

*DRTC Annual Seminar on Electronic Sources of Information
1-3 March 2000*

Paper: BE

SECONDARY AND TERTIARY "ELECTRONIC" SOURCES OF INFORMATION

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A key to finding the primary sources of information is the secondary and tertiary sources of information. These sources in the electronic form started with the online information retrieval systems. They have since evolved from magnetic tapes to the microforms and then to the CD ROMs. Now these are also available as DVDs and on the Internet. These sources have become an inevitable part of a scholar or a researcher's or even a student's pursuit of information. This paper is an attempt to give an overall view of some of the "electronic" secondary and tertiary sources of information.

1. INTRODUCTION

By the beginning of the twentieth century, the volume of primary publications had reached such a large size that it began to be difficult for scientists to find information. In order to simplify literature searching, secondary publications began to be produced. The purpose of secondary literature is to "filter" the primary information sources, usually by subject area, and provide the indicators to this literature. A secondary publication is a document such as an abstract, digest, index to periodicals, current awareness journal, or a database, which is prepared in order to disseminate more widely the information which has already appeared in another form, in a primary publication (3).

In primary publications, information on a given topic is widely scattered, for example, in many different journals. In secondary publications, information from such primary sources is collected together and organised in a structured form, for example, under subject headings, and designed to facilitate information searching. The objective of this paper is to give an overall view of some of the important "electronic" secondary and tertiary sources of information.

1.1 Secondary and Tertiary Sources in Electronic Form

People today discover via the Internet, vast wealth of information resources that can be brought right to their computer screens. The fundamental innovations in this direction took place 20 to 30 years ago. In the 1960s many online retrieval systems were invented, tested and used by small populations. Most did not make transition to the commercial or government systems.

The serious application of computers to document retrieval did not begin until the late 1950s, with slow serial searches of small files of bibliographic records on magnetic tapes. During the first half of 1960s the prototypes of several innovative systems were developed and used for experimentation. These had many limitations. Most operated with one terminal and one small database. The search systems had to share the resources of a mainframe computer system and could run therefore, only for a few hours per day at most. Taken as a group, the prototypes had remarkably advanced features such as online thesauri, ranked output, automatic inclusion of synonyms in the search formulation, Boolean logic, right and left truncation, cited-reference searching and natural language free-text searching. Some systems had automatic data collection programs to monitor use and satisfaction (1).

1.2 Important Secondary and Tertiary Sources in Electronic Form

The secondary and tertiary publications, in their printed version can take the form of single volumes, such as handbooks, or can be published at regular intervals, such as abstracts and indexes. The most important and widely used secondary sources are databases, abstracting and indexing journals, handbooks. Some of these in their electronic form are discussed here. Advances in computer storage, automatic telecommunications, software for computer sharing, and automated techniques of text indexing and searching helped the development of an on-line database service industry. Application of electronic dissemination to bibliographic control in libraries and archives has led to the development of computerized catalogs and of union catalogs in library networks.

2. DATABASES

Computers have been used since the late 1960s for the storage of large databases such as library catalogues and bibliographic references. Development of optical storage media such as CD-ROM has offered the possibility of storing large quantities of text, graphics, pictures, and sound at a low cost. The introduction of CD-ROM in the 1980s brought large databases with multimedia elements, navigable screens and gave the users, ability to control the course of events. Today this is one of the most successful and largest segments of the computer software market. Products are now being developed for children as young as one year old. There are a number of types of databases in electronic form:

2.1 Library Catalogues

Catalogues covering the holdings (books, reports, journals conference proceedings, etc.) of one or more library.

Computerised library catalogues were first introduced during the late 1960s. The online catalogue, known as the **Online Public Access Catalogue**, or **OPAC**, has gradually become more user friendly with the use of menus and simple commands. Access for users is now often in the form of a Web (World Wide Web) interface. These catalogues usually form an integral part of an automated library system, which includes circulation routines as well as acquisition processing. Computerised library catalogues contain the details of books, conference publications, reports, periodical titles, etc. OPACs do not, as a rule, contain details of individual

journal articles. The computerised library catalogues allow the user to:

- i) see if a certain book or journal is available at the library;
- ii) see which books are available on a specific subject;
- iii) see whether or not a book is currently available or out on loan.

