

which web developers will learn why and how they should:

- (1) consider the web content's audiences and website's competitors when analyzing keywords;
- (2) insert keywords into web text that will appear on SERPs;
- (3) involve the web content and website with other web content creators.

In two additional lessons in this paper's online appendices, web developers will also learn why and how they should, in Appendix A, optimize website content and structure for both human and search engine audiences and, in Appendix B, emphasize keywords in key spots on webpages.

Consider the Web Content's Audiences and Website's Competitors when Analyzing Keywords

Before optimizing web content or a website, web developers should first analyze the keywords—the search engine queries—for which the site will be optimized. In this lesson, web developers will learn why and how they should

- analyze keywords that their target audience will use
- target long-tail keywords that are competitive.

Analyze Keywords That the Target Audience Will Use:

Within the fields that technical communicators serve, keywords often emerge from the communities of subject matter experts who conduct a field's research, patent its innovations, and engineer its applications. However, a website's targeted audiences may well use different search queries than the specialists responsible for the content and site would themselves use. One study found that without even clicking on any of the search returns, searchers revised their query more than half the time [38], suggesting that searchers may struggle through an iterative process to formulate an optimal query. In particular, among a website's targeted audiences, it may be those least knowledgeable about the site, its content, or the organization behind it who would turn to search engines. Accordingly, whereas the name of the site or the organization, its trademarks, or the specialized lingo used by the subject matter experts or other insiders who contribute to the site ought to be considered as potential candidates for keywords, they may not be the sole or best candidates.

The best keyword candidates are, of course, distinct to each organization and each website.

But good candidates commonly recommended by SEO practitioners include, for instance, words and phrases naming the problems or needs that the organization or site resolves [6], and terms identifying the organization's off-web location [5], [6]. A survey of US consumers found that, in searches for local businesses, few said that they enter a query based on the business name, presumably because it is their lack of familiarity with the business that is prompting their search [40]. By contrast, at least half said they enter a query that describes the kind of service they seek, and almost half also enter a geographical term to localize their search. Similarly, a study of search queries related to travel accommodation found that the destination city was included in almost half the search queries, and the state or country were each included in more than a tenth of the queries [41]. By contrast, even though many travelers are no doubt concerned about the cost of their accommodations, price-related terms figured in fewer than 1% of the queries. Such a contrast suggests that web searchers might be adopting a terse search query genre that does not necessarily describe what they are seeking in the same way they might describe it when, say, speaking with an industry specialist like a travel agent.

What query might nonspecialist audiences enter when searching for general information about the field of technical communication, for instance? Among specialists within technical communication's research, academic, and professional communities, the term *technical writing* is generally recognized as having been supplanted by the term *technical communication*, a more contemporary and more accurate representation of the field's diversity, but that should not necessarily imply that the latter term is the better keyword for a site about technical communication to target. A recent search in Google Trends [42], a tool showing the relative popularity of a query over time or in contrast with another query, revealed that *technical writing* is still more commonly used than *technical communication*, though the popularity gap between the two is closing. (See Fig. 1.)

A useful tool for discovering other potential keywords is Google's Keyword Tool, which returns not only the estimated search volume of a keyword but also hundreds of related keywords and phrases, in particular marketable ones [44]. For instance, a search on the keywords *technical writing* and *technical communication* listed, among the hundreds of related keywords and phrases, several

