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Common End User Errors

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Abstract:
Traditional end user mistakes include spelling errors, deviant interfaces, Boolean logic errors, and term errors. Spelling assistance should be made a standard on every search system as spelling errors are perhaps the most common errors made by all types of users.

Full Text:
REFERENCE AND user instruction librarians spend hours helping end users recognize and correct searching mistakes. I recently polled several reference librarians to find out what mistakes they see most often. Whether in academic, special, or public libraries or on commercial online systems, CD-ROM, the online catalog, or the Internet, certain errors seem to come up repeatedly.

If different people consistently make the same mistakes, and if librarians can readily identify those mistakes, why aren't better software design and smarter systems fixing those problems? Perhaps a catalog of common errors may comment more on poor system design than on the capability of the average novice online user.

Input errors

Some common errors are trivial indeed. Given the state-of-the-art for online or CD-ROM systems today, these systems could offer more user-centered features. Failure to offer truncation to get singulars/plurals and word ending variations is a common error in this category. LEXIS/NEXIS automated truncation for singulars and plurals 20 years ago, and DataStar allows searchers to turn automatic truncation off and on, but many systems still leave truncation up to the user. This should be easy to fix.

Spelling errors are probably the most common mistakes made by users of all ages and levels. Though this problem is a bit complex, much of it can be fixed automatically. Take a look at transaction logs from your online catalog to see the most creative spellings imaginable.

If you don't want to slog through more logs, a mesmerizing real-time transaction log is available for the Webcrawler search engine. Try <http:// webcrawler.com/WebCrawler/SearchTicker .html> for a scrolling "ticker" of what people search. Warning: this can be habit forming; it also can be X-rated at times.

In one minute at slow speed, there were nine misspelled words, among them "environmentzl," "serveillance," and "tomatos." In the next ten minutes, none of the words appeared spelled correctly, so presumably the searchers gave up or changed tactics completely.

Spell-checkers, system links to dictionaries along with links to lists of commonly misspelled words and to sound-alike spellings (e.g., Brown and Braun), have been around for years in software packages like Excalibur/ConQuest Retrieval Ware. Since these errors are common and often lead to complete failure, spelling assistance should be a de facto standard on all search systems.

Where am I?

The problem of divergent interfaces seems to have hit its peak and is now being ameliorated. A typical library today may offer a dozen or so different CD-ROM systems, two or three online systems, and access to the World Wide Web. Not all patrons recognize that these are distinct systems, each requiring different procedures and different strategies. Moreover, screen designs vary in several complex ways.

"Many times it is not clear to the novice user what to do next," observes Alan Wallace, reference librarian at the Hodges Library, University of Tennessee, Knoxville (UTK). "There is such a variety of [screen] designs."

Paula Galbraith, librarian for the Mary Kay Company, observes that end users "don't want to read the screen. They look at the interface of whatever product they are using and say `What is this' or `What do I do now?' We usually spend quite a bit of time pointing out the importance of reading the screen."

Web-based interfaces, such as SilverPlatter's Webspirs or OCLC's FirstSearch Web, are improving this situation. Both offer dozens of databases with a common (and less intimidating) interface. At least the overarching web browser interface used in these systems is beginning to look familiar to many users.

Boolean logic errors

Boolean logic, still the most common search method today, has many advantages. However, such logic is counterintuitive to the uninitiated; many common errors result from poor command of Boolean operators. Sophisticated implementations of Boolean logic (such as nesting with parentheses) cause problems. So does lack of a basic understanding of what ORs and ANDs do in a search.

Diane Nahl and Violet Harada at the University of Hawaii found that high school students they studied made, on average, two errors in each search statement. Boolean logic, syntax, and semantic errors were commonplace. Students confused ANDs and ORs, neglected to use Boolean operators completely, omitted necessary concepts in ANDing, and added unnecessary concepts.

Such logic errors transcend age groups. Marcia Stoklosa of Texas Instruments reports that CD-ROM searchers in her corporate setting "don't always realize that using OR gives more results and using AND gets fewer." Gayle Baker, electronic services coordinator at UTK, examined the search queries from a locally loaded Current Contents file and found the erroneous use of Boolean operators to be common. Nesting in particular is a problem; "not using parentheses with OR'd terms when mixed with AND" is common, she says.

Martin Courtois, biological sciences reference librarian at UTK, says most new users "will readily grasp the idea of looking for a term in combination with another. But as soon as I start to use the words AND or OR, confusion sets in. I think the basis of the problem is that AND, in particular, carries a different meaning in everyday speech than it does in Boolean operations. It's best for the user if I can explain these concepts without using AND or OR."

