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ABSTRACT

This paper presents the most important concepts and techniques to use in successfully searching the major World Wide Web search engines and directories, explains the basics of how search engines work, and describes what is included in their indexes. Following an introduction that gives an overview of Web directories and search engines, the first section explains features of search engines, including treatment of single words, truncation or wildcards, case sensitivity, and treatment of multi-word queries and phrases. Major search engines and directories are discussed in the second section, including AltaVista, HotBot, WebCrawler, Excite, Magellan, Ultraseek and Ultrasmart by Infoseek, Lycos, Yahoo!, and Cyberhound. The next section covers mega search or parallel search sites, including: ALL-IN-ONE Search Page, CUSI, search.com, MetaCrawler, SavvySearch, and Infomarket Search. The fourth section describes specialized search engines such as a directory of sources for finding e-mail discussion groups, A Business Compass (ABC), 555-1212.com, and Argos. A table contains specific search capabilities, display features, and other special features of the most commonly used search tools. Relevant Web sites are noted throughout. (Contains 30 references.) (DLS)

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# Practical Tips and Strategies for Finding Information on the Internet

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## Abstract

Since the volume of information available on the World Wide Web is so overwhelming, searchers need to acquire additional skills in order to find relevant sites. This paper presents the most important searching concepts and techniques to use in searching the major search engines. Selected subject directories, mega search engines, and specialized search engines are also covered. Tables are included to specify search capabilities, display features, and other special features of several of the most commonly used search tools.

## Introduction

As the quantity of information available on the Internet continues to explode, it is increasingly necessary to learn efficient ways of finding specific bits of information. Numerous search tools are available to help locate appropriate sources. Without these search tools, the chances of finding anything on the Web would be slim. Even with the help of the search tools, users must be able to use sophisticated searching techniques in order to find relevant information. This is essential due to the amount of information included in the indexes and the depth of the indexing. The purpose of this article is to help users understand the basics of how the major search tools work and what is included in the indexes. Only those tools which are freely available on the Internet will be included.

There are several different kinds of search tools available free on the Internet. One type, usually referred to as a directory or a subject listing, is created by humans who actually look at a site and assign it to a subject category. Yahoo! is probably the oldest example. Sites are compiled into a database with hot links to URLs and usually a brief description or review of the site. Even the largest directories cover only a small fraction of the pages available on the Web. Even so, when searching for information on

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a general topic, a directory is usually the best place to start.

Another type of search tool, usually called a search engine, covers a much larger part of the Internet. Search engines send computerized "robots" over the Web to find pages and record all or part of each page. The information is compiled into a huge index. It is this index which is searched when a user enters a query.

There are many different search engines now available, and often the same query will find completely different hits using the different engines, depending on how and what the engine actually searches. When information on a very specific topic is needed, a search engine is the best place to begin.

Searchers must use several different search engines to assure coverage of a topic, just as several different print indexes must often be consulted. Because it is time-consuming to go to several different search pages and type in the same query over and over, another type of search tool has been created called Mega search pages or Parallel Search pages. They submit a query to several search engines simultaneously or provide a list of search engine query boxes on one screen. There are also PC based software programs available for purchase which accomplish this multiple search, but they are not covered in this article.

In the scramble to stay on top in the battle for numbers of visitors to their search pages and therefore the advertisers' dollars, some providers of search tools are attempting to add extra value to their sites. Some focus on a particular subject; some which were subject listings have added a keyword search of the Web; some which were keyword search engines have added subject category listings and/or reviews of sites. Just as most things on the Internet are constantly changing, so the search sites multiply, divide, combine with each other, appear, disappear, and change.

## Search Engines

Different search engines have different features and treat searches in slightly different ways. Although it is easy to simply type in terms in a query box and get results, it is essential for users to understand specific search techniques in order to get the most from each different one. The importance of some of these techniques will be discussed and a chart presented at the end of the paper to identify how some of the major search engines treat them.

