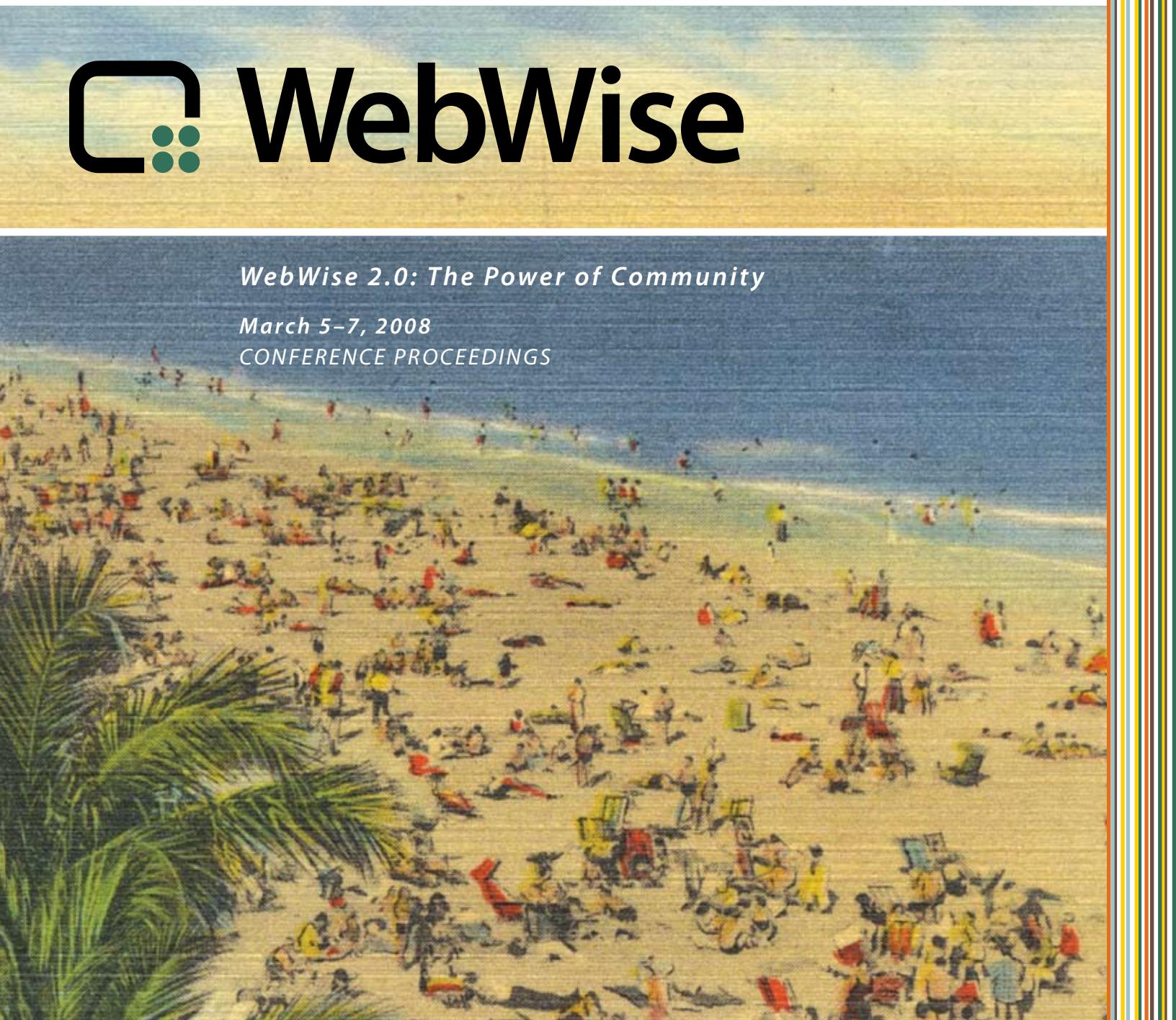




08



WebWise

WebWise 2.0: The Power of Community

March 5–7, 2008
CONFERENCE PROCEEDINGS

INSTITUTE OF MUSEUM AND LIBRARY SERVICES

1800 M Street NW, 9th Floor

Washington, DC 20036

202-653-IMLS (4657)

www.imls.gov

Printed February 2009 in the United States of America

Written by David Green, except where otherwise noted

The 2008 WebWise Conference on Libraries and Museums in the Digital World was held March 6–7, 2008, with pre-conference workshops on March 5, 2008. Conference activities took place at the Miami Beach Conference Center in Miami Beach, FL.

The 2008 WebWise Conference was co-hosted by the Institute of Museum and Library Services and The Wolfsonian–Florida International University.

**Library of Congress Cataloging-in-Publication Data
not available at the time of printing.**

Dear Colleague

The ninth annual IMLS WebWise Conference on Libraries and Museums in the Digital World had as its theme *WebWise 2.0: The Power of Community*.

This theme is particularly relevant as we continue to move further into a world in which it seems that “everyone is connected” through cell phones, text messages, and the Internet. We know from the technology survey that IMLS conducted in 2004 that most museums and libraries today recognize the power of the Internet as a communication tool and that most have Web sites that serve to guide visitors to their doors, entice audiences with images from current exhibitions, and provide information about their institution and collections. This conference went a step beyond these basics to focus on the innovative ways that cultural heritage institutions can use technology to engage online audiences, create communities of interest, and build strong, sustainable programs to support research, education and lifelong learning.

We brought leading experts together to talk about social networking technologies, such as blogs, wikis, and podcasts, and we highlighted outstanding projects and tools that extend the capacity of museums and libraries to make their collections and programs more accessible to all types of users, from educators to students and the general public.

Our partner for the 2008 conference was The Wolfsonian–Florida International University, which allowed us to provide the WebWise Conference for the first time in the South. The partnership with The Wolfsonian is a response to earlier participant suggestions to hold the conference in different regions of the country in order to give more people an opportunity to attend, and we are pleased that this has in fact happened. We have now held the conference in the Midwest, West, and South, in addition to the East Coast, and in each area the response has been enthusiastic and gratifying.

We are also grateful for the contribution of the National Endowment for the Humanities, which organized and sponsored the pre-conference workshop on “Digital Applications for the Humanities,” and to the Florida Center for Library Automation and additional sponsors and supporters for their contributions.

Sincerely,



Anne-Imelda M. Radice, PhD
Director, IMLS



Table of Contents

Introduction	4
The WebWise Partners: Welcoming Remarks	6
Pre-Conference Workshops	8
Workshop 1: An Introduction to Web 2.0 for Libraries and Museums	9
Workshop 2: Digital Applications for the Humanities	16
Conference Day One	26
Keynote Address: Rights and Responsibilities Online: A Paradox for Our Time	27
Session 1: The Power of Discovery	30
Keynote Address: The Power of Trust: Forging Interconnections Between Virtual and Physical Worlds	34
Session 2: The Power of Presentation	36
Session 3: The Power of the User.....	40
Conference Day Two	44
Keynote Address: Animating the Archive	45
Session 4: The Power of Collaboration	49
Conference Wrap-Up: What Does It Mean and Where Are We Going?.....	54
Resources.....	56
Full Text of Keynote Address: Dr. Jonathan Fanton.....	57
Full Text of Keynote Address: José-Marie Griffiths.....	62
Full Text of Keynote Address: Dr. Jeffrey Schnapp.....	70
Pre-Conference Workshop Speaker Biographies.....	76
Conference Speaker Biographies	79
Project Demonstrations	88
Glossary	94



Introduction

Introduction

None of the roles or models of institutional identity formation will vanish with the wave of a digital wand branded 2.0 or 3.0. But they are already undergoing substantial modification and bringing in their train challenges to conventional ideas of ownership, restricted use, storage and display, content creation, and curatorial control.

