, microfilming and photocopying services, etc. It has a rich collection of industrial profiles, which are periodically updated.

2.9 SUMMARY

The unit defines information centre, sums up its activities and services. It explains the need for information centres. It describes different types of information centres, organisation and planning of information centres. It explains ten various types of information services. It describes four national and four international centres.

2.10 EXERCISE

1. How would you define an information centre ?
2. State some reasons for the need of information centres.
3. Give details about the different types of information centres.
4. How would you organise an information centre ?
5. What are the basic functions of information centre ?
6. Enumerate services in detail provided by the information centre.
7. Write short notes on any three national information centres.

2.11 REFERENCE AND FURTHER READING

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UNIT 3 □ DATA CENTRES AND DATE BANKS

Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Types of Data
- 3.3 Data Organisation
- 3.4 Data Centre
 - 3.4.1 Data Centre Vis-a-Vis Data Bank
 - 3.4.2 Role of a Data Centre
 - 3.4.3 Organisation of a Data Centre.
 - 3.4.4 Work Methodology of a Data Centre
- 3.5 Committee on Data for Science and Technology (CODATA)
- 3.6 Data Centres in India
- 3.7 Data Services of Data Centre
- 3.8 Data Banks
 - 3.8.1 Sectoral Data Bank
 - 3.8.1.1 General Purpose Data Bank
 - 3.8.1.2 Special Purpose Data Bank
 - 3.8.1.3 Data Banks for Different Disciplines
- 3.9 Conclusion
- 3.10 Summary
- 3.11 Exercise
- 3.12 References and Further Reading

3.0 OBJECTIVES

In this unit you will know the meaning of data, their types; know the functions and activities of data centres and its difference with databanks. You will be acquainted with CODATA and national data centres and databanks. Data is defined in its strict sense to mean numeric or quantitative information relating to physicochemical and other properties.

3.1 INTRODUCTION

Every modern society needs data for planning and development activity in every sphere, namely, in decision making, policy making as well as in formulating a plan of action. These decisions and plan of actions are needed at various levels, viz. at national level, planning level, administrative level, and execution level. The Department of Science and Technology needs data for formulating a Science Plan for the nation.

A laboratory director will need data for determining priorities and allocating facilities. A research worker will need data for executing his research work. Thus requirement of data is different for different purposes. It varies with the purpose and nature of decision involved. The data collected for one purpose may also be used for another purpose, with some manipulation. This means that the raw data could further be processed to yield systematised and integrated data needed for decision making and other purposes.

Data numeric or quantitative information in tabular form is a feature of many handbooks, and as the proportion of tables to text increases, the handbook as a form of literature merges into the book of tables. Tables are a convenient way to present clearly details such as melting points, atomic weights, and solubilities. Indeed in certain fields like thermo-dynamics, or spectroscopy, or crystallography, tables are vital to the whole study and progress of the discipline, simply because such a large amount of information has been collected in tabular form. The purpose of the tables is to save time. Indeed, as R.T. Bottles points out'. . . many details of physical properties are deeply buried in the literature, and effort, patience and time are required to retrieve them.'

Data are collected from studies involving observations and surveys. In such form, the data are called 'Raw Data.' Raw Data are not usable for decision making. These become useable only after certain manipulations involving organisation and synthesis. These data are termed 'Systematized Data.' All the 'Systematized Data' may not be required or relevant to a particular decision involving executive action. These data must be further analysed and evaluated. Whatever may be the position of data, these must be stored and be accessible. The sources and uses determine the types of data.

3.2 TYPES OF DATA

There are different types of data. We discuss the following types:

1. **Scientific data** : Under this category comes the observation data collected during the experiment like thermal properties of material, spectroscopic data of the material, and data on chemical analysis of material. In this category we can conveniently include the printed standard data tables or critical tables. Indeed in certain fields like spectroscopy or crystallography, tables are vital to the whole study and progress of the discipline, simply because such a large amount of information has been collected in tabular form, e.g. International Union of Crystallography, International tables of x-ray crystallography (Birmingham, Kynoch Press, 1952-62) in three volumes.

2. **Technical data** : In this category the data pertaining to the specifications of

various commodities or services are included. These normally cover engineering specifications.

3. **Techno-economic data** : In this category the data availability of raw material, the semifinished material, the consumption, and both internal and international market are included.

4. **Business data** : In this category data pertaining to manufacture, sales, warehouses, profits and losses, etc. are included. It also includes employment data on various labour along with the data on capital generation and formulation.

5. **Industrial data** : In this category are included data on various types of industries, their production capacity, the licensing capacity, the consumption of raw material and power, the product data, etc. It also includes data on the various skills employed in the production of products and services.

6. **Man Power data** : In this category data on various types of skills, employment potential are included.

7. **Socio-demographic data** : In this category data pertaining to the geographical distribution of the resources as well as the manufacturing capabilities and manpower are included. Apart from the above categorisation, data are amenable to grouping from the users' view point and from the stability considerations. These groups are stable data which do not change frequently; unstable data which require frequent updating; and live data which change due to on going processes in an industrial context like process control, material control, etc; or by the very use like rolling stock, air-line reservation, etc. The complexity of live data demands computer environment for collection, processing, servicing and display. Unstable data depending on the frequency and types update also require sophisticated skills and equipment. However, stable data and some unstable data needing only replacement as an update operation are to some extent amenable to manual manipulation and servicing.

3.3 DATA ORGANISATION

The problem areas relating to the data organisation are : (a) availability, (c) timing, (d) compatibility, (e) processability.

(a) **Availability** : A major source of data is operational administrative data gathered by institutions during the performance of their functions. For instance, data collection by Government would be guided by its executive responsibility, which data collections by industries and private organisation is generally confined to their particular areas of operation. The data so created would not cover the entire information areas. Quite often, even when such data are required by an agency it goes unrecorded either because it is costly to collect it, or because of lack of proper evaluating techniques. The nature of the reporting units can also render data unavailable. For planning

purposes the data on projects and forecasts are not available. In any case, availability of data is a continuous problem owing to the dynamic nature of the requirements of the users of data.

(b) **Reliability** : The accuracy with which the phenomenon and its characteristics are recorded is affected by the training and capabilities of the human recorder and the sensitivity and capacity of the mechanical aids used. Therefore, certain degree of subjective evaluation of the recorder should be allowed. As for data collected by satellites, etc. the use of data involves interpretation with a high degree of human judgement.

(c) **Timing** : This problem is confined to the time-lag in data compilation and also to the time-coordination in recording different data sets. For instance census and survey methods are so laborious and costly that they cannot be conducted frequently. These methods cannot by themselves provide data sets that are time-correlated, thereby matching of data sets is rendered very difficult. Data from other sources require to be updated continually in relation to other data compilations.

(d) **Compatibility** : Compatibility between different data compilation can be achieved only through standardization of the concepts of the data elements and their attributes. Apart from standardization the solution lies in data gathering at the level of individual entries to lend flexibility in aggregation. Similarly data-gathering from finely specified location of phenomenon lends greater compatibility between data sets with different spatial aggregations.

(e) **Processability** : The basic equipment of mechanical data-processing is that the input data should be convertible into machine-readable form.

3.4 DATA CENTRE

3.4.1 Data Centre Vis-a-Vis Data Bank

As noted earlier Data Centres handle quantitative numerical data. Their primary function is collecting, organising and disseminating data chiefly numerical. They provide a measurement service and advance relevant measurement techniques. Data centres vary both in size and in scope.

Data centres handle only numerical data, mostly for science and technology dealing with physical and chemical properties, Data Banks are multidisciplinary. Every documentation or information centre will have to be suitably linked with national specialised data banks and through them to international banks. Even then smaller information centres can create and maintain databanks and provide data service. In fact the concept of data bank has brought with it a new concept in information service. It can be recognised as a new concept in the information system.

Data centre handles data themselves or literature about data where as data bank handles data only. It handles all types of data particularly administrative, statistical, techno-economic, census and survey and management that are produced by various institutions.

3.4.2 Role of a Data Centre

An institution in developing data handling capabilities may be called a Data Centre. In the context of National Information System for Science and Technology the data handling capabilities should be developed at the Branch Information Centres; This is logical in the sense that the expertise needed for evaluating and compressing the raw data in a given discipline is available to a Branch Information Centre as its environment. In the totality of all the Branch Information Centres, this distributed facility will provide a ready access to data which are collected at a considerable expense of resources and time over a wide spectrum of discipline. The data handling capability in a Branch Information Centre may be referred to as the Data Centre.

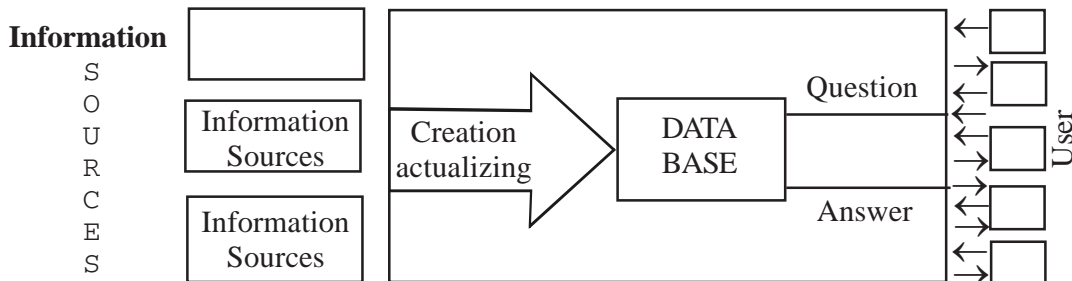
3.4.3 Organization of a Data Centre

The organization of a Data Centre has two main aspects-one is a general aspect and the other applied aspect. If we compare the organization of a complex information system with that of the Data Centre, we should note that the main difference between the two lies in the importance given to the information analysis. This difference is apparent in all stages of the organization and is affected through the following categories of personnel:

- (a) data coordinators
- (b) data specialists
- (c) data analysts and
- (d) programmers.

The data specialists form an essential component of the Data Centre. The need to examine the data leads to the use of highly specialized personnel able to appraise the correctness of the data received to solve all the correlations, which needs numerous contacts between the sources and the users of the data centre.

The general scheme of organization can be represented thus :



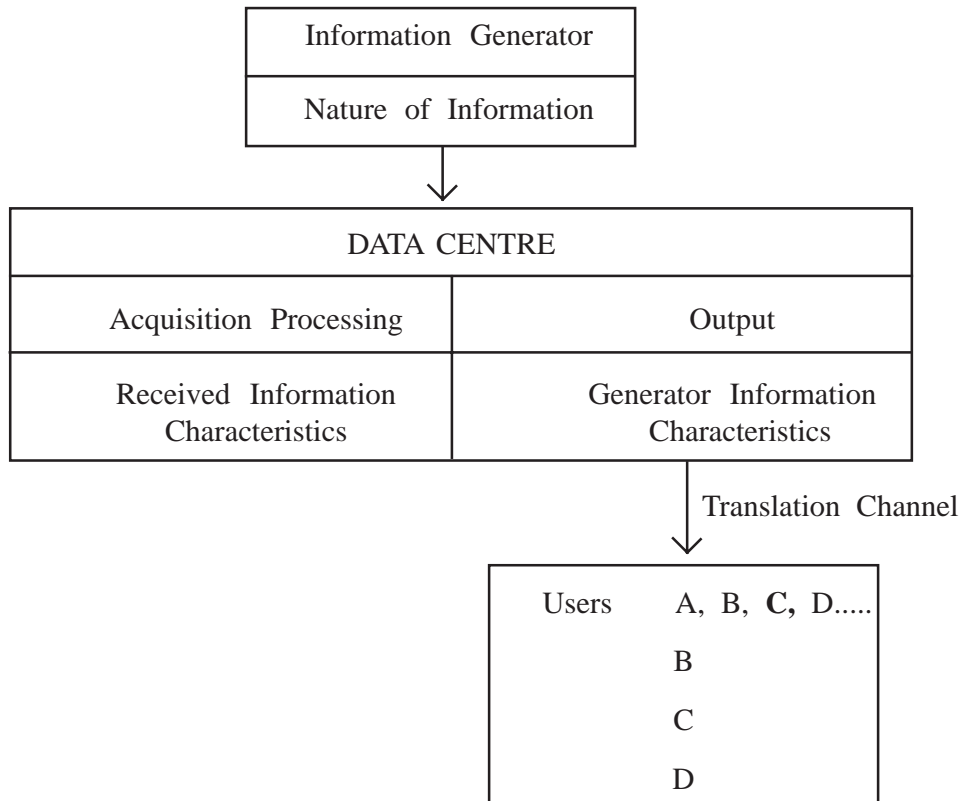
Needs covered by the Data Centre

The general concept of a Data Centre is based on an analysis of existing data and determination of the needs to meet. The above stated elements help us to determine the general structural organization of Data Centre in terms of

(a) the data source; (b) the documents which supply them; (c) the internal technical characteristics of the system; (d) the users need.

The most efficient method of organization consists in establishing assumptions, concerning what the Data Centre may offer, thus establishing the data needs.

The second and more important aspect of organization of a Data Centre is the applied aspect. The organization of a Data Centre has become all the more necessary only to ensure a contrasted data base to which one may always appeal and which shall include the basic data. The main considerations in the structuring of a Data Centre are : the volume and kind of data and the existence or possibilities of access to a computer. The flow of information of Data Centre may be represented thus :



Principles involved in the organization of Data Centre :

(a) Data are received and collected from different documents by a group of specialists who decide the importance and relevance of the data, control and fit them with the generator source.

(b) The received data are organised in order to establish that they represent the basic data which must be processed or synthetic data which may be necessary for further use in their initial form

(c) The data are registered on punched cards in order to build the card indexes which represent the data base for the computer.

3.4.4 Work Methodology

In order to ensure efficient functioning of a data centre the following operations need to be performed :

- (a) data collecting
- (b) data control
- (c) data codification
- (d) data storage
- (e) organization of the card indexes and
- (f) data retrieval.

3.5 THE COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY (CODATA)

The problem of data collection and maintenance was international in character. Even an affluent country like the USA realised that no single country had the resources of money and manpower to support the massive effort that is needed. The next step inevitably brought about international collaboration in this area of information requirements. Some efforts in this direction culminated in the formation of CODATA in 1966. In fact, International Council of Scientific Union (ICSU) took the initiative in 1966 to organise the CODATA. The objectives are to achieve informal coordination among and provide guidance for numeral data competing projects on a world wide basis and encourage support for data compiling projects by appropriate agencies. The CODATA, is itself not an operating agency for the compilation of data.

Data is one field of scientific activity where the benefits of international cooperation is evident, and CODATA has done much to stimulate joint effort. In 1974 it completed a major study for UNISIST (World Science Information System) on the problems of the accessibility and dissemination of data for science and technology. The main recommendation was the establishment of world scheme or network comprising three parts : for each subject discipline a data evaluation centre; for each country, a data dissemination centre with broad subject, coverage, and a global referral centre for directing users, enquiries to the most appropriate source. Such World Data Referral Centre has now been established in Paris. CODATA in now compiling a directory of data sources for science and technology.

The mission of CODATA is therefore, to ascertain on a worldwide basis the current activities in data compilation and publication activities; to achieve coordination among existing programmes and minimise uninternational or indecisive overlap and to recommend new computation programmes; to encourage the support of needed work by appropriate agencies; to stimulate wider distribution of compilations of high quality, to encourage and coordinate research on new methods for the preparation and dissemination of erotically evaluated data generally expressed in numerical tables.

In the CODATA there are two categories of members— union members representing ICSU and members representing countries. CODATA started with 12 union members and 15 national members. Prominent union members are—International Union of Pure and Applied Chemistry (IUPAC), International Union of Biological Sciences (IUBS), International Astronomical Union (IAU), etc. The prominent national members are U.S.A., U.K., etc. Japan is the only Asian member of CODATA-The main executive office of CODATA, Known as the Bureau, is situated in Frankfurt.

For better accessibility and dissemination of data a global plan has been drawn up by CODATA. The plan envisages three different types of service centres: Data Evaluation and Compilation Centre; Data Dissemination Centres, and Data Referral Centres.

CODATA organises conferences on data handling and its development. It brings out some regular and adhoc publications. For example, CODATA Newsletter—announcing current data compilations;

CODATA Directories of data Sources;

CODATA Referral database;

CODATA Bulletin. Oxford, Pergamon, bimonthly. It publishes conference proceedings on the subject of data in science and technology, research papers, and CODATA reports on new developments in data handling and presentation, it also incorporates the **Directory of Data Sources for Science and Technology**. Certain issues of the Bulletin are essentially concise directories of data centres and other formal projects which serve as sources of quantitative numerical data on properties of well-defined physical and chemical systems and with each issue devoted to a subject area, such as corrosion and geomagnetism.

3.6 DATA CENTRES IN INDIA

In India we are on the way to get into the mainstream of data activity and service. The NISCAIR has taken up the work related to data dissemination. The DST and INSDOC jointly brought act a '**Directory of Data Centres in India**' in 1977. The National Committee for CODATA was set up in India for coordination of all the Data

activities in the country. There are several institutions and organisations engaged in data activities. A few such institutions are noted below :

The Indian Institute of Science, Bangalore is engaged in the collection and evaluation of thermophysical properties programme. This institute lends support to a few centres at :

(a) Indian Association for the Cultivation of Science for thermodynamic and transport properties.

(b) University of Madras for crystallographic data (NICRYS)

(c) University of Allahabad for stability contents of coordinate compounds.

The Bhabha Atomic Research Centre (BARC), Bombay is engaged in collecting Nuclear Science and Technology data. This centre is giving Indian input to the International Atomic Energy Agency, Vienna.

The Central Glass and Ceramics Research Institute (CGCRI) Kolkata has a hard data centre for advanced ceramics.

The National Institute of Oceanography has set up the Indian National Oceanographic Data Centre.

3.7 SERVICES OF DATA CENTRE

The data centre works in two ways in order to meet the request of the users. It supplies the current information including the synthetic data obtained from the processing on different criteria of the basic data. The second method is to supply answers to the requests of the users. The answers include the basic data stored in the databases and selected on certain constraints imposed by the user as well as synthetic data obtained through processing on other criteria other than those used in the previous case, of the stored data.

3.8 DATA BANKS

During the last three decades, many experimental data banks, data centres were created in developed countries, mainly in Sweden, Norway, USA, Great Britain and France. They include sectoral banks for management and general data banks for national, regional and urban planning intended for Government or for private users. Data banks are of different types according to the type of decision makers, users and nature of rapidly available data. They may pertain to one given sector or to multi-sectoral level.

3.8.1 Sectoral Data Bank

The industrial information system proposed by United Nations Industrial Development Organisation (UNIDO) is a sectoral bank project which has to be started within an

industrial firm and investment projects. For example a Management Information System (MIS) or information system within a sector Industrial firm with 20 to 30 employees can be set up at sectoral level whereas data necessary for planning must cover many sectors like commerce and industry, manpower, foreign trade, etc., which are called multi-sectoral or general data banks. It requires several information systems relating to different fields for decision making those these decisions may only concern one field.

Data banks are classified as general-purpose and special purpose data banks, depending on the purpose it serves.

3.8.1.1 General Purpose Data Bank

A gigantic central databank servicing the general public is impracticable.

3.8.1.2 Special Purpose Data Bank

Owing to inadequate resources, it is preferable to set up various types of special purpose data banks linking the producer and specific users, each bank being equipped with an appropriate body of experts to perform the needed intermediary function.

3.8.1.2.1 Data Banks for Different Disciplines

Indian National Scientific Documentation Centre (Now NISCAIR), Delhi, Council of Scientific & Industrial Research (CSIR), Department of Science and Industrial Research (DSIR), Electronics Commission (EC), Planning Commission, etc. have been compiling data relevant to Science and Technology Information Bank.

The National Committee on Science & Technology and the Council of Scientific & Industrial Research have established a national network of Technology Information Bank for national planning and decision making purpose. They have established Technology Information Bank for Leather, Cement, Food, Instrumentation, and others. The Data bank for social sciences is also a new organizational phenomenon.

Keeping in view the needs of the present day, there is a scheme for developing a system for small scale sector.

In addition to these, data banks have been developed in different fields like machine tools.

3.9 CONCLUSION

Increasingly to be found are data bases containing substantive factual information of many kinds, not merely quantitative or numeric. These are commonly referred

to as data banks or factual or factographic data bases. We have been told that non-bibliographic data bases are the wave of the future, and some observers have remarked growing expectations among many library users that the on-line terminals they see should be used to interrogate the growing number of source data bases. Librarians are not resisting this : the Canada Institute for Scientific and Technical Information has already added scientific numeric data bases to its list; 40% of Euronet/ Diane data bases are data banks; the National Library of Medicine already offers TDB (Toxicology data Bank) for online search, and MEDLARS III plans to include several source data bases.

The 'confidentiality' problem is one of the factors affecting many aspects of the data bank. Though confidentiality of data may sometimes be a pretended notion, purporting only to avail possible abuse of data, the protection of personal or business secrecy is the legitimate claim in many societies. It may be solved by (a) excluding any possibility of free physical access to data stored in the data bank; (b) classification of the users of data and installation of appropriate methods for controlling their access to data; (c) sufficient aggregation of elementary data when processed for general dissemination.

3.10 SUMMARY

In this unit we have explained the meaning of data and their types. We have discussed the functions and activities of data centre and its difference with data banks. We have described the CODATA and other national data centres. We have highlighted the services of data centres and different types of data banks and data banks of different discipline. We have noted the importance of non-bibliographic data bases and the confidentiality problem is one of the factors to be reckoned with.

3.11 EXERCISE

1. Explain the meaning of data and discuss the different types of data.
2. Discuss the problem areas relating to the organisation of data.
3. Explain the difference between data centre and data bank.
4. Discuss the role of a data centre.
5. What are the components of a data centre ? Discuss the needs covered by the data centre.
6. How would you organise a data centre ?
7. Write a note on CODATA.
8. Show your acquaintance with data centres in India.

3.12 REFERENCES AND FURTHER READING

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UNIT 4 □ REFERRAL CENTRES AND CLEARING HOUSES

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Referral Centre : Definition
- 4.3 Need for Referral Centre
- 4.4 Functions.of Referral Centres
- 4.5 What is a Resource ?
 - 4.5.1 Types of Resource
 - 4.5.2 Inventory Taking
- 4.6 Working of a Referral Centre
- 4.7 Feedback
- 4.8 Publication
- 4.9 Collaboration
- 4.10 Summary
- 4.11 Exercise
- 4.12 References and Further Reading

4.0 OBJECTIVES

Information services are concerned with users. But the services provided by all kinds of institutions will aim to make information flow from sources to seekers. If the users are not satisfied, the flow would either never take place or take place inefficiently. This unit is meant to get you acquainted with the need and functions of referral centres.

4.1 INTRODUCTION

There has been in recent years, increasing recognition of the fact that no perfectly quantitative attack—even computer armed can ever cope successfully with the growing mass of information contained in the professional and technical journals, in the profusion of research and development reports, in the hard data accumulating from space technology, biological and medical research, and all other myriad facts of our technological world. With this recognition referral centres have come to introduce switching and control mechanisms to make the complex information network function efficiently and effectively.

4.2 REFERRAL CENTRE : DEFINITION

‘Harrod’s Librarian’s Glossary. . .’ defines Referral Centre thus

1. “An organization for directing researchers for information and data to appropriate sources such as, libraries, information evaluation centres, documents and documentation centres and individuals. A referral centre does not supply data or documents.”

2. “A referral centre is some sort of an ‘Information Desk’ for the scientific and technical community which does not provide in answer to enquirers directly with the information they need but suggest sources (organization, facility, individual) likely to satisfy the users/clients.”

