

## THROUGH THE MAZE: NEW AGE PATHFINDERS

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**ABSTRACT:** Focusing on science, engineering and marine sciences, this paper describes finding aids and unique search tools librarians use to guide patrons of the University of California, San Diego to the best information resources for their research.

### Introduction

The pathfinder is a ubiquitous feature in libraries. While the traditional, paper-based pathfinder still has a place for some applications, new technology requires re-tooling many of our guides to meet the demands of user's working in the computer-based, Internet medium. Information resources at the University of California, San Diego (UCSD) now extend to the virtual library. New age pathfinders are beginning to emerge that help UCSD science librarians guide patrons to the best information resources for their research. Understanding the features of paper-based guides, Web search engines, subject-oriented Internet guides, and a unique database search tool developed at UCSD, helps librarians design and use pathfinders in the virtual, electronic environment.

### What is a pathfinder?

Library instruction and reference pathfinders are organized, concise directions and information about a place, a service or a resource. Pathfinders frequently give step-by-step directions, for example, in the use of the library catalog, a CD-ROM product, databases and/or print media. They are also used to summarize key resources in a given topic or discipline by listing appropriate encyclopedias, dictionaries, journals, databases, Web sites, etc.

Pathfinders are a mainstay of library instruction programs and reference service. We place pathfinders near reference and circulation desks for patrons who need a guide to help them use a particular database or conduct research within a discipline or topic.

Librarians, themselves, use pathfinders when searching unfamiliar or complex databases. Pathfinders help patrons and librarians locate areas and materials in physical library collections, understand classification schemes, and navigate through the myriad information resources and materials available. The most familiar format is the traditional, paper-based, printed handout. Examples of non-print formats listed in Table 1 indicate how the scope and content of modern pathfinders have evolved beyond the traditional form.

NON-PRINT FORMATS	EXAMPLES
film or video	Video tours of a library building Descriptive methods for handling materials, i.e. <i>Slow Fires</i> (Maddow 1987)
Audio	Museum audio tours Taped instruction programs such as " <i>Library instruction for faculty and graduate students</i> " (CCLI 1980)
Computer Aided Instruction (CAI)	<i>ShelveIt!</i> a computerized tutorial designed to teach the basic knowledge and skills of shelving books, covers LC, Dewey Decimal, National Library of Medicine, and Superintendent of Documents (GPO) classifications. Users select which classification scheme to learn. <i>ShelveIt!</i> provides practice sorting virtual books on a virtual shelf and is an ideal tool for training library assistants, library volunteers, and library science students. Patrons and students can also use <i>ShelveIt!</i> to learn the library's classification scheme. (Kohler 1997)
tutorials and self-guided training programs	UCSD web-based tutorials such as, <i>Database Tips and Tutorials</i> (UCSD 1997a), ROGER tutorial (UCSD 1997b), or INSPEC tutorial (UCSD 1997c) UC Berkeley Teaching Library's <i>Finding Information on the Internet</i> (UCB 1997a)
on-line guides	The SIO Library Web page, <i>Oceanography on the Net</i> (Brueggeman 1997a) and " <i>Library resources and databases</i> (Brueggeman 1997b) <i>Welcome to the SIO Library</i> (Berteaux 1997) <i>MELVYL® System overview</i> (Regents 1997)
on-line help	Q: What is UPDATE, the MELVYL® System's current awareness service? (UCB 1997b)

e-mail tutorials	Melvyl INSPEC® E-mail class (Jensen 1995) UCSD BioMedical Library's E-mail Medline® Course (Butros 1997)
Internet-based teaching and training	As employed in distance education programs (Herther 1997)
live or recorded meetings, seminars and teleconferences	Satellite transmission of training programs, teleconferences, etc. such as PBS or College of Dupage library (Dupage 1997) satellite programs

**Table 1: Non-print formats of pathfinders**

The patron entering the library for the first time needs basic information about the library building and its collections. First level pathfinders help patrons answer the question "Where can I find...journals, books, photocopiers, reference desk, microcomputers, microfiche readers, card catalogs, maps, restrooms, etc.?" Once these fundamental, directional questions are answered patrons generally engage in the second, higher level of information seeking with a desire to master the basic concepts of using the library catalog and relevant database(s). At this level, the shift from paper-based to electronic library catalogs and databases places demands on the patron to have new "navigation" skills for successful information retrieval. Some users, familiar with their library's classification scheme, know they can find books on their specific subject in the Library of Congress (LC) call number area in their library. Reliance on this system is not advised for information retrieval because electronic texts and journals will not be found on the shelves. Furthermore, modern cataloging practices do not guarantee that materials will all be brought together under the same call number—this is especially true for conferences and new editions.