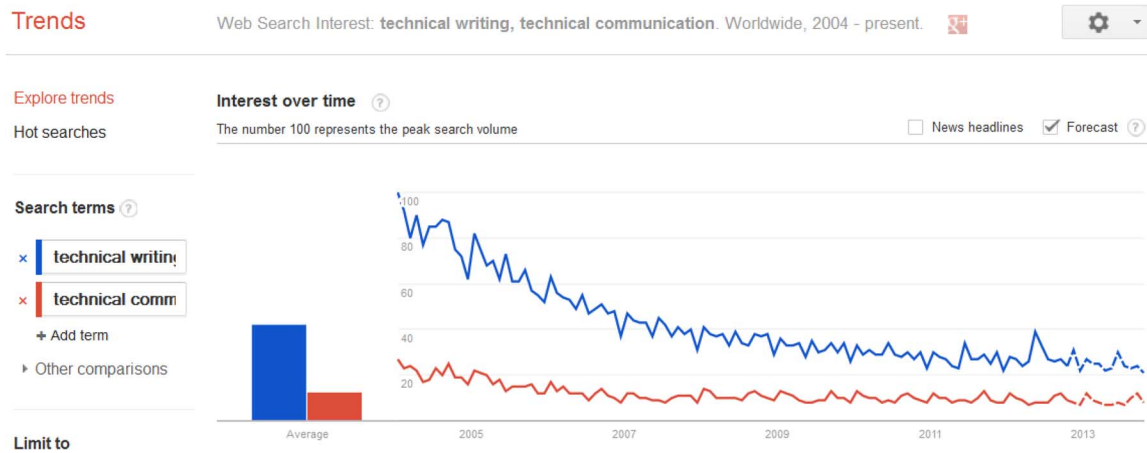


Fig. 1. Google Trends results comparing the relative search volume of the queries *technical writing* and *technical communication*. According to Google, the graph shows an approximation based on only a sample of data [43].

phrases related to education, like *technical writing courses*. (See Fig. 2.)

Along with researching the keywords that their own site's targeted audience would use in a query, web developers are recommended to research the keywords that their competitors are targeting by examining their webpage titles and text [6], [45]. For instance, an examination of the websites of journals that share overlapping interests with IEEE's TRANSACTIONS ON PROFESSIONAL COMMUNICATION (IEEE TPC) will turn up some that feature the keyword "technical" in both their names and throughout their websites; that keyword is not featured prominently on IEEE TPC's own webpages. Not surprisingly, whereas IEEE TPC's website typically ranks among the top for Google queries based on parts of its title, such as "professional communication journal," it remains buried in obscurity for near synonymous queries like "technical communication journal." In general, examining competitors' sites enables web developers to discover search queries that might be relevant to their own sites, to find search niches in which competition might not be so intense, and to discover strategies for phrasing their own sites' text.

Target Long-Tail Keywords That are Competitive: SEO professionals generally distinguish between "**head**" and "**tail**" keywords: the former are more generic and typically just one or two words long (e.g., *writer* or *technical writer*), whereas the latter are often subcategories of the former and typically three or more words long (e.g., *Silicon Valley technical writer*). The *head* and *tail* nomenclature was inspired by statistical graphs plotting a line starting at a peak (the head) and tapering off as it moves farther away (the tail). The popular "long

tail" metaphor was first proposed by Anderson, who argued that, especially with digital media, companies can cost-effectively market not just their most popular products and services (the head) but also the many lower-volume niche products and services (the long tail) [46], [47]. As an example, he described Google's search advertising model, in which marketers can effectively target the small numbers of searchers who enter various tail queries [47].

A meta-review of previous studies of queries logged with search engines listed average query lengths ranging between 1.6 and 3.3 terms [34], with queries of 1, 2, or 3 terms in length being the most common [35], [48]; many of these are likely head terms. However, because head terms attract so much competition, SEO professionals generally recommend that most sites, especially new sites, target some tail keywords and phrases (e.g., [4]–[6], [49]), where competition is less intense and fulfilling matches with users' specialized interests are more likely. More specifically, they recommend that a site's homepage target the most popular head keyword for which the site might be competitive, whereas the site's more specialized pages each target a related tail keyword. It is generally advised that each webpage target no more than a few keywords or phrases (e.g., [4]–[6], [50]).

For instance, consider a hypothetical site offering various handy resources for technical communicators, such as trial versions of the field's software, reviews of such software, as well as relevant books, tutorials for using such software and for composing various technical communication genres, sample technical communication documents and document

