Chapter -I
Introduction
CHAPTER - 1

Introduction

Data, Information and knowledge are often used synonymously though there is difference in their meaning. Data piece of information, data is unorganized piece of facts. When this data is organised to convey a meaningful message, it become information. Knowledge is the totality of what is known.

Information originates from an idea that creeps in the mind, as a result of observation. These ideas/ facts when organized or processed to convey significant meaning about something, is information [1]

Sources of information

Since the beginning of civilization, people have looked for ways to record, share, and distribute information. People once kept their records on such materials as bone, clay, metal, wax, wood, papyrus, silk, leather, parchment, and paper, in more recent time film, optical, and magnetic media have become more popular as storage information.

In ancient time

Stone and Clay: - From the earliest time man has tried to preserve his thought for the coming generation samples of Egyptian in pictographic Writing known as hieroglyphic were found in building stones dating back to 3000 or 4000 B.C. since writing on stone was replaced by clay writing has been called cuneiform.

Papyrus comparatively better communication media replaced the clay tablets.

b) Papyrus: Papyrus was made from the stem of plants growing in the delta of the river. Its stem was cut into strips, which were placed across each other with their fibers running at right angles. The fibers were immersed in water, lamination and then dried in the sun. The writing on these sheets was done with a pigment.

c) Silk and skin: The papyrus plant was grown in certain geographical areas only. In the third century B.C. the Chinese started using cloth
material to write upon. Camel hairbrush was used for writing purposes. Since cloth was too costly to be spared for writing; parchment and Vellum replaced papyrus as the recording medium. They are prepared with lime, which gives them smoother surface.

d) Leaf and bark of tree: In South India the leaf the Palmyra palm tree was used for writing purposes. In North India, the inner bark of the brick tree was used for this purpose. Chinese used wooden strips for writing.

After paper and printing

Before the advent of paper, information was communicated through above media. Ts'ai Lun invented paper in 105 A.D. Since writing on the wooden strips were difficult and the use of cloth was expensive, paper a wonder writing upon material was developed.

a) Gutenberg’s printing: In 1440 A.D. Gutenberg invented printing from movable type. The combination of paper and the printing press has probably done more to preserve man’s accomplishments than any other single human achievement. In brief, paper and printing have joined hands together to give documents, the source of all information.

b) Towards Document: Knowledge per se is an abstract entity. Until or unless it is embodied in some physical carrier, it cannot easily be handled, preserved and disseminated. Through the nature and physical shape of knowledge carriers, called documents have changed pari passu. With the technological advances of society, documents have remained a major means to record preserve and disseminate knowledge. This has been true since the invention of the alphabet and more so since the discovery of portable writing surfaces.

Information is power and it is contained in documents in the form of kinetic Power the documents contain the wisdom of sages, experiences of philosophers and the discoveries of scientists. [2]
Documents are an embodied thought. It is a record of work on paper or other material for easy physical handling, transportation across space and preservation through time. It is the material carries of knowledge through mankind for e.g. books, journals, thesis, report, pamphlet, and patent. [3]

According to oxford English dictionary, “information is an assemblage of data in a comprehensible form recorded on paper or some other medium and capable of communication”. [4]

Harrod’s Librarian’s Glossary and Reference defines “An assemblage of data in a comprehensible form capable of communication.”[5]

![Diagram 1 Nomenclature of sources of information](image-url)
According to **Dr. S.R. Ranganathan** has grouped knowledge containers into four categories, depending on their physical medium of recording, and size and mode of recording. However, information characteristics in documents have not been taken into account.

These four categories are as follows:

- **Conventional Documents**

  Under this group, he included the documents recording the information on paper by writing, typing printing or some near printing methods, e.g. Books, periodicals etc.

- **Neo-Conventional Documents**

  They include a new class of documents called micro-documents, such as patents, standards and specifications.

- **Non-conventional Documents:**

  This group includes documents, which are non-conventional in medium of recording shape and size, e.g. audio-visual material, microprints and microfilms.

- **Meta documents**

  Under this group Dr. Ranganathan included documents, which are produced by the direct recording of social or natural phenomena, using some instruments e.g. photographs.[6]

**Habban** categorized the documents as:

- **Primary** includes books, Journals, reports, patents, thesis, trade literature, standards.

- **Secondary** Abstracting and indexing journals, citation indices, subject bibliographies, reviews and survey.[7]
**Dennis Grogan (1982)** has grouped information sources into two types: -

- **Documentary (Primary, Secondary and tertiary)**
- **Non-documentary**

**Documentary Sources**

This category requires a physical medium to record the information. It has been further grouped into following three sub-categories.

i) **Primary Sources:** - There are the sources of original investigation representing new knowledge or new interpretation of old knowledge such a literature is difficult to locate and is known to contain original, unfiltered, unorganized and scattered information which may be available in a variety of published or unpublished forms, such as periodicals those devoted to original research only, research reports, conference proceedings, official publications, patents, standards, trade literature, theses and dissertation, etc.

ii) **Secondary Sources:** - These sources repackaged the originality existing knowledge from primary sources. They are well-organized sources, arranged according to some conven artificial plan of arrangement depending on their possible use. Examples of such sources are indexing and abstracting periodicals, review of progress, reference books, treatises, monographs and textbooks.

iii) **Tertiary Sources:** - This group includes sources which compile information, collected from primary as well as secondary sources; e.g. directories and yearbooks, bibliographies, guides to literature, lists of research in progress, guides to libraries and sources of information and guides to organizations etc. All the sources listed above take the form of physical documents.
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Introduction

ORGANISATION
OF SOURCES OF
INFORMATION

PRIMARY

SECONDARY

TERITARY

LITERATURE
SEARCH

Diagram-2 Showing the structure the sources of information

Non-Documentary Sources

This group requires no physical material for embodiment of knowledge. These sources form substantial part of communication especially in science and technology. These sources provide information, which other sources do not. Further it can be divided into two kinds, formal and informal. [8]
Krishna Subramanyam (1981) under “the structure of scientific literature’ has categorized the documents into three categories primary, secondary and tertiary, same as given by Geogan.

