

## **DATABASE ADVISOR: A GUIDED TOUR**

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**ABSTRACT:** This paper reports on the Database Advisor (DBA), a web-based front-end to all sciences bibliographic and full text databases to which UCSD has remote access. Database Advisor was initiated and developed by science librarians of the University of California, San Diego (UCSD) to increase awareness and use of the bibliographic databases available to our faculty, staff and students. This paper will focus on the project scope, search capabilities and user interface. It will include a brief description of the web technology employed and the development process. Methods of using Database Advisor in reference and instruction, and information about the source code will also be presented. I invite you to take a look at Database Advisor at: <http://scilib.ucsd.edu/Proj/dba/>

### **Introduction**

The Database Advisor is a web-based front-end to all sciences bibliographic and full text databases to which University of California, San Diego (UCSD) has remote access. Database Advisor (DBA) software was initiated and developed by Science Libraries of the University of California, San Diego to increase awareness and use of the bibliographic databases available to our faculty, staff and students remotely. The development process, Web interface, search capabilities, current status and future plans are described.

To see the Database Advisor in action, visit the public version for the Sciences at: [http://scilib.ucsd.edu/Proj/dba/dba\\_public.html](http://scilib.ucsd.edu/Proj/dba/dba_public.html). Source code information is available at: <http://scilib.ucsd.edu/Proj/dba/code/dba-source.html>

### **Development phase**

In 1996 the UCSD Science Libraries had over 25 science & engineering databases with access via Web, Z39.50 and telnet. We realized that faculty, students and library staff needed help deciding which database to begin searching and which database would have the best coverage for the research topic. We also wanted to increase use of some expensive and underutilized databases. Database Advisor was created to aid database users in selecting the best database for their query and to increase the use of underutilized databases in the sciences. This new product is designed to increase awareness and use of

the bibliographic databases available to faculty, staff and students. DBA helps guide researchers to appropriate science databases available at UCSD for locating articles and other materials on a particular topic.

We needed a tool that would simultaneously search all our databases (no commercial product was available). Our development criteria included: let the user specify terms, automatically perform a keyword search of all available science databases, quickly return the results on the query, work like a DIALOGWEB's DIALINDEX® search, sort results so the user can see where each database stands relative to the others, allow the user to refine the search, and include a Web link to each database from results page.

Database Advisor was developed by an interface team and a team of programmers. The DBA Interface Team included three Science Librarians: Susan S. Berteaux from the Scripps Institution of Oceanography Library, Christy Hightower from the Science and Engineering Library and Jennifer Reiswig from the Biomedical Library. This is the team that developed the Web-based user interface, graphics, search help, selected databases and assigned them to appropriate subject categories, wrote database profiles and search strategies. We limited searching capabilities to the "profiled" databases. Search strategies were designed to achieve an equivalent search of title words, abstract words, and subject terms in each database comparable to a MELVYL® system keyword search. To achieve uniformity across databases, DBA's search strategies are by necessity rather generic. Keeping graphic load to a minimum, the Interface Team developed a familiar, easy-to-use Web interface. In the final design stage we used focus groups helped us with fine tuning features. The Science Libraries at UCSD hired a team of three student programmers to write the code. The programming team was managed by Christy Hightower, a science librarian. A single programmer currently on staff in the library is now maintaining the code, adding and adjusting database scripts as necessary.

### **A familiar, easy-to-use Web interface**

DBA works somewhat like a DIALOGWEB's DIALINDEX® search -- on a much smaller scale, and with results customized to our unique local database mix. Database Advisor's appearance (input boxes, point-and-click, radio boxes, etc.) will be familiar to Web users. For example, in the Web environment hitting the "enter" key sends a search query, so we observed this convention. On the Welcome Screen it is obvious where the user enters search terms (Fig. 1).

The user is given options to change default settings. Searching current files is the default, but the user can choose to include backfiles. Most users want to search ALL databases quickly but the user can select subject categories thereby limiting the databases searched (Fig. 2). Most search results are listed within 1 minute, but if more time is needed the user can increase the search time --this is a useful feature when databases timeout before

returning results. The Help section provides guidance in structuring DBA searches (Fig. 3).