3. “Referral centre is an organization for the indication of sources (of persons, institutions and publications) from which scientific information may be obtained on a given subject.”

Here we quote a memorable commentary from J. H. Shera—”the reference librarian, I think, historically came into being because of the gap between the key to the library resources (i.e. the catalogue) and the resources. In other words, the key was only an imperfect key, unlocking only certain doors; there were a lot of other doors around the key wouldn’t fit. So in a sense the reference librarian, the keeper of the keys, has all those other resources to investigate.” So referral service has come to offer certain switching and control mechanisms to other resources beyond libraries.

4.3 NEED FOR REFERRAL CENTRE

Libraries now constitute, as much as ever before, a fundamental part of the information network—but there are factors related to the pressure under which today’s researcher works that frequently demand assistance beyond the citation of books or pages. These factors may be discussed below :

(a) Bulk is a factor : the researcher needs some kind of information filtering mechanism.

(b) Time is a factor : the researcher cannot afford hours or days spent in scanning volume after volume.

(c) Current awareness : the researcher needs up-to-date information or he may find himself with absolute statistics or techniques.

(d) Evaluation : the researcher needs data that have been evaluated by his peers.

(e) Personal contact : the researcher requires access to a problem and will be able to provide him with a direct answer. He needs advice on people and places to which he may turn, and it is for purpose of providing such advice that referral centres have come into being.

(f) Another factor in favour of establishing referral centres is that information is not always obtained from documentary sources. In some circumstances it is more helpful to put the user directly in touch with an expert or specialist who can provide an immediate answer than to furnish documents or written summaries of information from which the user must extract what he wants to know. This is specially so when the required knowledge is so new that it has not yet appeared in published form. Sometimes it is more helpful to refer the inquirer to a forthcoming meeting or a symposium when he is likely to gain knowledge that has bearing on his problem.

4.4 FUNCTIONS

As noted earlier referral centre may be described as the ‘information desk’ of the scientific and technical community. It does not provide technical details to inquiries or furnish bibliographic assistance. It functions rather, as an intermediary, directing those who have questions concerning scientific and technical, subjects to organisations or individuals who have specialised knowledge in these fields and are willing to share this knowledge with others.

In answer to requests for guidance and assistance, the centre provides names, addresses, telephone numbers, and brief description of appropriate information resources. To achieve this a referral centre has certain basic tasks to perform. These may be listed as : (a) To inventory all significant information resources in science and technology, (b) To compile and publish directories of scientific and technical information resources; (c) To analyse the operating relationships comprised in the scientific information complex.

4.5 WHAT IS A RESOURCE ?

For our purpose, an ‘Information resource’ can be defined broadly to include professional societies, university research bureaus and institutes, government agencies, laboratories, museum specimen collections, testing stations, and individual experts, as well as more traditional sources of information such as technical libraries, information and documents centres, and abstracting and indexing services.

The National Referral Centre for Science and Technology, Library of Congress, has adopted its own working definition of an ‘Information resource’ which is any organization facility or individual willing and able to give authoritative response to scientific or technical inquiries out of an existing store of knowledge or expertise.

4.5.1 Types of Resource

There are two types of resources. They have termed as ‘direct resources’ and ‘indirect

resources' to denote on the one hand, those resources which respond to an inquiry, on the other those which provide bibliographies, reference lists, or copies of actual documents. The former exist as research teams, laboratories institutes, testing stations, observatories, and other units. In such places are the scientists and engineers who have compiled and distilled information, who have performed experiments, and who have evaluated the data available in their chosen fields. Many of them are willing to share their specialized accumulated knowledge, saving time and effort for their colleagues elsewhere. In many cases, of course, an information resource, may have both 'direct' and 'indirect' capabilities as in the case of centralized data centres.

4.5.2 Inventory Taking

Inventory of potential resources is a complex problem for referral centres. There have been many difficulties in conveying to the organizations what referral centres mean by 'resource', but also in obtaining the data needed for effective referral operations. The centre should know what kind of information a given resource deals with, how the resource handles this information, and how the resource makes this information available, to whom and under what conditions. The referral must know the size and kind of collections, if any the particular service provided, and in specific terms, subjects of specialization. In large number of cases, it is necessary to follow up the original contact by correspondence, telephone, or personal visit to obtain these data. Only those resources which are willing to cooperate with the centre are included in the register, and that any restrictions which may apply to services provided by a resource are strictly adhered to by the centre in making referrals, The gathered data may be retrieved or utilized either manually or mechanically. The referral centre will be able at any time, by machine printout to report how many libraries are registered with the centre in what subject areas; how many, and what kind of resource exist in the field of say, electronics; where special collections pertaining to a particular subject are located, what occupational groups are represented among those who have come to the centre for assistance, etc.

4.6 WORKING OF A REFERRAL CENTRE

The passing on of the enquirer to another agency for the answer to his question is one possible response that the referral centre can make. Indeed, community information services make extensive referrals as a matter of policy. There is the specially compiled resource file or index of names and places to which enquirers can be referred for specialist advice and help. In some special libraries referrals are almost as common as in community information services. Any referral centre keeps

a file of names of addresses of individuals and organizations able to provide specialist information. There are too sound pieces of advice : one, either referral centre must learn how to referrals the right way or they shouldn't do them at all; and two, a referral that has been handled badly is more lethal than a wrong answer'. It should take the form of a deliberate and positive recommendation, decided on as the best means of reaching the solution to a particular problem. And never should referral be made 'blind', in a speculative fashion.

Attempts have been made to devise a simple referral form. The form is handed to the enquirer with instructions on it where to go; the reverse is used to report back on the outcome; the numbering of the forms provides an indication as to how many enquirers decide not to bother. A referral centre usually receives requests by letter, telephone, and personal visits. The information given is a list of names and addresses of resources appropriate to the request. A brief description of the subject and service capabilities of each resource are also furnished.

4.7 FEEDBACK

To evaluate the effectiveness of its services, most centres rely on a comprehensive 'feedback' programme. Every requester is asked to supply information on how he fared in his search for information, and which resources were the most useful, etc. A referral centre in this way keeps on modifying and updating its files. If is found that a resource has claimed more than what it can honour in terms of supplying information, suitable modifications may be made in the files of the referral centre. Similarly any useful information available with the resource, but initially overlooked or omitted can be added/Feedback also helps a referral centre in enlisting new resources, which the user might have come across accidentally or by its own initiative and about which, the user can write to the referral centre.

4.8 PUBLICATION

A referral centre may also have a publications programme. For example, 'the Library of Congress National Referral Centre of the science and Technology Division **A Directory of Information Resources in the United States** : physical sciences, engineering, Washington, 1971. It is list designed to cover all possible sources. If referral functions are more formally established and emphasized in their programme, they can interlock effectively with traditional acquisition, cataloguing, reference and retrieval activities. For example, through its acquisitions and indexing operations, a library can develop, as a relatively inexpensive by-product, a list of organizations producing the information—professional societies issuing journals, and monographs—

and can supply, in addition to literature citations, the names of the originators as resources to which a researcher may turn. Such an activity may be thought of in terms of an annotated bibliography the annotations being in the form of resources rather than the standard explanatory remarks.

4.9 COLLABORATION

Referral centres should explore continuously the possibility of collaboration with professional societies, with a view to gaining from professional groups the knowledge individual members have about resources in their special fields and of making these resources, by including them in the registers of the centres, available to all members of such groups. Besides, referral centres welcome registration by any organization having knowledge or expertise that it is willing to share with others, and also a referral centre should be notified directly about any information resources not already listed.

4.10 SUMMARY

This unit presents the recognition of some efforts to introduce some switching and control mechanisms in the form of referral centres to make the complex information network function efficiently and effectively. Several factors have been discussed to highlight the need for referral centres. Referral Centres function as an intermediary between those who have certain questions concerning scientific and technical subjects and those organizations and individuals who have specialised knowledge willing to share with others. Information resources along with its working definition has been discussed. Working of referral centre and the feedback mechanism have been highlighted. A referral centre may have source publications channel in the form of directory which gives information on resources in different disciplines. The collaboration with professional societies is also an important factor to gain expertise from professional groups.

4.11 EXERCISE

1. What is referral centre? Why is it needed?
2. Define 'information resource'. Mention its types.
3. Explain why in the working of a referral centre feedback mechanism is needed.
4. Write a short note on the publication programme of referral centre.
5. Why should a referral centre explore the possibility of collaboration with professional societies?

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UNIT 5 □ INFORMATION ANALYSIS AND CONSOLIDATION CENTRES

Structure

- 5.0 Objectives
- 5.1 Introduction
- 5.2 An IAC Centre : Definition and Meaning
- 5.3 Functions, activities and products
- 5.4 Information consolidation : Definitions
- 5.5. Problem of using information
- 5.6 Users
- 5.7 Value and benefits of consolidated information
- 5.8 Products and efforts of IAC
- 5.9 IAC Centres in India
- 5.10 Summary
- 5.11 Exercise
- 5.12 References and Further Reading

5.0 OBJECTIVES

An overabundance of literature or even of information on any one topic today presents a most formidable modern information problem. However, for many information users and potential users, for many decision makers at all levels the problem is quite different; there is lack of appropriate information, namely of information which they can comprehend, assimilate and use with some confidence on their own level and within the framework of their own circumstances. This unit will give an idea about Information Analysis and Consolidation Centre, its scope, functions, activities and services.

5.1 INTRODUCTION

With enormous growth of the primary scientific literature, the individual scientist or engineer is faced with different problem of its retrieval and evaluation as most of the information remains hidden in published documents. Much information which is published in primary journals never catches the eye of the information seeker. And whatever information is noticed, is generally so diluted that it is of not much use unless it has been distilled by a suitable process. Besides libraries, information centres

and other types of information institutions there is need for another type of information institution which has been termed Information analysis and consolidation centres (IAC). This unit discusses such institutions, their origin, growth, need characteristics and functions.

A potentially useful tool for the transfer of scientific and technical information exists in this type of centre. Such centres, usually serving specific fields in which large amount of data exist and require critical evaluation, consist of one or more active specialists who (a) systematically collect, index and store information in a field, (b) analyse and evaluate this information, and (c) make it available in a form and language keyed to the needs of specific groups of users.

5.2 AN IAC CENTRE : DEFINITION AND MEANING

An IAC Centre as noted earlier, has been defined as ‘an organization which indexes, abstracts, translates, reviews, synthesises and evaluates information and/or data in a clearly defined specialised field or pertaining to a specific mission, to provide definite users’ groups with digested, repackaged or otherwise, organised pertinent information or data.

An IAC, at least in theory is the most efficient system for transferring to a user timely, authoritative, evaluated information in a convenient form. In an era marked by constant expansion of scientific and technical literature, it is apparent that users want the data and information contained in the literature and not the documents themselves. To quote Branscomb, “it is just as absurd for the user to take the total collection of raw material for his data as it would be for the jeweller to order six tons of gold-bearing ore when he wants to make a cuff link.” The IAC centre helps in making information available in a useful convenient form; “relieving the user from the arduous task of mining the sand of literature for the few grains of gold.” Retrieval of documents is not the same as retrieval of information; a technical specialist actually needs the information contained in the published literature, not the published literature itself. In order to meet this need, it is necessary to extract and compile the data themselves that is, the results of scientific research and observations. To retrieve information, the technical community has devised and organised information analysis and consolidation centres.

An IAC centre is a formally structured organizational unit specifically established for the purpose of acquiring, selecting, storing, retrieving, evaluating, analysing, and synthesising a body of information and/or data in a clearly defined specialized field or pertaining to specific mission with the intent of compiling, digesting, repackaging, or otherwise organizing and presenting pertinent information and/or data in a form most authoritative, timely and useful to a society of peers and management.

The following criteria characterise and identify an IAC Centre : The key activities are the analysis, interpretation, synthesis, evaluation and repackaging of information for the purpose or numerical data of a specific field.

The centre produces new evaluated information in the form of critical reviews, state of the art monographs, or data compilations and usually provides substantive evaluated responses to queries. An IAC provides assistance to a community of users and not just assistance to 'in-house' personnel.

E.L. Brady originally had put the IAC in the following three categories.

1. "Discipline Oriented" centres working primarily with the formally published literature of a particular field.

2. "Mission Oriented" centres concerned with specific problems of interest to the community they served and which received their input not only from the formal literature but also from government reports, industrial literature, and from other informal communications; and

3. The centres handling large volumes of data sometimes called a 'synoptic centre' or a 'census bureau' which collected raw or partially processed data or partially processed results and often concerned with large scale phenomena such as encountered in the study of oceanography, the upper atmosphere or in interplanetary space. This type of information analysis centres also included census type activities providing data on people, goods and materials.

Later, Brady re-categorised them as :

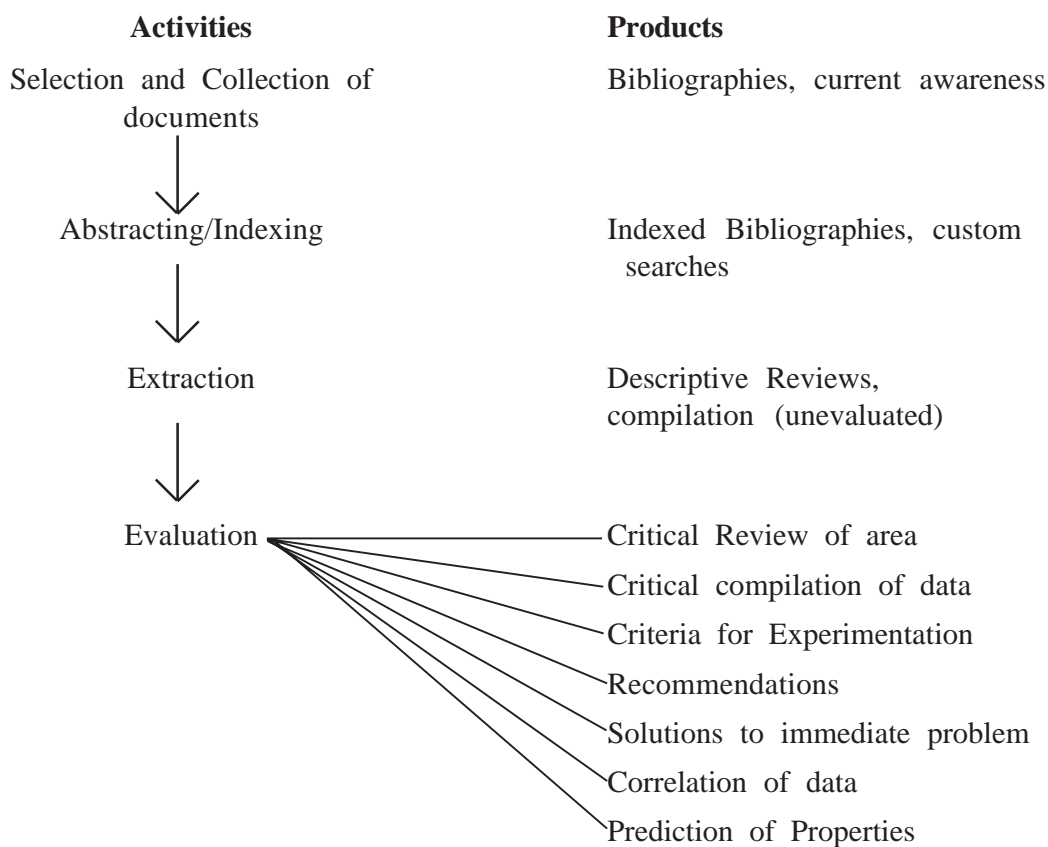
1. Research oriented group working primarily with formal published literature.

2. The problem solving group that obtains its input not only from the formal literature but from government reports, industrial literature, and other informal communications; and

3. Research oriented group whose input is primarily raw observational data, usually of multinational studies such as weather, oceanography or acronomy.

5.3 FUNCTIONS, ACTIVITIES AND PRODUCT

The functions, products and services of IAC vary in detail and with the needs of its user population—but on the whole are similar. The first step in its functioning is the selection and acquisition of relevant documents. This may yield a comprehensive but unevaluated bibliography. The next step is abstracting and indexing the document. This process often consists of assigning key words to each document to identify the data or information. An indexed bibliography is a more useful document, since it can indicate to a user exactly the type of data contained as well as parameters of data points. The next phase consists of selective extraction of chunk of information, such as quantitative data description of methodologies, interpretations,



and other material necessary for the ultimate utilization—evaluation of the content. The products resulting from this phase might be an unevaluated compilation of data or a descriptive review, sometimes referred to as the state-of-the-art review. The descriptive review is a selective extraction of information from the literature on a particular subjects; some state-of-the art reviews go beyond the description of who did what and what happened and offer some evaluation, but, on the whole, descriptive reviews are summaries of the activities described in the literature for a set period of time, usually a calendar year. Uncritical data compilations can be useful products in that scientific and technical reviews and state-of-the-art reports.

Information analysis centres using high levels of selectivity, evaluation and analysis of existing information, particularly in science and technology and then synthesizing products like handbooks containing findings and/or data from a number of sources, compilations of critical evaluated data for given materials, processes or phenomena, and the like.

The analysis of barriers and of the solution as presented has led to the evolution of information analysis and consolidated centres. The greatest impetus for the

development of information consolidation came from the practices of information analysis centres as instituted from the 1950's onward.

5.4 INFORMATION CONSOLIDATION : DEFINITIONS

The idea of consolidated information comes from discussions of information problems in developing countries. Many of these problems relate to the lack of information, low resources for information work, inadequacy of information infrastructure and low propensity of users to use of information. However, it is also recognised that mere possession of information—having it available and accessible—is not guarantee of its use.

A number of United Nations Organizations have been actively seeking solutions to the information problems in developing countries, UNESCO being the most active one. Information consolidation as a suggested solution to the problems of barriers to use of information was a particular topic of three meetings sponsored by the **General Information Programme (PGI)**, UNESCO.

1. **First Meeting of the UNISIST Working Group on Information Analysis Centres.** Unesco House, Paris, 3-5 November, 1975.

2. **Symposium on Information Analysis and Consolidation** (second meeting) Colombo, Sri Lanka, 12-15 September, 1978.

3. **Third Meeting of the UNISIST Working Group on Information Analysis and Consolidation** Kula Lampur, Malaysia, 12-16 September, 1983 they provide a handy, time-saving amalgamation in a convenient format. These products are prerequisites for the fundamental function of the IAC. This results in the creation of new knowledge—like critical reviews, critical data compilations, criteria, recommendations, solutions to problem, correlations, and predictions.

5.5 PROBLEM OF USING INFORMATION

Historically, the concept of information consolidation evolved as a response to complaints about and analysis of barriers to fruitful use of information among them:

There is too much information on a topic and the potential user is overloaded or overwhelmed—the sheer amount decreases the willingness to use information, taking too much time and effort.

Information is presented in a context or with examples that are outside the user's cultural framework—the divergent cultural attributes impede the ability to relate to specific circumstances.

The packaging may be an impediment to information absorption.

Validity and reliability of information is not evaluated and thus information is questioned.

These and similar barriers have been a serious impediment in the use of information throughout the world.

Clearly, bibliographic organization, classification, indexing and abstracting services, related databases and the like, are important solutions to the problem of controlling and locating information. Without them there would be total and unthinkable information chaos and a great many activities such as science, would grind to a halt.

However, these services contribute directly to overcoming the listed barriers to use of information. It has been recognised that other solutions are needed. Over the years a number of them have been tried and proven successful. Some of them may be noted here.

The following definition was adopted at the Colombo meeting : “Information Consolidation Activities is used to define the responsibilities exercised by individuals, departments, or organizations for evaluating and compressing relevant documents in order to provide definite user groups with reliable and concise new bodies of knowledge. Individuals or groups of individuals performing information consolidation activities would each constitute an INFORMATION CONSOLIDATION UNIT (UCI).

A related, but more elaborate definition was offered by T. Saracevic and J. Wood:

“**CONSOLIDATED INFORMATION** is public knowledge specifically selected, analysed, evaluated, and possibly restructured and repackaged for the purpose of serving some of the immediate decisions, problems, and information needs of a defined clientele or social group, who otherwise may not be able to effectively and efficiently access and use this knowledge as available in the great amounts of documents or in its original form. The criteria for selection, evaluation, restructuring, and repackaging of this knowledge are derived from the potential clientele.”

5.6 USERS

The users of IAC centres address several distinct types of user groups :

Scientists, engineers and professionals engaged in R & D activities, manufacturing, health services, planning, education, etc.

Managers and business people engaged in small and large business, commerce marketing, etc.

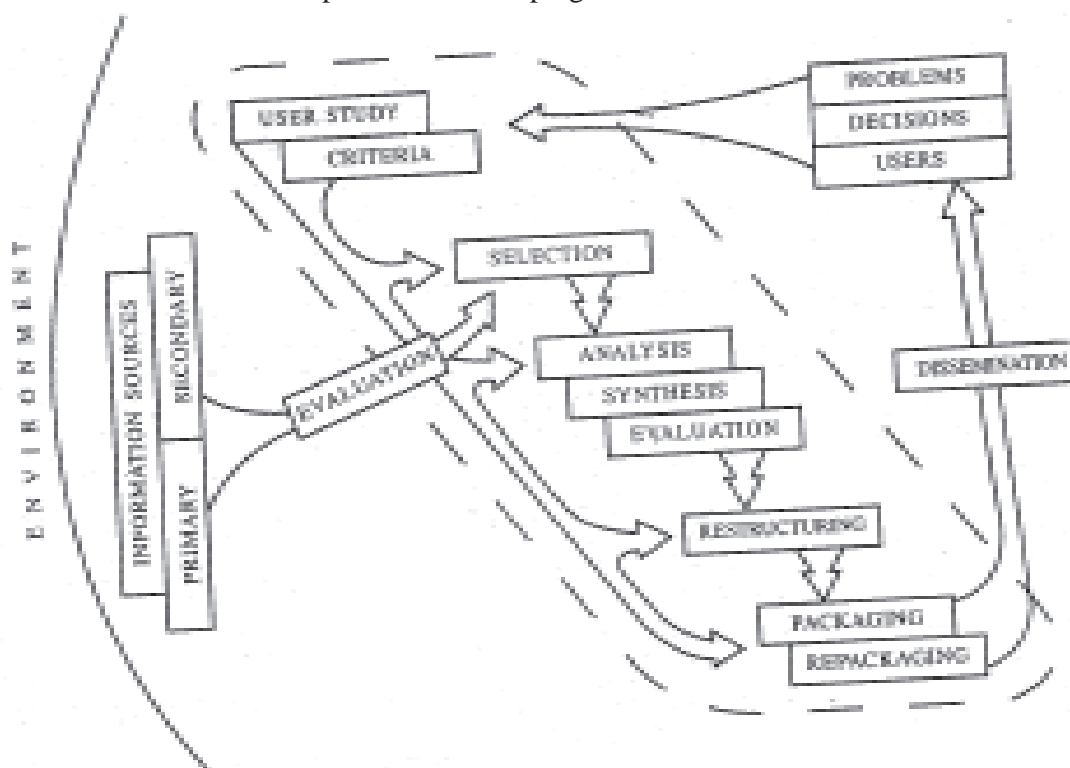
Policy and decision makers in government.

Technicians, supervisors, paraprofessionals.

Communicators such as extension workers, local leaders in adaptings new technology or practices.

Agricultural and industrial workers from rural and urban populations.

The information needs of the last two groups mentioned above, are receiving particular attention from information consolidation efforts, because these are the groups that are left unserved by majority of existing information services and products produced in both developed and developing countries.



Processes in information consolidation

Processes in Information Consolidation

Implied in the definition noted above are the following basic processes invlved in the preparation of information products.