### Treatment of Single words:

How does the engine treat a single query word? Some automatically determine the root of a query word and find all occurrences of the root. If this simply means it retrieves both the singular and plural forms, it may be a helpful feature so that users do not have to enter two words (as "cat or cats"). However, if the root has several possible endings, some of which are not relevant to the query, then unwanted matches may be retrieved. For example if the word "psychologist" is entered, automatic searching for the root would find all words beginning "psychol..." and thus find psychology, psychological, psychologically, psychologist, psychologists, etc.

### Truncation or wildcards:

Sometimes a user wishes to search for a root word or partial string. Many search engines allow the use of a symbol, often an asterisk (\*), as a wildcard to substitute for no characters or a set number of characters. This capability is useful in many instances to avoid entering several forms of a word connected by OR.

### Case sensitivity:

Some search engines are case sensitive and some are not. Usually the case sensitivity is only when a query contains capital letters and not when a word is all lower-case letters. If the word "turkey" is entered as a query, most engines will return all references to Turkey or turkey or TURKEY or even TurKey. However, if the entry word contains any capital letters then only words which match the capitalization exactly will be retrieved. "Turkey" retrieves only Turkey and "TURKEY" retrieves only TURKEY. This feature can be very useful for proper nouns and for words with unusual capitalization, such as NeXT.

### Treatment of Multi-word Queries and Phrases:

Sometimes multi-word queries may be searched using an implied AND, an implied OR, or as an exact phrase. If AND is assumed, then a search for Hillary Clinton returns all references to both words appearing anywhere in the document in any order. They may refer to Sam Clinton and Hillary Jones. An assumed OR returns references to any occurrences of the word Hillary PLUS any occurrences of the word Clinton. The document may discuss only Hillary Jones and have nothing to do with Hillary Clinton. On the other hand, if the query is treated as a phrase, then the words Hillary Clinton must appear next to each other in that order. This search would miss any references to Hillary Rodham Clinton or Clinton, Hillary.

Some search engines allow the search for an exact phrase by enclosing the words in double quotation marks, as "to be or not to be," or by a choice from a menu. Many also allow the user to enter on the query line such limiters as a plus sign (+) to insure that a term is present and a minus sign (-) to eliminate a term. If an engine defaults to connecting terms with an OR, then using the plus sign (+) before each term you require will give more relevant results. Often the Boolean operators AND, OR, and NOT or the proximity limiters NEAR, ADJACENT, or FOLLOWED BY may be entered in the query. This is usually true if an "Advanced" search is available. Some engines offer a pull-down menu allowing such choices as "All of the words" (equal to AND), "Any of the words" (equal to OR), and "Exact phrase".

The NEAR operator requires that the two terms be within a certain number of words or characters of each other, but they usually may be in any order. In Alta Vista NEAR requires the words to be within 10 words of each other while in Open Text it is within 80 characters and WebCrawler provides a switch to indicate how close NEAR should be. FOLLOWED BY is a less frequently available option. As is implied, the order of the words is retained but the distance between words varies. ADJACENT usually means the words must be together in the order indicated. The user should read the documentation for each search engine to determine which of these limiters are available and exactly how they work in each one.

Another important question is whether the search engine returns hits on every word in the query, or ignores certain "stop words" which occur many times in the index. Can you search for the quotation "to be or not to be" or are all those words considered stop words? Many online databases ignore small unimportant words such as conjunctions and prepositions, but some Web search engines will also ignore such words as "web," "internet," "system," and "university" because they occur so frequently. The AltaVista Search Revolution has a list of the 1,000 most common words found on the Web (Seltzer 240-254). If possible, avoid those words in a query. Several search engines save every word of a Web page in the index which makes it possible to do exact searches for complete phrases and sentences. They may not be able to find our Shakespearean quote when it is entered as a group of words because the common words are ignored, but they will find it when it is searched as a phrase. To lessen the problem of ignored search words, users should identify rare or unusual words or proper names associated

with the topic, enter all words that may matter, or search for an exact phrase when possible.