Gray Literature

“Grey Literature” is that literature in the libraries which is neither “white” (available catalogued, classified) nor “black” (not available, unknown, not obtainable secret) “Grey literature” is dynamic in nature, as it will constantly change, has used sources would be left out while others would be included. [9]

According to David Wood, “It is literature which can not be readily obtained through normal book selling channels”. It is sometimes referred to as non-conventional, informal, ephemeral, invisible, fugitive, unpolished and not commercially available literature.

PRIMARY DOCUMENTS

Periodicals

Publications appearing at regular or irregular continuity are known as periodical or serial publications. The synonymous terms used are the journals or magazines, though these have different connotations. One common feature of these publications is that these are not one-time publications like books. It is a different matter that books have reprints or new editions.

Serials- Serials contain more recent facts and opinions than books, which often take several years to be published. Contents of serials may include articles, letters, statistical data, news items, books reviews, job advertisements etc. Serials fall into five main types:
<table>
<thead>
<tr>
<th>Newspaper type</th>
<th>Contain news items, job advertisements and some longer articles, e.g. ‘New Scientist’, ‘New Society’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Journals</td>
<td>Deal with company profits, production figures, imports and exports, personalities, etc. for a particular trade.</td>
</tr>
<tr>
<td>House Journals</td>
<td>Produced by firms for the benefit of staff and customers. Usually free, they are generally of limited value although they do contain current information about the company.</td>
</tr>
<tr>
<td>Learned society journals</td>
<td>Aimed at members of the profession or learned society and not published for profit. High quality serious articles. Sometimes useful for job advertisements.</td>
</tr>
<tr>
<td>Learned journals commercial</td>
<td>Produced for a profit by commercial more spare publishers (e.g. Pergamon press) and often very expensive, contain serious articles.</td>
</tr>
</tbody>
</table>

**Research reports**- Research reports form a very important component of primary sources of information. Research reports are the unpublished reports of sponsored research. The contractor, or grantee, is usually required to submit periodic reports to grantor (government, academic or industrial) regarding the progress of his work. These reports are not printed initially in any periodical rather they are duplicated for distribution either on request or to a mailing list. They are frequently issued in series, each containing a single report or review.

**Conference Literature**- Presentation of papers at local, National, and International conferences has been one of the most important methods of disseminating scientific information. Nascent R&D information can be communicated more rapidly and directly through conference papers than through papers published in journals on the average, papers are presented at national conferences about one year prior to their publication in journals. Another advantage of the conference paper over the journal article is the possibility of obtaining immediate feedback from the conference participants in the form of questions and comments following the presentation of the paper. Conferences also provide additional opportunities for non-formal communication and for developing and strengthening personal contacts with other scientists engaged in similar pursuits. [10]
Patents- A patent is “a government grant of exclusive privilege of making or selling new invention, process, so protected”. In other words, patent is granted exclusive rights to operate the process or use the product for the limited time period and have the sole right for the monetary gains.

Patents are also a very important source of primary information. They contain the information about new discoveries and inventions. This is not generally published in any other form or in accepted printed media. They contain the information about new discoveries and inventions. Scientists and technologists to gather information and knowledge about the quality of a product, of materials of engineering and technology and of methods of testing, frequently use them.

Patents are granted for new inventions and discoveries, including processes, machines, manufactured items etc. patent specifications are being published so rapidly throughout the world that they are on the verge of replacing conventional science- technology journals as sources of information on new ideas and latest developments.


Standards. The need to measure up to a certain level of quality and efficiency in products and services is felt both in the public and private institutions. Standardization was initially done only of material commodities but later considered for services and procedures of all kinds. The awareness to maintain high quality and technological developments has helped to access durability and performance levels.

The standards are a type of government documents and generally comprise of two or three pages. They make an important segment of the collection of special libraries being core documents for products and services. E.g. Handbook of ISI Publications, New Delhi, Indian Standards Institution, 1968.

Specification- They are usually purchase documents that contain descriptions of technical requirements for a product, material, process, or service, which are designed to meet purchaser’s particular needs. They consist of specific description by applicant of patent, about the preparation and use of his invention.
In particular cases or in subject areas as survey, architecture, etc. where specific information is essential, these documents play very vital role, they are formulated and standardized for uniformity and reliability, which is the only one of its kind, thus constituting a primary source.


Research Monographs- Research monographs are "separately published reports on original research that are too long, too specialized, or otherwise unsuitable for publication in one of the standard journals. Each monographs is self-contained frequently summarizes existing theory or practice before presenting the authors original and previously unpublished work, and is likely to be one of a series of such research monograph in the same field. It is a short treatise it differ from the treatise in the sense that it is a work done on a more limited scale. E.g. Creativity and the prepared mind, by Ray Hyman (National Art Education Association research monographs, 1), Washington, DC, National Art Education Association.

Trade Literature- Information, which is in the form of product catalogues, information on processes and materials, guides, manuals, house journals etc. the main purpose of which is product advertisement is also a source of primary information. This literature provides technical information about products or materials offered for sale by the manufacturers. These materials form an integral part of special libraries, as the details regarding the usage of the product or similar information can be found only in them. In the present day context, they have a greater value, as with the advancement in science and technology; we are moving towards a mechanized community. In this case, the use of modern appliances, their utility and similar technical information can be of great help not only for the specialists but also for general users.

