
UNIT 3 INFORMATION INSTITUTIONS

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3.0 OBJECTIVES

After reading this Unit, you will be able to:

- explain the nature of information institutions and their growth pattern;
- identify different types and nature of information institutions and their specific role in the dissemination of information to individuals, groups, as well as organisations that might require information in different forms and formats;
- explain the importance of “planned institutional building” with particular reference to developing countries;
- discuss how the technologies are impacting the organisational structure;
- discuss the characteristics of new millennium organisations;
- explain the preparedness of and understand the nature of Information Institution for its legitimate role in knowledge-based economy (KBE); and
- describe the indicators of preparation for KBE.

3.1 INTRODUCTION

The significance of institutions in modern society cannot be underestimated. In this context, the opinion of Peter Drucker needs careful consideration. He emphasises that “every major task, whether economic performance, or health care, education or protection of environment, the pursuit of new knowledge or defence, is today being entrusted to big organisations, designed for perpetuity and managed by their managements. On the performance of these institutions, the performance of modern society – if not the survival of each individual – increasingly depends”. Drucker further affirms that every institution comprises human beings – men and woman, whose performance brings success or failure to the institution and there by to the society.

It is often stated that modern society is transforming into a knowledge society. *Knowledge* is now recognised as the *driver of* productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance. As a matter of fact, the term *knowledge-based economy (KBE)* stems from this fuller recognition of the production, distribution and use of knowledge and information. The concept of (*KBE*) has generated tremendous interest in recent years. As a result, a *paradigm* shift is taking place for information organisations. In fact, organisations, companies and workers are constantly urged to prepare for the new era of (*KBE*). Effective exploitation of information in organisations appears to be distinguishing feature of this new *socio economic model*. Since formal provision of information and knowledge has been the main responsibility of information institutions, it is imperative that to stay relevant in the new environment they respond quickly and appropriately to the challenge posed by KBE. Many writers have stressed that information institutions must find a role in KBE by adopting new methods and tools, re-making and repositioning themselves, furthering their knowledge of customer needs, and embedding themselves in the organisations they work for. Libraries and information centres have also been advised to focus more on evaluating, analysing, synthesising, qualifying and delivering externally created contents. The information professionals in the knowledge economy are also expected to be aware of the changes in the organisational structure in order to make themselves as integral part of new organisation. They should be willing to refine their roles to function as information managers, research analysts, and knowledge facilitators. In this context, it is of interest to note that *different professions are converging on the emerging community of knowledge practice* giving rise to a variety of *specialist knowledge professionals*.

It must be pointed that not many research reports are available on *modern information institutions or organisations* in the literature of library and information science. In this Unit, an attempt has been made to examine and discuss a variety of organisations, whose main stock in trade are knowledge, literature and information evolved out of users needs and demands. The Unit also depicts the information transfer patterns which have resulted in the creation of information institutions with varying functions.

3.2 EVOLUTION OF INFORMATION INSTITUTIONS

In the literature of library and information science we do not come across studies exclusively devoted to the evolution, development, organisational structure and functions of information institutions. However, if we examine the institutions that have come up during 20th century, especially in the latter part, we can discern a typical pattern in their growth. However, this pattern could be perceived only in the industrially advanced countries of the West. As it happens, their influence extended to the Third World Countries also; with the result many Third World Countries have accepted the Western Model in designing and developing their own institutions.

The report entitled “Into the Information Age, A Perspective for Federal Action on Information” prepared by Arthur D Little, Inc. describes the development of information institutions in the USA. In doing so, the report identifies three basic models of information transfer. The report contends that the process of transfer of information / knowledge comprises a chain of activities, the main 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. The institutions that normally perform these activities can broadly be grouped into three categories indicated below:

- i) Knowledge creating institutions (under this category come: research laboratories, R&D institutions, institutions of higher education and research centres attached to universities, etc.)
- ii) Knowledge / information processing and dissemination institutions such as: publishers of books and journals / statistical data organisations, science and technology data centres and the like, and
- iii) Institutions that collect, store, process, disseminate and service knowledge / information recorded in various forms such as libraries.

A careful analysis in this aspect reveals that over the years, there has been an increasing interaction and cooperation among all these categories of institutions. It may also be noted, that with the application of modern technologies in information generation, processing, dissemination, distribution and use, many of these functions are getting blended, reducing the distinction between different link elements of information chain. At this point in time, the different types of institutions mentioned above operate with their distinct identity. Therefore, we need to discuss them in their present form.

3.2.1 Growth Patterns

In spite of many efforts to locate latest information on the growth patterns of information institutions, none has been found from surfing the Internet depicting the growth patterns in the context of emerging knowledge society. As such, the effort made by Arthur D Little Inc in the form of Vincent Giuliano’s report remains the model historic perspective of information transfer pattern and institutional framework and modes of information transfer. The three modes considered are:

- i) The Discipline Oriented Information Transfer corresponding to the value system of pure science, academic and basic research called Era I;
- ii) Mission oriented Information Transfer corresponding to the value system of government sponsored missions (such as AEC, NASA in the 1960s) called Era II;
- iii) Problem-oriented Information Transfer corresponding to the value system of solving societal problems called Era III.

The principal characteristics and features of the above mentioned eras are briefly discussed in the following paragraphs.

Discipline-oriented Information Transfer (Era-I)

The basic principle associated with *Era-I organisations* is that they are created to provide knowledge and so are to support education, research and development. Knowledge and information are generally disseminated through journals, monographs, seminars and meetings usually associated with academic and research institutions, learned societies, professional bodies, etc. Access to the primary information is provided through bibliographical tools like indexing and abstracting services which are made available by institutions facilitating access to documents and use, mostly the libraries and other departments attached to the parent bodies. The user community comprises academicians, scholars, research workers and students. Financial support to the system is derived from internal budgetary provisions, grants and subsidies provided by the government. This traditional system of free information service has been continuing since a long time, notwithstanding the difficulties encountered every now and then. The components of this system namely libraries and journal publishing often face financial troubles. The producer / user complexes control the quality and the content of the system.

Mission-oriented Information Transfer (Era-II)

The organising principle behind the *Era II systems*, is that they exist to accomplish a specific job. For example, information systems developed during 1950s and 1960s have been created to provide information support to mission-oriented agencies such as AEC, NASA and similar purpose-oriented projects. In this context, the information transfer process is characterised by a defined need for coordinating and using information and knowledge concurrently from a variety of disciplines. For example, in the case of NASA mission, inputs of information from diverse subjects like electronics, biology, medicine, aeronautics, chemistry and physics, etc. are necessary. In this context, information is disseminated through *technical reports*, besides conventional publications like journals. Technical information centres attached to the main agencies undertake the responsibility of developing interpretative information services meant for the user communities comprising scientists, engineers, technologists and managers belonging to the agency. The system has a feedback mechanism, which enables it to determine the performance efficacy of the system. The results of the feedback analysis will be constantly fed to the system for its improvement as also to determine changing information needs of the entire range of clientele.