1. **Study of potential users** to derive criteria for all other processes.
2. **Selection of information source(s)** potentially containing the most useful information for given user problems and information needs; the selection can be done from a variety of primary and secondary sources.
3. **Evaluation of information** as to its intrinsic merit, validity and reliability.
4. **Analysis** to identify and extract the most salient features.

5. **Reconstructing** (if necessary) the extracted information into a content that can be used most effectively and efficiently by users; this may involve synthesis, condensation, rewriting, review, state-of-the-art presentation, etc.

6. **Packaging and/or repackaging** of restructured information in a form that will enhance the potential of its use. (Restructuring concerns with the contents or substance of information while packaging deals with the media, format and the form of its presentation).

7. Diffusion or Dissemination of information in ways that will encourage and promote its use; this may also involve education of users in the use of information and marketing of information.

8. **Feedback** from users, evaluation of the effects, and adjustment.

The above figure summarizes the processes, elements and relations involved. Although related to other information activities, most notably abstracting and indexing, information consolidation is a proposition of much higher complexity and greater demands. In this lies the basic problem of information consolidation.

5.7 VALUE AND BENEFITS OF CONSOLIDATED INFORMATION

On a general level information consolidation is justified for its contribution to the process of social and economic development. On a specific level its benefits can be argued as a contribution in problem solving and decision making. Let us discuss in turn.

The process of development in an increasingly interdependent world involves and requires an increase in sophistication and use of scientific, commercial and related information. The value of such information does not lie in its existence (or even in the systems that assure its availability and accessibility), but in its acceptance and use. In turn, chances for acceptance and use of information are increased by its being more appropriate. Consolidated information aims at being more appropriate to the users, their needs and levels, the capacities and time allotments given to information absorption and similar user—related factors. Clearly, arguments for consolidated information should involve economic aspects (savings, earning, productivity, competitiveness, etc.), but its value may be even greater because it is related to other values in a society. Consolidated information may contribute to information sophistication of a population, which in turn contributes to quality of life. For instance, consider the value of consolidated information that helps to improve sanitation, which in turn decreases disease, pain and suffering. More specifically, the value of consolidated information can be argued in relation to its role in decision making and problem solving. Making decisions and solving problems, even those encountered in everybody work, requires information.

Moreover :

As complexity of decisions or problems increases, the need for information intensifies;

As the amount of available information proliferates, it becomes harder to get and use the relevant information;

As complexity, interdisciplinarity and technical sophistication of available information increases, less can be used by decision makers and problem solvers as presented in its original form.

All these point to the need for consolidated information.

As the amount of information presented to a decision maker is increasingly consolidated, its value increase; as the information is increasingly expressed in the everyday language and social/cultural framework of the user, its value increase for that user; as the information is increasingly packaged in a way that will make its use easier, its value increases.

5.8 PRODUCTS AND EFFORTS OF IAC

Several information centres in developing countries have devoted part of their efforts to development and distribution of information consolidation products particularly aimed at the broader audiences (technicians, villagers, extension workers, teachers in rural areas, etc.). Among these are :

Tata Energy Research Institute, Bombay, India: **Biogas Handwork, Biogas Technology: A Manual for Decision Makers, Biogas Technology: A Manual for Extension Workers, Windpump Handhook and Cooking Stoves Handbook.**

International Ferrocement Information Center in Bangkok, Thailand publishes a "Do It Yourself Series" among these are : **Ferrocement Canoe, and Ferrocement Water Tank.** Cassava Information Center in Cali, Columbia : **Cassava Drying, Cassava Harvesting Aid.**

Further description of activities from 15 other information centres from 13 countries can be found in **Specialized Information Analysis Centres in International Development** from the International Development Research Centre of Canada. Most advanced and among the best designed information consolidation products are produced by the four information centres in geotechnical engineering, environmental sanitation, ferrocement and renewable energy of the Asian Institute of Technology in Thailand, described in some detail in **Information Services for Developing Countries** by J. Vails.

The Canadian International Development Research Centre (IDRC) has devoted considerable efforts to fostering specialized information centres around the world.

IDRC efforts in this area have been quite effective, highly visible and noted with great favour among information professionals in developing countries.

Unesco has commissioned a handbook on information consolidation [Saracevic, T and Wood, J: Consolidation of Information. A Handbook on Evaluation Restructuring and Repackaging of Scientific and Technical Information. Paris, Unesco, 1981 (PGI/81/WS/16)] and published a guidelines in 1982 for the establishment of information consolidation units [Mazumder, A: **Consolidation of Information: Biogas Handbook**. Paris, Unesco, 1982 (PGI/82/WS/19)] Central Machine Tools Institute. **Machine Tool Design Handbook**. Bangalore, NICMAP.

Indian Council of Medical Research Handbook of Radio-immunioassay. New Delhi, 1987. Central Machine Tools Institute. **Trend Report on Electrochemical Maching 1965-72**. Bangalore, WICMAP. Central Leather Research Institute : **Health and safety at work: Leather, Leather goods and Footwear Industries**. Madras, NICLAI, 1985.

There are mannuals published by Indian Council of Medical Research on Laboratory Techniques from Hyderabad in 1983, on Low Cost balanced diets and school lunch programme suitable for south India from Hyderabad, National Institute of Nutrition in 1977.

There are state-of-the-art reports on studies on Himalayan Glaciers, published by Department of Science and Technology, New Delhi, 1984; on Sal Fat published by Central Food Technological Research Institute, Mysore.

5.9 IAC CENTRES IN INDIA

In India some of the information centres held by Tata Energy Research Institute, Central Food Research Institute, Leather Research Institute, Defence Science Documentation Centre and few other centres established by the Department of Science and Technology are bringing IAC products to cater to the needs of in-house scientists at various levels. But these centres have not yet been geared up to meet the needs of specialised groups all over the country. At present India needs establishment and all round development Information Analysis and Consolidation centres to meet the needs of research community at various levels in the country.

5.10 SUMMARY

This unit addresses the problems of the proper use of information in this age of information explosion. This unit contributes to the clarification of consepts, problems and requirements of specific information practices referred to as information analysis and consolidation. The aim of information analysis and consolidation centre is to

increase the effectiveness of information usage and to widen the circle of population of users served. Information analysis and consolidation is neither an information panacea, nor substitute for any of the existing information activities. It is one approach in the whole spectrum of information practices needed for various aspects of development.

However, information consolidation is an effective approach to fulfilment of specific informational needs for evaluative and synthesized information services for yet unserved. Here in this unit we have discussed functions, activities and products of IAC Centres and steps in the processes of information consolidation. Information consolidation has proven its value and benefits in information transfer. Therefore, information consolidation should be given a proper consideration in the institution or refinement efforts serving developing countries.

5.11 EXERCISE

1. What is an IAC centre? How does it differ from other types of information centre?
2. What are the functions of an IAC centre ? Discuss its activities and products.
3. Define information consolidation. Discuss the role of Unesco in this context.
4. Discuss the problems encountered in the use of information.
5. Describe the processes in information consolidation.
6. Explain the value and benefit of consolidated information.

5.12 REFERENCES AND FURTHER READING

1. Atherton, Pauline : Handbook for information systems and services. Paris, Unesco, 1977.
2. Bhattacharyya, Ganesh: Information analysis for consolidation. DRTC Annual Seminar 18, Paper A 1981.
3. Saracevic, Tefko : Process and problems in information consolidation. *Information Processing and Management* 1986, 22(1), 45-60.
4. Seetharama, S : Planning of information analysis centres : some general considerations. DRTC Annual seminar 18, Paper H.D. 1981.

UNIT 6 □ LITERATURE SEARCHES

Structure

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Scope
- 6.3 Literature search-benefits
- 6.4 Literature searching—the route
- 6.5 Locating devices
- 6.6 Literature searching in library and information science
- 6.7 Exercise
- 6.8 References & further study

6.0 OBJECTIVES

In this unit you will learn :

Literature searching, its benefits, the routes or paths of literature searching, the devices adapted for searching, the locating devices of literature, and especially literature searching in library and information science.

6.1 INTRODUCTION

Literature searching is an intrinsic part of scholaiship. A true scholar cannot pursue his search for truth or knowledge without a proper route to the published or unpublished literature in his field. Literature search is especially vital for undertaking a research. It has been and will be a very important part of a research work.

6.2 SCOPE

It is vital for researchers to know what has already been done in their fields. They learn this by turning to records of observations and experiments of their predecessors. This record of earlier work on a subject is known as its literature. Locating this information is called making a literature search.

Literature searching is a procedure by which the searcher tunes in on the scholarly discussion at the level of generality corresponding to the familiarity of the subject and then follows the discussion through closer analysis of more specific matters to reach the level of detail and currency indicated by the problem. The most generalized and firmly established principles are sought out first, and these provide the necessary

background for consideration of more detailed and unsettled matters, closer to the advancing frontiers of knowledge. The literature search is of value to researchers by helping them to regard their studies as contributions to a larger topic of which the inquiry is only a part.

6.3 LITERATURE SEARCH—BENEFITS

Literature search is the endeavour to identify, locate, and synthesize the complete research reports, articles, books, and other materials about the specific problems of a research topic. Literature searches help to specify and clearly mark the research problem; it reveals overlooked conclusions and facts that must be considered before a research is to be undertaken; suggests new approaches and plans for investigations; helps to look at the extent to which the particular problems have been dealt with and helps to understand the theoretical approaches of proposed problems.

6.4 LITERATURE SEARCHING—THE ROUTE

The route of literature searching encompasses from the general to specific forms of literature. As is known, the most comprehensive, generalized, and many sided account of a subject is presented by a scholarly encyclopedia. Encyclopedias summarize current knowledge as well as the background and developmental history of a subject.

The history of a discipline conveys ‘what is known’ at another level. From the historical perspective, existing knowledge is viewed as the outcome of the scholarly effort as it has developed over time.

The textbook represents yet another approach to synthesis. It formulates a systematic body of explanation and definitions derived from the past research effort. An essay collection performs the similar function.

The handbook summarizes current activity in a research field, and examines the status of questions of current interest. So its approach to a topic is apt to be more fragmented than that of an encyclopaedia or textbook. Handbooks give more stress on the specifics of data and methodology to the unsolved problems and issues engaging the interest of researchers.

The periodic stocktaking review considers the ongoing research effort, outlining its directions and accomplishments and the issues of major current interest.

The review article represents a more limited and detailed level of approach to ‘what is known’. It examines and infers the evidence from a body of research in quite specific terms and proposes conclusions that may be drawn. Such reviews often reveal gaps in available knowledge and indicates directions for further research.

The reports of individual studies view 'What is known' with emphasis on newly acquired knowledge proposed for addition to the existing stock. So the research reports are the gateways through which new information and ideas enter the system, to combine and interact with what is already existing and, potentially to produce changes in what has been set forth all the way back up the line to the generalized formulations of textbooks and encyclopedias.

This route from the generalized, comprehensive account of what is known about a subject to the detailed studies of single instances insulates is the basic pattern of information seeking in scholarly literature. This is the case for the advanced scholar as well as undergraduate students for the exhaustive study of a subject.

This route from the general comprehensive account of what is known about a subject, to the detailed studies of single instances, is the basic pattern of information seeking in scholarly literature. This is not to say that every search must traverse the full route of publications from encyclopedias to research journals with all immediate steps. Only a portion of the sequence may be involved on any particular occasion, even though the basic pattern and direction are essentially unvarying.

The portion of the literature to be traversed in a given instance represents the distance from where the searcher is, in terms of his prior knowledge to where he wants to go. The point at which a literature search ends is determined by what the searcher wants to know. That is, the reader proceeds along the route from more general to more specific publication forms until he reaches the level of detail and specificity corresponding to the question he has in mind. This sequence from more generalized to more detailed accounts can be matched to a corresponding sequence of publication forms, from encyclopedias to journals.

6.5 LOCATING DEVICES

There are several methods to identify the literature relating to a subject. One familiar procedure is to follow up references cited in the works that the reader has already seen. An advantage of this method is that it focuses directly on the problem under consideration. But a major drawback of this method is that the process normally moves backward through time and cannot be used to investigate the subsequent development of an idea. The technique of citation indexing is designed to deal with this problem.

The second means relies on the searcher's memory and personal familiarity with what has been written on a subject. This approach is employed quite often by scholars and can be used only to a very limited extent by students.

The use of bibliographies is another method of locating information in the literature. The current awareness list, 'retrospective bibliography,' 'guide to the literature' are

all important bibliographic tools of scholarship which comprise a system whose structure and organization parallels that of scholarly literature.

On-line searching is another effective tools which permit an interaction between the searcher and the system. The most important advantage of this is that this system gives current, up-to-date information instantly. Indexing and abstracting databases are also nonetheless important in aiding the researcher in literature search process. In addition to searching the literature through abstracting and indexing services, one should scan through the footnotes in retrieved papers to find other related publications; such citation analysis often points to older materials missed in a search of current databases.

6.6 LITERATURE SEARCHING IN LIBRARY AND INFORMATION SCIENCE

An example of literature search in library and information science is 'Library Literature'—the author and subject index to selected library science materials, published by H. W. Wilson Company. It is among the most useful sources for locating relevant contemporary literature. When searches are needed for retrospective or historical information, the indexes like 'A Bibliography of Librarianship', 'Bibliography of Library Economy' proves useful. Theses and dissertations are also valuable sources of research information. The Journal of Education for Librarianship', 'Libri', Journal of Academic Librarianship' provides research topics on library science. A part from these, other bibliographies of library science thesis and dissertations which includes 'Library Science Dissertations', 'Master's theses in Library Science', are worth mentioning.

Other specialized reference tools which have proved to be valuable for literature searches are 'Advances in Librarianship', 'Annual Review of Information Science and Technology', 'Encyclopedia of Library and Information Science', 'ERIC Educational Documents Abstracts', and 'Australian Library and Information Science Abstracts'.

Other helpful journals in this field which needs regular scanning are 'College and Research Libraries', 'RQ', 'Library and Information Science Research', 'Library Resources and Technical Services', and the 'Journal of the American Society for Information Science'. Some journals not directly related to the field are also worth considering, like Internet Research.'

For directories and guides in this field, one has to consult 'The ALA Handbook of Organization', 'Subject Directory of Special Libraries', 'Directory of Special Libraries and Information Centres', British Library Resources. A Bibliographic guide',

'Directory of Academic Library Consortia', 'Guide to Reference Sources in Computer Science', and 'Guide to the Research Collections of the New York Public Library'.

6.7 EXERCISE

1. Discuss the importance of literature search in research work.
 2. Give an idea of the literature search in library & information science.
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6.8 REFERENCES AND FUTURE STUDY

1. Busha, Charles H.— Research methods. In Encyclopedia of Library and Information Science, Vol. 25, Edited by Allen Kent and others; p. 283-284. Marcel Dekker.
2. Gorman, G. E. and Clayton, Peter— Qualitative research for the information professional: a practical handbook. London : The Library Association, 1998.
3. Mellon, Constance A.— Naturalistic inquiry for library science : methods and applications for research, evaluation and teaching. Westport, C.T. : Greenwood Press, 1990.

UNIT 7 □ DOCUMENT DELIVERY SERVICE

Structure

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Definition and scope
- 7.3 Document delivery services-categories
- 7.4 Document delivery—key agencies
- 7.5 Document delivery—the future
- 7.6 Exercise
- 7.7 References & further study

7.0 OBJECTIVES

This unit will give you an idea about the second type of information services-document delivery. You will learn its scope and definition and the categories of document delivery services, the key agencies implementing these and lastly, the future of document delivery service.

7.1 INTRODUCTION

Document delivery refers to the provision of materials that is provided to the users through the libraries, and that may be retained by the users. The medium of the document delivery have undergone a vast change, but the main framework within which this system works remains the same. It differs from the interlibrary loan service, which is more complex and depends on many factors. Document delivery is much simple, cost effective and userfriendly.

7.2 DEFINITION AND SCOPE

Document delivery is the service in which a library or other agency makes some form of publication available when needed and requested by a library user. Earlier this term meant the delivery, to the user of an original publication from the library's own collection or borrowed from another library. Today, the delivery of a publication, or part of it, to a library user can be achieved by a wide variety of methods and sources. The photographic methods of reproduction has become more efficient and economical, and the delivery of an original item has been replaced by the delivery

of a photocopy. Document delivery, in a broad sense, means the provision of materials that may be retained by users. Document delivery encompasses the provision of published or unpublished documents in hard copy, microform or digital form, usually for a fixed fee upon request. This means that the physical or electronic delivery of documents from a library collection to the residence, or place of business of a library user, upon request, is provided through this service. This service enables users to order copies of materials retrieved by on-line searches, either by direct despatch of items or via an agent.

Document delivery can be proactive or reactive, depending on the users and their needs. In the early 1990s Current Alerting Services-Individual Article Supply (CAS - IAS) was launched, which provided a mechanism for alerting end-users and librarians to the existence of new article titles. In this above mentioned service, a database is constructed, chosen from the tables of contents from important journals that are in active use. Searching this database enables individuals to identify titles of particular relevance to their query and to place an order online for the article itself. These services are more costly than interlending or centralized document delivery services, because a royalty payment is made to the copyright holder, or publisher in order to comply with national copyright laws. In case of reactive service, document delivery is used by the librarians according to budgetary requirements. Due to the growth in budgets, it is not possible for the libraries to acquire all types of materials that the users require. Such economic pressures, combined with the rapid increase of information available electronically, has led to the changing role of libraries, which now do not own much material and instead provide access to those materials to the users via document delivery.

Document delivery is a complex process which spans time and distance between customer and supplier. The key factors involved here are document discovery, the location of a supplier, request and delivery. In the modern age, librarians, publishers and other document delivery services need to combat with the complexities of this system, since conventional document delivery is nowadays intertwined with electronic document delivery. Document delivery has generated significant attention in recent times. Owing to financial crunches, with adequate access to journals for researchers, document delivery seems to be the only solution. Today libraries have a choice in how to provide customers with needed but unowned materials through this service. Another factor, for many libraries is the limitation of space libraries have had difficulty maintaining their operating budgets; when it comes to securing funding for additional space to house the evergrowing collections, it becomes much more difficult. One way to gain space in an existing facility is to look at long back volumes of journals, especially those that have very little usage. Withdrawing the physical volumes provides shelving space. But the question then becomes how to provide access to the withdrawn

titles. Buying microfiche film versions is one option; but microfilm storage cabinets take up space, and the cost of microforms and the equipments to use them must be considered. So accepting the document delivery option saves space and the cost of requested materials may never equal the cost of the microforms.

7.3 DOCUMENT DELIVERY SERVICES-CATEGORIES

Document delivery consists of three main items—

- a) creation of a document through authors, editors or publishers;
- b) alerting to document existence-through library, publisher, subscription agents current awareness service, bibliographic database producer and on-line search service;
- c) provision of a document through library, library consortium, subscription agents, publishers, current-awareness service, and commercial document delivery service.

Documents may be delivered through CD-ROM, fax, on-line or web, or in print form. Different types of documents delivered are books, journals, journal articles, or reference works. The nature of the delivery may be in the form of purchase or loan. The various categories of document delivery services are discussed below :

(i) Library networks and consortia—

The cooperative activities of the libraries is a relatively old concept, and through these exchange of print based documents or interlibrary loan is facilitated. Now-a-days print delivery has been supplemented by electronic document delivery. The networking of libraries relate to the creation of union catalogue database as a means of accessing and sharing the resources of a group of libraries. The networks help in revealing the contents of a large number of libraries or a large number of publications, especially through accessibility of catalogue databases, and making the resources shown in these databases available to individual libraries and users when required. Many organisations have taken to this networking and various projects are going on in this area, like CONSER (cooperative on-line serials), OCLC, RLG (Research Libraries Group), BLAISE (British Library Automated Information Service), LASER (London and South Eastern Region), JANET (Joint Academic Network), EARN (European Academic Research Network) etc.

(ii) Document delivery on CD-ROM

Both bibliographic and source databases are supplied on CD-ROM. Where the library acquires a document on CD-ROM, they may provide networked access to the document under appropriate networking licenses. A DONIS is a CD-ROM based

article delivery system. There are articles from over 680 titles and more than 70 publishers in the biomedical fields. The documents in ADONIS are images, so the actual text of the article is not searchable. Items included in the index alone have currency as search terms. This index is assertible using Boolean searching, comparative and proximity searching, and wildcard searching. Printing an article incurs the Publishers Copyrights charges, which is set by each publisher. Update CD-ROMS are produced as soon as ADONIS has processed the journal issues.

(iii) Commercial document delivery services.

Many new commercial document delivery services are directed towards end users. Most involve partnerships between document providers and on-line services. They rely on a combination of technologies, or on alternative technologies, like fax, Internet, or electronic bulletin board system. OCLC First!: Search is an on-line search service that is very much used in the academic community. It provides access to a wide range of databases, with an easy-to-use menu interface with cost controls through end use pricing. KR Source One is another example of a commercial service, linked to a search service. Documents can be ordered through DIALORDER, on DIALOG, or through email, phone, fax or WWW. Un cover is a sister service to KR Source One. Document delivery is from a periodicals database that indexes 17,000 multidisciplinary titles. This database can be searched through a web interface by topic, author name, or periodical title.

(iv) Library suppliers & subscription agents.

Recently many book suppliers have established electronic ordering systems. These allow the library to consult a book suppliers database on-line for book selection purposes. In the electronic ordering of books, links can be made from author to retailer via publisher, wholesaler and library. Libraries interface with suppliers or wholesalers, and then makes items available, recording transactions through their circulation control systems. Many serial subscription agents such as SWETS, EBSCO and Blackwell have developed a range of services based on the databases of journals and links with publishers and libraries. Services like data swets give electronic access to the subscriptions database enabling users to search for bibliographic and price information, and to look up subscription details.