— Jeffrey Schnapp

Since it was coined by Tim O'Reilly in formulating the first Web 2.0 Conference in 2004, the term "Web 2.0" has definitely caught on as a designation of a second generation of Web design and experience that emphasizes a high degree of interaction with, and among, users.¹ Rather than simply consulting and reading Web pages, the Web 2.0 generation is contributing material and participating in new online communities. A new generation of Internet technologies and easy-to-use tools is enabling individuals and groups to share news and observations and to collaborate in creating and organizing documents, events, and projects in these new networks. Certainly for the young, the new social networking sites are replacing the malls and parks where an earlier generation met. A similar transition is occurring in many institutions, where activities and transactions online intersect and collide with their counterparts in physical space. As the nature of community is affected by these new technologies, archives, libraries, and museums will need to strategize how they address and harness these new patterns for their own future.

The 2008 WebWise Conference addressed these issues with its theme, *WebWise 2.0: The Power of Community*. Over the course of two and a half days (March 5-7, 2008), several hundred members of the archives, library, and museum community met in Miami Beach, and online via a conference blog, to consider the implications of these new ways of organizing knowledge and social interaction for their own institutions. There were many examples of institutions collaborating with each other to

produce more sophisticated Web sites, collaborating with their patrons and discovering new sources of expertise, and increasingly reaching out to engage their communities in a more even-handed conversation than before. What the future held was unclear, especially with regard to the relationship between the physical world of bodies and buildings and the new virtual worlds and virtual communities. In his wrap-up speech to the conference, Rob Semper suggested opening a research agenda for the next WebWise conference, inviting experts from other fields to contribute to an extended conversation about the implications of these new capabilities for institutional life.

In the meantime, presentations of the *WebWise 2.0* speakers can be seen and read in several formats. Many of the conference papers appear in the online journal *First Monday* (www.firstmonday.org), which has been publishing WebWise papers in a special issue each year since the first conference in 2000. Full-streaming video and slide presentations from the conference are available for viewing online (www.tvworldwide.com/events/Webwise/080306), and video clips of all the speakers can also be seen on uVu, a Service of Digital 2 (<http://uvu.channel2.org>).

This summary report provides another view of the conference: an abbreviated overview of participants' observations and discussions about the new kind of social contract that is being woven between cultural institutions and their communities, catalyzed by the new creativity and communications tools easily available on the Internet.

¹ Tim O'Reilly, "What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software," *O'Reilly Media*, September 2005, www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

The WebWise Partners: Welcoming Remarks

For nine years, the WebWise conferences have offered cultural heritage professionals a forum to discuss and learn about themes critical to the role of libraries and museums in the digital world. Three partners hosted the 2008 WebWise Conference: the Institute of Museum and Library Services (IMLS, www.imls.gov), the Wolfsonian-Florida International University (www.wolfsonian.org and www.fiu.edu), and the National Endowment for the Humanities (NEH, www.neh.gov). Each organization has extensive interest and experience in promoting cultural heritage using digital technologies. The conference opened with welcoming remarks from the leaders of the three sponsoring organizations.

Florida International University

Dr. Ronald Berkman, provost of Florida International University (FIU), described the rapid evolution and growth of FIU, from its opening in 1972 as a two-year, upper-division school, to today, when it is one of the nation's top urban public research universities. FIU began delivering online courses in 1998 and today has 365 sections online, from the arts and sciences to nursing and social work. Dr. Berkman was curious why universities, working for decades at the leading edge of new digital technologies, had not been more active in investigating the impact of those technologies on the educational process, noting, for example, that it wasn't until quite recently that the National Association of State Universities and Land-Grant Colleges (NASULGC) had asked its members to formally consider these questions. While new technologies can foster long-distance engagement and a more active participation by a wide array of students, they can also induce a greater mechanization of teaching and learning. Dr. Berkman thus welcomed the timeliness of the WebWise exploration and the relevance of its theme, The Power of Community, just as we are beginning to understand something about the new communities that are being created online. Will they erode other physical communities, or will they complement them?



Institute of Museum and Library Services

Dr. Anne-Imelda M. Radice, director of IMLS, was struck by the relevance and parallels between Web 2.0 and the issues of conservation and preservation that were at the heart of the 2007 WebWise Conference. While the 2007 conference demonstrated how digitization was a key component of cultural stewardship, the 2008 conference would explore how digitization could engage communities more effectively with cultural collections. She noted that, in 2007, IMLS had announced its *Connecting to Collections: A Call to Action* program to raise awareness of the need for conserving national heritage materials. After a very successful national summit in June 2007, the Call to Action took to the road in a series of forums designed to inspire participants to share what they had learned and to make collections care a top priority. The first forum, *Preserving America's Diverse Heritage*, was held in Atlanta; others will be announced on www.imls.gov/collections.



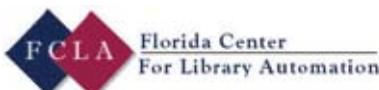
National Endowment for the Humanities

The Honorable Bruce Cole, chair of the NEH, declared that it wasn't until his arrival at the endowment that he understood the potential of the Internet to educate more people more deeply about our cultural heritage. The NEH believes that digital archiving will lead to a broader and deeper understanding of our world and that, for humanists today, new discoveries will increasingly depend on mining data and combining information from many heterogeneous sources. Dr. Cole spoke of the creation of the Digital Humanities Initiative in 2002 (later recast as the Office of Digital Humanities), which, under the direction of Brett Bobley, is already making a real difference, partnering not only with IMLS but also with the National Science Foundation and the Department of Energy. The impact of this new office can be seen in the fact that 70 percent of applicants to the new category of Digital Humanities Start-up Grants had never before applied to the NEH. Like many of the IMLS grants, these encourage collaboration. Both the NEH and IMLS benefit by reaching out to new constituents and inspiring new kinds of projects. Just as scientists study data sets, so those in the humanities are increasingly able to use their own kind of data sets in their research. As museums and libraries are the key keepers of that material, Dr. Cole declared that it is critical that the humanities community continue its close relationship with these institutions.



