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The Newspaper for Users and Producers of Digital Information Services

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INSIDER'S PERSPECTIVE

The Art and Science of Literature Search

Someone once said that art and science have their meeting point in method. Nowhere is that statement truer than in scientific literature search. And nothing illustrates that point like the most basic of search concepts: the keyword.

First, the science. What better place to start than the database itself. The good thing about scientific databases (Google Scholar, PubMed, etc.) is that there are so many of them. The bad thing about databases is that there are so many of them. While each provides the usual host of operations that include searching within results, analyzing results, and searching by taxonomic data, they also have their own unique rules and features for conducting searches. What's more, for a comprehensive search, say, in support of a regulatory finding, you quickly discover that one search does not fit all; the search syntax

used actually varies by the database you're searching. (See Figure 1.)

Once those differences are squared away, when you perform a basic keyword search, the database system locates the matching words and phrases throughout the bibliographic record. The challenge is when the collection of articles of interest is really large and needs to be narrowed. That's where the advanced search comes in.

You may indeed need to perform multiple searches in multiple ways before you find the results you need.

The advanced search functions of the database provide the user with greater control, allowing for a more refined search. In addition, they permit

multiple search terms in multiple fields to be searched for simultaneously.

The use of Boolean operators with your keywords will also help to narrow—or broaden—your search. These include the logical operators AND, OR, and NOT. If your search is retrieving too many articles, you can narrow it by adding terms or limiting terms to particular fields. But be careful: If the search is too narrow, you may miss important papers. This is

especially significant for regulatory filings.

Finding the Most Useful Keywords

There's one more thing you'll need to have a heads up about. Sometimes the keywords in scientific literature are contained in the metadata that have been applied to the articles. Other times, they're in the article abstract or in the article itself, in which case, you'll need to conduct a free-text search. And don't neglect the indexing in the database—i.e., the tags that have been applied to the articles. The bottom line is that

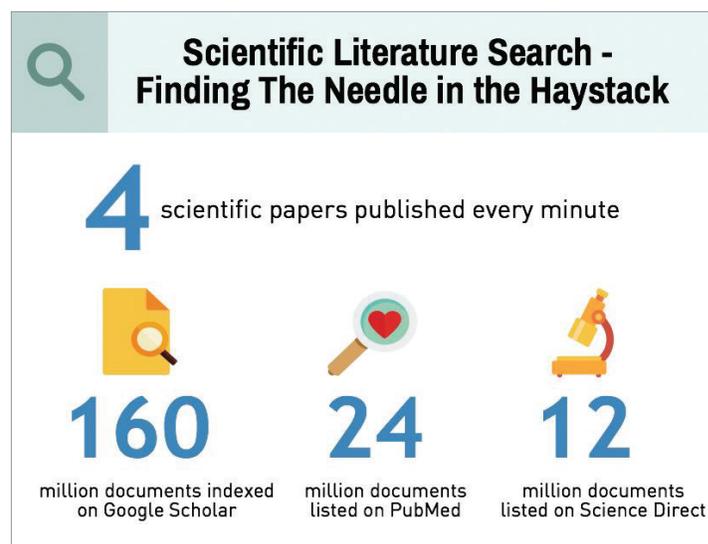


Figure 1: Researchers need to learn the search syntax for each database.

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an effective “comprehensive” search must orchestrate multiple search tactics in an overall search strategy.

And that brings us to the art of search. The most difficult aspect of conducting a good search is figuring out which terms to use and how to combine them to find the most relevant scientific literature. So how best to optimize? Start with a search statement. A search statement is a query that identifies the information you are searching for in a bibliographic database. There’s also a method to it. Because a topic can be described in many different ways, it can be helpful to break the search statement down into concepts and keywords. Here is a good example: academics.smcvt.edu/sburks/1s101_basic_boolean_searching.htm. The search statement is a terrific aid for thinking through your search parameters and also for surfacing keyword synonyms; if you don’t include synonyms, you could miss a great deal of relevant literature.

If this is all starting to overwhelm you, don’t worry. It’s normal. Scientific research is seldom a linear process. The

same goes for literature search. You may indeed need to perform multiple searches in multiple ways before you find the results you need. The key is in ensuring that the search strategy is broad enough to capture all relevant literature, but specific enough that it doesn’t yield a barrage of false hits. And that takes iterative tuning. (See Figure 2 for retrieval options.)

Choosing the Right Retrieval Platform

What ultimately matters is the quality of the search results. Indeed, not all articles are created equal. Even when your search strategy has turned up the appropriate content, you’ve still got to filter those results for the articles that are going to provide the best possible research or clinical evidence you’re seeking. That’s where a research retrieval platform comes into play.

In addition to enabling you to search in your preferred discovery environments, whether they are Google Scholar, EMBASE, PubMed, or dozens of others, such a platform also helps you acquire the literature of interest in the most ef-

ficient manner possible. Some help you narrow your search results even further. For example, rather than simply returning flat, face-value search results, those same search results could be extracted for simplified viewing and then augmented with Altmetric scores indicating the online popularity of citations, full-text prices (including rental options when available), and notifications for if the document is already in your holdings or available through your current subscriptions. Bookending a robust search strategy with a powerful research retrieval and knowledge management solution such as Re-



Figure 2: The amount of published scientific literature is staggering.

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