In addition to the automated individual library catalogues, there are union catalogues, which show the holdings of a number of libraries and indicate where a given item is available. Since the early 1970s, university libraries have contributed catalog records to databases maintained collaboratively. A critically important role in the collaboration has been played by two organizations, the OCLC (originally the Ohio College Library Center, now the Online Computer Library Center) and RLG (the Research Libraries Group).

2.2 Some Examples of OPACs

2.2.1 Indian

i) J.R.D.Tata Memorial Library, Indian Institute of Science

Library maintains network accessible databases such as Online Catalogue, i.e. books holdings available in the main library (over 1,28,000 records searchable by author, title and subject of the book) periodicals holdings, library user database etc. Library Online Catalogue, Periodical holdings, Weekly list of additions is accessible on web as well.

Online Public Access Catalogue (OPAC) for books:

Telnet access

For searching the OPAC user can telnet to 144.16.72.102, then enter
login as opac
password opac

As soon as the user logs in there will be a prompt to enter terminal type information. The user should enter TERM=vt100.

Catalogue searches can be done by Author, Title, and Subject or through the classified catalogue. KWIC (Key Word In Context) and Boolean searches are possible. While making a search, it is possible to see the complete bibliographic information of a specific title.

Web access (Only Books) is possible at <http://144.16.72.150/ncsi/library/opacweb.html>
Currently the OPAC has catalogue data for over 1,25,805 books and will be updated regularly. This is the first release of the Web-OPAC search interface and has some limitations, for e.g., the search cannot be limited to a particular field.

Union Catalogue of Journals is accessible at
<http://144.16.72.150/ncsi/database/upac/upac.html>

The **union list** covers some important libraries from Bangalore like: Aeronautical Development Establishment (ADE), Center for Development of Advanced Computing (C-DAC), Central Manufacturing Technology Institute (CMTI), Central Power Research Institute (CPRI), Indian Institute of Astrophysics (IIA), Indian Institute of Management (IIM), Indian Institute of Science (IISC), Indian Space Research Organisation (ISRO), L&T Komatsu Limited (LTL), Raman Research Institute (RRI).

Union Catalog of Books on an experimental basis is accessible for books held in IISc, RRI and NAL libraries. The catalogs can be searched independently or in their combined form. The union catalog has been put up using three public domain indexing softwares, namely Using MG, Using FreeWAIS, and Using WWWISIS. This catalogue is not yet complete. It has been put up for evaluation purposes.

Currently the IISC OPAC has catalogue data for over 1,22,000 books. The RRI catalogue maintains around 20,000 books. NAL maintains around 34,000 Books and Reports.

A list of Current Periodicals Subscribed by IIT Libraries can be accessed at <http://144.16.72.150/ncsi/library/iit/iitlist.html>. Periodicals available at IIT's located at Bombay (BOM), Delhi (DLH), Kanpur (KNP), Kharagpur (KGP), and Madras (MAS) are listed. Union Catalog of Current Journals of Major Libraries in Bangalore,

Special Collections including Mathematics Books & Journals (From National Board of Higher Mathematics) can also be accessed.

ii) Indian Institute of Management at Indore (India): (<http://www.iimdr.ernet.in/book.html>)

Books database contains bibliographic information about books and monographs available in IIM, Indore Library.

iii) Centre for development of advanced computing (C-DAC)
(<http://stp.allindia.com/cdac/html/library/libsys.html>)

C-DAC Library database i.e. OPAC (Online Public Access Catalogue) can be accessed making telnet connection to the Library System.

A user can login as 'guest' and give 'guest' as password, then give either vt100/xterm as terminal type to access C-DAC Library database. It was found to be slow when tried by the author.

2.2.2 Some other OPACs

i) Baker Library, Harvard Graduate School of Business Administration
Boston, Massachusetts. (<http://voyager.library.hbs.edu/>).

User can search the library collection for known author, subject (using Library of Congress subject headings), Title and call number of the document (if known).

ii) MIT: Massachusetts Institute of Technology (<http://owens.mit.edu:8000/>)

Barton is the Online Catalog of the MIT Libraries. Barton includes materials from all MIT Libraries, including books, journals, theses, CDs, videos, electronic publications, and more, acquired and cataloged since 1963. Also included are many earlier items, and items on order.