During the period of operation of Era-II institutions importance has been given to the type of dissemination products such as newsletters and trade journals indicating that some Science Technical Information (STI) systems have a major economic value and emphasis has to be given to market-oriented information transfer mechanism.

Problem-oriented Information Transfer (Era-III)

The organising principle that paved the way for the establishment of information organisations in this *era is solving societal problems* by exploiting appropriate information. Systems that evolved in this period reflect a context in which information is used in problem solving such as economic development, industrial planning, agricultural productivity and environmental protection, etc.

The institutions that came into existence during this period had the capability to handle specific type of information and could provide new products and services. However, they could not evolve appropriate structures. Though the systems which were developed during this *era* exhibit characteristics necessary to meet the informational requirements of the times, needed further development and legitimisation. The community of users whose needs the systems were expected to fulfil was somewhat amorphous and ill defined involving a variety of groups such as elected representatives of people, judiciary, technologists, media people and the general public. In addition to the amorphous nature of the users, the information systems had to tackle different types of information largely non – STI – some of the categories being local, ill-organised, proprietary, value-added and reflecting value judgements.

Naturally this situation augured well for the proliferation of information brokers, consultants, information intermediaries in the form of new types of institutions to offer specialised and qualitative services. Repackaged information, collected from a number of sources with validated and authentic data, in the form of new type of specific information service came into being.

It may be mentioned that the STI system has been evolved to meet the requirements of scientists and technologists. It has been addressing audiences of high technical competence and others having the training to understand the material communicated to them. Expanding the context of information usage to societal problem-solving entails interpreting technical results appropriately to non-technical users to take informed decisions adds a new dimension. This type of information is available only at a price.

Preparation and delivery of such information needed a private enterprise willing to invest capital and take risks with the market-oriented approach. This situation gave rise to information industry to satisfy the needs of consumers.

Individual-oriented or Customised Information Service

This period may be considered as the Era-IV. This era introduced new challenges to information professionals in the form of identification of individual users and their needs, and development of new information products and services that could be marketed. Delivery of information to home bound citizens and consolidation, condensation and repackaging of information to scientists and engineers in industry became the prime organising principle behind the development and growth of information institutions of this period. Fee-based

information services, on demand companies, information consultancies, information Intermediaries, information brokers, etc. sprang up in countries like USA, U.K., France, Germany, Austria and Belgium.

It may be mentioned that the major organisations like PREDICASTS, Arthur D Little co. Inc., Lockheed Information Services, SDC, BRS, New York Times Information Bank, etc. have been in existence since a long period whereas others came up during 1970s and developed in 1980s. The industry has further developed in 1990s and in the 21st century.

New Millennium Organisations

The last decade of the 20th century has seen extraordinary change in the way organisations are viewed and managed. Organisations may no longer be considered as production-oriented entities, divided by function (such as R&D, operations research, marketing, etc.) and controlled by layers of management.

Many terms have been employed to describe the new type of organisations. Each of these descriptions conveys a vivid impression of new millennium organisations. For instance, one of the descriptions conceives it as a *knowledge-based* organisation in which employees' knowledge is the organisation's primary asset. Another perception of a new millennium organisation is that it will be a learning organisation in which the individuals, teams, and the organisation itself continuously learn from the environment and from their activities, and act on what they have learnt. A third view is that it will be a knowledge-based organisation in which the products and services are customised and continually enhanced or changed to reflect what has been learnt from customers. In other words, it will be an extended enterprise, in which customers, clients, suppliers, governments and other stakeholders are included explicitly in the definition of organisation itself. Yet, another view is that it will be a "networked organisation" in which computer-based communication networks enable wide spread and rapid communication among all groups in the extended enterprise. Network technologies like the Internet will enable *any time, any place* communication and access to information. The Internet has often been described as a new frontier housing endless possibilities within a democratic atmosphere. Information likes to be free – an expressive phrase on the Internet reflecting a mentality of open critical minds that were part of the net's genesis. It may be mentioned that two important considerations shape the modern organisations. One is the focus on learning and knowledge and the other is the convergence of information technology, telecommunications, and information resources and networked environment. The rise of knowledge management as the focus of organisational improvement efforts calls for knowledge managers. This aspect has implications for information profession. In other words, information professionals must identify knowledge management process to which they can contribute. Knowledge management is concerned with the acquisition, transfer and use of knowledge in organisations. The primary role of management is to develop the *intellectual capital* of the organisation. In this context, it must be noted that for any organisation the knowledge of its workers is the foundation of the organisations' *intellectual capital*. Knowledge management strives to improve the organisation and its contribution to the economy by increasing *the intellectual capital* of the organisation.

Note: i) Write your answers in the space given below.

ii) Check your answers with the answers given at the end of the Unit.

1) Briefly describe the growth pattern of Information Institutions.

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2) How do you characterise a new millennium organisation.

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3.3 TYPES OF INFORMATION INSTITUTIONS

In the literature of Library and Information Science we come across different types of information institutions. The primary objective of all these organisations happens to be *collection, processing, organisation and dissemination of information* to individuals, groups and organisations as and when they require it. The most important type of these institutions are: libraries, documentation centres, information analysis centres, etc. Apart from these traditional institutions, which have been in existence for long, many *de-institutionalised information services* have sprung up lately. Some of these are discussed in the following sections of this Unit.

3.3.1 Libraries

Libraries are important resources both for individuals and for communities of people who are interested in the preservation of knowledge. Their importance stems from their ability to maintain records of human endeavour within a range of different contexts using many different media. Libraries will, therefore, continue to play important social, cultural, technical, and pedagogic roles in the future. Indeed, for majority of people libraries will act as a powerful multimedia window on the outside world, particularly through the use of computer network systems. Obviously, some changes in the *library concept* will be needed in order to accommodate the requirements of the new information storage and delivery technologies and what these enable people to do. It may be noted that the increasing availability of information generally and of *new kinds of information more particularly* will lead to a *redefinition and integration of the different categories of information organisations*. Traditionally these have been created to manage different *formats and media* such as print and its surrogates (*libraries*),

objects (*museums*), and paper records of organisational activity (*archives and record repositories*). Differences in organisational philosophy, function and technique have arisen from the exigencies *presented by these different formats and media*.