Theses and Dissertation- Another important category of scientific communication is the postgraduate/M. Phil dissertations and doctoral theses submitted to universities for the award of degrees. They are valuable and primary sources of research results, reporting the original research work in specific fields. These sources yield invaluable amount of unpublished information in a specific area of research. These works often remain
unpublished. Since these sources are the result of original research produced by the academic institutions, they do not appear in any trade or national bibliography. Their existence as well as information contained in them generally remains unknown.

Pamphlets- In special libraries pamphlets have been regarded as indispensable sources of current information, which may not be available from any other source. Unlike a book, a pamphlet is a document running into less than 50 pages; usually available in stitched or stapled form generally, contents given in such services are descriptive in nature. Due to its physical format and importance, such material is maintained separately forming an important component of special materials available in special libraries. However, such material has not been usually found useful in other types of libraries; Therefore, it is not maintained by them. Advertising literature, inaugural/convocation addresses, keynote addresses, speeches of high profile personalities are usually available in pamphlet form for distribution in functions.

SECONDARY DOCUMENTS

Secondary sources of information are published for achieving the bibliographical control of the literature. Secondary sources site primary sources of information and assist the user in locating primary sources of information. Secondary sources of information includes as.

Periodicals- All periodicals do not report original work. There are a number of periodicals, which specialize in interpreting and providing opinions on developments reported in primary sources of information. Such periodicals may be considered as secondary periodicals for example, New Scientists, edited by Bernard Dixon, London, IPC Magazines, 1956, weekly.

Indexes- An index to a work contains an alphabetical list of names, topics, places, formulae, and titles of any significant item referring to material presentation in the main part of the work. A well-compiled index adds to usefulness of a work. For example American economic association, index of economic journals, Homewood, iii, Irwin, 1961-62, 5 vol.
Bibliographies- A bibliography is an original list of primary or other sources usually arranged alphabetically by author, or chronologically or topic wise. It may be comprehensive or selective. The basic aim of a bibliography is to assist the user in locating the existence of an identifying book or any other material, which may be of interest to him. A well-prepared bibliography provides a definite coverage of documents over a period of time within specified limits. It also serves the purpose of retrospective searching of literature. For example, *ASLIB BOOK List monthly list of recommended scientific and technical books with annotations*, London, ASLIB, Vol. 1, 1935-Monthly.

Indexing Periodicals- An indexing periodical is regarded as an important secondary source of information. It acts as a guide to the recorded information. With the increase in literature in different subject areas immediate access to all published material becomes an impossible job. So, with the help of indexing periodicals published at regular intervals, it is possible to get an idea of the published material and pinpoint the documents required by the users. It saves the time and labour of the scholars who may utilize their valuable time in further research work. For example, *index Medicus*, Washington, Carnegi Institute, 1879.

Abstracting Periodicals- Abstracting Periodicals cover a large number of periodicals on the subject and its related fields, irrespective of language. They provide modern libraries with ample facilities to collect and disseminate information on articles published in a wide range of periodicals, all of which cannot be possessed. An abstracting periodical is a regularly used compilation of concise summaries of-

(i) Significant articles that appear in current primary source journals.

(ii) Important new research monograph reports, patents and other primary source publications in that field.

As these periodicals help the scholars to decide whether they have to read a particular document or not, they are liked and used by them more frequently. They have become a very important reference tool for research scholars as they help in
avoiding time lag and duplication of work. For example, Chemical abstracts (SM), Washington, American Chemical Society, and Vol.1. 1907.

Reviews of progress- A review is a survey of the primary literature. It aims to digest and correlate the literature over a given period. A review provides background information to a new problem in a suitable form and serves as a key to literature. It also indicates the developments and trends in the field concerned.

Usually reviews of progress are published annually, in which information is broken up into easily manageable parts, and then separate articles on them are written along with bibliographical details. There are some reviews, which are collection of papers presented at conferences. They form a good secondary source of information in assisting the users to acquaint them with the developments, in a subject area. For example: Annual review of biochemistry, 1932-, Palo Alto, Annual Reviews, Annual.

Treatises- A treatise is a comprehensive compilation or summary of information on a subject, a treatise on a subject provides enough information to a person to acquire basic knowledge, so essential for carrying out advanced research.

For example, Treatise on the calculus of finite differences, 4th Ed, New York, Chelsso, 1960

Monographs- A research monograph may be defined as “separately published reports on original research that are too long, too specialized, or otherwise unsuitable for publication in one of the standard journals. Each monographs is self contain frequently summarizes existing theory or practice before presenting the authors original and previously unpublished work, and is likely to be one of a series of such research monographs in the same field. Its scope is narrower than that of a treatise and embodies result of seminal research”

Books- A book is a physically independent document other than a periodical publication, that is, it has been completed or has been intended to be completed in a definite number of volumes. It is a macro document. As per the norms of UNESCO, a book should have at least 49 pages, 22 to 32 cm height and 1.5 to 4 cm thickness.
Books further may be divided as

a) Textbooks

A textbook is a book of instruction. Its primary aim is not to impart information about a specific subject but to enable one to develop proper understanding of the subject. It cannot be comprehensive often presentation is colorful and attractive, giving plenty of illustrations and diagrams. For example, *A textbook of crop production*, by P.C. Raheja, etc. Bombay, Asia, 1873. [11]

b) Reference Books

A reference book as defined by the *American Library Association’s Glossary Terms* is “a book designed by its arrangement and treatment to be consulted for definite items of information, rather than to be read consecutively and it is a book whose use is restricted to the library building”. [12]

Gates says, “A book which is consulted for aid or information on a topic, a theme, an event, a person, a date, a place or a word is a reference book”.

