by terence k. huwe
Director of Library and Information Resources
Institute for Research on Labor and Employment
University of California–Berkeley

Library 2.0, Meet the 'Web Squared' World

FOR INFO PROS, THE BROAD ACCEPTANCE OF SOCIAL MEDIA PRESENTS A NEW CHALLENGE TO KEEP SERVICES RELEVANT.

By now even modestly funded libraries and their staff have been thinking about—and participating in—the Web 2.0 revolution. We often think of 2.0 life as a two-way conversation, which it most certainly is. But the web has been undergoing a related evolution that is rewriting the rules. Mobile devices, "active tags," and cloud computing are growing fast, and the 2.0 world has taken on a richer growth dynamic. Tim O'Reilly and John Battelle caught the digital sea change well over a year ago, at the 2009 Web 2.0 Summit meeting. In their paper "Web Squared: Web 2.0 Five Years On," they argue persuasively that the web is now more than static pages, blogs, and microblogs; the web now answers to an avalanche of data flowing from myriad input sources, including smartphones and a constantly growing list of other linked devices (see www.web2summit.com/web2009/public/schedule/detail/10194). These data are ubiquitous. They are generated by devices recording events, but the web also receives data from really smart mobile sensory entities: us. The result is a new data-rich terrain that is not just about Android apps or GPS in your car; it touches every aspect of our online lives. Indeed, the new web-squared world holds potential to merge our daily life experiences with the archiving and memory-fetching power of the network.

Much of our dialogue about Library 2.0 focuses on applications we can put to work on behalf of our users. This has been a welcome trend, because many of us are sharing knowledge about actual case studies, which demystifies the leap to 2.0 for everybody. But in the larger sense of Web 2.0, we are rapidly reaching a moment when perceptions of services and feedback about what we are doing will run at real-time rates. This will signal a major opportunity to change how we conceptualize information services. Hmm. We know about ramping up for new technologies and the 24-hour news cycle, but what else should we be thinking about? The answers are elusive but hold great promise.

O'Reilly and Battelle offer provocative insights about how to harness the web-squared era from the strategic high ground. Info pros will also have to join the creative brainstorming process if they wish to lead the way in a web-squared future. That's a tall order. To help us get started—or support initiatives already underway—here are some key characteristics of the web-squared world, some thoughts on our high-value physical space as an asset, and some questions—which may take time and effort to answer fully.

How the Web Was 'Squared'

In order to move quickly in the web-squared world, we need a firm grasp of exactly what is going on and why. Finding time to do so is not easy, as technology cycles continue to accelerate. My sense is that many of us know a great deal about the 2.0 movement and where it is headed, but demands on our time keep our focus close to the ground. What is

happening in the "blue sky" of research, or indeed, in the "cloud"? It turns out that there is quite a bit happening.

There are two key factors in the web-squared world that are driving change: community and immediacy. Our metaphors for the network now must stretch to include "community" in new and often exciting ways; the "smart mob" no longer goes far enough. Text- and image-based thinking, writing, and teaching each has a two-dimensional, single-author-driven "feel" to it, even nowadays. The web-squared world adds depth and context that cannot be caught in most single artifacts, whether text, image, or even video. This depth is added by the plethora of sensors that we share the world with: smart meters for our utilities, CCTV in Great Britain, our smartphone cameras and microblogs, and our GPS systems, just to name a few. O'Reilly and Battelle argue that these massively productive data generators are redefining the concept of collective intelligence. Images taken and transferred to Twitter, Flickr, and YouTube create new datastreams that change second by second. When you add these datastreams together with solid, static webpages and predictable and reliable web-based services (such as news services and online shopping), what you have is a marketer's dream come true: instantaneous feedback on products, very rapid "polling" of opinions on anything from restaurants to politics, and ultimately, a group of co-creators that numbers in the billions.

Second, what is good news for the marketer is also good news for our profession. The squared web allows for a broader definition of collective intelligence that can reasonably encompass both machine- and human-created information. This rich new mix of contributing elements can be woven in innovative ways, most notably when it comes to teaching and learning. The very "immediacy" of the web-squared world holds exciting potential for classroom teaching strategies, as well as for our perceptions of basic research practices.

A Fresh Look at the 'Known'

There is much more to say about community and immediacy in the web-squared world, but I will limit my trend watching to just four important perspectives on the squared-web era, and what questions might arise for us as we think about how to respond.