The current wave of predictions that electronic technology will soon replace books and libraries, is inspired by a rapidly accelerating series of developments, in that technology which multiplies its power while drastically reducing its costs. Among those developments are communication satellites, cable TV, inexpensive mass – storage in the form of optical and digital video discs and powerful microcomputers on chips. With them, we have acquired a technology which *fires the imagination* and gives credence to even the most *fanciful forecasts!* In this sort of environment, there is a danger that those responsible for the financial support of libraries will neglect or prematurely abandon traditional libraries in favour of more glamorous alternatives in promising but as yet untested technologies.

The experts who are predicting the early demise of books and libraries have impressive credentials. They include management experts, information entrepreneurs, government officials, university professors, and popular futurists. Their forecasts of things to come are based on insights that come from solid knowledge and years of experience. They can neither be ignored nor accepted uncritically.

The insights and perspectives of theoreticians and futurists are useful: they help us to see and understand the complex social, economic, and technological forces that are at work in our larger environment, but only those with authority and responsibility can decide how and when these forces might affect any particular enterprise. Futurists can tell us what the future may be like, but they cannot tell us how to go there or when to make our moves. The really important decisions about any organisation or institution must, in the end, be made by those responsible for it, based on their best *judgement* and as much *practical wisdom* as they can muster. Prominent among and representative of those who are predicting an early end to books and libraries are: Dr. F. W. Lancaster and Dr. Vincent E Giuliano. Of course, their views are well known and documented. Dr. Lancaster is a proponent of the thesis *paperless society* and sums up his views in the following words: “We are moving rather rapidly and quite inevitably towards a paperless society. Advances in computer science and communications technology allow us to conceive a global system in which reports of research and development activities are composed, published, disseminated, and used in a completely electronic mode. Paper need never exist in this communication environment. We are now in an interim stage in the natural evolution from print on paper to electronics”. In the event a paperless society arrives as envisioned by Lancaster, there will be transformation of our society and our way of life. Obviously in that society, not only libraries but also the institutions and the scholars they serve, may also become obsolete. The best remedy is to cope with the changes, and try to plan for the future.

Giuliano has put forward many arguments which in effect plead for the abandoning of traditional libraries. Of these, the most important one demanding a careful consideration is “as far as the information institutions in our society go, libraries are of minor importance. Technology has already evolved to a point where access

to most of the world's literature can be obtained with in a couple of days through combination of online bibliographic searching utilities and vendors-supplied computerised order fulfilment system for books, documents and periodical articles". If Guiliano is right on this point, then libraries would have indeed served their purpose and may fade away. But, the truth is that most of the new technology based information business, are still largely dependent on the library market for their survival and the information brokers ultimately rely on libraries as the source for most of the documents they supply to their clients. Most of the books and journals go out of print with in a few years of their publication and are no longer available except in libraries. Another point to be noted in this connection is that most foreign books and journals and some specialised documents are not available through normal trade channels. Only a few research libraries manage to acquire and preserve them. Such materials are dispersed among a number of libraries in every country of the world. Older and out of print books can be had only from libraries.

Not with standing the arguments relating to the demise of the libraries by the futurists, and the idea that electronic technology in the hands of information entrepreneurs is going to put an end to libraries can be laid to rest. Libraries are here to stay but by no means are they going to stay the same. Their functions will remain, but the ways and means they used to perform those functions will change in varying speeds for different kinds of libraries in different countries.

It is worth noting that the World Wide Web (WWW) is changing the face of libraries – the way we use them and value them. The WWW will impact greatly upon the library, whether the library wants or not. This impact, to a large extent, would be dictated to the library by forces based both technologically and socially. As a result of the Internet and WWW technology, libraries are now presented with lack of linkage between the general user mainframe environment and having library resources on a separate machine or machines. The WWW can overcome the general user mainframe environment's lack of features for information discovery, as well as, provide the ability to create virtual site, where they can create an electronic presence that patrons (users) can easily locate – a starting point for library services. In fact, the WWW provides the tool for integrating other systems of library such as online catalogues, and searchable text databases, as well as allowing new resources and services. It may be stated that WWW is a technology, which could smell the end of library, as we know it today or be the beginning of a great transformation. It will surely have influence with or without libraries' participation. What will become of the library is not clear yet, as it often takes many years for a technology to come into its full stride. Given the rapid pace of changes that we are experiencing today, it might be inferred that technological change can force social change upon society and its institutions. Viewed from this point, the library of next few decades will be: i) a place where people won't come as a physical location of information resources; ii) will become an access facilitator; iii) will coordinate access to locally built digital resources.

In other words, it must be emphasised that the *stereotype of libraries as static* unchanging institutions, is no longer valid, they have to demonstrate a remarkable ability to grow, to adopt to changing conditions to meet new demands, and to implement new technologies. If these aspects are taken care of, then one need not give much weightage to the predictions made about their future existence.

3.3.2 Documentation Centres

Before World War II, research activity was largely an individual affair. But, the situation changed rapidly and it has become a team work. Both government and private organisations came forward to fund research and development activities in a big way. Specialisation became the order. Information explosion took place in science as well as in technology. Keeping abreast of new developments in any one discipline became a problem for scientists, engineers and technologists. Library-based information services proved inadequate to meet the specialised information needs of many research workers. To cope up with this new demand documentation centres came into existence. One of the basic functions associated with any documentation centre is that it brings to the notice of specialist users current and recent literature of value to them. However, the functions that are assigned to a documentation centre vary from one documentation centre to another. For example, a local documentation centre has the sole function of providing information services that support the activities and programmes of its parent organisation of which it is a part. It would collect and serve information concerning the actual work in progress of the parent institution. Towards fulfilling this objective, the local documentation centre may be engaged in the selection and acquisition of worth while material and its organisation for use. Its services may be designed both to satisfy the existing and anticipated needs of users. In other words, the local documentation centre might provide both anticipatory service as well as services designed to satisfy specific demands of users. A national documentation centre on the other hand will perform certain residual functions and might undertake activities, which are beyond the means of local documentation or information centres. Generally local documentation centres are attached to individual R&D institutions, business houses, industrial enterprises, and government departments, etc. and are administered by their parent institutions.

At the national level, it might be the responsibility of appropriate government agencies to establish and administer such a centre. The general norm recommended for financial support is 5% of the budget spent on R&D must be diverted to meet the expenditure of a national centre. In India, documentation centres are mostly established by the government. In this context, it may be mentioned that varying patterns of organisation exist in different countries. Centralised as well as decentralised structures have come into existence. Countries like UK have adopted a mixture of centralised as well as decentralised models. But, the network concept has gained importance in the modern times and the trend is now towards pooling and sharing of resources for achieving maximum economy and productivity.

