Information Sources, Systems and Services
DBLIS103

Unit-1

Information Sources: Concept and Need for Information

1. Introduction

Information gets generated in various ways and is recorded in a variety of sources and is made available for use by users. On the other hand, every user requires information for various activities like study, research, problem solving, or entertainment. Kinds of information required by user are defined as current, background, statistical or research type. Useful information is that which is used and which creates value. Experience and research shows that good information has numerous qualities. This information is relevant for a purpose, should be timely, accurate, complete, reliable and targeted to the right person. It has to be communicated in time with right level of details and is communicated by an appropriate channel, i.e., one that is understandable to the user. For this, sources of information are used to communicate information.

In this module, we will study the concept and need for information for users of library and information organisations. Information in its various forms, viz. books, journals, newsletters, databases, reports, etc. is a valuable resource for the society. So much so that it is aptly said that information is the life blood of the modern society. Defining information needs of users is most important aspect of any information organisation. We will also discuss the role of information sources in providing information to users in the desired format.

2. Information

Before defining information, it is essential to understand the distinction between data, information and knowledge. In libraries and information organisations, this distinction is useful and essential as it helps to determine the kind of services to be planned and offered to the users. Also the users' information needs can be identified as they help to build the collection of the information organisations depending on the various required information sources.

Data is raw facts that represent things or events that have happened. Data is observation of facts that are accurate and timely; specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and decrease in uncertainty. Data can also arise from direct capture, or as a by-product of another operation and can exist in any form, usable or not as it does not have any meaning. For example, readings from census, survey facts, etc. Data can be numbers, words, letters, images, sound, etc.

Information is a product of data processing and is data that has been given meaning by way of relational connection. It is equivalent to finished goods produced after processing the raw material. The information has a value in decision making as it brings clarity and creates an intelligent human response in the mind. It is knowledge that one derives from facts placed in the right context with the purpose of reducing uncertainty. Information is valuable because it can affect behaviour, a decision, or an outcome.

Data and information deal with facts and figures and knowing what to do with them requires knowledge. Therefore, when information is packaged or used for understanding or doing something, it is known as knowledge. It is thus the appropriate collection of information, such that its intent is to be useful.

Fig.1: Data, Information, and Knowledge

From the above, we can conclude that Data refers to raw values relating to facts, events or transactions. Information is processed data, which has meaning and context. And, Knowledge is the use of information in a context to make decisions. Let us understand this by an example:

Data	Information	Knowledge
100, 50, NH1	A Truck is travelling at 100 KMPH on the NH1.	We apply knowledge that the speed limit on the National Highway is: Car: 90, Bus/Truck: 55 and two Wheelers: 50. We now know that the driver is breaking the speed limit.

2.1 Definition of Information

What is information? There are many definitions of information drawn from various sources. In fact, there are too many formal definitions of information and none has universal acceptability. This is so because the term information is used differently in various contexts by various experts. Several information scientists, just to name a few, viz. N J Belkins, Daniel Bell, B C Brookes, A Debons, Fritz Machlup have given their views on the term 'Information' as used in the discipline of Information Science. These are not discussed here as these are being covered in the paper on 'Knowledge Society'.

However, in the context of information sources, some definitions of information are:

- Information is the act of telling or imparting knowledge.
- Information is facts communicated or learned.
- Information is interpreting data to make it useful.
- Information is knowledge acquired from others.
- Information is all about facts and figures.
- Information is the lifeblood of society of the 21st century.
- Information is power.

Thus information could be any, some or all of the above. However, whatever may be the definition, information is an important ingredient of our lives. It is also said that we are presently living in the information age. Let us understand what this means in practice.The modern society is referred to as the 'Information Society". Information Society is a term for a

society in which the creation, distribution, and manipulation of information has become the most significant economic and cultural activity. An information society may be contrasted with societies in which the economic underpinning is primarily Industrial or Agrarian. The tools of the information society are computers and telecommunications.

2.2 Information Age

In the information society, the information age is affecting our lives in many ways. The Information Age, also commonly known as the 'Computer Age' or 'Information Era', is a concept and an idea that the current age will be characterized by the ability of individuals to transfer information freely, and to have instant access to knowledge that would have been otherwise difficult or impossible to find previously. The information age is changing our daily activities and making tedious tasks run more efficiently. Use of information sources available to users in the desired suitable format, especially electronic sources, is increasing tremendously.

In the information age, we can classifyinformation on the basis of:

- Source
- Nature
- Level
- Time
- Frequency
- Use
- Form
- Type

In the information age, the information professionals are involved in the creation, classification, distribution, and application of information. There is visible teamwork, interconnection and shared information. The technological advances of the 'information age' have made it easier for us to access the desired information from various information sources.

2.3 The Value of Information

It is often said that we are in the information age, and that information is a valuable commodity. But a question arises here that why is information valuable? This is because:

- It allows information organisations to plan how to carry out their activities more effectively. For example, libraries can acquire and stock what their users want, when they want, and can anticipate demands.
- Information activities can be targeted at users that the organisations know could be interested in their products and services.
- This can lead to increased user satisfaction and therefore lead to complete utilization of information resources and sources.

2.4 Characteristics of Information

The parameters of a good quality are difficult to determine for information. Quality of information refers to its fitness for use, or its reliability. The meaning of information quality

lies in how the information is perceived and used by its user. Given below are the essential characteristic features of information that help determining its quality.

a. **Timeliness:** Timeliness means that the desired information must reach the users within the prescribed timeframes. Delay usually destroys the value of information. The characteristic of timeliness, to be effective, should also include up-to-date, i.e., current information.

b. **Accuracy:** Information should be accurate. It means that information should be free from mistakes, errors and have clarity. Accuracy also means that the information is free from bias. Many times, wrong information given to researchers may lead to wrong results in research.

c. **Relevance:** Information is said to be relevant if it answers especially for the recipient what, why, where, when, who and why? In other words, the information professionals should provide users the information which is useful and helps them in their desired activities. Information should be relevant both to the context and to the subject.

d. **Adequacy:** Adequacy means information must be sufficient in quantity. Information needs to be sufficient for the purpose it is generated, but just barely so. There is a lot of information out there in the world and as per users' requirements it is to be decided what material to ignore and what to use. It is an known fact that inadequacy of information leads to crisesbut information overload results in chaos.

e. **Completeness:** The information which is given to a user must be complete and should meet all his needs. Incomplete information may result in chaos and thus may not provide desired outcomes for the users.

f. **Explicitness:** Information issaid to be of good quality if it does not require further analysis by the recipients for carrying out their activities.

g. **Impartiality:** Impartial information contains no bias and has to be collected without any distorted view of the situation.

h. **Worth its cost:** Information is not free. It costs money to develop an information organization, its resources, and to maintain them. For information for be worth its cost, there must be an appropriate relationship between the cost of information and its value to the concerned users.

Some other characteristics of information are:

a. **Form -** This is described in terms of qualitative and quantitative, numerical and graphic, summary and detailed.

b. **Frequency-** This is a measure of how often information is needed, collected or produced.

c. **Breadth-** This defines the scope of information.

d. **Origin -** Information may origin from sources inside the organization or outside.

e. **Time horizon-** Information may be oriented toward the past, toward current event or toward future activities and events.

2.5 Finding and using information

There are too many sources of information and not all information is available in readily available. An attempt to conduct a search to identify all of these sources is likely to demand more time and effort than is practical to devote to this task. Information in all its forms,i.e., documents, books, newsletters, e-mail, databases, reports, images and many more, is a valuable resource in all societies. So much so that it is now said that "quality information is to an organization what healthy blood is to the body".

In order to make available information to users, the modern libraries and information organisations have to develop certain information handling skills. These skills include:

- Defining a user's information needs
- Finding information sources in a variety of media using a range of sources
- Evaluating information in relation to the task in hand using information efficiently
- Referring efficiently and accurately to the available information, and
- Organising and presenting information

The technological advances of the 'information age' have made it far easier for us to access the kinds of information we need in our daily lives.

3. Information Needs

Identifying information needs of users is the most important part of any information related activity. When defining a need for information, there are two useful questions to ask, these are:

Firstly, 'Why is the information needed?' One way of defining the need for information is always the purpose for which user needs information. For example, it may be needed for some academic activity of the users, for taking a particular decision by the user, or may be needed for a personal interest of the user.

Secondly, 'What is already known to the user requiring information?' Considering what is already known to the user, can be a useful starting point as it helps the library professionals to identify the gaps in available information. Prior knowledge of the subject on which information is required is also a sound starting point in this regard.

Users may need different types of information at one time or another. Some of the information needs may relate to:

- News
- Ideas and opinions
- Research results
- Routine information, like railway timetable, phone numbers, maps, etc.
- History or background information
- Fact and figures
- Technical information
- Legal information

In some cases, the required information may be instantly available from existing knowledge. But in other cases, we may have to go elsewhere for information. This necessitates defining the information need.

3.1 Defining Information Need

Information need is defined as a state or process when one perceives that there is a gap between the information and knowledge available to solve a problem and the actual solution of the problem. Information need is different from information competencies as information competencies are defined as the capabilities developed to reach the solution of a problem by searching for new information or knowledge that could fill the perceived gap. While defining a user's information need, answers to the following questions are required:

- How much information is needed?
- How much detail is needed?
- How current the information should be
- Should the information be facts or opinions or both?
- Should the information come from primary or secondary or other sources?
- Should the information come from scholarly sources?

Information need is also defined as the difference between the way information is available and the way that a user would like it to be. The basic idea is thatthere is a perceived, that is, subjective difference between the available knowledge and the knowledge that is needed to perform an activity. The size and type of the difference between available knowledge and knowledge that is required determines the size and type of the information need. In addition, refinements have to be made with regards to use of information, that is, a need for new information to confirm availability of information already available and to elucidate the already available information. The information needs of different groups of people and organizations are determined the same way as those of the individuals when a knowledge and meaning gap is perceived.

3.2 Selecting Information Sources

The best way to begin a search for information is to define a user's information needs. One may need an overview, a comprehensive search of a topic, a quick reference or fact, or an in-depth treatment. Once it is decided what type of information is needed, we can select a source that will likely have the information or plan a search strategy that will include several types of sources. There is a wealth of sources available to help us locate information.

Information can come from anywhere, viz. Books, articles, reference books, web sites, expert opinions, personal experiences, and so on. Knowing what kinds of information is offered by different types of sources helpsto locate relevant information. Further details will be discussed in section 11 of this Module.

3.3 Information Overload

Information overload refers to an excess of incoming information thatforcesonetobeselectiveintheinformationreceivedandretained.With the advent of modern technologies,the ability to create, duplicate and access vast amounts of information has

created information overload for the information organisations and information users. Many experts are of the view that more access to information will not actually help us but will lead to information overload because:

a. Information users will have access to too much information about desired topic(s) that they do not want or need to know about,

b. Information users will be receiving too much information too fast resulting in the fact that it become a liability instead of an asset,

c. Information users will have little control over information as quality becomes dubious at times,

d. When users cannot keep pace with the available information flow, they feel de-skilled, and

e. Technology changes so fast that it quickly becomes obsolete and users cannot afford to change the technologies often.

4. Information Sources and Information Resources

A source is a place or person from which you can obtain something useful or valuable. A resource is something that can be used to perform some function. The sources from where we get information are called information sources and these comprise of documents, humans, institutions as well as mass media like radio and television. Information sources are significant for information organisations and information users. This is because the sources indicate the current development in all fields, avoid duplication in research, give answers for specific queries, help us to understand some unfamiliar terms, provide meaning for terms and indicate broadened view of a subject. Information sources also provide an in-depth treatment of a topic or aspect of a topic and can also provide a broad overview or historical view of a topic. This is so because these sources are prepared after browsing wide variety of knowledge and also examine past studies to predict future trends, etc.

Information sources are different from reference sources. An information source is one which provides us the required information. Whereas, reference sources are to obtain specific types of information which is compiled specifically and designed to provide information in a most convenient form. An information source thus is the source from where we get information. It deals with documents and non-documents. Information sources are also different from information resources.

An information resource is not the same as a resource and is defined as a resource which can convey or describe (essential) characteristics of a resource in some way. The data and information assets of an organization are referred to as information resources. Information and related resources, such as personnel, equipment, and information technology are also information resources of an organisation. Good research involves using a variety of reliable information resources to find out facts and information about a topic.

There are experts who refer to some information sources as information resources. Examples of such information resources are encyclopaedias, books, articles and websites.

Encyclopaedias-Encyclopaedias are great for providing a summary or background information, and they are a reliable source/resource of information, written usually by several experts. There are many print and online encyclopaedias.

Books - Books give us a greater amount and more in-depth information on a topic than an encyclopaedia. They are also a reliable source/resource of information, having been written by credible author(s) who have gone through a publishing process.

Articles - Newspaper, magazine, or journal articles can provide up-to-date information on very specific topics and they are generally a reliable source of information.

Websites -We can find information on almost anything on the Internet, so it can be a great resource, especially when looking for hard to find or very recent information. However, the information found on websites may not be correct or reliable.

5. Characteristics of Information Sources

Information sources have several characteristics, which are:

    a. Availability
    b. Cost
    c. Currency of information
    d. Amount of detail, i.e., depth
    e. Breadth of coverage
    f. Reliability
    g. Format
    h. Medium

Given below are characteristics of Information sources on the basis of information available in them.

a. Factual or Analytical: Factual information is a statement that can be proved, for example $1 + 1 = 2$. It is also information that will always remain the same no matter where you look it up.

Examples: Reference sources (print or electronic) such as dictionaries, almanacs, atlases, directories.

Analytical information is an interpretation of factual information. It includes interpretations or analyses of facts, often made by experts.

Examples: Books, articles and web pages.

b. Objective or Subjective: Objective information consists of non- judgmental or balanced reporting that presents all sides of a topic, including basic facts.

Examples: Encyclopedias or handbooks. Can be in books, articles or web pages but the source must be carefully evaluated first.

Subjective information means that only one point of view is represented. It expresses opinions or judgments based on individual personal impressions on a topic rather than external facts.

Examples: Books published on basis of individual author(s) experience, research results of viewpoints.

c. Primary or Secondary

Primary information represents information in its original form. It has not been edited, interpreted, evaluated or translated in any manner which might result in a change from the original information. Primary sources can present original thinking and observations, such as original research used to write articles reporting on original scientific studies, experiments or observations.

Examples:

- Novels, plays, lyrics, poems, original works of art
- Diaries, memoirs, autobiographies, speeches
- Government documents, legal documents, patents
- Surveys, polls, statistical data, technical reports, experimental research results

They are created by participants or recorders who experienced the events or conditions being documented. Often these sources are created at the time when the events or conditions are occurring, but primary sources can also include autobiographies, memoirs, and oral histories recorded later. They reflect the individual viewpoint of a participant or observer. Primary sources enable the researcher to get as close as possible to what actually happened during a historical event or time period and can vary by disciplines.

Secondary information is information "removed" in some way from its original form. It represents restatements, interpretations, translations or analyses of information from one or more primary sources. Examples include scholarly or popular books and articles, reference books and textbooks.

Examples:

- Books and textbooks
- Dictionaries and encyclopedias
- Biographies
- Review articles
- Historical studies

5.1 Kinds of Information Sources

Based on the characteristics listed above, we can identify different kinds of information sources that make available desired information. These basically fall in two categories, namely, sources that answer simple queries and sources that answer complex queries.

Sources that answer simple queries carry:

- actual information
- Biographical information
- Statistical information
- Product information
- Patent information
- Maps, images and other geographical information

On the other hand, the sources that answer complex queries, carry:

- Research information
- Professional details and interpretation
- Popular opinion
- People, organisations and company details

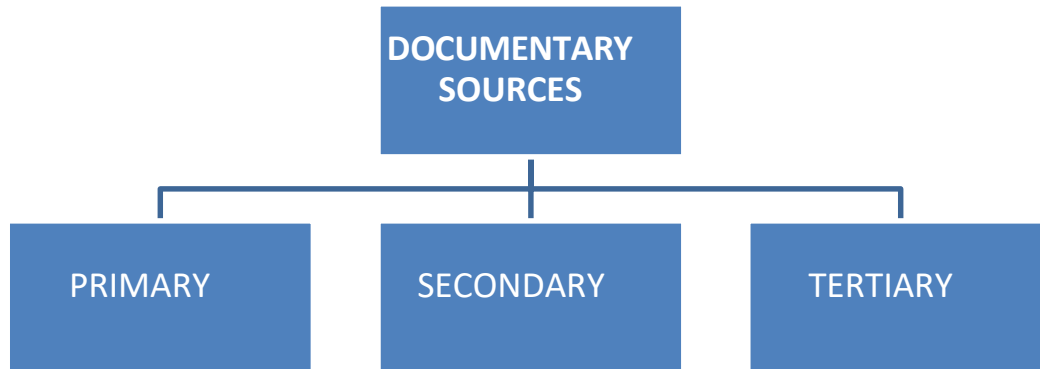### 6. Types of Information Sources

While conducting user-requirements analysis, it is important to identify the sources of information. For this, we need to select different sources of information in order to gather complete and accurate information. Information sources are usually organized according to their information contents, type, media or form to cater to the different needs of the users. The sources of information are broadly classified into:

- Documentary Sources
- Non-Documentary Sources

All recorded sources of information irrespective of their contents and form come under documentary sources. These may be published or unpublished, in print or in electronic form. Documentary sources can be categorized as primary, secondary and tertiary sources on the basis of appearance of information. In primary sources, information appears first, secondary sources comes out next and tertiary sources are the last to appear. The non-documentary sources of information can be defined as those sources and resources of information that are not contained in any document. The non-documentary sources comprise of formal and informal sources.

7. Documentary Sources

All recorded sources of information irrespective of their contents and form come under documentary sources. These may be published or unpublished, in print or in electronic form. These may be books, periodicals, magazines, or reference books and others. Documentary sources may be defined loosely as records relating to individuals or groups of individuals that have been generated in the course of their daily lives. This is not to say that documentary sources do not require a structured approach; on the contrary, the use of letters, diaries and the like need a careful methodology in order to extract their relevance for the understanding of society. The documentary sources of information such as books, periodicals, articles, dictionaries, newspapers, dissertations, guidebooks, directories, etc. are organized into quite basic and fundamental categories based on their information contents. Depending upon their

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              ┌─────────────────────┐
              │    DOCUMENTARY      │
              │      SOURCES        │
              └─────────────────────┘
         ┌──────────┼──────────┐
    ┌─────────┐ ┌───────────┐ ┌──────────┐
    │ PRIMARY │ │ SECONDARY │ │ TERTIARY │
    └─────────┘ └───────────┘ └──────────┘
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contents and organizational level, these can be grouped into:

- Primary
- Secondary, and
- Tertiary sources of information

Fig.2: Documentary Sources

The libraries and information organizations receive different types of questions. Each type of question requires different sources of information. This can be best illustrated with the help of an example. Suppose a researcher is beginning research on a wholly unknown topic. The first step is usually to consult encyclopaedias on the topic. These are examples of 'Tertiary' sources as they provide overview or general explanation in a condensed form on the topic for all kinds of users. The encyclopaedias also have references for further reading. Other tertiary sources can also be used, for example, subject dictionaries give full definitions and meanings of the subject's terminology.

After the general concept of the subject is clear, the next step is to consult various secondary sources to know what has already been written on the topic, at different times and from different points of view, by others on the topic. 'Secondary' sources are thus sources on the topic in question by other researchers, whose work has been based on Primary sources after consultation with the Secondary sources on the topic which had existed at the time.

In view of what existing Secondary sources make available 'Primary sources' are then consulted for further views of the topic under consideration. Here, some may be same as others have already consulted; some may be new not covered by others. This new research then usually identifies new aspects of the topic that have emerged which the others have not consulted or was not of interest to them.

In the above example concerning use of various sources, it can be seen that research is based initially on the analysis of primary sources, guided by the perspectives on the topic which already existed via secondary source and the tertiary sources provide only a general overview on the topic.

8. Non-Documentary Sources

The non-documentary sources of information can be defined as those sources and resources of information that are not contained in any document. The non-documentary source comprises of formal and informal sources. Formal sources include information of research organizations, societies, industries, government departments, universities, consultants, etc. Informal sources include human sources, conversation with colleagues, consultants, experts, resource persons, mass media, etc.

The main categories of non-documentary sources are:

- Institutions or Organizations
- Humans
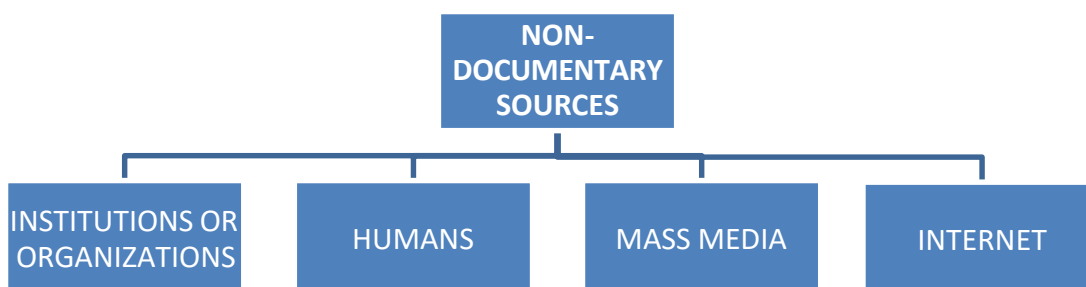- Mass Media other than print media, and
- Internet

Fig.3: Non-Documentary Sources

The organizations as sources of information include academic institutions, government ministries and department, research and developmental organizations, societies, publishing houses, international and national agencies, etc.

The human resources are the experts, consultants, resource persons, extension workers, and even the common human beings.

Mass media refers to any means of public communication that can reach a large audience. Examples of the mass media include - the internet, television and radio. Magazines and newspapers are also deemed to be mass media.

Internet is another very important source of information. Internet is interactive digital media and is different from the traditional media such as print and television. World Wide Web (WWW), also called the Web, is collection of websites on the Internet and offers information on almost all the topics.