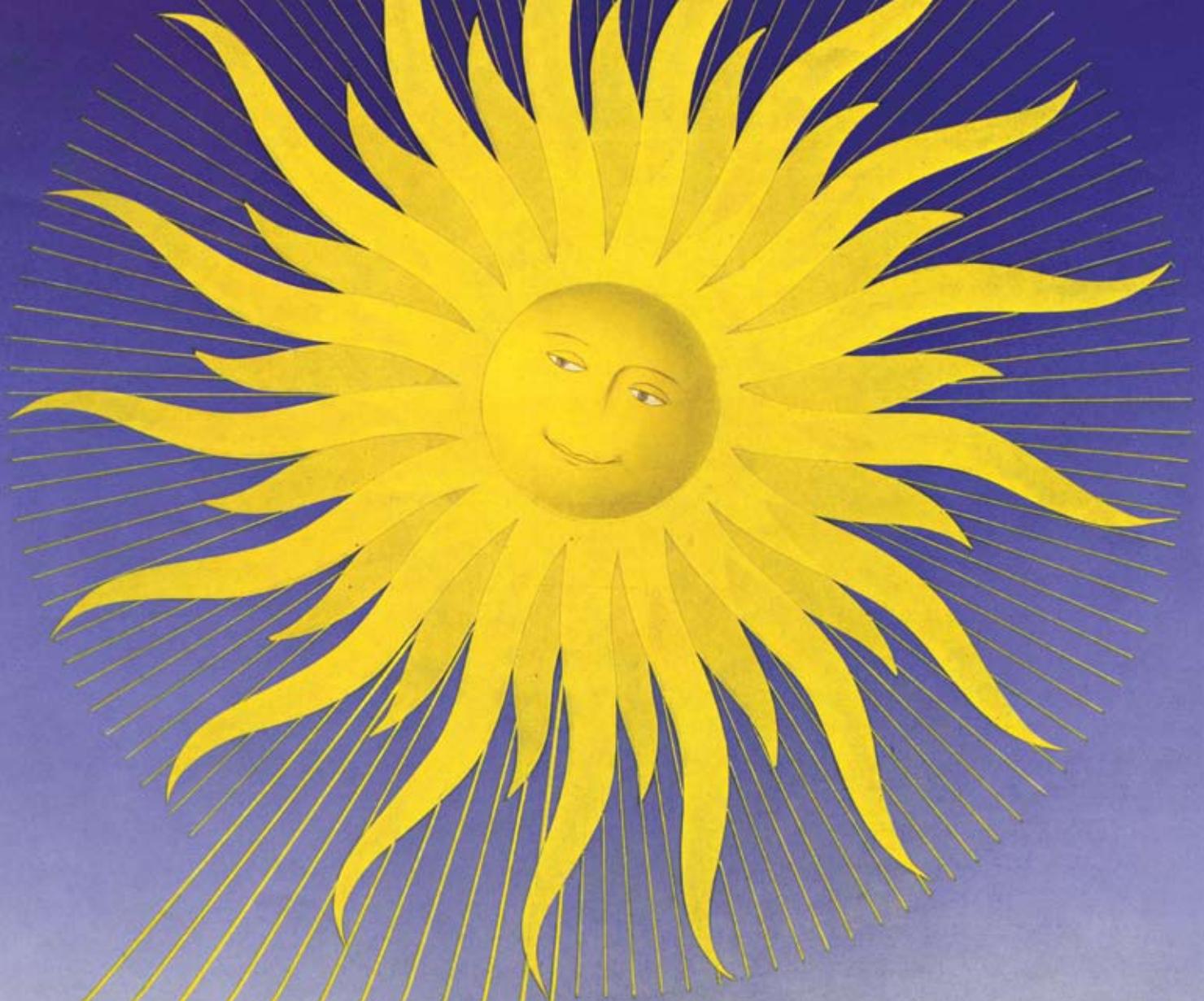
WebWise was presented with additional support from:

Submerge Yourself...



2008 Program Committee

- Matt Burdetsky, Capital Meeting Planning, Inc.
- Priscilla Caplan, Florida Center for Library Automation
- Joel Hollander, the Wolfsonian-Florida International University
- Cathy Leff, the Wolfsonian-Florida International University
- Susan Malbin, IMLS
- Paul F. Marty, Florida State University
- Joyce Ray, IMLS
- Bernard F. Reilly, Center for Research Libraries
- Marsha Semmel, IMLS
- Robert Semper, the Exploratorium
- Susanna Temkin, the Wolfsonian-Florida International University



Pre-Conference Workshops

Workshop 1: An Introduction to Web 2.0 for Libraries and Museums

Paul Marty, assistant professor in the College of Information at Florida State University and moderator of the first pre-conference session, introduced the panelists and described the three-part division of the morning: a definition of Web 2.0-related terms; panelists' favorite examples of Web 2.0 at work in their institutions; and a look at some pros and cons of using Web 2.0.

Professor Marty first quizzed the audience to get a sense of who currently blogged, twittered, subscribed to, or ran their own RSS feeds or podcasts. How many used and contributed to del.icio.us, LibraryThing, Wikipedia, MySpace, Facebook, LinkedIn, or CiteULike? How many were looking up these terms on their laptop, PDA, or iPhone?

Having taken the pulse of the crowd (and ensuring they'd be responsive), Professor Marty introduced **Helene Blowers**, digital strategy director at the Columbus Metropolitan Library, who opened her presentation on Web 2.0 terminology by recalling the impact that Web 2.0 had when it was introduced: from the April 2006 Newsweek cover, "Putting the 'We' in Web," to the December 2006 Time cover naming each of us "Person of the Year."



Figure 1. Helene Blowers, Web 2.0 on news magazine covers, 2006.



Figure 2. Ken Yarmosh, Web 2.0 watermill process.

The key functions of all Web 2.0 tools, Blowers declared, were to enable individuals to collaborate and share information online. For sharing photographs, we can use Flickr; for videos, YouTube; for bookmarks, del.icio.us; for presentation slides, Slideshare; for knowledge, Wikipedia; and for sharing everything, MySpace or Facebook. Tim O'Reilly, who coined the term "Web 2.0," defined the essence of sharing knowledge as "harnessing collective intelligence,"² which Blowers thought was best illustrated by a Ken Yarmosh diagram. His "Web 2.0 Watermill Process" shows the complex interaction of knowledge collection, knowledge sharing, knowledge building, and knowledge discovery, always with people at the center.³

Demonstrating the huge variety of available Web 2.0 tools, Blowers showed a mosaic of their logos onscreen, asking the audience to identify the ones they knew. Of the 114 displayed, she said she had

² "What Is Web 2.0?," O'Reilly Network, September 30, 2005, www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

³ Ken Yarmosh, "Why Web 2.0 Matters to Your Business—The Web 2.0 Watermill," *Technosight*, December 14, 2005, www.technosight.com/why-web-20-matters-to-your-business-the-web-20-watermill

Workshop 1: An Introduction to Web 2.0 for Libraries and Museums



Figure 3. Helene Blowers, logos. of Web 2.0 tools.

used just thirty-five herself. Each had its own niche, and she advised participants that, in looking around for a tool, they should look for one that fits the niche they need to fill.

Blogs

Blowers' guided tour of types and examples of Web 2.0 tools started with blogs. There were more than 70 million blogs in March 2007, and they had been doubling in number roughly every six months for the last few years.⁴ Blowers recommended that institutions use blogs both for internal and external conversations, but she urged the audience to experiment with blogs internally before going public. Blogs she recommended included those at the Darien Library, where the Director's Blog shares news across the community, and the Charlotte Public Library (www.darienlibrary.org/directorsblog), where all 35 staff members keep one another up-to-date about what's going on via an internal blog. As easy starter tools for would-be bloggers, Blowers recommended Blogger (www.blogger.com) and Bloglines (www.bloglines.com).

Wikis

A Hawaiian word meaning "quick," a collaborative Web space that anyone can edit, or a useful tool for sharing museum or library knowledge to engage users? All these possible definitions of a

wiki, which Blowers offered in a quick quiz of the audience, turned out to be correct. A wiki is a quick way to create a Web site using a simple markup language, enabling anyone to add or edit information (although in creating a wiki, you can determine levels of access for different users). While a blog is a personal, often idiosyncratic, space, a wiki is a communal working space. A wiki also keeps track of the changes made to information (versioning), allowing users to refer to any former state of the wiki, something that can't be done in a blog.