Access is available through Telnet (requires a password) and Web. Search by Location (library) and Search by Type of Material is available. Type of material include Audio CDs, Audio Tapes, Films, Phonograph Records, Scores, Videos, Video Disks, CD-ROMs, Government Documents, Internet Resources, Electronic Journals, Maps and Theses.

The MIT libraries include the Aero/Astro Library, Barker Engineering Library, Dewey Library, Hayden Reserve Book Room, Humanities Library, Institute Archives, Lindgren Library, Lewis Music Library, (Limited Access Materials), Physics Reading Room, Rotch Library, (Limited Access Materials and Rotch Map Room), Rotch Visual Collection, RetroSpective Collection, Schering-Plough Library, Science Library, Space Center Reading Room and Women's Studies Research Room.

iii) University of Brighton Libraries, England
(http://library.brighton.ac.uk/www-bin/www_talis)

The OPAC can be used to find material held in the six University libraries.

iv) Tel-Aviv University Library Catalog System
(<http://aleph.tau.ac.il:4500/ALEPH/ENG/XXX/eng-lib-list>)

The libraries are the Academic Research Information System (ARIS), Central Library, Dayan Center for Middle Eastern Studies, European Economic Community Records, Exact Sciences and Engineering Library, Law Library, Life Sciences and Medicine Library, Social Sciences and Management Library. Telnet and Web access is possible.

v) Peking University Library OPAC System
(<http://pul2.lib.pku.edu.cn/www/service/wopac.html>)

The OPAC can be searched in Chinese or in Western (English) languages for author, title, subject, keyword ISBN, ISSN etc.

2.3 OTHER DATABASES

i) Bibliographic databases containing bibliographic references, with or without abstracts.

ii) Reference databases (in addition to those mentioned above), for example, current research projects, handbooks, encyclopaedias, product suppliers, etc.

Factual databases or data banks contain information, often in numerical form, which can be used directly, e.g. chemical structures, tables, and terminology. **Full-text databases** contain the complete version of the text of given publications. These two are treated as primary sources.

Information from the primary sources is collected together and organised, for example under subject headings and authors in these databases.

Accessing these databases

These can be accessed in a number of ways:

- i) searching online from a database mounted on a host computer from a commercial information retrieval service (IRS). This requires a password,
- ii) by means of a searchable compact disk CD-ROM database, and
- iii) from a database with WWW interface mounted either locally or available from a remote server.

Online information retrieval from databases is the acquisition of information from a distant computer via a terminal or PC, involving an interactive dialogue between enquirer and computer. The computer handles a number of databases stored in electronic form, consisting of references to journal articles, conference papers, reports, books etc, which the Information Retrieval Service (IRS) or 'host' makes available to interested users, such as university libraries, on a commercial basis.

CD-ROMs and WWW interfaces have been designed for end-users. They are relatively user-friendly and the search software is (more-or-less) self-explanatory. Today, CD-ROMs often are mounted on a server, so in reality the user will not be able to notice any differences between using online databases or a CD-ROM.

Three types of skill are necessary for carrying out interactive computerised information searches:

- a) subject knowledge;
- b) skill in using the PC;
- c) knowledge of the information system to be used - the appropriate commands, type and quantity of information available, database, structure, etc.

2.4 Some important database services

i) OCLC (Online Computer Library Center)

OCLC EPIC service: Access to 55 databases, many with full text, for information professionals.

OCLC FirstSearch service: The OCLC FirstSearch service gives library users access to

85 online databases and more than 5 million full-text articles. Included are these OCLC databases: WorldCat, OCLC FirstSearch Electronic Collections Online, OCLC NetFirst, OCLC ArticleFirst, OCLC ContentsFirst, OCLC PapersFirst, OCLC ProceedingsFirst, and OCLC Union Lists of Periodicals.