The most difficult tasks for Internet users are determining which files or databases exist, whether they are relevant, where they are located, if they have access privileges, how to search/query the database and how to extract relevant information. Several Internet utilities such as gopher, wide-area information service (WAIS), and the World Wide Web (WWW) improve file location and transfer. However, because some patrons in the oceanographic research community still need basic information about navigating the Internet and using new Internet-based library resources, two publications were written specifically addressing the needs of these users: *Oceans '95* (Berteaux 1995) and *Sea Technology* (Berteaux 1996). Generic Internet guides (Kehoe 1993; Hahn and Stout

1994), and (Krol 1994) are good, comprehensive references. While there is a plethora of published information about using the Internet, the librarian is still responsible for helping patrons navigate in the new information environments.

### **Pathfinders move to the Web**

It is reasonable to provide print or electronic pathfinders for some frequently used databases. However, in the Web environment, it is not feasible to provide print-based pathfinders for all resources patrons may use. "Pathfinders, guides, bibliographies, and other typical handouts really do require a computer—retyping them each semester is labor intensive, and they should be updated frequently." (Feinman 1993) At the Social Sciences and Humanities Library numerous printed pathfinders can be found near the reference desk. However, very few print pathfinders are needed in the SIO Library. Electronic formats are preferred over paper for a number of reasons: 1) the frequency of change in electronic resources requires constant updating which is expensive, time-consuming, and wasteful, 2) space is limited, 3) SIO does not have the staff resources to develop or maintain paper-based guides, 4) Web resources are more directly linked back and forth from help screens to the actual databases, thereby increasing functionality of Web-based pathfinders.

Regardless of the format, the purpose of the pathfinder is to lead one to the best source(s) in which to perform research or answer a simple reference query. Some examples of the Web-based tools used at SIO and UCSD follow, hereafter. New students and faculty are *Welcome[d] to the SIO Library* (Berteaux 1997) or directed to *Oceanography on the Net* (Brueggeman 1997a) where they can follow links to *Library Resources and Databases* (Brueggeman 1997b). A Web-based map helps users locate the SIO Library (Brueggeman 1997d) and a *Photo Tour of SIO* (Brueggeman 1997e) help users identify the library and other buildings on the campus. The UCSD Instruction Services Advisory Committee (ISAAC) develops and maintains numerous Web sites such as the *Database Tips and Tutorials* page (UCSD 1997), ROGER, the UCSD library on-line catalog (UCSD 1997b), and INSPEC (UCSD 1997c) tutorials. UC Berkeley has developed a tutorial for Melvyl System® *Update* service which is heavily used by UCSD patrons. (UCB 1997b).

Librarians (and many of our users) know what is in our print collections: in the journals, in the grey literature, in the government documents, in the books, in the conference proceedings, in the theses. We know what to expect when we look for information in the traditional materials of our library collections. We know how our old card catalogs and the newer automated library catalogs work. We know the results we can expect when we

search in them. We know how on-line and CD-ROM databases are constructed and we know their content and the kind of results to expect when we search them. We even know the content of many electronic resources on the Internet, like favorite newsgroups, bulletin boards, chat rooms, gopher and ftp files, Web sites, databases, etc.—especially if we are “frequent flyers” at those sites! We know what to expect when we enter searches into these electronic domains, and, as librarians, we sincerely want to understand how Internet search engines work, so we can interpret search results, find the data, and assist users.