When the user hits the “enter” key, Database Advisor automatically performs a keyword search of more than 25 science databases (see Appendix A).

# Welcome to DATABASE ADVISOR SCIENCES

This service will help you decide which of the UCSD Libraries' 25+ science databases to use to locate the articles and other materials you need. For assistance with non-science databases, try the experimental version of Database Advisor for the Social Sciences and Humanities.

Enter the terms you would like to search for:

toxic dinoflagellates

Submit!

for example: hiv protease inhibitor

How many minutes are you willing to wait? 1 min

[Search Help](#)

By default, Database Advisor searches only databases with current articles. You can include databases with older articles as well ("backfiles") - include backfiles?

Current only       Include backfiles

Figure 1. Welcome Screen -- enter search terms

## SUBJECT (optional) CATEGORIES

[▲ Return to Top](#)

- To limit your search by subject category, click in the box next to that category. You can select more than one.
- If you select nothing from the sections below, all subject categories will be assumed.
- There are 10 broad subject categories included in Database Advisor, each of which includes a number of different databases.
- A list of the databases included in each subject category is available.

All Subject Categories

Biology

Chemistry

Computer Science

Engineering

Mathematics

Medicine

Oceanography

Physics

Science Business

Science Education

Figure 2. User selects Subject Categories

## SEARCH HELP

▲ Return to Top

**Database Advisor (DBA)** will take the terms you specify and automatically perform a **keyword search** in over 25 different databases. Your results indicate the number of **hits** that would be found in each one, ranked from the most to least hits. You can then link directly to the database of your choice to perform your search. Here are some tips to help you use **Database Advisor** most effectively:

Tip	DO ☺	DON'T ☹
<b>Keep it simple</b> <ul style="list-style-type: none"><li>• limit to one or two main concepts</li><li>• don't use multiple synonyms; use only one word for each concept.</li></ul>	bridge corrosion	bridge corrosion rust acid rain precipitation
<b>Boolean searches</b> <ul style="list-style-type: none"><li>• Do not use AND, OR, or NOT.</li><li>• AND is implied between each word.</li></ul>	aspirin headache	(aspirin OR ASA) AND (headache OR migraine)

The following are **not** available in Database Advisor, but may be available in one or more individual databases when searched directly:

- author searching
- phrase searching / word adjacency
- single letters and special characters - e.g.,  $\pi$ ,  $\Sigma$ ,  $\acute{e}$
- wild card characters / truncation symbols - e.g., \* ? #
- case sensitivity - e.g., MIT vs mit

### For more help

For personalized help with science database searching, contact the reference desk of the library you use most.

Biomedical Library: 534-1201  
Medical Center Library: 543-6520  
Science & Engineering Library: 534-3258  
Scripps Institution of Oceanography Library: 534-4817

For assistance with non-science databases, try Database Advisor for the Social Sciences and Humanities. Technical details about DBA's search strategies are available.

Figure 3. Search Help

DBA spawns a search process for each of our nine database vendors and returns the hits on the query (Fig. 4). Results are ranked, so the user can see where each database stands relative to the others. Each database has a link that can be followed to access the database and continue the search process. A legend (Fig. 5) explains the Results page. At this point the user can examine the database profiles (Fig. 6), refine all aspects of a search (Fig. 7), or click on a database name to run a search in that database.

# DATABASE advisor

# RESULTS

You searched for: toxic dinoflagellates

*Help reading this page*

Feedback is appreciated!

Want to refine your search?

Technical details about DBA's search strategies are available.

# Hits	Database Name & Description
447 :	MOFR: Marine, Oceanographic & Freshwater Resources <b>A</b> Profile International marine and oceanic information, as well as estuarine, brackish water, and freshwater environments
163 :	ASFA <b>A</b> Profile Science, technology and management of marine, fresh & brackish water environments & organisms
89 :	BIOSIS Previews <b>A</b> Profile Life sciences and biology; indexes over 6000 journals, plus books and conferences
22 :	Current Contents Profile Covers 6500 scholarly journals in all disciplines from 1989+
17 :	National Science Foundation Funded Projects <b>A</b> Profile The NSF Grants and Awards database contains information, including abstracts, for NSF awards made since 1989
16 :	MEDLINE PLUS <b>A</b> Profile Citations to journal articles in all areas of medicine and health sciences
14 :	MAGS: Magazine & Journal Articles <b>A</b> <b>T</b> Profile Cites general-interest and selected scholarly articles, many with abstracts, some with full text
6 :	Applied Science and Technology Abstracts <b>A</b> Profile Indexes literature emphasizing the applied aspects of physical science and technology
6 :	GeoRef <b>A</b> Profile An index to materials on geology, geophysics, seismology, earth sciences and the environment

Figure 4. Results screen

### Explanation of Database Advisor Results Listing:

(Click your browser's Back button to return to your results.)