Reference books are consulted only for specific information. These are the sources of ready reference. The organization of information in a reference book is motivated for quick and easy use, which is either alphabetical or in chronological order, or skillfully affected by the use of detailed indexes and copious cross references. [13]

Reference books include as follows

(i) *Encyclopedias*- These works attempt to deal with the whole of knowledge (general encyclopedias) or a section of knowledge (subject encyclopedias) by means of series of articles. The arrangement is usually alphabetical by subject. The contents may include articles, bibliographies, illustrations, maps and a gazetteer. The encyclopedias may be approached through the index, which sometimes forms a separate Volume. Encyclopedias are particularly useful; as starting points for projects or literature searches.

(ii) *Dictionaries*- Dictionary Provides information about words (spelling, meaning, derivation, pronunciation, usage etc.)
There are two main types

a. Inter-language translating dictionaries

b. Single language dictionaries containing definitions of words.

(iii) **Yearbooks and Almanacs** - A Yearbook is an annual compendium of data and statistics for example, who’s who; Europa Yearbook etc.

(iv) **Biographical sources** - Among the biographical sources, biographical Dictionary is more important for example, Webster’s Biographical Dictionary, Sen’s Dictionary of National Biography, etc.

(v) **Directories** - The ALA Glossary of Library Terms Defines a directory as “a list of persons or organizations systematically arranged usually in alphabetical or classed order, giving addresses, affiliations, etc., for individuals and addresses, officers, functions and similar data for organizations”.

(vi) **Handbooks** - A handbook is a compilation of miscellaneous information in a compact and handy form. It contains data, procedures, principles etc. Tables, graphs, diagrams and illustrations are provided. For example, *Handbook of chemistry and Physics: a ready reference book of chemistry and physical data, 52nd ed.*, Cleveland, Ohio, Chemical rubber, 1971.


(viii) **Tables** - Many of the handbooks contains data in the form of tables. Tables are a convenient form to present data. (e. g. density, melting points, atomic weights, boiling points, reactions, etc). These are extremely useful in science and especially physical sciences and technology For example. *Tables of Constants and Numerical data* Oxford, Pergamum press, 1947, vol.1.
(ix) **Translations**—Translations are an important part of secondary sources. Their characteristics are the same as those of primary or secondary or tertiary sources from which these are translated.

**Tertiary Documents**

Tertiary sources of information act as a guide to the secondary and primary sources of information. They indicate towards the information contained in primary and secondary sources. Tertiary sources of information contain information distilled and collected from primary and secondary sources. The primary function of tertiary sources of information is to aid the searcher of information in the use of primary and secondary sources of information. Out of various kinds of sources, tertiary sources are the last to appear.

Following are the kinds of tertiary sources.

**Bibliography of Bibliographies**

A bibliography of Bibliographies is that which direct readers to useful bibliographies through subject, name of an individual/place/institution etc. As the number of bibliographies published every year is large therefore Bibliographies are highly selective in nature.

For example: *Bibliographic Index*, cumulative bibliography of bibliographies, 1937-, New York, Wilson, 1938.

**List of Research in Progress**

List of research in progress covers the research activities of a single institution or laboratory, a group of institutions, e.g. Universities or research – in – progress, within a specified subject. It consists of a short description of projects, name(s) of investigator(s), period of investigation, name of finding agency, and in some cases, reference to sources of publication of results or results likely to be published.
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This list has its importance as it helps in planning of research, avoidance of duplication and above all, in the anticipation of information. For example, *Current Research Projects in CSIR Laboratories, New Delhi, INSDOC, 1976.*

**Directories**

A directory is a list of names and addresses of persons, organization manufacturers or periodicals. The word ‘directory’ may or may not appear in the title for example, *World directory of Mathematicians, 4th ed. Stockholm, Alinquist and Wiksell, 1970.*

**Guides to Literature**

A guide to literature assists a user to use literature of a specific subject. It helps to evaluate and introduce literature. It lays emphasis on literature rather than the content of a specific subject. For example, *Readers’ guide to the social science,* edited by Bert F. Herllitz, revised edition, New York, Free Press, 1970.

**Non-documentary sources of information**

**Consultants**

A consultant is a professional who provides advice: usually on payment basis. There are various categories of consultants such as legal consultant engineering consultants, consulting physician and so on. In the case of litigation, we take the advice of a legal consultant. *For setting up an air conditioning plant for an office building, a cinema hall, etc.* we consult an engineer who is an expert in the matter. For our ailments, we consult a physician. In all cases we are to pay fees fixed the consultants.

**Experts**

An expert is a person who possesses sound knowledge on a subject technique, and so on. On many occasions we need their help. For example, for appointing information scientists in an organization, we setup an interview board comprising experts. They interview the candidates, judge their suitability for the post, and finally choose the best candidate depending on his/her knowledge, skill
qualification and experience. For classifying a book, many a time a classifier cannot decide the subject. In such a case, he/she usually takes the help of an expert who knows the subject.

Technological Gatekeepers

A technological gatekeeper is a well-informed person in a particular field. Usually, some scientists, technologists, and professionals in business, etc. have got a tendency (possibly an inborn) to acquire information from various sources, to keep himself/herself abreast of the development in the field, and disseminate the information to the person or group who may be interested in the information. There is no formal course to train a person as a technological gatekeeper. Almost automatically, they grow into a technological gatekeeper. [14]

According to 'Zagnoli (Internet 2) a technological gatekeeper should have:

1) 'Technical authority, a high standard of technical and scientific professionalism and a high level of verifiable performance (scientific publications, congress communications and internal relationships, etc.);

2) A formal role in the organization (often gatekeepers are coordinators of groups or project managers) a proponent and constructive attitude to the general problems of the business, and

3) An open and interested attitude to innovation problems and to discussion with colleagues'.

