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Credible Technical Information in the Information Age by Steven M. Cramer, P.E., PhD, University of Wisconsin-Madison & Dan L. Wheat, P.E., PhD, University of Texas at Austin

With more information than ever available at the touch of a button, it's important to filter your search results with an astute eye for what is and isn't too good to be true.

True knowledge exists in knowing that you know nothing. And in knowing that you know nothing, that makes you the smartest of all."

These loosely translated words are from Plato's Apology and they are attributed to Socrates in his defense on charges of corrupting youth, among other things. In the information age, as one searches the Internet for technical information, one could say, "True knowledge exists in suspecting that you have bad information. And in suspecting you have bad information that makes you the smartest of all."

Caveat lector—let the reader beware. New information on nearly any topic may be obtained almost instantaneously on the World Wide Web, and the packaging of that information allows one to find his or her poison or remedy. Those of us who predate the information age and who searched paper-based libraries for information had the same problem, not at warp speed, but at a snail's pace. That is, we could still find our poison or remedy, but we patiently searched card catalogs and later electronic catalogs, and spent more time vetting information through much slower non-electronic sources: library sources, knowledgeable friends, professional acquaintances and colleagues.

The Internet and search engines such as Google™ and Yahoo!® present many opportunities for expedient retrieval of good information, but there are pitfalls and potholes into which a user may land. The purpose of this article is to help our community to parse these information sources more effectively. Let us consider our community to consist of both industry and academic populations in search of industry and academic information sources. As an example, industry information might be manufacturing or processing data, and academic information might be laboratory test data. Both industry and academic users may be in search of industry or academic information. It is likely that the academic information is somewhat better protected against outlandish claims because of the often-rigorous peer review process for academic papers. But sometimes outlandish claims may be wrapped with laboratory test data to provide a sense of credibility even though that test data may or may not support the claim. Other times the academic data may never have been subject to peer review or if it had, it may have been rejected, prompting the author to seek the unregulated forum of the web. The problem of misinformation is an old one, but our ability to find it is so much faster.

Printed materials have traditions and standards that provide various levels of credibility, but these traditions and standards have not immediately translated to Internet publishers. In academia, the most respected sources of information come from archival journals that have a rigorous peer review process. In general, these archival journals require that a manuscript undergo a peer review, usually by three independent reviewers. The intent of this review process is to make certain that published articles have been scrutinized for their soundness in scientific methods, merits and conclusions; the process is not intended to squelch controversial opinions, but to insure that any opinions are supported by sound science. Some journal acceptance rates for publication are as low as 25 percent of the number manuscripts submitted. Unfortunately, the review process can take from several months to two years for a single article.

In contrast, anyone can publish anything on the Internet. Any person with any cause can publish on the Internet with few, if any, academic or experiential credentials. Pity the child doing research for a school assignment who submits the name of George Bush, or Martin Luther King, or some other political or historical figure. Whatever that child previously has been taught about these people, he or she easily may be led to a well-disguised web site of a completely perverse nature. For professionals in search of technical information, especially that not having an academic stamp of approval, the consequences of accepting Internet information at face value can be equally perverse.

In absence of a recognizable peer review process, there are resources to guide sorting through the accuracy and suitability of Internet information. Major universities have developed resources to allow the assessment of web sites and it should come as no surprise that you can access most of this information from university web sites. Below are some of the key points from The University of Wisconsin-Madison libraries (<http://www.library.wisc.edu/instruction/instmat/webeval.htm>). Although these recommendations are from an academic institution, the guidelines may be considered applicable to any type of Internet search. This checklist is shown below:

- **WHAT** is the site about? Does it have the kind of information you need?
 - Look at the browser title bar, document title, content and links
- **WHO** created the page/site? Can you find and verify the author's qualifications, whether an individual or an organization?
 - Look for "About the author/About us" links for author's name and contact information.
 - Verify author's qualifications in another source, e.g. journal, encyclopedia, directory, etc.
 - Look for a link to the home page of the web site where the document lives.
 - Look at the parts of the URL or address to find organizational affiliation.
- **WHERE** is the information coming from?
 - Look at the address or URL: e.g., .edu=educational, .com=commercial, .org=organization, .gov=government, two letter country codes.
 - Look up domain owner with Whois search (http://www.networksolutions.com/en_US/whois/index.jhtml)
- **WHY** is this site on the web and how does it affect the information?
 - Look at "About us/Mission/Purpose," links, content and advertising.
 - Determine purpose of the site:
 - Advocacy or "soapbox" (tries to persuade).
 - Informational (often multiple viewpoints and references).

- Business or marketing (tries to sell).
- Entertainment.
- Choose sites whose purposes are compatible with your information needs.
- **HOW** accurate or credible is the page?
 - Examine references and bibliographies.
 - Verify information in another reputable source (e.g., encyclopedia, journal, book, other web site).
 - If you notice many errors in spelling, punctuation or grammar, question accuracy of other information.
- **WHEN** was the page or information created? Is the date important for the timeliness of the content?
 - Look for dates. Can you tell what they mean? Publication or copyright date? Last modified or updated? Date statistics gathered or published?
 - Note date you accessed the site. You need this to cite the web site!

While this checklist provides a simple means to assess Internet information, two of the bullets warrant emphasis. A WHY analysis is critical to assessing the objectivity of information. Web sites exist with a purpose or motive. Information presented within a web site supports the purpose of the web site and thus the information may be incomplete or biased. A HOW analysis further establishes accuracy and credibility. Factual information has a source and acknowledgement and assessment of the objectivity of these sources is critical to assessing Internet information.

Other sources of recommendations on evaluating web sites are found in college and university information science programs and, yes, their web sites, and in domain name registries.

Finally, in assessing opinions and supposed facts expressed on a web site, there is no substitute for blending the speed of access on the Internet with the patience required for good library research and connecting with friends and colleagues for their opinions of your findings.

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