UNIT 7 LITERATURE SEARCH AND DATABASE SERVICES

Structure

7.0   OBJECTIVES

We noted in Unit 5 that indexing and abstracting services are essential access tools to published literature. In this Unit, we shall discuss methods and techniques of using these tools for searching literature:

After reading this Unit, you will be able to:

- distinguish between `reference service' and `literature search' and state the need for the latter;

- outline and describe the steps involved in the process of literature search; and

- explain the desirability of computer databases and their use for literature search as also for non-bibliographic searches.

7.1   INTRODUCTION

In this Unit, we shall be discussing two themes. The first theme deals with the methods and techniques of literature search which are to be related to the varying information needs of users. Strategies for literature search will correspondingly vary with the purpose and use of information: After identifying the information needs of users, we will explain the different steps involved in literature search process.

The second theme in this Unit deals with computer databases. The advent of computer and communication technologies and their applications to bibliographical organisation have created opportunities to access literature with greater speed and efficiency. Online searching through computer-communication networks with facilities for interrogation of and interaction with databases on the video screen has given a new dimension to information services.

Today, there are more than 3,000 computer databases covering both bibliographic and non bibliographic information.

7.2   USERS-THEIR INFORMATION NEEDS AND LITERATURE SEARCH

The ultimate objective of any documentation or information activity is to provide the user with the information he needs, to the extent he requires, within a reasonable time and cost frame. Let us now examine all these elements involved in information retrieval, and what literature search is all about. The user could be a layman who needs information to satisfy his curiosity, a student who needs more details than what is provided by the text book, a technical worker needing information to perform a certain task (e.g., a new welding process or a special distillation or purification technique), a research worker embarking on a new area of research, a product manager contemplating a new product line, or an administrator who has/to give his decision on anew project report or formulate a new strategy. Obviously, the nature and extent of information required by each, of them are different. Moreover, the urgency for getting information varies in different circumstances. While some of the needs of most of the users can be satisfied by the routine reference service provided by a good library, the needs of some others, especially research workers and project managers, can be satisfied only by extensive literature search entailing the use of several resources of a modem information centre and the skill and ingenuity of the information scientists.

7.2.1   Reference Service and Literature Search

A reference service, according to *the A.l.A. Glossary of Library Terms,* is "that phase of library work which is directly concerned with assistance to readers in securing information and in using the resources of the library in study and research". Usually a reference service responds to request for a specific piece of   information – about a person, or place or an event, a method, procedure, or formula, etc. The nature of information sought in such a situation is very specific and quite often the answer could be found from the conventional reference tools like dictionaries, encyclopaedias, manuals, handbooks, gazetteers, directories, yearbooks, etc. (See course BLIS-06, Unit 5).

Literature search, on the other hand, can be equated to "long range reference service", where the search has to be more exhaustive, both in depth and extent. The range and complexity of reference sources to be consulted are wider and generally, more than one source has to be consulted to adequately carry out a literature search. Besides bibliographies, other secondary sources like abstracting and indexing services, reviewing periodicals are the main sources of information. The demand for this service has been growing with the growth of scientific and technical literature which has assumed frightening proportions in the post-Second-World-War era.

Self Check Exercise

l)   List the various categories of users and their need for information.

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

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

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7.2.2   Need for Literature Search

While the scientific and technical literature has been growing exponentially, the amount of time that any user has for reading this literature remains more or less the same. Clearly, no research worker, unlike his predecessors who knew everything worthwhile in their field of specialisation, is able to keep abreast of the latest developments in his field of specialisation. To keep abreast of such developments he often needs the help of information specialists. These developments, the knowledge of which is so essential, get recorded in the literature devoted to the respective subject disciplines. The vastness of this literature and the lack of time for the user to look it up create a gap between him and the information he may find useful., Literature search is the means to bridge this gap. Thus, the main function of an information service facility is to bring together the user and the information he needs.

