

Double-click on the key icons to read my *Power Point* notes. --BFB



Searching the Internet

How to find what you're looking for

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Searching Effectively

Three keys to effective searching

- **Decide what you want to find out**
- **Choose one or more appropriate search sites**
- **Formulate a search strategy**
 - Know enough about the subject to include related concepts
 - Use advanced-query logic




Library Terms

 **collection**

 **catalog**

 **index**

 **acquisition**

 **retrieval**

 **scope**

 **coverage**

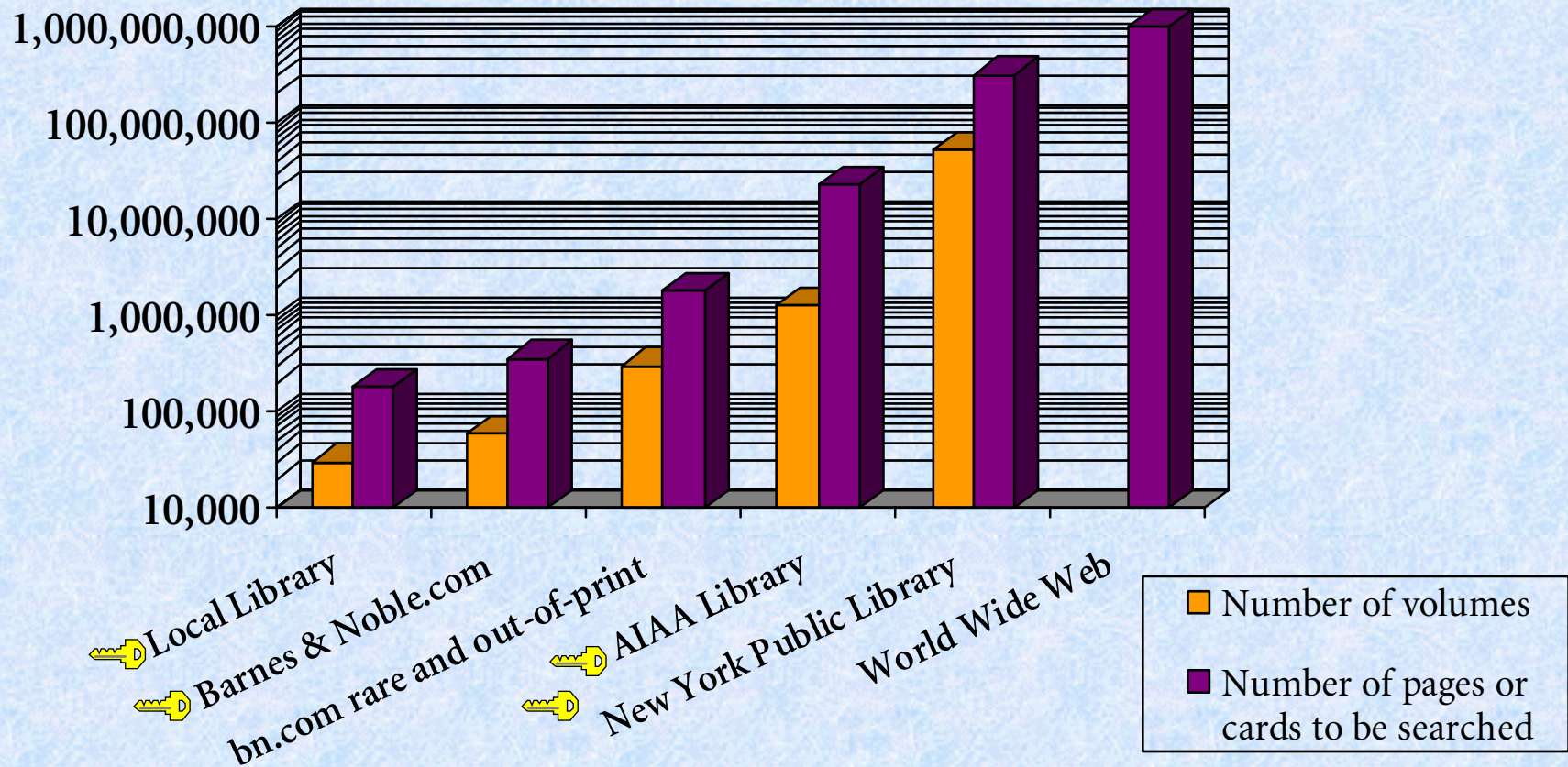


Problems in Searching the Internet

- **Sheer size**
 - over 1,000,000,000 pages and growing
- **Granularity (specificity)**
 - A lot of people with similar interests have sites with similar information. Which one (or several) have *exactly* what you want?
- **Dynamic collection**
 - Number, size, location, and linking of pages is constantly changing