9. Electronic Sources

Most of the available Information is traditionally thought of as in print sources, but now with the Internet access, many printed resources are available electronically. Regardless of the fact that information or related contents appear in print or electronic format, it is important that we are able to assess the same without knowing whether it is reliable and authoritative. Electronic materials in the libraries have several advantages over print media:

- Information may be updated easily
- Often up-to-the-minute information
- May be keyword searchable
- May be accessed outside of the library
- Multiple users can look at the same information at the same time
- Easily printed, download, or manipulate information

Managing a collection of electronic information resources is quite different from managing a collection of non-electronic information resources. Unlike a book, computer equipment and networks are needed to access electronic information. Digital format of traditional information sources is available as:

Print Format	Digital Format
Books	eBooks
Periodical articles	Online journals, e-journals
Pamphlets	Web pages
Dissertations and Theses	Full text Databases
Maps	CD-ROMs
Government documents, etc.	DVDs, etc.
Printed Reference Sources	Online in Full text
Library Catalogues	Online Public Access Catalogues

9.1 E-Resources

An e- resource is material which requires computer mediation in order to access its content and make it useful. Both online and offline resources such as online material and CD-ROMs fall within the scope of E-resources. The term e-resource refers to all the products which a library provides through a computer network. The electronic resources are also known as online information resources covering bibliographic databases, electronic reference books, search engines for full text books, and digital collections of data. They include both "born digital" materials which have been produced directly online. For example, e-journals, databases, and print resources which have been scanned and digitized. The electronic resources, e-journals, online databases are not "owned" by the libraries as they own the print material. Ownership of electronic resources lies with the providers of these resources. Access to the electronic resources may be free via Internet or may be available against a fee.

Some of the examples of e- resources are magazines, encyclopaedia, newspapers, journals or articles published in them. These may be accessed on Internet connected devices such as computers, tablets, smart phones, etc.

10. Selecting Information Sources

On basis of information needs of users, as already identified, suitable information sources are to be selected. The table below lists the most important types of sources of information for finding what users usually need for their information requirements.

Kind of Information	Selecting the Information Sources
Biographies	Books, periodicals, encyclopedias, websites
Companies, people, organizations	Directories

Facts	Almanacs, atlases, books, databases, dictionaries, encyclopedias, government documents, handbooks, manuals, newspapers, websites, yearbooks
Graphics/Image-based	Almanacs, atlases, books, databases, websites
Original documents	Bibliographies, books, periodical articles, websites
Popular opinion	Books, periodical articles, newspapers, websites
Product information	Databases, manufacturer and vendor catalogs
Professional commentary	Bibliographies, books, periodical articles, websites, yearbooks
Research	Bibliographies, books, government documents, periodical articles, statistical abstracts
Statistics/Data	Almanacs, atlases, books, databases, statistical abstracts, websites, yearbooks

10.1 Strategies for Identifying Information Sources

Many kinds of information are found in more than one type of source. To help determine which type of source is most likely to contain the information a user requires, the following question are required to be asked.

a. How broad or narrow a focus is needed?

Are we are looking for a broad overview of a topic, or do we need highly specific information that covers a narrow topic in great detail? Encyclopedia articles will give a broad overview of a topic. Books will also give a broad overview of topic but in considerably greater detail, and may summarize the published information on required topic. Journal articles will give information on very specific aspects of the topic. Often we will need a mixture of encyclopedias, books, and periodical articles to find the desired information.

b. What level of information is needed?

Do we need in-depth research by an expert in the field or do we require information written in common terms?If we need in-depth research or technical information, choose scholarly journals. If we need general information on a topic choose an article written for the educated layperson in substantial news or general interest publications such as Scientific American, Science Reporter, National Geographic, etc. Articles in these publications can also provide us with needed background information that will help us to understand the technical language used in scholarly journal articles.

c. How current does the information need to be?

Are we are researching a current event/topic, or is the information we need several years, or even decades, old? Currency can be a deciding factor in identifying the best source for information. We can think of currency as a continuum with different types of information sources falling at different points on the continuum. For example, for one week old information look for websites, newspapers, etc.; for month old information look for monthly journals; 1 year old information can be found in year books, almanacs; and for older information we may look for books, encyclopaedias, annual reviews, etc.

d. Do we need specialised information?

At times we need specialized information such as statistics, maps or diagrams, or addresses for people or the manufacturer of a product. These special kinds of factual information are most often found in atlases, almanacs, yearbooks, directories, catalogs, or government documents. As factual information can change rapidly, we have to pay close attention to the publication dates. Usually the most current editions of these information sources are found in a library's reference department.

e. Do we need primary, secondary or tertiary information?

Sometimes we need information that is only available from the original or primary source. Primary sources include personal experiences, eyewitness accounts, product information, and historical documents. Most of the time, to save time, we use secondary materials. Secondary materials are raw data and primary source materials that have been analyzed and then organized into coherent presentations by someone-usually a researcher. Tertiary information is commentary or opinions about a given topic, based on and quoting primary and secondary sources.

10.2 Information Access Tools

Libraries provide a number of tools to identify specific sources of information. These are referred to as access tools and fall into various categories. The strategies for locating specific information sources vary depending on the access tool needed to find them. The three broad categories of access tool susually used to find the desired information sources are:

- Library Catalogues
- Printed Indexes and Databases
- Web Indexes and Search Engines

Generally we may need to use more than one access tool because well-balanced information activities usually requires information from different kinds of sources. The table below gives the type(s) of access tools required based on the type of information sources needed.

Information Source	Access Tools
Almanacs	Library catalog, web indexes, search engines
Atlases	Library catalog, web indexes, search engines
Bibliographies	Library catalog, web indexes, search engines
Books or book chapters	Library catalog, databases and print indexes, web indexes, search engines
Dictionaries	Library catalog, web indexes, search engines
Directories	Library catalog, web indexes, search engines
Databases	Databases, search engines
Encyclopedias	Library catalog, web indexes, search engines
Government documents	Library catalog, web indexes, search engines
Handbooks	Library catalog, web indexes, search engines
Periodical articles	Print indexes, databases, search engines
Manuals	Library catalog, web indexes, search engines
Newspaper articles	print indexes, databases, search engines
Statistical abstracts	Library catalog, web indexes, search engines
Manufacturer & vendor catalogs	Library catalog, web indexes, search engines
Web sites	Web indexes, search engines
Yearbooks	Library catalog, web indexes, search engines

10.3 Relationship between Information, Information Sources, and Access Tools

Different kinds of information is found in different types of information sources, for example, research related information is most likely found in scholarly journals. Different types of

information sources use different access tools to locate the information source, e.g. journal articles are located by using indexes and databases.
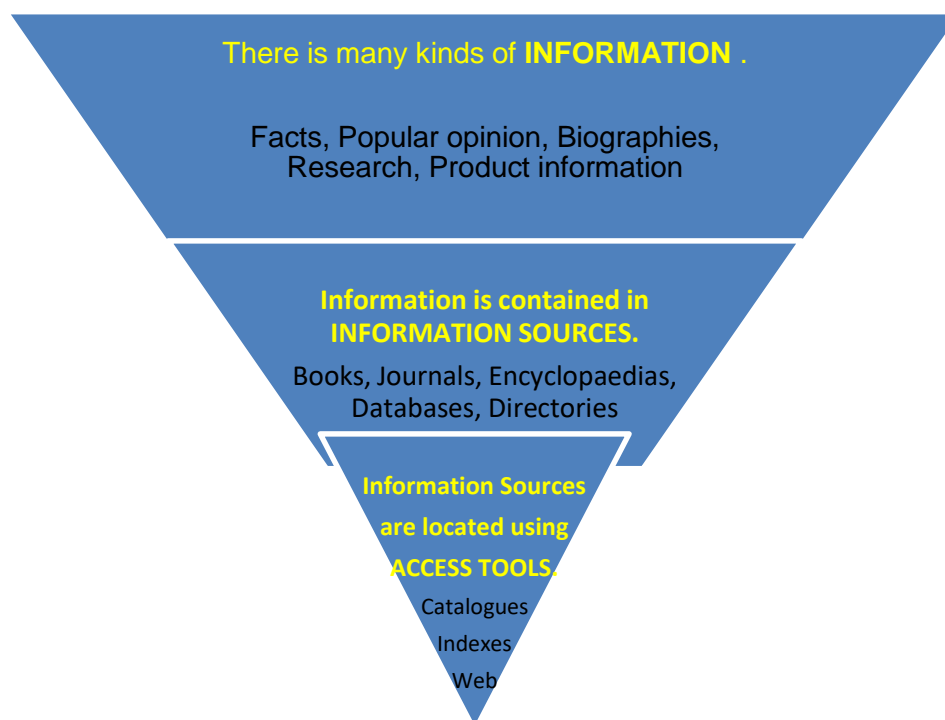

There is many kinds of **INFORMATION** .

Facts, Popular opinion, Biographies, Research, Product information

Information is contained in INFORMATION SOURCES.

Books, Journals, Encyclopaedias, Databases, Directories

Information Sources are located using ACCESS TOOLS.

Catalogues

Indexes

Web

Fig.4: Kinds of Information

The information access tools either directly provides access to the information sources that a user needs or provides information directly to help find a source.

11. Summary

In this Module, we have discussed the nature, definition and concept of information. This leads to identification of information sources that are best suited for specific information need. Information sources are different from reference sources. Many kinds of information are found in more than one type of source. To help determine which type of source is most likely to contain the information some strategies are required to identify the desired information source.Information sources are different from reference sources. An information source is one which provides us the required information. Whereas, reference sources are to obtain specific types of information which is compiled specifically and designed to provide information in a most convenient form.

Information sources are of two types, namely, Documentary Sources and Non-Documentary Sources. All recorded sources are documentary sources. All non-recorded sources are non-documentary sources. Based on the Information content and organizational level, a documentary source may be primary, secondary or tertiary source. Although most of the available Information is traditionally thought of as in print sources, but now with the Internet access, many printed resources are available electronically too.

On basis of information needs of users, as already identified, suitable information sources are to be selected. A list of various kinds of information sources has also been identified. Libraries provide a number of tools to identify specific sources of information. These are referred to as access tools and fall into various categories. The information access tools either directly provide access to the information sources that a user needs or provides information directly to help find a source.

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Unit 2

Types of Information Sources: Documentary Primary Secondary and Tertiary

I. Objectives

After reading this Module, you will be able to:

- Know the characteristics of Information sources,
- Identify documentary and non-documentary sources,
- List various types of information sources,
- Know about the Primary, Secondary and Tertiary sources,
- Distinguish between Primary, Secondary and Tertiary sources of Information, and
- Give examples of documentary sources.

II. Learning Outcome

After studying this module, you will learn the need for various documentary information sources. Besides studying the various documentary sources of information, you will also learn their characteristics, categorization and use in different contexts. The documentary sources are categorized into the primary, secondary and tertiary sources. In primary sources, information appears first, secondary sources come out next and tertiary sources are the last to appear. We will learn their development and importance in study, research, recreation and personal development.

III. Module Structure

1. Introduction

Information gets generated in various ways and is recorded in a variety of sources and is made available for use by users. On the other hand, every user requires information for various activities like study, research, problem solving, or entertainment. Kinds of information required by user defined as is current, background, statistical or research type. Useful information is that which is used and which creates value. Experience and research shows that good information has numerous qualities. This information is relevant for a purpose, should be timely, accurate, complete, reliable and targeted to the right person. It has to be communicated in time with right level of details and is communicated by an appropriate channel, i.e., one that is understandable to the user. For this sources of information are used to communicate information. In this Module, we will study the various documentary sources of information, their characteristics and use in different contexts.The documentary sources are categorised into the primary, secondary and tertiary sources. We will learn their development and importance in

study, research, recreation and personal development. The non-documentary sources will be discussed in the next Module, i.e., Module 3.

2. Information Sources

A source is a place or person from which you can obtain something useful or valuable. A resource is something that can be used to perform some function. The sources from where we get information are called information sources and these comprise of documents, humans, institutions as well as mass media like radio and television. Information sources are significant for information organizations and information users. This is because the sources indicate the current development in all fields, avoid duplication in research, give answers for specific queries, help us to understand some unfamiliar terms, provide meaning for terms and indicate broadened view of a subject. Information sources also provide an in-depth treatment of a topic or aspect of a topic and can also provide a broad overview or historical view of a topic. This is so because these sources are prepared after browsing wide variety of knowledge and also examine past studies to predict future trends, etc.

Information sources are different from reference sources. An information source is one which provides us the required information. Whereas, reference sources are to obtain specific types of information which is compiled specifically and designed to provide information in a most convenient form.An information source thus is the source from where we get information. It deals with documents and non-documents. Information sources are also different from information resources. An information resource is not the same as a resource and is defined as a resource which can convey or describe (essential) characteristics of a resource in some way,

3. Types of Information Sources

While conducting user-requirements analysis, it is important to identify the sources of information. For this, we need to select different sources of information in order to gather complete and accurate information. Information sources are usually organized according to their information contents, type, media or form to cater to the different needs of the users. The sources of information are broadly classified into:

- Documentary Sources
- Non-Documentary Sources

All recorded sources of information irrespective of their contents and form come under documentary sources. These may be published or unpublished, in print or in electronic form. Documentary sources can be categorized as primary, secondary and tertiary sources on the basis of appearance of information. In primary sources, information appears first, secondary sources come out next and tertiary sources are the last to appear. The non-documentary sources of information can be defined as those sources and resources of information that are not contained in any document. The non-documentary sources comprise of formal and informal sources.

4. Documentary Sources

All recorded sources of information irrespective of their contents and form come under documentary sources. These may be published or unpublished, in print or in electronic form. These may be books, periodicals, magazines, or reference books and others.

Documentary sources may be defined loosely as records relating to individuals or groups of individuals that have been generated in the course of their daily lives. This is not to say that documentary sources do not require a structured approach; on the contrary, the use of letters, diaries and the like need a careful methodology in order to extract their relevance for the understanding of society.

Documentary Sources can further be categorized based on their information contents and physical form as follows:

- Documentary Sources (By Contents)
- Documentary Sources (By Form)

4.1 Categorisation of Documentary Sources

Several library and information science experts have categorised the documentary sources of information. Some experts have categorised as below:

4.1.1 S. R. Ranganathan

Dr. S R Ranganathan, the father of Library Science has classified the documentary sources of information into four categories. These categories reflect the chronological order of their development and are based on the physical characteristics of documents.

a. Conventional - Books, periodicals, maps and atlases

b. Neo-Conventional - Standards, specifications, patents, data

c. Non-Conventional - Audios, visuals, audio- visuals, microforms

d. Meta Document - Direct created documents without any human intervention

4.1.2 C. W. Hanson

C. W. Hanson, former editor of Journal of Documentation in an article entitled 'Introduction to Science Information Work' published in 1971 by ASLIB divided the documentary sources of information into two categories, namely, primary and secondary.

a. **Primary Sources**

Hanson was of the view that the primary documents exist of their own and usually contain original information based on the first formulation of any new observation, experiment, ideas, etc. Thus, Hanson explained that - a monograph, an article in a journal, text book, and encyclopaedia are all primary documents. He opined that although an article in encyclopaedia or text book may not contain any new information on the subject but it presents the information in the particular form for the first time. These articles concerned are not condensations or rewriting in any way of any existing document but have been specially written for the text book or the encyclopaedia. Thus these are also primary sources. The sources like books, periodicals, dissertations, reports, patents, standards, trade literature, conference proceedings, etc. are to be included in this category.

b. Secondary Sources

The secondary publications were identified by Hanson as those that present the contents of the primary documents in a condensed form or listed them in a helpful way. This is to enable the existence of a primary document so that it can be known and access to it can be made. In this category, the sources to be included are Catalogues, Bibliographies, Indexes, abstracts, Indexing and abstracting journals, etc.

Besides the above two categories, Hanson also gave a third category which he called as:

c. Primary/Secondary Sources of Information

Some publications like the monographs, conference proceedings, theses and dissertations, etc. have the characteristics of both primary and secondary sources of information. In case of these publications, the documents that represent new facts can be regarded as primary publications and those that have the characteristics of reviews, etc.are to regarded as secondary publications. As a result of such mixing of primary and secondary sources of information, some library and information science experts do not consider this category to be much practical utility.

4.1.3 Denis Grogan

Denis Grogan, the famous British Information Scientist and Educator, on the basis of level of reorganization, classified the documents into three categories,viz. primary, secondary and tertiary.

i. Primary Sources

Grogan identifies the primary publications as those in which the author, for the first time, supplies evidence, describes a discovery, makes or drives a new proposition or brings forward new evidence about previous proposition. It was created at or near the time being studied, often by the people being studied. It is a fundamental, authoritative document related to a subject of inquiry, used in the preparation of a later derivative work. Thus, the primary sources of information are basic sources of new information which have not passed through any filtering mechanism like condensation, interpretation or evaluation and are the original work of the author.

Primary sources may include periodicals, patents, standards, research reports, dissertations and theses, reprints, trade literature, classic books, letters, diaries, and other personal papers, photographs, interviews and transcripts, government and historical records, newspaper clippings, and other original sources.

There are certain primary sources of information, which remain unpublished. Very often these may be consulted for historical interest. Such materials include laboratory note books, memoranda, diaries, letters to and from a particular individual, company, etc. The libraries many times try to procure such type of material if it comes within its scope of area or is relevant to its purpose.

ii. Secondary Sources

The secondary sources have been identified by Grogan as documents concerning a particular subject of inquiry which is derived from or based on the study and analysis of the primary sources of information. In the secondary source of information, the original information is selected, modified and arranged in a suitable format for the purpose of easy location by the user. The secondary sources of information thus provide digested information and also serve as bibliographical key to primary sources of information. Secondary publications include text books, monographs, reference books, indexing and abstracting journals, reviews of progress/literature, etc.

iii. Tertiary Sources

Grogan called those sources the tertiary sources of information which are last to appear and mostly do not contain subject knowledge. These sources are designed to provide information about information and so acts as a guide to the primary and secondary sources of information. The main function of tertiary sources is to aid the users in using or accessing primary and secondary sources of information. The tertiary sources of information are bibliographies of bibliographies, yearbooks, directories, guides to literature, guides to organisations, lists of accession, lists of research in progress, etc.

4.1.4 Categorisation

The above sections indicate the categorisation of documentary sources by various experts. It is clear that eventually there is no rigid line of demarcation between primary, secondary and tertiary sources of information. However, the categorisation of documentary sources as given by Denis Grogan has been found to be most acceptable and is universally prevalent. He has given a detailed account of these categories, with suitable examples of each of these categories in his book entitled 'Science and Technology: an introduction to the literature'.In this Module, the categorisation of documentary sources as proposed by Grogan has been followed

.
5. Documentary Sources of Information

All recorded sources of information such as books, periodicals, articles, dictionaries, newspapers, dissertations, guidebooks, directories etc. are organized into quite basic and fundamental categories based on their information contents. Depending upon their contents and organizational level, these can be grouped into:

- Primary
- Secondary, and
- Tertiary sources of information

The libraries and information organizations receive different types of questions. Each type of question requires different sources of information. This can be best illustrated with the help of an example. Suppose a researcher is beginning research on a wholly unknown topic. The first step is usually to consult encyclopaedias on the topic. These are examples of 'Tertiary' sources as they provide overview or general explanation in a condensed form on the topic for all kinds of users. The encyclopaedias also have reference for further reading. Other tertiary

sources can also be used, for example, subject dictionaries give full definitions and meanings of the subject's terminology.

After the general concept of the subject is clear, the next step is to consult various secondary sources to know what has already been written on the topic, at different times and from different points of view, by others on the topic. 'Secondary' sources are thus sources on the topic in question by other researchers, whose work has been based on Primary sources after consultation with the Secondary sources on the topic which had existed at the time.

In view of what existing Secondary sources make available 'Primary sources' are then consulted for further views of the topic under consideration. Here, some may be same as others have already consulted; some may be new not covered by others. This new research then usually identifies new aspects of the topic that have emerged which the others have not consulted or was not of interest to them.

In the above example concerning use of various sources, it can be seen that research is based initially on the analysis of primary sources, guided by the perspectives on the topic which already existed via secondary source and the Tertiary sources only provide only a general overview on the topic.

6. Primary Sources

Primary means 'earliest', 'original' and any such source is a primary source of information. UNESCO (1968) defines a primary publication as 'an original scientific paper describing new research, techniques or apparatus.' Primary does not mean superior. It refers to the creation by the primary players, and is distinguished from a secondary source, which is a historical work, like a scholarly book or article, built up from primary sources.

Primary sources are those sources which contain original information. Primary sources include new raw data, new interpretation of previously known facts or idea, any new observation or experiment, etc. Primary sources are those sources which contain original information that has been published, reported or recorded for the first time. Primary sources include raw data, new interpretation of previously known facts or idea, any new observation or experiment, etc. Information tends to be latest and comes out in the form of an article in a periodical, monograph, research report, patent, dissertations, reprint of an article or some other work. By its very nature, the primary sources of information are widely scattered and it is difficult to locate the information contained in them.

Primary sources are original material son which other research is based. They are from the time period involved and have not been filtered through interpretation or evaluation. They are usually the first formal appearance of results in physical, print or electronic format and present original thinking, report a discovery, or share new information. Primary sources allow researchers to get as close as possible to original ideas, events, and empirical research as possible. Such sources may include creative works, first hand or contemporary accounts of events, and the publication of the results of empirical observations or research. Primary Sources are original materials from the time period involved, and have not been filtered, influenced or analysed through interpretation. They bring us as close to the original eventor thought as possible.

6.1 Characteristics of Primary Sources

Characteristics of primary sources are:

- Primary sources can either be first-hand observation/analysis, or accounts contemporary with the events described.
- Primary sources document events, people, and viewpoint of the particular time.
- When research is more periods- based, rather than based on sequence of events, scope of possible primary sources broadens considerably.
- Primary sources represent a researcher's perspective which has to be used with secondary or tertiary sources to broaden the views through which the researcher is looking at an event, era, or phenomenon.
- It is important while using any documentary source as a primary source that the user/researcher has knowledge of or is aware and sensitive to the bias of the person/expert/researcher who created the primary source, and also to the broader cultural biases of the time (period) in which the primary source was created.
- The researcher's perspective, or the arguments or points for which a researcher plans to use a primary source as evidence, is significant in determining what sources will be primary.
- Reproductions of primary sources remain primary for many research purposes.
- Some attributes are based more on the perspective represented in the source and context in which the source is being used by researcher.

6.2 Problems of Primary Sources

Primary sources are widely scattered and are available in such a large number that it is extremely difficult to keep track of all that is published even in a single discipline. To solve this problem, bibliographic control of these sources is required and it is always not possible for every kind of primary source. The widely scattered information in primary sources is constantly being compressed, organized and rearranged according to some definite plan and communicated through another set of publications called secondary sources of information.

When conducting research, researchers usually use both primary and secondary sources. However, while primary source documents are useful, every researcher should be aware of possible problems with them. Some major possible problems while using primary sources include bias and objectivity. Every document is biased, whether deliberately or unconsciously, by the point of view of the person who wrote it.

Another major problem with using primary sources is that they do not cover everything that a user might need to cover for a particular assignment. This is so because the user does not always get the entire context as it may have one person's point of view, or the reigning viewpoint of the time.