Invisible College

In reality, an invisible college is not a college, Around 1645 a group of persons interested in natural philosophy and other parts of human learning started meeting secretly at Gresham College or elsewhere in London under the name of the invisible college’. In the meeting, they used to discuss about their research activities, results obtained, new areas that can be researched, and so on. The practice continues today, of course, not in secret but in open meetings like national and international conferences where scholars belonging to the same discipline get acquainted with each other, come to know who is doing what, and
discuss their areas of research, problems they are facing, latest findings, and so on. This acquaintance many a time turns into friendship and that continues when they exchange their reprints, correspond with one another through letters, talk over the phone, and so on. In this way, nowadays-invisible colleges are formed. Hence, we can now define an invisible college as a loosely formed association of like-minded people who come together to share their experiences and knowledge.

Organizations

Organizations are also important sources of information. There are different categories of organizations and they provide different types of information. Information provided by an organization is generally considered to be authentic. Here we are going to discuss about the following categories of organizations highlighting the various types of information that these agencies can provide.

International Agencies

These agencies can be broadly categorizes into two groups international and regional. The United Nations, UNESCO, F/O WHO, etc are the examples of international organizations. On the other hand, Asian Development Bank (ADB), South Asian Association for Regional Cooperation, (SAARC) etc, are the examples of regional organizations. All these agencies generate as well as gather information from various sources and then disseminate by placing the information on the Internet. Bringing out various publications and other means for examples, UNESCO gathers data from various member countries of the world on education, science and technology, culture and communication. Basing the data, statistical tables are compiled and published in the form of a book called UNESCO Statistical Yearbook a very important source of information on the subjects. Similarly, Asian Development Bank gathers socioeconomic data from more than 40 developing countries and publishes key Indicators which are also available online.
Research and Development (R&D) Organizations

Research laboratories institutions, etc generates information through research. This information is published in the form of research papers, short communications, etc. whenever a scientist receives national or international award, media people flock to the organization where the scientists are working to gather more information. The biographical data, service profile, correspondences, photographs, laboratory notebooks and much other information about scientist can be obtained from an R&D organization.

Academic Institutions

Universities, colleges, polytechnics, schools, etc are academic institutions. These institutions furnish information as to the number of courses they run, syllabus, duration, fees, faculty members, etc of each course. They also keep substantial information for each student comprising his/her date of admission, date of leaving, results of various examinations performances in sports, and so on. Information about the teachers is also available with them. Sometimes photographs of students, teachers and other staff are also available with them. Hence, for collecting biographical material, these institutions provide a lot of help.

Libraries and Information Centres (LICs)

We all know from our experience and studies how LICs are functioning possibly as the most common source of information to all. Researchers, scholars, teachers, students, and even common men flock to the libraries for various types of information they need.

Information Analysis Centers

When we talk of an information Centre we mean an organization that provides information on demand. Suppose somebody wants information on the pros and cons about the construction of a dam at a particular place. The information Centre will supply news items and other information available on the dam as it is. It will not analyze, evaluate and synthesis the information. On the other hand, if the same
information is demanded from an information analysis Centre, it will select the relevant information from databases, Internet and other sources; acquire them, then classify them in such categories as: (i) favoring the construction; (ii) opposing the construction; and (iii) providing neutral view. At the next stage, experts will study the literature so classified and they will analyze, evaluate and finally synthesize the information sometimes with their own input. It is to be ensured that the information given is authoritative and substantially helpful in decision-making.

There are many information analysis canters in the world. The Carbon Dioxide Information Analysis Centre (CDIAC), for example, is the primary global change data and information analysis center belonging to the department of energy (DOE) of the United States. It attends to requests for data and information received from such users all over the world as are concerned with the greenhouse effect and global climate change [Internet 3]

Referral Center

A referral Centre is an organization that directs information seekers to appropriate sources of information such as libraries, information canters, and individuals that are likely to provide the information. A referral Centre usually does not supply information or documents.

Newspaper Clippings

Newspapers are the current source of information on events topics and other matter. An important service of any special library is to collect news items related to the institutions activities for reference. These clippings may be stored for further contributions in the form of ready reference.

Reprints

Latest information or material available in journals can be had in the form of reprints. They also constitute a good source of information especially in research or scientific libraries.
Non-Conventional Sources

Besides the documentary and non-documentary sources, there is prevalent feeling that new mechanism is needed to make information more readily accessible and that better techniques are needed to channel it to the ultimate consumer. Thus there are a number of non-conventional sources, which are in machine-readable form. A few of them have been discussed below

Audio-Visuals

Audio-visuals form a separate class of documents, comprising of slides, discs, tapes, cassettes, gramophone records, video-records, motion pictures, etc. These sources record the sounds of visuals or both. Such sources help in listening the recording of original sound or see the recording of important events captured through audio-visual sources. Nowadays, all these sources are under greater use in education for teaching and learning programmes. Course material in the form of lectures or instructions is recorded and distributed among the students. UGC (University Grants Commission) and IGNOU (Indira Gandhi National Open University) are bringing out a large amount of educational material in audio-visual form. Depending on the form of documents, specific type of equipment is needed for their use.

Microforms

The microforms are the non-documentary sources of information, grouped with audio-visual material, as they require some device for reading. Microforms contain images of textual documents (originally available in paper), reduced by photographic techniques to the extent that they cannot be read with unaided eyes. It is translation of printed page. Microforms, comprising of microfilms, microfiches and micro-opaque cards are preferred for backsets of periodicals and newspapers. They are quite popular in special libraries because of,

(i) These are most economic as compared to hard copy.