Still another question is whether a query can be entered as a natural language question, such as "How long is the day in Juneau, Alaska in November?" Some search engines can take such a question and focus on the relatively rare words, discard the common words, and return the most likely matches.

### **Major Search Engines and Search Directories**

AltaVista is fast, powerful, big, and fairly up-to-date. The Simple Search mode is easy to use, but knowing some tips such as enclosing phrases in quotes and using the + and - helps to narrow the results. The Advanced Search allows sophisticated search techniques, but you must know how to formulate the complex queries. Users may also control the relevancy ranking by indicating terms to be weighted highest. Note that if no terms are entered in the box for weighting, then the results of Advanced searches will not be ranked at all.

Web searches may be limited by domain, host, or media type and Usenet searches may be limited by the structural elements such as all or part of an e-mail address, anything on the subject line, or all or part of a newsgroup name. See the help pages for examples of this very powerful feature.

HotBot is also fast and big. It claims to include the most Web pages in its index. Pull-down menus allow the equivalent of Boolean features. The Expert mode lets users narrow searches to a particular technology, site, domain, or geographic location. Open Text Index is not as large as HotBot or AltaVista, but it is a good alternative for an obscure topic. The Power Search offers standard Boolean functions and includes not only NEAR but also FOLLOWED BY. Truncation is not available, so alternative forms of a search term must be entered with OR.

WebCrawler is not as fast as AltaVista or HotBot, but it returns good results. Boolean features are available. The NEAR function allows users to set the proximity, for example Franklin NEAR/2 Roosevelt will get either Franklin Roosevelt or Franklin Delano Roosevelt. WebCrawler is operated and content produced by America Online, but it is free to the Internet. In addition to the Internet search engine, it offers fifteen content categories with sub-categories and reviews. Included in the subjects are such categories as entertainment, travel, sports, and reference which are aimed at the general public. A recent partnership with MapQuest allows a unique feature on WebCrawler. When a search query in WebCrawler contains the name of any of the 22,000 U.S. cities in the MapQuest database, the results page will include a hypertext link to an interactive map of that city.

Excite is one of the better of the search tools due to the combination of the search engine, reviews, current news, and other features. It allows searching of the web, reviews of sites, and Usenet newsgroups. Excite's NewsTracker contains articles from over 300 newspapers and magazines. A personalized start page can be initiated through Excite Live!

Excite is fairly easy to use yet powerful due to the natural language searching, the capability of all boolean functions, phrase searching, etc. It will also provide the user with similar "More Like This" sites. In the display of the sites found on a query, the user may specify sorting by relevance or sorting by site. The "sort by site" feature is a good way to find out how many different sites it really found because it will group together the sites that are just different pages of the same site (Excite).

Magellan, a subject directory site containing twenty-six subject categories, has

recently been acquired by Excite and now contains some features of Excite. Magellan contains "rated and reviewed sites," "yet to be reviewed sites," and "green light sites" as the choices to search. The "green light sites" are those free of content for mature audiences (Magellan).

Ultraseek by Infoseek provides a powerful search engine which is easy to use. It will allow boolean searches, but the default is to use natural language searching which allows, for example, a user to pose a query of plain English. It will search for phrases which are similar to the query. Ultraseek also has a feature which allows you to retrieve pages related to those it has found (Infoseek).

Infoseek provides Ultrasmart, a subject directory search engine. Ultrasmart has twelve categories which are searchable. If you don't find what you need, you may modify your search to search the web instead (Infoseek).

Lycos contains a search engine, and two subject directories (Sites by Subject and Top 5% Sites). One feature that differs from many other search engines is that although the engine does automatic word stemming the user may require the engine to search for an exact match through the use of a period (.) after the word (Lycos). (Ex. Education would normally get education and educational. Education. would get only education.) Sites by Subject are the top 10% of sites most linked to by users. The Top 5% Sites are those in the top 5%. Reviews are available for the Top 5% Sites. In addition to the sixteen subject categories, Lycos also provides current news, maps, city information, and a company database (Lycos).