### Web search engines

Internet search engines with new age names like *YAHOO*, *Lycos*, *Webcrawler*, *HotBot*, *Infoseek*, *AltaVista*, *Excite*, etc. generate “on demand” results thereby creating a pathfinder of Web resources on the user-specified topic. Unfortunately, the results are not always satisfactory or consistent. In addition to search results containing so many references to irrelevant Web sites, the results frequently leave out other Web sites that hold important material.

The creators of search engines realize their products are lacking quality indexing, and some interesting developments have been occurring in three of the major Internet search engines: *Lycos*, *AltaVista*, and *Excite*. Although automatic truncation is not supported, *Lycos*' Custom Search offers full Boolean searching, nesting with parenthesis, proximity searching, adjacency operators, and phrase searching within double quotes. *AltaVista* began by offering full Boolean, phrase, and field searching. Its Live Topics attempts to refine large searches, but the relevancy of categories selected by the system and the need to include/exclude terms make this product less than desirable. *Excite*'s Channels combines “a variety of information services into a single Web page. Rather than offering new search features, *Excite* is reorganizing information from its supplemental databases into a one-page starting point...like a subject pathfinder. For information professionals searching for specific information, this approach is not very useful, except for finding current news.” (Notess 1997) Improvements to search engines will make web searches more productive, but the fundamental problems of computer-based library research will remain—patrons need help to navigate in the modern, information environment.

So, how does one really find the best, most useful information using the plethora of navigation tools and search engines currently available? Clifford Lynch (Lynch 1997) explains: The nature of electronic indexing can be understood by examining the way Web search engines, such as *Lycos* or Digital Equipment corporation's *Alta Vista*, construct indexes and find information requested by a user. Periodically, they dispatch

programs (sometimes referred to as web crawlers, spiders or indexing robots) to every site they can identify on the web—each site being a set of documents, called pages, that can be accessed over the network. The web crawlers download and then examine these pages and extract indexing information that can be used to describe them. This process—details of which vary among search engines—may include simply locating most of the words that appear in Web pages or performing sophisticated analyses to identify key words and phrases. These data are then stored in the search engine's database, along with an address, termed a uniform resource locator (URL), that can be clicked on to connect to the sites identified by the search.

Existing search engines service millions of queries a day. Yet it has become clear that they are less than ideal for retrieving an ever growing body of information on the Web. In contrast to human indexers, automated programs have difficulty identifying characteristics of a document such as its overall theme or its genre—whether it is a poem or a play, or even an advertisement. The web still lacks standards that would facilitate automated indexing. Furthermore, no authority files are applied to ensure uniform, constant data. As a result, documents on the Web are not structured so that programs can reliably extract routine information that a human indexer might find through cursory inspection: author, date of publication, length of text and subject matter, i.e. Metadata. Developers will certainly improve Web search engines so we can depend on quality, consistency and reliability of results. In the meantime we need to explore other techniques for finding answers.

### **Subject-oriented Internet Guides**

The Argus Clearinghouse for subject-oriented Internet resource guides at: <http://www.clearinghouse.net/> provides a central access point for value-added topical guides which identify, describe, and evaluate Internet-based information resources. The Clearinghouse only accepts guides to resources that are Internet-based. Coverage of oceanography, marine and aquatic science is poor in the Argus Clearinghouse. INFOMINE, developed by the Library of the University of California Riverside, is more advanced than the Argus Clearinghouse and covers most disciplines. INFOMINE is a World Wide Web virtual library which provides indexing, annotations and links to resources of scholarly use to the academic community. (Mitchell 1996) Both of these resources provide the opportunity for librarians to submit guides, thereby increasing their value to library research.

Subject-specific indexes developed by librarians are the most important organizational, Internet navigation tools librarians and patrons have. "Librarians contribute to the

networked information environment through the development of subject-oriented Internet resource guides. For each guide, an author (or team of authors) searches the Internet for information on a particular topic and selects appropriate resources for inclusion. The author then organizes the resources according to topic and format and may provide evaluative and descriptive information as well as instructions for accessing those resources." (Morville 1996) One example of subject-oriented guides in marine science are the topical pathfinders developed by Peter Brueggeman, titled *Internet Guides & Indexes* (Brueggeman 1997c) and *Library Resources and Databases* (Brueggeman 1997b). Science & Engineering and Biomedical Libraries' subject guides provide information about relevant databases and links to resources and electronic journals (UCSD 1997d). Direct links from web-based subject guides to library holdings, such as the History of Science pages (UCSD 1997e), tell the user if the item is available in the library collection.