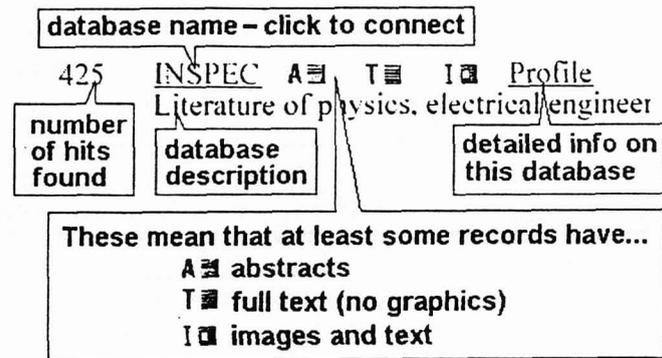


Figure 5. The "Legend" explains the Results screen

Database Name	ASFA
Search URL	http://scilib.ucsd.edu/cgi-bin/asfa-ws
Title URL	http://scilib.ucsd.edu:80/cgi-bin/asfa-ws/www.csa.com/csa-home.htm
Starting date	1992
Ending date	present
Abstracts	Y
Full text	N
Full image	N
Subjects	Biology, Chemistry, Oceanography, Science Business
Update frequency	Monthly
One line description	Science, technology and management of marine, fresh & brackish water environments & organisms
One paragraph description	The ASFA database provides citations and abstracts of the world's literature dealing with the science, technology and management of marine, freshwater and brackish water environments and organisms. This unparalleled source combines three major files that cover the biological sciences and living resources; ocean technology, policy and non-living resources, and aquatic pollution and environmental quality. Two specialized files are also included, which cover the increasingly important fields of aquaculture and marine biotechnology. The complete ASFA database provides the most comprehensive coverage; if preferred, the five, more focused files that comprise this unique database are also available as separate databases. ASFA is produced by Cambridge Scientific Abstracts in cooperation with four United Nations agencies and a growing network of national research centers throughout the world.

Figure 6. ASFA database profile

Refine Your Search		
Your Search Terms toxic dinoflagellates		<input type="checkbox"/> Include Backfiles
Subject Categories you Selected		
<input checked="" type="checkbox"/> All Subjects	<input type="checkbox"/> Engineering	<input type="checkbox"/> Physics
<input type="checkbox"/> Biology	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Science Business
<input type="checkbox"/> Chemistry	<input type="checkbox"/> Medicine	<input type="checkbox"/> Science Education
<input type="checkbox"/> Computer Science	<input type="checkbox"/> Oceanography	
Timeout: 1 min <input type="button" value="v"/>	Help	<input type="button" value="Resubmit!"/>
Technical Details about DBA's search strategies are available		

Figure 7. Refine Your Search

### Search capabilities of DBA

A Database Advisor search differs from searching in a specific database. Searches are limited to the databases profiled by the librarians and databases in the user-specified subject categories. While users supply the keywords, the librarians have already supplied the search strategies to standardize the search across the various databases. Precise technical search strategies and fields are used to search each database. Our goal in designing search strategies was to achieve an equivalent search of title words, abstract words, and subject terms in each database. This was not always possible because of the differences in the fields available and the way in which each database searches these fields. To achieve uniformity across databases, DBA's search strategies are by necessity rather generic.

Database Advisor guides users in choosing a database, it does not perform the most precise search possible in each database. Using the unique features and search capabilities of a database, more precise searches can be performed and users can refine their search as appropriate for each database used. For help formulating the best search strategy once they choose the database they wish to use, users consult help files provided by the specific database.

