Engaging Engineers

Establishing Best Practices for Research:
A Guide for Information Professionals In the Engineering Industry

October 2015

Jan Sykes
Owner, Information Management Services

Engineers value self-sufficiency, which is ultimately a positive thing. Regardless of their specialty, they are avid consumers of information, and often have their own techniques for finding content that is relevant to their work.

However, if an engineer is an inexperienced researcher, that "do-it-yourself" attitude may lead to inefficient search practices or even the retrieval of inaccurate information, setting projects back months or years. In the ultra-competitive field of engineering where every minute counts, information professionals have an unprecedented opportunity to step in and provide guidance and value.

As a longtime consultant in the information industry, I've spoken with many info pros over the years about the importance of engaging end users, particularly engineers—because access to published literature is a fundamental requirement of their work. In the process of writing this paper, I set out to examine the progression from mediated searching (where info pros conduct literature searches on behalf of users) to the more prevalent scenario today, where info pros consult with users to select online databases and tools to use in their normal workflow.

Using the ProQuest Dialog platform as an example, this paper explores key strategies that info pros can employ to establish a closer working relationship with engineers, and tactics to support them in their search for high-quality information so they can be successful in their research. Understanding our users and the resources and capabilities that directly meet their needs are critical so together we can make greater strides in the innovation race.

Engineering Information Overload

There are millions of engineers in the world practicing in all industry sectors, so gross generalizations about how they search for and use information are impractical. However, we can confidently state that just as publishers have weathered the transition from print to a variety of electronic formats and platforms, engineering subscribers have altered their access patterns along the way. Individual engineering journal titles are both directly accessible by subscribers and distributed to users in curated databases of engineering documents.

Engineers now have more ways to access information, more information available to them, and more informal channels for accessing information – including social media, blogs, communities of practice and networking forums. In early 2015, Research and Markets published a study(1) forecasting a 13.73% compound annual growth rate for digital content in the period 2014 to 2019. Their analysis included text, audio, video and games—all adding to the vast amounts of content indexed by search engines and accessible by business users.

This influx of information means that more than ever, we need to ensure that trusted, authoritative sources are present in research. Databases that have long been considered the gold standard for engineering information must be included in the repertoire for info pros working with engineers. These include EI Compendex®, Inspec®, NTIS and SciSearch®. Other databases that focus more narrowly on technical information about specific materials are equally authoritative. Engineers working in these areas find value in deep dives into a more narrowly defined subset of literature when embarking on a research project or monitoring technical developments.

Subscribers to ProQuest Dialog can search these databases individually or in any combination, providing maximum flexibility and cost-effectiveness. A recent study on global productivity by the Conference Board (2) reinforces the benefit of access to premium resources. One of the principles addressed in the study is that innovation is not free. Analysts say that in order for technology to drive productivity, organizations must build a culture of innovation, stating: "This requires higher investment intensity not only in human capital, but a range of intangible knowledge-based assets: R&D, software and data, business organization, marketing and brand capital."

Engineering a Better Search: A Survey of Info Pros

In the process of writing this paper, I conducted a survey of info pros who work directly with engineers to better understand the techniques that their researchers use for finding information relevant to their work. I surveyed 10 info pros—including those who work for engineering firms, information centers in large corporations, and as independent consultants. The results from this small sample were largely consistent.

Based on my conversations with engineering info pros, I have distilled some common search practices and suggested tactics for process improvement that allow us to add value by complementing what engineers may already be doing.

"Plenty of things can be answered by Google; it's when [engineers] need more or realize they might not have complete information that they look to better quality sources."

−Information professional at a Fortune 250 chemical company

Common search practices of engineers	How info professionals can provide more value
Tend to search Google first.	• Show engineers a comparison of Google results with those from professional search services like ProQuest Dialog (see "A Tale of Two Searches" in the next section). Use information center website and marketing materials to discuss pros and cons of both. • Demonstrate ease of searching and filtering results in commercial databases.
Develop deep expertise in their field and search familiar locations on the web where they have found relevant information.	• Emphasize time saved when searching collections of authoritative, curated information rather than searching databases separately. • Promote global nature of many research databases for broader awareness and insights. • Communicate benefits of surveying research in other disciplines when embarking on new projects.
Value membership in professional societies focused on their specific discipline and often rely on those society publications.	• Become familiar with resources of professional societies in order to identify gaps and complementary information resources. • Attend conferences or local chapter events also attended by target audience to learn more about their work.
Place high priority on conversations with peers and colleagues, including at workshops and conferences.	• Lurk in social networking sites like LinkedIn groups, ResearchGate and internal communities to become more familiar with current topics. • Contribute to the conversation when your information resources could provide value.
Like to discuss articles and reports that are helpful to them when collaborating with colleagues.	• Promote collaborative tools like ProQuest Dialog, where multiple users can share search results.
Maintain relationships with universities where they may have access to library services.	• Proactively initiate conversations about information needs and schedule follow-up calls to discuss potential next steps. • Promote the quality and simplicity of your organization's library services and precision search skills of info pros in engineering-specific disciplines. • Position yourself as a trusted advisor regarding trusted advisor regarding sources and search strategies. • Launch tools such as search widgets and templates to facilitate effective searching from various intranet pages. • Post testimonials from satisfied customers.
Expect quick and easy access to full-text documents.	• Source articles immediately for end-users from in-house subscriptions or external suppliers with sources like the ProQuest Dialog document ordering tool.
Have less familiarity with business databases or investigate markets and competitors.	• Set up alerts in a tool like ProQuest Dialog so that your end-users can receive information from global news and trade sources.
Are cost-sensitive.	• Be prepared to discuss the financial risks of not having comprehensive and current information. • Track expenditures with a cost estimator or by project code and then assess ROI. (ProQuest Dialog's administrator tools let info pros monitor usage for accurate billing back to departments or clients, or to analyze usage patterns.) • Use a tool like ProQuest Dialog that has multiple pricing options, including transactional (pay-as-you-go) plans can help organizations budget.
Enlist the help of info pros for patent and prior art searching.	• The risk of missing patent information is too great to allow engineers to rely on the self-serve approach. Ensure that your organization has access to a comprehensive patent searching tool (ProQuest Dialog has the largest full-text patent and prior art collection in the industry).