The problems that are mentioned above with regard to primary sources are that of perspective. That's why secondary sources are so important. We do not have to be the expert when using these sources; we simply have to be able to understand the interpretations that experts have deciphered. Then we have to form an opinion of those.

6.3 Examples of Primary Sources

As discussed above, primary sources are those sources which contain original information that has been published, reported or recorded for the first time. Primary sources are of varied type, large in number and are widely scattered. Some typical examples of primary sources of information are primary periodicals, newspapers, technical reports, dissertations, conference papers, patents, standards, etc.

6.3.1 Periodicals

A periodical is a publication with a distinctive title which appears at stated or regular intervals, without prior decision as to when the last issue shall appear. It contains articles, editorials, features, columns, stories or other writings, by several contributors. The periodicals are important sources for current information on any subject. UNESCO has defined a periodical as "a publication that constitutes one issue in a continuous series under the same title, published at regular or irregular intervals, over an indefinite period, individual issues in the series being numbered consecutively or each issue being dated."

The important aspect about the subject material of periodicals is that the latest or current information is provided to the readers through them. This library material upon receiving in the library is displayed prominently to the readers and is replaced by the subsequent new issues received by the library.

Periodicals are also referred to as serials or journals. Besides these, magazines are the most typical type of periodicals. Magazines are also like journals with each issue starting at page one but they are not academic or professional publications. These are not peer-reviewed.

6.3.1.1 Type of Periodicals

Periodicals are distinguished either on the basis of literary content contained in them or by their sponsoring institutions. The different types of periodicals are:

a. Scholarly periodicals

This category of periodicals report original research or experimentation, often in specific academic disciplines. These are meant to increase knowledge in a field, give information concerning research findings, present new ideas and to invite discussion. The targeted users are the scholarly researchers, faculty and students. It has articles written by experts in the field, and are signed. Most scholarly journals subject their articles to the peer review process prior to publication. Journals that employ the peer review process are also referred to as "refereed journals." The scholarly periodicals areusually published by professional or scholarly associations, research and academic institutions.

Examples: Indian Journal of History of Science, INSA; Journal of Organic Chemistry, ACS; International Journal of Research in Social Sciences, IJMRA

b. Trade journals

The trade journals discuss practical information and concerns in a particular industry. They contain business news, product information, advertising, trends in technology, and law and are targeted at the professionals in that industry, or students researching that industry. Their purpose is to increase practical knowledge/information in an industry/profession, provide industry news, contacts and updates concerning the industry. The articles in trade journals are written by experts in a particular field for other experts in the same field and often include

colourful illustrations and advertisements. These publications do not involve a peer review process. Trade journals are published by trade or professional associations/organizations and corporate or commercial organizations.

Examples: Foreign Trade Review, Indian Trade Journal, Publishers Weekly, PC World, Auto India

c.   Popular and general interest periodicals

These cover news, current events, hobbies, or special interests and are targeted at the general public, and available to a broad audience. The articles or features are usually written by a member of the editorial staff or a free- lance writer.The language of the articles is mostly written for any educated audience, and does not assume familiarity with the subject matter. These periodicals contain advertisements; include many illustrations, often with large, glossy photographs and graphics for an aesthetically pleasing appearance. This category does not involve a peer review process.These are usually brought out by commercial organizations or specific interest groups.

Examples: Readers Digest, Newsweek, Time, Scientific American

As discussed above, periodicals published in three categories, are many in number and cover almost the whole of the universe of knowledge. They are published at various intervals. The frequency of a periodical may be daily, biweekly, fortnightly, monthly, bimonthly, quarterly, half-yearly, annual or irregular. Besides periodicity, a periodical publication also has a distinguishing number for each successive volume. This is known as its volume number and each individual issue carries an issue number.

The main feature of scholarly periodicals is that, the page numbers are consecutive throughout the volume. On the other hand, in other categories of periodicals, each issue begins with page one. The learned periodicals generally issue title page, contents and index when each volume is complete. These are supplied either with the last number of a volume or with the first number of the next volume. Some, but not all journals, are available on the Internet. Some electronic journals (or e-journals) just give you access to the table of contents (TOCs) and abstracts, whereas others give you access to the full text of the articles. Access depends on what the institution has paid for.

6.3.1.2 Advantages of Periodicals

- As these are published frequently, periodicals are the best sources for current information.
- Periodicals often contain information on the latest trends, products, research and theories.
- Current events are usually discussed in periodicals long before they become the subject of a book.
- Periodicals are the best source for ephemeral or very specialized information.
- They are portable and easy to handle physically.
- Periodicals exist for every field and every area of interest, providing access to a variety of hard-to find information.
- Due to the shorter length of periodical articles, more topics may be covered within one volume of a periodical than in one book.

6.3.2 Newspapers

A newspaper is not only a source of information; it's a storehouse of information.It is a scheduled publication containing news of current events, informative articles, diverse features, editorials, and advertising. It usually is printed on relatively inexpensive, low-grade papers known as the newsprint. It is a publication issued periodically, usually daily or weekly containing most recent news. Newspapers, thus, provide an excellent means of keeping well informed on current events. They also play a vital role in shaping of the public opinion.

Different library and information science expertsthink differently about newspapers being primary sources of information. In fact it depends to a great extent on the contents of the newspaper articles. Some newspaper articles are clearly primary sources. For example, a reporter's account of an event that he/ she witnessed first-hand (e.g., a natural phenomenon like an eclipse) is a primary source. Similarly, an opinion piece or a letter to the editor in a newspaper is primary source.However, some newspaper articles could be secondary sources. Most newspaper stories are written by reporters or special correspondents who have gathered information from witnesses or participants in a newsworthy event, so the story's content is second-hand news and thus a secondary source. If someone who actually took part in the event and wrote the story, that would be a first- hand resource. For example, if a climber who personally climbed Mt. Everest wrote an account about the climb and the new equipment used in the process that would be first hand news concerning the climb and the evaluation of the equipment. This is a primary source of information.

Newspapers usually meet the following four criteria:

- Accessibility: Its contents are reasonably accessible to the public.
- Periodicity: It is published at regular intervals.
- Currency: Its information is up to date.
- Universality: It covers a range of topics.

Newspapers are available in various categories as below:

a. Daily newspaper – issued every day.
    Examples: The Times of India, The Hindustan Times, The Hindu, The Economic Times.

b. Weekly or fortnightly – published once a week or fortnight.
    Example of Weekly: The Newage Reporter, Union Times Today, Sadbhavana Times
    Example of Fortnightly: Northeast Mail, NGO India

c. National – a newspaper that has national focus and circulates throughout the country.
    Examples: The New York Times, The Hindustan Times, The Times of India

d. International – a newspaper having international editions.
    Examples: The International New York Times, The Daily Telegraph, The International Herald Tribune, The Wall Street Journal Asia

e. Online – most printed newspapers these days have online editions too.
    Examples: Times of India, The Hindu, Business Standard, The New York Times

f. Some newspapers have only the web-based editions.

Examples: The Yorkshire Times, Atlantic Highlands Herald, Southport Reporter

Most modern newspapers are in one of the three sizes:

- Broadsheets: 600mm X 380 mm (23 X 15 inches)
- Tabloids: half the size of broadsheets at 380 mm X 300 mm (15 X 11 ¾ inches)
- Berliner or Midi: 470 mm X 315 mm (18 ½ X 12 ¼ inches)

The newspapers contain the world, national, state and local news. They carry editorials, opinion columns, featured articles and entertainment items. Very often, the news items or the stories are also supported by illustrations and photographs. A lot of newspapers bring out glossy and coloured supplements too in order to attract more readers. Some, but not all journals, are available on the Internet. Some electronic journals (or e-journals) just give access to the table of contents (TOCs) and abstracts, whereas others give access to the full text of the articles. Access depends on what the subscribing institution has paid for.

6.3.2.1 Advantages of Newspapers

There are several benefits of newspapers as primary sources of information.

- Newspapers are less expensive than other primary information sources.
- In contrast to some Internet resources, most newspaper articles have been well-researched, written with reliable sources and edited for accuracy.
- Newspapers are also more widely available, most convenience, available in categories and easy to search for information.
- Many newspapers in large metropolitan cities have weekly supplements in specialised areas, with more opinion-based articles and lists of local events.

6.3.2.2 Disadvantages of Newspapers

For many users, there are some drawbacks too of newspapers as well. With newspapers, it's impossible to communicate events in real-time. As newspapers must go through the process of producing content, printing, and distributing the finished paper, articles/features that were written the previous night before may be out of date by the time they reach the readers the next morning. Some newspapers can be biased, depending on what kind of organisation(s) they are owned by. The process of producing newspapers is considered a waste of paper and energy resources as most of the papers also available online. Lastly, in today's fast world, the news is transmitted using many other faster mediums than newspapers like internet.

6.3.3 Technical Reports

A technical report is a formal report designed to convey technical information in a clear and easily accessible format. It is usually a document written on any field of knowledge by a researcher detailing the results of a project. It provides information on a technical topic but in such a way that is adapted for a particular audience that has specific needs for that information. It is divided into sections which allow different readers to access different levels of information. Technical reports are mostly required in the field of science and technology

as in these fields, the researchers usually need information that is current and at times not even published in journals.

The technical report provides background on a topic, for example, cloud computing, global warming, biodegradation, eating disorders, etc. However, the information on the topic is not just for anybody who might be interested in the topic, but for some individual or group that has specific needs for it and is even willing to pay for that information. For example, an entrepreneur needs to set up a fruit processing industry in a particular region. For this he needs to have general knowledge about available fruits in the region season-wise, available options, manpower availability and the technologies used to start it, but they do not want to go digging in a library to find it. What he need sis a technical background report on the subject.

Although technical reports are very heterogeneous, they possess the following characteristics:

- Technical reports may be published before the corresponding journal literature.
- Contents may be more detailed than the corresponding journal literature, although there may be less background information as most of the readers already know it.
- Technical reports are usually not peer reviewed unless the report is separately published as journal literature.
- Reports carrying classified contentsusually have limited access.
- Technical terminology and acronyms are frequently used.

Technical reports can be very useful sources of information about results or on the progress of research as they are published more quickly than journals and are often very detailed.

Examples:

Wood, Alan: Software Reliability Growth Models. Tandom Technical Report, HP Labs, 1996.

Bin Fan, Algorithmic Engineering Towards More Efficient Key-Value Systems. Computer Science Technical Reports 2013, School of Computer Science, Carnegie Mellon University, Pittsburgh.

6.3.4 Dissertations and Theses

A dissertation or thesis is a document submitted in support of an academic degree presenting the author's research and findings. Its purpose is to inform and present scholarly information. This category of documents is usually collected by academic or special libraries as they contain results of original research. In present times, besides a printed copy, most of the dissertations are also submitted in electronic form.A thesis/dissertation can be new data on an important issue; an innovative data collection method; an analysis of existing data sets in new ways to answer new and important questions; or a derivation of new research methods and a demonstration of their usefulness.The objective is to help the student learn how to think through and investigate a research question. The thesis/dissertation should show competence in the development, implementation and reporting of a research project.

6.3.4.1 Difference between Dissertation and Thesis

People are often confused with the differences between a Thesis and a Dissertation.Some universities consider both thesis and dissertation as similar. Even the dictionaries would define them as somewhat similar. The standard dictionary defines Thesis and Dissertation as follows - "A dissertation is a long formal piece of writing on a particular subject, especially for a university degree," and "A thesis is a long piece of writing based on your own ideas and research that you do as part of a university degree, especially a higher degree such as a PhD." The Dictionary thus defines both thesis and dissertation to be likely similar to each other. But there are broad features that distinguish them apart. A thesis involves conducting original research. A dissertation is usually done with already existing research work which may require the researcher to add own thoughts to it.

Examples:

Murali D.: Studies on p53 and its role in cell proliferation, athesis submitted to the Centre for Cellular and Molecular Biology, Jawaharlal Nehru University, New Delhi for award of doctorate degree. 2014.

Khurana, Poonam: Role of ethics in personal, team and organisational effectiveness, a thesis submitted to Department of Management Studies, University of Delhi, Delhi for award of doctorate degree. 2013.

Chopra, Shika: SMART Materials and Structures: a survey of published literature, a dissertation submitted for award of Associateship in Information Science, INSDOC (NISCAIR).

6.3.5 Conference Papers

A conference is a meeting where people in specific subject fields get together and share information by having discussions, presenting papers, posters, etc. There are thousands of different conferences held every year all over the world. Reports/proceedings of a conference provide information about a conference and are also the published form of the papers that were presented at the conference. Conference papers and proceedings can provide very useful information. They usually contain the latest and newest research and findings by specialists in a particular field.

Papers from conferences organised by learned societies or associations (sometimes called symposia, workshops) are often published as 'Proceedings of ... conference'. They are usually published in book format, sometimes in a number of volumes depending on how many papers were presented or submitted. They are useful sources ofprimary information, as they present research at an early stage, before journal articles have been published.

Examples:

Proceedings of the National Academy of Sciences, India Section A: Physical Sciences. Springer India, New Delhi. 2014.

57th All India Library Conference Proceedings on "Knowledge Society : Innovations in Librarianship (ILAKSIL 2012), Edited by B. Ramesha,SanjeevDutt Sharma, O.N. Chaubey, N.S. Shokeen, B.K. Vishala, Anuradha Gupta.

Proceedings of 8th International Convention CALIBER-2011, Goa University, Goa, 2-4 March, 2011.

6.3.6 Patents

A patent is defined as 'a government authority or licence conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention.' It is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. It is means to protect intellectual property rights. Patents are considered a unique source of information for scientific and technical information because a granted patent gives the patentee an exclusive right over his/her invention and he/she is able to try to stop anyone who uses it without permission. Although patent infringement is not a criminal offence, but patentee can enforce the patent rights by taking a legal action under civil law.

6.3.6.1 Advantages of Patents

According to World Intellectual Property Organization (WIPO), patent documents have following advantages as sources of information.

- They contain information which is often not divulged in any other form of literature.
- They have a relatively standardized format including abstract, bibliographic information, a description of, and in most cases also drawings illustrating the invention and full details on the applicant.
- They are classified according to technical fields.
- They provide examples of industrial applicability of an invention.
- They cover practically every field of technology.

Examples:

A K Singh, N K Pandy, A K Gupta: A composition of insulating fluid and process for the preparation thereof. Granted in India on 15/06/2012.

A K Singh, O N Anand, A K Gupta: A process for medial working fluid from heavy alkylate. Granted in Canada on 11/10/2011.

6.3.7 Standards

A standard is a document that provides rules or guidelines to achieve order in a given context. We use standards in our daily life for most of the chores and activities, for example, in everyday commodities, communications, media, healthcare, transport, construction, libraries, etc. According to British Standards Institution, 'a standard is an agreed way of doing something. It could be about making a product, managing a process, delivering a service or supplying materials – standards can cover a huge range of activities undertaken by organizations and used by their customers.' Standards thus are documents prepared by an authority to specify a product, material, process, quality, etc. Initially used first for industrial products, these later began being used by services sector. The purpose of these documents is to maintain quality control and efficiency. They provide guidelines for standardization in products and activities. Standards enable us to exchange products or services with other organizations. Some organizations that provide standards internationally and nationally are International Organization for Standardization (ISO), National Information Standards Organisation (NISO) and Bureau of Indian Standards (BSI).

Standards cover several subjects like computers, construction and building safety, library activities and library equipment, etc. Standards are produced for many different products and services, and may be created for company, national, regional or global application. They may be used on a voluntary basis, or made mandatory by company policy, national or international regulation, or by law. They can be very specific or a particular type of product or general such as management practices. A standard, therefore, provides a reliable basis for people to share the same expectations about a product or service. This helps to facilitate trade; provide a framework for achieving economies, efficiencies and interoperability; and enhance consumer protection and confidence.

Standards are very useful for modern society as if we do not have any knowledge of standards the products might not work as expected, might be of inferior quality, incompatible with other equipment, non-standardized products may be dangerous, consumers will be forced to buy from one manufacturer or supplier, and due to lack of competition manufacturers may exploit consumers.

Examples:

IS 5835:1970: Method for estimation of Vitamin D in foodstuffs, 2010.

IS 4579:1968 Methods of measurements on television picture tubes, 2013.

ISO 2709: Standard for Bibliographic Record Formats. 2008.

6.3.8 Trade and Product Bulletins

Trade and product bulletins are information products brought out by the publishers, manufacturers and distributors of various types of materials, products or services. Trade and product bulletins cover every kind of material, product or service ranging from books, drugs, chemicals, household goods to complex machinery and equipment used in research and industry. The basic purpose of this type of trade literature is to describe various attributes of the product, material or service and promote its sale to the potential customers. Trade and product bulletin are primary sources of information and information reported about specific commercial product is not likely to be published in any other form of literature.

Examples:

Foreign Trade Enquiries Bulletin, Spice Board of India

Purolite Product Bulletin, ThePurolite Company, USA

Phenol Product Information Bulletin, Shell Chemicals, USA

6.3.9 Other Primary Sources

Researchers consult primary sources in pursuit of new material or knowledge which has not been reported or searched by others. We often think of primary sources as being written or as documentary sources, but they may also be in other forms, including interviews, recordings, paintings, or even computer software, e-mail correspondence and web pages. Examples of primary sources others than those discussed above include:

- Personal papers
- Letters (both personal and business)
- Diaries (both personal and business)
- Photographs & paintings, sketches, original maps, etc.
- Advertisements, posters, and banners
- Memoirs
- Genealogy records, both personal/family and from public records
- News footage (newsreels, videotapes or audiotapes, etc.)
- Newspaper articles written at time of the event
- Speeches
- Oral histories
- Minutes of meetings related to the event
- Legal cases, treaties
- Statistics, surveys, opinion polls, scientific data, transcripts
- Records of organizations and government agencies
- Original works of literature, art or music
- Films, cartoons, postcards, posters, etc.
- Objects and artifacts that reflect the time period in which they were created(computer software, e-mail archives, web documents, etc.)
- Computer software, e-mail archives, websites, web documents, etc.

Besides the above, determining which kinds of documents to use which constitute primary sources depends upon the topic one is researching. Primary sources enable the researcher to get as close as possible to what actually happened during an event or time period. A primary source reflects the individual viewpoint of a particular topic or subject area. Many primary sources are unique and can only be found in very fewlibraries or collection in the world.

7. Secondary Sources

Secondary sources analyse, review, or summarize information contained in primary resources or other secondary resources. Even sources presenting facts or descriptions about events are secondary unless they are based on direct participation or observation. Moreover, secondary sources often rely on other secondary sources and standard disciplinary methods to reach results, and they provide the principle sources of analysis about primary sources.Secondary Sources build on the primary sources with more extensive and in-depth analyses. They summarize, evaluate, and analytically interpret primary material, often by offering a personal perspective. It is thus one step removed from the original source.

A secondary source, therefore, provides "second-hand" information that has been digested, analysed, reworded or interpreted, and often combines information taken from primary sources and even other secondary sources.They are mostly dependent upon primary sources of information for their existence. Secondary sources are often written well after the events

they report on, and can put past information into its historical context. In a secondary source, the impressions and experiences of other works are reported. Their main advantage is that they usually present the contents of primary documents in condensed form or list them in a helpful way so that existence of primary documents is known and access to them is made easy. For example in sciences, a primary source is a journal article where a scientist describes his research work on the subject 'Cloud Computing.' A secondary source would be a review article commenting or analysing the various scientists' research on the subject'Cloud Computing.'

7.1 Need for Secondary Sources

In a secondary source, the impressions and experiences of other works are reported. They are required for most of the researcher and library professionals as these:

- Present the contents of primary documents in condensed form or list them in a helpful way so that existence of primary documents is known and access to them is made easy.

- Help to get expert opinions in order to evaluate what the primary sources really contain.

- Enable to gain insight by examining the same content from different perspectives.

- Assist the researchers to form own opinion.

- Save reading time of users by collecting information from a number of different sources.

- Can broaden a user's perspective and research.

7.2 Category of Secondary Sources

Based on the reorganization of information in these sources, the secondary sources can be grouped under following categories:

7.2.1 Books

A book is defined as a written or printed literary work, which is separately published and has an independent physical existence, with pages fastened along one side and encased between protective covers. In many libraries, books are referred to as monographs. UNESCO defines a book as 'a bound non-periodical publication having 49 or more pages, exclusive of cover pages, published in a country and made available to the public.

In other words, a book is a document that normally deals with one particular subject having continuous thought content. Most books have a protective cover. Books are reasonably inexpensive and convenient to store, transport and find knowledge and information. The book thus ranks as one of the humanity's greatest inventions. People have used books in the same form for over 5,000 years. Although most books in libraries are usually bound with hard covers, paperbacks are also becoming popular now. A book can be simple or composite, single-volume or multiple-volume, a general book, a text-book or a reference book.

7.2.1.1 Text Books

A book supporting any teaching programme or belonging to some course curricula is referred to as a text book.There are several definitions for textbooks, one common definition is that a textbook is a printed and bound artefact for a course of study. They contain facts and ideas around a certain subject. They have been used to aid teaching as these are not just teaching and learning objects but are documents that hold content that reflects the vision of a specific group. Although their presentation has changed over the years, their main goal has remained the same, i.e., to help build the platform of knowledge for students.Although most textbooks are only published in printed format, many are now available as online electronic books. A textbook is a secondary source as a primary source is a work of the research done by a scholar. A textbook combines a number of pieces of research reports into one united book. Instead of reading a hundred books on a subject, the users read the summary provided in one single books or a few of those few books.

Examples:

G. Edward Evansand Patricia Layzell Ward: Management Basics for Information Professionals. Neal Schuman Publishers, 2007.

Arlene G. Taylor: Introduction to Cataloging and Classification (Library and Information Science Text Series). Libraries Unlimited, 2006.

7.2.2 Reference Books

The Merriam-Webster Dictionary defines reference books as 'a book (as a dictionary, encyclopaedia, and atlas) intended primarily for consultation rather than for consecutive reading' and also 'a library book that may be used on the premises but may not be taken out.'Another definition by Business Dictionary is reference books are, 'Atlas, dictionary, directory, encyclopaedia, handbook, thesaurus, or any other workdesigned to be used in finding specific items of information, rather than for cover to cover reading.'

Some unique features of reference books are that:

- These are looked up rather than reading from beginning to end.
- Reference sources provide a representation based upon which we proceed with retrieval of information from another source (mostly primary).
- They are information source that provides access to organized information.
- Reference collection specifically serves to address information queries.

From the above we can conclude that the reference books are those sources that are referred to only for referencing. Most popular reference sources containing information are-encyclopedias, almanacs, dictionaries, directories, handbooks, yearbooks, atlases, government information, statistical sources, etc.