Library wikis that Blowers recommended included a subject guide at the St. Joseph Public Library, in South Bend, Indiana (www.libraryforlife.org/subjectguides), where librarians answer questions on, say, American history, and the Princeton Public Library's Book Lovers Wiki (<http://booklovers.pbwiki.com>). While these are wikis designed for the public, the Charlotte Public Library has an internal wiki for staff to use for strategic planning purposes.

RSS

Blowers again quizzed the audience: "Is RSS short for 'Really Simple Syndication'; an effective tool for keeping up-to-date; or a great way to find out what people are saying about your organization?" All are true. By using an RSS reader (such as bloglines, myyahoo, Google Reader) and signing up for specific information feeds, one can be alerted to regular updates, new information, or other changes on a Web site. Hennepin County Public Library, for example, has RSS feeds for new catalog information, the latest library news, classes, subject guides, and the like (www.hclib.org/pub/search/RSS.cfm). RSS can be an effective tool for discovering how an institution is perceived by establishing a news feed that tags and sends a message any time the institution is mentioned online. This can also be done with Flickr and YouTube for an institution's images or video references.⁵

⁴ Dave Sifry, "State of the Blogosphere," April 2, 2007, www.sifry.com/stateoftheliveweb

⁵ See "3 RSS feeds every Library Director should subscribe to..." *LibraryBytes*, August 6, 2006, www.librarybytes.com/2006/08/3-rss-feeds-every-library-director.html

Podcasts

"Word of the Year" for 2005, a podcast is simply an audio file that is distributed, usually through RSS feeds, and played back on portable media players or computers (www.oup.com/us/brochure/NOAD_podcast/?view=usa). Podcasts can also be made available on a Web page. Both the Lansing Public Library and the Homer Library in Homer Glen, Indiana, have discovered that helping teens make podcasts about their favorite books is an effective tool for engaging this age group. Fellow teens eagerly subscribe to hear the voices and opinions of their peers.⁶ Podcasting, Blowers assured the audience, is easy to master; all that is needed is a microphone and a computer. Odeo (www.odeo.com) and Audacity (<http://audacity.sourceforge.net>) are two free, simple recording and editing tools. Adding a mike to an iPod is another simple solution.

Social Networking

Social networking is certainly the most popular form of online activity for those under 20, on sites such as MySpace and Facebook. Some library pages on MySpace include Denver Public Library's eVolver and the Charlotte-Mecklenburg Public Library's LibraryLoft.⁷ That library recently gathered 1,800 students for a Friday night event during a teen read week after advertising only on MySpace. Rather than going to a library Web site to discover a library event, teens can find it right on MySpace. The equivalent on Facebook is a fan group, where people can connect and share information.⁸



Figure 4. Messages created with image generators.

Image Generators

The last topic Blowers covered was image generators and image-hosting sites. An online image generator, such as Big Huge Labs, enables clients to make image-based messages, magazine covers, trading cards, press releases, and more, simply by uploading a photo, adding text, and editing. During National Library Week, for example, the Columbus Library made a poster using an image generator, inviting the public to submit images of themselves and how libraries motivate them.

Blowers concluded by pointing out that the bottom line with all the technologies she had introduced is that they are about expanding communities, empowering individuals, engaging users, and encouraging participation. To engage, one has to have a certain state of mind: Web 2.0 is not so much about the tools as about a shift in sensibility toward sharing information.

Paul Marty agreed that this shift in attitude was key, and told a story that illustrated some of the unexpected ramifications of using Web 2.0. Always interested in other professors' syllabi (and hoping to discover a Web 2.0 syllabus-sharing system), Marty, who enjoys reading students' blogs on their courses, discovered that one of his articles was being used in a class at the University of Glasgow. At one point a student blogger reported how the whole class was confused about a particular passage of one of Marty's articles. One can imagine the surprise of the class when Professor Marty himself entered the discussion (a true *deus ex machina* moment).

⁶ For examples, see www.lansing.lib.il.us/webfiles/podcast/teen_poetry_cafe_2007.mp3 and www.homerlibrary.org/audioreviews.asp

⁷ www.myspace.com/denver_evolver, www.myspace.com/libraryloft

⁸ See, for example, the Charlotte & Mecklenburg County Library's page at www.facebook.com/pages/Charlotte-NC/Public-Library-of-Charlotte-Mecklenburg-County/8155960271

Workshop 1: An Introduction to Web 2.0 for Libraries and Museums

In comments and questions from the audience, two other networking sites were mentioned: LinkedIn (for professional networking) and Google Docs (for collaborating on documents). To a question about how to make an engaging institutional blog, panelists Robert Semper and Helene Blowers agreed that, as the blog is such a personal medium, institutions should encourage staff with strong personalities to blog, rather than try to write from an institutional point of view.

Professor Marty moved on to the second section of the workshop, showing examples of how institutions are using Web 2.0 tools. He discussed the “personal gallery” tool that enables visitors to create an online collection of favorite works. Arts ConnectEd, the education site of the Minneapolis Institute of Arts, features personal slide shows that individuals can create, annotate, and share with others.⁹ It’s proving very useful for K-12 classes. However, the original idea behind such a capability, that the “collector” creates a bond with the museum through a cycle of creating the personal gallery, visiting the works in the museum, going home and studying the favorites online, only to return again to the museum, is not working out as planned. People enjoy the process of creating a gallery, but they tend not to return.¹⁰

Another example of a personal gallery tool is the Getty Guide, with which visitors can create bookmarks of their favorite works in the Getty Museum and then print out a map of where their bookmarked artworks are physically located.¹¹ Although this could be said to encourage visitors to narrow their focus, the museum does gain useful information on who is

looking at what and how it might use that information to help guide visitors in different ways.

Professor Marty then introduced **Elizabeth Yakel**, associate professor at the University of Michigan School of Information. Interested in improving archival finding aids and access to archives, Professor Yakel had started experimenting with Web 2.0 tools two years earlier and had arrived at some useful conclusions.

Yakel had started with a set of 65 small, digitized photography collections of the “American Intervention in Northern Russia,” nicknamed the “Polar Bear Expedition,” in which several units of soldiers, mostly originating from northern Michigan, were sent to fight the Bolsheviks at the end of World War I.¹² Yakel wanted to engage users and include their comments and corrections on the photographs and archives. Available for two years, the site now has hundreds of comments, including exchanges between contributors about the material. For Yakel, the project has turned out to be not so much about creating better finding aids as about connecting people with collections, with parts of their history.

Since this is one of the earliest examples of an archive using Web 2.0 tools, Yakel said she might approach the project differently a second time around. Issues to consider more carefully would include how “authority” is shared and how the curator is positioned. She realized that while questions are usually directed to the archivist, in many cases they might be directed more usefully to the community. Yakel is now trying a collaborative filter on the site, as she’s seen sites that do this well. One is the Everglades Digital Library, where, after visitors rank lesson plans and findings, they receive recommendations for what else they are likely to be interested in on the site (“if you like these papers then you might like to look at these”).¹³ This can be helpful in finding items that otherwise might not be discovered.