3.3.3 Information Analysis Centres

The origin of activities pertaining to information analysis may be traced back to the 19th century. But the idea of a systematically organised centre for information analysis activity is relatively new.

The Weinberg Report extensively discussed the role of information analysis centres (IACs) and their importance and emphasised that the activities of most successful IACs are intrinsic part of science and technology. The centres not only disseminate and retrieve information; they create new information The

process of sifting through large masses of data often leads to new generalisations ... In short, knowledgeable scientific interpreters who can collect relevant data, review a field, and distil information in a manner that goes to the heart of a technical situation, are more helpful to the over burdened specialist than is a mere pile of relevant documents. Such knowledgeable scientific middlemen, who themselves contribute to science are backbone of the information (analysis) centre; they make information centre a technical institute rather than a technical library. The essence of good technical centre is that it is operated by highly competent working scientists and engineers – people who see the operation of centre as an opportunity to advance and deepen their own personal contact with their science and technology. The COSATI standing panel wrote the following comprehensive definition into its *charter*: “An Information Analysis Centre is a formally structured organisational unit, specifically (but not necessarily exclusively) established for the purpose of *acquiring, selecting, storing, retrieving, evaluating, analysing* and *synthesising* the body of information and / or in clearly defined and specialised field or pertaining to a specified mission with intent of *compiling, digesting, repackaging* or otherwise *organising* and *presenting* pertinent information and / or data in a form most authoritative, *timely* and *useful* to a society of peers and management”.

The key activities of IACs 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, state-of-the-art-monographs, or data compilations,* as well substantive, evaluated responses to queries – for the purpose of assisting a community of users more broadly representative than the staff of the parent institutes or laboratories. Fig. 3.1 illustrates the main activities of a typical IAC.

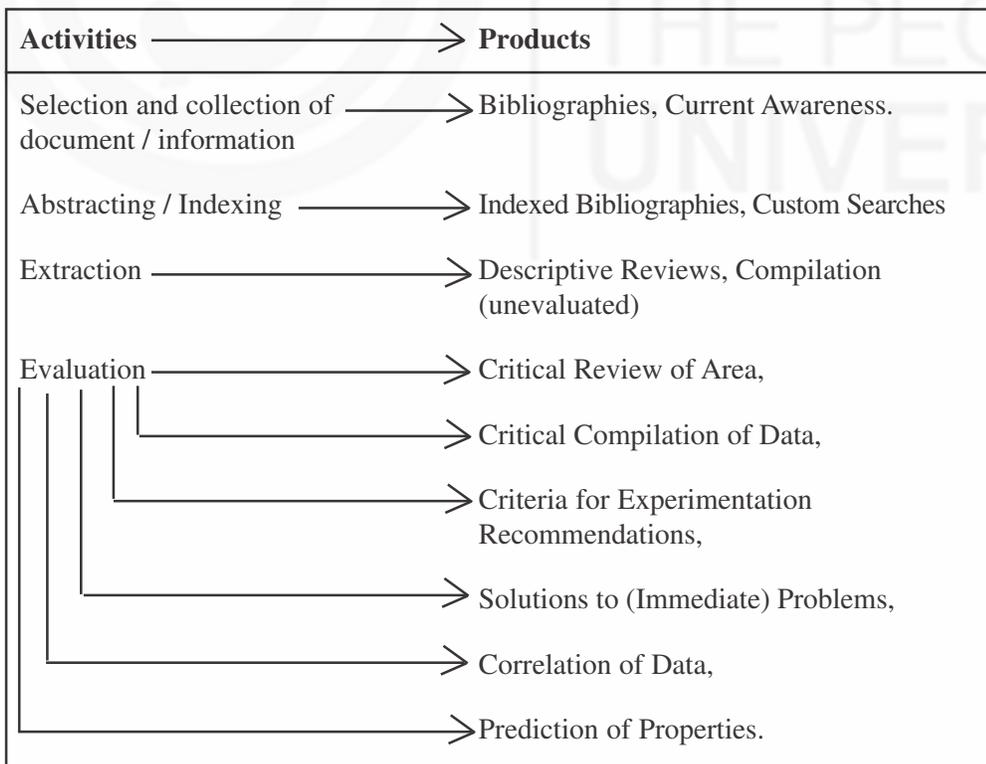


Fig. 3.1: Activities of an IAC

3.3.4 Data Centres

Data is an important ingredient of research. Its societal importance can not be under estimated. The contemporary society needs data for various activities such as planning, development and decision-making, etc. in every sphere of human progress.

Data must be collected, processed and organised so as to facilitate its utilisation in an effective manner. Managing scientific data has been identified as one of the most important emerging needs of scientific community because of the sheer volume and increasing complexity of data collected. Effective generating, managing and analysing the data requires a comprehensive approach that encompasses all the stages from the initial data acquisition to the final analysis of the data. For this purpose, an institutional mechanism is essential. Such institutional mechanisms are known as *data centres*.

According to UNESCO a data centre “constitutes an organisation handling quantitative numerical material data”. Such centres take the primary function of collecting, organising and disseminating data and also provide a measurement service and are in a position to advance relevant measurement techniques. The term *data centre* is used interchangeably to define a range of information centres, not all of which are critically evaluating data. Data centres vary both in scope and size. There can be data centres at local, national, regional, and international levels.

A data centre generally includes three major components:

- An organised data collection (i.e. the database);
- A connection with data sources which feed the database; and
- A contact with users who are expected to interact with the data base with different types of questions.

These can be diagrammatically represented as:

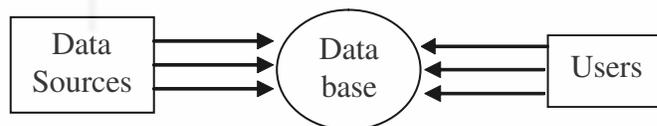


Fig:3.2 Component of a Data Centre

Modern data centres are usually maintained by organisations in order to handle core operations in information services including the Internet connectivity, intranets, LANs, WANs, and extranets. The most basic *data centre* will have a computer network and security applications which amounts to very large amounts of data stored in a number of computers. Generally larger companies will have IT infrastructure to handle the activities of a data centre.

It may be stated that the activities of data centre comprise:

- Data collection,
- Data control,
- Data codification,

- Data organisation and structuring into a database and
- Data retrieval.