A Tale of Two Searches
Search 1: Robotic technology in autonomous or self-driving vehicles, particularly trucks.

One key piece of information that we gathered from our interviews was that engineers tend to search Google first. So in June 2015, we conducted side-by-side searches on Google and the professional search service ProQuest Dialog (Figures 1 and 2) for information on the use of robotic technology in autonomous or self-driving vehicles, particularly trucks, and analyzed the top 40 items retrieved (Table 1).

Our search strategy for both resources was straightforward, much the same as what we would expect to be used by non-info pros. For those wanting a high-level introduction to the topic or news update, the Google results were satisfactory, even complementary. However, for researchers seeking authoritative, research-based content, the ProQuest Dialog results were preferable. There was no overlap in items retrieved from the two services.

In the table that follows, we compare search results between ProQuest Dialog and Google; the format for our comparison can easily be adapted to a topic or a tool that resonates in your organization and used as a conversation starter when asked about the benefits of premium databases.

	ProQuest Dialog	Google.com
Items retrieved	403	About 207,000
Content searched	35 engineering and technology databases	Google repository
Geographic coverage	Global	U.S. content, defined by Google profiling
Content types (in top 40 items)	• Scholarly journal articles (26) • Dissertations (10) • Conference proceedings (3) • Books (1)	• Corporate websites (12) • Academic websites (5) • Popular journals/newsletters (5) • Research organizations (5) • News sites (4) • Government sites (3) • Wikipedia (2) • Scholarly journals (1) • Youtube (1) • Meetup.com (1) • Images (1)
Date range	2014-2015	2005-2013, with 11 undated

Table 1

ProQuest Dialog search results

Figure 1

Google search results

Figure 2

Beyond the Search

While these search results speak for themselves, there's more to research than just the search component. Unlike most of the free sources that are available to engineers, professional search services such as ProQuest Dialog have interface enhancements and search and filtering options that make it easier for info pros to collaborate with engineers and other end-users.

For example, users may choose the basic search interface if they are infrequent ProQuest Dialog users or are in a hurry; more experienced searchers can switch to advanced or command line interfaces. Search results can be further narrowed with filters based on metadata and specific searchable elements within the cluster of databases being searched.

Post-processing capabilities built into the interface design fit seamlessly into workflows for both info pros and engineers. Results can be downloaded, shared, and delivered in custom formats. Depending on the user's ultimate use of the search results, the output can be formatted in a variety of ways—a PDF including cover page and table of contents, an HTML document with live links from the table of contents to items retrieved (depicted in Figure 3), a citation management format for software such as RefWorks or EndNote, or in a spreadsheet format.

Info pros who possess a dual understanding of the intended end use for search results and familiarity with the functionality of professional online services platforms are uniquely suited to positively impact productivity of engineering colleagues. When info pros customize database collections for various user groups, set up search and output preferences, and create templates and wizards, they streamline the search process for their users. All efforts to remove barriers to retrieving and managing information pay off in terms of improved speed of innovation and execution, adding value to the organization.

Cementing Best Practices

Info pros acknowledge and applaud engineers' self-sufficiency in research. And the good news is that due to most engineers' in-depth knowledge of their subject areas, they can often obtain some relevant material with a first pass of searching familiar sites.

However, as illustrated in this paper, info pros can further the research goals of their organization if they develop a closer collaborative partnership with engineers. The consultative process of talking with users about what information they need, what has already been obtained, and how it can best be used and shared will often uncover opportunities to tap additional high-value resources, apply sophisticated search strategies and deliver results to save time, effort and money in the long run. When mission-critical projects are at stake, by working with the information center, engineers can focus on what they do best designing, developing and building—with assurance that they will not miss information critical to their projects.

1. *Global Digital Content Market 2015-2019 (2015, Feb. 24) M2 Presswire. Retrieved from:*
    http://search.proquest.com/professional/docview/1657621645/fulltext/14DA52DA52D5EDDFE7A/1?accountid=159074

2. *Global productivity: Drifting into crisis. (2015, Jun 18). PR Newswire. Retrieved from:*
    http://search.proquest.com/professional/docview/1689943968?accountid=159074

ProQuest®
Dialog®