2014

The Scholarly Publishing Scene: Materials Properties Data

Myer Kutz

Myer Kutz Associates, Inc., myerkutz@aol.com

Follow this and additional works at: <https://docs.lib.purdue.edu/atg>

Part of the [Library and Information Science Commons](#)

Recommended Citation

Kutz, Myer (2014) "The Scholarly Publishing Scene: Materials Properties Data," *Against the Grain*: Vol. 26: Iss. 5, Article 48.
DOI: <https://doi.org/10.7771/2380-176X.6882>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

From the African Diaspora and Geographies of Identity

To the Politics of Embryonic Stem Cell Research

Project MUSE is the trusted provider of authoritative humanities and social sciences content for the scholarly community, providing 100% full-text digital access to more than 600 journals and 29,000 books from many of the world's most distinguished university presses and scholarly publishers.

The Trusted Voice In The Scholarly Community.

PROJECT MUSE®

<http://muse.jhu.edu>

The Scholarly Publishing Scene — Materials Properties Data

Column Editor: **Myer Kutz** (President, Myer Kutz Associates, Inc.) <myerkutz@aol.com>

I spent the early portion of my professional career working as a mechanical engineer. (I hold mechanical engineering degrees from MIT and RPI.) Specifically, I was involved in thermal design. Among other pursuits, I worked on temperature control of the inertial guidance system used in the Apollo program. (If the components of such a system become too hot or too cold, it steers a vehicle off course.) Like most young men, I thought I knew everything. So, for example, when I needed values of materials properties, such as the thermal conductivity of high-performance metals to use in calculations to determine operating temperatures of key components of the Apollo inertial guidance system, I believed that tables of materials properties published in something called *Materials Selector* were sufficient for my purposes.

Materials Selector was an annual publication of *Machine Design*, an advertising supported magazine that arrived on my desk free of charge, as I recall, and *Materials Selector*

was replete with tables of materials properties data. I don't remember caring too much about whether there was any documentation testifying to the validity of the numbers in the tables. Whatever was in the tables was good enough for me, and I had faith in the results of my calculations. It was the equivalent of using Wikipedia today, I suppose. In any case, the projects I worked on didn't suffer any catastrophes because I used materials properties values that might not have been fully vetted. They were good enough for engineering work, as a variation of the old joke would have it. Besides, I knew that my calculations weren't the last word. The groups I worked in ran tests to determine how things would be under operating conditions.

I used tables from *Materials Selector* (with permission, of course) in my first book, *Temperature Control*, back in 1968. Years later, when I started putting together engineering handbooks, I keenly felt

a responsibility not to lead young practitioners astray. For the materials chapters in my *Mechanical Engineers' Handbook*, for example, I made sure to enlist expert contributors who would provide detailed references about the origins of materials properties tables in their chapters. As time went on, industry groups such as the **Aluminum Association** and the **Copper Development Association** became involved with and even sponsored the compiling of data in chapters covering materials. Those are the chapters that tend to have the most exhaustive materials properties data, although I should say that a handbook cannot strive for completeness in this area. There are just too many variables affecting the precise value of a material's property — the ingredients in it, how it was manufactured and the conditions under which the property was measured, to name just a few.

In the Internet age, I'm not sure how much of this vetting process matters to young engineers, who have been thought to be a principle market for engineering handbooks. The Internet is filled with materials properties

continued on page 89

Fictional researcher **Hannah Chen**, the main character in each scenario, is a representation of future patrons and the types of environments in which the business of acquisitions might be conducted. In scenario one, where individual researchers are akin to rock stars or action heroes, **Hannah** expresses how it feels “strange” to be on a university campus because she usually works remotely. **Hannah** achieves success as a researcher in scenario two because of her networking skills and talent in “following the money.” In scenario three, **Hannah**, who had never planned to work for a university, is employed by a private research co-op where she excels in project management and logistics support. In scenario four, **Hannah** thrives because she is mobile and able to shift from a research culture formerly based in North America to one that is based in China, India, and the Middle East.