For accomplishing all these functions a data centre should be equipped with suitably trained manpower. In India many data centres have been established under the erstwhile NISSAT programme. National Information Centre for Crystallography is an example of a data centre.

The World Data System (WDS) was established to achieve and distribute data collected from the observational programmes of the 1957-1958 International Geographical Year. It was originally established in the United States, Europe, Russia and Japan, since then the WDS expanded to other countries and to new scientific disciplines. The WDS presently includes 52 centres in 12 countries. Its holdings include a wide range of solar, geographical, environmental, and human dimensions data. It is funded and maintained by host countries on behalf of the international scientific community.

3.3.5 Referral Centres and Clearing Houses

There are a variety of organisations involved in information dissemination activity. These different organisations need to be properly coordinated by an agency for their effective functioning. A new type of establishment with specific mandate to act as a *switching mechanism* among different information dissemination institutions is an essential requirement. Such an organisation is referred to as *Referral Centre*. The Harrods's Librarian's Glossary provides the following explanatory annotation to the term *Referral Centre*:

- “An organisation for directing researchers for information and data to appropriate sources, such as libraries, information evaluation centres, documentation centres, documents and individuals;
- A Referral Centre is some sort of an *Information Desk* for the scientific and technical community which does not provide enquiries directly with the information they need, but suggests sources likely to satisfy the users / clients;
- Referral Centre is an organisation for the indication of sources (of persons, institutions and publications) from which scientific information may be obtained on a given subject”.

In other words, a referral centre serves as an intermediary, directing those who have queries relating to information requirement on scientific and technical subjects, to the organisations as well as to individuals who have specialised knowledge in those fields and are willing to share that knowledge with others. To carry out its functions referral centre must:

- be equipped with an inventory of all significant information resources in different disciplines;
- compile and publish directories of scientific and technical information resources;
- analyse the operating relationship that exists in the scientific information complex.

As in the case of IACs the referral centres exist at different levels (i.e. local, regional and international).

Clearing Houses

In scientific parlance, a *clearing house* is a relatively new concept. It represents a depository for documents with the additional objective of servicing as a central agency engaged in the distribution of information. It also includes such functions as collecting and maintaining records of research and development. Sometimes, subjective questions about items in these records are referred to the source and thus a *clearing house* may have to perform the function of a referral centre. In the United States as well as UK such clearing houses are in existence and are functioning. Most of the clearing houses have *information gathering networks* to acquire documents in their subject areas. They answer specific and general type of questions and may act as central searching place for enquiry especially relating to R&D reports.

3.3.6 De-institutionalised Information Services

In the preceding sections of this Unit, we have discussed different types of information institutions and their role in the dissemination of information to people at large. We shall now discuss the deinstitutionalisation of information services caused by advances in information and communication technologies. For a long time information handling has been the preserve of a group of trained people called librarians or information professionals. The profession's strength stemmed from the fact it operated as society's *institutionalised* information retailer. The universal non-availability of information allowed the profession to fulfil a useful role at the societal, organisational and individual level. In many cases access to information was, and is, via designated institutions like libraries, information centres, etc. However, technology appears capable of de-institutionalising information and handing over access to the individual, thus cracking the mould of library. This de-institutionalisation of information has created a lot of dissonance within the profession and the burgeoning of *info-business*. However, the information service is no longer exclusively defined in terms of activities carried out in a traditional library and information centre. It may be observed that during the last two or three decades the *phenomenon* of *information broker* has developed apace, especially in the USA and other advanced countries. In the USA itself there are a number of brokerage firms in operation, the important ones being *Information Store* and *Information Unlimited*.

Information Broker

The information broker is an individual or a firm, who, on demand seeks to answer questions using all available sources and who is in business for profit. Broking rests on the *axial principle: information for payment*. In case of libraries information is provided but costs are not charged to the user. One must understand the important distinction between information which is freely available and information which is free. The services offered by brokers comprise:

- Briefing or instant education;
- Information repackaging;
- Market research / analysis;
- Personnel recruitment;
- Press cutting service; and
- Seminars / workshops.

Information brokers specialise in providing fast and efficient services. These firms largely staffed by the people with library backgrounds provide literature searches, retrieve and supply documents. These firms may not pose any threat to libraries. In fact, they supplement them by filling needs and demands that publicly supported libraries cannot try to meet by providing special and expensive services to business, professional and other users who can afford them.

Human Networks

Traditionally the major focus in information management, information science literature has been on the physical nature of the information resource and its enabling technology rather than on the *soft, more qualitative human dimensions* of information processing. Understanding the *human factors* behind information transfer and the nature and the role of informal communication networks in organisations including the primacy of interpersonal sources of information, is crucial to the effective management of the organisational information resource. Human networks are central to information dissemination in organisations. With most of us, it is the people rather than printed or computer-based information resources that constitute our primary information source.

Information Networks and Information Flows

In management organisations, normally two channels of communication operate. They are formal and informal channels. Formal structures represent an ordered system that regulates authority and communication flows, links decision makers at different levels, and generates orderly flow of information and decision processes. The general flow takes place from top to bottom levels with feedback arrangement which enables the authorities to assess the performance and problems at lower levels.

On the other hand, the informal channels represent the social interactions that occur within organisations. While the two concepts are not necessarily mutually exclusive, a distinction is made between them. In other words, in contrast to formal flows, informal communication patterns tend to be spontaneous, without much of regulation. However, certain individuals within one group play a key role in organisational communication, linking different hierarchical levels or divisions or acting as *gatekeepers* of strategically important data emanating from outside organisational boundaries. The informal network exerts a powerful and constant influence in organisations. In the analysis of informal networks the organisation is regarded as a mutually independent social system made up of *components* and *connections* among those groups. In 1960s, there has been involved research into communication networks by J. J. Allen and others. They identified particular informal communicative and informational roles within organisational settings. The *technological gatekeeper*, the *internal communication star* and the *external communication star* are some of the new concepts that were put forward and discussed by them. These *stars* are approached by others in the organisation for advice or technical matters due to their perceived knowledge and experience.

Information Filters

Information filters is a new concept, which is related to personalised information delivery. It involves a variety of processes involving delivery of information to people who need it. The *Information filters* are essential mediators between

information sources and information users. In most cases, both information sources and information users possess no mutual knowledge that might guide them in finding the information most relevant for the users' immediate or long term needs. *Filters*, which are positioned logically as *third parties* to the communication between the users and sources, should possess both the knowledge and functionality to critically examine the information in the sources and to forward the information they *judge* as relevant to individual users.

The special feature about *information filters* is that they can work *on behalf of users as well as sources*. In the first case, which is the most common today, filters assist users in finding relevant information and overcoming the *information flood*. In the second case, filters can be used by sources to *target* information to potentially interested users.