DBA searches three types of **bibliographic** databases: web, Z39.50 and telnet. Precise technical search strategies used and fields searched for each database in Database Advisor are available at: [http://scilib.ucsd.edu/Proj/dba/search\\_strat.html](http://scilib.ucsd.edu/Proj/dba/search_strat.html).

Web Search Strategies - The MELVYL® keyword search is what we considered “ideal”. It searches for any of the search terms in any of the following fields: subject, title, and abstract. Each of the search terms must be present in at least one field, but need not be present in all fields. Because most web databases search each field separately, this is difficult to duplicate without multiple searches on the same topic. At times, we were forced to “AND” the search terms together and perform a Boolean “OR” between the search fields. This requires all the words to appear in at least one field, which is more restrictive than the MELVYL keyword search. We hope that this will yield the best results to the user.

Z39.50 - This is a type of database request protocol. It is specialized for retrieving data and is also a fast interface. Most of the MELVYL® databases are hooked up to a Z39.50 interface. All databases that we access via Z39.50 are searched the same way. In the case of MELVYL® databases, our search replicates a FIND KEYWORD search.

Telnet Search Strategies - We use telnet as a last resort, preferring to access a databases via Web or Z39.50. Some telnet searches take time to process because there is no way to “jump into the middle” as we do with Web databases when we know the URL.

Database Advisor does not search Yahoo or the rest of the Web. DBA was designed to search bibliographic indexes and abstracts, like Inspec and Compendex, because we lacked a good tool that searched across databases supplied from so many different vendors. Several meta-search engines (like Inference Find and Metacrawler) exist that traverse the publicly accessible webspace. Perhaps in the future we will offer a link to one or more of these meta-search engines from DBA, as long as the results remain useful rather than overwhelming or confusing to the user.

We are investigating ways in which DBA might alert people to the existence of databases in their subject area that are currently only available in print or on CD-ROM in the library. The Social Sciences and Humanities Library at UCSD is experimenting with ways to display reminders to consider these other databases on the DBA results page.

## **Current Status**

In September 1997 Database Advisor was released for use in the science disciplines of oceanography, bio-medical, science and engineering at UCSD. A steady increase in usage indicates the target audiences -- undergraduate and graduate students, reference librarians and faculty -- are discovering and using more of the databases available to them. Currently DBA averages 81 searches a week. Not surprising, the peak hours of use are from 9am-5pm, Monday through Friday. 11% of overall usage occurs on weekends, which implies remote usage. We also collect information about the nature of the searches performed: the keywords and subjects used, whether the search is refined or not, what WWW browser was used, etc. This will allow us to perform more detailed analysis of Database Advisor usage patterns in the future.

A fully functional version of DBA is available to users of UCSD Internet accounts (i.e., those using a UCSD Academic Computing account, or those in an on-campus building). When DBA first rolled out, the Web-spiders picked up on it immediately and usage increased dramatically. Database Advisor was searching UCSD-licensed databases from non-UCSD IP addresses: 35% of all DBA searches were from non-UCSD people and 12% of the searches were from indeterminate sources. Non-UCSD remote users were exercising vendor servers and the high volume of usage by non-UCSD users was using up ports, denying access and slowing down service to our own users. Obviously, non-UCSD usage of databases has licensing implications -- even if non-UCSD users cannot connect and run searches in databases from DBA results they were still exercising vendor servers. Because other libraries want to see a "live demonstration" of how Database Advisor works, the decision was made to create a public version. Some databases are removed from the public version of DBA due to license restrictions. Anyone with Web access, regardless of UCSD affiliation, can use the demo version of Database Advisor. However, many of the databases that show up on the Results page are restricted to University of California (UC) or UCSD users, and may not allow access from outside IP addresses. To see DBA in action, visit the Public Version of DBA Sciences at: [http://scilib.ucsd.edu/Proj/dba/dba\\_public.html](http://scilib.ucsd.edu/Proj/dba/dba_public.html)

## **How to get source code**

The source code for Database Advisor (DBA), Sciences version, is available under the terms of the GNU General Public License (<http://scilib.ucsd.edu/Proj/dba/code/dba-source.html>). The Database Advisor program is free software. You can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation (either version 2 of the License, or any later version). The program source code is distributed in the hope that it will be useful, but without any warranty. For more details about the GNU General Public License see: <http://www.gnu.ai.mit.edu/copyleft/gpl.html>.