FirstSearch offers a variety of document delivery choices, including E-mail, interlibrary loan, fax, overnight carrier, and regular mail. Access options include a Web interface, TTY interface, and Z39.50 connection. OCLC provides access to FirstSearch only through libraries.

ii) The LEXIS-NEXIS service

The LEXIS service, the first commercial, full-text legal information service, began in 1973 to help legal practitioner's research the law more efficiently. The companion NEXIS news and business information service launched in 1979 to enrich research with recent and archival news and financial information. Since that time, the NEXIS service has grown to become the largest news and business online information service, including comprehensive company, country, financial, demographic, market research and industry reports. Providing access to thousands of worldwide newspapers, magazines, trade journals, industry newsletters, tax and accounting information, financial data, public records, legislative records, data on companies and their executives. Areas covered are Law, General Legal, Financial, International Law, International News, Medical/Scientific, News, Public Records, and states of USA.

iii) Ovid Technologies (5)

Over 90 commercial databases are available through Ovid. They include the definitive bibliographic resources in many research areas. For research in medicine and allied health, Ovid offers MEDLINE and EMBASE; in nursing, CINAHL; in bioscience, the BIOSIS databases; for general reference, Current Contents, Newspaper Abstracts and Wilson Reader's Guide Abstracts; and so on in business, humanities, engineering, agriculture, science & technology, and social sciences.

Most databases offered by Ovid are accessible online via Ovid Online or any of several in-country servers located throughout the globe. CD-ROM versions of most databases are available for installation on locally based OvidNet for UNIX and Ovid Standalone Solution systems. Ovid Online supports user access via the Ovid Java Client, and the Ovid Web Gateway with a Web browser such as Netscape Navigator or Microsoft Internet Explorer. A non-graphical Telnet/VT-100 option is also available for additional access flexibility.

Full Text Online

Journals@Ovid is the largest 100% searchable sci-tech-med full text database in the world, and is available exclusively via Ovid Online. It is a single database that contains every full text journal offered by Ovid — currently 367. Subscriptions are available for any or all of the journals in the database. Regardless of the number of subscribed titles, however, every Journals@Ovid subscriber gets access to the complete tables of contents, bibliographic citations, abstracts, and references for every article in the full database.

Full Text on CD-ROM

For installation on standalone or local network systems, Ovid offers nearly 100 full text journal titles on CD-ROM for use with local networks. Journal titles are packaged in seven subject-themed Full Text Collections (sets of journals), namely,

- Ovid Core Biomedical Collection
- Ovid Biomedical Collection 2
- Ovid Biomedical Collection 3
- Ovid Biomedical Collection 4
- Ovid Mental Health Collection
- Ovid Nursing Collection
- Ovid Nursing Collection 2: Lippincott Premiere Nursing Journals

To meet the unique needs of the practicing clinician, Ovid offers information resources that enable doctors, nurses, and other allied health professionals to quickly get bottom-line summary information on clinical topics to aid decision-making at the point of care.

Ovid On Call: Currently in development for release in 2000, Ovid's clinical information platform will integrate textbooks, drug information resources, journals, bibliographic databases, and other resources to provide concise, and quick answers to clinical questions at the point of care.

iv) Silverplatter

Gale Directory of Databases - The Gale Directory of Databases is a comprehensive guide to over 14,000 publicly available databases produced worldwide. Covering databases of all types in a variety of subject areas, the Gale Directory of Databases contains descriptions of 5,800 databases accessible through more than 820 online services, plus more than 4,600 databases available on CD-ROM, diskette, and magnetic tape from 950 vendors. The directory also includes separate records for nearly 3,500 database producers and over 1,800 online services and vendors with full contact information, branch offices, and database products available. Software and system requirements information is also listed. Access Options include Internet, CD, and Hard Disk. The coverage is current. It is updated semi-annually.

v) NTIS (National Technical Information Service)

The NTIS Collection of nearly 3 million titles includes: business and management studies, international marketing reports, materials and chemical science data, technology innovations, training tools. Information is available in various formats: printed reports, CD-ROMs, computer tapes and diskettes, online, audiocassettes, videocassettes, microfiche.

The National Technical Information Service offers information collections and datafiles directly on the Web as fee based subscriptions. (<http://www.ntis.gov/>).

Agricola Database, Agrobase Database, World News Connection, Energy Science and

Technology Database, Federal Research in Progress Database (FEDRIP), Federal Research in Progress Database (FEDRIP) are some of the NTIS databases available on the Web as fee based subscription.