Notable in Lycos is the new Companies Online database. Lycos has partnered with Dun & Bradstreet in creating this. Although it is not yet complete (as of Feb. 1997), it is worth a serious look for more information about companies than one would normally find on any of the search engines' pages.

One of the most popular directory search engines is Yahoo! It was one of the first large directories of this type and covers fourteen subject categories. Yahoo! like many of the other search engines is now including special features in addition to the subject categories. It is possible to see top headline news updated hourly (Today's News), search for news within the last seven days, and easily link to special search engines for companies and people (Yellow Pages, People Search) ("Yahoo Help").

Yahoo! has recently begun to offer Net Events which searches for upcoming events on the Internet such as links to broadcasts of C-SPAN, sports events with live audio, chat room events, and Fed Net America. Yahoo! allows an individual to set up a personalized start page through My Yahoo! A user specifies interests so that a customized page (My Yahoo!) will just display the appropriate subject headings, current news, stock quotes, etc. based on those interests.

Although too small to really be included in the same category as the major search engines, Cyberhound is a new search engine of only reviewed sites. It has such extensive search capabilities in the Expert Search option and has so much descriptive information that it is worth trying. Created by Gale Research, a well known publisher of reference works, Cyberhound currently contains information on 30,000 sites. The ratings system criteria are clearly defined for the areas of content, design, technical merit, and entertainment (Gale).

A chart presenting special subject features of some of the previously discussed search tools is included at the end of the paper.

### **Mega Search or Parallel Search Sites**

There are many standard Web search services available, each with its own strengths and weaknesses. Users often need to repeat their queries using different services, which is time-consuming and awkward. Another level of service is becoming available which provides a single starting point for searching multiple search engine databases.

Some of these allow users to submit a query to multiple search engines one at time. Notable among this type are ALL-IN-ONE Search Page [[www.albany.net/allinone/](http://www.albany.net/allinone/)], CUSI [[pubweb.nexor.co.uk/public/cusi/cusi.html](http://pubweb.nexor.co.uk/public/cusi/cusi.html)] and c/net's search.com [[www.search.com](http://www.search.com)].

Others, such as MetaCrawler, SavvySearch, and Infomarket Search submit a query to multiple search engines simultaneously. They do not maintain an index database, but query a number of existing free search engines and integrate the results. All-4-One [[www.all4one.com/index.phtml](http://www.all4one.com/index.phtml)] does a simultaneous query in AltaVista, Lycos, Yahoo, and WebCrawler, but it returns the results in four small frames of a cluttered screen rather than combining the results. More detail follows on the other three mega search or parallel search services.

MetaCrawler - [www.metacrawler.com](http://www.metacrawler.com)

An easy to use opening screen provides a query line and choice of searching for a phrase, all of these words, or any of these words. Users may also choose either a "fast" or a "comprehensive" search, but it is not clear what is meant by these choices. An option to search for a person's homepage using Ahoy!, which works very well, is also given on the first screen. The help page says searchers may use advanced syntax on the query line, including quotes for a phrase and + or - for requiring or excluding a term. MetaCrawler will use these features in the engines which support them.

It is not clear which specific search engines are included in the search. The help page says MetaCrawler sends a query simultaneously to "several web search engines, including Lycos, WebCrawler, Excite, Alta Vista, Yahoo, HotBot and Galaxy." Extra Functionality, which must be enabled from the "Configure" option, allows setting maximum results per source from 10 to 30; time limit from 1 to 5 minutes; and results from everywhere, a geographical area, or educational, commercial, or government sites. SavvySearch - [guaraldi.cs.colostate.edu:2000/form](http://guaraldi.cs.colostate.edu:2000/form)

SavvySearch includes 19 search engines including those which search Web pages, Usenet Newsgroups, FTP sites, yellow pages and name directories, etc. It makes an "educated guess," using information from past searches, as to which engines will do best for the query and forms a "search plan." From two to five engines will be simultaneously searched, but other choices are available from the display of the plan.