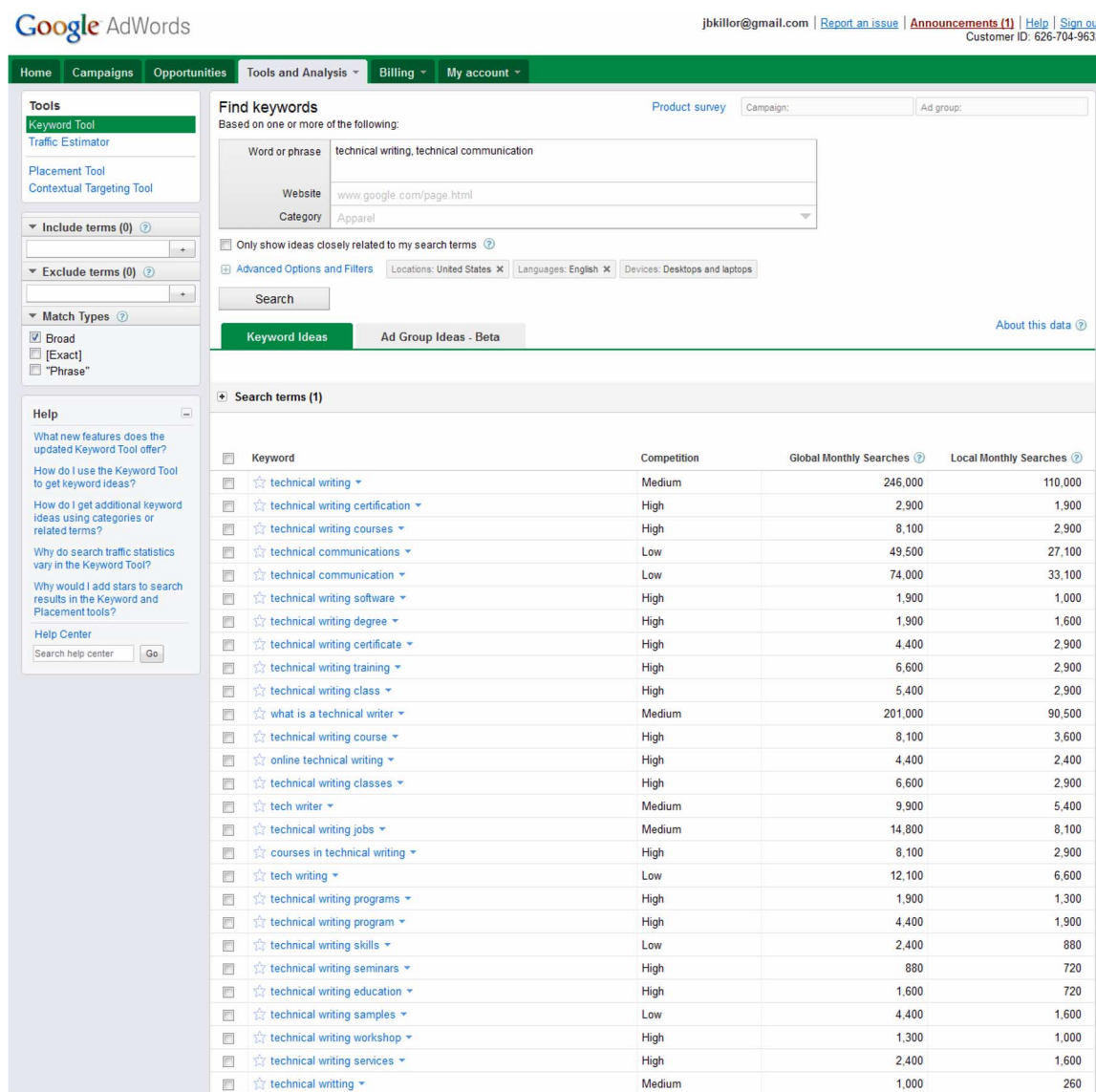


Fig. 2. Excerpt of Google's Keyword Tool search results on the keywords *technical writing* and *technical communication*, showing a partial list of related keywords and phrases, bidding competition for each in Google Adwords, and the approximate monthly Google search volumes of each both globally and within the U.S. The full list included hundreds of related keywords and phrases.

templates, and so forth. Judging that the site would be particularly popular and competitive for its software downloads and reviews, its web developers might target for its homepage such head keywords as "technical communication software" and "technical communication reviews," whereas a specific tutorial page within the site might target the tail key phrases "how to usability test websites" and "website usability testing tutorial." The next lesson as well as the lesson in online Appendix B, available online at <http://ieeexplore.ieee.org>, detail how webpages can be optimized for particular keywords and phrases.