For further details of reference sources, independent Modules devoted to most of the above mentioned reference sources may be consulted. (Paper: Information Sources, Systems and Services - Module nos. 4, 5, 6, 7, 8, 9, 11)

7.2.3 Indexing/Abstracting Periodicals

Secondary periodicals regularly scan the literature published in primary sources, select the relevant items, arrange them in helpful sequence and bring them to the notice of researchers at regular intervals, viz. weekly, fortnightly, monthly or quarterly interval basis. These publications contain bibliographical references of each item with or without abstracts. A secondary periodical with abstract is an abstracting periodical and without abstract is an indexing periodical. These publications bring together recently published literature in specific subject discipline scattered over wide range of primary sources. The researchers, however, need indexes, firstly, to keep them abreast of the literature of their field, and secondly, to serve for retrospective searches of all the literature appropriate to their subject.

Secondary publications list and arrange the relevant items from the primary documents for easy and quick access. For instance, indexing and abstracting periodicals systematically scan the current primary sources of information (like primary periodicals, research reports, conference proceedings, etc.) on a particular subject field, select the relevant items, index (or provide brief summary of) each item, and arrange it in a helpful sequence so that each item can be easily located and identified. Indexing and abstracting periodicals are brought out at regular intervals and keep users abreast of the current literature on a subject and serve as important guides to the primary literature. Without these secondary sources, a large part of primary literature may remain unknown and unused. Indexing and abstracting periodicals are available in every subject field. At present most of the national as well as international indexing and abstracting periodicals are available in print form, CD-ROM and online on the web.

7.2.3.1 Indexing Periodicals

In indexing periodicals the relevant items with full bibliographical details are selected from primary sources and are arranged either under broad subject headings or under class numbers. This arrangement brings all the items on the same subject together. Bibliographical details help the reader to identify and locate the original document. For example, if the document is a journal article, bibliographical details will provide the name(s) of the author(s), title of the article, title of the journal, its volume number, issue number, year of publication and the page numbers of the article. The indexing periodical also provides author and subject indexes of the items covered.

Indexing periodicals are of following three types:

a. **General Indexing Periodicals:** These indexing services cover various periodicals in a wide field of knowledge. The coverage is not limited to single subjects and several subjects are covered in this category.
   Example: Humanities Abstracts (H.W. Wilson), Current Contents (Thomson Reuters)

b. **Subject Indexing Periodicals:** This category covers the various documents in a narrow field or subject area that includes besides periodicals, new books, pamphlets, conference proceedings, reports, etc.
   Example: Applied Science & Technology Index (H.W. Wilson), Library Literature and Information Science Index (H.W. Wilson).

c. **Indexes to Individual Periodicals:** These indexing services belong toa single periodical and are usually issued on an annual basis.
   Example: Guide to Indian Periodical Literature: Social Sciences and Humanities (Indian Documentation Service).

7.2.3.2 Abstracting Periodicals

In abstracting periodical, the contents of the selected items are condensed or summarized (called abstracts) along with bibliographical details of the documents. Bibliographical details of the documents help the users to identify and locate the original documents. The abstracts of the documents enable the users to make decisions regarding accessing the full documents. At times a well prepared abstract serves as substitute for the original document. Abstracting periodicals also provide author and subject indexes.

Examples:

Chemical Abstracts (Chemical Abstracts Service), Biological Abstracts (BIOSIS, Thomson Reuters)

Further details on Indexing/abstracting periodicals are available in Paper 2: Information Sources, Systems and Services - Module no. 10.

7.2.4 Bibliographies

A Bibliography is defined as 'a complete or selective list of works compiled upon some common principle, as authorship, subject, place of publication, or printer' (Dictionary.com). In other words, it is a systematic list of documents that share a common factor that may be subject, a language, a period, an author or some other criteria. The list may be comprehensive or selective. The list is arranged by some order. Such bibliography, known as enumerative or systematic bibliography, attempts to record or list. Each entry provides bibliographical details of the document.

Bibliography is considered as a secondary source of information as it is a systematic compilation of already produced primary sources of information. Bibliographies have a vital role for users as they help to retrieve relevant information and thus save the time of the user. They bridge the gap between the original document and the user acting as a key to the treasure of primary knowledge.

Bibliographies help to identify important and relevant sources on a topic, find what research has already been done on a topic, find articles and books written by or about a particular person and find out where to look for relevant information. Bibliographies are available as national bibliographies, trade bibliographies and subject bibliographies.

Examples:

The British National Bibliography (BNB) lists the books and new journal titles published or distributed in the United Kingdom and Ireland since 1950.

American Book Publishing Record® provides immediate access to the cataloguing records for the entire year of the books published or distributed in the United States.

Books in Print, United States

Further details on Bibliographies are available in Paper 2: Information Sources, Systems and Services - Module no. 9.

7.2.5 Survey Publications

When plenty of information is available on certain subjects, survey publications which are prepared as a result of information consolidation are found to be the possible solution. These are usually in the form of reviews, state-of-the-art reports, trend reports and technical digests. These publications survey the selected portion of primary literature and provide an overview of the subject or highlight significant literature on the subject (e.g., Treatises) or depict the progress of a particular field of study (e.g., Annual Reviews, advances,etc.) or present the contents of primary literature on a subject in easy and understandable form keeping in view the particular group of users (e.g., Couse material, Instructional books, etc.).

Examples:

Annual Review of Financial Economics, 2009-

Advances in Electrical and Computer Engineering, 2001-14

George Reisman—Capitalism: A Treatise on Economics

State-of-the-Art Reporton Fiber Reinforced Concrete, 2002.

8. Tertiary Sources

Tertiary sources are based on primary and secondary sources of information and serve as key to the primary and secondary sources. Tertiary sources are usually compilation from primary or secondary sources and help the searcher to select required primary or secondary source which will be most relevant for his purpose. These publications do not carry subject information but guide the users to the source where information on that subject will be available. Tertiary sources are usually not credited to a particular author. In the order of appearance, first primary sources are published, and then based on primary sources, secondary sources are compiled. Tertiary sources are third in the order of appearance and these sources are based on primary as well secondary sources and serve as guide to primary as well secondary sources. Tertiary sources consist of information which is a distillation and collection of primary and secondary sources. Tertiary sources provide overview of topics by synthesizing information gathered from other resources and often provide data in a convenient form or provide information with context by which to interpret it. The information is compiled and digested into factual representation, so that it does not obviously reflect points of view, critiques or persuasions. Tertiary sources are typically the last to be published in the information cycle. Under tertiary sources of information come publications like 'guide to the literature', 'guides to the reference sources', bibliography of bibliographies, etc. Other examples of tertiary sources are the almanacs, directories, handbooks, guides, manuals, etc. Textbooks are also considered by some information scientists as tertiary sources. Some reference materials and textbooks are considered tertiary sources when their chief purpose is to list, summarize or simply repackage ideas or other information. As tertiary sources, encyclopaedias and textbooks attempt to summarize and consolidate the source materials into an overview, but may also present subjective commentary and analysis (which are characteristics of secondary choices).However, most information scientists categorise textbooks as secondary sources only and these have been discussed in the previous section.

The various tertiary sources are explained in the following sections.

8.1 Almanacs

Almanacs, originally a calendar with notations of astronomical and other data have been known in simple form almost since the invention of writing, for they served to record religious feasts, seasonal changes, and the like. Present day almanacs include a comprehensive presentation of statistical and descriptive data covering the entire world. Major topics covered are geography, government, demographic data, agriculture, economics and business, health and medicine, S&T, transport, sports, awards and prizes. Contents also include articles focusing on events of previous year as well as summary of recent events. The present almanacs are more like yearbooks as both depend on government sources for statistical data. The only differencebeing that almanacs present astronomical data, which is absent in the yearbooks.Almanacs are brought out annually.

Examples:

Kalnirnay (India)

Whitaker's   Almanack   (United   Kingdom)

Astronomical Almanac (USA)

8.2 Handbooks

A handbook is defined as a comprehensive and detailed work on a particular topic for practitioners, structured for quick reference and often used as a supplement to a text book. Handbooks are collection of useful information, combining some of the features of both a dictionary and an encyclopaedia. It is also a publication that reviews available information concentrating on critical data and/or guidelines for accepted and tested procedures, techniques, processes and standards. Here critical data refers to chemical structures, mathematical formulae and other such data. Handbooks are very popular and have widespread uses, particularly in science, technology, industry, manufacturing, healthcare and other related subject areas.

Professional organizations usually produce a variety of handbooks ranging from short, duplicated or photocopied set of regulations to glossy multi-coloured reports. These are produced for different type of users such as technical personnel, office staff, industrial workers, shareholders of a company, etc. Certain handbooks are brought out for general information, for example, history of the organization, and certain only for the benefit of the employees, for example, set of rules.

Examples:

MLA Handbook for Writers of Research Papers, 7th ed., 2009

Perry's Chemical Engineers' Handbook, 8th ed. 2007

CRC Handbook of Chemistry and Physics, 92nd ed. 2011

Saracevic (Tefko) and Wood (J B): Consolidation of Information, A Handbook on Evaluation, Restructuring & Repackaging Of Scientific & Technical Information. UNESCO, 1981.

8.3 Manuals

Manual is defined as a document with instructions, especially for operating a machine or learning a subject or performing an operation. A manual is a concise reference handbook dealing with a particular process, procedure, operation, mechanism, job instruction, etc. It is essentially a how-to-do-it document prepared with meticulous care containing details of the concerned subject-matter. It explains howa certain things happen or how a particular job should be done.

Manuals are of different kinds dealing with various jobs, functions of descriptions. An examination of various kinds of available manuals in the present day professional world indicates that they can be classified into three main categories, namely, Technical Manual, Procedure Manual and Laboratory Manual. Plenty of manuals related to company products, automobiles, softwares, etc. are available online and can be downloaded freely.

Examples:

PHP Manual, 2014

Merck Manual of Medical Information–Home Edition, 2nd ed. 2003

Sony Manuals

8.4 Directories

A directory is a list of names and addresses of people and organizations. Directories are ready reference tools in the libraries that provide information related to individuals, organisations, institutions, etc. Entries in the directories are arranged in the alphabetic or classified order. Directories of persons cover name, address, status, experience, etc. of individuals. The directories of organisations or institutions contain name of the organisation, address, functions, objectives, activities and names, addresses, phone numbers, email id, etc. of the officials of the organisation. Directories are broadly categorized as General Directories and Special Directories. An example of General Directories is the telephone directory and examples of Special directories are professional, trade and business directories.

Examples:

Universities Handbook, 32nd ed. 2010

The Europa World of Learning 2013, 63rded.

Kothari Industrial Directory of India, 40thedition, 1996

IndiaMART- Indian Manufacturers Suppliers Exporters

8.5 Bibliography of Bibliographies

Bibliography of bibliographies is defined as a type of bibliography which includes information about bibliographical aids.It is a list of bibliographies listed in a systematic and logical order. It includes all types of bibliographies published in different fields. The listed bibliographies lead readers to useful bibliographies though various approaches.

Examples:

Bibliography of Bibliographies of the Languages of the World, Volume I: General and Indo-European languages of Europe. Compiled by Rudolph C. Troike. 1990.

P. William Filby: A Bibliography of American County Histories. 2002.

8.6 Guides to the Literature

The Guides to the Literature direct the users to appropriate sources in a particular field of knowledge. In each of the Guides to the Literature, we can find annotated bibliographies of books, journals, websites, databases, and other types of publications or information sources on specific topics. These can be useful when we cannot find desired information in other resources, or when attempting to comprehensively cover a topic. These guides also covers other literature guides; databases, and indexing and abstracting services; bibliographies; dictionaries, encyclopaedias, and handbooks; directories, guides, and other reference sources; Web-based reference sources; and associations and publishers. These guides are available in most of subject areas, especially in sciences and technology and are useful sources for any specific subject specific library or information organisation. Most of the major publishers bring out series of these guides.

Examples:

Schmidt, Diane: A Guide to Reference and Information Sources in Plant Biology.2006

Max Marmor and Alex Ross, Eds.: Guide to the Literature of Art History 2. 2004

Computer Science and Computing: A Guide to the Literature. 2006

Freides, Thelma: Literature and Bibliography of the Social Sciences. 1973

Directories of periodicals may also included in this category of tertiary sources. This is due to the reason that the Directories of Periodicals identify and describe the journals pertinent to a field of study. Their this function resembles that of guides to the literature as directories to periodicals do not point out any specific literature in a subject, but indicate the publications that are most likely to contain types of relevant material.

Examples:

World List of Social Science Periodicals, Unesco.

Ulrich's Periodicals Directory, 52nd ed. 2014

8.7 Guides to the Reference Sources

Reference sources provide answers to specific questions, such as brief facts, statistics, and technical instructions; provide background information; or direct users to additional information sources. In most libraries, reference sources are not circulated and are located in a separate reference collection. This practice makes reference sources readily available and easily accessible. However, at times, it becomes a little difficult for users and library staff too to identify suitable reference sources for particular activities. For this, there are sources that are required to direct us to the best reference sources by field or type of source (e.g.,

dictionary or encyclopaedia or biography or reviews, etc.). The Guides to Reference Sources enable us to identify the best possible reference sources for research needs. Like the guides to the literature, these guides cover reference sources in various subject fields arranges in helpful order to enable the users to search the relevant information sources.

Examples:

Guide to Reference Books, 11th ed. (Formerly referred to as Winchell (Constance) Guide to Reference Books.

Guide to Reference, online successor to Guide to Reference Books, is a selective guide to the best print and online reference sources since 2008.

Walford, Albert John. Walford's Guide to Reference Material.3volumes, 1998

Lester, Ray (Ed.)The New Walford Guide to Reference Resources. Vol. 1: Science, Technology and Medicine. 2005.

8.8 Union Catalogues

A union catalogue is a catalogue listing the holdings or part of holdings of two or more libraries. It may be local, regional or national and cover the book collection or periodical holding or any other part of the collection of the participating libraries. Their chief function is to serve as a tool for location of the library materials. They are to be updated regularly to indicate new additions to the libraries and also enable inter-library loan, thereby, being a major tool for resource sharing or networking. With the use of computer applications in modern libraries, it has become very convenient to use and maintain the union catalogues.

9. Distinction between Primary, Secondary and Tertiary Sources

The distinction between primary, secondary, and tertiary sources can be ambiguous and is not always clear. An individual document may be a primary source in one context and a secondary source in another. Depending on how or why it is being used, a secondary source may also be a primary source. As discussed in the previous sections, the 'Primary Sources' are original materials from the time period involved, and have not been filtered, influenced or analysed through interpretation. They bring us as close to the original event or thought as possible. The 'Secondary Sources' build on the primary sources with more extensive and in-depth analyses. Lastly, the 'Tertiary Sources' are distillations and collection of primary and secondary sources.

The distinction of these three sources is presented in the table below:

Source	Definitions	Timing Of Publication Cycle	Formats	Example
Primary	Sources that contain raw, original, interpreted and	Primary sources tend to come first in the publication	Research papers, preprints, letters, conference papers, diaries,correspondence,	Article in a Library and Information Science

	unevaluated information.	cycle.	fiction, poetry, newspaper articles about current events.	journal
Secondary	Sources that digest, analyse, evaluate and interpret the information contained within primary sources. They tend to be argumentative.	Secondary sources tend to come second in the publication cycle.	Indexing and abstracting periodicals, Bibliographies, Reference Books	Library and Information Science Abstracts (LISA)
Tertiary	Sources that compile, analyse, and digest secondary sources. They tend to be factual.	Tertiary sources are the last in the publication cycle.	Reference books like Encyclopaedias, Directories, Bibliographies of Bibliographies, Guides to Reference works, etc.	Ulrich Periodicals Directory

Examples from various subjects

Subjects	Primary	Secondary	Tertiary
Agriculture	Conference paper on Animal Nutrition	Review article on the current state of research in the field of Animal Nutrition	Encyclopaedia article on Animal Nutrition
Chemistry	Chemical patent	Chemical Abstracts	Table of Related reactions
Library Science	ISO 2709: Standard for Bibliographic Record Formats. 2008.	Progress in Librarianship	Walford's Guide to Library Material
Physics	Einstein's diary	Bibliography on Einstein	Bibliography of Bibliographies on Relativity

10. Summary

In this Module, we have discussed the information sources and categorised them based on their type, information contents and physical form. Information sources are of two types, namely, Documentary Sources and Non-Documentary Sources. All recorded sources are documentary sources. All non-recorded sources are non-documentary sources.Based on the Information content and organizational level, a documentary source may be primary, secondary or tertiary source.

Primary sources contain original information, are in large number and widely scattered. Primary periodicals, technical reports, dissertations and theses, patents and standards are primary sources of information. Secondary sources of information are based on primary sources and present the contents of primary sources in condensed form and list them in helpful way, so that the existence of primary documents is known and access to them is made easy. Secondary sources can be grouped as Indexing/Abstracting, Survey type and Reference type. The Tertiary sources of information are based on primary and secondary sources of information and act as key to the primary and secondary sources. Some reference materials and textbooks are considered tertiary sources when their chief purpose is to list, summarize or simply repackage ideas or other information.

The primary sources are easily identifiable as they are the original sources of any newly generated information. The secondary sources are less easily defined than primary sources. Generally, they are accounts written after the fact with the benefit of hindsight. They are interpretations and evaluations of primary sources. Secondary sources are not evidence, but rather commentary on and discussion of evidence. However, what some define as a secondary source, others define as a tertiary source as context is everything. The tertiary sources compile or digest other sources. Some reference materials and textbooks are considered tertiary sources when their chief purpose is to list, summarize or simply repackage ideas or other information.

Lastly, the distinction between the primary, secondary and tertiary sources has been discussed.

Tertiary sources of information are based on primary and secondary sources of information and act as key to the primary and secondary sources.

11. References

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3. Katz (W A): Introduction to reference work. 8th ed. New York: McGraw-Hill, 2001. 2 V.

4. Kawatra, P S. Textbook of Information Science. New Delhi: APH Publishing Corp, 2000.

5. Lester (Ray), ed.:The New Walford Guide to reference resources. Vol. 1: Science, Technology and Medicine. London: Facet Publishing, 2005. xix, 827 p.

6. New Walford's Guide to Reference Resources. 3 volumes. London: Facet Publishing, 2005.

7. New Walford's Guide to Reference Resources. 3 volumes. London: Facet Publishing, 2005.

Unit 3
Types of Information Sources: Non-Documentary: Organisations and Humans

1. Introduction

The information requirements of users belonging to various subject areas are taken care of by libraries and information organisations. For this, it is essential for every information organization to carry out information resource development which includes development of both documentary and non-documentary sources of information. The development of documentary sources is also referred to as collection development. However, it is also essential to develop or maintain the non-documentary sources of information as many of the formal documentary sources may not be able to provide what is otherwise available in non-documentary sources. It is an essential activity for modern information organizations as it facilitates providing of efficient and effective library services.The non-documentary sources of information are extremely important in the process of communication. This is due to the fact that whenever a user, while doing research or working on a project, wants some information immediately, he/she approaches a colleague or a non-conventional source. This is to save time as using or searching from a documentary source or visiting a library very often may result in delay. Non-documentary sources of information provide information instantly and are very easy to handle.

The non-documentary sources of information include government establishments, departments, universities, technological institutions, data centres, information centres, referral centres, information analysis centres, clearing houses, consultants, technological gatekeepers, etc. Non-documentary sources of information also include discussion with colleagues, visitors, participants of seminars and conferences, etc. The library through the referral service provides access to important non-documentary sources of information which may include the learned societies, research associations, mass media, etc.

In this Module, the various non-documentary sources of information are categorised and discussed with little details along with examples.

2. Information Sources

An information source is any system producing information or containing information intended for transmission. In library and information science, the information sources are the sources from where we get information for satisfying our information requirements. Information sources being the means for transmission of information are usually represented in various forms, which are textual (books, journals, manuscripts), graphic (graphs, diagrams, plans, charts), audio-visual (sound recordings, motion pictures, slides) and electronic. These sources comprise of documents, institutions or organizations and human being. The most important division of information sources is considered to be the documentary sources, and

non-documentary sources. For example, a book or periodical or dictionary or an encyclopaedia is a documentary source, and an expert or an R & D organization is a non-documentary source.

The documentary sources thus include all the modern and traditional reference and information sources that we have already discussed in the Module on Documentary Sources. All recorded sources of information irrespective of their contents and form come under documentary sources. These may be published or unpublished, in print or in electronic form. On the other hand, the non-documentary sources are those sources which are not recorded in any form.

Information sources are different from information resources. The data and information and other assets of an organization are referred to as information resources. Resources in libraries are libraries complete stock or collection, uninterrupted supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively.

3. Non-Documentary Sources of Information

The non-documentary sources of information can be defined as those sources and resources of information that are not contained in any document. The non-documentary source comprises of formal and informal sources. Formal sources include information of research organizations, societies, industries, government departments, universities, consultants, etc. Informal sources include human sources, conversation with colleagues, consultants, experts, resource persons, mass media, etc.

The main categories of non-documentary sources are:

- Institutions or Organizations
- Humans
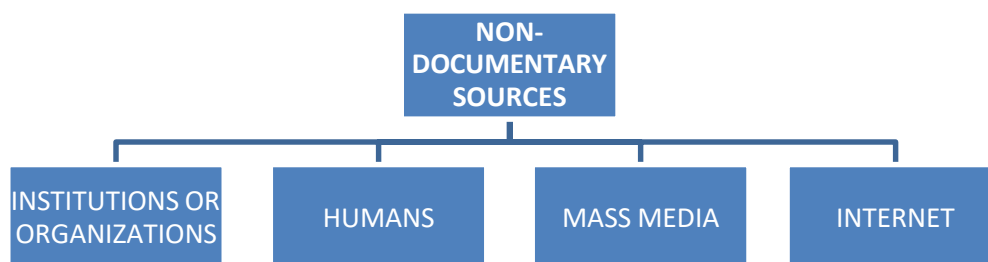- Mass Media other than print media, and
- Internet

Fig.1: Non-Documentary Sources

The organizations as sources of information include academic institutions, government ministries and department, research and developmental organizations, societies, publishing houses, international and national agencies, etc.

The human resources are the experts, consultants, resource persons, extension workers and even the common human beings.

Mass media refers to any means of public communication that can reach a large audience. Examples of the mass media include - the internet, television and radio. Magazines and newspapers are also deemed to be mass media.

Internet is another very important source of information. Internet is interactive digital media and is different from the traditional media such as print and television. World Wide Web (WWW), also called the Web, is collection of websites on the Internet and offers information on almost all the topics.

4. Institutions/ Organisations as Sources of Information

As mentioned in the preceding sections, institutions and organizations are also sources of information. There are various categories of institutions and each one makes available certain type of information for different target users. It is a known fact that information made available by institutions/organisations is always authentic.