Boolean solutions

Vendors have offered many solutions to the Boolean problem over the years. Some systems, such as Wilson-disc. disguise operators, using instead the word ANY to mean OR and employing separate lines in a template form to indicate AND. Others offer statistical search engines that allow for partial matching as alternatives to exact matching Boolean logic.

Personal Library Software (PLS) and Westlaw Is Natural (WIN) led the way for commercial online systems; almost all web search engines now support non-Boolean searching. The more terms that are input, the more retrieved because statistical partial match search engines will retrieve documents that include any or all of the terms input. Presenting them in relevance ranked order by word occurrence helps overcome the usual difficulty of retrieving an overwhelming number of documents. Relevance ranking is a necessity in a web environment--for example, the search California Summer Camps in the web search engine "Excite" retrieves over 20 million matches with one or more of these words.

Manning-Naier, a patent searching online service introduced at the Online World Conference last fall, uses the DA-LINK search engine to offer an even more sophisticated approach to non-Boolean searching. DA-LINK allows natural-language queries, then applies linguistic analysis to recognize important words, dissect the parts of speech and meaning of those words to build concepts, then retrieve related documents ranked in relevance order.

Information retrieval researchers are busily working on more solutions to the Boolean "problem." In the meantime, search results are often more precise in the old-fashioned Boolean systems, as long as novices learn to manipulate them to their own advantage. Nahl and Harada recommend "teaching Boolean thinking, rather than Boolean logic--a finer distinction since search engines don't always require explicit use of Boolean logic, but students need to understand how the search engines apply Boolean logic implicitly in order to control the output of searches."

Term errors

End users often have trouble with their choice of search words or concepts. It's difficult for many searchers to hit the right level of specificity. Often they use words that are too general, such as searching for "Schools" in ERIC, which results in either too many hits, or in documents that are too broad to cover the topic of interest. Just as often, end users choose words or phrases that are too specific, resulting in zero or few documents. While watching the WebCrawler SearchTicker, I wondered about the person searching for the broad term "pictures" or, at the other extreme, the one searching for "Canadian precision skating-Halifax" again and again.

Retrieving too many hits may not concern users as much as it does librarians. Stoklosa observes users "will read through 300 hits instead of figuring out what they really want." Ruth Pagell, director of Emory University Libraries' Center for Business Information, explains, "Most people do not want to do efficient searches. When they get no hits or very few hits, they just walk away assuming the database does not have the information they need, rather than asking for help or trying a different search strategy."

Controlled vocabulary based on hierarchical thesauri are meant to assist specificity problems, but thesauri are underused. Thesauri today are most often employed as a database-specific term list to assist indexers to assign terms before documents can be searched. In addition, most CD-ROM systems, such as SilverPlatter, InfoTrac, and Wilsondisc. offer a "descriptor" or "subjects" button to display

controlled terms used within a specific database. OVID has made the Medical Subject Headings (MeSH) an integral part of searching its versions of MEDLINE online or on CD-ROM.

However, thesauri have not been integrated into online systems as well as they could be. Usually they are database-specific rather than mega-thesauri usable by multiple databases. Although LEXIS/ NEXIS. Westlaw, and Wilsonline offer a systemwide "thesaurus" function, they are really just synonym lists, phrase lists. Or "see/use" functions rather than hierarchical thesauri that provide specificity assistance with narrower and broader terms. When a user inputs "education" in ERIC. the more useful system reaction would be to inform the searcher that this is a very broad teem, then display the many specific choices that might be better.

Conceptual errors

The most complex errors are conceptual ones. Students and teachers may not understand an assignment or the limitations and strengths of information resources. Galbraith finds corporate end users usually believe "if they thought up a question, then there should be an answer out there. One of the most difficult areas is to explain that all information is not necessarily available, especially in the format they would like." Lori Goetsch. head of reference at UTK libraries. agrees: "The primary problem continues to be a lack of understanding and ability to conceptualize a research problem" and select the right database.

This problem seems to be getting worse with the advent of the WWW. UTK's Baker has observed recently how students are transferring web search engine features (such as the + to indicate required words in Alta vista) into library searches. Since web search engines offer inconsistent search features and indexing styles, confusion transferred from the web environment is likely to grow.

User instruction classes and undergraduate library and information science courses now focus on evaluating the usefulness and source of information. Understanding content, search features, and systems at the conceptual level is not something that can be learned in a brief reference interaction, nor can it be handled easily by better system design.

They don't read instructions

And then there's the basic problem of human nature. Baker and Stoklosa troth observe that end users, regardless of age. don't read onscreen instructions. (They don't read instructions on paper, either.)

Unfortunately, people are not likely to start reading instructions now, even it it could help avoid deeper conceptual misunderstandings, Systems must solve the trivial errors automatically, but user instruction librarians must help solve the more complex problems. True understanding of the search process and the interplay of a variety of sources must be taught over time. There is no easy fix.

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