Mobile applications are connected applications. If you read *The New York Times* and other high-quality reviewers of new technology, you might think that smartphone applications (apps) are mostly for fun and entertainment. Certainly they are a source of endless fun, but they are also much more than that. Every app has a double identity as a "connected application," running in plain sight on the internet. The datastream that flows from the "app-i-sphere" has become a bonanza for startup firms with good ideas about how to use real-time data, such as Groupon and Blippy, which is "a website where people obsessively review everything they buy" (see http://blippy.com). How can we harness that datastream to "push" services and "pull" attention to our services? Twitter feeds are just the beginning. It's time to think much bigger.

Real things have internet "shadows." With so much data being generated about everything we do, we have gained what O'Reilly and Battelle call an internet "shadow" in just a few short years. All of our recorded actions combine to make a coherent shadow-self online. It's a useful metaphor because the shadow follows the person, and thus *following the shadow* can cast light on pathways taken. The metaphor of the data shadow has been well-plumbed in speculative fiction. Peter F. Hamilton, writing in his Dreaming Void series of science fiction, envisions a world where the net becomes the "U-Verse," and everybody has a "U-Shadow" that they use to communicate (New York, Del Rey, 2008). Hamilton lives in southern England, and most likely, he is aware that he already has a shadow of his own. In the world of data shadows, how can information services integrate themselves more closely with users? The short answer is "every way possible." The detailed answers will come by trial and error.

Real time is for real. In past columns, I have commented on Twittering food wagons and bakeries as examples of how to keep a microblog genuinely relevant. What these vendors (and an ever-increasing number of retailers) know is that real-time data on customer behavior has become a useful, even reliable, source for planning services. The question for us is how can we put real-time data about our users to work? We have a good sense of how to conduct e-metrics, so that is a basis for further research and discovery.

Traditional use of space and services blends well with innovation. The web-squared era accelerates the ways in which we might put our "smart" physical space to work, right now, using real-time information. A high percentage of library physical spaces are well-networked, allowing users to connect their devices in a number of ways. We can "square" our use volume by inviting users to co-create with us with the tools they already have. For example, why not invite users to comment on their online research while they are doing it, as well as how and what they are studying? Some of us are already doing this, and there is room for more co-creation of this sort. Likewise, library space itself is no longer chained to "traditional" uses; the commons area is a terrific site for conferences, meetings, small groups, and more. If we can monitor what is happening at a real-time rate, what strategies can we create to make our space more relevant, more valuable, and more beloved? How we answer these questions will have a large impact on our future success in public services and outreach.

Question We Should Be Asking

The web-squared era was augured long ago in the 1980s, by Xerox PARC researchers who imagined a digital domain, indeed, a "web of things" where the real and the virtual become connected. O'Reilly and Battelle are telling us that we are either already there or close to arriving at such a moment. For info pros, the broad acceptance of social media presents a new challenge to keep services relevant. Library-based mashups, data on research practices, and similar information sources are valuable and interesting to—well, just about anyone who works in education. How can we analyze these data and what they say to advantage? That is the first of many questions I will conclude with.

The second question is, if data are ubiquitous and can be perceived as creating a shadow for every networked user, how must our services evolve? Is it enough to focus on the smartphone or the tablet/reader as the new frontier, or should we set our sights higher? Here's another consideration: Social media users love connectivity, but they are struggling with ways to set boundaries (doubters: read up on Facebook's privacy travails). This implies that trust is now highly prized, closely monitored, and actually craved by social media users. Libraries and universities are among the most trusted institutions in the U.S., by a number of measuring tools. How can librarians become leaders in establishing trust in this web-squared world? Could it be that there is now a greater need for information specialists in society who can partner with users and help build trusted online domains?

As I said, the answers to these questions may not appear overnight. But if we can commit sufficient energy to search and discovery, experimentation may lead to innovation, innovation to relevance, and relevance to respect. These seem like desirable outcomes not only for the web-squared era but also for every new moment that will follow in the wake of new and "disruptive" technologies. ■

Terence K. Huwe is director of library and information resources at the Institute for Research on Labor and Employment at the University of California–Berkeley. His responsibilities include library administration, reference, and overseeing web services. His email address is thuwe@library.berkeley.edu.