Various institutions that make available information always sought out by the users are:

- Academic institutions
- Research and development organizations
- International agencies
- Government Ministries, departments and agencies
- Exhibitions and trade fairs
- Learned societies and professional institutions
- Publishing houses
- Database vendors
- Museums and archives
- Libraries and information centres
- Information analysis centres
- Referral centres

Let us know some details of each of the above mentioned institutions that help users to access information for use.

4.1 Academic Institutions

Academic institutions are the universities; colleges; Indian Institutes of Technology; medical, law, veterinary, pharmacy and management schools; polytechnics; secondary and senior secondary schools, etc. The information furnished by the academic institutions usually relates to the number, types and duration of courses run by the institution, details of faculty, past records of students concerning the dates of admission, leaving, results, performance in cultural activities and sports, etc. These institutions mostly provide biographical details of individuals along with photographs, etc. The libraries/information centres of these organisations have valuable resources which are available for consultation by any person requiring the same.

Examples: Jawaharlal Nehru University, New Delhi; Indian Institute of Management, Lucknow; Indian Institute of Technology, Mumbai; Meerabai Polytechnic, New Delhi; Delhi Public School, Noida

4.2 Research and Development Organizations

The key activity of research and development organizations is generating information through research work. This research related information is published in the form of research papers, short communications, reports and monographs. Research and development organisations usually establish information centres. In such cases, there is a possibility of discussion and exchange of information between the members of an association. These organizations make available details related to core areas of research work of scientists, biographical details of individuals working in these institutions, service profiles, laboratory notebooks, correspondence, details of path to achievements and any other significant information related to individuals or research work.

Examples: National Physical Laboratory, New Delhi; Defence Research and Development Organisation, New Delhi; National Remote Sensing Centre, Hyderabad; Indian Institute of Tropical Meteorology, Pune

4.3 International Organisations

An international organization is an organization with an international membership, scope, or presence. These organisations operate at international or regional level and usually collect, process, generate and disseminate useful information through their products, services or publications. Many times, vital information is also available from the websites of these international agencies. The international agencies usually collect statistical details from various countries related to academic activities, socio-economic data, scientific workforce and many other areas like cultural, demographic data, etc.

Examples: International Organisations - United Nations; Organisation for Economic Cooperation and Development; World Health Organisation; International Atomic Energy Agency

Regional Organizations too are international as they incorporate international membership and encompass geopolitical entities that operationally represent a group of nations in a region. They are established to foster cooperation and political and economic integration or dialogue amongst states or entities within a restrictive geographical or geopolitical boundary.

Examples: Regional Organisations – South Asian Association for Regional Cooperation, European Union, African Union

4.4 Government Ministries, Departments and Agencies

A government ministry is a specialized organization responsible for a sector of a government usually led by a minister or a senior public servant, that can have responsibility for one or more departments, agencies, bureaus, commissions or other smaller executive, advisory, managerial or administrative organizations. A government agency is a permanent or semi-permanent organization in the machinery of government that is responsible for the administration of specific functions. A government agency is normally distinct both from a department or ministry, and other types of public bodies established by government. The

functions of an agency are normally executive in character, since different types of organizations (such as commissions) are most often constituted in an advisory role.

The various government ministries, departments and agencies usually make available authentic and latest data related to their sphere of activity as they gather and generate information from their own sources. The ministries, departments and agencies are usually approached for a large variety of information by planners, policy makers, researchers and decision makers. The election bodies, national standards bodies, etc. also fall in this category.

Examples: Ministry of Agriculture, Ministry of Home Affairs, Department of Women and Child Development, Department of Revenue, Election Commission of India, National Commission on Women

4.5 Exhibitions and Trade Fairs

Exhibition is an event to collectively display different art, product or skills. Both individuals and businesses partake in this event to reach specific goals. Various types of exhibitions are especially organized to cater the needs of the participants. There are commercial and non-commercial exhibitions. Commercial exhibitions are intended to attract buyers and sell the displayed items while non-commercial exhibitions are simply arranged for appreciation of talents and skills. Each item displayed in exhibition is referred to as an exhibit. Usually organized for a short period, exhibitions are highly informative and provide a great deal of information concerning exhibits displayed in the exhibition. During many exhibitions conferences and panel discussions are also held, which are a useful source of information for concerned users.

Examples: Concrete Show India 2014; India International Leather Fair 2014;8th Renewable Energy India Expo 2014

Trade fair is a massive, stage-set, and usually regular trade event at which a large number of manufacturers from a particular industry present their products and show their capabilities to distributors, wholesalers, retailers, and end-users. Some trade fairs (like the Book Fairs) attract participants and visitors from all over the world and provide widespread interactions and exposure. Trade fairs are a popular means of sales promotionalso because they enable face to face contact between sellers and buyers.A trade fair (or trade show) in other words is an exhibition organized so that companies in a specific industry can showcase and demonstrate their new products and services. Some trade fairs are open to the public, while others can only be attended by company representatives (members of the trade) and members of the press, therefore tradeshows are classified as either "Public" or "Trade only".   During the trade fairs, the manufacturers and traders print their own product catalogues that provide chief features of the products with diagrams and photographs, etc. These catalogues are main source of information and are available free of cost to users/customers. Many manufacturers, instead of catalogues, bring out only brochures or leaflets to describe their products that may give details of cost, features, quality and even comparison with other similar products.
An increasing number of trade fairs are happening online, and these events are called virtual tradeshows. They are increasing in popularity due to their relatively low cost and because there is no need to travel whether you are attending or exhibiting.

Examples: India International Trade Fair 2014;Jewellery & Gem Fair 2014; India International Trade Fair 2014

4.6 Learned Societies and Professional Institutions

A learned society, also referred to as a scholarly society or academic association or professional institution) is an organization that exists to promote an academic discipline or a profession, or a group of related disciplines or professions. Membership isusually open to all who have acquired same qualifications. This kind of grouping of professionals is characterized by patterns of relationships between these individuals that may have distinctive culture and institutions, or, more broadly, an economic, social and industrial infrastructure in which a varied multitude of people or peoples are a part. In each major profession there are societies which are at international, national and local level. The professional societies and associations are a rich source of information as they usually bring out journals, newsletters and technical compilations. As some of the societies are very old, their archives contain valuable information. Indian Library Association (ILA), Indian Association of Special Libraries and Information Centres (IASLIC) and Delhi Library Association (DLA) are in examples of professional associations in our own field, that is, of which professionals from library community are members.

Examples: Indian National Science Academy, American Chemical Society, SahityaAkademi, International Federation of Library Associations and Institutions

4.7 Publishing Houses

It is an organisation/group that publishes books, journals and other related publications including the electronic material. An individual does not usually have the resources to originally invest into putting a document or book on the market. A publishing house is a company that will pay for these original costs, like writing the book, editing, marketing, and printing. But to make money, they also get paid based on the number of copies sold, often as a percentage of total profit. The publishing houses bring out catalogues, prepare databases, and bring out publications being brought as part of some series. And all these are important sources of information. Also the manuscripts before editing and actual printing are usually stored by publishing houses and these are a valuable source of information for users involved in research.

Examples: Oxford University Press; R. R. Bowker; H. W. Wilson &Co.; National Book Trust; S. Chand & Co.

4.8 Database Vendors

A database is basically a collection of information organized in such a way that a computer program can quickly select desired pieces of data. A database is like an electronic filing system. A database vendor, or a supplier of databases, is an organization or an individual that provides access to or services from database(s) to subscribers. The database vendors are the most appropriate sources of information when details about a database,

sources available in it, services provided by the same and associated costs are required by users.

Examples: Thomson Reuters; Proquest; EBSCO

4.9 Museums and Archives

As a source of information, museums and archives have great value. One can see the exhibit, read the enclosed notes/details, and also pursue the catalogues and available documents for having further details on an item.

A museum is a "permanent institution in the service of society and of its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment, for the purposes of education, study, and enjoyment". Museums enable people to explore collections for inspiration, learning and enjoyment. In other words, they are institutions that collect, safeguard and make accessible artefacts and specimens, which they hold in trust for society. There are thousands of museums all over the worldthrough their programmes and activities, the museums can affect target groups like teachers, adults, the youth, and others through popular forum discussions on the goals of the nation for the promotion and better understanding of its heritage and its agenda for national development.

Examples: National Museum, New Delhi; National Museum of Natural History, Washington; Smithsonian Institution, Washington

An archive, on the other hand is a collection of historical documents or records of an institution, government, place or an individual. Records are documents in any format which are created by an individual or organization in the course of conducting their business. Records with long-term value and usefulness are selected for permanent preservation and become archives, acting as the corporate memory of institutions and businesses and, for some, a testament of individual experience. Archives help to tell the story of our past and to preserve our collective memory and cultural identity. These are different from libraries as libraries contain copies of published material but archives may have rare documents, files, papers, manuscripts, inscriptions, etc. Many times a particular archive has the only copy available of a particular document.

Examples: National Archives of India;National Film Archive of India;National Mission for Manuscripts (India);National Archives in Washington

4.10 Libraries and Information Centres

A library is a collection of books, periodicals, and sometimes films and recorded music for use or borrowing by the public or the members of an institution. Technically, a library is a collection of information sources, resources and services. It is organized for use and maintained by a public body, an institution, or a private individual. In the more traditional sense, a library is a collection of books for general public (Public Library) or academic community (Academic Library) or for users requiring special material, R & D material, etc. (Special Library or Information Centre).

In the technology era, the information service units in organizations are usually referred to as 'Information Centers' or "Information Departments'. The emphasis in this case, as mentioned earlier, is towards provision of information contained in the documents, rather than documents themselves which is the main consideration of traditional libraries. An information center can be defined as: "an organizationthat (i) selects, acquires stores and retrieves specific information in response to requests; (ii) announces, abstracts, extracts and indexes information; and (iii) disseminates information in response to requests from documents or in anticipation."

The libraries/documentation centres usually provide services based on their documentary sources. But many of the modern libraries, depending on their objectives, also acquire non-documentary sources of information.

Examples: National Library, Kolkata; Ratan Tata Library, University of Delhi, Delhi; Indian Council of Historical Research, New Delhi

4.11 Information Analysais Centres

An information analysis centre is a formally structured organization established for the purpose of acquiring, selecting, storing, retrieving, evaluating, analysing and synthesizing the body of information in a specialized field of knowledge. The chief activities of an information analysis centre include analysis, interpretation, synthesis, evaluation, packaging and repackaging of information. The process is carried out by subject specialists and result in production of new information in the form of reviews, state-of-the-art reports, monographs, compilations, etc.

Examples:FICCI Research & Analysis Centre, New Delhi; Information Sharing and Analysis Center, National Security Database, New Delhi; Information AnalysisCenters, Defense Technical Information Center, United States

4.12 Referral Centres

Referral centres are organizations that provide switching mechanisms among different types of information institutions. They do not contain or provide any information as such but chiefly serve as intermediaries and direct users to institutions and individuals that can satisfy the information needs. A referral centre possesses an inventory of all significant information resources in particular discipline, compiles and contains directories of information sources/resources and has communication mechanism to assist user community.

Many modern libraries offer a referral service which is in the form of a directing service for users of the library. In this service, user is directed to a source of information which may be an organization or an individual expert. Usually, when a library or information centre does not have some material required by its users and it cannot itself obtain the same due to some constraints but knows the exact location of the document/information, then it can refer the user(s) to the sources of information.

Examples: Information and Referral Centre of Greater Montreal, Canada; Teri Library, New Delhi (Referral Service)

5. Humans as Sources of Information

Research into everyday information seeking behaviour of most of the library users has revealed that people ask other people for a lot for information. This means that at times, for some exclusive information, a particular person is "objectively" the best source. In other words, like organizations, people too can be sources of information. Human beingsare considered an important source of information as the educational background, knowledge, experience, maturity and exposure to various situations makes certain categories of individuals an authority on certain topics. Thus it has been established that in many situations, only human beings can make available certain information for use by various categories of users.

Humans serve as useful sources of information for latest information which has not been recorded in any form. Ranging from experts to common man act as important sources of information depending upon the nature of information required. As an example, for historical information of a place, the living elderly people of that place are the best sources of information. Similarly, for information regarding an accident, the persons present at the accident site can serve as useful witnesses. Similarly, an expert's opinion is very valuable, when a researcher encounters some problem while carrying out research and a solution is immediately required.

There are various categories of human that can be considered as sources of information:

- Library Consultants
- Information Brokers
- Peers/Experts
- Resource Persons
- Extension Workers
- Representatives of Firms
- Invisible Colleges
- Technological Gatekeepers
- Patent Attorneys
- Industrial Liaison Officers
- Common Persons

Let us study the above in certain details.

5.1 Library Consultants

A consultant is a professional who provides advice in a particular area of expertise such as marketing, finance, economics, accountancy, technology, law, human resources, medicine, public affairs, communication, engineering, etc. A consultant is usually an expert or a professional in a specific field and has a wide knowledge of the subject matter. Users have to pay fees as fixed by consultants for using their services.A consultant usually

works for a consultancy firm or is self-employed, and engages with multiple and changing clients. Thus, clients have access to deeper levels of expertise than would be feasible for them to retain in-house, and to purchase only as much service from the outside consultant as desired. Often a consultant provides expertise to userswho require a particular type of knowledge or service for a specific period of time, thus providing an economy to the client.

As far as libraries are concerned, there are many types of library consultants. Their expertise can focus on different types of libraries, on IT, on Web sites, on space planning, on fundraising, on marketing library products and services or on other disciplines. Library consultants are either librarians who have developed their expertise by running or working in libraries, or they are people from outside the field who have specific knowledge relevant to libraries and information systems.

5.2 Information Brokers

Information broker is an individual or an organization that on demand seeks to answer queries using resources available in various places. Information brokers are in this business for purpose of profit and themselves do not have any sources available. However, they are knowledgeable persons and obtain information desired by their clientele from various organizations and then pass on the answers or information related to seek queries. They usually help their clients in getting appropriate information for projects, research, market surveys, etc. The services offered by information brokers are cost effective and also save time of the clients.

Information brokers are also referred to as consultants or consultancy organizations. The various services offered by these professionals include providing of information related to project evaluation, plant design, market surveys, marketing and sale promotion, tender evaluation, procurement and evaluation of equipment, etc. Besides these, information brokers may also carry out feasibility studies related to carrying out certain projects, activities or modernization depending upon the requirement of an industry.

5.3 Experts/Peers

An expert is a person who possesses sound knowledge on a discipline, techniques, etc. Also referred to as peer, an expert is an individual who is usually an authority in a subject area. They are widely recognized as a reliable source of techniques or skills whose faculty for judging or deciding rightly, justly, or wisely is accorded authority and status by their peers or the public. An expert, more generally, is a person with extensive knowledge or ability in a particular area of study. Experts are called in for advice on their respective subject, but they do not always agree on the particulars of a field of study. An expert can be, by virtue of training, education, profession, publication or experience, believed to have special knowledge of a subject beyond that of the average person, sufficient that others may officially (and legally) rely upon the individual's opinion. Like consultants, experts too have to be usually paid for their expertise or services. For solving research or subject oriented problems, help of these experts is required on many occasions.

5.4 Resource Persons

A resource person is one who has knowledge, relevant skills, competence and expertise to give a talk, guidance or first-hand information in a given subject or area. They are often persons who are well versed with the subject matter but are different form experts. This is because; resource persons can be of great help in training/teaching programmes usually of short durations. On the other hand, experts are of help in research oriented or typically subject related problems only. Short term training programmes usually have participants who have to be need to learn the basic concepts of the concerned topic(s) in an easy but faster manner. The resource persons thus play in vital role in coordinating teaching/learning process and help the students understand the nuts and bolts of the topic under consideration. In other words, the resource persons provide main intellectual inputs to these training programmes.

5.5 Extension Workers

The role of extension workers varies depending on the context. An extension worker is usually a technically trained person with excellent skills in managing people. They enjoy working with people, can deal with complex technical and social situations, are holistic thinkers, good problem solvers and have excellent empathy skills.

In several situations it is not possible to set up a proper information facility and the services are thus expended with the help of extension workers. An extension worker is an individual who is knowledgeable about a particular area and extends assistance to users beyond the normal area of activity, in other words, an extension worker actually reaches the users and provides all types of assistance. They are individuals usually familiar with the surroundings and persons being provided the extension services. For example, extension workers can be of help to prison inmates, hospital patients, users in rural areas, etc. In this context, health workers in villages, agricultural extension workers, workers in literacy programme, etc. are the most common examples of extension workers. In the particular field of activity, the extension workers assist users in all respects to have not only information but also in acquiring various facilities too.

5.6 Representatives of Firms

A representative is a person employed by a firm or a commercial organisation for sales promotion and other activities. Among other activities related to sales promotion, this representative also carries out market survey, study of users' reaction, identification of competitors and prospective buyers, etc. The business organizations often employ trade representatives for promotion and sale of their products. As per the usual practice, the representatives visit the prospective buyers, supply samples or brochures of various products of their organization and also give a demonstration of the products. Besides the above, the trade representatives also offer concessions, explain and negotiate the price of the product and explain the term and conditions of supply, warranty, guarantee, payment terms, after sales service and annual maintenance contracts, etc.

As the trade representatives are professionally qualified personnel, experienced and well versed with their work, they are able to answer most of the technical queries raised by the customers related to product specification, preference related to a particular product, need based product, market trend, etc.

5.7 Invisible Colleges

Invisible colleges help to disseminate unfiltered, informal communications produced by communities of people who share an interest in a common subject or discipline. E-mail, personal conversations, conference papers, unpublished diaries, meeting minutes, phone calls, newsletters, memoranda, and other sources that may not pass through the usual publishing, broadcasting, and distribution channels ensure that invisible colleges phenomena works effectively. In this way, the invisible colleges not only highlight the significance of informal communication in the information transfer process but also help to grasp the characteristics of information network among scientists and researchers.

These are composed or prominent or learned scientists who are high performing and form an informal network of scientific communication and published literature. Although this elite group is geographically dispersed, the key specialists within an international or a national invisible college network appear to perform the same type of role as do technological gatekeepers. In modern times, these groups have become very active as there is facility of computer-mediated communication technologies like email, fax, teleconferencing, etc. The invisible colleges thus helps scientific community seeking details related to a query with the help of top experts in the field.

The invisible college's phenomenon emerged in the form of a network of intellectuals exchanging ideas initially by post. This is an alternative model to that of the learned journal, dominant in the nineteenth century. The invisible college idea is exemplified by the network of astronomers, professors, mathematicians, and natural philosophers in 16th century Europe. Prominent scientists communicate information and ideas to each other in an invisible college. One of the most common methods used to communicate was through annotations written in personal copies of books that were loaned, given, or sold from person to person.

The term now refers mainly to the free transfer of thought and technical expertise, usually carried out without the establishment of designated facilities or institutional authority, spread by a loosely connected system of word-of-mouth referral or localized bulletin-board system, and supported through barter (i.e., trade of knowledge or services) or apprenticeship. In other words, it is merely an attempt to circumvent bureaucratic or monetary obstacles by knowledgeable individuals and civic groups. Said entities generally feel a need to share their methods with fellow learned men, so to speak, and to strengthen local techniques through collaboration. Members of an invisible college are often referred to as independent scholars who loosely form an association of like-minded people who can come together to share their experience, views and knowledge.

5.8 Technological Gatekeepers

A technological gatekeeper is a well-informed professional in a particular field. Usually some scientists, technologists and professionals in technical or business organisations have a tendency to acquire information from various sources to keep themselves abreast of the

developments in their field and to disseminate the information to a person or group who may be interested in that information. Thus, a technological gatekeeper can be defined as a key person, who facilitates information transfer by informal communication. This is enabled by acting as some kind of 'Intermediary' between information source and information seeker.

With the informal communication system of the organizations, certain individuals play a key role in organisational communication, linking various hierarchical levels, or departments and there by act as gatekeepers of valuable information/data emanating from outside organizational boundaries. This kind of informal system works successfully in situations where formal communication systems are not functioning effectively. The employees are thus informed of problems, issues affecting them and the possible solutions to overcome the problems. The individuals involved in this kind of informal communication system are referred to as technological gatekeepers.

Technological gatekeepers are middle level professionals working in industries or other organizations. These are the personnel who play a key role between available information and those seeking information. The technological gatekeepers are named so as they open gates of knowledge to other colleagues in the same organization. They have excellent communication skills, higher opportunities of expose to professional, scientific and industry related literature, attend more conferences, have better interaction with professionals in other organizations, and are better equipped to handle complex technical problems or issues. In organizations where professionals require technical information, the technological gatekeepers are found to be very effective, as many times, the libraries or their services are unable to provide solution to a large number of complex technical queries and these persons have usually answers to all queries.

A technological gatekeeper is not only a person who in well informed in own field of activity and has better access to information from various sources from and outside the organisation. But such persons also keep themselves abreast of the developments in the field, maintain good relationships with all staff members and disseminate information to other colleagues who may be interested in the particular information. They are thus called technological gatekeepers as they open gates to provide access to knowledge or information to others.

5.9 Patent Attorneys

Why do some individual users or scientific research organisations need a patent attorney? As an inventor, a scientist or researcher knows the scientific and technical knowledge involved in his/her invention. However, the preparation of a patent application and conducting proceedings with any patent office requires knowledge of patent law and rules and the patent office's practices and procedures. Every scientist certainly has the right to prepare his/her own applications and file them and conduct own proceedings. However, without having the knowledge that a patent attorneydoes have may get the scientist into considerable difficulty. Many times, a scientist may even be granted a patent, only to find out later that it does not adequately protect his/her invention. Therefore, most inventors usually employ the services of a registered patent attorney or patent agent.

The patent attorneys are legal experts on patents and deal with all legal aspects of patents. They assist the inventor in drafting the patent application, filling the application, obtaining required licenses, etc. As the patent attorneys have experience of handling all aspects of patents, they are the most suitable persons to answer technical queries that relate to patents.

5.10 Industrial Liaison Officer

In the industrial sector, especially in the small scale industries, an officer on the staff, usually referred to an Industrial Liaison Officer (ILO), is responsible for establishing and maintaining a liaison between the industry and its sponsors, innovations facilitators and scientists/researchers. Each industry needs to decide during the start-up and development phase how they are going to carry out this function, guidance is provided as to the key requirements, challenges, opportunities and benefits to the industry of this position. Some industry liaison officers also consult with government and acquire government contracts for their industry. These officers provide particularly the preliminary information needed to put a firm on the right track and for information which needs to be given personally and supported by practical advice in order to be fully effective. They visit firms, explore their needs and problems and help them to find solutions, sometimes directly on the spot, more often by putting them in touch with specialized sources of information and assistance or refer to some other specialists.