⁹ See the art collector at www.artsconnected.org/art_collector/user/newuser.cfm

¹⁰ See Silvia Filippini-Fantoni and Jonathan Bowen, “Bookmarking in Museums: Extending the Museum Experience Beyond the Visit?,” in J. Trant and D. Bearman (eds), *Museums and the Web 2007: Proceedings*, Toronto: Archives & Museum Informatics, March 31, 2007, www.archimuse.com/mw2007/papers/filippini-fantoni/filippini-fantoni.html

¹¹ www.gettyguide.edu/mygetty

¹² <http://polarbears.si.umich.edu>

¹³ <http://cwis.fcla.edu/edl/SPT--Home.php>

One of the institutions that has done the most with Web 2.0 is the National Archives in the United Kingdom, which has two quite different sites. One, *Moving Here*, outlines how to go about a records search in tracing a family or ethnic group.¹⁴ Visitors can not only use the records but also contribute their own immigration stories, in effect becoming part of the archives themselves. The other site is *Your Archives*, a wiki with material mostly contributed by users, designed to complement information held in the main catalog, research guides, and the National Register.¹⁵ Users contribute and edit pages on different subjects. Some pages link to National Archives collections, others show finding aids. Some users even help by explaining how to use the older types of finding aids where access is difficult.

Beyond Brown Paper is an example of a community-building site using photographs from the archives of the Brown Paper Company, which for a century has been a major part of the town of Berlin, New Hampshire.¹⁶ Prompted by images of everything from company buildings, workers, and machines to the company school, visitors to the site have commented on different aspects of company town life, including identifying many of the people in the photographs. For example, many of the children in this 1949 school photograph, taken at the Brown Company's Sanmaur depot, have been identified on the site, even though many of them now live in Quebec.¹⁷

Yakel commented on the success that the Library of Congress has had in gathering information from the public about photographs in some of its collections, using the Commons section of Flickr (www.flickr.com/commons). The Australian National Archives has also used Flickr in its Picture Australia initiative, encouraging citizens to post their images



Figure 5. Schoolchildren in Sanmaur, 1949. Brown Company Collection, Michael J. Spinelli Jr. Center for University Archives and Special Collections, Herbert H. Lamson Library, Plymouth State University.

of the nation to augment its own collections. These sites clearly represent an important paradigm shift, away from explaining collections to the public toward fostering a community around collections and learning more about them.

Professor Yakel concluded that while she was expecting a few comments and corrections from the public about the "Polar Bear" collection, she was completely unprepared for the size of the response, which included the donation of 20 new collections. Not only did the archives have to establish a new work flow in order to incorporate all the new material, but they also had to learn how to review and analyze the comments from the public. This is a new activity for archives and provides an opportunity to carefully think through objectives and strategy when planning the next online collection. What kinds of services and systems would help? Would it be useful to establish a blog? She advised audience members to be very reflective when they experiment with new formats, carefully considering what works and what doesn't.

In questions, there was interest in developing the ability to connect individuals' "personal galleries" across different museums. Panelists commented that this was currently unlikely, both because museums are still keen to keep their identities in the forefront (though visitors show little interest in that) and, more important, because museums had still not achieved the ability to share their data effectively and to

¹⁴ www.movinghere.org.uk

¹⁵ <http://yourarchives.nationalarchives.gov.uk>

¹⁶ <http://beyondbrownpaper.plymouth.edu>

¹⁷ <http://beyondbrownpaper.plymouth.edu/item/973#comments>

Workshop 1: An Introduction to Web 2.0 for Libraries and Museums

enable searches across collections. Marty recalled Eleanor Fink's challenge, at the first Museums and the Web conference, in 1997, to make it possible to search across the collections of every museum in the world by 2005.¹⁸ We are not there yet.

Robert Semper, executive associate director of the Exploratorium in San Francisco, spoke next about how Web 2.0 technologies are working to define and develop museums' social engagement. Emphasizing how quickly Web technologies are moving, Semper opened with a chart showing how long it took different technologies to reach 25 percent of U.S.

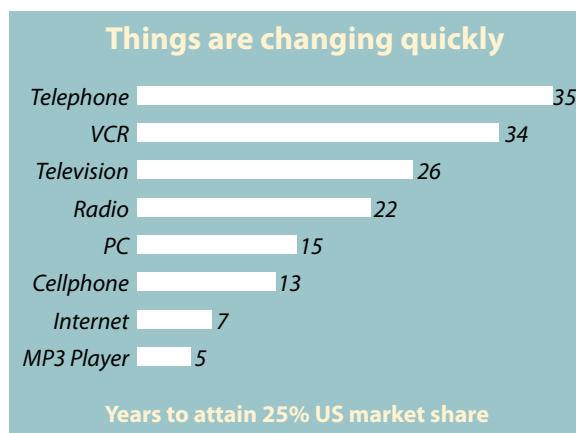


Figure 6. Robert Semper, rate of adoption of new technologies.

market share: the Internet took just seven years compared to the telephone's 35 years.

Semper thought the most powerful engines driving the Web 2.0 world are mashups, which combine two or more sets of technologies or content by embedding software hooks that link the two. The combination of Google Maps with just about any content is perhaps the most frequently encountered mashup. San Francisco's KQED radio station, for example, uses Google Maps to show the physical relationships among news stories around the city.

Semper characterized the Web 2.0 opportunity for museums as a **mashup** between cyberspace

and museum space and gave three examples. One is connecting networked devices within a museum. This might be the classic audio tour extended to cell phones, iPods, and other devices that can connect to the Web. The opportunity here is to figure out how museums get to work with the devices that people bring with them. Or, as he put it, "how we connect into their world, rather than their having to connect to ours."

A second opportunity lies in the idea of "alternative curation." Although museum staff are often shocked when they discover visitors have alternative audio guides, such as the Art Mobs guide to the Museum of Modern Art or a creationist's guide to the American Museum of Natural History,¹⁹ there is an opportunity to engage in a dialogue with these visitors, who have a different perspective on coming to "our place" and will blog about it.

Related to this is the third opportunity: of cocreating the experience of a museum visit. Visitors are not only text-blogging but also posting photographs and videos about their museum visits. In a recent scan of the Internet, the Exploratorium discovered 123 pages of videos on YouTube and 6,143 photographs on Flickr reporting on visits to the museum. What happens to institutional control when the tools of production are in the hands of your visitors?

All in all, Semper concluded, Web 2.0 offers unique opportunities for museums to engage their audiences, but at the cost of relinquishing a measure of control that they now enjoy.

In introducing **Holly Witchey**, director of new media at the Cleveland Museum of Art, Paul Marty raised a cautionary note about generational approaches to the Web, especially regarding privacy. In a course on interface design, Marty asks his students to design the vending machine of the future, which invariably knows everything about everyone's junk food preferences, although privacy never seems to concern any of the students.

¹⁸ Eleanor E. Fink, "Sharing Cultural Entitlements in the Digital Age: Are We Building a Garden of Eden or a Patch of Weeds?," Museums and the Web conference, 1997, [www.archimuse.com/mw97/speak/fink.htm](http://archimuse.com/mw97/speak/fink.htm)

¹⁹ http://mod.blogs.com/art_mobs

A technologist and art historian, Witchey continued this cautionary theme, advising museums to think through their priorities and approaches to online activity before they engage too deeply with Web 2.0. While agreeing that museums should absolutely take advantage of the opportunities presented by Web 2.0 tools, especially for becoming more involved in their communities, he stressed that it was important to prioritize. If a museum didn't have its collection digitized and its information in a standards-based database, it should weigh how much it should experiment with Web 2.0. Her priority list: "Get your content online. Tell stories. Help people make connections. Enjoy your work, and have a sense of humor!"