Insert Keywords into Web Text that Will Appear on SERPs Terms from a user's search query are shown in bold type wherever they appear in SERP's listings of webpage titles, snippets of text, and URLs. Aside from acting as strong visual cues to users who let their eyes skim down the list of results [38], these three features are thought to be among a webpage's most influential keyword features in Google's algorithm. When asked to rank 21 possible characteristics of keywords on a webpage—such as their placement, encoding, formatting, repetition, and so forth—according to the weight that Google's algorithm allocates to such

characteristics, respondents to the SEOmoz survey introduced before ranked as first and second keywords placed anywhere in the title tag, and placed first in the title tag. Also ranking near the top were keywords within the page's URL string [7]. In this lesson, web developers will learn in greater detail why and how they should:

- name web domains, directories, and files based on keywords
- prioritize keywords in webpage titles.

As for the snippets, search engines typically excerpt these from text within the webpage; lessons for composing webpage text for SEO purposes are presented in online Appendix B.

Name Web Domains, Directories, and Files Based on Keywords: The first tasks in creating a site include securing a domain name (web address) and creating (and, hence, naming) files. In the SEOmoz survey mentioned before, SEO industry professionals asked to apportion the weight that Google's algorithm accords among various clusters of SEO factors allocated approximately 11% of the weight just to keywords in a site's domain name. However, when asked in another question whether that allocation of weight would decrease, stay the same, or increase over the subsequent 12 months, a majority of respondents predicted that it would decrease [7]. Similarly, others have long suspected a decreasing allocation in a domain name's weight [4].

When choosing a domain name, SEO practitioners generally recommend choosing a name based either on an existing keyword or phrase or a new brandable name that, in either case, the site will be optimized for (e.g., [4]). Common keywords and phrases have long since been claimed, leading webmasters developing new sites to choose domain names based on newly invented brand names or longer key phrases, sometimes rendered readable by hyphens. However, SEO practitioners recommend minimizing the length of a domain name because future audiences would have to type the long URL string to visit or to create inbound links [5]. They also recommend minimizing hyphens in the domain name as these have been a feature common among the multiple domains created by spammers and could raise the suspicions of both prospective audiences and search engines [4], [5].

In a URL string, after the domain name comes the names of directories and, finally, a file name, and these too provide opportunities for keywords.

Both Google and Bing encourage webmasters to incorporate keywords into their URL strings, and Microsoft has confirmed that such a tactic can improve a page's Bing ranking [50]. For file names based on two or more words, Google encourages webmasters to insert hyphens, but not underscores, to separate words (e.g., "technical-writing.html"), explaining that it finds the resulting file names easier to read than nonhyphenated, fused key phrases [51].

Google recommends against using generic file names ("page1.html"), repeating keywords ("seo-seo-seo.html"), and relying on computer-generated alphanumeric codes, parameters, and session IDs that are meaningless to search engines and offputting to searchers and web developers creating inbound links [52]. Because SEO techniques contribute to a page's ranking cumulatively, it is generally recommended that each file be named using the same keyword that is used in the page's optimized title (see next subsection) [4], thereby reinforcing that page's relevance for that particular keyword.

Prioritize Keywords in Webpage Titles: Among the page elements extracted on SERPs, perhaps the most important for human users is the page title. In one study, student collaborators evaluating sites listed on SERPs were found to rely largely on the titles, even though the SERPs, of course, also featured snippets, URLs, and direct links to the sites they were ostensibly evaluating [53]. Aside from being hyperlinked in SERPs—thereby drawing the focus of users as they navigate—titles also appear at the tops of the browser windows or tabs and in bookmark lists when the pages are bookmarked. Titles should not be confused with headings that appear in the browsers' main windows (headings are discussed in online Appendix B) as titles are encoded within an HTML file's "head" section, not the "body" section that is made visible to web browsers.

In general, web developers are advised to title their pages with keywords referring specifically to the page content rather than with generic words [6], [54], avoiding, in particular, such generic words as "home" (whose homepage?), "products and services" (which products and services?), and so forth. SEO practitioners generally recommend that each page title focus on the keywords or phrase that page is targeting (e.g., [6]). In the case of the organization's name, which would presumably apply indiscriminately to all of a site's pages, Grappone and Couzin recommended including it to