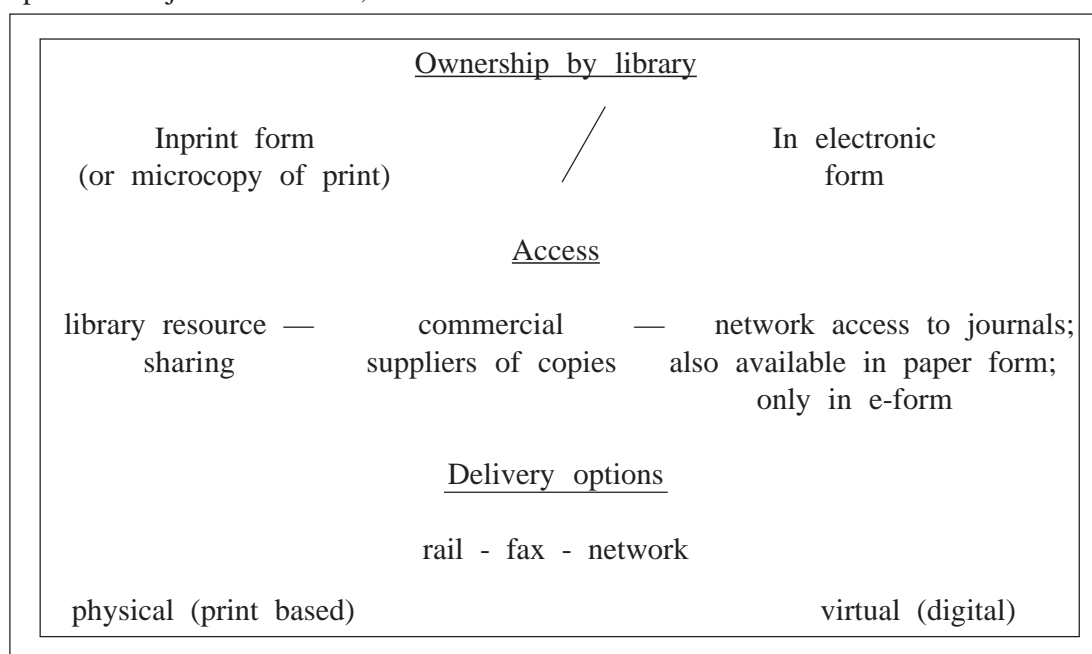
(v) Electronic journal publishers and suppliers

There are two forms of electronic journals—journals that are originally published in print form, and which are available in digital form; journals that are born digital which often do not need a publisher, and which can be managed by an editor and a scholarly community. The rise in the 1990s of e-journals available via the world wide web posed a challenge to traditional forms. Such journals are in some cases referred, some are freely available, and some of them command a price. Many of them do not have a printed equivalent, from which a document request might be

satisfied. Document delivery is a particularly contentious issue for venders of electronic information, and a clear definition of terms is one of the most valuable functions model licences can perform in supporting the needs of the library's document delivery functions. A model license is an idealized version of a licensing contract that gives both libraries and venders a basis for evaluating and negotiating contracts that will be fair and profitable to all parties. A development in the UK electronic journal environment is the National Electronic Site Licence Initiative (NESLI) established by the Joint Information Systems Committee (JISC). It is intended as a service designed to promote the widespread delivery and use of e-journals in the U.K. higher education and research community. In case of delivery services for e-journals, one should be cautious in choosing an e-journal vendor, and should see to the following criteria-

- type of access provided
- quality/content of the database
- ordering options (user, library)
- costs & what is covered (copyright fees)
- delivery options (fax/email)
- reliability
- payment options
- customer service availability

Lancaster and Sandore (1997) have chalked out a possibility of access/delivery options for journal articles, which is shown below :



According to them, the most physical form of delivery can be considered as the delivery to the user of an original item from the library's collection or from that of another institution. Somewhat less 'physical' is the delivery of the photocopy of that item. The most 'virtual' is the provision of access to journals that exist only in network-accessible form.

7.4 DOCUMENT DELIVERY—KEY AGENCIES

The British Library Document Supply Centre (BLDSC) dominates the U. K. Scene for document delivery. It was set up as British Library Lending Division (BLLD) in 1973 by amalgamating the stocks and services of the National Central Library with the National Lending Library for Science & Technology. It receives over 3.8 million requests each year, over a million of which are from outside U.K. Three quarters of the requests received by BLDSC are made electronically. Most of the orders are despatched by mail, and delivery to clients takes place very fast. BLDSC makes provision of service to science, technology and industry, and also supplies documents to the humanities and social science communities. Requests are carried out electronically through the BLDSC's proprietary ART system. Similar services operate in France (INIST), in Germany (Hanover, Cologne), in Canada (CISTI) and in other countries that have adopted the BLDSC model as their basis.

EDDIS is a project that is automating to integrate the whole process of information access, from discovery to delivery. EDDIS is designed as an end user service which integrates document discovery, location, request and receipt available through a www interface. This project have demonstrated that electronic document delivery is possible, but implementation depends upon the type of users and also acceptance of standards.

BLDSC has contributed to the EDIL (Electronic Document Interchange between Libraries) project, with partners in France, the Netherlands and Germany, working on a system enabling the fast interchange of electronic documents between libraries. This project shared the view that Interned standards and electronic mail are the most appropriate approaches to electronic document delivery.

BIDS, the service offered by the UK office for Library Networking, established in 1989, supports the development of networking activities among UK Libraries. It has played an important role in making electronic databases available at competitive rates within the UK academic community. Key databases are BIDS ISI Service, BIDS COMPENDEX service, BIDSEMBASE service, etc.

EBSCO, an important name in electronic journal services offers four services which are EBSCO subscription services, EBSCO publishing which publishes electronic indexing, abstracting both on-line and on CD-ROM, EBSCO dock, a document delivery

service providing article delivery of print documents, and EBSCO host, an on-line client-server system providing search and retrieval of abstracts & full-text articles.

In USA, OCLC plays a leading role in providing an interlibrary lending subsystem to its library management system, thus facilitating the creation, sending, and tracking of document delivery and interlibrary loan requests for materials included on World Cat (OCLC's On-line Union Catalogue), which provides access to the combined resources of over 6700 libraries, totalling over 43 million records. It has developed its own Article First, and Contents First database too. OCLC First Search is the on-line search service that is widely used in the academic community. Document delivery for articles identified through access to OCLC First Search's bibliographic database can be brought through a number of different modes like ASCII full-text on-line, printed document images, and electronic document images.

INFLIBNET has initiated a new Document Delivery Service in collaboration with six university libraries : Banaras Hindu University, Varanasi; University of Hyderabad; Indian Institute of Science, Bangalore; JNU-New Delhi; Punjab University Chandigarh and Tata Institute of Social Science-Mumbai. These serve as document delivery centres and deliver, on demand, the copies of papers from learned journals, conference proceedings and other materials.

7.5 DOCUMENT DELIVERY—THE FUTURE

Document delivery service will gain immense momentum in the future, though the nature of document supply will inevitably change as an increasing amount of material becomes available only electronically. But side by side, a number of factors will be taken into consideration too. The debate over copyright law and its application is an impatient one as libraries and publishers attempt to deal with the implications of new technologies, new formats for information and improved networks of communication. The development of standards for the delivery of materials is another issue. The increasing number of commercial suppliers and the increasing possibility of a changing marketing model are other issues. As libraries move from a traditional model where they are the resource centre and purchase items, to an access-based model, this role becomes even more critical. Document delivery will become more streamlined, more integrated and less reliant on library personnel mediation as suppliers move towards providing direct electronic access to the end-user. The need for a library-based document delivery department will remain but it is likely that its role will change. To sum up, we can say that the following factors will have a direct impact on the document delivery services—

- a) Increase in information

- b) The nature of document delivery
- c) Technological developments.
- d) Shift from holdings to access based policies
- e) Integrated and wider catalogue access among libraries
- f) Current-awareness services.

It can be concluded in the words of Suzanne Ward that ‘The only certainties in document delivery today are that the number of requests will increase exponentially and that tomorrow there will be ever more suppliers and methods for ordering from them.’

7.6 EXERCISE

1. What are the various categories of document delivery services?
2. Discuss the key agencies involved in the document delivery services.

7.7 REFERENCES AND FURTHER STUDY

1. Evans, Edward G. & Zarnorky, M. R. — Developing Library and Information Center Collections. Libraries Unlimited, 2004.
2. Finnie, E. — Document delivery, ASLIB, 1998.
3. Morris, A. & Blagg, E. — Current practices and use of document delivery services in U. K. Academic Libraries. *Library Management*, 19 : 271-80

UNIT 8 □ TRANSLATION SERVICES

Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Definition and Scope
- 8.3 Translation Services : Role of libraries
- 8.4 Translation types
- 8.5 Translation methods
- 8.6 Translation pools
- 8.7 Translation tools
- 8.8 Exercise
- 8.9 References & Further Study

8.0 OBJECTIVES

This unit brings into forefront the third type of information services, i.e. translation services. You will learn the role of libraries in this aspect, the types of translations, the methods of translations, various translation pools and translation tools.

8.1 INTRODUCTION

Translations have always been regarded as an important part of information services. The information explosion has much augmented the necessity of translation services as a huge amount of publications are in different languages of the world. The importance of translation pools and translation tools have soared high and a number of agencies are now involved in this work at Government, Non-government, public and private level.

8.2 DEFINITION AND SCOPE

The word 'translation' is a popular one in the English language dictionary. The Random House Dictionary describes it as to turn from one language to another. The Oxford English Dictionary gives its meaning as 'Express the sense of word, speech, book etc. in one or into another language into another form of representation.' So we can say that translation in libraries, is a written work expressed in a language other than the languages in which it was originally composed. The purpose of a translation is to make a document accessible to those who have insufficient knowledge of a

language, to be able to comprehend the text in its original form. Language constitutes a very serious barrier in communication. It has been found that more than 50% of the world's scientific and technological information appears in language other than English. So dissemination of non English foreign languages in scientific and technological literature is difficult. Some scientists and engineers feel that they may safely ignore materials written in languages other than their own native tongue. But this is a very serious mistake on their part. The need for translation is increasing rapidly as increased industrialization and national prosperity are causing useful information to appear in one or more languages. On-line access to multilingual database is also contributing to the need for translation, a need which is growing, as scientists attempt to keep up with the immense proliferation of scientific literature in their fields.

8.3 TRANSLATION SERVICES : ROLE OF LIBRARIES

The role of libraries in providing translation services is being increased day by day. Libraries often have their own pool of experts who provide translations to their customers. The character of a library in this service should be such that it must be national in scope, and should not duplicate or bypass existing translation projects, should publish & bring out bulletin containing lists of newly reported translations. It should translate data on all known resources, national or international. Not only this, but libraries must have information about translation pools and centres, professional associations conducting translations, government agencies, commercial publications and their products, like cover to cover translations, preparation of digests and abstracts, bibliographical lists in English or other foreign language titles and translation of monographs, and similar others, directories of translators and translation firms. Libraries often maintain on up-to-date basis, ability to assist clients in identifying institutions holding the needed translations.

The role of libraries or library staff is noteworthy in this respect. The provision, in house, of a Current Awareness Service, may often indicate that the librarian or the library staff possess some foreign language ability, depending on how the service is compiled. The translators, may be often employed by the organization, in which case they are part of the library staff to help users. Staff members should be able either to translate, to abstract or make summaries of materials needed for translation. Translators act as a kind of medium, expressing ideas which would be inexpressible otherwise. The foremost duty of the translator is to keep the style and character as much as similar to the original, and faithful as much as possible to the original.

If all these factors play well, then we can prove the saying that translation builds libraries & libraries nurture translations.

Often the concept of 'double barrier' is felt in dealing with the translation literature. First is the language barrier, which has been dealt with, and the role of libraries in solving it has also been discussed. The second barrier is the time lag between the appearance of the original paper, and its subsequent translation, provided the translation is made. Therefore sometimes a common network is provided by the libraries or by the 'invisible college' of scientific researchers which in some way obviates the need for translation. A prior translation of articles, therefore can be predicted by a citation analysis to have a wide impact, and therefore their publication in a selected translated format.

8.4 TRANSLATION TYPES

The types of translation varies according to the nature of material to be translated. Natural, applied and social science documents are translated adhering to the content of the original. The legal materials, technical information, correspondence, pure and applied sciences all fall under the category of literal translations. In this type of translation, the subject matter is vital, styles and techniques are important. These type of translations are made for mass consumption, and these are repeatedly translated too. For example, Rabindranath Tagore's Gitanjali may be translated for mass consumption repeatedly. On the other hand, the scientific and technological translations are meant for specialists, and these are translated once a while. So these translations need precision and accuracy. Free translation refers to the freedom to substitute for the original word, that which is more appropriate, timely & understandable to the readers of the target knowledge, who live not only in a different country, but in different centuries too.

Published translations are accessible to a wide audience through conventional outlets such as libraries and booksellers. A translation can be published in the same form as the original (e.g. book, report, journal) or incorporated into a collective publication such as a translation journal. Translation journals contain a selection of translations from either the same source or multiple sources, usually in the same subject field. A cover-to-cover translation journal is a full translation of a journal originally published in another language. A dhoc (unpublished) translations are translations that have been privately commissioned by an individual, commercial or government organization for in-house use. Source organizations make their scientific and technical translations available through the World Translations Index (WTI) database to give other researchers the benefit.

8.5 TRANSLATION METHODS

There are mainly two methods of translation-human & machine. The most common method of translation is that of human translation performed by someone with a good knowledge of both the subject and the source & target languages.

Since the 1960s it has been possible, to a varying extent to employ computers to generate translations. This is known as machine translation. A machine translation is a translation generated by a computer, with or without the assistance of a human intermediary. Machine translations provide translations of entire sentences or texts but can offer translations that are unacceptable. Machine aided translation is another type of translation generated by a human with the help of a computer. This help can be in the form of word processing, terminology banks or dictionaries, other computerized databanks, spelling, grammar or style checkers & electronic publishing.

8.6 TRANSLATION POOLS

Translation work is a very expensive and time consuming process. So cooperation at international and national levels is essential for an effective translation process. This cooperation has resulted in the formation of translation pools. These pools publish various tools of translations, like indexes or bulletins. There are pools of translation at ASLIB and BLDSO, and elsewhere. The National Translation Centre at Chicago, the International Translation Centre at Delft, the National Virtual Translation Centre deserves special mention.

(a) The National Translation Centre

Located at the John Crerar Library, Chicago, it is an important depository and information source for unpublished translations into English from world literature of the natural, physical, medical and social sciences. It is a valuable research tool for the English speaking scientific community. Many scientific and professional societies, government agencies, colleges, universities and other academic institutions in U.S.A., and elsewhere deposit the translations prepared by them in the centre. Inquiries are also answered on the availability of translations from the centre. It acts as the national clearinghouse of information on translations. A number of indexes have been published by the centre which are as follows :

- i. Author list of translations, 1953 and its supplement, 1954.
- ii. Translations monthly, 1955-58
- iii. Technical translations, 1959-67

iv. Bibliography of translations of Russian scientific and technical literature, 1954-56.

v. Consolidated index of translations into English, 1969.

In 1967, the NTC started publishing its new index under the title *Translations Register-Index* which is a semimonthly journal. This section announces newly accessioned translations of the NTC recorded in subject categories arranged by the COSATI classification and terminology. It also indexes translations from other sources including the NTIS. The NTIS is responsible for collecting translations from both U.S. and foreign government sources. Translations available from the NTC are also available from the BLDSC of Great Britain on loan, or in photocopy.

(b) The International Translations Centre

Also called *Centre International des Traductions*, is a non-profit organization, serving as a clear house for information on existing scientific and technical translations from any source language into western languages. Founded in 1961, it is the part of a network that includes national translation centres in a dozen countries. It maintains a central reference catalogue and an information bureau to facilitate identification of and access to nearly one million translations. It produces the *World Translations Index*, a hardcopy and machine-readable index to scientific translations in all fields. The centre provides reproductions, and acts as a referral centre in relation to the national centers and other organizations holding translations, but it is important to role that the Centre does not perform translations itself. The major input here is in the form of notifications of translations from cooperating national centers and more than two hundred other organizations throughout the world. The centre maintains the machine readable *World Translations Index* data base, which holds approximately 250,000 references and covers the period from 1977 to the present. Approximately 28,000 items are added each year. The *World Translations Index* is published jointly with the *Documentation Centre* of the *Centre National de la Recherche Scientific*, Paris, and in cooperation with the *National Translations Centre* at the *University of Chicago*. It announces more there 28,000 translations per year (both completed & in-progress) of serial articles, patents, standards and monographs. The *Journals in Translation* is one of the Centres, publication, published jointly with the *British Library Document Supply Centre*, Boston Spa. *Five-Year Cumulation of the World Index of Scientific Translations (1967-1971 & 1972-1976)* is its another publication. *Nine-year Cumulation World Transindex (1977-1985)* published jointly with the *Documentation Centre* of the *National Scientific Research Centre*, Paris. It contains more than 190,000 notifications of scientific and technical translations, which includes source and author indexes.

The *World Translations Index* data base is also available on-line through *ESA/*

IRS, and it is produced by means of the PASCAL system. The database provides such bibliographic data as author name, title of translations, number of pages of translations, agency name from which the translation is available, price, language, name, year, volume & number of the original periodical. Reproduction of translations can be ordered through the Questorder service of ESA/IRS.

(c) National Virtual Translation Centre

Established in 2003, it is an inter-agency element with a small, but diverse office staff coming from different agencies, academia, industry, etc. The main work of this centre is to develop policies, procedures & systems for managing translation requirements & services; create a virtual information sharing architecture that connects the translation tasks, language resources and linguists anywhere in U.S.A.; identify and utilize translation resources from U.S. Government, academia and private industry; support continued development and fielding of proven human language technologies designed to help processing of foreign language data. It was established for the purpose of providing timely & accurate translation of foreign intelligence for all elements of the intelligence community.

(d) The British Library Document Supply Centre

The BLDSC is the most important depository of translations in Britain. It collects and promotes translations from and to various sources. The BLDSC holds a comprehensive collection of translation into more than half a million Journals translated by English from a wide variety of languages particularly several articles translated from Japanese, Russian, German and French ranging from 1800 to present day. It holds cover to cover translation of selected Russian scientific serials many available through ZETOC. Patents, Standards, conference papers and books translated into English are also available. BLDSC often checks for an existing English version of the document required by any one. As an alternative it supplies documents in its original language item.

(e) NISCAIR

Formerly known as INSDOC, this Indian centre provides a translation service since the inception of INSDOC. The demand on this service is mainly for important European languages like German, Russian, French, into English. There is source demand of translations from Japanese & Chinese too. INSDOC had brought out a bulletin entitled National Index of Formulations (NIT). At present this index lists the translations of INSDOC and 22 collaborating institutions. Translations done in NISCAIR and a few other institutions in the country are regularly announced in the World Transindex of the International Translations Centre.

(f) Centre for Translations—Sahitya Akademi.

Sahitya Akademi, the famous Indian centre for literature, has established four centres for translation at Bangalore, Ahmedabad, Delhi and Santiniketan. These centres bring out special series of books from the language of one area of India, translated into English and other languages. Beginning with a series of premodern classics from the Bangalore centre, these centres will also translate books for the scheme “one hundred twentieth century classics,” being brought out in English by Sahitya Akademi in collaboration with National Book Trust, India. The Bangalore Centre is stated to bring out translations of premodern classics in different languages under the series ‘Prachya’.

Apart from these, there are other important translations pools which cater to the needs of the scientists and researchers all over the world. These are as follows : Royal Library of Belgium-National Centre for Scientific & Technological Documentation; Linguistic Research centre of the University of Texas, Austin; Institute for the Translation of Hebrew Literature; Canadian Index of Scientific & Technical Translation (CISTI) etc. In the Indian scenario, National Centre for Software Technology (C—DAC) is worth mentioning. It is a scientific society of the Department of Information Technology, Govt. of India, involved in research and development into the area of software technology. The project undertaken by it is called Matra which is the human aided machine translation system of English, Hindi and other languages.

8.7 TRANSLATION TOOLS

Translation indexes are the most important tools of translations which cover translations produced by a single organization or a country, or pertaining to a specific subject field. The most significant of these indexes is the Index Translationum which is the International Bibliography of Translation. It lists translation of books published by member states of UNESCO. It does not include journal articles. Articles covered are from 1932 to date. Searching mode is by author or title. It is published annually. Arrangement in it is by names of countries and ten main divisions of UDC. The details of World Translations Index has been discussed earlier. The subjects covered here are engineering and aeronautics and aerospace technology, biological and marine sciences, chemistry, earth sciences, iconography, agriculture, maths, physics, nuclear science, energy and technology. Half of the English translations were originally published in Russian and 30 percent were from Japanese and German originals.

Other important translation tools are Consolidated Index of Translations into English (1969), supplemented by Translations Register Index (1969); World Index of Scientific Translations (1972); National Institute of Health’s Translation Index (1954-

63); Literature of the World in English Translations : A Bibliography (3 volumes) etc. 1969, the NTC issued an important guide, Consolidated index of translations in English (CITE). CITE contains details of 142,000 translations. CITE II, covering the years 1967-1984, appeared in 1987. In the USA, the Joint Publications Research Service (JPRS) produces many pages of scientific and technical translations each year. JPRS translations are notified in the announcement service Transdex index. Current announcements of translations from British sources are carried out in British reports translations and theses (BRTT).

8.8 EXERCISE

1. Discuss the importance of translations in the modern society.
2. Describe the important translation pools.

8.9 REFERENCES AND FURTHER STUDY

1. Guha, B. — Documentation & information, services, techniques & systems. Calcutta, World Press, 1983.
2. Kent, Allen, ed. — Encyclopedia of library & information science. Vol. 31, Merce Dekker.
3. Mann, Thomas — A guide to library research methods. New York. Oxford University Press, 1987.

UNIT 9 □ TRADE LITERATURE

Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Forms of Trade Literature
- 9.3 House Journals
 - 9.3.1 Internal House Journals
 - 9.3.2 External House Journals
- 9.4 Problems of trade literature
- 9.5 Commercially available trade literature services
- 9.6 Uses
- 9.7 Guides to trade literature
- 9.8 Summary
- 9.9 Exercise
- 9.10 References and Further Reading

9.0 OBJECTIVES

We take trade literature to mean literature which an organization produces in connection with its products or services. By reading this unit you will know that manufacturers or dealers issue in a tremendous variety of forms, ranging from single sheets to multi-volumed sets, to describe and instruct their goods or services, of course such 'product data' as it is often called is his prestige. You will know different forms of trade literature, one of them is house journals. You will also understand the problems of their acquisition, arrangement, retrieval and use.

9.1 INTRODUCTION

One authoritative estimate is that in the United Kingdom alone there are over 30,000 companies producing trade literature. Its function may be to advertise or instruct the reader in the use, exploitation or maintenance of these products. Some of this literature is more information oriented than sales oriented, and some even encourages the reader to find new application for the products or materials available. The literature may take the form of sales brochures, catalogues, manuals, house journal, annual report, a handbook, a newsletter or a trade journal. Commonly it is very technical: in the case of chemicals, for instance, as Crane points out, it will frequently summarize

the chemistry of compounds, give extensive information on physical properties, tell how to use them in various ways, and give references to the literature. In many cases the aim is as much to inform potential customers, users and others, e.g. students, teachers, research workers, about commercially available materials, equipment and processes, as to stimulate sales as such.

In recent years manufacturers have been stepping up the informational content of the literature to encourage users themselves to find new applications and new markets for particular products. In some companies as much as half the advertising budget is devoted to trade literature. It has been estimated, noted by Grogan that in the field of electronic engineering, for instance, suppliers use 200,000 pages of trade literature to describe their wares. Some of these publications are merely trade catalogues, i.e. basically little more than enumeration of available goods, with brief details and sometimes supplementary indexes or keys. Prices are usually omitted, although separate price lists are sometimes available on request. Often of course this information is of commercial rather than strictly scientific or technical value. Even so they serve a vital function for the scientist and technologist: the chemist who needs a substance with certain characteristics, or the engineer looking for a piece of equipment to perform a specific task finds such catalogues invaluable, for without their aid he may not be able to ascertain easily whether they are available commercially and may thus be obliged to synthesize or build for himself. But what raises manufacturers' publications to the level of a primary source of scientific and technical information is the continuous flow of sheets, folders, pamphlets, bound and loose-leaf volumes, on new products and processes, theory and applications, containing original data that has not yet appeared in the regular literature.

It would be a mistake to assume that trade literature has only ephemeral importance. It is being increasingly realised how valuable are retrospective collections of trade literature for studies such as industrial archaeology, business history and the history of science and technology. It has frequently been discovered that contemporary manufacturers' brochures are often the only source of information on various museum objects or industrial relics particularly of the nineteenth century and early twentieth centuries. Unique so far is L. B. Romaine *A Guide to American Trade Catalogues 1744-1900* (New York, Backer, 1960).

It may be mentioned in passing that not all trade literature is published by individual firms : trade associations sometimes issue catalogues listing their members' products, e.g. *British Chemicals and their manufacturers* (Association of British Chemical Manufacturers). Works of this kind are very similar in layout and use to the conventional trade directories. In fact trade directories are often regarded as a form of trade literature, though their publication in most cases through normal book-

trade channels would seem to indicate that they are best looked on as a specialized form of directory. Some trade directories do make a feature of including what is undeniably trade literature, e.g. the manufacturers' data sheets and catalogue pages describing products and services in *concrete yearbook*. Other examples are :

Kelly's Manufacturers and Merchants Directory. East Grinstead, Kelly's Directories, annually.