In the extensive discussion concluding the workshop, one audience member, who had been pondering the idea of the smart vending machine that Paul Marty had introduced, asked if this wasn't in fact a model of what librarians were supposed to be: knowing what anyone coming by is likely to want to know? She said that rather than being worried about a vending machine knowing her preferences, she was interested in becoming that smart vending machine. Holly Witchey not only thought that this was a correct response but also suggested that museum staff might learn from librarians about how to offer the information visitors are indeed likely to want.

Another participant, while understanding the value of creating spaces for visitors to add comments or tags to material, was more interested in being able to connect data between institutions. Commenting from the audience, the Internet Archives' Linda Frueh said that there are many technologies that can assist institutions in offering their collections in mixable form. She recommended David Weinberger's book *Everything Is Miscellaneous*, which shows some ways of doing this, and promised a discussion on this topic in her presentation later in the conference. She also commented on institutions' fear of loss of control over items once they are available online. The Internet Archive had found that online exposure for collections usually drives traffic to the physical institution. Yakel added that, from her experience, it was an illusion to believe that institutions had control

in the first place and that the tools now available to institutions gave them the gift of being able to use often unsuspected expertise in the public to identify, describe, or comment on collections, often as well as the professionals. As she crisply put it, "Giving up control, with a few rules, can give us a lot more—and get more people invested in our collections."

Responding to a comment on how some institutions block some museum sites, Mr. Semper reported that the Exploratorium had been blocked twice, once by a San Diego school district. This made him realize the extent to which the Exploratorium was working outside the social contract that operates within the schools and aroused his interest in the situations where Web 2.0 might bring realms of experience into arenas where control is a real issue. What are the situations where personal freedom of expression associated with Web 2.0 conflict with institutional controls?

Wrapping up this first workshop session, Professor Marty encouraged attendees to take the Web 2.0 mentality to the conference itself, to use the conference blog, to share what they were learning, and to turn it into a collaborative community experience. The watchwords, he said, were "collaborate" and "share."

Workshop 2: Digital Applications for the Humanities

Brett Bobley, chief information officer for the NEH and director of its Office for Digital Humanities (formerly the Digital Humanities Initiative, or DHI), welcomed the audience to this panel that would demonstrate something of the variety of Web 2.0 projects funded by the NEH. He noted that this involved different forms of community input and that collaboration is not easy, especially when it involves a large number of partners.

Bobley briefly reviewed the work of the NEH and its five divisions (Research, Public Programs, Education, Preservation and Access, and Challenge Grants). The Office for Digital Humanities had been created to help the NEH take more of a leadership role in promoting digital scholarship, as the new technologies brought a paradigm shift in the way that the humanities would be studied and taught. The NEH felt it important to be playing a role in determining the kind of **cyberinfrastructure** to be built for the humanities.

Introducing *Our Cultural Commonwealth*, the report by the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities and Social Sciences,²⁰ Bobley quoted one section:

The emergence of the Internet has transformed the practice of the humanities and social sciences—more slowly than some may have hoped, but more profoundly than others may have expected. Digital cultural heritage resources are a fundamental dataset for the humanities.

He especially wanted to emphasize the fact that just as chemists use chemical data or astronomers use sensor data from a telescope, so humanists use the data set of cultural heritage: texts, sculptures, films, etc. *Our Cultural Commonwealth* made a number of recommendations for how infrastructure can be improved, and Bobley emphasized that

this would need to be a huge collaborative effort. Agencies need to lead by working together more closely. The NEH, for its part, is partnering not only with obvious peers, like IMLS, but also with the National Science Foundation, the Department of Energy, and the UK's Joint Information Systems Committee (JISC).

Bobley reviewed NEH grant programs that fund digital projects to which library and museums should pay attention. They include the Digital Humanities Start-up grants, encouraging innovation in the start-up phase of projects (both the Ashes to Art and the InPhO project below received these grants); Humanities Collections and Resources, supporting preservation and access to collections, and especially suited to projects designed to unify, integrate, or aggregate humanities resources; America's Historical and Cultural Organizations, awarding planning and implementation grants encouraging the use of innovative technology; Institutes for Advanced Topics in the Digital Humanities, funding centers of expertise to train their colleagues in topics such as text encoding or using geographic information systems (GIS); NEH Fellowships at Digital Humanities Centers, where scholars and librarians work for six-to-twelve-month periods on another campus, assisting technologists and scholars on innovative projects; and the JISC-NEH Trans-Atlantic Digitalization Collaboration Grant, assisting UK and U.S. institutions to digitize and create access to key resources together. Stressing the new focus on collaborative research and production, Bobley concluded his introduction with a demonstration of the NEH's new program, Picturing America (www.picturingamerica.neh.gov).

Martin Halbert, director of digital programs and systems at Emory University, spoke about Voyages,²¹ a radically expanded online version of an earlier resource, the Trans-Atlantic Slave Trade Database, an enormous compilation of all the available primary data on the 35,000 voyages over the four centuries of the transatlantic slave trade that ended in 1837. The original project was available

²⁰ American Council for Learned Societies, Commission on Cyberinfrastructure for the Humanities and Social Sciences, *Our Cultural Commonwealth*, www.acls.org/cyberinfrastructure/acls.ci.report.pdf

²¹ www.slavevoyages.org

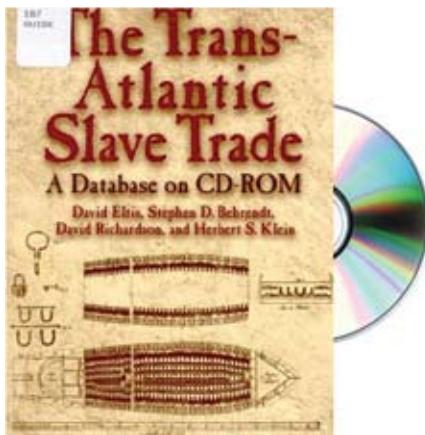


Figure 7. The original Trans-Atlantic Slave Trade Database, published by Cambridge University Press.

in CD-ROM format, published by the University of Cambridge in the early 1990s as a database with some elemental charting and mapping. The principal scholars in the original team wanted to create an expanded, online version of the database with more advanced and flexible features, and the Voyages project, funded in 2006 by the NEH as a scholar-librarian collaboration, was formulated to achieve those ambitions.

Voyages was already being used in courses worldwide before its formal release in May 2008. More a portal than a database, Voyages has a sophisticated interface capable of statistical charting of data, GIS mapping functions, a time line display, an image database, a repository of lesson plans, and other contextual material. Some 200 variables can be used, through several interfaces, to mine information on any of the 35,000 individual voyages. Most significantly for this presentation, Dr. Halbert pointed out that the project had developed a secure editorial and peer review system for submitting new materials online.

Dr. Halbert thought this project was an especially effective demonstration of the benefits of digital scholarship, especially in the dynamic ways it can both create new knowledge and provide data and tools for others to use in their own scholarship. The scholar-librarian collaboration was itself a subject of study of Voyages: While scholars bring subject knowledge and research methodology

to be instantiated in the digital medium, as well as their own collaborative network of people and institutions, to the project,²² librarians designing systems and organizing access to information bring specialty understanding and focus, drawing on a universe of literacy and skills bridging scholarly and technology areas, unlikely to be found in traditional library staff. In a parallel way, the digital scholars often have a skill set that includes knowledge of technology and an understanding of the issues that concern digital librarians.

