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

Searching the Internet

How to find what you're looking for

by

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Speaker Notes

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

Speaker Notes

Library Terms

- collection
- catalog
- index
- acquisition
- retrieval
- scope
- coverage

Speaker Notes

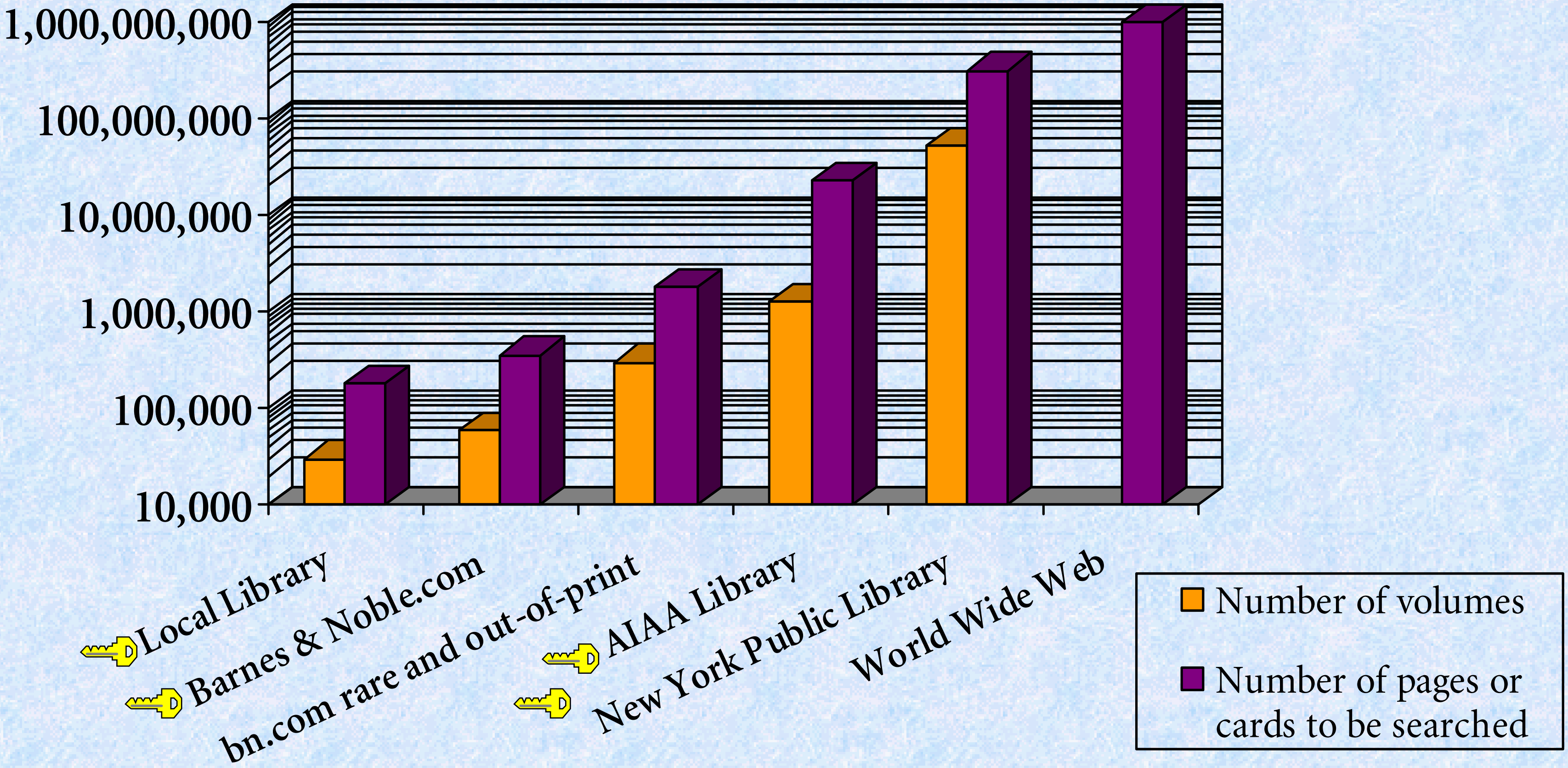
Problems in Searching the Internet

- **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

Speaker Notes

Enormity of the Web Collection

(thousands of volumes)



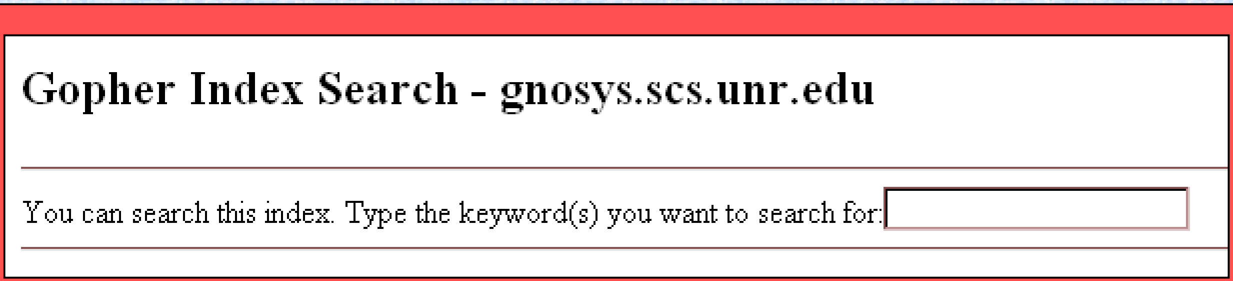
Speaker Notes

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 SR-71 blackbird jet fuel JP-7	246 12	16/20 0
Air Force Link	fuel AND blackbird; fuel AND SR-71	13 8	15/16 (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