7.3   STEPS LITERATURE SEARCH

There are many points to consider in making an effective literature search. The first and foremost step is to ascertain the purpose, scope, depth and precise field of enquiry. This may entail a dialogue between the user and the information specialist. A quick assessment of the nature and extent of the enquiry will show whether the search is for specific factual information, mainly required by a technical worker, or for a few select references, normally adequate for an administrator or a policy maker, or for a comprehensive bibliographical search, which is usually the requirement of a research worker. Once the parameters of a query are fully understood, a proper search strategy should be chalked out. Haphazard searching of literature will lead not only to wastage of time and money, but also to the risk of missing a number of important documents. Much of the expertise in literature searching lies in choosing the most appropriate sources to consult with in each case and the order in which to consult them.

7.3.1   Selection of Sources

A good approach to literature search is looking up a bibliography, an encyclopaedia or a review publication. This provides background information as also some useful references. After this preliminary search is over, searches should be carried out with secondary publications like abstracting and indexing services. Depending upon the topic, any one of the following situations may arise

i)   Secondary periodicals are available on the subject.

ii)   Secondary periodicals are available on the subject as well as on the broader area encompassing it.

iii) No secondary periodical is available on the subject, but available on the broader area.

iv)   No secondary periodical is available on the subject, or on the broader subject.

7.3.2   Search in Secondary Sources

When secondary periodicals are available on the subject as well as on the broader subject, the search must first begin with the secondary periodical on the subject proper, supplemented by references collected from the periodicals covering the broader subject. Usually, the secondary periodicals covering broader subjects would cover peripheral journals and some times quite alien to the main subject of search. But it is a well-known fact that there is a considerable scatter of information on a given topic over a whole range of periodicals covering core, peripheral and alien fields. Although a few core journals cover a considerable part (50-60%) of the published literature on a given topic, yet sizeable portion (30-40% or more) can be covered by scanning a large number of peripheral journals in alien fields (e.g., an article of medical interest, say malaria eradication, may be published in a sociology journal).

Skills are to be developed for the consultation of secondary periodicals, since a wide variation is observed in the pattern of the arrangement of the entries as well as in the methods of indexing, and also the types of indexes provided. Usually, the indexing method used is

explained in the introduction to the index. Pertinent subject headings vary from one secondary periodical to another. The searcher should acquaint himself not only with the scientific nomenclature and terminology, but also with the popular and trade names.

7.3.3 Search in Other Sources

No search will be complete without a look at other sources of information, specially for topics for which' there are no secondary periodicals available. Such other sources are conference proceedings, research reports, theses, patents, standards and specifications, trade literature and in some cases monographs and treatises. There may be cases where information will be available from non-documentary sources like institutions and experts.

Whatever may be the type of information, sources may be needed to consult at sometime or the other. So,some knowledge of the main characteristics of different of source's is, needed. As mentioned earlier, much of the expertise in searching for information lies in choosing the appropriate sources to consult in each case and the order in which to consult them.

7.3.4 Recording of References or Information

Every literature searcher develops his own style of taking notes of references, While every effort should be made to optimise the time and efficiency of search, it is good to remember that a few extra seconds spent to make proper preliminary records may save many frustrating hours later. The first principle in saving search time is to use a single operation to serve multiple purposes. For example., references recorded on sheets of paper can serve only one purpose _- providing a list of references without any order. But records on cards or slips, with one reference per card or slip, can serve several purposes. Abstracts can be added under each reference, if required, and the cards can be arranged by subject, author or chronologically, as may be required.

7.3.5 Presentation of Results

Proper presentation of search results requires as much skill and care as in defining the subject and parameters of search. Reading lists need only be selective and may require brief aouoᵗu1ioᵒm. But a search on behalf of a researcher will need exhaustive treatment, and may need slanted abstracts conforming to the user's need. The choice of arrangement also depends on what the user needs - alphabetical (by author's surname), chronological, source-wise (monographs, periodicals), non-conventional (microfilms, audio visuals, etc.), classified, or some other arrangement. The best arrangement is that which the user finds most helpful. An indication should be given as to how complete the bibliography is. The sources should be stated giving the exact references.