The opening screen allows a choice of searching for all query terms, a phrase, or any term and retrieving from 10 to 50 results from each engine. Choose "Integrate Results" to eliminate duplicates and display the hits from all engines together. This takes a little longer. The query is sent exactly as entered to the different engines. There is no option for NOT nor for letter case.

Infomarket Search - [www.infomkt.com/](http://www.infomkt.com/)

Infomarket Search is a type of specialized mega search page. It is sponsored by IBM and appears to be aimed more at the business market. Users may search for free and may purchase information using IBM's special Cryptolope technology for this purpose.

This service simultaneously searches multiple commercial and Internet databases including over 75 newswires, 300 newspapers, 819 newsletters, 6882 journals, and 11

million companies in a variety of subject areas. There is little help available, but the screen is user friendly. There is no indication of how many hits were retrieved.

## Specialized Search Engines

Sometimes a specialized search engine should be used to locate information. Specialized search engines focus on providing directories and/or search engines for one subject area. Since there are hundreds from which to choose, the following directories/engines are just a small sampling to indicate the variety available. A directory of sources for finding email discussion groups (<http://www.nova.edu/Inter-Links/listserv.html>) is available at a page at Nova Southeastern University. Rob Kabacoff, who created and maintains the site (Inter-Links) of which this directory is a part, states in his site that it "was the first place on the Web that provided users with search engines for locating Electronic Mailing Lists, PC software, Usenet Newsgroups, E-mail Addresses, and GIF Images."

A Business Compass (ABC) (<http://www.abcompass.com>) is a new specialized search engine/subject directory of business research information ("A Business Compass Introduces" 41). According to the company, A Business Compass LCC, the editorial staff select sites that business people "can use for market research, industry data, news, analysis, and competitive intelligence" ("ABC Information"). As of this time, it searches exact keywords only. It has subject, industry, and geographic directories. Each site in ABC contains a description of the expected business use of the site, content description, special features, and direct links to specific valuable pages within the site as well as the home page of each site.

Of the many sites available for searching for phone numbers, email addresses, etc., one might try 555-1212.com (<http://www.555-1212.com>). It allows searching three different databases of phone numbers, a reverse phone number directory, yellow pages, fax directory (under construction), and a Toll-Free directory.

Argos is a search engine which claims to be the "first peer-reviewed, limited area search engine (LASE) on the World-Wide Web" (Beavers). It limits coverage to sites which contain information about the ancient and medieval world and which are approved by an editorial board. Although the board does not approve each page, each site as a whole must meet the board's approval.

## Conclusion

If one needs to find preselected sites which are organized, described, and in some cases reviewed, one should search first in the subject directory search tools. Those looking for very specific items will need to search in one of the major search engines such as AltaVista, Excite, or InfoSeek's Ultraseek. If the searcher needs to be very thorough in the search process or if the searcher is seeking a hard to find item of information, one of the mega search engines could be selected. Information sought in a specific subject area may be found more easily with a specialized search engine or directory. Each searcher should become familiar with the search techniques in this paper and in the help screens which are available at each search site. By selecting from among the different types of search tools available, understanding search concepts, and mastering the search techniques of several of the major search engines, a user should expect to obtain fairly successful search results.