🔑 Enormity of the Web Collection

(thousands of volumes)



Internet search tools

- **Historical tools**
 - command-line interface
 - text-driven
 - menu-driven
- **Web-based tools**

Historical search tools

- **archie** — anonymous-ftp “archiver”
- **gopher** — menu-driven document servers
 - **veronica** — Very Easy Rodent-Oriented Netwide Index to Computerized Archives
 - **jughead** — Jonzy’s Universal Gopher Hierarchy Excavation and Display
- **WAIS** — Wide Area Information Server
- **whois, X.500, netfind** — directory services

Gopher Index Search - gnosys.scs.unr.edu

You can search this index. Type the keyword(s) you want to search for:

Veronica interface to gopher at <gopher://gnosys.scs.unr.edu:2347/7/> viewed in IE 4.0

Web-based Internet Search Tools

- **free search sites**
 - Yahoo, Infoseek, GoTo, Dogpile, Google
- **subscription search sites**
 - STNWeb, DialogWeb, CSA
- **hybrid (paid and free) search sites**
 - Northern Light Special Collection, Intelligence Online

Methods of Data Acquisition

- **owner submission**
 - the page or site author, webmaster, or publisher submits a number of Web pages or sites, or other documents, to a search site or a selection of sites
 - in some cases, this is similar to sending a review copy of your new book to the *New York Times Book Review*
- **“spiders” and “crawlers”**
 - computer programs that automatically search the Internet for new Web sites and add their URLs to a search site’s existing catalog(s)
- **solicitation**
 - subscription databases and private libraries solicit contributions from authors and publishers

Types of Indexes

- **full-text index**
 - retrieves documents based an index of (almost) every word in every document in the collection
 - stop words like “and”, “the”, “it”, “or” are not indexed.
- **keyword retrieval**
 - retrieves documents based on a number of pre-defined key words, phrases, or concepts by which every document in the collection has been categorized
- **bibliographic index**
 - retrieves documents based on bibliographic information such as author, publisher, place of publication, and corporate sponsorship

Indexing for Retrieval

- **indexing**
 - manual, automated, machine-assisted
 - frequency, <META> tags, submitted abstracts
- **general categories**
- **key words and phrases**
 - free-text
 - controlled-vocabulary
 - may be based on full-text

Types of Search Sites

- **intrasite**
- **dedicated search engine**
- **metasearch site**
- **portal**
- **special-interest portal**
- **vortal**
- **database portal**

Choosing the Right Search Site(s)

	Intrasite	Dedicated search engine	Metasearch site	General interest portal	Special interest portal	Vortal	Database portal
General information		✓	✓	☆			
Highly-specific information	☆	✓	✓	✓	☆	☆	☆ (requires subscription)
Technical or industry-related information	☆			✓	☆	☆	☆ (requires subscription)



possible to find



best place to find

Sample Search — SR-71 “Blackbird” reconnaissance aircraft

Potential Problems:

- confusion with songbirds**
- confusion with businesses named
“Blackbird _____”**
- confusion with “State Route 71”**
- confusion with Honda CBR 1100 XX Super Blackbird
motorcycle**

First Results — “blackbird” and “SR-71 blackbird”

site	search string	number of “hits”	false hits in top 20 sites
Yahoo Site Matches	blackbird	30	18
	SR-71 blackbird	1	0/1 (link is dead)
Yahoo Web Page Matches	blackbird	18,733	16
	SR-71 blackbird	268	0
Lycos	blackbird	19,313	15
	SR-71 blackbird	1,830	0
Alta Vista	blackbird	42,600	16
	SR-71 blackbird	59,661	0
Google	blackbird	22,000	15
	SR-71 blackbird	3,139	0
Air Force Link	blackbird	35	6
	SR-71 blackbird	16	0
Web Crawler	blackbird	937	20
	SR-71 blackbird	14,168	14
Northern Light	blackbird	55,137	17
	SR-71 blackbird	4,463	0

First Results — “blackbird” and “SR-71 blackbird”

site	search string	number of “hits”	false hits in top 20 sites
Yahoo Site Matches	blackbird	30	18 (90%)
	SR-71 blackbird	1	0/1 (link is dead)
Yahoo Web Page Matches	blackbird	18,733	16 (80%)
	SR-71 blackbird	268	0
Lycos	blackbird	19,313	15 (75%)
	SR-71 blackbird	1,830	0
Alta Vista	blackbird	42,600	16 (80%)
	SR-71 blackbird	59,661	0
Google	blackbird	22,000	15 (75%)
	SR-71 blackbird	3,139	0
Air Force Link	blackbird	35	6 (30%)
	SR-71 blackbird	16	0
Web Crawler	blackbird	937	20 (100%)
	SR-71 blackbird	14,168	14
Northern Light	blackbird	55,137	17 (85%)
	SR-71 blackbird	4,463	0