7.3.6 Skills in Literature Search

Expertise in literature search can be gained only by experience. Some attitudes or traits conducive to a good literature search are: imagination, mental flexibility, thoroughness and orderliness, persistency, judgement in resolving contradictory information and accuracy in recording. A basic knowledge of the field of search is considered helpful though not absolutely essential.

Self Cheek Exercise

2)   Enumerate the different steps involved in literature search.

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

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

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7.4 COMPUTER DATABASES

As would be evident from the foregoing description, literature search is essentially a process of information retrieval. The term "Information Retrieval" was coined by Calvin Mooers in 1950, who described it as "searching and retrieval of information from storage, according to specification by subject". Retrieval of information is the objective in the process of communication between human beings. The process of communication involves the following steps:

i)   Collection of information;

ii)   Selection of information for inclusion into the system;

iii) Classification and/or indexing;

iv)   Dissemination;

v)   Storage for future recovery; and

vi)   Retrieval.

However, the process of communication of information is increasingly getting difficult due to the following factors

i)   The existence (old information retains its value for a considerable period of time) and continuing growth of information due to the so-called information explosion;

ii)   The inter-disciplinary nature of information;

iii) Information scatter in numerous sources; and

iv)   Geographical, language and other barriers to communication.

7.4.1 Indexing and Abstracting Databases

A study of growth of indexing and abstracting services over the years would show that during the past two centuries, these services have been trying to help the information communication process mentioned above. However, the increasing tempo and baffling complexity of information generation were causing enormous strain on the resources and capabilities of these information communication systems. But the advent of computers in the fifties and their applications and the developments in the field of communication technology also have been of great help in improved bibliographical control and access of documents. With these developments, the machine readable records have become most useful as databases, enabling the users to -get access to the required information at a much faster rate. These databases are available on (i) CD-ROM which the libraries can search on their own computers and (ii) networks on which the databases of major libraries as well as those of the conglomerates like Lockheed (DIALOG) and System Development Corporation (ORBIT) are accessible. Because of such large databases and their availability for conducting literature searches through networks and vendors, there now exists enhanced access opportunities to world literature output in a given discipline,

7.4.2 Online Searching

The real difference between manual searching and online searching lies, according to William A. Katz, in the mechanics and the jargon of the latter. However, after doing a number of searches, one becomes proficient in searching databases online. In short, it is practice that makes one perfect in the art. Besides, each international information service has brought out its user guide which helps attain mastery over, what Katz calls `mechanics`.

Online searching is particularly helpful and resorted to when (i) depth search is involved, and (ii) exhaustive search is called for. Yet another merit of the online searching is the facility it offers of using Boolean logic which allows limiting or expanding the search as required

Because of the three logical operations symbolised by OR, AND and NOT, it is possible to co-ordinate the relevant terms by modifying the search strategy. The online search, unlike the manual search, ensures at once enhanced, quick and refined access.

7.4.3 Some Examples of Online Databases

The adoption of modern technology has resulted in the proliferation of machine readable databases. The National Library of Medicine (USA) designed its MEDLARS which became operational in 1964. Later appeared its online version as MEDLINE. Engineering Index of the Engineers° Joint Council (USA) and Biological Abstracts soon had their corresponding online versions, viz., COMPENDEX and BIOSIS. Yet another very large online database is that of Information Services for Physics and Engineering Communities, called INSPEC (UK) representing the three printed versions of Physics Abstracts, Electrical and Electronic Abstracts and Computers and Control Abstracts. CA Search and AGRICOLA, the online counterparts respectively of Chemical Abstracts and Bibliography of Agriculture (NAL, USA) are worth mentioning. These are all also devoted to sciences.

Of the social sciences, there exist a number of large online databases particularly in economics, psychology, political science and management. For example, PsychINFO is the online version of Psychological Abstracts.

MARC database of the Library of Congress is a good source to search for resources in humanities. It is also worthwhile to know about two full text online databases: one is LEXIS in law and the other is NEXIS that offers several newspapers and business publications.