(ii) Incredible space saver (up to 90 per cent), avoids the problem of shelving,

(iii) Compact, portable and easy to carry
(iv) Rare documents can be preserved more economically.

(v) Avoids binding problems

(vi) Can be duplicated easily like books

(vii) Durable, avoids the problem of mutilation and theft, which, otherwise, is a very serious problem for a library.

(viii) Far more easy and economical for mailing and transportation to far off distances.

Microforms are available in different varieties and dimensions. Therefore, different equipments are needed for their reading. Their reduction ratio varies as they come in various magnifications. They are prone to misplacement and their organization, storage and maintenance also require special environment conditions and care. However, due to availability of ICT, electronic resources are replacing microforms.

Databases

Today, Indian libraries have also crossed the barrier of traditional sources, as they have started collecting documents in electro-magnetic forms. Large numbers of publishers are, today, involved in publishing databases in various fields of knowledge, particularly in science and technology. Therefore, libraries have also started acquiring electronic databases, which have certain built-in advantages for libraries as well as for the users. In addition to large number of individual databases (e.g. Chemical Abstracts, Biological Abstracts, library and Information Science abstracts) some important commercial databases in the field of science and technology are: ABI/Inform, the INSPEC, Request Science and Science Direct. They provide access to a large number of bibliographic and full-text journals. Such databases (online as well offline) have been found very useful for providing various types of library services. Publishers offer sufficient discount to subscribers for their complete list of journals. New technologies do not change the basic nexus of information but rather help in extending users’ reach, crossing all geographical bounds.
Chapter 1

Introduction

Electronic Resources (e-resources)

Electronic publishing is slowly overtaking the print on paper. This new publishing medium has given scope for more efficient means of storage, maintenance and quick access from remote places. Under financial constrains, libraries need to concentrate on developing electronic documents and have an access to electronic information resources, using network facilities to serve the users in a more fulfilled way. Emergence of electronic resources has caused a shift in users' perception also. In the changing dimensions, it does not matter what you have but the important issue is to have an access to it. Evolution of electronic/digital resources, Internet sources and networked journals, etc. have changed the ways of collection development and seeking the information. Today, one can have seamless access to any information from anywhere anytime crossing all the geographical boundaries, provided basic infrastructure is available. All these developments are leading to the emergence of digital libraries, electronic libraries or virtual libraries in a parallel way. In the present scenario, users are seeking a one-stop shop to satisfy their information needs. Electronic documents can meet the instant desire of users to have an access to information. Users do not wish to wait for weeks for requested documents to arrive.

Today, various types of electronic resources are available. Some of them are discussed briefly in the following sections.

(a) Electronic Journals

Publication of electronic Journals (e-journals) has led to the development of new opportunities to deliver information to the researcher community at a much faster rate. Electronic journals started publishing in 1990s, later followed by electronic books. These are available on optical discs, over networks or in any other electronic form and are read electronically. Electronic publishing has considerably reduced the problem of time-lag between the submission of an article and its publication, as in such journals, writing, editing, refereeing (peer reviewing) and distribution is carried out electronically over telecommunication networks without involving any paper intermediaries. Revision and submission of
articles is much easier. The user-friendly packages help in reducing the tedious job of proof reading, thus reducing the time lag of publication [15]

Lee and Boyle (2004) the main objective of e-journals is to disseminate the nascent information among the end users as speedily as possible. Currently, most publishers offer electronic journals along with print versions, with free access to the electronic versions. Some charge 10-15 per cent extra for print plus electronic access. [16]

Tammaro (2000) suggests “the library could make available double the number of periodicals by changing the acquisition policy from ownership to access, with an additional cost of 15 per cent”. These developments have far reaching impact on acquisition practices of special libraries, which are now increasingly subscribing to full-text journals available online/offline (CD-ROM), in addition to having an access to network or consortia journals.

SOME FULL-TEXT E-JOURNALS

There are quite a number of digital libraries or digital databases for full text electronic journals. The popular ones are indicated here.

- **IEEE (Institute of Electrical and Electronic Engineers)** – regularly brings out 80 periodical publications. The journals are available online with back files right from the inception of each of the titles.[http://www.ieee.org/web/]

- **EBSCO**- Another popular database of journals which provides access to 600 titles of all disciplines, specialized service called “Pay per Exposure” is also introduced here by which one can seek access to relevant articles from some selected journals of current origin. The service will be delivered to the e-mail address of the individual. This is an economical means of getting access to full-text.[http://www.ebscohost.com]
• **Emerald Library** – covers 55,000 recently published articles from journals in the areas of management science and library and information science. The Emerald Library database is a popular one and widely accessed by researchers and professionals in the area of Management science and public administration.

[http://www.emerald.insight]

• **Science Direct** – Provides on-line access to 1200 core journals in basic sciences. It is said to be the widely used database of journals especially by the academicians and research in science disciplines.[http://www.sciencedirect.com]

• **Ingenta** – A popular site for variety of information/data/statistical details covering all most all-major subjects. It is said to have covered summaries of 25,000 publications and also establishes links to about 6000 full text journals of recent origin.[http://www.ingenta.com]

• **Medline** – a common site for on-line access to publications in medicine and allied disciplines. The database is also available on CD-ROM. The coverage is of 9 million of records/documents from 4000 journals. The database is managed and regularly updated. In fact, “Medline” happens to be the first on-line information retrieval system in the world started in 1962. During those days information used to be stored on micro-fiches as the optical laser technology was not there for CD-ROM diskettes.[http://www.medline.com]