Key British Enterprises. The top 20,000 British Companies 2 vols. London, Dun and Bradstreet annually.

Sell's Directory : products and services. Epsom, Sell's Publications, annually.

Thomas Register of America Manufacturers and Thomas Register Catalog File. New York, Thomas Publishing Company, annually.

9.2 FORMS OF TRADE LITERATURE

The typical piece of trade literature is a folder or pamphlet, glossily produced but commonly of a nonstandard size and thousands of each pieces are distributed by manufacturers daily. What distinguishes such publications from general advertising is the wealth of technical detail and the very solid body of information conveyed. Substantial pamphlets with dozens of pages of well written text and diagrams are common, e.g. *Shell chemicals Ltd. Building with plastics* (1965), Foredo Ltd. *Friction materials for engineers* (1961) and booklets of a hundred or more pages are frequent e.g. NV philipes *Audio amplifier systems* (1970), ICI Ltd. Dyestuffs Division. *Rubber Chemicals for footwear* (Manchester, 1961). They may be no more than a single page, e.g. the data sheets on British Oxygen Chemicals Ltd. range of products issued as *BOC information*.

Some catalogues appear in serial form, e.g. *Elastomers notebook* (Du Pont), though they are usually too irregular to rank as journals.

Some of the trade literature are almost equivalent of a standard work in their field e.g. C.E.A. Shannon *Chemical analysis of flat rolled steel products* (Richard Thomas and Baldwins Ltd., 1961). In some cases, they are indistinguishable from regular textbooks or monographs, save for the fact that they are issued by an industrial firm and not a publishing house, e.g. Sir Joseph Lockwood *Flour milling* (Stockport, Henry Simon Ltd. fourth edition, 1960) is the basic text on the subject. A number have attained the status of recognized reference books in their fields, e.g. Yorkshire Engineering Supplies Ltd. *Bronze : a reference book* (Leeds, 1962), *Alcoa aluminium hand-out* (Pittsburgh, Aluminium Company of America, 1962). The number of trade publications in the form of bibliographies is a further indication of the sophisticated approach to the user, e.g.. ICI Fibres Ltd. *Select bibliography on nylon* (Pontypool, 1966). The amount of literature produced by a number of the major companies is

so great that some have felt it necessary to produce bibliographies of their own publications, eg. ICI Ltd. Dyestuffs Division *Technical publications subject index to June 1963* (Manchester, seventh edition, 1964): some indication of the range of materials is given by the list of series covered—sales circulars, Chemicals pamphlets, technical information series, technical circulars, pattern cards, swatches, manuals.

A special form of this literature is the customer's handbook, or maintenance manual, service manual, or user's guide, as they are variously called. These are basically textbooks and/or reference books prepared by the manufacturer for his customers on how to install or operate or maintain or repair his particular equipment. The best known examples of this type are the workshop manuals for the various makes of cars, but there are similar compilations for most kinds of scientific and technical hardware, such as electron microscopes, furnaces, lathes, etc. Some are necessarily very elaborate, eg. the series of volumes known as the *IBM Systems Reference Library*, covering the hardware and software of all IBM Computers and peripherals.

9.3 HOUSE JOURNALS

One of the distinctive forms of trade literature is the periodical published by a particular industrial or commercial firm or public corporation e.g. *Atom news* (UKAEA), *Dupont magazine*, *Welder*, the '*Planters Chronicle*' (First house journal in India), *NCR World* (USA). These are known as house journals or house magazines (also as house organs in USA). Like other forms of trade literature they are basically advertising publications, but in some instances they also have great information value.

9.3.1 Internal House Journals

In the United Kingdom the total number probably approaches more than two thousand, and in the United States perhaps five times that number. A large proportion of house journals are designed for internal consumption, that is, by the companies own employees or shareholders, and may indeed be restricted to them e.g. *Vickers news*, *The lamp* (Exxon Corporation), *Nobel times*, *British Aerospace news*. The internal house journals are meant for the employees of the concerned organization. Their aims are to inform and educate the employees about the organization. They also aim to provide the employees with a form to express their views and grievances. They are also meant for the welfare of the organization. They serve the function of newspapers written a firm and certain information, for instance, personnel changes, suggestion schemes, expansion plans, although a number do have roles other than communication and morale building. The importance attached to them by the companies and the

care with which they are directed at their particular audiences can be seen in the fact that Esso Petroleum Co. Ltd. have a whole range of such journals : *Esso Oilways international*, *Esso newslines*, *Esso magazine*, *Esso air World*, and *Esso farmer*. The international character of many modern companies can be seen reflected in the separate language editions of a number of their journals, e.g. *Philips technical review* appears in Dutch, English, French and German. Of Course many of them have little scientific or technical interest, e.g. bank reviews.

9.3.2 External House Journals

The journals of most concern to us are those which circulate outside the companies and these fall into three main categories and are meant for the external audience. Categories are:

(a) Prestige : Usually aimed at the nontechnical reader, and often lavishly produced, but more with creating goodwill and preserving a favourable public image, e.g. *Ciba-Geigy journal*, *Aramco World Magazine*, *Oil lifestream of progress* (Caltex Petroleum Corporation), one of the best of all, the now defunct *Far and Wide* (Guest keen and Nettlefolds)

(b) Scientific technical: these are clearly aimed at a knowledgeable audience and qualitatively may be equal of some of the research and technical journals e.g. *IBM journal of research and development*, *steel research* (British Steel Corporation), *GEC journal of science and technology*, *The Bell System technical journal*.

(c) Popular : these are similar in appeal to the commercially produced popular subject periodicals e.g. *Decorating review* (Wall Paper Manufacturers Ltd.). Motoring journals are particularly well represented, e.g. *Ford news*, *Austin—Morris express*, *Specialist car* (British Leyland). And yet when the joint research team reported on their study of house journals they called their article. ‘The hidden literature’. They had concluded that ‘House Journals’ are generally regarded as and proved to be, an extremely elusive form of literature’. Only a small proportion can be found in standard bibliographies such as the *World list of scientific periodicals*, the *British-catalogue of periodicals*, or the *Union list of serials*.

9.4 PROBLEMS OF TRADE LITERATURE

Trade literature abounds with problems of acquisition, arrangement, retrieval and use. Since virtually all such literature (including house journals) is available free of charge from the manufacturer, simply for the asking, the librarian might well wonder whence comes the acquisition problem. In point of fact, it is the very availability which causes one of the major difficulties : like the research reports trade literature is outside the usual source of literature supply, the book trade. Booksellers are naturally reluctant

to deal on large scale with producers of literature other than regular publishers and even more disinclined to deal with free material. This means that librarians are obliged to employ direct or do-it yourself acquisition procedures, by first identifying appropriate manufactures from trade directories, advertisements and other sources, and then writing either for particular items or with a request to be placed on the mailing list. Trade literature is either ignored or deliberately excluded from most current bibliographical lists (including abstracting and indexing services). The quarterly *COPNIP* list published by the committee on Pharmaceutical Non-serial Industrial Publications of the Special Libraries Association is a unique example of a current list devoted to trade literature. The best sources of information on new trade publications are the scientific and technical periodicals a number of which make a feature of noticing or at least listing new titles, eg. *Engineering Metallurgia*, *R & D*, *Chemical Week*.

But acquisition is a simple task compared to the organization of a collection. Despite the British and American standards the variety of sizes and shapes encountered is immense, no doubt because to a manufacture whose products have to compete with rivals a publication in an unusual non-standard format has a head-start, and for a collection composed mainly of folders and pamphlets even the simple question of storage needs careful thought.

As to arrangement, it will suffice to indicate the nature of the problem. Ideally, any system should provide for access by name of manufacture, name of the product, trade name, and subject; yet one trade catalogue may describe hundreds of different products. And perhaps more than any other form of scientific and technical literature the information content, and therefore its value, varies unpredictably. A particularly acute problem is maintenance. The provision of accurate and up-to-date prices is a particular headache. Because access to the information in trade literature is devoid by indexing and abstracting services, adequate arrangement, indexing and maintenance is more than usually crucial, without it a collection is virtually unusable.

9.5 COMMERCIALY AVAILABLE TRADE LITERATURE SERVICES

A partial solution to the librarian's problems is to subscribe to one of the 'package libraries' or 'catalogue services' which are now increasingly available. Known also as product information services, for an annual fee they will provide within a particular subject field an indexed collection of trade literature in standard format: the newer services will also guarantee to maintain the collection, usually on a monthly basis. Commercially available 'product data services' take the form of collections of trade

literature with specially compiled product and company indexes. These collections are hired out and maintained by service organizations. Two examples are as follows:

The Technical Indexes System, available from Technical Indexes Ltd. Willoughby Road, Bracknell, Berkshire. *Barbour Index*. Barbour Microfiles, New Lodge, Drift Road, Windsor, Berkshire.

9.6 USES

To help you choose suitable products, equipment, materials, services, etc. for your requirements.

To give you detailed information about products, equipment, materials, etc. which are already in your possession and which you wish to use or maintain.

To give you details about rival products or services.

9.7 GUIDES TO TRADE LITERATURE

If the name of the supplier or manufacture is known, but their literature is not available in your organization or locally, the problem is usually to find their address or telephone number, so that you can approach them direct. The directories to the various types of organizations or their database equivalents will help you here : for example, telephone directories or KOMPASS : United Kingdom for British commercial organizations. The Science Reference Library publishes *Trade Literature in British Libraries* (a brief directory).

If you only know the type of product you want, the first problem is to identify the name of a suitable supplier or manufacturer. You may do this via the product or subject index of your local collection of trade literature, if you have one, or via the indexes in the directories.

If you wish to keep up-to-date with new products in a particular field, you have to rely on the various periodicals for advertisements, or ask appropriate suppliers or manufacturers to keep you informed of their own products. There are some journals which consist entirely of advertisements, and there are those which actually list details of new trade catalogues.

9.8 SUMMARY

We have discussed the importance of trade literature to the scientists and technologists. We have noted the different forms of trade literature. One of the distinctive forms is the house journals-both internal and external. We have highlighted the different

problems of trade literature, commercially available trade literature services, and uses and guides to trade literature. The functions of telephone directories and KOMPASS in locating various trade literature have been discussed.

9.9 EXERCISE

1. What do you understand by 'trade literature'? Illustrate.
2. Give examples of at least five trade directories.
3. What are house Journals? Discuss their functions.
4. Discuss the problems of retrieving information from the trade literature.
5. What are the guides to trade literature? Give examples.
6. Show your acquaintance with the commercially available trade literature services.

9.10 REFERENCES AND FURTHER READING

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UNIT 10 □ STATE-OF-THE-ART REPORT

Structure

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Reviews of progress
- 10.3 Types of Review Publications
- 10.4 Classification of Review on the basis of their Intellectual level
- 10.5 Comprehensive Reviews
- 10.6 Topical Reviews
- 10.7 Review Journals
- 10.8 Bibliographical control
- 10.9 Summary
- 10.10 Exercise
- 10.11 References and Further Reading

10.0 OBJECTIVES

Side by side with the growth in the volume of information, attention has been given to the limitations of the systems that have been made use of during the past three centuries for the dissemination of information. This unit presents with the aim to overcome the complaint ‘so much has already been written about everything that one can’t find out everything about it’ and to make the proper use of information.

10.1 INTRODUCTION

Of the various phenomena that have occurred in the field of communication of information during the past few decades, two are particularly noteworthy. First, scientific and technological information has been accorded the status of a vital resource. The benefits that a nation can aspire to derive from this resource are no less important than those derivable from the material resources like mineral, plant or animal wealth, energy sources, etc. However, the information resource differs radically from other resources in that its exploitation is not limited by barriers of national interests. Through a network of media, information has over the decades been flowing into a common pool of knowledge for anybody to exploit it.

The second notable phenomenon has been the explosive rate of generation of information. Particularly during the last five decades, the volume of scientific

information has been growing in geometric progression. Surveys of recent trends indicate that at the moment the rate of generation of technical information is faster than that of scientific information.

The two major weaknesses of the primary periodical system recognized are dilution and dispersion of information. New information gets distributed over some 50,000 and odd primary periodicals. An active research worker is bound to get bewildered in trying to get at articles of specific interest to him through primary sources. Thus, information of specific interest to the research worker lies scattered in a high state of dilution.

The search for alternatives aimed at ridding the research worker of the tedium of having to go through all that is relevant to his work and the work in related areas has been going on for the past few decades. A number of systems have been emerging in the form of secondary media of different types the abstracting, alerting and indexing media on the one hand and the review publications on the other. It has been clear for some years that even the scanning of indexes and abstracts is proving too much for some workers, and there have been urgent pleas for more digestible forms of secondary publication. In response we have seen a remarkable revival of the review, a literature form far older than abstract, but which has lain in its shadow for a hundred years or more.

10.2 REVIEWS OF PROGRESS

Reviews of progress are now seen very definitely to be of great importance; by some they are regarded as offering a possible pathway out of the literature jungle. In some fields they are used more heavily for literature searching than abstracts and indexes. H.V. Wyatt for instance considers that 'The future of biological literature lies not in classification by words but in distillation by review'. The preface to the first (1962) *Advances in nuclear science and technology* refers to the 'bewildering information problem to both expert working along its narrow crevices and the dilettantes hoping to keep abreast of the ever expanding frontiers. Clearly what is needed by both groups are well-organized review articles' The preface to the first (1960) *Advances in computers* describes how the review is 'intended to occupy a position of intermediate between a technical journal and a collection of handbooks or monographs. It is customary for a new scientific or technical result to appear first in a journal, in a form which makes it accessible to specialists only. Years later it may be combined with many other related results into a comprehensive treatise or monograph. There appears to be a need for bridging the gap between these modes of publication, by surveying recent progress in a field at intervals of a few years and presenting it in

a form suitable for wider audience.' Such reviews are seen as supplementing rather than supplanting the abstract journals.

10.3 TYPES OF REVIEW PUBLICATIONS

The basic difference between the traditional retrieval systems and the reviews is the failure of the former to give the following essential treatments to information handled:

Condensation
Analysis
Interpretation
Synthesis
Evaluation

By giving these treatments to the mass of information handled, reviews possess the unique advantage of converting information into usable knowledge.

There are different types of review publications. The most common types are as follows :

(i) Periodic reviews which are usually annual review type containing state-of-the-art reviews, published in book format. These reviews are concerned with a limited subject area and limited period of time.

Annual review of nuclear and particle science
Annual review of biochemistry

(ii) Advances type containing both critical and state-of-the-art reviews, published somewhat less regularly in book format.

Advances in computers
Advances in chemical engineering

(iii) Journal type containing critical reviews, often published as a quarterly or monthly journal

Chemical reviews
Recent progress in surface science

(iv) Popular journals—generally broad in scope, providing popular articles in topical areas

Scientific American
Science Today

(v) Yearbook type— a form of the state-of-the art reviews dealing with individual copies.

Yearbook of radiology
Yearbook of science & Technology

(vi) Monograph series, usually irregular series of long treatises in a particular field, forming a definitive work or milestone in the development of subject.

Botanical and Zoological monographs brought out by the Publications & Information Directorate., CSIR, New Delhi.

(vii) Essay types, generally providing tutorial type reviews aimed at a broader audience than the subject specialist, particularly teachers and lecturers.

Essays in toxicology

(viii) Comments type, usually containing brief review of a subject, taking one or a small number of recent papers as the nucleus.

Comments on Atomic and Molecular Physics.

10.4 CLASSIFICATION OF REVIEW ON THE BASIS OF THEIR INTELLECTUAL LEVEL

An alternative system of classifying reviews bases the distinction on their intellectual content. Thus, there are

(i) the critical reviews, the preparation of which involves lot of intellectual effort and subject knowledge on the part of the expert who prepares the review and (ii) an indicative or bibliographic review which represents more or less a bibliography in narrative forms. In between two extremes lie other variations, the preparation of which requires varying degrees of effort, skill and subject knowledge. Thus, there are the interpretive, the state-of-the-art, the evaluative and finally the critical review. On the basis of the intellectual effort involved, reviews may be arranged as follows :

Type of review	Function Performed
Evaluative } Expert } Analytical }	Critical
State-of-the art	Topical
Interpretive } Popular }	Explanatory
Informative } Indicative }	Bibliographic

The value of a well prepared review is immense, since it neglects the trivial, omits the mediocre, selects the significant and stresses the important.

10.5 COMPREHENSIVE REVIEWS

These are thorough, systematic, and condensed accounts of developments in broad field over a narrow time interval (and sometimes within a particular geographical

area). Long-established examples to study are *Annual reports on the progress of chemistry* (1904-) and *Annual review of biochemistry* (1931—). Firmly based on the literature, they provide extensive references e.g. in *Annual surveys of organometallic Chemistry* for 1965 the six-page survey on aluminium has 76 references; the fifteen-page account of carpets in *Review of textile progress* for 1965-66 has 114 references.

Some surveys are published as articles in periodicals, eg. 'Progression in heat transfer—review of current literature; annually in *Progress engineering*; 'Annual review of the literature on fats, oils and detergents' in *Journal of the American Oil Chemists' Society*. One issue each year of *Rubber Chemistry and technology* is 'Rubber reviews'.

Surveys of this kind have an obvious appeal to the specialist in that their comprehensive nature enables him to fill any gaps in his knowledge of recent developments and their broad coverage can often give him a new angle on his subject.

10.6 TOPICAL REVIEWS

These are 'state-of-the-art' reports on selected, specific topic of active current interest. Increasingly in the last five decades these have appeared collected in volumes issued as a series e.g. *Progress in Semi-conductors*, *Reviews in engineering geology*. Examples of individual reviews in such volumes are 'Jewels for industry in *Modern materials : advances in development and application* 6 (1968), 'Immunity to ticks *Advances in parasitology* 18 (1980); 'History of noise research' in *Advances in electronics and electron physics* 50 (1980); 'Dehydrated mashed potatoes' in *Advances in food research* (1979).

They are specifically designed to be intelligible to the non-specialist, and while not 'popular' in approach are aimed at all levels of readership from the student to the director of research. One particular aim they have is interdisciplinary cross-fertilization, and their target is the worker in related fields of science and technology anxious to remain in touch with the more significant developments outside his immediate area of interest. Such reviews of progress are evidenced by the reaction to the first (1960) *Advances in computers* Volume, 'felt by many readers as a welcome attitude to the ever-growing specialization of technical fields'.

Although written by specialists, like the comprehensive surveys, topical reviews are seen by their editors as something much more flexible. Topical surveys can obviously be published in a variety of forms, but it is burgeoning review services such as *Advances in chemical engineering*, *progress in optics*, *Recent progress in surface science*, *Macromolecules* reviews, which have been responsible for the spectacular rise to its present prominence of this form of scientific and technical

literature. Each of these new series follows more or less the same pattern, with separate volumes containing half-a-dozen or more review articles, appearing at intervals.

Reviews need not be published in collected volumes : they can be issued separately as are the paperback sigma science surveys, deliberately limited to 5000 words in length and issued at the rate of four a month. Some appears in both forms : each article in *Progress in material science* is also published separately to make it available quickly.

A popular way of or the 'state-of-the-art' surveys to appear is in the form of papers read at conferences, and these may be later published separately in a periodical or collected in a volume of conference proceedings. A number of scientific societies try to include such review papers in their programme as a matter of deliberate policy. Occasionally the whole conference may consist of reviews or review-type papers : the series *Advances in the astronautical sciences* are the proceedings of annual and other meetings of the American Astronautical Society, and *Progress in astronautics and aeronautics series* is based on papers read at symposia of the American Institute of Aeronautics and Astronautics.

10.7 REVIEW JOURNALS

For many years there has been a special category of periodical solely devoted to review articles, e.g. *Science progress*, *Chemical reviews*, *Biological reviews*, *Quarterly review of biology*, *Contemporary physics*. Apart from their format and frequency, these review journals are often indistinguishable from review series discussed above. The editorial policy of the *Review of modern physics* is that 'The best papers in the journal should be milestones of physics, embodying the intellectual contributions of hundreds of others whose work appears in the original literature' the objective is to publish perspectives and tutorial articles in rapidly developing fields of physics as well as comprehensive scholarly reviews of significant topics.'

10.8 BIBLIOGRAPHICAL CONTROL

The ways in which reviews of current progress serve the scientist and technologists are obvious. Currently they help them to remain aware of the major advances outside their particular areas of activity. So the demand is there. The attempt by librarians to satisfy it soon brings home the fact that even for the resources which already exist bibliographical control although improving still has some way to go. A useful aid to identify, appropriate collected reviews is UNESCO *List of annual reviews of progress in science and technology* [Paris], 2nd edition, 1969, with some two hundred titles in subject order; the then British Library Lending Division produced lists which

included review journals as well, eg *Some current review series* (1964) and KWIC index to some of the review publications in the English language (1966). The most comprehensive list is A M Woodward *Directory of review serials in science and technology*, 1970-1973 (ASLIB, 1974) with about five hundred titles.

Reviews are not always easy to recognise : out of 8601 reviews in the field of chemistry it was found that only two contained the word 'review'¹ in the title. Some indexing and abstracting do try to signal reviews. *Chemical abstracts* uses R to mark reviews in its index; *Biological abstracts* augments the title with the word 'review'. *Science Citation Index* uses (R) to indicate review article. Fortunately, the need for special tools is gradually being recognized and there now available a handful of bibliographical confined to reviews : *Bibliography of medical reviews* is a cumulated listing based on the corresponding section in the monthly *Index medietes*; *Bibliography of reviews in chemistry* derived from *Chemical abstracts*, but ceased publication after 1962 for lack of support, although it was revived in 1975 in the shape of *CA reviews index*, a computer produced KWIC index produced twice a year with some 20,000 review articles per issue.

Bibliographically much remains to be done. And if what we read in the introduction to *Macromolecular reviews* for 1966 is true '... the review article is becoming the primary [in principle] source of information to a large majority of scientists'. One hopeful sign is the first general index to appear, the computer-produced *Index to scientific reviews* from the Institute for scientific Information.

10.9 SUMMARY

Information is one among the major resources of a country such as its raw materials, finances, manpower, etc. that needs to be mobilised, organised and utilized for the progress and well being of the people. Any work undertaken, invariably begins with a search for information already generated and recorded in that area. The several barriers to fruitful use of existing information and the solutions proposed to overcome the barriers have been discussed. Thus the state-of-the-art reports are more appropriate than the traditional reviews. We have discussed in this unit reviews of progress, types of review publications, classification of reviews, comprehensive reviews and topical reviews on selected, specific topic of current interest. The demand for such reviews is obvious and the bibliographical control of reviews is all the more necessary.

10.10 EXERCISE

1. Discuss the Characteristics and functions of reviews.
2. Indicate the important barriers to the use of information.

3. Describe the different types of review publications.
4. Highlight the values of well prepared review.
5. What is understood by 'topical reviews'. Illustrate.
6. Discuss the various attempts to control reviews bibliographically.

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UNIT 11 □ TECHNICAL REPORTS

Structure

- 11.0 Objectives
- 11.1 Introduction
- 11.2 History of Report literature
- 11.3 Characteristics of Report literature
- 11.4 Status of technical reports
- 11.5 Types of technical reports
- 11.6 Security classification
- 11.7 Technical report numbers
- 11.8 Clearing houses
 - 11.8.1 National Technical Information Service
 - 11.8.2 Defence Documentation Centre
 - 11.8.3 National Aeronautics and Space Administration
- 11.9 Summary
- 11.10 Exercise
- 11.11 References and Further Reading

11.0 OBJECTIVES

Engineers are found to depend more heavily on internal (inter-corporate) sources of information than on outside sources. In sharp contrast to the approach of the scientists, the technologists are not quite free to communicate the results of his R&D effort. Here in this unit you will know about the accepted bibliographic format for dissemination of technical information.