Disintermediation

This concept means the finding of the information by an end-user without the need for a third party. In other words, the process whereby users are encouraged to interact directly with services and service providing systems such as online systems. Similarly the *introduction of self service issue* is a process of disintermediation. This concept is also closely related to what is known as *end-user empowerment*. End-user empowerment refers to users having access to information and having the necessary skills to retrieve their information according to their own needs. With empowerment, they should be less dependent on information specialists. This does not, however, necessarily mean that the information specialist as an intermediary will become obsolete. This is because all end-users will not have the time or the interest to do their own information searches. Although, there is a connection between end-user empowerment and disintermediation, end-user empowerment does not necessarily imply disintermediation. It may be emphasised that with the advent of the Internet and the increase in both the access to and awareness of information, it seems inevitable that end-users will be doing their own information searching. It is obvious that there will be some form of disintermediation. The level and extent of disintermediation will depend on many factors, such as: organisational policies on end-user searching, available technology, and the services provided by individual information services. To minimise disintermediation, information specialists will require *critical self-reflection*, refinement of their existing skills, continuing expansion of new skills and active research involvement. As end-users' job requirements, their access to information, and their need for information change, therefore, there have to be simultaneous changes in the role of intermediaries. This is important for intermediaries who aim to improve society's access to quality information.

Knowledge Mediators

The process where libraries provide users with insight into the existing body of knowledge and assist users in acquiring resources referring to or containing such knowledge is known as knowledge mediation. The institution or persons involved in such process are called *Knowledge Mediators*. They certainly constitute a link in *information transfer chain*.

In the foregoing paragraphs an attempt has been made to explain some of the important concepts relating to non-traditional information organisations or deinstitutionalised information services. This is only illustrative and not exhaustive.

Self Check Exercise

- Note:** i) Write your answers in the space given below.
 ii) Check your answers with the answers given at the end of the Unit.
- 3) Describe briefly different categories of Information Institutions.

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- 4) Mention the activities and products of Information Analysis Centre (IAC).

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- 5) What do you understand by the concepts *disintermediation*, and *end-user empowerment*?

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3.4 INDIAN SITUATION

After the independence from colonial rule in 1947, the Government of India designed plans and made efforts to initiate societal development. Deliberate policy decisions were taken to harness science and technology for the economic growth of the nation. In the process, a variety of institutions have sprung up in every sphere of activity in the country. Scientific research received increasing patronage from the government. Development of infrastructural facilities necessary for organising appropriate and effective information systems and services received governmental support. This situation paved the way for the development of libraries and information institutions distributed through out the country. In a way; in the growth pattern we can observe the influence of the *Three Era Frame Work*, though not with all its characteristics.

3.4.1 Growth Pattern

Institutions such as libraries, documentation and information centres at academic and professional levels, R&D institutions and laboratories, government agencies

and many public and private sector undertakings have emerged in large numbers. In the initial stages, all these organisations functioned in isolation without any linkages among themselves. But, with the passage of time, we could perceive established linkages among some categories of institutions that emerged during era-I.

On the other hand, during era-II organisations which were established during 1950s and 1960s fulfil the needs of mission-oriented establishments like the Atomic Energy Commission (AEC), the Indian Space Research Organisation (ISRO), and the Electronics Commission. Also, Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR), Defence Research and Development Organisation (DRDO), and other research complexes may also be included in this group. However, there has not been any effort to coordinate the informational activities of these *two eras* of institutions.

From 1970s, it may be stated that era-III type of organisations started to emerge. Institutions like Small enterprises documentation centre, documentation centres attached to National Health and Family Welfare Institute, and few others, might be considered as information support centres to problem solving type of institutions. Most of the CSIR Laboratories started problem-oriented research and required specialised information centres. This enabled the development of organisations like the National Medical Library, etc. Public sector enterprises like BHEL, CMTRI, SAIL and private sector industries like Bharat Electronics, Tata Energy Institute, RANBAXY, etc. also developed their own specialised information cells for meeting their technical information needs. Since most of the above mentioned organisations grew in the context of serving scientific and technical information and hence they did not attempt provision of societal information. The National Informatics Centre (NIC) tried to integrate societal information with administrative information in its efforts to design an administrative information system for India. At this stage, it may be emphasised that information services in India have not reached the level of sophistication either in terms of utilising modern technologies to offer versatile services or in the production of reprocessed and consolidated packages of information which could meet the specific information needed at policy and decision-making levels. In other words, the institutions that emerged as result of three era framework could offer only traditional type of information services with hardly any distinction in spite of an urgent need to introduce distinctiveness in their services and products.

The period of 1980s however witnessed a change in the policy of government towards information infrastructure in the country. As a result, many changes have occurred. For example, the government encouraged modernisation of information systems in a systematic manner. This resulted in the development of national information systems like NISSAT (now discontinued), ENVIS, and BTIS, etc. Coordination of these national information systems and sharing national information resources using modern communication technology became an important step in the reorganisation of information institutions in the country. Efforts were made to establish resource sharing networks. Projects such as INFLIBNET, DELNET, and CALIBNET making use of facilities provided by INDONET and NICNET have been designed and made operational. Networking and resource sharing concept is being seriously pursued in the development of information services and products at different levels. The *organising principle*

behind this growth appears to be optimum and effective use of available resources for societal development. In this context, the progress achieved by DELNET and INFLIBNET is considered significant.

3.4.2 Future Directions of Growth

The perspective of information institutions discussed in the earlier sections of this Unit, indicates the manner in which these institutions grew. The growth has been uneven, and not necessarily based on a well drafted plan. This situation needs to be rectified through a well-thought-out National Information Policy, which provides guidelines relating to *priority areas* for developing and fostering information institutions in the country. It is needless to emphasise that these institutions should have flexible structures which will enable them to meet the changing needs of the emerging information society and the new *competitive era*.

It may be mentioned that the strategies and approaches for institution building vary from country to country in accordance with its own environment, requirements, priorities and the level of existing institutions. In fact, the perspective mentioned earlier is meant to serve precisely this purpose. Information institution building is a complex process. It involves men, material, machinery and money which should be managed for obtaining optimum results. Of the components essential in institutional building manpower is considered to be the most complex and difficult component.

Human resources that operate the institutions are primarily responsible for the success or failure associated with them. It is human resources that provide leadership, technical skill, managerial control and evaluation of performance of any institution. Such manpower need to be built up systematically. Many factors need to be considered in manpower building.