(b) **CD-ROM Databases**

CD ROM (Compact Disc Read Only Memory) has become the computer industry’s preferred medium for software and multimedia contents distribution. This technology came into being in mid 1980s and became increasingly popular in 1990s A CD ROM with 4.72 inch diameter can store up to 640 MB of data, equivalent to 3,00,000 pages of text. This format is regarded very useful for the material, which is under very frequent use, such as reference materials like indexing/abstracting periodicals, encyclopedias, dictionaries, directories, etc.
Although the initial investment to use this technology is high but later on it is cost-effective as it offers unlimited access time facility to any number of users at no extra charge. Most CD ROM products work best on stand-alone workstation. It means that they are available within the library and not via the network. CD ROMs can run on local networks to be used by large number of users/libraries in a multi-user environment. On account of its immense potential, the demand and use of CD ROM technology is increasing day by day. Most of the special libraries are using CD ROM services either through stand-alone system or through networked services. Nowadays multimedia effects to provide better understanding of the contents supplement CD ROMs. Initially, these compact discs were able to 'read’ only but in 1990s various versions of CD ROMs, such as CD-R (compact disc record able or compact disc-writable) emerged with re-writable CD-RWs (compact disc re-writable) came to prominence at the end of 1990s. [17]

**Herther (1998).** These developments have made it possible to ‘write’ (save) also on CDs. CD ROM Review and CD ROM Librarian are standard selection tools for CD ROMs.

(c) **DVDs**

Digital Versatile Disc (DVD) is an optical storage device came after the emergence of CD ROM in late 1990s DVD can more easily store data in a variety of formats (video, audio, recording, etc) and looks the same as a compact disc. It can hold about 15 times more information and is capable of transferring it to the computer 20 times faster than CD ROM. On a DVD, both sides of the discs can be used to store data. Disc can be single layered or dual layered. Single layer single side disc holds 4.78 gigabytes of data whereas dual layer single side disc holds 8.5 gigabytes of data. Double side disc has doubled the storage capacity. Therefore, dual layer double side disc can hold 17 gigabytes of data. Its application is primarily in entertainment sector for watching movies. It can cover four hours of move on one side. Double-sided DVD has much higher capacity. When compared to CD ROMs, DVD allows for better graphics, greater resolution, and increased storage capacity, because of its phenomenal storage capacity. It can store the
complete back files of large bibliographic databases, such as ERIC and MEDLINE on a single disc. [18]

Scammel (1997) Like CD ROMs, various forms of DVDs have also emerged, such as DVD-R (write once read many) having 3.9 GB capacity and DVD-RW (rewritable) with 3 GB capacity.

(d) E-Books

E-books constitute the latest fashion in the world of paperless digital media. They are available on CD ROM and Internet for some time. E-books can be read on a personal digital assistant (PDA), desktop or laptop computer. E-books are the paperless portable computerized devices, which are far more expensive than the paper versions. Some of the e-books are designed for use with specially designed dedicated readers (machines), e.g. the first Rocket e-book with dedicated machines appeared in 1999, with no functionality other than the reading process. There is now available second generation of Rocket e-books marketed by a book company (www.softbook.com/) which holds thousands of pages and can link to the internet to download titles. They also have built in dictionary (Lee and Boyle, 2004, pp. 50-1). There are numerous advantages of e-books but they are unlikely to take off in the popular market because of their prices. The readers (machines) are relatively light in weight and have the capacity to store thousands of pages. Rocket e-books offer annotation facilities, book marking, linking to dictionaries, and instant access to thousands of titles through built in modems. [19]

Deegan and Simon (2002) E-books may contain different types of information, such as text, pictures, sound (talking books) or all of them. The new concept of e-books on web is emerging which is likely to have largest influence of any electronic development on how libraries do their business. Three main companies that have emerged are: Questia, (www.questia.com), e-brary (www.ebrary.com/) and net library (www.netlibrary.com/), offering full-text of books, journals and encyclopedia articles. They have added value in terms of reference and discussion services (Deegan and Tanner, p. 80) book store like Amazon.com and Barners & Noble are selling all kinds of e-books available from the major publishers.
Internet Resources

Internet has been defined as a 'network of networks'. It opened new vistas for information seekers during 1990s. During this period, the Internet transformed itself into a widespread, popular and commercial means of communication, accessible by a large number of people, organizations and libraries of all kinds. Today, a vast amount of information is set up by individuals/institutions on Internet as key information server tool the World Wide Web (WWW), many journals, reports, papers and reference sources are available free on Internet and they even constitute many of the sites on the web.

Web Sites

With the fast developments of technology, a large number of web sites (general or specialized) are available on Internet. It has become difficult to say what constitutes a good web site, particularly because of the volatile and changing nature of web sites. Everyone does not have adequate idea about which web site to access for what kind of information. Normally, for finding relevant information through Internet, one has to go through bulk of sites to identify the most suitable site available on one's own subject. In this process, a lot of precious time of the users is wasted. However, subject gateways provide solution to such a problem.

Subject Gateways

Today, lot of literature is available on Internet for which one needs to spend sufficient time in searching by going through vast amount of junk information. To solve this problem, information professionals and subject experts who have created subject gateways to include high quality resources only have done a lot of research. Excessive availability of information on the web has led to the development of a variety of subject search mechanisms. [20]

A guide to finding Quality Information on the Internet by Cook (1999) is very helpful for finding quality information available on Internet. Cook has provided various approaches for this purpose, which has been classified into four groups (search engines, subject catalogues and directories, rating and reviewing services and subject-based gateway services). Access to information can be made through
one of this group. However, for a researcher or subject specialist, subject based gateway approach is most suitable. The examples of such gateways include BUBL Link (available at http://www.bubl.ac.uk/link/), Biz/ed (available at http://www.bized.ac.uk/), and SOSIG (available at http://www.sosig.ac.uk).