Databases that are available for lease from NTIS or by access through commercial sources include: NTIS Database, AGRICOLA Database, AGRIS Database, Energy Science and Technology Database, Federal Research in Progress Database, NIOSH Pocket Guide to Chemical Hazards Database etc.

2.5 Search Engines

Many structured databases are now available on the web. They are referred to as web databases. However in this paper web databases refer to those databases which are developed by the Search Engines.

The search engines develop their own databases of the web pages. All the major search engines operate the same way: a gathering program explores the hyperlinked documents of the web, foraging for web pages to index. These pages are stockpiled by storing them in some kind of a database or repository. Finally, a retrieval program takes a user query and creates a list of links to web documents matching the words, phrases, or concepts in the query.

A major problem with web page databases is that records are never static. They point to pages that may have been accurately indexed at the time the database was created but which has since vanished, moved, changed or undergone a complete rewrite. Therefore all databases of web pages must be dynamic with constant attention given to the whole database (2).

The web databases can still be useful for searching information on the Net if they can be evaluated for scope, structure and currency.

scope - any descriptions should be given on the top-level page, in the help files, FAQs and any other documents. Some metasites are selective and generally offer relatively small databases. Some are not even searchable, but only provide access through a hierarchical subject structure.

For subject specific databases, a well-managed site should describe clearly the breadth of the database, what is covered, what is intentionally excluded and how selections are made.

structure - One best example of communicating the structure of traditional databases is the DIALOG bluesheets. These clearly supply a sample record and specify the searchable fields. This kind of information is almost nonexistent for web databases. If a web database provides access only through keywords then the database is likely to be generated automatically. A hierarchical subject structure implies that the database is developed selectively.

While evaluating the structure of a metasite, a look at both, the record structure and the subject hierarchy is necessary. The record structure and index structure used in databases of large search engines is rarely explained. One technique to evaluate the subject structure is to compare

it with traditional thesauri. Another way is to compare it with ones' own understanding of the field.

currency - Given the changeable nature of the Internet, it is important to know how up-to-date the records are. Ideally each record should be refreshed as soon as the page it points to changes. One way of evaluating the currency is looking for dead or misdirected links. With many link-checking programs, there should not be many dead links in a well-maintained database. In evaluation, the percentage of problem links and frequency of their occurrences are the important factors. In an automatically generated database, the date of a misdirected link gives a rough idea of how frequently the entire database is refreshed (2).

2.6 Some web databases

All the popular search engines have their own databases of web pages. The most popular ones are Altavista, Infoseek, Yahoo!, Hotbot, Metacrawler etc. While some search engines develop their own databases, meta search engines make use of other search engines. They consult more than one search engine simultaneously.

3. INDEXES AND ABSTRACTS

Information from primary sources has been collected together and organised under subject headings and authors in secondary publications called Abstracts and Indexes. These are published at regular intervals - weekly, monthly or quarterly - and are usually brought together, or cumulated, annually or for even longer intervals. From the beginning, all abstracts and indexes were published in paper format. Now most of these publications are available on CD-ROM or accessible for online searching on a remote host computer and/or via the Internet.

Indexes provide search entry points, for example, by authors or subjects. The primary publications can be identified by means of detailed information as to the author, source of the publication and year of publication. Indexes only contain titles of the primary publications (e.g. articles) together with identification details, such as author(s), name of journal, date of publication, volume, issue number and pagination. Indexes include any of countless bibliographies of currently published material, usually of articles in periodicals. Sometimes libraries have created these tools for journal articles. For example, the U.S. National Library of Medicine has produced Index Medicus, a monthly listing of current articles from some 3,500 biomedical journals throughout the world. Abstracts or abstract publications are secondary publications that include a short abstract of the contents of the primary publication in addition to the identification details.

Since the 1960s many indexes and abstracts have become available electronically. In subject areas having a low level of user demand, libraries can obtain information about journal articles by connecting their computers to those of database vendors. In areas of higher demand, libraries can buy the electronic form of indexes and abstracts on CD-ROM (compact disc read-only memory). These can replace several volumes of an index or abstracting service. In areas of the highest user demand, libraries can purchase the electronic indexes and abstracts on magnetic discs or tape and enter this information about journal and magazine articles into the same

computer that contains the library catalog information. In this way, the OPAC (on-line public access catalog) can be extended to include information about both books and journal articles.