To run DBA at your site you need a UNIX computer with Internet connectivity and the equivalent of an Apache Web server (common in academic settings). You need the following software to install Database Advisor:

**Z 39.50 API Client software for Z39.50 connections:** You obtain the code from [http://lindy.stanford.edu/~harold/z3950/www\\_gateway.html](http://lindy.stanford.edu/~harold/z3950/www_gateway.html)

**GNU C compiler:** To compile the zclient code for your machine. For more information on the GNU project and a list of FTP sites for GNU software go to <http://www.delorie.com/gnu/>

**perl (version 5.004\_01 or later):** You can get the latest version of perl and the modules listed below from: <http://www.perl.com>

### Future plans

The Social Sciences and Humanities version of DBA will go live in Fall of 1998. Ways to alert users to the existence of important databases still only available in print or on CD-ROM in the library are under investigation. The concept of "instant gratification" that would take users directly to the results of a search when they choose a database to use will be pursued as funding permits. This function presents some technical challenges and may take some time to implement. Six other University of California campuses have expressed interest in installing versions of DBA on their campuses in the next few months. The California Digital Library may be interested in Database Advisor.

For more information about Database Advisor, the source code, hardware or software requirements, please contact Christy Hightower ([chightow@gort.ucsd.edu](mailto:chightow@gort.ucsd.edu)) at the Science & Engineering Library, 0175E, University of California, San Diego, 9500 Gilman Drive, La Jolla, California 92093-0175.

### Additional reading

Hightower, Christy, Jennifer Reisswig, and Susan S. Berteaux. June 1998. "Introducing Database Advisor". *College & Research Libraries News*, 59(6):409-412.

## Subject Guide to Databases Covered

### Biology Databases

ASFA: Aquatic Sciences and Fisheries Abstracts  
BIOSIS Previews  
Current Contents  
MEDLINE Plus  
MOFR: Marine, Oceanographic & Freshwater Resources  
PsycINFO

### Chemistry Databases

Applied Science & Technology Abstracts  
ASFA: Aquatic Sciences and Fisheries Abstracts  
BIOSIS Previews  
COMPENDEX Plus  
Current Contents  
Engineered Materials Abstracts  
GeoRef  
INSPEC  
MEDLINE Plus  
METADEX  
MOFR: Marine, Oceanographic & Freshwater Resources

### Computer Science Databases

ABI/Inform  
Computer Journals  
Current Contents  
INSPEC  
MathSciNet

### Engineering Databases

Applied Science & Technology Abstracts  
Arctic & Antarctic Regions  
COMPENDEX Plus  
Computer Journals  
Current Contents  
DOE Reports  
Earthquake Engineering Abstracts  
Engineered Materials Abstracts  
GeoRef  
INSPEC  
METADEX  
MOFR: Marine, Oceanographic & Freshwater Resources  
NASA Reports and Aerospace Literature

### Mathematics Databases

Current Contents  
INSPEC  
MathSciNet

### Medicine Databases

BIOSIS  
Current Contents  
Magazine & Journal Article Database  
MEDLINE Plus  
PsycINFO

### Oceanography Databases

Arctic & Antarctic Regions  
ASFA: Aquatic Sciences and Fisheries Abstracts  
BIOSIS  
Current Contents  
GeoRef  
MGA: Meteorological and Geostrophysical Abstracts  
MOFR: Marine, Oceanographic & Freshwater Resources

### Physics Databases

Current Contents  
DOE Reports  
INSPEC  
MGA: Meteorological and Geostrophysical Abstracts

### Science Business Databases

ABI/Inform  
ASFA: Aquatic Sciences and Fisheries Abstracts  
Business & Industry  
Commerce Business Daily  
Computer Journals  
Current Contents  
Magazine & Journal Articles Database  
MOFR: Marine, Oceanographic & Freshwater Resources  
National Science Foundation Funded Projects  
Newspaper Articles Database

### Science Education Databases

Current Contents  
ERIC  
Magazine & Journal Article Database  
Newspaper Articles Database