Search Engines

Information has become a pervasive necessity in every phenomena of life. So many terms defining the present age such as “information age”, “global information village” and “global information economy” have been heard, which reflect the presence of information in each field of society and services. Vast developments are taking place in the present time and it is the information, which is required everywhere. But nobody can ignore the fast spread of information, and the speed of spread. This spread of information depends upon the dissemination of various sources that become major resource for the information.

A search engine is an as locator of information available on the Internet via the World Wide Web. It contains reference to thousands of web documents. It provides an interface between a user and the related database. To provide information to users is composed of two parts; available information with data and method of indexing of information. The users interface by asking their query. The response of the search engine comes in the form of “result”, listing addresses of matching and relevant resources. For giving the matching results, it runs the query terms (known as search string) against databases. Many a popular search engines are yahoo, Alta Vista, AQL Search, Ask Jeeves, Google, Lycos, Advance search, Meta search and MSN Search.

Through different search engines accomplish their task through different methods but some common ways of providing information to user can be explained as under:

1. Searching information on the basis of important and defined keywords
2. Indexing of keywords and related URLs (Uniform Resource Locators)
3. Making available the keywords or pages to users
E-mail

Electronic mail is the most commonly used services of the Internet. E-mail facilitates communication with people all over the world. It's made the geographical boundaries of nation, as one can send mail to among connected to Internet wherever, he is almost instantaneously. It has become the lifeblood of Internet with millions and millions of message exchanged across the globe daily. Electronic Mail in most of the cases, reduces postal delays, which otherwise is a usual phenomenon in traditional corresponding. The E-mail is received within seconds and it is not uncommon to receive reply in another of few hours (even minute).

The important use of e-mail in library environment is in document delivery text and image files, downloaded from database can be detailed with regular mails as attachments. Even printed pages can be scanned and sent as image files.

News group (Usenet)

News group is a world wide-distributed discussion system. Use Net have thousand of new groups, which are, basically, electronic bulletin boards where users can pass message.

Electronics Conferences

In recent time; e-mail based discussion group called electronic conferences (e-conferences) have come into vogue. Here the originator of the idea of an e-conference accepts the responsibility to maintain it, distributes to massage through dissevers on other special mailing list management software.

Thus, these can be viewed as moderated news groups (as against use net news groups many of which are not moderated). Several surveys have been conduct. It was found that researchers are using e-mail communications to replace other. It was also found that those who are connected (through e-mail) are better informed as well as more productive and creative. A majority of professional information are reliable sources of professional and research information for personal use. [21]
The University

Aligarh Muslim University (AMU) is one of the oldest and most distinguished universities of the subcontinent. Founded in 1882 as Mohammadan-Anglo-Oriental College by the great social reformer, Sir Syed Ahmad Khan, it blossomed into a full-fledged university in 1920 by an Act of Parliament. There are 18 Halls of residence accommodating nearly 28000 students. There are 12 faculties under which nearly 80 of studies operate.

Faculty of Management Studies and Research

Faculty of Management Studies and Research is among the youngest faculties of AMU. It was established in March 1996. At present there is only one department, which is Business Administration under the Faculty of Management Studies and Research.

Historical background

AMU has been the forefront of the development of management education in India. Efforts were initiated in 1965 and a one-year diploma in business administration was started under the aegis of the Department of Commerce. In 1969 it was replaced by three-year part time diploma program in Business Management (DBM), which was converted in a part time, three-year program leading to the Master of Business Administration (MBA) in 1972. In the same year, a separate Department of Business Administration was created, in the same year regular M. Phil and PhD programs were started. It was further upgraded in to two-year full-time MBA in 1976. Two part-time, PG Diploma courses, one each in Marketing Management and Personnel Management, were introduced in 1984. Recent addition has been the Master of Business Administration (IB) program introduced in 1993. Apart from all these Degree and Diploma Courses, PhD in Business Administration through distance learning mode is started in collaboration with All India Management Association (AIMA), New Delhi.


Teaching Programme

- Masters of Business Administration (MBA)
- Masters of Business Administration (International Business) (MBA (IB))
- PG Diploma in Marketing Management (PGDMM)
- PG Diploma in Human Resource Management (PGDHR)

Research Programme

The Department runs a full time PhD Programme. Approximately 60 Research students from India and abroad have earned their PhD degree in Business Administration till date. The department of Business Administration also a parallel PhD programme in Business Administration in association with All India Management Association (IIMA), New Delhi.

Training Programs

The Department has conducted several training programs for the industry and educational institutions. Among them, prominent are the management development programs for university and college administrators, computer applications in industry, entrepreneurship workshops, administrators' development program for women, training program for management teachers.

CONCLUSION

Information generated and recorded in documents is termed as sources of information. Information sources play a vital and important role in research work. There is always a need for proper literature available for the research. Literature reviews is an important step for research program. For accurate and original research, primary sources are most important. The secondary are based upon the information of primary sources and bear the colour of the approach. Tertiary sources are based upon the formulation of the secondary source. They give proper direction to users to get his required document and without wasting time.
The above analysis of the sources has been done on the basis of the present situation, information, stored in a number of media, is disseminated in different ways and presented in a systematic and organized manner in these sources. With the incoming of never technologies they are becoming more and more important and complex in nature.

The knowledge of these sources and their inherent contents are very eventual in the fast changing world. This is also use of information at the right time, as with the time lag a particular piece of information loses its effectiveness. However, the same can be retained by the use of sources which guide the users the enact information without the loss of time and wastage of energy.
References


2. *Ibid*, pp.43-44.


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