There are today several thousand abstract and index publications, some of which are of an interdisciplinary type, for example, the Engineering Index, New York, and the Referativny Zhurnal, Moscow. Other abstract publications cover more specific subject fields, for example, Chemical Abstracts, Computer and Control Abstracts, Electrical and Electronic Abstracts, Index Medicus, Metals Abstracts, and Physics Abstracts. These publications form part of comprehensive information retrieval services based on databases from which they are printed.

Some abstract and index publications cover a certain type of primary publication, instead of a specific subject. Examples of such publications are Dissertation Abstracts, which presents information from doctoral theses from a wide number of countries, and Government Reports Announcements & Index, listing reports from projects supported by the American government.

3.1 Some of the important Indexing and Abstracting services

i) Institute for Scientific Information (4)

The **Web of Science** is the powerful Web interface providing access to the Arts & Humanities Citation Index, Science Citation Index Expanded, and Social Sciences Citation Index, and the Web of Science Corporate Editions (BioSciences Citation Index, Chem Sciences Citation Index, and Clinical Medicine Citation Index). Some of its features are e-mail search results, query management (to save a query), Alt-text (for disabled people) etc.

Multidisciplinary Citation Indexes: Arts & Humanities Citation Index, Science Citation Index, Social Sciences Citation Index, ISI Basic Indexes.

Specialty Citation Indexes: Biochemistry & Biophysics Citation Index, Biotechnology Citation Index, Chemistry Citation Index, CompuMath Citation Index, Materials Science Citation Index, Neuroscience Citation Index.

Current Awareness Products: Current Book Contents, Current Contents: Current Contents Connect, Current Contents Desktop

Current Contents editions include: Agriculture, Biology & Environmental Sciences, Arts & Humanities, Clinical Medicine, Engineering, Computing & Technology, Life Sciences, Physical, Chemical & Earth Sciences, Social & Behavioral Sciences,

Current Contents Collections: Business Collection, Electronics & Telecommunications Collection, Current Contents Proceedings, CC Reference Edition/CC Desktop Archive

Indexes to Proceedings, Book Contents & Reviews: Index to Scientific Book Contents, Index to Scientific Reviews, Index to Scientific & Technical Proceedings, Index to Social Sciences & Humanities Proceedings.

ii) Bell & Howell Information and Learning (formerly UMI) (www.umi.com)

Bell & Howell Information and Learning now provide access to information from periodicals, newspapers, out-of-print books, dissertations, and scholarly collections in various formats.

ProQuest Digital Dissertations provides Web access to UMI's Dissertation Abstracts database. While only institutional subscribers have access to the entire database, others have free "guest" access privileges that allow you to search citations and abstracts for all titles in 1999 and 2000. (<http://wwwlib.umi.com/dissertations/>)

Criminal Justice Periodicals Index A periodicals database for criminal justice scholars is based on print index, CJPI on ProQuest provides cover-to-cover access for 45 criminal justice journals frequently consulted by professionals, plus complete abstracts for over 100 additional titles. The delivery formats include Full Text (ASCII), Citation, Page Image, and Abstract. It contains magazines and journals and is accessible online via ProQuest. The subject areas covered are Government and Law.

ProQuest Full-Text Newspapers -- 150 newspapers online, now available individually. Accessible through ProQuest Direct, ProQuest Full-Text Newspapers provides indexing and searchable ASCII full text for some 150 key national and international papers.

iii) Research Libraries Group (<http://www.rlg.org/cit-ave.html>)

Avery Index to Architectural Periodicals A Research Libraries Group Citation Resources File — produced by the Getty Research Institute for the History of Art and the Humanities and the Avery Architectural & Fine Arts Library, Columbia University. It provides access to more than 150,000 citations and abstracts from the worldwide literature on architectural design, the history and practice of architecture, historic preservation, interior design, and city planning. Avery Index surveys more than 700 US and foreign journals. It covers not only the international scholarly and popular periodical literature, but also the publications of professional associations, US state and regional periodicals, and major serial publications in the architecture and design of Europe, Asia, Latin America, and Australia. Avery index also includes interviews, obituaries, book reviews, and exhibition reviews dated 1977 to the present. Retrospective indexing of six magazines is also included, some dating back to 1860. Avery can be accessed through a Windows 95 interface. It is updated daily.