## Search Engines

	<b>Alta Vista</b>	<b>HotBot</b>	<b>Open Text</b>	<b>Webcrawler</b>
Web Address	<a href="http://altavista.digital.com">altavista.digital.com</a>	<a href="http://www.hotbot.com">www.hotbot.com</a>	<a href="http://index.opentext.net">index.opentext.net</a>	<a href="http://http://webcrawler.com">http://webcrawler.com</a>
		54 million		



Size	54 million documents	documents; claims to be the most complete index		
What part of Internet is included	Web pages & Newsgroups Choose from pull-down menu	Web pages and Newsgroups Choose from pull-down menu Full text. Opening screen allows choice for	Web pages, Newsgroups, email, & current events	Web pages, ftp, & gopher sites
What part of each page is included and searchable	Full text (but many stopwords). Can limit to title, parts of URL, & more.	media type. Location includes "cyberplace" which is host name & domain. Screen also has options to Modify and use Expert mode.	Full text; claims there are no stopwords. Power search pull-down menu for Page Elements include: Anywhere, Summary, Title, First-Level Heading	Does not index certain words which appear frequently nor combinations of letters and numbers.
Natural language searching	Yes	Yes Implied AND.	No- searches for every word	Yes
Limit by required and prohibited terms (Boolean Operators)	Implied OR. Use +/- in Simple Search; Use AND, OR, AND NOT in Advanced Search. Use parentheses for nesting in Advanced Search.	Pull-down menu offers: All the words, Any of the words, The exact phrase, The person, Links to this URL, The Boolean expressions. Use parentheses for nesting in Advanced Search.	Implied AND. Can search for "these words" or "this phrase." Power search pull-down menu offers: AND, OR, BUT NOT. No nesting.	Implied OR. Allows AND, OR, NOT. Use parentheses for nesting.
Limit by Proximity	NEAR=withing 10 words	No proximity, byt searching for a person uses a type of proximity.	Pull-down menu: NEAR=within 80 characters before/after. FOLLOWED BY = follows within 80 characters.	Allows Near with a switch to indicate how close (NEAR/20) and ADJ = together in order indicated.

	Use quotes for a phrase.	Use quotes for a phrase or choose from menu under "modify" option.		
	Truncation -- use * for up to 5 lowercase letters.	No truncation.	No truncation.	Use quotes for a phrase.
Other Searching Features	All lowercase entries retrieve either upper or lower case; use of any capitalization limits to exact match.	Ignores letter case except in "interesting cases" such as NeXT which matches exactly.	Ignores letter case.	No truncation.
Refining searches/finding similar sites	Query remains in box for easy revision.	A "Revise Search" button available at bottom of results list.	Option to "Improve your result" displayed when results are returned.	Query remains in box for easy revision. Choose a button from the Summary display to search for similar pages.
Display of results	Displays 10 at a time; no limit. Choose display in standard or compact form. Relevance ranked-1st by location of terms and then by frequency. In Advanced Search user can control ranking. Allows user to input words for use in relevance ranking in Advanced search.	Displays 10 hits at a time unless changed in pop-up menu. Gives score of relevancy determined by frequency first, then location.	Displays 10 at a time; no limit. Relevance determined by frequency and location. "Summaries" are given with links.	Choose to display 10, 25, or 100 hits at a time. Choose to display titles or summaries. Icoin shows relevance ranking determined by frequency.
Special features	Can limit both Web and Usenet searches in a number ways using the name plus a colon (example-domain: edu)	Expert mode allows narrowing by Web site, domain, location, or geographic technology.	The "Discover" button offers cool sites, cartoons, columnists, and other special searches.	Includes summaries of sites produced by analyzing first 100 words. Searches for US cities link to map of the city. Also includes some subject category listings.
Why or when to use site	Excellent for searches for obscure topics using advanced techniques.	Easy to use menus make this a good choice for beginning users.	A good alternative to AltaVista and HotBot which are larger.	Easy to use and especially good for popular topics. Often busy.
Web Address	<b>Excite</b> www.excite.com	<b>Infoseek Ultraseek</b> www.infoseek.com	<b>Lycos</b> www.lycos.com	<b>Yahoo!</b> www.yahoo.com
Size	50 million URLs	50 million URLs Web, Usenet	70 million URLs	