5.11 Common Persons

There are a lot of facts referred to as 'Common Knowledge' for which formal information sources need not be consulted. For this, in our day to day activities, a lot of persons provide us assistance in many ways. The kind of information one may require be about someone's family background, or first-hand information on a place of tourism or way to a particular destination or details concerning a religious function/ceremony, etc. In many families and even in villages, elderly persons, although illiterate, are usually a reservoir of knowledge when one is pursuing historical research. Some other acceptable examples of common knowledge are related to general common knowledge, well known historical facts, known date and time of some events, etc. Thus we find that common men also act as an important source of information in many situations. Examples of common men who act as sources of information are: our elders in the family, colleagues and friends, priests, village headman, postman, receptionists, etc.

6. Mass Media as Source of Information

Mass media is a means of communication of information through broadcasting and telecasting or a combination of these two for the masses, which is more effective than any documentary sources. The medium by which news and information, etc. is communicated to general masses, that is, the public, is called mass media. Mass media includes press (newspapers, magazines, etc.), radio and television. Of these, radio and television have been found to be most effective. Main advantage of television is that it brings sight, sound and action directly to users in their homes. Radio stations located at various regions in the country broadcast news (local, regional, national and international), entertainment, musical, sports

and educational programmes of various kinds. Radio stations broadcast suitable programmes for all groups of people including men, women, children, farmers, professionals and others. Similarly television is most popular mass media offering range of programmes through hundreds of channels. You must have noticed that there are special television channels devoted exclusively to telecast news, movies, music, sports and games, religious discourses, tourism and travel, fashions and styles, wildlife, history, science and technology.

Mass media is media that is intended for a large audience. It may take the form of broadcast media, as in the case of television and radio, or print media, like newspapers and magazines. Internet media can also attain mass media status, and many media outlets maintain a web presence to take advantage of the ready availability of Internet in many regions of the world. Many people around the world rely on this form of media for news and entertainment, and globally, it is a huge industry.

6.1 Press/Media

The news agencies and newspaper publishing houses are referred to as press. The newspaper publishing houses bring out newspapers, weeklies, bi-weeklies, monthlies and annual publications. They usually maintain all the back issues in their libraries or archives. The back issues are an important source of information not only for news items but also for photographs, special features, video clips, etc. For users requiring information while conducting historical research, preparing biographies, etc. these sources are highly valuable.

6.2 Broadcasting Stations

Radio and television broadcasting stations are also valuable sources of information as these days these cover speeches, features, summaries, debates, discussions, etc. by prominent personalities. The broadcasting stations usually keep all their record in CDs, VCDs and DVDs of all the events. These are maintained properly in the form of a media library and are available for use as and when required. Presently a lot of private channels are also operating in this area and some examples are CNBC, NDTV, ZEE TV, STAR TV, AajTak, etc.

7. Internet as Source of Information

Internet with its many other uses is also used as a source of information on almost any subject imaginable. Thus it has become the best source of information as there is everything on which we can find information by browsing the internet, whether about science, technology, mathematics, history, countries, sociology, medicine, engineering, sports, games, music, movie, jobs or education. Also with online encyclopaedias and different sites on various subjects to gather information about a topic is a very easy task.

Internet is interactive digital media and is different from the traditional media such as print and television. World Wide Web (WWW), also called Web, is collection of websites on the Internet. WWW offers information on any topic you want. Whatever the topic may be, Web always has some website on that topic. The Web gives latest news related to any event from any part of the world, and very often making available the news before it is broadcast by other media. The Web is a source of information for companies, business houses, educational

institutes, government departments and individuals. Many educational institutes in India and abroad put useful information on the Web, such as about their activities, courses offered, fee and other details. On this media, individuals can interact, exchange ideas, share information, provide social support, and conduct business. Using Web you can do shopping, banking, purchase airlines, rail tickets, and even cinema tickets, play games, watch movies, and listen to music and do many more things. In modern times, Internet allows greater flexibility in working hours and location, especially with the spread of high-speed connections. The Internet can be accessed almost anywhere by numerous means, including through mobile Internet devices.

8. Summary

In the modern times, information is available from a variety of sources including non- documentary sources. In this Module, we have learned about the importance of sources of information. The sources of information can be documentary or non-documentary. Non- documentary sources of information are those sources which are not recorded in any form. The non-documentary sources of information can be defined as those sources and resources of information that are not contained in any document. These sources comprise humans, organizations, mass media (like television and radio), and internet.

Besides published and electronic information, we have studied that organizations are also a valuable source of information. The organizations as sources of information include academic institutions, government ministries and department, research and developmental organizations, societies, publishing houses, international and national agencies, etc.The human resources are the experts, consultants, resource persons, extension workers and even the common human beings. Mass media is media that is intended for a large audience. It maytake the form of broadcast media, as in the case of television and radio, or print media, like newspapers and magazines. Lastly, Internet serves as a source of information on almost any subject imaginable. With the evolution of several search engines we can simply open a web browser and find information at the click of the mouse.

Finally, the main disadvantage of non-documentary sources of information is that theseinvolves high cost when distance between the people who require information and who have it available is large and that it also demands the use of highly sophisticated techniques, i.e., computer system, video conference, telephone, etc.

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Unit-4

Reference Sources: Use and Evaluation Criteria, E-Information Sources

1. Introduction

A reference source provides answers to brief facts, statistical information, background information, or directs the searcher to additional information source. The reference librarians usually provide reference services on the basis of reference sources in their collection.

The ALA Glossary of Library and Information Science provides a functional definition of reference sources as "A book designed by the arrangement and treatment of its subject matter to be consulted for definitive items of information rather than to be read consecutively."

2. Reference Sources/Books

Reference sources are used for providing 'Ready Reference' service to the library users and for locating original documents on specific subject or topic. In most libraries, these books are not issued and are located in a separate reference collection. This practice makes reference sources readily available and easily accessible. Most of the reference books are specifically designed to provide required information quickly and in most convenient form.

Although, the term 'reference book' is frequently used, reference sources may be books, serials, online databases or internet. Reference books include dictionaries, encyclopedias, handbooks, manuals, yearbooks, almanacs, directories, biographical and geographical sources.

Bibliographies, indexing and abstracting periodicals and databases also come in the category of reference sources, as they are used for locating original documents on specific subject or topic.

Librarians develop catalogues, bibliographies and subject guides, which also serve as in-house reference tools to facilitate access to resources of the library.

2.1 Categories of Reference Sources

In the following sections different categories of reference sources, their characteristics and uses are discussed.

2.1.1 Dictionary

Dictionary is a book containing words of a language arranged alphabetically with their meanings. Most dictionaries list pronunciations, grammatical labels, illustrative quotations, synonyms, antonyms, usage notes, etymology and other information. Some dictionaries give derivation and history of the words too. The ancient Greeks and Romans were the first to produce dictionaries. But most Greek and Latin dictionaries were either lists of rare and difficult words or specialized list of words.

The other reference books which deal with words are thesaurus and glossary. Thesaurus is a book in which words that have the same or similar meaning (synonyms and sometimes antonyms) are grouped together. In contrast to dictionary, which helps to find meaning and pronunciation of the words, thesaurus helps to find most appropriate word to express an idea and also other related

words. Roget's Thesaurus is most widely used English language thesaurus developed by Dr. Peter Mark Roget in 1852. The first edition had 15,000 words. Each new edition has been larger. Roget's II: The New Thesaurus, 3rd Edition is free online searchable thesaurus with 260,000 synonyms and cross references with word definitions. The thesaurus also has hyperlinked category index. (http://www.enwikipedia.org/) (http://www.education.yahoo.com/)

A glossary is an alphabetical list of words related to a specific subject, text or dialect with explanation. A glossary is usually provided at the back of the book showing the definitions of technical terms in that particular field of knowledge used in that book. You will learn in detail about dictionaries in Module -5.

2.1.1.1 Uses of Dictionaries

Based on the number of words, scope and coverage of other items of information, the dictionaries can be categorized into four following groups:

- General Language Dictionaries
- Subject Dictionaries
- Special Dictionaries
- Bilingual and Multilingual Dictionaries

The above four groups of dictionaries are discussed below:

- **General Language Dictionaries**

General language dictionaries cover all the words of a language and give meanings, definition, and explanation of the words in the same language. The language may be English, French, Hindi, German or   Russian. General language dictionary can be further divided according to size and target user group.
According to size, general language dictionary may be:

a. Comprehensive/Unabridged,
b. Pocket dictionary,

a. Comprehensive/Unabridged dictionary: It covers all the words of a language, including past as well currently in use words. For example, **Merriam-Webster's Third New International Dictionary of the English Language** is in 3 volumes and has over 450,000 entries. **Online version** of this dictionary is **Merriam-Webster Unabridged-Online Dictionary**. (http://www.merriam-webster.com)

b. Pocket dictionary: A dictionary that is small enough to carry in the pocket for quick reference. The dictionary covers 40,000 to 60,000 words that are currently in use. For example, **Merriam-Webster's Pocket Dictionary** has 40,000 entries.

According to target user's age, general language dictionary may be for: i)   School   children

(ranging from kindergarten to high school children), ii) College students, and iii) Adults.

Children's dictionaries cover words related to the course curriculum. The meanings and definitions are written in simple language which children can comprehend. Children dictionaries also include more illustrations to make children understand the concept. **Merriam-Webster's School Dictionary** includes more than 100,000 words, nearly 1,000 illustrations and about 15000 usage examples.

Most of the reputed publishers of unabridged standard general language dictionaries bring out abridged, desk, college, and children edition of their dictionaries. Publishers of these dictionaries try to do continuous revision. With each new printing they add or delete a given number of words. This is particularly true for desk dictionaries which are used by young people and must reflect current usage and new words introduced into the language via radio, television, music, technology and like.

- **Subject Dictionaries**

Subject dictionaries concentrate on the definition of the terms in a given subject. Subject dictionaries are becoming increasingly common, due to increase in study and research in different subject areas ranging from arts, humanities, social sciences to science and technology. For example, **McGraw-Hill Dictionary of Scientific and Technical Terms,** 6th edition, is a comprehensive dictionary of scientific and technical terms covering over 115,000 terms and 125,000 definitions in 104 areas of science and technology. http://www.mcgrawhill.ca)

- **Special Dictionaries**

The special dictionaries deal with special types or special aspect of the words. Special type or class of words includes obsolete words, acronyms, abbreviations etc. Special aspect of the word includes linguistic aspect of the words (such as pronunciation, synonym and antonyms, etc.), or literary aspect of the words (such as quotations, idioms, proverbs, etc.). Though most of these aspects of the words are covered by general language dictionaries as well, but special dictionaries cover these aspects much more comprehensively. Special dictionaries supplement general language dictionaries. Examples of special dictionaries are as follows:

Cambridge English Pronouncing Dictionary. This dictionary provides spoken British and American pronunciation for every word. Cambridge dictionary is also available for mobile phones.

Cambridge Idioms Dictionary. This dictionary explains the meaning and use of over 7000 idioms in British, American and Australian English.

The Oxford Dictionary of Quotations. This dictionary lists short quotations that are common in English language and culture.

- **Bilingual and Multilingual Dictionaries**

The bilingual dictionaries give meaning of a word from one language to another language. For example, an English-Hindi dictionary will list words in English and give equivalent words in Hindi. This type of dictionary is called bilingual dictionary. A multilingual dictionary gives meaning of a word in more than two languages. These dictionaries are also called translating dictionaries.

These dictionaries generally do not define the words, but translate the words from one language to another language. Many of them are limited in scope to certain subject fields such as astronomy, biology, electronic, etc. Examples of bilingual and multilingual dictionaries include the following:

Oxford University Press brings out a number of bilingual and multilingual dictionaries.

Concise Oxford Spanish Dictionary, 4th edition published in 2009, is comprehensive English-Spanish and Spanish-English dictionary with 175,000 words and phrases and over 200,000 translations. The dictionary has online edition as well. (http://www.oup.com/)

Multilingual Biomedical Technical Dictionary: (in English, Spanish, Portuguese, French, German, Swedish and Dutch). The dictionary covers over 40,000 entries with about 40,000 synonyms and details each, in seven languages.

Shabdkosh- English-Hindi Dictionary (http://www.shabdkosh.com) the site provides English to Hindi as well as Hindi to English translation.

Many sites offer free translation facility on the Web. Listed below are some of these sites:
http://www.freetranslation.com/
http://www.babylon.com/

2.1.2 Encyclopedia

A well planned general encyclopedia presents facts about humanity, human beliefs, ideas, and achievements; about the world people live in; and about the universe to which they belong. It presents these facts using language that is easy to understand.

Different articles in an encyclopedia vary in length ranging from a paragraph to over hundred pages depending upon the topic covered; target audience and type of encyclopedia (whether single volume or multivolume encyclopedia). Articles in standard encyclopedia are written by subject specialists and then edited by the encyclopedia staff editors to conform to policies of the encyclopedia in terms of content, style and punctuation. Editorial staff ensures that each article in the encyclopedia has similar writing style, headings and sub-headings. Pictures and diagrams are included wherever necessary to clarify the concepts and enhance learning process. Most encyclopedias are arranged alphabetically from A to Z. Some are topically arranged, such as one volume may be devoted to 'Animals', another to 'Plants', 'Earth' and Universe', or some other subjects.

2.1.2.1 Types of Encyclopedias

Encyclopedias can be broadly divided into two types, viz. General Encyclopedias and Subject Encyclopedias. General Encyclopedia covers all fields of knowledge, for example, Encyclopedia Britannica. Subject Encyclopedia covers either single subject such as Encyclopedia of Physics or group of subjects such as Encyclopedia of Science and Technology.

a. General encyclopedia can be further categorized according to

- Size (single volume-set or multivolume-set), and
- Target users (for adults, students or children).

Most of the publishers of general encyclopedias bring out different sets of encyclopedias for adults, students and children of various age groups. Articles in Children's encyclopedias are written in simple language and with illustrations to make the topic clear and understandable.

Examples of Encyclopedias

Encyclopedia Britannica is a general English language encyclopedia, published by Encyclopedia Britannica Inc. The set contains 73,645 articles. The articles are aimed at educated adults and are written by about 100 full time editors and more than 4000 expert contributors. It is regarded as most authoritative and scholarly encyclopedia. The 2010 Edition of the encyclopedia in print consists of following 32 volumes:

- 12- Volume Micropedia with short articles (generally fewer than 750 words) for ready reference;
- 17-Volume Macropedia with long articles (ranging from two to 300 pages) for in-depth study of a topic.
- One-Volume Propedia giving outline of knowledge; and
- 2- Volume Index.

Single Volume Britannica Concise Encyclopedia has 28,000 short articles condensing the larger 32-Volume Britannica.

Britannica Student Encyclopedia: The 16-volume Britannica Student Encyclopedia has more than 2,300 articles with 3,300 photos, illustrations, charts and tables to make students understand the concept and subjects. The encyclopedia has 1,000 maps and flags of various countries of the world.

Recent advances in information technology and rise of electronic encyclopedias such as Microsoft Encarta and Wikipedia has reduced the demand for printed encyclopedia. The publisher of the Encyclopedia Britannica has developed electronic version of the encyclopedia on CD-ROM, DVD and World Wide Web.

Encyclopedia Britannica Online contains the text of 32-volume Encyclopedia Britannica plus

additional articles and images not available in the print set. It has more than 120,000 articles. The site offers natural language searching and A-Z browsing facility. It is continually updated to provide most current information. It has daily features, updates and links to news reports from The New York Times and the BBC. Subscriptions are available on yearly, monthly or weekly basis. Special subscription plans are offered to schools, colleges and libraries. (http://www.britannica.com/)

Wikipedia
It is a multilingual, web based free content encyclopedia supported by Wikipedia Foundation and based on open editable model. Wikipedia is written collaboratively by internet volunteers (about 77,000 contributors) who write without any remuneration. Since its creation in 2001, Wikipedia has grown rapidly into one of the largest reference web site attracting millions of visitors. There are more than 30 million articles in 285 languages, of which there are over 4 million articles in English. (http://www.en.wikipedia.org/wiki/Wikipedia:About)

b. Subject Encyclopedias

Subject encyclopedia provides detailed information on specific area of knowledge such as arts and humanities, science and technology, social sciences, etc. There are thousands of subject encyclopedias ranging from broad subject area to a very narrow subject field. There are multivolume as well as single volume subject encyclopedias. Some subject encyclopedias are meant for subject specialists and some are for students and general readers interested in that subject.

Examples of Subject Encyclopedia

McGraw Hill Encyclopedia of Science and Technology, 11th edition, is an English language 20-volume encyclopedia specifically focused on scientific and technical subjects. The encyclopedia covers life sciences, physical sciences as well as engineering and technology topics. The McGraw Hill's 'Access Science' website provides online access to this encyclopedia. The site provides full content of encyclopedia articles, includes 13,000 illustrations, and 135 articles with animation. In addition, it provides full text of the Year Book of Science and Technology from 1998 to 2003. The site is updated daily.(http://www.accessscience.com)
McGraw Hill Concise Encyclopedia of Science and Technology is one-volume set based on the full set. The latest version is 6th edition published in 2009. (http://www.mhprofessional.com)

Encyclopedia of Library and Information Science, edited by Allen Kent and published by Marcel Dekker, is a 35-volume set (33-volume main encyclopedia and 2-volume index) providing librarians, information/computer scientists, and students of library and information science convenient access to tools and techniques of both library and information science. The articles are written by over 1300 subject experts. The encyclopedia is regularly bringing out supplements (each supplement contains A-Z coverage). The supplements highlight new trends, describe the latest advances and give information about people making crucial contributions to this rapidly growing field. So far 36 supplement volumes have been published (Volume- 36 to Volume- 72).

2.1.3 Yearbooks

Yearbook, as the name indicates, is a book of information that is updated and published annually, i.e., every year. The basic purpose of a yearbook is to record events and developments of the previous year in a country or in the world. Based on their scope and type of information covered yearbooks can be categorized as:

    a. International Yearbook
    b. National Yearbook
    c. Subject Yearbook

a. International Yearbook provides reliable and handy statistical information about each country of the world. For example, **The Statesman's Yearbook 2014** published by Macmillan, provides political, economic and social account of every country (194 countries) of the world together with facts and analysis. The Yearbook is in two parts: Part-I deals with International organizations, and Part-II deals with countries of the world in alphabetical order. Online version of Statesman's Yearbook, in addition to the full-text of its print edition, covers additional features, such as monthly up-dates and highlights, economic overview and access to past editions of the Statesman's Yearbook from 1864 onward. (http://www.statesmansyearbook.com)

b. National Yearbook provides up to date political, economic and social account of an individual country. National yearbooks are mostly compiled by the respective government of that country and are considered reliable and authoritative. For example, **India 2011: A Reference Annual**, 55th edition, is a national yearbook published by Publication Division, Ministry of Information and Broadcasting, Government of India. The yearbook provides information on various subjects related to India like economy, rural and urban development, industry and infrastructure, arts and culture, S & T, health, defense, mass communication, etc. (http://www.publicationsdivision.nic.in)

c. Subject Yearbook: A yearbook devoted to specific subject or group of subjects is a subject yearbook. McGraw-Hill Year Book of Science & Technology- 2014 is an example of subject yearbook.

2.1.4 Almanac

Almanac is a reference book usually published once a year and contains many kinds of information. Almanacs originally provided a calendar of the months with eclipses, the movement of planets and the rising and setting of sun, moon and stars.

Present day almanacs include a comprehensive presentation of statistical and descriptive data covering the entire world. Major topics covered are geography, government, demographic data, agriculture, economics and business, health and medicine, S&T, transport, sports, awards and prizes. Contents also include articles focusing on events of previous year as well as summary of recent events. Now the almanacs are more like yearbooks. Both depend on government sources for statistical data. The only difference is that almanacs present astronomical data, which is absent in the yearbooks.

Examples of almanacs:

World AImanac and Book of Facts 2014 published annually in U.S.A. by Barnes & Noble. (http://www.worldalmanac.com/)

Whitaker's Almanack 2014 published annually in U.K. by A&C Black Publishers. (http://www.whitakarsalmanack.com/)

2.1.5 Handbook

The word handbook is derived from German word 'Handbuch' meaning a small book giving useful facts. The literal meaning of the term 'handbook' is a book which is 'handy' to use as it contains useful facts and handy to carry it conveniently. Handbook by definition is a concise reference book providing specific information or instruction about a topic or a subject. Subject handbook basically gives brief information such as facts on a subject. They are designed to be easily consulted and provide quick answers. Handbooks are widely used by practitioners and specialists working in an industry or a laboratory.

CRC Press brings out large number of handbooks for practitioners. Some of the examples are: **Handbook of Chemistry and Physics; Handbook of Lipid Bilayers**. (http://www.crcpress.com)

2.1.6 Manual

Term 'manual' is derived from Latin term 'manuals' meaning a guide book. Manual basically provides step-by-step instructions on how to do a particular job or operate a particular machine. When a customer buys any home appliances, such as a television, an air conditioner, an oven or even a mobile phone, he/she is provided with a manual which gives proper instructions on how to use that appliance. For example, a cookbook or a book providing step-by-step instructions to assemble a computer is a manual.

2.1.7 Directory

A directory is a list of names and addresses of people and organizations. Directories are also very important reference tools in the library to answer directory type of enquiries from the users. Directories can be broadly categorized as:

- General Directories, and
- Special Directories.

a. General Directories

Telephone directory comes under the category of **general directories.** You must be familiar with telephone directory. Every city in a country has telephone directory giving information about

telephone numbers of the subscribers. It also provides addresses along with the telephone numbers of the subscribers. These directories are usually compiled by post and telegraph departments.

b. Special Directories

Directories of organizations are called special directories and can be broadly grouped into following three types:

- Directories of academic and research institutions;
- Professionals Directories; and
- Trade and business directories

Directories of academic institutions list institutions of higher education and learning such as universities and colleges. Under each academic institution, information provided is, the type of courses and facilities offered, eligibility criteria, names of the senior staff members, etc. These directories may be international or national in coverage. For example, The Europa World of Learning 2013, 63rd edition, is an international directory. It is a comprehensive guide to 33,000 academic institutions of higher education and research in the world. The directory is available in print and online form. (http://www.routledge.com/)

Universities Handbook: 32nd edition published by Association of Indian Universities (AIU) in two volumes is a national directory listing 341 university level institutions in India. Published every alternate year, the directory provides information on the type of courses offered, duration of the courses, eligibility criteria, last date for admission, library and research facilities, scholarship and fellowships, names of professors and senior staff members.