11.1 INTRODUCTION

The term technical literature encompasses a number of different types of publications : technical reports, standards and specifications, patents, company publications (including house journals) and trade catalogues. The technical report is an accepted bibliographic format for the dissemination of technical information generated through applied R&D effort, in the same way as the scholarly journal article is the accepted channel for communicating the results of scientific research. According to C.P. Augur 'A report is a document which gives the results of or the progress with research and/or

development investigation. Where appropriate it draws conclusions and makes recommendations and is initially submitted to the person or body for whom the work was carried out, commonly a report bears a number which identifies both the report and the issuing organization'. The report normally contains sufficient data to enable the qualified reader to evaluate the investigative process of the original research or development.

A very large number of technical reports are issued each year. In 1963 the Weinberg Panel estimated about 100,000 Government reports written each year in the United States. About 85% of the world output of report literature is produced in the United States. Report literature has been regarded by the regular bibliographical tools, as a 'minefield in which only the wary venture'.

11.2 HISTORY OF REPORT LITERATURE

Neil Brearley suggests that technical reports predate scientific journals and that 'scientists were exchanging reports with one another long before scientific communication was institutionalized'. Copernicus distributed a preliminary draft of his new cosmology to a few selected scientists two decades prior to publishing his monumental work in 1543. [Edward Rosen, 'Copernicus published as he perished' *Nature*, 1973, 241 (5390), 433-444] Industrial research laboratories have always used technical reports for internal communication. But the history of technical service reports as a distinct format dates back only to the beginning of the 20th century. The *Professional papers of the United States Geological Survey* (1902-) and the *Technological Papers of national bureau of standards* (1910-) may be said to mark the beginnings of report literature. Since 1928 the *Technologic papers* have been incorporated in the *NBS Journal of Research*. The earliest reports issued in Great Britain were the *Reports and Memoranda* series of the Advisory Committee for Aeronautics (now known as the Aeronautical Research Council) which began in 1909.

The Second World War spurred a great deal of research activity, especially in subjects directly or indirectly affecting the war effort. Government expenditure on R & D increased greatly as a large number of defence-related projects were sponsored by numerous government agencies, including the Army, Navy, and the War Production Department. A separate agency called the Office of Scientific Research and Development (OSRD) was set up in June 1941 to mobilize scientific and technical information resources for national defense.

With the cessation of hostilities, the OSRD was abandoned, but the pace of government-sponsored research effort and the generation of technical reports from these were not lessened in the years following the war. After the war in June 1945

a cabinet Committee Called the Publications Board (PB) was established by the executive order to release scientific and technical information generated during the war. Each report was given a PB accession number, and weekly announcement service titled *Bibliography of Scientific and Industrial Reports* (BSIR) was established with a view to promoting wider dissemination of reports. The announcement service has evolved into the present *Government Reports Announcements and Index*.

The Publication Board merged with a new agency called the Office of Technical Services (OTS) was set up in 1946 under the Department of Commerce to look into the distribution of technical reports. During the years 1957 and 1958, and number of nongovernmental libraries were designated as depositories of PB reports. In 1964 a new facility the Clearinghouse for Federal Scientific and Technical Information (CFSTI), was established under the National Bureau of Standards and functions of the OTS were transferred to the clearing house. In 1970 CFSTI was merged with the newly established National Technical Information Service (NTIS), a part of the Department of Commerce.

This series of developments represents one stream of events that led to the establishment of NTIS as a national agency for the Centralized bibliographic control and distribution of technical reports. Cousequently, a number of parallel series of events took place, and these culminated in the establishment of various agencies such as the United States Atomic Energy Commission (USAEC), the Defence Documentation Centre (DDC) and the National Aeronautics and Space Administration (NASA) all of which have been responsible for the production and distribution of large quantities of report literature.

11.3 CHARACTERISTICS OF REPORT LITERATURE

In view of great variations in the nature and quality of the contents the boundaries of reports literature are not easy to delineate. On the heterogeneous nature of report literature, the following observation was made in the SATCOM Report:

‘Other attributes of technical reports as a whole are so heterogeneous that one can find ready examples to support almost any generalization that happens to strike his fancy : that they are too long or too short; badly refereed or well refereed—or not refereed at all; reliable or unreliable; inadequately distributed or too widely distributer; too detailed and technical or not technical enough; to expensively printed or shoddily assembled; a valuable complement to journals or a serious handicap to conventional publications.’

Much of the debate recurring in published literature centres around three themes: (a) the uneven quality : Most technical reports are of uneven quality because

- (i) most of them are written by engineers or technologists
- (ii) the reports are addressed to the technical experts of the sponsoring agency and not to entire scientific and technical community
- (iii) the time available for the preparation of reports is usually very limited
- (iv) because of the confidential nature of their contents, reports are not refereed by outside experts
- (v) technical editing expertise and facilities available for report editing are usually very limited.

(b) Diversity of contents : Technical reports vary greatly in the nature of their contents. Besides the results of research and developmental work, diverse types of material such as literature reviews, bibliographies, compilations of statistical data, catalogues, directories and conference papers and proceedings appear as technical reports.

The subject covered in technical reports encompass all branches of science, engineering, technology, the social and behavioural sciences that include various aspects of energy and environment, and even some branches of humanities.

11.4 STATUS OF TECHNICAL REPORTS

The uncertain status of technical reports as a form of scientific literature was described by the Weinberg Panel thus :

‘The documentation community has taken an equivocal attitude toward informal reports : in some cases the existence of these reports is acknowledged and their content abstracted in the abstracting journals. In other cases informal reports are given no status; they alleged to be not worth retaining as part of permanent record unless their contents finally appear in a standard hard-copy journal. Editors of many scholarly scientific journals have criticized the uncertain quality and uncontrolled proliferation of technical reports.

Notwithstanding the controversy over the status, technical reports are becoming increasingly important as vehicles for the dissemination of technical information. The strength of technical reports lies in their timeliness and flexibility. As vehicles for disseminating technical information, technical reports are much faster than journal articles.

11.5 TYPES OF TECHNICAL REPORTS

The COSATI Task Group on the Role of Technical Report has identified the following eight types of technical reports.

- (i) “Pre-Print” Reports : Manuscripts of reports or papers intended for publication

in a journal or for presentation in a conference, after distributed by the author to a select group of specialists known to him. Sometimes the PrePrint is given some degree of formal or official status for example, the “p” papers of the Rand Corporation.

(ii) Corporate “Proposal-type’ Reports : These are of a proprietary nature, and their circulation is usually limited to the staff of the agency commissioning the report.

(iii) Institutional Reports : These are periodic reports of activities and progress, usually issued annually, by government agencies, foundations, corporations, societies. Much of this material is directed at general public audiences, customers, shareholders and society members.

(iv) Contract Progress Reports : These are primarily directed at the sponsors of contractual R & D effort who require the periodic reporting of progress on the contractual project.

(v) Contract Final Reports : These are perhaps the most valuable type of technical reports.

(vi) “Separate” Topical Reports : Encouraged either by research sponsors or by a desire to disseminate their findings to a wider audience, contractual investigators often publish separate, topical reports in addition to the progress reports and final reports submitted by the sponsors. Various called ‘research memoranda’, ‘technical memoranda’ or ‘technical notes’ these come closest to journal articles in style and they are after submitted to journals for publication, usually in an abbreviated form, after expert review.

(vii) “Books” in Report form : State-of-the-art reports, reviews and surveys prepared by information analysis centres or agency contractors are after issued as technical reports.

(viii) Committee Reports : There are issued by the investigative and advisory committees of governments, national and international societies, and other agencies. They incorporate details of investigations, hearings, findings, conclusions, and recommendations.

11.6 SECURITY CLASSIFICATION

Since some technical reports contain sensitive nature of contents, their distribution is restricted to varying degrees by a system of security classification. Reports of research in aerospace, nuclear energy and the like containing sensitive information of importance to national security are usually classified, at least for an initial period of time. Typical security designations are “Top Secret”, “Secret”, “Confidential”, and “Restricted Circulation” Numerous other designators for example, “Addressee only”,

“For U. S. Government use only” are used in government documentation to indicate various levels of restricted access to documents.

The Freedom of Information Act (PL 89-487), which became a law on July 4, 1967, was promulgated to maximize the disclosure of information to the general public, without prejudice to national security.

11.7 TECHNICAL REPORT NUMBERS

One of the principal features of a technical report is their issue in series, characterised by number or letter code. Originally adopted for security reasons, was intended to be a helpful device for facilitating for physical and bibliographical control of reports. But the uncontrolled proliferation of reports and report numbering schemes has been a vexing problem to technical librarians and users of report literature. Indeed they may be deliberately contrived not to reveal but to conceal their origin and availability. In his book on report literature C P Auger cited one announced in scientific and technical aerospace reports with no fewer than thirty characters : N72-28275 [NLL-M-20984-(5828, 4F): NEN 3005]. Over 20,000 such codes are listed in L.E. Godfrey and H F Redman *Dictionary of report series codes* (New York, Special Libraries Association, Second edition 1973); they describe the situation as ‘Chaotic’, with an ‘astounding number of codes blossoming each year’. Complementary to some extent is D Simontom *Directory of engineering scientific and management document sources* (Newport. Beach, cal, Global Engineering, 1974)

Report numbers are made up of code designators that indicate several of the following data elements :

- Sponsoring agency
- issuing agency (where the report was written)
- Location of specific branch or department of the issuing agency where research was done
- Distributing agency or clearinghouse
- Subject matter
- Type or form of report
- Date of preparation or release
- Individualizing identifier
- Security classification code.

It is obvious that not all report numbers contain designators for each of these data elements. Most report numbers consist of three or four of the elements in various permutations.

11.8 CLEARINGHOUSES

A clearinghouse is a control agency for collection, classification, and distribution, specially of information. The definition would encompass all information centres and most special and conventional libraries.

For our purpose it is a depository of documents with the additional mission of serving as a central agency for collection, classification, and distribution of information. It also includes such functions as collecting and maintaining records of research and development in the planning stage, in progress and completion. Sometimes, substantive questions about items in these records are referred to the source, and thus a clearinghouse may act as a referral centre also. The National Technical Information Service combines the functions of a document centre with those of a clearinghouse, and referral centre.

The Defence Documentation Centre (DDC) is a depository of reports and other documents generated by the Defence Department, both classified and unclassified; it is also a referral centre for indentifying experts in various fields.

The function of a clearinghouse is primarily to collect, and disseminate scientific and technical information with the purpose of making the results of technological research and development more readily available to industry and business, and to the general public. Clearinghouses came into existence because it began to be generally felt that the information explosion required effective information dissemination and analysis mechanism, and there was need to develop some effective central mechanism to achieve the above ends. Let us discuss some important clearinghouses.

11.8.1 National Technical Information Service (NTIS)

NTIS whose history can be traced back to 1945 is one of the world's largest specialized information service organizations. It is responsible for the bibliographic control and distribution of America and foreign technical report literature and other speciality information products. The principal announcement service for technical reports is the *Government Reports Announcement and Index* (GRAI), a biweekly abstracting and indexing service that has evolved through a services of changes from the *Bibliography of Scientific and Industrial Reports* started by the erstwhile office of Technical Services in 1946. The report summaries are arranged under the subject categories developed by the Committee on Scientific and Technical Information (COSATI) of the Federal Council for Science and Technology.

11.8.2 Defense Documentation Centre (DDC)

The Armed Services Technical Information Agency (ASTIA) was set up in 1951 under

the operational control of the United States Air Force by merging two earlier agencies which were responsible for handling classified technical reports (a) the Navy Research Section of the Library of Congress, established in 1946 and (b) the Central Air Documents Offices at Dayton, Ohio, Started in 1948 and operated by the United States Air Force. ASTIA gave accession numbers starting with letter AD (ASTIA Document) to reports received from the Department of Defence (DOD) research facilities and their contractors. In 1963 ASTIA was renamed the Defence Documentation Centre (DDC).

DDC receives technical reports from various research laboratories of the DOD and their contractors. It continues to assign AD numbers initiated by ASTIA, but the abbreviation now stands for Accession Document.

11.8.3 National Aeronautics and Space Administration (NASA)

NASA was created by the National Aerospace and Space Act of 1958. The act required that the aerospace activities of the US should contribute to the expansion of human knowledge of phenomena in atmosphere and space. Six program offices, 10 field centres and the National Space Technology Laboratories constitute the principal components of NASA for planning, directing and managing its activities. NASA publishes a semimonthly abstracting journal entitled *Scientific and Technical Aerospace Reports* (STAR). The abstracts are grouped under 34 subject categories and arranged in an unbroken series of accession numbers starting with the letter N and the last two digits of year of accession (e.g. N 72-10856).

A complementary abstracting service entitled *International Aerospace Abstracts* (IAA) covering journal articles, books and conference papers is published semi-monthly by the American Institute of Aeronautics and Astronautics under NASA contract.

NASA operates a SDI service '*Selective Current Aerospace Announcements*' (SCAN), especially designed for scientists and engineers employed by NASA and its contractors.

11.9 SUMMARY

This unit describes the history of report literature and its characteristics features. It discusses the quality, states and types of technical reports. Technical reports involve security classification and technical report numbers are assigned to each report for control. It highlights the functions of clearinghouses and discusses the three most clearinghouses in the United States.

11.10 EXERCISE

1. What is understood by 'Report literature'? What led to the development of report literature?
2. Discuss the characteristics and states of report literature.
3. Write a note on the uncertain states of technical report.
4. Describe the different types of technical reports.
5. What is clearinghouse? Give a brief description of three clearinghouses for report literature.

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UNIT 12 □ TRADE CATALOGUES

Structure

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Commercially available trade catalogues
- 12.3 Characteristic of Trade Catalogues
- 12.4 Types of Trade Catalogues
- 12.5 Trade Catalogue Services
- 12.6 Acquisition and Control of Trade Catalogues
- 12.7 Summary
- 12.8 Exercise
- 12.9 References and Further Reading

12.0 OBJECTIVES

By reading this unit you will understand the characteristic features of trade catalogues along with their functions. Trade catalogues with the dual function of information and persuasion appear in a variety of sizes, formats and colours. Because of their peculiar nature systematic acquisition and organisation in libraries and information centres are tedious.

12.1 INTRODUCTION

The term 'Trade Catalogues' denotes a variety of literature produced by manufacturers and distributors of every kind of material, product, or service from pets, books, drugs, and chemicals to extremely complicated equipment and components used in research and industry. The basic purpose of trade catalogues is : (i) to provide information on the various attributes of a product process, material or service, (ii) to stimulate sales of the product, process, material or service. The earliest trade catalogues were book lists distributed by booksellers. A catalogue of books issued in 1564 by Gorge Wilier, an Augsburg bookseller, is believed to be the first such catalogue.

This was a subject list of 256 books. Andrew Munsell brought out the first trade catalogue of books in England in 1596. Benjamin Franklin issued a catalogue of books in 1744. According to Romaine, the first American drug catalogue was issued in 1760 by John Tweedy of Newport. The second drug catalogue of John Day and Company was printed in 1771.

During the 17 80s metal manufacturers of Birmingham and Sheffield were sending out elaborately illustrated catalogues to their agents in France, Italy, America and also perhaps to India and Russia. In many of these early British trade catalogues, the manufacturers names were omitted so that customers were forced to order goods through agents. In contrast to this, American trade catalogues always contain the manufacturer's name to facilitate direct ordering of goods to the manufacturer.

An excellent annotated guide to early American trade catalogues is Lawrence B. Romaine's *A Guide to American Trade Catalogs, 1744-1900* (R.R. Bowker, New York, 1960). Columbia University, the Centre for Research Libraries in Chicago, and Smithsonian Institution Library have large collections of trade catalogues.

12.2 COMMERCIALY AVAILABLE TRADE CATALOGUES

The conception of assembling in standard format the catalogues of several manufacturers goes back at least 75 years, as can be seen in the publication of organizations like standard Catalogue Co. Ltd. of London; e.g. the four volumes of the *Architects Standard catalogues* for 1981 comprise over three thousand pages on building materials, components, and services, one third of which are the manufacturers' own leaflets and brochures. In the United States, the Reinhold Publishing Corporation have for many years been providing a similar consolidated bound set of manufacturers' literature with the title *Chemical Engineering catalogo*. Best known of all is probably the massive series of volumes from Me Graw-Hill, *Sweet's Catalogue file*, covering mainly engineering and building.

In 1963 the Microcard Corporation Started a service to supply in the form of 6 in by 4 in microfiches some 14,000 catalogues of the companies listed in *Thomas' register of American manufacturers*. There are on the market a number of product information services using microforms, and some former hard copy services have added microfiche or microfilm also and some have switched almost entirely to microforms, e.g. Technical Indexes Ltd.

12.3 CHARACTERISTIC OF TRADE CATALOGUES

A cursory glance through Thomas Register of American Manufactures is enough to reveal the vast variety of products described in trade catalogues. Apart from this tremendous variety in the products themselves, there is considerable diversity in the format, size, and source of catalogues, as well as in the nature and amount of information provided therein. Trade catalogues range from a small advertisement in

a periodical or a piece of paper briefly announcing a simple product, to elegantly bound multivolume compendia or frequently up-dated loose-leaf services describing in detail thousands of products of a large number of manufactures, often with photographs, drawings and even bibliographic references to literature. Some product advertisements are so indistinguishable from journal articles that editors of some journals (e.g. the *Reader's Digest*) label them as "Advertisement" to distinguish them from feature articles. Some general characteristics of trade catalogues are trade catalogues contain application-oriented descriptive information rather than discourses on theoretical principles. However, trade literature describing medicines and complex scientific instruments frequently includes a brief description of relevant background research, supported by charts, diagrams, equations, and literature references.

Trade catalogues are primary sources in which information about products or processes appears prior to its publication in journals or other forms of literature. In fact, much of the information about specific commercial products depicted in trade catalogues is not likely to be published at all in other forms of literature.

Much of the information contained in trade catalogues loses currency very quickly as new products and processes are constantly being developed and improvements are made to existing ones.

In general the following types of data are included in product catalogues :

1. Historical overview of the manufacturing company.
2. Research background leading to the development of the product.
3. Product description (dimensions, capacities, materials of construction, shape, size, colour, or other physical or engineering properties)
4. Applications.
5. Operating characteristics.
6. Installation instruction.
7. Operation and maintenance procedures, repairs.
8. Mode of acquisition, terms of licensing or lease, shipping and insurance data, delivery period, availability of spares and auxiliaries and the like.
9. Illustrations, including photographs, layout plans, circuit diagrams, etc.
10. List of customers, testimonials from satisfied customers.
11. Names, addresses, and telephone numbers, agents, local distributors, and service centres.

Trade catalogues are often undated, supplied free. Price is usually not included and has to be requested by interested customers. Some technical journals for example, *Chemical Engineering* with plenty product news and advertisements are supplied free to qualified professional engineers. Because of their dual function of information and persuasion trade catalogues come in a variety of sizes, formats and colours. The

American National Standard Institute and the British Standards Institution have formulated several specifying the format and contents of trade catalogues.

12.4 TYPES OF TRADE CATALOGUES

The design of trade catalogues seems to be governed by the psychology and economics of advertising and selling rather than by consideration of their use and preservation. Despite bewildering variety in the physical characteristics of trade catalogues, a few basic types can be identified :

- (a) Advertisements and announcements in technical journals and trade magazines.
- (b) Special issues and supplements of journals.
- (c) Manufacturers' Catalogues and data sheets.
- (d) Directories of industries, products, and companies.
- (e) Product descriptions supplied at trade expositions, convention exhibits, etc.
- (f) Trade catalogue services.

12.4.1 Advertisements and Announcements in Journals

Most technical journals and trade magazines carry product advertisements as well as product news and notes compiled by staff writers. Almost always each issue has an advertisers' index. Some journals (e.g. *Production Equipmen Digest*, *Chemical Processing*, and *Product Engineering*) carry entirely new product announcements and advertisements. Another feature that is becoming increasingly common in Journals containing product announcements and advertisements is the inclusion of one or more "Reader Service Cards" (RSC) in each issue. The RSC is a simple mechanism for the reader of the journal to obtain more detailed information about a product or service advertisement or announced in the journal from the manufacturer or distributor.

Some journal publishers periodically send bunch of postage-paid product inquiry cards to journal subscribers. Each card contains a description of one product and address of the manufacturer or supplier. The user simply has to write his own address on the card and mail it.

12.4.2 Special Issues and Supplements of Journals

Many technical journals publish an annual special issue or a supplement, usually called "Buyers' Guide" or "Directory Issue". Annual buyers' guides issued by *Chemical Engineering*, *Electronics*, *Hydrocarbon Processing*, *Chemical Week*, *Machinery*, and *Nuclear News* are typical examples. These special issues are independent publications

containing product and company information and advertisements. *The Nuclear News Buyers' Guide* contains : (a) an annual survey of important developments in the nuclear industry; (b) a world list nuclear power plants; (c) a directory of nuclear products, materials, and services; (d) a directory of suppliers, including companies located outside the United States. Each year in November, the journal *Science* (published by the American Association for the Advancement of Science) issues a special directory of scientific instruments.

The American Chemical Society's annual *Lab Guide* is a directory of laboratory supply houses, manufacturing companies, instruments, equipment, chemicals, supplies, analytical and research services, trade names and new books in analytical chemistry.

In most libraries these special issues and supplements are treated as reference works of the directory type and are shelved along with other directories.

12.4.3 Manufacturers' Catalogues and Data Sheets

These range from a single sheet of paper with a technical description of one product to a bound volume containing detailed descriptions and technical data on numerous products of a company, or loose-leaf service kept up-to-date by periodic supplements. Some catalogues for example, *Alcoa Aluminium Handbook*, published by the Aluminium Company of America, Pittsburgh, have attained the status of a reference work.

12.4.4 Directories

These are independent publications containing data on a number of companies and their products in one branch of science, engineering or technology. *World Aviation Directory* (published by Ziff Davis Publishing Company, New York) is an international directory of air carriers, manufacturers of aircraft and related equipment, government agencies and other organizations concerned with aviation in some 160 countries.

The Directory of Chemical Producers, USA (published by Stanford Research Institute) is kept up-to-date by quarterly supplements. *Chemical Engineering Catalogue* (published by Reinhold Publishing Company, New York, 1916-) is a book of reference for engineers, buyers and others seeking information on chemicals, equipment also publishes an annual *Chemical Materials Catalogue*.

12.4.5 Trade Fair Catalogues

Manufacturers exhibit their products and distribute catalogues at conventions and conferences organized by professional societies. Trade catalogues are also issued at international trade fairs and expositions such as the famous Leizig and Frankfurt Fairs.

12.5 TRADE CATALOGUE SERVICES

A number of commercial catalogue services have started providing copies of manufacturers' catalogues on a continuing basis; sometimes this subscription service also includes an inquiry service. The Thomas Publishing Company, New York—publishers of the well-known *Thomas Register of American Manufacturers* (annual)—supplies microfilm copies of catalogues of most of the manufacturers listed in the annual *Register*.

Another trade catalogue service on microfilm is the Visual Search Microfilm File (VSMF) offered by Information Handling Services, Inc., Denver, Colorado.

R. A. Wall has described an SDI service for trade catalogues offered by Indata Limited, in England. Interest profiles of subscribers are matched every week with new additions to a computerized database of trade catalogues and subscribers receive weekly lists of new items as well as data cards containing specifications of the products. Collection and subject indexing of the catalogues are done in collaboration with the British Scientific Instruments Research Association.