The main objective should be to build a cadre of information scientists and technologists with diverse specialisation and skills, operating with cohesion to organise and offer high quality information services. Constitution of a National Manpower Consortium for Information Professionals would enable such a task. The consortium should formulate a unified approach that would enable the formation and sponsoring of research projects on manpower development studies. If such measures are taken well in time, the manpower needs of the newly established institutions could be taken care of. The consortium should be a representative body comprising members from information institutions, applied manpower research institutions and professional associations etc. The National Knowledge Commission may also be approached for its advice on the matter. The above suggested steps if implemented would lead to the establishment of effective information institutions in the country.

3.4.3 Role of Information Institutions in Knowledge-based Economy (KBE)

In the foregoing pages, we have learnt about a range and variety of information institutions existing in India. However, we have not attempted to know how far these organisations are prepared for their role in new competitive era, called Knowledge-based Economy (KBE). We do not find case studies assessing the preparedness of Indian information institutions reported in the literature. However,

on studies conducted elsewhere, some *performance indicators* which might prove helpful as parameters for such studies are presented in the following paragraphs.

The parameters are:

- Organisational restructuring: these include
 - i) Reorienting the structures according to markets, products or processes;
 - ii) Becoming flatter and more flexible;
 - iii) Relying more on informal communication; and
 - iv) Creating flexible work groups.
- Expansion in roles and functions
 - i) IT specialists
 - ii) Trainees / educators
 - iii) Negotiators
 - iv) Filters
 - v) Navigators
 - vi) Knowledge managers.
- New initiatives in products and services
 - i) Development and / or involvement in the Intranet
 - ii) Customisation and development of databases
 - iii) Design of websites, web pages and interfaces
 - iv) Introduction of push-technology-based services
 - v) Creating and launching of knowledge products.
- Strategic alliances and networking
 - i) Enhancing internal communication
 - ii) Strengthening networking
 - iii) Building new partnerships
 - iv) Expanding external relations.
- Effective user liaison mechanisms
 - i) Redefining user groups
 - ii) User consultation and defining information needs
 - iii) Refocusing newsletters
 - iv) Initiating, briefing and online delivery of hot news.
- Creative use of out sourcing of operations
 - i) Procurement of information materials
 - ii) Processing operations and services
 - iii) Automated delivery of documents
 - iv) Portals

Case studies must be conducted taking Indian information institutions as *bases* to assess their preparedness for the KBE using the above listed parameters. The new facts that such studies reveal will form the premise for revamping these organisations and making them relevant to the new era.

Self Check Exercise

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

6) Explain the growth and development of Information Institutions in India.

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3.5 SUMMARY

This Unit emphasises the significance of institutions in modern society specially that of information institutions. In the absence of latest studies on the subject, the report entitled *Into the Information Age* is found helpful in delineating the contents of the Unit. The *three modes of information transfer* with important features associated with *three eras* have been briefly discussed. The basic characteristics relating to different types of information institutions emphasising their specific role in the process of information dissemination have been explained. The impact of non-traditional institutions such as information broker, etc. and new emerging concepts like *information filters*, *human networks*, *knowledge mediators*, *technological gate keeper* on information flow among researchers and dissemination to user community has been explained in simple language. The Unit also briefly discusses *disintermediation* and *end-user empowerment* phenomena as new trends which initiated a professional debate relating to the need and relevancy of services of information specialists in the changing environment. The Unit concludes by emphasising the role of information institutions and their paradigm shift to meet the new challenges posed by Knowledge-based Economy (KBE). Some suggestions relating to the future direction of growth of information institutions in India have been included in this Unit. It is hoped that the information provided in the Unit will be found helpful to the candidates pursuing the BLIS Programme.

3.6 ANSWERS TO SHELF CHECK EXERCISES

1) The growth pattern of Information Institutions has been described under *three* basic modes of information transmission. Each mode follows a different value system. These have been categorised as:

- i) The Disciplinary Information Transfer corresponding to the value system of pure science, academic and basic research called Era I;

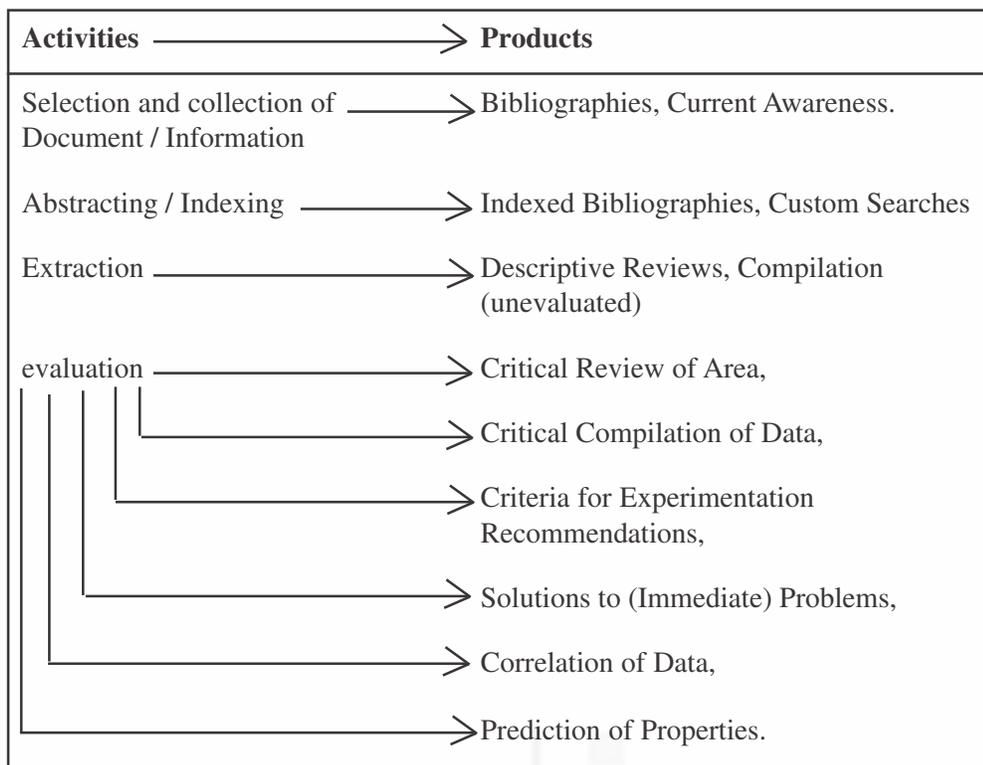
- ii) Mission Oriented Information Transfer corresponding to the value system of government sponsored missions (such as AEC, NASA in the 1960s) called Era II;
- iii) Problem-oriented Information Transfer corresponding to the value system of solving societal problem called Era III.