Professionals Directories: There are thousands of learned societies and associations in the world, in almost every significant field of knowledge. Members of these associations are scholars in their respective area of specialization. These associations also compile directories listing details of their members. Example: The University of Adelaide Professional Directory.

Trade and Business Directories: These directories provide information about trade, business and industries. For example:

Kothari Industrial Directory of India, 40th edition, 1996, is trade and business directory published by Kothari Enterprises.

2.1.8 Geographical Information Sources

Geographical information sources include maps, atlases, globes, gazetteers, and guide books. These sources provide information about places, people, rivers, mountains, forests, lakes etc. To meet information needs of the users, libraries maintain geographical information sources in their reference collection. Though other reference sources like dictionaries, encyclopedias, yearbooks and almanacs also include information about places, people, etc., but they cover only selected and prominent places.

This special collection of geographical information sources covers these topics more comprehensively and is specifically designed to locate the information quickly. This collection comprises the following three types of sources:

- Maps, Atlases and Globes;
- Gazetteers; and
- Guide Books

a. Maps, Atlases and Globes: Map is a pictorial presentation of earth's surface or part of it, showing countries, cities, rivers, lakes and mountains. Map can also be a drawing of the sky showing the position of stars and the planets.

Types of Maps: There are many types of maps. Most familiar types are:

- General Reference Maps and
- Thematic Maps

General Reference Maps: General reference maps identify and locate a variety of geographic features. Such maps may include land features, boundaries of water, political boundaries, cities and towns, and many other elements.

Political Maps: Maps that depict boundaries of countries, states, continents and other political units are called political maps.

Physical Maps: Maps that depict the location of physical features of the earth's surface such as mountains, rivers and lakes are called physical maps or terrain maps.

Road Maps, Street Maps and Charts: Some maps are designed to help people to find their way from one place to another. These are maps for travel on land, on water or, in the air. Maps showing different categories of roads, such as motorways, four-lane, or six-lane roads are called road maps, They also show the cities, towns, parks and other places connected by those roads. Street maps are similar to road maps, but a street map shows a much smaller area in much more detail. A map used to navigate a ship or an airplane is called a chart.

People use general reference maps to locate specific places and to observe their location in relation to other places.

Thematic Maps: These maps show the distribution of a particular feature such as, population, rainfall or natural resources like coal, petroleum, metals and minerals on the earth. Many thematic maps express quantities by means of symbols or color.
Atlas: A book containing collection of maps is called an atlas. A big atlas contains the map of every county.

Globe: It is a map that has been pasted or printed on a hollow sphere. Only a globe can give

correct picture of the earth as a whole, as the surface of the globe is rounded like the earth's surface. A globe represents all parts of the earth's surface correctly. The proportions and positions of the earth's land features and oceans in relation to each other are seen on a globe exactly as they are on the earth.

National Maps and Atlases

The reliability of maps and atlases depend upon the expertise of editorial staff and the cartographers. Most of the countries have their own cartographic survey agencies. In India, we have Survey of India, Dehradun. It is a National Principal Mapping Agency. This organization is responsible for mapping and production of geophysical maps and aeronautical charts.

National Atlas and Thematic Mapping Organization of India (NATMO), Kolkata is involved in the preparation of National Atlas of India, Thematic maps and Digital maps.

National Atlas of India in Hindi popularly known as 'Bharat: Rashtriya Atlas; first published in1957 by NATMO, had 26 multi-colour maps portraying physical and socio-cultural structure of the country. Its revised edition titled 'Bharat: Rashtriya Atlas' has 300-multi-colour plates. It covers all aspects of the land, people and economy of the country. The atlas is being issued in 8 volumes and available for sale. (http://www.natmo.gov.in/)

International Maps and Atlases

The Times Comprehensive Atlas of the World, 13th edition published in 2011, is most comprehensive atlas of the world with an index of over 200,000 place names. The Atlas begins with contributions from experts in many geographical fields, providing detailed information on key issues facing the world today such as climate change, environmental threats, global communications, biodiversity and energy resources, with supporting maps, photographs and graphics to illustrate the physical world today and man's interaction with it.

The publisher has published a wide range of atlases. Some of the titles are as follows:

- The Times Concise Atlas of the World;
- The Times Atlas of the World Desktop Edition;
- The Times Atlas of the World Mini Edition

(http://www.timesatlas.com/)

b. Gazetteers

A gazetteer is a dictionary of geographical names. It lists names of places, seas, mountains and other geographical entities of particular area along with its history, economic development, geography and the people. As a reference source, a gazetteer provides historical, social, cultural, political, industrial, demographic and administrative details of a country, state or a district.
Based on their coverage, gazetteer can be categorized into:

- International Gazetteer,
- National Gazetteer; and
- Local Gazetteer.

International Gazetteer: Merriam Webster's Geographical Dictionary, 32nd edition is an international gazetteer with 54,000 entries, and 250 detailed maps.

National Gazetteer: Gazetteer of India -The Indian Union, New Delhi: Publication Division, 1965-78 is in 4 volumes:

- Volume I: Country and People.
- Volume II: History and Culture.
- Volume III: Economic Structure and Activities.
- Volume IV: Administration and Public Affairs.

District Gazetteer: Singh, Raghbir & Ranga, Jeet Ram, ed. Haryana District Gazetteer. Chandigargh: Haryana Gazetteer Organization, 1986.

c. Guide Books

Guide Books are basically travel guides or tourist guides meant for people who want to visit various places in their own country or any other part of the world. Main purpose of the guide book is to guide the travelers when to visit a particular place, how to reach, where to stay, what to see, and what to buy. The travel guides include information on historical sites, museums, parks, and other places worth visiting in that city or a country. Other aspects covered are information on the routes and travel facilities, best time to visit the place, the types of hotels, restaurants and shopping complexes, etc. Maps, illustrations and distances are also provided to enhance the usefulness of the guide book. In addition, information regarding visa, money exchange, weather, etc. is also given for the benefit of the foreign visitors. Usually a guidebook covers a region, a country or a city.

Tourism Departments of the Governments in most of the countries bring out tourists guides to promote tourism in the country. In India, most of the States (28) and Union Territories (7) have State Tourism Departments, which provide information and bring out tourists guides for the visitors. Ministry of Tourism, India and most of the State Tourism Departments have also launched their websites for the benefit of the visitors. These sites provide up-to-date information to the users. Some of these websites are as follows:
(http://www.incredibleindia.org/ (http://www.delhitourism.nic.in/

Many printed guidebooks are also available for a large number of countries. Among those, Fodor's guides are famous ones. Fodor has brought out 300 travel guides to 7500 destinations of the world.

2.1.9 Biographical Information Sources

A biography by definition is an account of a person's life, usually written by someone else and published or intended to be published. Biographical sources are publications listing biographical details of famous people. Such sources cover biographies of world leaders, people holding key positions in international organizations, people with outstanding performance in sports, music, dance, acting and other professional fields like science & technology, medicine etc. A biographical source may contain a biography of an individual or biographies of group of people (called collective biographies). A book containing collective biographies is also called **'Biographical Dictionary'**, for example; **The Dictionary of International Biography**.

The type of information covered in such sources also varies from a brief factual type of data to detailed essay type of biography for each entry. Some biographical sources cover famous people from all walks of life. Such sources are called **'general biographical sources'.** In some, the coverage of people is restricted to a single discipline or some other special criteria. Such biographical sources are called **subject/special biographical sources.** Again, a biographical source may be **international or national** in scope depending upon the coverage of persons. Some biographical sources cover living persons only, e.g. **'Who's Who',** Some cover persons who are no longer living, e.g. **'Who was Who'**, and some sources cover life sketches of both, living and dead persons, e.g. **Webster's Biographical Dictionary.**

Some examples of biographical sources:

General Biographical Sources - International

Who's Who in the World 2013, 30th edition. Known as Maquis' Who's Who is an American publication providing biographies of the world's most noteworthy people. Information provided in each entry is personal data and career history, education, achievements and membership. The publication is also available online.
(http://www.marquiswhoswho.com/)

General Biographical Sources - National

India Who's Who, 31st edition, 2010-2011, published by INFA Publications, contains 5000 concise biographies of prominent Indians from all walks of life including politics, civil service, education, arts, entertainment and sports. Entries are arranged profession wise.

Who's Who National Portal of India

The Who's Who section of National Portal of India provides information about persons holding the highest office as well as persons holding respectable positions at executive, judiciary and legislative levels in the country.
(http ://www.india.gov.in/my-government/whos-who/)

2.1.10 Bibliography

Bibliography is a list of documents that share a common factor that may be a subject, a language, a period, an author, or some other criteria. Some of the types of bibliography are mentioned below.

i. A national bibliography lists publications produced in a country. It serves as an effective book selection tool.
ii. Trade bibliographies are brought out by publishers, booksellers, distributors and printers. These bibliographies list books available for sale. These publications help librarians to select books for the library.
iii. Subject bibliographies list documents on a particular subject. A well prepared subject bibliography meets the information requirement of a user, who is looking for documents on a particular subject.

2.1.11 Indexing and Abstracting Periodicals

Indexing and abstracting periodicals bring together recently published literature in specific subject discipline scattered over wide range of primary sources. These publications, known as secondary periodicals, regularly scan recently published primary sources (primary periodicals, research reports, conference proceedings, dissertations, patents, standards, etc.), select relevant items, arrange them in helpful sequence and bring to the notice of the researchers at regular intervals. Each item is listed with full bibliographical details, with or without abstract. A secondary periodical without abstract, is called an indexing periodical and with abstract, an abstracting periodical. Bibliographical details help the reader to identify an original document. An abstract helps the reader to decide, whether to read original document or not. Sometimes a well prepared abstract, serves as substitute for the original document. Indexing and abstracting periodicals help users to overcome language barrier, keep them abreast of current developments in their subject fields, and solve their research problems, if any. Indexing and abstracting periodicals are published in almost all subject disciplines and are now available in machine readable form as well. These are available as CD-ROM product or for online searching on the Internet, as bibliographical databases. These databases are either accessible free such as PubMed or are subscription based such as CAS Databases (Chemical Abstracts Service).

2.1.12 Databases

Electronic databases are organized collection of data or information that are stored in computer readable form and can be easily accessed, modified and updated. There is wide range of databases; here we will be discussing bibliographic, factual and full text databases. Bibliographic database is a database of bibliographic records. It provides an organized collection of references to published literature, including journal articles, newspaper articles, conference proceedings, reports, government or legal publications, patents, books, etc. A bibliographic database may be general in scope or cover a specific subject discipline. A factual database is a database of complete facts and data, collected from material of a specialized subject area and made available for analysis and application. A full text database or complete text database is a database that contains the complete text of books, dissertations, journals, magazines, newspapers, etc. (http://www.en.wikipedia.org)

Examples of databases:

MEDLINE is U.S. Library of Medicine's premier bibliographic database, which contains over 19 million references to journal articles in medicine and allied disciplines. Currently, citations from over 5,600 worldwide journals in 39 languages are covered. The database is updated daily by adding 2000 to 4000 citations every day. PubMed provides free access to MEDLINE and links to full-text articles when possible.

PubMed database comprises more than 23 million citations covering biomedical literature from MEDLINE, life sciences journals and online books. Citations may include links to full-text content from Pubmed central and publishers' websites.
(http://www.nlm.nih.gov/)   (http://www.ncbl.nlm.nih.gov/pubmed/)

CAS (Chemical Abstracts Service) databases: Some of the databases from CAS are as follows:

CAplus is a subscription based bibliographic database from CAS publisher. The database provides abstracts of articles selected from 10,000 journals of chemical sciences and related disciplines and 63 patent authorities. The database has over 38 million records.

CAS Registry is a factual database containing chemical substance information, including chemical structure, names, properties, etc: of over 83 million substances.

CASREACT is a factual database showing chemical reactions. It covers more than 70.7 million reactions. (http://www.cas.org/)

3. Evaluation of Reference Sources

Selection and evaluation of reference sources for a library is an equally important task as of provision of reference service. To handle this task efficiently librarian should have knowledge of library user's requirements, knowledge of reference sources and should know how to evaluate these sources. There are publications which help the librarians to select and evaluate the reference collection for particular library. Publications such as, New Walford's Guide to Reference Resources (2005) and Recommended Reference Books for Small and Medium Sized Libraries and Media Centers (1981), come handy while building reference collection for the library. American Reference Books Annual (ARBA) published by Libraries Unlimited, reviews all new reference works in print, online or on CD-ROM published in United States and Canada during a year. Online version of this publication adds 150 to 200 reviews every month.

The other sources where reviews of new reference works are published are Reference Book Bulletin of Booklist, Library Journal, Choice, and Reference and User Services Quarterly. In addition to the above sources for reviews, lists of recommended reference titles are produced by committees and some publications. RUSA committee brings out a list of "Outstanding Reference Sources" every year and publishes it in May issue of American Libraries. April issue of Library Journal also includes a compiled list of "Best Reference Sources". Web site of Gale publisher also publishes reviews of reference sources under "guest Columnists". (http://www.cengare.com/reference/)

3.1 General Evaluation Criteria

If no published review is available, then general evaluation criteria should be applied while selecting a reference source for the library. This includes checking scope and purpose, authority, currency, arrangement, format, cost the suitability of the reference source for the potential library users.

i. **Scope and Purpose:** Check the introduction or preface of the book, scope and purpose written by the author is normally available here. This will provide you an idea if this source is useful for your library.

ii. **Authority:** Then check who are the publishers and author(s) of the source. Reputed publishers of reference works have trained editors and hire services of subject experts for the compilation work.

iii. **Accuracy and Currency:** Check accuracy and currency of the content. Accuracy of the content can be checked by comparing it with other works on the same topic. Currency can be checked by seeing the copyright date of the source and references cited by the source.

iv. **Arrangement:** Arrangement of the content should be such that the source is easy to use. Text should be organized with proper headings and subheadings for ease of browsing. It should have good page layout with clear typeface and proper margin, for ease of reading. It should have good table of contents and index with cross-references if required.

v. **E-version:** When the choice is between print and electronic format of the reference source, then it is advisable to go in for electronic source where the contents are changing too frequently. For example, indexing and abstracting periodicals should be purchased in electronic format. Even electronic format is good choice for the directories, as telephone numbers and addresses keep on changing, and updating is required frequently. The other reference sources, such as geographical sources, biographical sources, handbooks, may be purchased as printed sources.

4. Electronic Reference Sources

Most of the reference sources are now available in electronic form. Some of the sources which were available in print form earlier are now available in electronic form only. Most of the material published today exists in computer readable form at some stage of its production process and making it in electronic form is easy.

4.1 Advantages of Electronic Reference Sources

There are many advantages of electronic reference sources than their print counterparts.

- Electronic reference sources are more frequently updated than their print counterparts.
- They provide more search options.
- Provide access to wider range of information.
- Provide faster and easy access to information. This is particularly so in the case of indexing and abstracting periodicals, where back volumes are consolidated into single searchable database, search is easy and extremely fast.
- Online bibliographic databases provide linkages from citations to full text e-journals.
- Full-text data can be delivered instantly on the remote computer.
- Content can be delivered in multimedia format where text, video, and sound can be added.
- A print source can be used by one user at a time, whereas an online source can be accessed simultaneously by many users.
- An online electronic source can be accessed at any time and from any place where network exists.

4.2 Limitations of Electronic Reference Sources

- Use of electronic reference sources requires expensive infrastructure, which must be acquired, maintained and upgraded. This covers computer hardware and software, Internet connection and subscription to databases.
- Electronic reference sources, despite being user friendly, require certain degree of computer literacy to get maximum benefit from them. This means libraries have to incur expenses to train their staff as well as their users to use these resources.
- Most of the publishers of e-reference books sell their products through license agreement, which imposes certain restrictions on their usage.
- Reading from computer screen is strenuous. Most of the users prefer to take print out for reading.

Presently, most of the library users prefer to use electronic reference sources, because of the speed of searching, remote access and availability of these resources on the internet on 24/7 basis. Many libraries have a web page showing frequently used online reference works. It is observed that online sources most frequently used by the users are dictionaries (50%), followed by online periodicals, telephone directories and encyclopedias.
(http://www.mhhe.com/katz/)

5. Summary

Reference sources provide answers to brief facts, statistical information, background information= or direct the user to additional information sources. Reference collection in a library is extensively used for providing ready reference service to the library users as well as for compiling subject bibliographies and handling specific search or research types of queries. Reference sources include dictionaries, encyclopedias, handbooks, manuals, yearbooks, almanacs, geographical and biographical information sources. Bibliographies, indexing and abstracting periodicals and databases also come in the category of reference sources, as these are used for locating documents on specific

subject or topic. In-house tools developed by an individual library such as catalogue,

bibliographies, subject guides can also be categorized as reference sources, as these tools facilitate access to library holdings. To build an appropriate reference collection for a library, the librarian must have knowledge of users' requirements. He/she should know how to use and evaluate the reference sources. General evaluation criteria cover checking scope and purpose, publishing and compiling authority, currency, arrangement, format, cost and suitability of the reference sources for the potential users.

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Unit 5

Alerting Services: Concept, Need & Techniques of
Current Awareness Services (CAS)

1. Introduction

All types of libraries/information centres are organized to provide some basic services which are rendered either in anticipation or on demand from the users. For example, a typical library brings to the notice of its users new documents accessioned and new issues of journals received to attract its potential users. It also helps to find a specific document, or a part of the same. The information services provided in anticipation are termed as alerting services as this alert the users about the new information of their interest. Broadly speaking, the same is also termed as current awareness service though there are some more services falling under the scope of alerting services. It may be noted that the term 'alerting services', besides containing general names of the information services, may also assume some specific names like company profiles, notification of contracts, product information bulletins, etc. in the context of a business or industrial library/information centre.

Alerting services usually referred to as Current Awareness Services have been important means for keeping the users up to date in their areas of interest. A current awareness service may be as simple as copy of table of contents or a bulletin containing bibliographic records, of articles selected from the current issues of journals and other material, and usually organized by subjects. These services satisfy the current approach of the users and have several characteristics. These characteristics have been described in this module.

In this module, we will learn the various current awareness services offered by modern library and information organisations. The various CAS covered include both the manual and computerised CAS. The computer based solution offers better services, with more flexibility and easier maintenance of the resources along with lower costs.

2. Current Awareness Services (CAS)

Alerting Services are also termed as Alert Services or Current Awareness Services or CAS. These services assist the library users in keeping up-to-date with current research in specific areas of interest. In this context, current awareness refers to a way to stay up-to-date on the latest information from journals in a field, to receive automatic alerts about new information/articles in a specific research area and using modern technology that helps a user to organize and mediate the information that is required to conduct research.

According to Encyclopedia Britannica, 'the purpose of a current-awareness service is to inform the users about new acquisitions in their libraries. Public libraries in particular have used display boards and shelves to draw attention to recent additions, and many libraries produce complete or selective lists for circulation to patrons. Some libraries have adopted a practice of selective dissemination of information… ....'

The CAS is in-house services offered by information organisations. A successful CAS involves knowledge of subjects or topics to be covered, which users require what

information, knowing the sources for obtaining the latest information and making available required information timely, regularly and reliably. The major benefits of CAS include providing the users latest information on desired topics, saving time and leading to creation of new ideas.

The CAS has several advantages over other information services, which are:

- Keeping users better informed
- Providing access to needed information/documents
- Supporting academic, professional and managerial tasks
- Automating the process of searching for retrieving relevant information
- Providing information in a preferred format

2.1 Definition

There are several definitions for CAS and it has been defined by several prominent library and information science professionals. Some of these are mentioned below:

Ranganathan defined CAS as 'documentation periodical, listing the documents appearing during the period covered, and without being, selected to suit the requirements of a particular reader or of a specific topic under investigation. This is of the nature of a general appetizer. It endeavors to keep the clientele informed promptly of all the nascent thought created in their fields of work and related fields.'

Guha defines it as 'a device of the information system through which the users of information can be informed promptly, as soon as possible after publication but before absorption into the comprehensive secondary sources of current literature on a broad subject field or on an area in which a group of persons are interested, and presented in a manner, a volume, and rhythm intended to facilitate or cultivate current approach to information. In the context of a library, the time limit should be after the receipt of the publications but well before the receipt of the secondary publications contains them.' According to him, CAS is 'a system of informing the users as soon as possible after publication.'

Lucille J, Strauss and others have defined it as "the establishment of a system for reviewing publications immediately upon receipt, selecting information pertinent to the programme of the organisation served, and recording individual items to be brought to the attention of those persons whose work they are related. It involves a combination of processes including the selection of pertinent information from periodicals, books pamphlets, patents and reports, in fact, anything of serious content that is received

Alasdair Kemp defines CAS as 'a system for reviewing newly available documents, selecting items relevant so the needs of an individual or group, and recording them, so that notifications may be sent to those individuals or group to whose needs they are related.' According to him, CAS is "a system of informing the users as soon as possible after publication.'

From the above definitions, it can be seen that CAS is the process of reviewing selected items according to the information needs of the users, selecting the relevant items according to the information needs of the users' recording the items systematically, and sending the notifications to the users who need it.

2.2 Factors influencing on Current Awareness Service

CAS is influenced by the following factors:

- **Current Approach**: It is necessary for every information professional to keep abreast with the current literature or the latest development of subject. He/she must know all the important areas of research in a subject as soon as published or generated.

- **Continuous need**: CAS is very much required where there is continuous need of current affairs and developments by the users. More the continuous need, more Current Awareness service.

- **Direct demand**: For many specific research areas the user may not be immediately interested but some of the references may be demanded by them later onurgent basis. For such needs, some of the references are recorded in diaries or personal file kept with the library or information professionals, so that when need arises they may be supplied with latest developments.

2.3 Steps in Current Awareness Service

The steps in the provision of CAS are given bellow:

a. Review or scan documents immediately upon receipt.

b. Select information and record individual documents pertinent to the information requirements of the individual users or groups being served. This may be done by comparing the documents/information with the needs of users being served.

c. Send notification to the users about items or information of interest to them.

3. Need for Current Awareness Services

Current awareness process is basically the opposite of the retrospective search. The retrospective search begins with a need to locate information on a specific topic for a specific purpose. The goal of current awareness on the other hand is less specific. It is the need to understand current developments in order to do one's work more effectively. In view of this, following needs for alerting services can be identified.

3.1 Growth of literature

The published scientific and technical information has grown rapidly on account of large expenditures on research and developments (R&D)by the government. The enormous growth of scientific information has caused serious problems of accessibility, storage, retrieval and dissemination for the researchers, scientists, etc. This results in many problems in accessing the information and keeping the researchers up-to-date in their areas of interest. CAS enables the researchers, scientists, etc. to keep themselves up-to-date and well informed in their field of specialization. Thus, CAS aims to serve the current information needs of the users.