What part of Internet is included	Web, Reviews, Usenet Newsgroups, NewsTracker (Click on Bullet to select)	Newsgroups, News Wires, Premier News(7 news sources on Web), Email addresses, Company profiles, Web FAQs	Web, Sounds, Pictures, and by Subject (Pull down menu)	Yahoo! sites, Usenet, Email addresses (in Search Options Screen)
What part of each page is included and searchable		Full Text. Search on any word, sites, links, URL,, title words.		Yahoo Categories, Yahoo web sites, Today's news, Net Events. Search for title words, by date added.
Natural language searching	Yes	Yes	No	No
Limit by required and prohibited terms (Boolean Operators)	Implied OR, accepts AND, AND NOT, OR, +, -	Implied OR, accepts +,0	Implied OR, accepts -. Custom Search will do AND, OR, match 2, 3, AND, OR. 4, 5, 6, 7 terms.	Implied AND, accepts +,-. Search option screen will do
Limit by Proximity	No		No	No
Other Searching Features	Use quotes for phrase, case sensitives	Use quotes for phrase or hyphens between words. Case sensitive, Capitalize proper names. Finds word variants (mouse, mice).	Use . at end of word for exact match. \$ for truncation.	Use quotes for phrases. Case sensitive. * for truncation.
Refining searches/finding similar sites	Refind - Yes. Find similar sites with "More Like This"	Query remains in box and can choose "Search only under these results" to narrow. "Similar pages" feature.	Query remains in box, terms searched are displayed, and may choose to search those terms. May also choose to repeat search in by Subject, Images, and Sound searches.	Query remains in box. Query can also be reivsed in Search Option Screen. Relevance ranked by

Display of results	Relevance ranked. User may specify sorting by sites.	Relevance ranked by location of terms, frequency, high weight (uncommon terms).	Relevance ranked. User may select display as summary, standard, or detailed and how many per page.	multiple keyword matches, location of terms, generality of category. User may choose Alphabetical order and may choose how many per page.
Special features	Excite Reviews, Reference categories, Personalized start page - Excite Live!, Newstracker (articles from over 300 newspapers and magazines).	Subject searching in Ultrasmart. Current news in News Center. Can search for images.	Advanced search screen - Custom Search. Subject category searching in Sites by Subject, and Top5 % Sites.	Net Events. Personalized start page - My Yahoo! Automatic link to Altavista if search not found in Yahoo!
Why or when to use site	Natural language searching, sort by sites featurem Reviews, Newstracker.	Natural language searching, ease of use, News Center.	Top 5% Sites, Sites by Subject, searching for images, Sounds.	Well-organized directory, Net Events, My Yahoo!

SUBJECT FEATURES OF SEARCH ENGINES

Features	Excite	Infoseek	Lycos	Magellan	Yahoo!
Finding People, Email Addresses	People Finder, Email Lookup	Big Yellow	People Find	People Finder, Email Search	People Search
Finding Companies	Bigbook Yellow Pages	Smart Info, Big Yellow	Companies Online, GTE SuperPages	Bigbook Yellow Pages	Yellow Pages
News, Weather	NewsTracker, Excite Live!	News Center, Personalized Info.	Top News	Excite Live!	Today's News, Yahoo! Weather
Business News Stock Quotes	News Tracker, Excite Live!	News Center, Smart Info	Top News, Stock Find	Excite Live!, Excite Live!	Today's News Stock Quotes
Regional Info, Maps	City.Net	Smart Info	City Guide, Road Maps	City.Net	Regional (subject), City Maps
Name of Subject Directory, Number of Sites	Excite Reviews, 60,000 reviewed	Ultrasmart	Top 5% Sites, Sites by Subject	Magellan, 40,000 reviewed, 15 million total	Yahoo!
Reviews, Ratings	Yes, Yes	No, Yes	Yes, Yes	Yes, Yes	No, Yes
Subject Categories	20	12	16	26	14
Education Subtopics	14	15	7	34	32

**WORKS CONSULTED**

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