In the present context networking and resource sharing concept is given importance in the development of information services and products at different levels through various institutions. The main organising principle behind this new pattern appears to be optimal and effective use of available information resources for solving complex societal problems related to development. Efforts towards designing Institutions using enabling technologies which will be successful in delivering information support to the emerging Knowledge Society and in achieving Knowledge-based Economy (KBE).

- 2) The last decade of 1990s has witnessed many changes. Organisations are no more considered as *production-oriented entities*, divided by functions such as human resource management, accounting, R&D, and marketing service, etc. According to management experts, modern organisations are *flexible structures* characterised by geographically dispersed work-force in which client oriented terms based around organisational process act independently to fulfil the objectives and goals of the organisation.

Many adjectives have been used to describe the new millennium organisations. For example, one of the descriptions conceives it as a *Knowledge-based* organisation in which the knowledge of the employees is the *primary asset*. Another perception of a new millennium organisation is that it will be a *learning organisation* in which the individuals, teams, and the organisation itself continuously learn from the environment and from their activities, and act on what they have *learnt*.

- 3) There are different categories of Information Institutions. Of these, the popularly known types are: Libraries, Documentation Centres, Information Analysis Centres and Data Centres, etc. Apart from these traditional institutions referral Centres and Clearing Houses, and many *deinstitutional* information services came up lately. Libraries - public, academic, governmental and special provide the only means of access in our society to any book, journal or document that is out of print or more than a few years old. Most foreign books and journals and specialised documents which are not obtainable at all through normal trade channels are acquired and preserved by libraries. Documentation Centres are basically for specialist users in the field. These are organised at local, regional and national levels in the country. Information Analysis Centres not only disseminate and retrieve information, they create new information. Data Centres collect, control, codify, organise and retrieve data for users.
- 4) The main activities and products of an Information Analysis Centre are represented by means of a table indicated below:



- 5) Technological developments have influenced the services provided by libraries and other information institutions. Many commercial services aimed at end-users have come into being. The introduction of more user friendly services and the introduction of CD ROM data bases enabled end-users doing their own online searches for information. This growth was rather slow and did not pose a problem to information professionals. All of sudden, the information specialist is confronted with a changing social and working environment. This situation is triggered by the advent of the Internet. More and more people who have access to computers and get connectivity to the Internet are in a position to access information. This situation enabled end-users to perform their own information searching. Thus, *disintermediation* and *end-user empowerment* have become *buzzwords*.

Disintermediation relates to the finding of information by an end-user without a need for a third party. As applied to libraries *disintermediation* means diversion of information from centralised physical repositories to alternate sources available directly through computer networks.

End-user empowerment refers to the end-users having access to information and having the necessary skills to retrieve their own information according to their own needs – in other words, they can do it on their own. With *empowerment* they should be less dependent on information specialists. This, however, does not mean that the information specialist as intermediary will become obsolete. This is because not all end-users will have the time or interest to conduct their own searches.

- 6) The growth of Information Institutions can be discussed on the analogy of *Three Era Framework*. It may be observed that in India, *Era-I* institutions such as Libraries, Documentation and Information Centres, R&D institutions, government and public sector organisations have come up in large numbers.

Initially, these institutions functioned in isolation without any sort of coordination. On the other hand, the institutions established during 1950s and 1960s fulfilled the exclusive information needs of mission-oriented organisations like CSIR, ISRO, ICAR, and Atomic Energy Commission. These efforts may be likened to Era-II organisations.

From 1970s Institutions like small Enterprises Documentation Centres; Documentation centres attached to CSIR Laboratories gave rise to specialised information centres which provided information support to problem solving type of research activities. Public sectors enterprises like BHEL, CMTRI, SAIL and private sector industries like Bharat Electronics, Tata research Institute, RANBAXY, etc. also developed their own specialised information cells.

In 1980s the government encouraged modernisation of information systems in a systematic and in a more organised manner utilising modern technologies. As a result, national information systems like NISSAT (now discontinued), ENVIS, and BTIS etc. were developed. Networking and resource sharing concept using modern ICT is being pursued seriously. These developments enabled India to take a forward leap into the Knowledge-based Economic era.

3.7 KEYWORDS

- Development** : Process of differentiation of activity (ies).
- Disintermediation** : Relates to the role of the *intermediary* in acting between information (and other products) and its end-users. In other words, it is the finding of the information by an *end-user* without the need of a third party.
- As applied to libraries, disintermediation means the diversion of information from centralised physical repositories to alternate sources available directly through computers and computer networks.
- End-user Empowerment:** Refers to end-users having access to information and having the necessary skills to retrieve their own information according to their own needs – in other words, they can do it on their own. With empowerment, they should be less dependent on information specialists.
- Era** : Period of history.
- Evolution** : Process of organisation by development.
- Growth Pattern** : Process of increase in size and number with some consistency.
- Information Broker** : An individual of a firm, who, on demand, seeks to answer questions using all available sources and who is in business for profit.

- Information Filter** : An essential mediator between information sources and their users.
- Information Institution:** An institution which normally performs the activity (ies) related to the knowledge / information transfer.
- Information Manager Network** : Network consists of a group of information managers each of whom is assigned information responsibility for a specific technical division while remaining organisationally linked.
- Information Transfer** : A chain of activities, the main link being information 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.
- Intelligent Agents and Push Services** : Sometimes called *bots* (and information industry *know bots*) are persons who assist user in document access and delivery.
- These agents take query from a user and act on his/her behalf to find a solution. They form the part of the *portals* infrastructure. Typical example is the *Shopping bot*.
- Invisible College** : An elite of high performing scientists who has an informal network of scientific communication and the published literature.
- Knowledge Mediators** : Persons or libraries who provide users with insight into the existing body of knowledge and assist them in acquiring resources referring to or containing such knowledge.
- Technological Gatekeeper** : Expert both internal and external communication star, having much higher incidence of exposure to the professional literature, attends more conferences and has more professional affiliations.

3.8 ACRONYMS USED IN THE TEXT

AEC	Atomic Energy Commission
CDRI	Central Drug Research Institute
CFTRI	Central Food and Technological Research Institute
CMTRI	Central Machine Tools Research Institute
COSATI	Committee for Scientific and Technical Information
CSIR	Council of Scientific and Industrial Research
DRDO	Defence Research Development Organisation
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research

ISRO	Indian Space Research Organisation
NASA	National Aeronautic Space Agency
SAIL	Steel Authority of India Limited
STSI	Scientific Technical and Societal Information

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