The key challenges of this kind of work, Dr. Halbert said, include building and funding the infrastructure and ensuring that a preservation strategy is in place for its sustainability. On preservation, he pointed out that Emory University is a lead member of the Meta Archive Cooperative, which promotes a method of preserving and distributing resources to partner institutional repositories, thus guaranteeing multiple copies.

Very often, the campus infrastructure for a project such as Voyager will not exist, so there is a good opportunity to build out an infrastructure that can be used for future projects, which may need the kind of advanced technology that can be developed only through alliances with computer science departments. Digital projects often cost more than traditional humanities projects, and, having no established funding lines, may conflict with existing priorities, leading to antagonism or a failure to see where such projects fit into the normal work of a history department or a library.

Dr. Halbert summarized the key lessons to be learned from the Voyages project:

- Cultivate collaborative centers of expertise in digital scholarship and digital libraries that can serve as catalytic foundations for future work;

²² The Wilberforce Institute at Hull University in the UK, the Tubman Institute at York University in Canada, and Emory University were just three of many institutions involved in the project.

Workshop 2: Digital Applications for the Humanities

- Think long term, identifying projects that can build over time and can serve as a foundation for subsequent work; and
- Grow a cadre of staff (program managers, grant writers, programmers, etc.) and relationships that will allow these projects to succeed over time

Dr. Halbert tentatively recommended new organizational models:

- Institutes for digital scholarship, based in libraries, with scholars and librarians as collaborative constituents, which could be catalytic centers for progressive, collaborative projects;
- Matrix management structures, in which staff report in different ways to different people within and outside the library and the academic structure, in order to coordinate projects across institutional units; and
- Interinstitutional organizations (such as the Meta Archive Cooperative) that can help distribute the costs of mutually beneficial new capabilities (like digital preservation).

Last, he offered four sustainability strategies:

- Lobbying for long-term institutional funding to create infrastructure that can be sustained and leveraged over time for different projects, and finance ongoing positions (such as digital scholarship program managers and repository technical leaders) to staff the infrastructure;
- Engaging international communities of scholars to use and to build an institution's digital resources;
- Raising endowments for larger projects; and
- Building systematically on accomplishments with new sponsored funding (such as the recent \$350,000 NEH award for "Origins and Identities of Africans Entering the Transatlantic Slave Trade," which will enable Emory to do much more specific work on individuals whose records are in the database).

He concluded by reading part of a longer quote from the late historian Roy Rosenzweig: "The past is a reservoir of alternatives for the present." Rosenzweig understood very well many of the possibilities new technology offered humanities research, and Dr. Halbert suggested that projects like Voyages are foundational to a new era of collaboration between libraries and scholars, pointing toward the possible use of the past for people to shape their civic futures.

The next speaker, **Colin Allen**, professor of history and philosophy of science and professor of cognitive science at Indiana University, Bloomington, spoke about the Indiana Philosophy Ontology project (InPhO; <http://InPhO.cogs.indiana.edu>). InPhO grows out of the Stanford Encyclopedia of Philosophy (SEP; <http://plato.stanford.edu>), an online, open-access work started in 1996, now with some 1,000 articles, written and maintained by 1,200 scholars worldwide. With a million visits a week and broad coverage of science and philosophy, the SEP is the launching path for the Ontology project, which aims to build a dynamic representation of the

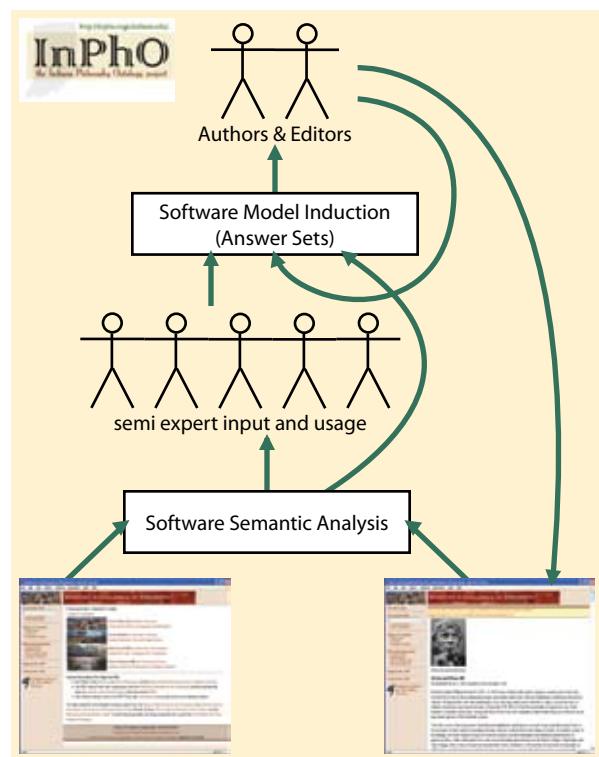


Figure 8. Colin Allen, Web 2.01, the InPhO process of Stratified Collaboration.

entire discipline of philosophy for a variety of uses, including the support of richer and more intelligent search, navigation, research, and discovery in a variety of digital philosophy applications.

InPhO is building an interactive taxonomy of philosophy, mapping relationships among philosophers and to the ideas that make up the discipline. It constantly mines the SEP, but at 10 million words and growing fast, the SEP is beyond the comprehension of any one individual. How do you build structure and cross-reference within such a rapidly changing body of knowledge? How do you measure the value of developments for scholars and for the general public? How do you know what other valuable material lies outside the profession and the SEP? And how do you combine many different information sources to get a structured set of knowledge about the discipline?

Although experts build the SEP and software can statistically analyze the relationships among terms, that software is not perfect and the results need verification to ensure that they meet both general scholarly standards and those of the SEP. Other sources, such as Wikipedia, the Philosophy Family Tree (tracking dissertation advisor relationships among philosophers), and WordNet (giving semantic relationships among key words in the SEP), also need to be verified.

How to do this? The InPhO plan judiciously uses a combination of experts, knowledgeable amateurs, regular amateurs, and software. Professor Allen calls this approach “Web 2.01,” the Stratified Collaboration model of the InPhO “layer cake.” It determines who the knowledgeable amateurs are, what they know, and how to build a community with them without the experts having to check everything. The software can be used to tie these three different communities together.

First in this process, semantic analysis software processes SEP entries to give some tentative hypotheses about possible term relationships. Motivated encyclopedia readers of varying expertise levels are then shown the results and asked to agree or disagree and discuss how related the terms are. Along with the original statistical data, these results are then fed into another layer of software, which fits it all together. Authors and editors consider the resultant suggestions of what might be cross-referenced with what. Examining the judgments of the authors and editors in selecting the suggestions, the team can then feed the information back into the extracting software, training it for the next round. Unstructured data go in and structured data come out: basic biographical data, relations among thinkers, what kind of ideas they had, what documents they wrote and edited, where they worked

Structured Data Out	
Thinker Properties	Died on, Born on, Spoke language, Nationality
Thinker-Thinker Relations	Teacher of, Influenced, Criticized, Defended, Dissertation Advisor of, Discoursed with
Idea Properties	Idea type [concept, position, etc]
Thinker-Document Relations	Wrote, Edited
Thinker-Organization Relations	Member of, Studied at
Thinker-Idea Relations	Worked on (problem), Created view, Attacked view, Espoused view, Aware of
Idea-Idea Relations	Opposed to Commits to (idea 1 commits one to idea 2)
Document-Document Relations	Published (article in journal/book)
Document-Idea Relations	Discusses
Ternary Relations	Disagreed with (Thinker X disagreed with Thinker Y on Idea Z)

Figure 9. Colin Allen, “Structured Data Out,” an example of ontology, the formal, machine-readable specification of the types of entities in a domain and relationships between them.