7.4.4 Expansion and Diversification

Diversification was the most important trend for databases during 1975-80. The early success of the Government-funded online experiments and the acceptance of online databases by the information community established the legitimacy of the medium. More and more non-profit as well as for-profit organisations undertook to produce databases. No longer the databases covered only scientific/technical contents, but they started covering the social sciences, humanities, and general interest or popular topics as well. Types of databases other than bibliographic began to emerge and directory and referral databases appeared on the scene. Full-text databases also increased in number. The number of online databases available at present is estimated to be over 3000. The era of computerised literature search has truly arrived.

7.5 GENERAL OBSERVATIONS

Literature search which began as a logical extension of reference service, gained momentum with the increasing tempo of research and development activities in the post World War-II period. The advent of computers and spectacular developments in the field of communication technology in the I960s brought about a sea-change in the information scene. Undoubtedly, the most important phenomenon in the past two decades has been the emergence and popularity of machine-readable databases, particularly online databases. In fact, databases can almost be said to have created the information industry as we now know it.

Self Check Exercise

3)   State the four advantages of online searches through databases.

4)   Give at least five examples of computer databases available for online searching.

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

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

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7.6   SUMMARY

This Unit has dealt with literature search in relation to fulfilling user needs. We have discussed the following :

i)   specific information needs of users and the necessity to search various types of sources to identify the right types of information needed;

ii)   the need for literature search in different contexts;

iii)   the various steps in literature search, namely, fixing the parameters of the query to evolve a proper search strategy; selection of appropriate sources for searching; organising the collected references to information in a standard format; and, finally, presenting the information in an acceptable form;

iv)   computerised databases in various disciplines, indicating reasons for the natural evolution of these databases;

v)   the advantages of online searches;

vi)   further expansion and diversification of computerised databases, both bibliographical and non-bibliographical.

7.7   ANSWERS TO SELF CHECK EXERCISES

Categories of Users	Information Needs	Purpose
Layman	General literature	Curiosity
Student	Study materials	Study
Technical worker	Technical information	Learning to perform a task, e.g., a new welding process or a special distillation or purification technique.
Research worker	Available information in the area	Embarking a new product line.
Product manager	Product information	Contemplating a new product line.
Administrator	Project information , statistical data etc.	Decision on a new project or formulating a new strategy.

2) The different steps in literature search are:

   a)   to ascertain the purpose, scope, depth and the precise field of query from the requester;

   b)   to evolve a search strategy on the basis of the nature of the query and the user requirements;

   c)   choosing the most appropriate sources for search; the sequence of search may be beginning with the search in a review publication followed by search in secondary periodicals and other sources such as conference proceedings, research reports, theses, patents, standards and specifications, etc.;

   d)   recording of references and information in a standard form; and

   e)   presentation of results in a form acceptable to the user.

3) Online searching of databases is a recent phenomenon which has come as a result of application of computer communication technologies to information activities. The main advantages of on-line searching are as follows:

i) Speedy searching of information sources on a particular subject.

ii) Direct interaction of the searcher with the database to identify the relevance of the selected references to the users' requirements.

iii) The search strategy can be altered or revised during the process of search as required by the user.

iv) Online searches can be conducted on different databases leading to the selection of comprehensive literature on the subject of search.

4) The computer databases available for online searching are:

i) MEDLINE

ii) CA Search

iii) INSPEC

iv) COMPENDEX

v) BIOSIS

7.8 KEY WORDS,

Access Tool	:	A tool that helps to locate relevant references, e.g., a catalogue or index.
Alien Field	:	A subject area totally unrelated to a given subject.
Bibliographical Control	:	The systematic recording of all the existing literature on a given subject with a view to providing access to it.
Conglomerates	:	Giant vendors holding several databases.
Nomenclature	:	A complete system of names in a given subject
Parameters	:	Variables
Phenomenon	:	event.

7.9 REFERENCES AND FURTHER .READING

Clevenland D.B. and Cleveland A.D.(1983) '*Indexing and abstracting services*' : An *introduction to indexing and Abstracting* Littleton: Libraries Unlimited .Chapter XII pp.158-67