12.6 ACQUISITION AND CONTROL OF TRADE CATALOGUES

Trade catalogues are seen as ephemeral materials that become obsolete very quickly; they are also thought of as expendable material because of the ease with which they are available to the users free of charge. Most engineers who regularly use trade catalogues do not find it difficult to acquire and maintain their own personal collection of trade catalogues. Conventional abstracting and indexing services do not cover trade catalogues. The acquisition of trade catalogues is relatively simple. Many manufacturers routinely mail their catalogues and promotional material to technical librarians and information officers in companies. Reader service cards can be used to acquire additional material free of charge.

The organization of trade catalogues is also simple. The catalogues themselves can be filed in vertical files or pamphlet boxes, alphabetically by manufacturer's name. A card index can be service maintained to provide access by product name. A simple coordinate index of Uniterm type is adequate for this purpose. Trade catalogues usually do not contain publication dates, and it is difficult to determine their currency. Without constant attention and weeding, a collection of current trade catalogues will soon become a retrospective collection of archival material, more useful for historical purposes than for obtaining current and accurate information on companies and their

products. Subscription to a commercial catalogue service will ensure the availability of up-to-date information on companies, materials, products and process.

One specific feature of trade catalogues is the extensive use of trade names to identify specific products. Many directories of companies and products include trade name index. Where such is not available, the following two publications may be noted for obtaining explanations of product names and the names of their manufacturers :

1. Crowley, Ellen T *Ed: Trade names dictionary*. Gale Research Company, Detroit, 1976.

This is a “guide to trade names, brand names, product names, coined names, model names and design names, with addresses of their manufacturers, importers, marketers or distributors”—described by its publishers.

2. Gardner, Willian : *Chemical Synonyms and tiade names*. 7th ed. rev. and enlarged by Edward. I. Cooke, Ohio, Chemical rubber Co. Press. 1971. This handbook provides definitions of trade names and where available, it gives the names of manufacturers.

12.7 SUMMARY

We have discussed about the manufacturers and distributors of various kinds of materials. We have noted an excellent trade cataloge by Romaine. Commercially available trade catalogues are highlighted. Trade catalogues are primary sources in which information about products appears prior to its publication in a formal channel. We have described the various types of data that are included in the trade catalogues. There are six types of trade catalogues and these types are discussed in detail. Acquisition, arrangement and control of trade catalogues are very simple and librarians can achieve all these very easily. Finally we have noted two publications for obtaining the names of the manufacturers and their products.

12.8 EXERCISE

1. What is a trade catalogue ? What purpose does it serve ?
2. Discuss the characteric features of trade catalogues highlighting their different types.
3. Describe some trade catalogue services. Give examples.
4. How would you organise trade catalogues in a library ?
5. Write a note on product advertisements, product news and notes.
6. What are the functions of trade catalogues ?

12.9 REFERENCES AND FURTHER READING

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UNIT 13 □ DATABASES : TYPES AND USES

Structure

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Database : Definition and Characteristics
- 13.3 Types of Data
 - 13.3.1 Word-Oriented Databases
 - 13.3.2 Bibliographic Databases
 - 13.3.3 Full text Databases
 - 13.3.4 Number Oriented Databases
 - 13.3.5 Image Databases
 - 13.3.6 Sound Databases
- 13.4 Public Databases
- 13.5 Production and Distribution
- 13.6 Search Services
- 13.7 Accessing Databases
- 13.8 Database use in India
- 13.9 Summary
- 13.10 Exercise
- 13.11 References and Further Reading

13.0 OBJECTIVES

By availing of in-house resources and resources available elsewhere we have seen in earlier units various information services and products can be offered to users. Here we shall discuss the Database Support services. In this unit we shall explain what is a database, its various type, importance of each type, search services and the use of database in India.

13.1 INTRODUCTION

The term database needs to be explored fully if one is to gain an understanding of and appreciation for it. The initial focus is on bibliographic information, but many other types of information and databases are created and used. A database starts when a publisher creates a format for information. This information might be a bibliographic citation, a statistical table, or a bibliographical fact, to name a few. The publisher

determines which elements of information are important, how these elements are to be displayed or printed and which elements can be manipulated by the computer. Machine-readable files of this information are created in the form of computer tapes or discs. Once the data is in machine-readable form, the file can be put to multiple use. One of the principal uses is to print a publication, such as an index or abstract, which is sold or distributed to the organization's members or subscribers. Another use is as an internal information database for the organization's own use; the telephone directory is an example of this process. A telephone company compiles data from its customers and puts the data into machine-readable form. This electronic version is used to create the published directories that are sent to the telephone company's customers and to subscribing libraries. A second use is for the telephone company's information operators as a machine-readable database. A third use is the learning or sale of these files to external information service companies.

Information service companies are sometimes called vendors, to distinguish them from the organizations that create the databases, which are called producers. A few organizations such as the National Library of Medicine, serve both functions.

Vendors serve as a link between the databases and those who use them. Using their own software and its associated search language, these companies make further decisions about which data elements are important, how to format each data element, which elements will be retrievable or searchable, and which elements will merely be displayed at the terminal or printable. These decisions are extremely important to database users, since they determine the ways in which these databases can be searched.

13.2 DATABASE : DEFINITION AND CHARACTERISTICS

The noun database has one meaning : an organized body of related information.

(1) A database is an application used to store and manipulate data. The application may be a simple one that provides for flat files only and that cannot be programmed, or it may have the capability of producing databases that are programmable and relational. (2) A collection of specified related information.

Database field : The part of a database record that contains a specific item of information; the basic unit of a database record.

Database file : A file made up of records of information in distinct, related fields.

Database set : A group of linked database files containing related data. For example, a set may contain one database with customer names and addresses, another database with price and quality information about items held in inventory for sale, and the third database with a record of order entered. Creating an invoice or statement may involve combining the customer information (complete with mailing address and

terms) and the order information which is supplemented by pricing from the inventory database.

Each unit of information stored in a database consists of discrete data elements, each consisting of a specific characteristic of the entity being described. For example, a bibliographic database will contain information relating to books, periodical articles, reports etc.

Author
Title
Call Number
Accession Number
Edition
Imprint
Collation
Series
Keywords

Each of the above represents a field. Thus a total of 9 fields, corresponding to each book will be there. This constitutes one record. The database will be as large as many are records or number of books.

13.3 TYPES OF DATA

Databases may be set up to organize form different categories of information : words, numbers, images (pictures or graphs), and sound. In addition, there are multimedia databases combining information on more than one medium. Each category has a distinct machine representation and requires a distinct kind of software (computer programs). Word-oriented databases have as their principal data words in the form of phrases, sentences, paragraphs, flat-text or structured factual data such as names and addresses. The principal data in numeric databases, often called databanks, consist of numbers and symbols representing numbers. They take the form of time series, tables of numbers, and graphs based on such tables. The term time series refers to events or phenomena observed over a span of time. Image databases, many of which are used for scientific or engineering purposes, may contain representations of virtually any multidimensional structure, including chemical structures, unclear predates, scientific photography, architectural plans, and geographic maps. Audio databases contain sounds—recorded or computer—generated sounds (discrete sounds, music or aural words).

13.3.1 Word-Oriented Databases

Word-orientated databases consist primarily of strings of alphabetic or alphanumeric

symbols known as character strings. A user's query typically is answered by a search of the database for strings of characters that match the string of characters in names, titles or other words or phrases listed in the query.

13.3.2 Bibliographic Databases

The earliest electronic databases introduced in the 1960s, were in the fields of science, engineering, technology and medicine. These databases were word-oriented, containing bibliographic references to published literature and only a few dozen were available. The first comprehensive directory of publicly available databases was published in 1976, with 301 databases listed. By the early 1990s over 7,000 electronic databases were publicly available.

Bibliographic databases range in size from small specially files such as Genetics Toxicity (GENTOX), covering 2,600 chemicals and produced by the U.S. Environmental Protection Agency; to CAD/CAM, a database containing 10,000 records and published by Bowker A & I Publications; to COM-PENDEX, by Engineering Information, Inc., which has approximately 2 million citations in Engineering; to CA SEARCH, produced by Chemical Abstracts Services, which contains more than 10 million citations. These databases are handled by libraries and information centres in various ways such as CAS, SDI, compilation of bibliographies, etc.

13.3.3 Full-Text Databases

Full-text databases provide immediate access to the texts of documents such as legal cases and statutes, newspapers, journal articles, encyclopedias and even textbooks. The pioneer full-text legal database, LEXIS, was established in 1973 by Mead Data Central and has long been regarded as one of the world's largest databases, most other full-text databases were established after 1980.

Full-text news databases include those of the United Press International and the Associated Press, among wire services; *the New York Times* and *Wall Street Journal*, among newspapers, and *US News* and *World Report* and *Newsreels*, among news magazines. Full-text journal databases are exemplified by the *Harvard Business Review* and many of the American Chemical Society journals; by the electronic journal *Current Clinical Trials* of the American Association for the advancement of Science, and by electronic encyclopedias such as *Encyclopedia Americana* and *Academic American Encyclopedia*. Textbook databases include *Gray's Anatomy Textbook of Surgery* and *Principles and Practices of Emergency Medicine*.

13.3.4 Number-Oriented Databases

Numeric databases Contain transactional data, statistics, time series, properties and other numeric data. The large databases called transactional databases record events

(transaction) in real time that is, as they occur and new data continually replace prior data. Examples of number-oriented databases include the *FOREIGN EXCHANGE DATABASE* of Interactive Data Corporation, which covers monthly exchange rates for 22 currencies, and the DRICOM (DRI Commodity Database) of DRI/McGraw-Hill, a time-series database of commodity futures.

13.3.5 Image Databases

Image databases are highly specialized and few in number. Their data consist chiefly of specifications for shapes, distances, geometrical relationships, colours, and the like. Image data include animated images and the use of images to represent numeric data in visual form (visualization).

13.3.6 Sound Databases

Audio databases of recorded or computer-generated sounds contain more than just sounds. An example of an audio database would be one that tracked the development of a particular type of music. The database might contain recorded music, images of music scores, narration and perhaps textual information describing the music.

13.4 PUBLIC DATABASES

The range of public databases has grown so enormously that it is now possible to find data on almost any subject. Databases have been created for nearly every field, including most major branches of science, business, management, law, politics, social sciences, arts, humanities, and religion, as well as news, consumer interest areas, stock quotations, and various subfields and problem areas such as transportation, shipping, rebates, oil spills, and child abuse. One-third of all public databases can be classified as business databases, these are followed by science, technology and engineering databases and then by health and life-science databases. Databases in the arts and humanities are less numerous.

When a database is developed for public use, it is usually made accessible to users through a telephone ('on-line') or on a distributable medium. Distribution media include CD-ROMS (Compact disks with read-only memory) and floppy disks for use on personal computers and workstations and magnetic tape for local loading on a mainframe. An online service may be provided by the producer of the database and offer online searching of several to many databases. Such online search services, also known as database vendors in the united states or 'hosts' in Europe, have computers and software that allow outside users to search the databases for numerical data, facts or textual information.

Users of public databases include most groups of people where occupations require that they have quick access to information such as scientists, lawyers, doctors, financial analysts, librarians, executives, and researchers.

13.5 PRODUCTION AND DISTRIBUTION

Databases are produced by a wide variety of commercial, non-profit and government organizations. The way in which database is created depends on its types. To prepare a bibliographic or reference, databases, for example, the producers cull the primary literature—journals, and conference proceedings for articles relevant to the subject area of the database. For each article selected, they prepare a bibliographic record that lists the author or authors, the title of the article, and any further identification needed to find the publication cited. The record is then entered into the database. In some bibliographic databases the records include index terms for the articles and book referenced; abstracts also may be included.

Most large databases are issued periodically (monthly, weekly or even daily) on magnetic tape. Some databases are issued on floppy disks or on CD-ROM for use on personal computers. Large databases are sold chiefly to government agencies and corporations for in-house use and to on-line search services, which retail access to the database to their subscribers.

13.6 SEARCH SERVICES

The principal mode of access to electronic databases is through on-line search services, also known as vendors. However, databases available in CD-ROM format may be used rather than on-line database, particularly in academic libraries. Database vendors provide on-line databases together with software for search and retrieval, data manipulation, and modelling. They are often called information utilities, because an on-line search service serves a far-flung network of users, providing access to information from databases, residing in a distant computer facility. Several hundred such services in the United States and Europe provided access to more than 3000 databases and databanks by the early 1990s.

Among the leading on-line services for searching numeric databases are DRI/ Me GrawN-Hill, General Electric Information Services Company (GEISCO), the WEFA Group—all three of which provide business databases and the Chemical Information System (CIS), which provide mostly scientific databases.

Among the Vendors of word-oriented databases are Mead Data Central (MDC);

DIA LOG Information Services Inc; ORBIT Search Service; the National Library of Medicine (NLM); WESTLAW; BRS Information Technologies; Compu Serve; and others.

13.7 ACCESSING DATABASES

Online use of a database requires an account with a search service that offers access to the database, a password to log onto the service, knowledge of how to use the service, and information about specific features of the database. The equipment required includes a computer terminal or personal computer (PC), a modem, and a telephone. The modem, a device that allows the PC to communicate over telephone lines, may be built into the terminal or PC, or it may be a separate, connected unit.

Procedures for using search services and the databases to which they provide access very widely. The degree of complexity in using a database depends on the type of information and on the nature of the group of users that the database is designed to serve. For example, searching a database for thermo dynamic properties of a certain class of substances knowledge than does searching a database for the names of hospitals in Kolkata. Similarly, an on-line system intended for professional researchers who are expected to use the system everyday can be considerably more complex—and therefore can contain more useful features than one aimed at occasional users.

13.8 DATABASE USE IN INDIA

Databases are some of the most primary components of an information retrieval system. In some subjects areas in-depth treatment is lacking in global databases, while in others local information has more importance than international information. Keeping these problems in view a major thrust has been given under the NISS AT (National information system for science and Technology) programme to the development of indigenous databases by the sectorial information centres set up on machine tools at the Central Machine Tools Institute, Bangalore; latter at the Central Leather Research Institute, Madras; food at the Central Technology Research Institute, Mysore; drugs and pharmaceuticals at the Central Drug Research Institute, Lucknow, textiles at the Ahmedabad Textiles Industry Research Association, Ahmedabad; Chemicals at the National Chemical laboratory, Pure; ceramics at the Central Glass and Ceramics Research Institute, Kolkata, and some others. At present in India more than 150 indigenous databases covering most of the disciplines are available to users.

The Physical Research Laboratory (PRL), Ahmedabad has developed an online bibliographic information storage and retrieval system called READ Fast which enables users to retrieve details of information using appropriate keywords, author names, classification numbers, accession numbers, date of publication, etc.

The Patent Information System (PIS) has been developed by NIC for on-line retrieval of patent information. The data and Information Centre at the National Institute of Oceanography, Goa has been developing a bibliographic database called OCEANLINE. The Defence Scientific Information and Documentation Centre (DESIDOC), New Delhi has already developed the software for creating a database on Military Science and allied subjects.

National Institute of Science Communication and Information Resources (NISCAIR) formed on September 30, 2002 has developed expertise in the design and development of databases. Some databases include Indian Science Abstracts. Database, National Union Catalogue of Scientific Serials in India Database, Indian Patents database and Aromatic Plants Abstracts Database. All these databases are available on-line.

One of the main objectives of INFLIBNET is to create database of projects institutions and specialists for providing online information services. INFLIBNET will provide database services—Bibliographic database services and nonbibliographic database services.

Both public and private sector organizations are now showing keen interest in the activities relating to database creation, maintenance and use in India. With the development of INFLIBNET and other regional networks it is that the database use will be strengthened in near future.

13.9 SUMMARY

In this unit we have defined database and its characteristic features. Different types of databases are identified and explained. At present databases are created for nearly every field. These databases have been developed for public use. It is made accessible through online services. Database are produced depending on its type. Some databases are created on magnetic tape, floppy disks or on CD-ROM for use on personal computers. We have defined vendors. They provide online databases since 1990 several hundred such services are being initiated in the United States and Europe. Accessing databases is an area that depends on the type of information and on the nature of group of users. Finally we have discussed the database use in India. NISSAT has created several databases and with the development of INFLIBNET India will have several users of databases in near future.

13.10 EXERCISE

1. Define 'database' and explain its characteristic features.
2. Discuss the different types of data and databases.
3. Describe the use of databases in India.
4. How would you develop 'database' for public use?
5. What is the mode of access to electronic databases?
6. Show your acquaintance with database vendors.

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UNIT 14 □ DATABASE INTERMEDIARIES

Structure

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Database Intermediary
 - 14.2.1 Definition
 - 14.2.2 Intermediaries are everywhere
 - 14.2.3 Anatomy of an intermediary
 - 14.2.4 End points and middle points
 - 14.2.5 Message streams
 - 14.2.6 Transaction streams
- 14.3 Search intermediaries
- 14.4 Role of Intermediaries
 - 14.4.1 As Searchers
 - 14.4.2 As Editors
- 14.5 Future of Database intermediaries
- 14.6 Summary
- 14.7 Exercise
- 14.8 References and Further Reading

14.0 OBJECTIVES

Information flows all around us all the time. Intermediaries can manipulate information streams. This unit introduces you database intermediaries who can help users to search databases. The most successful searches are those in which intermediary knows sufficient about the background of the user's query to ask pertinent questions, which would draw full answers about his requirements from the user. Here you will understand the role of intermediaries and know the their functions in searching databases.

14.1 INTRODUCTION

The major components of an information network are the user, the database producers, search service vendors, telecommunication networks and the intermediary who will carry out the search to the entire satisfaction of end user. As information becomes ever more pervasive and important, users increase on a variety of information streams

to meet their information needs. Rather stream replacing another in this economy of information, each stream has its own niche.

An information stream conveys data from an information provider to an information consumer. For instance, on the WWW (World Wide Web), servers generally provide information. Browsers generally consume information. Often the stream simply conveys the information after additional processing, as the telephone does, but sometimes information can be usefully injected or modified along the stream. For instance, some telephone companies provide real-time language translation, or some webs communicate from one network to another through a firewall. Nevertheless, the student can be forgiven for feeling confused by the proliferation of providers of information. And it does not make for clear understanding to find particular kinds of providers playing a variety of roles at the same time : service suppliers may also be data base producers, producers may also be suppliers etc. Libraries, with which student will be particularly concerned, in addition to provide in-house search services for their own readers may also be database producers (as the National Library of Medicine with MEDLARS) or agents for database producers (as the University of Loughborough with COMPENDESX) or online search brokers (as the Science Reference Library).

14.2 DATABASE INTERMEDIARY

Database contains information which intermediary collects on behalf of the users. It is the role of the intermediary to search database and provides answers to the user according to his requirement. The intermediary is the vital link between the database and the user. Intermediaries are information specialist and have the proper skills in searching databases. Their role is to identify the requirement of the user and meet his requirement by searching the database. The user may lack the capability to formulate his queries in the proper form and the intermediary help him in this regard. The intermediary selects the proper database to answer the queries of the user.

14.2.1 Definition

We define intermediaries as computational entities that operate on information flows along a stream. Because of the tremendous numbers of information streams that are now available, there is new opportunity to take advantage of intermediary computations. We believe intermediaries can add several different ways. Namely, an intermediary can (a) produce new information injecting it into the stream, (b) enhance the information that is flowing along and (c) connect different streams, possibly translating communication process. It may be noted that intermediaries do not create new

information devices (such as telephones or web browsers) but increase the value of existing devices by the streams up which the devices operate. Likewise, intermediaries do not create information streams but enhance existing streams.

In any way intermediaries need knowledge and experience of hardware, software, communication technology and the database. He should have skills in interviewing and communicating with end users. He needs efficiency to get access to database information. In a word, the database intermediary is an information specialist skilled in database searching and satisfying the end users.

Intermediaries can do more than simple network translation and caching. A web intermediary can compress large images before sending them across network link such as a telephone line.

14.2.2 Intermediaries are everywhere

The concept of an intermediary is not a new one. In fact, intermediaries are commonplace that it is sometimes difficult to notice them. For instance intermediaries abound. Travel agents translate customers requests into data airline reservation computers. In this way a travel agent acts as a protocol intermediary, effectively connecting a customer on the telephone to a main computer running the airline reservation system.

Scientific journal editors comprise another intermediary based system. To receive submissions from authors, send manuscripts to referees or reviewers, forward back to authors, receive corrections from authors, and deliver final copy to these activities are designed to add value to the information stream that requires authors writing down their findings. The journal editors enhances the value of information stream by providing competent reviewing, ensuring anonymity, organizing and indexing articles, and editing completed manuscripts.

Intermediaries are common in many other kinds of information streams as e-mail depends on intermediaries to hold messages after they have been sent and they have been received.

The collection web directories in Yahoo! Is another example of intermediary. These directories do not themselves contain topical information to provide an intermediary service for connecting web users to information.

Analysing such commonplace and complex systems of information flow in information origin, destination, and intermediaries illuminate design principle of computational intermediating systems.

14.2.3 Anatomy of an Intermediary

Though intermediaries on information streams are ubiquitous in both bumble

computational systems, a thorough and systematic study of their properties has been undertaken. In this section, we begin such a study by considering how many parts are needed to make up an intermediary process.

14.2.4 End points and middle points

Information streams consist of origin and end points, the stream itself, and various intermediaries that are located at and that operate upon the stream. A serious complication in analysing such that they may be decomposed into these constituent elements in many ways at many different levels. Consider the case of a person browsing a database in the Web. The basic elements include the user, a Web Internet, the Web server, and a database. In one decomposition of the system the database is the origin endpoint, the Web browser is the destination midpoint. Interment and webserver are intermediaries. However, Web servers are often as the information origin, even if they actually use a database. In that case, the Internet is the only intermediary.

Partitioning an information stream into origin endpoint, destination midpoint, intermediaries involves several division points : everything beyond origin point is the origin; everything beyond chosen destination point is destination; and various points in between are chosen as breaks between intermediaries. Many decompositions are possible, but the most suitable one matches the needs. Now let us consider the functions of the three basic entities: origin midpoint, destination endpoint and intermediary. The origin endpoint has connection point and transmits information to it. It may also receive requests for information may transmit proactively. The destination endpoint also has one connection point receives information from it. It may also transmit requests for information required to do so. An intermediary is most easily conceptualized by considering everything on one side of it to be an origin endpoint and everything on the other side to be a destination endpoint. The intermediary has two connection points : one to be an origin and the other to a destination.

14.2.5 Message Streams

Information streams vary widely in complexity, which roles of the processes involved in information transfer. The simplest information stream consists of a unidirectional flow from origin to destination. We refer to this system as a unidirectional message stream.

The next level of complexity occurs when the origin and destination endpoint are allowed to play both roles; that is the destination can transmit messages to the origin. If the endpoints can act in either role arbitrarily the system is bidirectional message stream. One example of such a system is a simple two-party chat either party can chat at any time.

14.2.6 Transaction streams

A more structured bidirectional system results if the reverse roles in a regular way occur. The most common example is when the destination sends a request message to the origin and then the origin sends a response to the destination. The terms *origin* and *destination* are chosen because the request normally includes a description of some desired information the response contains that information. The desired information flows from the destination; the request is simply a mechanism for accessing the desired information. An example of this system is the Hyper Text Transfer Protocol (HTTP) that is the World Wide Web. A browser sends a request message to a server with resource locator (URL) that describes the desired information. The server sends the response message that contains the information referred to by the URL. We call the system as a *Unidirectional transaction stream*. A transaction is defined as request-response pair.

The final structure we consider is the *bidirectional transaction stream*, and the previous case in which the origin and destination can reverse roles arbitrary special case of the bidirectional message stream because each request requires response, rather than simple message transmission.