3.2 Interdisciplinary nature of research

The interdisciplinary nature of research, nowadays, results in the scattering of information in different sources. Same type of information is available in different journals. Further, the information relevant to a given discipline may also be found in journals of other related

disciplines. For example, information relevant to the Biochemistry may appear in the Journal of Scientific and Industrial Research, or Indian Journal of Chemistry, etc. It is very difficult for user to find relevant information and hence there is a need of CAS.

3.3 Types and forms of documents

Although the journals are the main source of current information, useful information for researchers may appear in various types of documents such as journals, reports, seminar papers, etc. Documentation and information centers are providing a variety of information services in order to solve this problem. Providing CAS service is one of the important services which alerts the users about the current developments in their area of interest.

3.4 Users' help

A user himself may not be able to scan literature as widely, timely and regularly as could be done by CAS, because its coverage may be wider. Also, there may be some users who do not possess the ability or willingness to do scanning of sources. In this case, CAS will help the users to keep them abreast with the latest documents on the subject of their interest. It also helps to bridge the time interval between the publication of an article and the inclusion of an abstract. Ultimately, the function of CAS is to reduce the time taken by the specialists to scan the documents in periodicals.

4. Characteristics
Characteristics of CAS are as follows:

4.1 Approach not in response to specific query

For any active user, it is necessary to be up-to-date with his/her field of work and interest. Further, as no field of study can progress in isolation, one has to keep abreast of the developments in a broader field also. So far as one's specific field of work is concerned, one has to be very thorough regarding any important work as and when published or generated. As the current approach is not meant for any specific information, it implies that a user may not have a specific search formulation while approaching the information system.

4.2 Continuous need

Another characteristics of current approach is the continuous need irrespective of the stage of research work in hand, its findings, etc.

4.3 Retrieval not the only intention

This is an important characteristic which emphasizes that it is not always necessary to go to the original document as retrieval is not always the intention. In most of the cases, the user is satisfied to know that a particular piece of work has appeared in print or somebody is working on a particular problem or the results of a particular work is expected to be published in the near future and so on. Further, for most of the times, the user may get the information from abstracts only. For many of the items the users may not be immediately interested but some of the references may be noted by him/her in a diary or a personal file so that when the need arises the same may be retrieved.

4.4 Diverse requirements

CAS keeps the users well-informed and up-to-date about the current developments which take place in their areas of interest. This is a continuous service provided to the information seekers irrespective of the stage and progress of their research. There are some of the diverse requirements and prerequisites of CAS as described below:

- CAS is an announcement mechanism and not a pin pointed information; or a tailor-made or customized information service.

- CAS is provided to meet the current information requirements of the users.

- CAS is usually provided to a group of users (researchers, scientists, etc. having homogeneous information requirements), and not to the individuals.

- It may be available in a printed, electronic or any other appropriate form acceptable to the user.
- It is to be provided within a time frame (deadline) much before the information is published in secondary sources such as indexing and abstracting sources.

- It should be brought to the notice before the notification in secondary sources of information, e.g., abstracting and indexing services,
- Getting feedback is not a prerequisite in CAS.

- Speed, currency and ease to use are three factors to determine the efficiency and effectiveness of CAS in any organization.

5. Categories and types of CAS

5.1 Categories of CAS

There are generally two kinds of Current Awareness Services that may be recognized.

5.1.1 CAS for all the users

Services which may be provided to all the users to keep them up-to-date. These services include a list of recent additions in the libraries, compilation of bibliographies, indexing and abstracting services, table of contents of journal received in the library, etc. This may be provided in the following forms:

- Contents pages of journals
- Library bulletin
- List of new additions or accession list
- Newspaper clippings
- Routing of periodicals

5.1.2 CAS for homogeneous group of users

These are provided to a homogeneous group of users, i.e.,users having samesubject interest. These may include communication of information to individuals or group through various means such as by telephone, conversation, email, routing of journals, etc. These may also include circulation of materials in anticipation to individuals, keeping in view their information needs.

Those services, which are directed towards all users of theorganisation include accession lists (a list of recent acquisitions), bibliographies, indexing and abstracting services, bibliographic surveys, literature surveys, table of contents of periodicals received in the library, Current Awareness bulletin, etc.

5.2 Types of Current Awareness Services

Different kinds of current awareness services are offered depending upon the requirements of individual users. Listed below are main types of current awareness services offered by most of the libraries.
- Title announcement services
- Announcement of research in progress
- Notification of forthcoming conferences
- Selective Dissemination of Information (SDl)
- Newspaper clipping service
- Current awareness bulletin

6. Selective dissemination of information (SDI)

SDI is a type of CAS which keeps the users in touch with the latest developments in the field of users' interest. In other words, it is a personalized service meant for the individuals or a group of users having identical information needs. The characteristics of SDI service are:

- It is concerned with the published information.
- The source of current information may be available both within and outside the organization.
- It is a computerized assisted service.

There is urgent need for selective dissemination of information service for technology enabled academic, research and other special libraries as:

- The literature output at present is multiplying at a fast pace.
- The volumes of record information are growing exponentially.
- The users do not have time for reading the available voluminous literature in their respective fields.
- Modern technologies can help to satisfy the researchers' information requirements and their needs.

6.1 Objectives of Selective dissemination of information

- To provide current information on a particular subject,
  To receive, scan and provide the literature to right users,
- To notify the latest information about the particular subject clearly,
  To delegate the computer base technique for relating current profile of information to the interest of users,
- To achieve current requirements through the scan of journals, current awareness bulletins, and other important resources, and
  Expeditious service/time saving.

6.2 Components of SDI

6.2.1 User profile

It contains a file describing the subject field of the researcher by indicating proper indexing terms as keywords. The process of its creation includes the users' identification, as individual or a homogeneous group. The objective is to define the information needs properly. The requirement of information is collected by using questionnaire which is converted in to machine readable form (user profile).

6.2.2 Document profile/database

It is a bibliographical record of the documents related to user's information needs and areas of interest. It may be in-house or a commercial database. Both the systems have relative advantages and disadvantages. For example, coverage and scope of commercial database may be more than the in-house created one. On the other hand, in-house database despite being

very time-consuming as compared to commercial database, may ensure pin-pointed and better customization of information requirements

6.2.3 Matching user profile with document profile

It consists of matching the user's profile (UP) with the document profile (DP), i.e., contents of the DP with those of UP with the help of a computer. It is advisable to use computer rather than manual work if users are more than 100 or so. The task of the librarian/information professional is to translate the information requirements of user in to descriptors taken from the controlled vocabulary or thesaurus as it helps in perfect searching of documents/information stored in the database.

6.2.4 Notification

It is based on the match between the user's interest profile and the document profile. At the first instance, the individual user receives notifications from the system.If any loose match is observed between his/her profile and any document in the database, the same may be taken care of. Further, the user may indicate the usefulness of the documents/information disseminated to him/her. The notification may be sent by taking printouts along with the covering letter and feedback form. The same may be sent by e-mail or by using Bulletin board service, if the request from users is common.

6.2.5 Feedback

The user is expected to provide feedback to the SDI providers in a prescribed feedback form indicating whether the documents/information notified is most relevant, relevant but not needed, or not relevant at all. In case most of the items of information are found useful, then it can be concluded that the user profile has been properly prepared. On the other hand, if most of the information is not found useful, then it can be said that user profile does not match with the user's interest areas and hence must be modified.

6.2.6 Modification

In case, the user indicates through the feedback form that the output is not useful, the SDI provider takes action to modify the profile on the basis of the results provided by the user. The reasons for disseminating information that is not useful are analysed which may result in revision or modification of the user's profile. In some cases, the users' interest may also change due to the change in research projects or so. In such cases, the modification of user's profile itself is required. An active interest and personal contact between the user and the researcher is of great importance to ensure modification of the profiles.

6.3 Benefits of SDI

In SDI, an accurate representation of a user's interests is crucial to the performance of personalized search as this leads to a perfect match of user's information requirements and the information/document provided to the user.The following are benefits of SDI service.

- In view of users interest,   it encourages the research scholars to utilize current literature.
- Satisfies the researchers requirements and their information needs.
- Enables access to latest and particular subject information very quickly.
- Motivates research mindset and knowledge skills.
- Provides quality and current awareness literature.

7. Methods and Techniques of Providing CAS

Current awareness services alert scholars, researchers, and other users to recently published literature in their fields of specialization. Librarians who provide these services use various methods to keep current with academic and professional literature. Traditional methods include routing print journals, distributing photocopied journal tables of contents, and simply browsing professional publications. Newer methods include conducting saved searches in preferred databases and creating email table of contents alerts.CAS can be provided by the following methods:

7.1 Current Awareness Bulletin/List

This is one of the most popularform of current awareness service provided by libraries. In this type of service, the library or documentation center scans primary journals and other sources of current information received in the library. It may be provided in the form of library bulletin. It consists of a list of recent additions or a list of periodicals or indexing periodical (a list of articles from periodicals).The typical bulletin may contain all or some of the items which are given below:

- Library publicity and announcements in general
- News items (selected from news in the form of clippings)
- Announcements of forthcoming conferences/seminars and meetings
- List of current acquisitions (such as books, periodicals)
- Details of contents of recent periodicals
- Publication details from the secondary sources in original or as the reproduced one

The objective of CAS is to keep the R&D activities of the organisation and other interested organisations abreast with the current developments in their respective field of interest. For example, Chemical Titles of the Chemical Abstract Service produced by American Chemical Society, a professional body. The simplest form of a library bulletin is a list of recent additions. A list of contents based on journals is a quick and cheap method. Sometimes, it is used as an alternative to routing of periodicals in many of the areas, especially in science and technology. There are excellent international indexing and abstracting services, but there is very often time lag in receiving these. Therefore, local indexing and abstracting services (another name of documentation list) may have to be brought out. Very often, these services may be found more useful because these are tailor-made or customized. The scope of the bulletin depends upon the needs of the organisation and the resources made available to the library.

7.2 Routing of Journals

Routing or circulating the journals is an important means of dissemination of information. Generally in special libraries/information centers, the bound volumes of journals are circulated, but the current issues are also routed. Before the current issues of periodicals areissued, the library/information professional can scan these current issues and mark certain articles to draw the attention of individuals. In this method the library sends the current issues to the first person on the list, who passes it on to the next name in the list, ultimately the last person returns it to the library.

7.3 Display

Display is considered as an important method of offering CAS.It is a general practice of a library to display either all or selective items of recent acquisitions as part of their publicity programme. The item may be a book or periodical. It may be the jacket of a new book. This enables users to be aware of recent developments in their field of interest or related areas.

7.4 Research in Progress Bulletin

It is an alerting service which alerts the users about the new research projects and the progress made in the projects already in progress. This type of service generally requires joint efforts of more than one organisation or institution working in similar or closely related research areas. A parent body which funds or controls a group of research organisations could also bring out research-in-progress bulletin. For example, Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR), etc. bring out such bulletins in India. Research in progress contains information about the organization/laboratory at which the project is being carried out, name of the researchers, sources of funds, duration of the project, etc. It also includes information about the status of the research in terms of the progress achieved and thereby keeps the interested researcher up-to-date.

7.5 Contents by Journal Service

This service can be provided in-house or by commercial publishers. In this service, the library or documentation centers or commercial publishers distribute a publication which consists of content pages of the journals in various subject areas. For Example, in humanities, social sciences, etc. In this service, photocopies of the content page of the selected journals can be circulated to the users. There are some agencies such as Institute for Scientific Information (ISI), Philadelphia (now Thomson Reuters) which publish the content pages of journals entitled Current Contents which is a rapid alerting service database.

The main idea behind publishing the content pages of journals is that journals are important medium for communicating new information. If the users can be regularly informed of articles appearing in current journals in broader or narrow areas, they would come to know of recent developments that are taking place in their fields of interest. The simplest way is the duplication of the content pages of the journals and sending to the users. Another reason of providing this type of service is that this service enables the users to quickly know the titles of the articles which they value very high. Once they identify useful papers relating to their field of interest, they can then go to the library and read the papers.

Alternatively, they can also write to the author of the paper and can get copies of that paper. In this way, the user can build up good personal collection of articles of his area of interest. For example, Current Contents published by the Institute of Scientific Information (ISI) in the USA. The Current Contents—Physical Science, published weekly reproduces the contents pages of over 700 journals.

Nowadays, creation and maintenance of research in progress databases in computer readable form is available. Such databases can be used both for retrospective search before a new project is formulated and for CAS too. This will be further discussed in section on Computer-based services.

7.6 Newspaper Clipping Service

Newspapers are considered as a valuable source of current information as these are the current awareness media. They publish news of recent happenings in various fields such as in politics, health, sports, business, etc. Newspapers carry useful information for everyone from housewives to top management. They are of various kinds such as regional, national or international. Some newspapers specialize in particular subjects such as in Economics and allied fields, for example, Economic Times, Financial Express. They contain an in-depth knowledge of industry, trade, banking, etc. Important information available in the newspapers may be useful to the users. Newspaper clipping covers the clippings of daily newspapers, weeklies, current magazines, etc. Clippings may pertain to different languages.

Various libraries and documentation centers provide information services based on these newspaper clippings, known as the newspaper clipping service. For providing newspaper clippings, libraries/documentation centers subscribe to several newspapers, which may be daily or weekly newspapers. Each of these newspapers is scanned and any items of interest to the user groups are clipped, i.e., cut and pasted on a sheet of good quality paper. One or more clippings are then assigned sub-headings or class numbers or some code. At periodic intervals, i.e., daily or, weekly, the clippings are arranged by subject headings or some code and disseminated to the users. In smaller organisations, batches of clippings in one or more

groups may be circulated to users. In large organisations or where the circulation is wide, a bulletin containing news items with or without an annotation may be circulated. The clippings themselves are filled in verified or in file folders for use at later date.

8. Computer-Based Alerting Services

Electronic current awareness uses a computer-based technique for matching the contents file of the information product with the interest profile of the user. The computer based solution offers both a better service, with more flexibility and easier indexing and maintenance of the library's database in the longer term, coupled with lower costs. In ICT-enabled environment, information organisations can compile current awareness bulletins using predefined search strategy and search directly from the databases either on CD-ROM or online for getting the desired output. Subject to copyrights, the output can also be stored on a local system, and disseminated online (internet, intranet) and offline (print, CDROM, email). Table of contents of most journals are available free from the publishers' sites. Some publishers even offer free email update of table of contents. A large number of electronic publishing sites or portals now offer current information via email to registered users. Internet has also enabled a lot of innovations in contents, methods of production and distribution of current awareness products.
Given below are some examples of computerised current awareness services.

8.1 Alerting Services, RSS Feeds & Email

At one time, librarians regularly scanned manually through new journal issues, comparing contents against index cards submitted by uses listing areas of interest and typing up bibliographies of potential matches. Now alerting services (current awareness services) can provide such lists automatically. Alerts can be sent from publishers, article-indexing databases, or third parties that combine these sources.

Alerting services are offered by many databases that allow the users to keep up-to-date with new research in a particular field of study. For this purpose, one has to get himself/herself registered in return of which the alerts via email straight to the inbox or via an RSS feed are received. RSS, or 'Really Simple Syndication' is a family of formats used to publish frequently updated digital content, such as blogs, news feeds, journal alerts or podcasts. With an RSS reader (or aggregator) one can subscribe to many feeds and read the new entries all in one place, without having to visit individual Web sites to find them. Many publishers are using RSS feeds to provide an alerting service to advice on new information as it becomes available. Various types of journal alerts are available.

Examples of Alerts via RSS & Email

SCOPUS   Multidisciplinary

ISI Web of Knowledge   Multidisciplinary

EbscoHost   Multidisciplinary

PROQuest   Multidisciplinary

Pubmed   Nursing; Medicine; Health

Sciences IEEE Xplore   Electrical & electronics

engineering; IT

EI Engineering Village   Engineering, IT, Earth Sciences

Some of the Useful websites are enumerated below:

- Feedly RSS Reader - create your own account:http://feedly.com/#discover
- Google Alerts (email alerts):http://www.google.com.au/alerts?hl=en
- Obtain details of other RSS readers:http://allrss.com/index.html http://www.dmoz.org/Computers/Software/Internet/Clients/WWW/Feed_Readers/
- Subscribe to the FeedMyInbox Service from here:https://www.feedmyinbox.com
- TicTOCs - Journal Table of Contents Service: find scholarly journal TOC's and export the RSS feeds straight to your reader:http://www.tictocs.ac.uk

There are several kinds of alerts one can receive, through email or RSS feeds as listed in subsequent sections.

8.2 Table of Content Alerts

One can receive the table of contents of newly published journals which have been selected, often with links to the publisher's site with the article. However, it may not be from the location from where one can obtain the full article. These are often available well before the print issue is published.

8.3 Search Alerts

These are also called Saved Search Alerts or Keyword Alerts. A search is created that is periodically re-run, with new matches to one's search criteria already sent. A well-focused search is then constructed to limit the number of results sent and to ensure results are on-topic.

8.4 Citation Alerts

One can track when a specified article or author is cited in newly published articles with citation alerts. Most publisher sites limit results to citations appearing within their own journals, while databases can provide citations from many sources.

8.5 New Publication Alerts

In this case, notification of new publications (other than journal issues) from a publisher or professional organization are received. This could include books, proceedings, newsletters, standards, etc.

Many journal and other academic publishers provide alerting services for their publications. Most publishers provide this service for free (so a library subscription to their publications is not needed), though registration is typically required. As is often the case, one can receive alerts to publications to which the library does not have a subscription, or for which access from another source is received. For details of publishers, databases, RSS feeds, and books the URL http://www.lib.vt.edu/help/alerts/ may be visited.

8.6 Software packages for CAS

Many of the databases provided by the academic institutions, e.g., University of Washington (UW) Libraries offer alert services that automatically send email notifications for new citations or table of contents that match a requester's interests. These are termed as alert, auto alertorsaved search and the procedures for setting them up vary among vendors, but they generally operate in the same way. By specifying the search terms or the journal titles, the database automatically provides with updated results via email. One has to register with a password and establish a profile or personal account besides providing email id. Some alert services limit the number of searches one can save.

The received items can be scanned through electronic means in order to make CAS more efficient and current. For example, the same can be put on the LAN of the organization. This service can be updated more frequently in the computerized mode than the manual mode.

This type of service has more flexibility, currency and fast delivery of information to the end users. It can be generated as information product of an in-house database. The basic advantage of this mode is that a number of different information products in printed, and electronic form, can be generated from the same database. Computerized in-house service offers flexibility and easier indexing and maintenance of database.

There are number of software packages available commercially which are suitable for the generation of computerized CAS. Some of the examples are as below:

Software Package	Vendor/Supplier
DATAFLEX	Data flex
ORBIT	Maxwell on-line Inc
TINLIB	Information Made Easy Ltd.
STATUS	Harwell Computer Power

Besides the above, a number of personal bibliographic software packages are also available, which support users creating their own database on PCs for storing and displaying of desired records. Some of the examples are: Reference Manager, ASK SAM, Notebook, etc.

8.6.1 CAS provided by the External Agencies

This type of CAS is provided by some external agencies also. These are available from two main sources:

8.6.1.1 The Online Hosts

Services provided by online hosts are primarily generated from databases mounted by these hosts. This type of CAS service is available with almost all online hosts in a variety of subject areas. Notification is received from these hosts in print format, machine readable format, CD-ROM or directly to the computer of the user.

The following features have made this service more valuable.

- Downloads and stores records for future use on the basis of the contractual agreement.

- Avoids duplicate records received from various bibliographic databases.

- Handles graphics, chemical formula structure, trademarks, design and other complex figures.

- Offers cross-file searching ability to use one profile across several databases is available with online host.

8.6.2 By Database Producers

CAS are also provided by database producers. There are a large number of publishers and database producers worldwide who offer CAS online. On the basis of subject coverage, libraries and information centers may select appropriate database.

Some of the important producers and their services are as follows:

8.6.2.1 ISI Alerting Service (http://altertrng, http://isinet.com).

It is an alerting service that includes both profile-based and Tables of Contents (TOC)-based alerting service. It delivers current bibliographic information. It includes full length, English language author abstracts in the field of science and technology, social sciences, arts and humanities directly to the desktop of the user via web or e-mail. It is selected on the basis of the information sources selected by the user. Users may receive daily or weekly alert service by accessing the web or e-mail Users can also place order for full text documents from ISI Document Delivery Service

8.6.3 ISI Profile- based Alerting Services

Personal alert: It is a highly customized, profile-based service. It covers literature in over16,000 science and technology, social sciences and humanities journals, books and conference proceedings.

Discovery agent: It is a web-based alerting service. It can be used by the individuals for disseminating customized information A user can create and manage personal research profile. The profiles are filtered against current contents database over good journals.

Research alert: This is a print-based altering service that delivers complete bibliographic information. It is based on the personalized profiles developed for specific users.

Links alert by Springer: It is a free e-mailing CAS that delivers the table of contents of books and journals brought out by Springer.

Besides the above, there are a number of publishers and professional agencies offering CAS in various areas, e.g., DEAL Alert; IEEE-What's new?

8.6.4 E-mail and Bulletin board service

A number of networks offer e-mail and bulletin board services. These are useful for communicating new information and sharing of research output. These services may be operated within an organization for free flow of information. A Bulletin board services is meant for making general announcement to all users of a network and is used for publication of newsletters and other information services.

9. Summary

One of the basic functions of the libraries is to keep its users in touch with its information resources for maximum utilization. The same are accomplished by way of providing various information services in anticipation of demands of users. These are collectively termed as Alerting services and also broadly known as Current awareness services (CAS). The main reasons for providing these services are because of tremendous growth of literature, interdisciplinary nature of research, various types and forms of documents. The characteristics of alerting services have been described under the heads of 'Approach not in response to specific query', 'Continuous need', 'Retrieval not the only intention', and 'Diverse requirements'. The typical services under the category for all users are Contents

pages of journals, Library bulletin, List of new additions or accession list, Newspaper clippings, and Routing of journals. In the second category i.e. Services for homogeneous group of users include communication of information to individuals or group through various means such as by telephone, conversation, routing of journals, etc. The various traditional methods of CAS have been identified as Current awareness bulletin/list, Routing of journals, Research in progress bulletin, Display, Contents by journal service, and Newspaper clippings. Lastly, brief accounts of some of the computer based alerting services have also been described. These are categorized as Alert services; RSS feed, Email and Bulletin board services. Typically the users can keep themselves in touch with not only the table of contents of journals, but also the citation and search alert as per their needs and requirements in a more efficient and effective way. Apart from journals they can be in touch with new publications alerts. Many database producers and online hosts provide these types of services such as SCOPUS, Thomson Reuters (earlier Institute for scientific Information) – to name a few.

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