The metamorphic change of the acquisitions department between 2015 and 2030 will be remarkable in a variety of ways. First, current dependence on cost-per-use (CPU) as a primary assessment tool will give way to an emphasis on a rate on investment approach (ROI). In other words, purchases and renewals will be measured more by what a researcher gets out of the product than by how much a product is used — quality over quantity. Second, the big deal will be replaced by big data. Digital repositories, shrinking grant funding, and open access will put a premium on data that requires laser-beam-type acquisition practices. Third, a new philosophy of service from one of isolation, control, and limited flexibility to one of cooperation, fluidity, and mobility will emerge as the cornerstone of acquisitions service. Fourth, all acquisitions professionals will need to think globally to address the transfer of information knowledge from West to East as Pacific Rim countries develop their knowledge bases and Web services like Baidu Scholar, the Chinese search engine for Websites, audio files, and images. In short, by 2030 acquisitions librarians will be living in a professional world that operates vastly differently than their 2015 environment.

Conclusion

Recent July 2014 headlines in the *Chronicle of Higher Education*³ including “Around Retail Giant Amazon, University Presses Tiptoe and Whisper” and “Did Amazon Just Change the World? Unlimited Kindle Books is a Game Changer” seem to forecast the 2030 scenarios.

The Changing Face of Acquisitions

2015	2030
Purchaser	Provider
Selecting	Sharing
Library Pays	End-User Pays
Static	Mobile
Catalogs/Discovery Services	Search Engines
Record Keepers	IT Specialists
Approval Plan	Purchase on Demand
CPU	ROI
Retire	Retool
Isolation	Cooperation
Control	Conduit
Big Deal	Big Data

Regardless of where we conduct business, on a corporate complex or an academic campus, the business of acquisitions will still exist. The acquisitions librarian will bring to the table a network that might include memberships to collections that support a research team. Memberships and access to research collections, in any format, for any period of time, are part of the acquisitions librarian’s contribution to the research team. Procurement skills, negotiation skills, project management, and flexibility will contribute to the acquisitions librarian’s success in this highly entrepreneurial and mobile environment. 🌐

Endnotes

1. Be Prepared, The Lion King Soundtrack, 1994.
2. ARL 2030 Scenarios, 2010, <http://www.arl.org/storage/documents/publications/arl-2030-scenarios-users-guide.pdf>.
3. *Chronicle of Higher Education*.

The Scholarly Publishing Scene from page 87

information, some of it reliable, some not, of course. I’m not writing with the benefit of market research into the matter, but it wouldn’t surprise me if it were the case that practicing engineers use whatever properties data they find on a site that looks legitimate and don’t bother much with investigating the data’s provenance. That said, there’s plenty of reliable data available and current computer-based calculations using good data look and feel a whole lot more reliable than the pencil and paper scratches that I and my masters had to make do with back in the day. Let’s check out a couple of examples.

To start with, there’s **ASM International’s** Website, which has a ton of information about materials and the processes used in manufacturing. (In days of yore, **ASM** used to deal only with metals, but for some time it has provided information on plastics, composites and ceramics, as well.) Whatever information **ASM** provides, it becomes the gold standard. Or engineers can go to MatWeb for materials

properties data. How reliable are such data? Let’s hear from MatWeb: “Most of the data in MatWeb has been supplied to us directly by companies in the supply chain — the manufacturers, or, less commonly, distributors or fabricators. Other data has been taken from standards organizations or from similar materials/known relationships by the MatWeb staff.” I found this statement when I looked at the properties of silver, MatWeb also listed three books as data sources, all from the 1990s. But never mind that, I’d guess that the data are good enough for many design purposes.

Over the last several years, publishers have told me that they’re interested in materials and chemical properties data. I tell them that my handbook contributors sometimes provide such data, but by no means can I promise that I could provide a handbook with comprehensive data. I’ve seen my handbooks open on desks where engineers were making calculations or designing something. I try to make my handbooks very useful for such purposes. But I would expect my handbook users to have to consult additional sources for materials properties data in some instances. I simply can’t include all of it.

I tell publishers that if they want to provide comprehensive data, then relying on outside handbook editors and chapter contributors won’t achieve that end. To get there, a publisher would have to employ a team of experts to put together such databases. They would have to compensate the experts, not an enticing prospect these days, when publishers tend to rely more on outside contractors than in-house employees. In addition, merely applying a publisher’s logo to data won’t guarantee that the engineering public would blithely accept such data as the equivalent of **ASM’s** gold standard data. But handbook editors and contributors can provide accurate and useful information about how materials are mined and made, how their properties can be improved, how materials can be used and in what situations — and how they degrade in certain conditions. In other words, how materials properties change over time as a result of how the materials are used. But it does take a village to produce comprehensive materials properties data and it doesn’t come cheap, nor does it fit a typical publisher’s current business model. 🌐