To see this classification scheme in action, let us consider the standard telephone which consists of three parts : an origin telephone, a destination telephone, telephone central office intermediary. When the system is in its quiescent telephones are ‘on-hook’ and idle. One party lifts the receiver, which sends ‘hook’ request down the stream. This request is intercepted by the telephone office intermediary, which sends a ‘dial tone’ response back to the telephone completing the first transaction. The originating party then dials a destination number. The central office intercepts this request, sends a ‘ring’ request to the destination telephone, ‘ringing tone’ response back to the origin telephone. The second transaction is complete, and the third transaction has begun. When the destination phones it sends an ‘off-hook’ response to the central office intermediary, which completes third transaction. The central office now connects the two telephones together begins acting as a transparent intermediary, simply passing audio message forth between the two telephones. The system has switched modes : from unidirectional transaction system to a bidirectional message system.

14.3 SEARCH INTERMEDIARIES

On-line searches can be made by the scientist or technologist in person. Put at its simplest, the case for scientist or technologist undertaking his own search is that he alone knows exactly what he wants and he is familiar with the subject field. But bibliographical search has never been an easy task even for a professional searchers

and the complexities of on-line have added to the difficulties. We have seen that on-line search in many cases has to be combined with manual search to be fully effective. No one can deny that many of these computerised systems lack what has been called 'transparency' letting a searcher use this service without first becoming an expert in the complexities of its structure.

To what is basically the intellectual barrier of search formulation and strategy the advent of on-line has added a further hazard, immediacy, and has erected a quite new barrier, the command language. Both are direct consequences of the interactive nature of the search process. In the first place, his search strategy needs to be flexible. In the second place, because instructions to the computer on how to proceed with the search have to be individually given in each case, the searcher has to be familiar with the range of commands that may be needed. We should be careful to distinguish these commands about how to search from the distributors used in the search statement which indicate the subject of the search, that is, what to search for.

The Science Reference Library advises its readers that 'effective searching ... requires careful prior preparation involving the consultation of manuals, thesauri and term lists'. Such work usually confines themselves to one database, e.g. *AGRICOLA on-line users guide*, *BIOSIS search guide*. Sometimes there are two or more manuals for the same database, e.g. *Engineering index COMPENDEX online user's manual for the Lockheed DIALOG Information Retrieval Service* and *SDC COMPENDEX user manual*.

It had been very clear even in the earliest days of batch searching that there was a major problem, familiar to reference librarian the world over : the need for some kind of skilled and experienced intermediary between the users and the system, to explain, advise, teach and indeed to search on their behalf. In his pioneering 1968 evaluation of the MEDLARS demand search service F W Lancaster found that 'The greatest potential for improvement in MEDLARS exists at the interface between user and system'.

The plain statistical facts of the matter are that ever since on-line searching was introduced the great majority of searches have been undertaken by intermediaries. Such as librarians, information scientists, search analysts, etc. Even the Science Reference Library now states that 'searches will be carried out for you by trained intermediaries.' At the library KTH where all searches are carried out by intermediaries. Results from a research study of on-line searching at the University of Manchester Institute of Science and Technology showed that 'the most successful searches were those in which the intermediary knew sufficient about the background of the user's query to ask pertinent questions, which would draw full answers about his requirements from the user'.

From the foregoing analysis, it can be inferred that intermediaries should have

self-confidence, logical mind, good communication skill, knowledge about subject area, patience, and technological awareness.

14.4 ROLE OF INTERMEDIARIES

The database intermediaries usually play two major roles in providing data services from databases.

14.4.1 As Searchers

The searching process begins with the request from the end user and ends with completing the search after getting the probable answers to the request. When the search ends, the searcher keys the command to exit from the system.

14.4.2 As Editors

A properly edited and formatted copy of the search should be handed over to the user. So the editor's role includes—formatting the search, references/citations, database name, source, searcher's name, cost, document availability, and the like.

14.5 FUTURE OF DATABASE INTERMEDIARIES

Intermediaries effectively open up pervasive computing devices, establish to manipulate data within data flows of the device. In the future, it is likely that end users will perform their own searches when search procedures will be more simplified or user-friendly. So the end users should be trained properly to face the role of information consultant. A good deal of research is needed to make the role of intermediaries brighter and more effective.

14.6 SUMMARY

We have discussed in this unit the major components in the information network and the role of intermediaries in the process of search. We have defined the role of intermediaries and the end-users. The search strategy should be flexible and the searcher has to be familiar with the range of commands. The future has been predicted when the search procedure will be more user-friendly.

14.7 EXERCISE

1. Discuss the role of database intermediary.
2. Explain the message streams and transaction streams in database searching.

3. Explain what is the intellectual barrier to the search formulation and strategy.
4. What should be the qualities of intermediaries ?
5. How can intermediaries play the role of information consultant ?

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UNIT 15 □ ONLINE INFORMATION SYSTEMS AND INFORMATION NETWORKS

Structure

- 15.0 Objectives
- 15.1 Introduction
- 15.2 Technological Development
- 15.3 Online Searching
- 15.4 Functions of Online Services
- 15.5 Online Service Suppliers
- 15.6 Online Search Service Brokers
- 15.7 Service Charging
- 15.8 End-user Access
- 15.9 Problems of Online Searching
- 15.10 Information Networks
- 15.11 Online Information Systems and Networks in India
- 15.12 Summary
- 15.13 Exercise
- 15.14 References and Further Reading

15.0 OBJECTIVES

You will have an idea about technological developments in accessing online information systems and information networks. You will know the various online bibliographic services offered through networks.

You will understand the benefits and problems of online service. You will know the networking systems available in India.

15.1 INTRODUCTION

The key technological components of online systems are computers that can act in time-shared mode and teleprocessing systems with terminal equipment. On-line services employ on-line systems technology to provide remote users with access to information organized in databases with greater flexibility, precision and speed than comparable print resources can.

The development of networks ensures equitable access to services and contents especially in the public domain as well as facilitating the free flow of information.

In promoting the development of electronic networks, Unesco lays emphasis on policies and strategies to develop the most appropriate methodology to meet the specific needs of the different communities. Through its global and regional networks, the organization seeks to effectuate social development, democ-ratisation and good governance. By providing access to relevant information in an interactive format and in an easily assimilated form Unesco fosters capacities to acquire new knowledge and skills.

Regional information networks, virtual laboratories and learning communities and other information networks offer a new paradigm for global cooperation using traditional and multimedia technologies to promote applications in the organization's field of competence.

15.2 TECHNOLOGICAL DEVELOPMENT

Online systems have developed rapidly since the 1960's through the convergence of several streams of technological advances : time-sharing computers that permit large number of users to conduct simultaneous interactions with systems that may be located far from the central computer and its information store; interactive computer programmes *{software}* that are increasingly efficient, powerful and user-friendly; rapid—access storage devices that are growing in capacity and decreasing its data storage costs; computer terminals and compact, inexpensive personal computers that can transmit, receive and display information; telecommunication networks that provide fast, cheap data transmission; growing volumes of numerical and textual and graphical information *{databases}* created by publishers and other organizations in computer readable form. Local area networks permit online access over a limited site (e.g. University Campus). Wide area networks operate nationally and internationally and may themselves be linked together in a network of networks *{Internet}*.

15.3 ONLINE SEARCHING

In the late 1960s and early 1970s three simultaneous technological advances brought online bibliographical searching into the realm of the practical: firstly, the development of random-access computer memories on disk with greatly increased storage capacity, secondly, the availability of simple and cheap acoustic couplers and the more reliable modulator—demodulators (modems) to convert analogue signals to digital (and *vice versa*) and thus allow computer terminals to be linked to the regular telephone system; and thirdly, improvements in cable, microwave and satellite telecommunication which allowed greatly increased amounts of computer data to be transmitted faithfully over

greatly increased distances. Such online facilities permit the individual user to conduct his own bibliographical search of a distant computerized database using a two-way telecommunication link from a teletype terminal (which is like an electronic typewriter with more keys than usual and is sometimes fitted with a visual display unit) in his own laboratory, office or library. It should be explained that the terminals can be connected to the computer by private lines or dedicated lines leased from the telecommunications authorities or connection can be made by the user by dialling up the computer as required, over the regular telephone system. Increasingly, these methods may use the facilities of data (as opposed to voice) telecommunications networks, designed especially for computer traffic. This shows a great saving in cost, particularly if the data is transmitted by the 'packet-switching' technique, that is, interleaved automatically on a time-sharing basis with other packet-based traffic. Would-be users normally take out a subscription with a service supplier; they are then allocated a unique and confidential 'password' which allows them to identify themselves to the computer and thus gain access to the database they wish to search. Online bibliographical searches have increased enormously in number in recent years, particularly in the US and Western Europe.

Online access is now possible to well over two hundred bibliographic databases containing over 75 million records, mostly in science and technology. Currently the largest, most successful and most heavily used online database in the world is MEDLINE, the online version of MEDLARS.

15.4 FUNCTIONS OF ONLINE SERVICES

Most database producers, particularly those compiling bibliographic databases, license their databases to other organizations called 'online services' or 'host computer services' or simply *host*, which provide the computer, software and telecommunications support that enables remote users to access databases. There are more than 1500 commercial hosts operating worldwide. The larger one—of which DIALOG is an example—provide access to several hundreds of databases in a wide range of subject areas (they are sometimes called 'supermarket' hosts). The functions of hosts are structuring, loading and subsequently updating the databases into large time-sharing computers; maintaining 24-hour access; connecting their computers to national and international networks; maintaining user-friendly programmes so that databases can be interrogated easily and efficiently; offering downloading facilities enabling users to store and display retrieved information locally; providing gateway access that permits users to switch to other hosts; connecting to document delivery services by means of which the full text of retrieved references are delivered electronically (e-mail, fax) or by post.

15.5 ONLINE SERVICE SUPPLIERS

Thus we saw emerge yet another category information providers, the big-league service supplier, sometimes called system operator, concentrating exclusively on online provision and offering access to databases on an international scale over variety of telecommunications links. The market leader is DIALOG Information Services at Palo Alto, California, a subsidiary of the Lockheed Corporation. DIALOG provides 'fingertip access' to well over a hundred databases. This access is by dialling direct, or by leased line, or via TYMNET or TELENET which are major commercial data communications networks mainly serving North America but with modes around the globe. The second major US-based supplier is the Search Service of System Development Corporation at Santa Monica, California, a subsidiary of the Burroughs Corporation. Using the ORBIT retrieval system, SDC offer over sixty databases for searching.

In the UK the largest supplier is BLAISE (British Library Automated Information service) which commenced in April 1977 under the auspices of the British Library but using a rented computer. Linked with this development is MERLIN (Machine Readable Library Information), a new integrated computerized system being developed by the British Library to support bibliographical and cataloguing services and other library house-keeping activities for its own purposes as well as for external users.

The largest service supplier in Europe is the Information Retrieval Service of the European Space Agency (IRS-ESA) at Frascati, near Rome.

15.6 ONLINE SEARCH SERVICE BROKERS

This has led to the emergence of another category of information provider in the shape of the 'broker' (or service intermediary), whose role is to provide or sell online search services on demand to those who do not have access to a computer terminal. Unlike service suppliers such brokers do not necessarily require their own computer facilities or database tapes: all they need is a terminal providing online access to distant computerized databases, together with some experience in searching them.

15.7 SERVICE CHARGING

The main components of most charging systems relate to telecommunications rates; the elapsed time a user is connected to a host computer; storage of regular routines;

downloading and printing fees for retrieved information. The latter are often components of the royalty charges paid by hosts to database producers, with whom the copyright of the database usually resides. Some hosts charge a fixed annual subscription to their specialized services which allow unlimited access over a twelve month period.

15.8 END-USER ACCESS

In the earlier years of online services, connecting to hosts and searching databases was a complex, expensive activity and the task was often delegated to specialist 'intermediaries' (librarians and information officers). Recently the trend has been towards encouraging the individuals actually seeking the information—the end-users—to do their own searching. Users can download the searches of their results into a e-mail service. Complementary document delivery services have been implemented through which an end-user can request (and pay for credit card transfer) copies of original documents.

15.9 PROBLEMS OF ONLINE SEARCHING

Perhaps two controversial issues are cost and effectiveness: of course they are intimately linked. On the face of it at least, measuring the cost of an online search in order to compare it with alternative, that is, a traditional manual search, should be a simple straightforward matter. While one camp arguing that online is cheaper, the other retorting that when properly costed it is not. A. J. Hartley in discussing MEDLARS searches make the point that 'if the person using the output was a professor of medicine, it was almost always cheaper to the computer. If he was a research student it was cheaper to make him use *Index medicus* in the library'.

But cost comparisons alone prove nothing: what is really important is the effectiveness of the search. Whatever the truth about the relative cost and effectiveness of online and manual searches the comparison to be fair can only drawn for those searches that are judged appropriate in the first place for an online search. There is widespread agreement that for the less intricate everyday and background searches, for exhaustive searches covering many years, and for browsing, manual methods are not only more economical but also more effective. Experience has shown that it is usually misguided to embark on an online search with a vague or imperfectly-formulated question.

A number of much more fundamental problems stem from the fact that many databases were not created primarily for online searching: they usually originated as by-products of a publication system, consequent to computerization. On one matter

there does seem to be no doubt: online searching does save time. Many searches can be carried out either way, some must be undertaken using both methods. Even when the decision has been taken to search online, many would still agree with the conclusions of a team of lubrication engineers who compared CA CONDENSATES and ASCA : ‘One cannot totally dispense with some hand searching and following-up references to be reasonably sure of good coverage’.

15.10 INFORMATION NETWORKS

It seemed logical to many that linking information users and all the various information providers (database producers, suppliers, brokers, etc.) in an online network would be an obvious next step, certainly quite feasible with current technology. The aim would be to make the information in any one system available to as large a group of users as possible. Such a development is very much in line with the objectives of UNISIST.

For some countries of Western Europe such a data transmission network has been established under the direct sponsorship of the commission of the European Communities, which stated that its policy was to incorporate in the European network all information centres, systems or other useful institutions, which exist or are being set up in the Member States and link them together’. Agreement was reached in 1976 by the postal and telecommunication authorities (PTTOS) on the nine EEC countries on the establishment of EURONET, the actual telecommunication network. The ensemble of information services available to users via this network has itself been christened DIANE (Direct Information access network for Europe) and was opened in 1980. The President of the Commission, Roy Jenkins described it as ‘a new highroad on which to transport a key resource—information.’

At the early phase of consortium or cooperative networks were planned, designed and operational dependig on the network membership of particular region. The network structures were based on usualy the following types :

- Libraries of similar types like Research Libraries Group.
- Libraries of different kinds in a particular geographical area or region, for example NELINET, the New England Library Network.
- Libraries which required particular function or service for hardware and software consultancy.

The primary objective of most early networks was creation and maintenance of computerized union catalogue basically for the following purposes :

- 1 To support interlibrary loan services, and

2 Shared cataloguing on cooperative basis in some sort of standardized format mostly to share the exorbitant and repetitive cataloguing costs and other management expenses.

To achieve primary objective all the libraries got the union catalogue, larger database and database management system required for the member libraries. The system was known as cataloguing support system. It was the beginning of standardized catalogue format within the network system. The system eradicated the necessary and inherently evil problem backlogs of the member libraries. There are a number of information networks (online) and many of them are international in their scope and services. Some of them are discussed below :

(a) Online Computer Library Centre (OCLC)

OCLC, formerly known as Ohio College Library Centre was founded in 1967 by University Presidents to share library resources and reduce library costs. OCLC introduced online cataloguing system as early as 1971 for libraries and now it is used by libraries around the world. The inter library loan service was introduced in 1979 and since then it has been used for 110 million loans among 6,600 libraries around the world. OCLC is a nonprofit organization serving more than 40,000 libraries in 76 countries around the world. The public purpose is to further access to the world's information and to reduce costs by offering services for libraries and their users. OCLC membership is a unique cooperative venture giving global access to all the services and database including World Cat.

OCLC libraries also offer the OCLC First Search Service, which delivers online reference information through a rich collection of databases with links to online full text, electronic journals, web resources, library holdings, interlibrary loan and document delivery. It provides information on Electronic collections Online services, Site Search software and Contents Alert service.

The OCLC MARC Record Service (MARS) is a complete, comprehensive database preparation and authority control service that provides high-quality, accurate, standardized bibliographic and authority data functions for libraries and research institutions. This service provides authority control, customised record processing, bibliographic record updating, smart barcode number generation, manual review, ongoing authority updating and notification services, now bibliographic record processing and TOC MARC Enrichment.

The future programmes of OCLC are to transform World Cat from a bibliographic database and online union catalogue to a globally networked information resource of text, graphics, sound and motion. This enhanced version of World Cat will include a shared knowledge base supported by a set of integrated, Web-based tools and services that facilitate contribution, discovery, exchange, delivery, and preservation of knowledge objects and shared expertise of participating institutions.

(b) Research Libraries Information Network (RLIN)

The Research Libraries Group (RLG) was established in 1974 by Harvard, Yale, Columbia University and the New York Public Library. RLG acquired the BALLOTS bibliographic data system of Stanford University and started its own bibliographic utilities known as the Research Libraries Information Network (RLIN) in 1978.

The prime reason for the establishment of the RLIN was the need of researches for specialised research materials which could not be provided by a general database, even as large as that of OCLC. With only 159 resource sharing members, RLIN database has a record count of some 63 million, and a database focused on scholarly materials. But because RLIN allows for multiple item entries and higher quality cataloguing, this database is enriched by more than 170 million catalogue records.

RLIN is now an internationally available bibliographic information system used with RLG's Library resources. For RLIN's cataloguing, archival control, and interlibrary loan facilities RLIN Terminal for Windows software and an internet connection is needed. This software and connection also support searching in Arabic, Chinese, Cyrillic, Hbrew, Japanese and Korean.

The resources of Research Library Group are a set of online catalogues that offer reference libraries, archivists, cataloguers, bibliographers, scholars and other researchers million of records describing materials created around the world. The RLG union catalogue comprises eight bibliographic files. The RLG's EUREKA search system presents them as one file, as well as the RLIN technical processing interface presents them separately.

(c) WLN

Washington Library Network (WLN) was first operated by Washington State Library with its jurisdiction within the state. It was relatively a small library network. But the software development for its regional database which was developed since the late 1960's made the WLN software a very important one. The computerized bibliographic database was established in 1972 with the cooperation of the Washington's Libraries. The online system was introduced in 1975. More than 80 larger libraries or library systems in the six states became online participants in the Washington Library Network. As the area of operation was extended beyond Washington state to six adjacent states, it was renamed as Western Library Network keeping the same abbreviation, WLN.

WLN provides a broad range of innovative, high quality technical and database services to public libraries, university, college, corporate, legal, medical and other libraries throughout North America and abroad. WLN's union catalogue contains 15 million bibliographic records and over 30 million local library holdings.

With effect from 1st January, 1999, WLN, a non-profit corporation serving over 600 libraries in The Pacific Northwest region of the USA and Canada, merged with OCLC, having its headquarters in Lacey, Washington. OCLC and WLN believe the synergy created by the merger will allow the organization to more effectively meet a wide range of information needs of libraries and the end-users. Working together, OCLC and WLN eliminate duplicate services, introduce new and better products at lower costs for member libraries.

OCLC, RLIN and WLN were established as non-profit organizations supported and governed by the member libraries. There are no commercial considerations, whether for the use of databases or for technical innovations in bibliographic services.

(d) UTLAS

The University of Toronto Library Automation Systems (UTLAS) in Canada is a regional library network created on commercial basis. The UTLAS network is diverse in the types of libraries—academic, public, government, special, etc. It has no relationship with the University of Toronto, Canada. It has made an integrated approach to library automation based on the distributed processing network. During early 1980's the users of UTLAS had access to a database of over 6 million records growing at the rate of over 2.5 million records per year. The database included source files from the Library of Congress, the National Library of Canada, the Bibliotheque Nationale du Quebec, and the records of the National Library of Medicine. Bibliographic records are available for monographs, serials, audiovisual materials, music, maps, manuscripts. UTLAS has changed its name to Utlas International.

In addition to the national source files, there are users-created files. The Catalogue Support System of UTLAS (CATSS) supported both external databases and member-created databases.

15.11 ONLINE INFORMATION SYSTEMS AND NETWORKS IN INDIA

During the last sixty years the process of modernisation of library and the establishment of networks in India has not been encouraging. Although India has good expertise in the technologies of computers and communication technologies, their applications to online bibliographic databases or networks are sketchy. In the 1980s organised efforts were made to collect and disseminate information. The 1983 Technology information base. The 1983 Technology Policy Statement put stress on the need for a technology information base. The National Policy on Library and Information System submitted in 1988 recommended, among many other recommendations, using of information technology on a national level. However, the National Information System

for Science and Technology (NISSAT) in 1986 initiated the establishment of CALIBNET (Calcutta Library Network), and supported the establishment of DELNET (Delhi Library Network) in Delhi in 1988, PUNENET in Pune in 1992, ADINET in Ahmedabad in 1993 and BONET in Mumbai in 1994. The then INSDOC supported the formation of MALIBNET in Chennai in 1993. The UGC (University Grants Commission) established INFLIBNET (Information and Library Network) in 1988. However, this scenario of networks does not ensure the growth library networks in India.

It is worth to refer to the report of the Working Group of the Planning Commission on Libraries and Informatics for the ninth five year plan (1997-2002). The report includes the following major recommendations for the networking and modernisation of libraries.

1. Special attention should be given to all libraries in the domain of Humanities with particular reference to Arts.

2. There should be a National Library System (NLS) comprising the National Library, Kolkata, National Depository Libraries in Delhi, Mumbai, and Chennai, National Subject Libraries such as National Science Library, National Medical Library, etc. and National Documentation Centres such as DESI DOC, NISCAIR (then INSDOC), National Social Science Documentation Centre (NASSDOC), etc. and such other libraries of national importance. These should form part of one cohesive integrated system.

3. The automation and modernisation of university and college libraries should be accelerated. The databases in these libraries should be created using international standards.

4. The Information and Library Network (INFLIBNET) programme of the UGC, and Information Centres at Baroda, Bangalore and Mumbai should be made fully operational.

5. Among the city networks, it has been found that the DELNET has emerged as an operational library network in India with 103 libraries as its members. It is recommended that DELNET be supported to create National Database and develop on the OCLC pattern covering all subjects. It is also recommended that CALIBNET, MALIBNET, etc. be financially supported to undertake creation of databases as state and city levels.

6. INFLIBNET should coordinate with the existing networks in institution so that duplication in various categories may be avoided.

INFLIBNET began its operations in 1991. For promoting resource sharing MALIBNET in Chennai has created database of current serials in 50 libraries. It may be noted that BONET, MYLIBNET in Mysore, PUNENET, BALNET and ADINET have not yet created their value added databases. As DELNET has been regularly

increasing its services, the membership growth has been positive DELNET's membership outside Delhi is increasing phenomenally because DELNET databases can be accessed by users through internet. DELNET is a growing network.

15.12 SUMMARY

In this unit we have discussed technological development, online searching along with its functions, online service suppliers, online search service brokers and end-user access. We have noted the problems of online searching. We have also described some of the well-known information networks functioning in the USA, Canada and the UK. India's attempts to build up online information systems and networks have been highlighted.

15.13 EXERCISE

1. How would you define information networks? Discuss at least four information networks in the world.
2. Discuss the problems in online searching.
3. Who are online search service brokers? Who are end-users? Who are online service suppliers? Explain.
4. Describe the functions of online services.
5. Write a note on online searching and key components of online systems.

15.14 REFERENCES AND FURTHER READING

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