iv) Silverplatter (<http://www.silverplatter.com/catalog/waab.htm>)

The H.W. Wilson Company's Wilson Art Abstracts provides comprehensive abstracting and indexing of 260 international art publications, including English-language periodicals, yearbooks, and museum bulletins, as well as periodicals published in French, Italian, German, Japanese, Dutch, and Swedish. Art Abstracts references paintings that appear as illustrations for articles or advertisements, listing the works under the artists' names with full bibliographic citations. It is available on Internet, CD, and Hard Disk. Abstracts from 1994 and Indexing from 1984 are included.

Platforms that support it are Web, Windows, Macintosh, PC, and UNIX.

The subjects covered are Archeology, Architecture, Art, Film, Humanities, Marketing, Photography, and Product Description.

4. REFERENCE LITERATURE

Information from a number of primary publications is structured, organised and presented in other types of secondary publications, such as encyclopaedias, handbooks and dictionaries. These are usually grouped under the term "reference literature."

Many general and specialized encyclopaedias now publish electronic versions of their print sets, either as CD-ROM (compact disc read-only memory) products or as online services. As computer technology continues to develop it is possible that the electronic encyclopaedia will become less a version of the print set. It will become a product in its own right, presenting the database in a manner best suited to exploit the advantages of the electronic medium.

The most obvious advantage of electronic encyclopaedias is their "multimedia" capability, with animated graphics, recorded sound, and video recordings supplementing the text, photographs, and line drawings inherited from the print medium. With the development of more sophisticated data-processing applications, there will be truly "interactive" encyclopaedias, which would allow readers to retrieve, manipulate, and classify information according to their own designs.

4.1 Some Famous Reference Sources in Electronic Form

In 1983 the Academic American Encyclopedia was first encyclopaedia to be presented online by the licensing of its text to commercial data networks, which eventually included CompuServe and Prodigy Information Service. Nine years later Compton's Encyclopedia licensed its text to America Online, another commercial information provider.

In 1994 Britannica Online was released for subscription over the Internet, the global network of networks. In addition to the full text database and thousands of illustrations, Britannica Online served as a "gateway" to the World Wide Web by providing direct links to outside sources of information.

In 1985 Grolier, Inc., issued its Academic American Encyclopedia on CD-ROM. This text-only version received still illustrations in 1990, and in 1992, with the addition of audio and video, it became the New Grolier Multimedia Encyclopedia. Compton's MultiMedia Encyclopedia, then owned by Encyclopædia Britannica, Inc had introduced multimedia enhancement in 1989. Four years later the Microsoft Corporation released Microsoft Encarta Multimedia Encyclopedia, which enhanced the text of Funk & Wagnall's New Encyclopedia with extensive graphics, audio, and video. World Book, Inc., and Encyclopædia Britannica, Inc., issued the texts of their print sets on CD-ROM in 1989 and 1993, respectively.

5. ADVANTAGES OF ELECTRONIC SECONDARY SOURCES OF INFORMATION

1. Either online or in CD-ROM form, these are very useful tools in that they save time in the information retrieval process.
2. The sources on CD-ROM allow the user to work at his/her own speed without having to worry about telecommunication connect charges or costs for host computer time.
3. One major advantage of electronic indexes and abstracts is that they enable users to search for information using words from titles and abstracts in addition to the author and subject access provided in print versions.

6. CONCLUSION

The sheer quantity of printed information prevents any individual from fully absorbing even a small fraction of it. Such devices as tables of contents, summaries, and indexes of various types, which aid in identifying and locating relevant information in primary literature, have been in use since the 16th century and led to the development of what is termed secondary literature during the 19th century. The vast inventory of recorded information can be useful only if it is systematically organized and if mechanisms exist for locating in it items relevant to human needs. The availability of secondary and tertiary sources in electronic form has made the information retrieval process faster and exhaustive.

7. REFERENCES

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