### **Unique Tools**

By 1996 the University of California, San Diego (UCSD) Library was providing on-line access to over twenty five—Web, Z39.50 compliant and telnet—science and engineering databases. It was not always obvious which bibliographic and full text database(s) should be used to research a topic and many databases appeared to be underutilized. A simple, web-based tool that would quickly advise on the best science database(s) in which to begin searching was desperately needed. The concept was simple: 1) develop a web-based front-end to all sciences and engineering bibliographic and full text databases to which UCSD has remote access, 2) query multiple databases and 3) display the ranked results like a DIALOG Dialindex® search. Two functional teams developed the *Database Advisor (DBA)* product. A Technical Team consisting of two student programmers and a librarian/technical coordinator wrote the source code and scripts used to query databases. An Interface Team comprised of three science librarians was established in February 1997 to develop the Web-based user interface, graphics, search strategies and database profiles. The Interface Team researched and developed search strategies comparable to Melvyl System database keyword searches for all databases covered by *DBA*. The *Database Advisor* was rolled out to the UCSD community on September 15 and is being expanded to include other disciplines. Early user feedback indicates users are indeed discovering the existence of databases that were previously unknown to them. The most important feature is the ability to use *Database Advisor* to build a subject-specific pathfinder and have immediate access to the most relevant database(s). (Berteaux et al.1997)

The University of New Brunswick (UNB) has developed an "on demand" pathfinder service (UNB 1997) that generates a web-based guide for the patron at the point of use. When the user chooses a subject like "Psychology", the script writes back an HTML document that contains preformatted hypertext links for finding information on that subject. Some examples of these links could be subject search of the UNB catalog for "psychology and handbooks", a subject search of the UNB catalog for "psychology and (indexes or abstracts)," or a search of WebCrawler for the keyword "psychology." A "Psychology Pathfinder", as such, does not actually exist until the user requests one." (Sloan 1996)

Commercial providers, such as DIALOG, have developed on-line services that continue to provide quality indexing and a reliable search interface. DIALINDEX®, one-search, mapping, etc. are tools that guide users to the best databases in which to search. The *Gale Directory of On-line, Portable, and Internet Databases* (DIALOG file 230) corresponds to the *Gale Directory of Databases* (GDDB) and *Cyberhound's Guide to Internet Databases* (CGID). The file covers databases of all types in all subject areas produced worldwide that contain a collection of data or a body of information that is organized for rapid retrieval via a computer; are available on-line directly from the producer, through a third-party on-line service, or via the Internet; are issues on CD-ROM, diskette, magnetic tape, and/or handheld form, or are available through batch processing; are made publicly available. High costs keep libraries from making this type of commercial search service available to patrons—the price for searching File 230 is \$30 USD per connect hour and \$2.30 per full record typed, displayed, or printed.

UC Berkeley's *Finding Information on the Internet: A Tutorial* (UCB 1997a) is a good example of web-based instruction. This self-paced program teaches how to use the Internet and takes users *Beyond General World Wide Web Searching* (UCB 1997c).

The California State System is currently in the planning stages of an announced California Virtual University...the new coalition will include 106 community colleges, the 23-campus California State University system, the nine campuses of the University of California, Stanford University, the University of Southern California and Caltech. (Herther 1997) Distance learning programs will be developed to serve this community.

## **Conclusion**

Libraries are integrating electronic resources, databases, journals and on-line catalogs and document delivery, as evidenced by the newly established California Digital Library.



User instruction continues to be a significant component of library services. Technology requires development of new pathfinders to meet the demands of users working in the computer-based, Internet medium, and the virtual library. Although the way librarians serve the information needs of their patrons is evolving, pathfinders in all forms will continue to guide patrons to the best information resources for their research.

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