First Results — “blackbird” and “SR-71 blackbird”

site	search string	number of “hits”	false hits in top 20 sites
Yahoo Site Matches	blackbird	30	18
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Search strategies

- **Boolean logic**
 - AND, OR, NOT
- **proximity**
 - NEAR
- **limited-vocabulary**
 - broader, narrower, related terms
- **string search**
 - exact match
 - usually case-sensitive

“Advanced Search” Syntax

site	AND	OR	NOT	string
Yahoo	“matches on all words (AND)” in search options screen	“matches on any word (OR)” in search options screen	- ___	“ ___ ”
Lycos	“all the words (AND match)” in advanced search screen	“any words (OR match)” in advanced search screen	- ___	“exact phrase (quoted query)” in advanced search screen
Alta Vista	AND in advanced search screen	OR in advanced search screen	NOT in advanced search screen	“ ___ ”
Google	(default)	(does not support)	- ___	“ ___ ”
Air Force Link (uses Verity search engine)	AND	OR	- ___	“ ___ ”
Web Crawler	AND	OR	NOT	“ ___ ”
Northern Light	AND	OR	NOT	“ ___ ”

More Specifiers

site	required	proximity	wildcard	parentheses
Yahoo	+____		____*	(no)
Lycos	+____			
Alta Vista	+____	NEAR (within 10 words)	____*	
Google	(default)		(none)	
Air Force Link	+____	<NEAR> (may not be implemented)		??
Web Crawler	+____		____*	yes
Northern Light	+____		____* _____ (any length string) % (single character)	nesting

Still more features...

Search by

- URL, title, HTML tag
 (“zone” search)
- date
- language of document
- natural language

Retrieve data sorted by

- relevance (number of
 hits within a page)
 - ACCRUE (“fuzzy OR”)
- date (newest first)
- other options may be
 available on a given
 site

Results of complex search for info on SR-71's jet fuel

site	search string	number of "hits"	false hits in top 20 sites
Yahoo	SR-71 and "jet fuel"	30	18 (28/30)
Lycos	ALL THE WORDS: SR-71 blackbird "jet fuel"	50	13 (36/47)
Alta Vista	"SR-71" AND blackbird AND "jet fuel"	30	27 (23/30 total)
Google	SR-71 blackbird jet fuel	246	16/20
	SR-71 blackbird jet fuel	12	0
	JP-7		
Air Force Link	fuel AND blackbird;	13	15/16
	fuel AND SR-71	8	(total unique hits)
Web Crawler	SR-71 AND blackbird AND jet fuel	41	20 (38/38 unique hits)
Northern Light	"SR-71" and "jet fuel"	57	12 (45/57)

Types of false hits from complex search

- **General SR-71 sites**
 - photos, history, politics
- **What's the plane doing now?**
 - LASRE, NASA tests
- **SR-71 is used as a comparison point**
 - NOVA Online
- **Area 51** (“the UFO place”)
- **Dead links**
- **passing mention** (excerpts from Joe Weber's novel, *Prime Target*)

Why so many false hits?

- **Improper search strategy**
- **Pay for position**
- **<META> tags have misleading information**
- **“invisible” text**
 - outside of tags, same color as page bkgd, etc.
- **bad links**
 - **database not updated**
 - site owner didn't submit changes
 - crawler didn't visit site recently

What's being done to limit deliberate "false hits"?

- **"family filters" limit access to porn sites**
 - some might overfilter, denying access to sites on breast cancer, for example
- **site review before acceptance**
- **ignoring <META> tags**
- **blacklisting of sites that use inappropriate <META> tags**
- **full-text indexing makes it harder to ignore porn-related terms**

Looking towards the future

- **More information will be available online**
 - e-publishing
 - e-commerce
- **better query processing**
 - context-sensitive filtering
 - pattern-matching
 - neural nets
 - inference engines
 - fuzzy logic
- **more for-pay indexes; fewer free search sites**
 - database industry shakeout: online v. traditional
 - intellectual property laws

Recap

We have explored:

- the history of Internet search technology
- search theory and syntax
- search industry vocabulary
- types of search sites
- why searches sometimes go wrong
- where Internet searching might go from here

Finale

To search the Internet effectively, ask yourself:

– What do I want to know?

- define your search parameters

– Where am I likely to find it?

- choose the most appropriate search sites

– How do I ask for it?

- design a good search strategy
- use advanced search techniques where possible