Workshop 2: Digital Applications for the Humanities

and studied, and so on. This table is an example of this kind of structured data, or ontology.

The system is apparently working, as Professor Allen told of his own surprise at finding an entry on “divine illumination” flagged as potentially relevant to “mental content,” a topic from the philosophy of mind. Digging in, he found that despite his doubt about this suggestion, it was, after all, quite reasonable because of how medieval philosophers discussed the problem of how our minds can grasp abstract concepts. For them, God was the source of those abstract concepts, which is divine illumination. Professor Allen thought there were a handful of experts around the world who would know this, but it was the software that pulled it up and made the suggestion.

Allen stressed the lack of digital tools to prepare information for processing by InPhO. For example, thousands of unstructured philosophy bibliographies

(the encyclopedia cites some 67,000 items) cannot be used in the ontology, as there is no software yet that can recognize their components: author, title, publisher, etc.

Professor Allen demonstrated how ontology can significantly help any kind of word search from a preliminary version of the InPhO Web site. Searching for a term like “mental illness” won’t be just a flat keyword search: The request will be fed into a structured search of the hierarchical concepts, in this case, “philosophy of cognitive science,” together with “mental illness,” as two separate search strings combined. Noesis, a related philosophy search using Google’s restricted search engine, can also be deployed on top of the InPhO ontology.

The InPhO team is currently building a tool that will invite anyone onto the page and ask them to navigate the Ontology Tree and indicate relationships they see between terms. The software then correlates

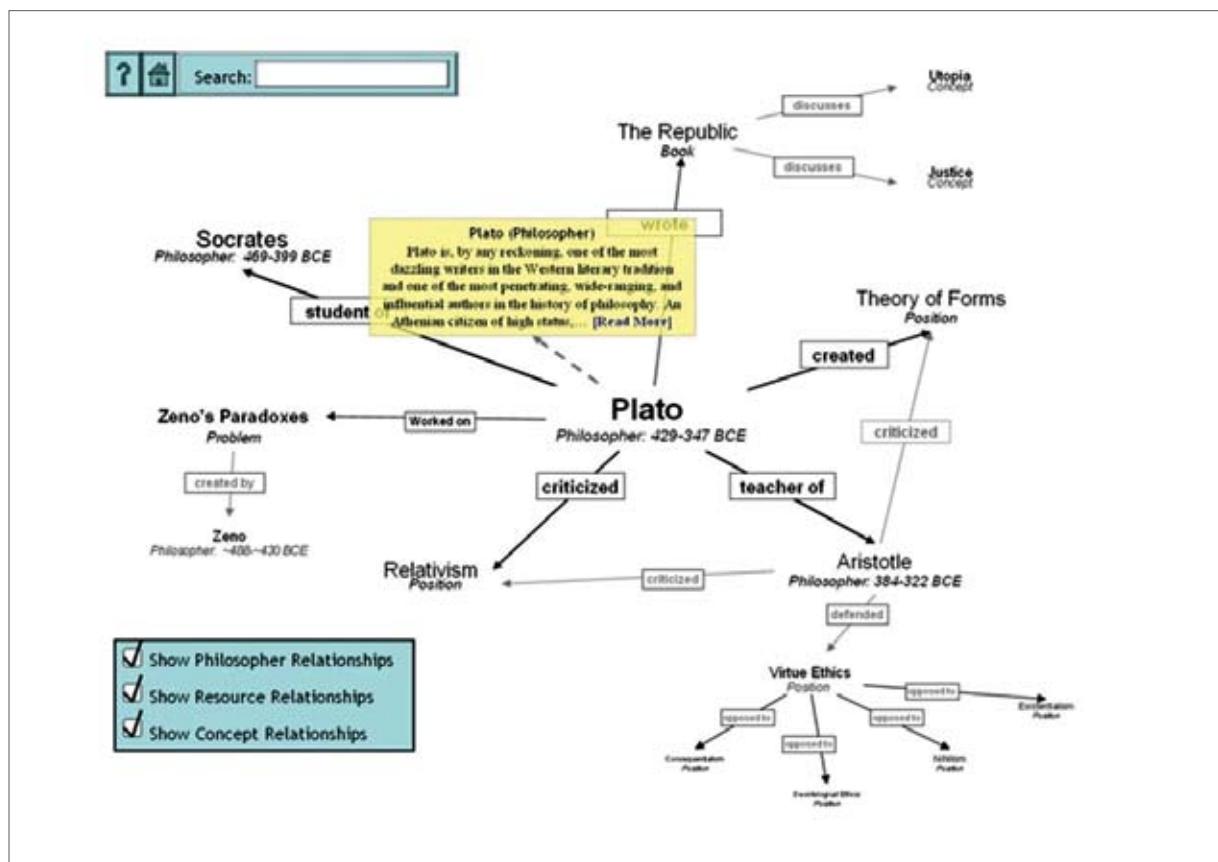


Figure 10. Colin Allen, sample InPhO search screen result for Plato, showing relationships between philosophers, resources, and concepts.

and rates responses to gauge the reliability of the volunteer: Agreement with others' ratings is a high indicator of reliability.

Professor Allen showed a screen of how a search result page may display the relationships between thinkers, concepts, and resources. The example in Figure 10 shows Plato, who created the Theory of Forms, as the teacher of Aristotle, who worked on the virtue of ethics, and so on. Scrolling over the name Plato could summon the first lines of the encyclopedia entry or go to the cited article.

Professor Allen concluded by emphasizing that neither the information nor the social world is flat; both comprise different communities with different expertise. InPhO and related projects seek to employ new information structures that can capture more of the dimensionality of the information available on the Web.

He recommended using stratified data to protect and use expert assets and public expertise: tracking users, what they know, where they come from, and how reliable their knowledge is in which topics. In other words, use software to find the structure, use the structure to collect feedback, and use the feedback to generate yet more structure. Only in this iterative fashion does he think the profession will be able to use the Web's potential for developing scholarly disciplines such as philosophy.

Arne Flaten, assistant professor of art history at Coastal Carolina University, discussed Ashes2Art: Digital Reconstructions of Ancient Monuments, (www.coastal.edu/ashes2art), a collaborative, interdisciplinary program of Arkansas State and Coastal Carolina Universities. Combining art history and archaeology, and using graphic and Web design, 3-D animation, and digital photography, the undergraduates working on this project re-create ancient monuments online. The students conceive and create the individual projects, travel to the sites, take photographs and GIS readings of the sites and their topography, and make precise measurements of the buildings. The Coastal Carolina students are assembling the temple dedicated to Athena Pronaia in fourth-century B.C. Delphi. Measurement is key. Students use their own measurements, working to



Figure 11. Detail of reconstruction of the temple of Athena Pronaia at Delphi. Greg Schultz, Coastal Carolina University.

an accuracy of at least 1 mm, combining them with measurements taken by the French School at Athens. The task of virtual reconstruction aids in thinking things through. For example, how did the lion's-head waterspouts actually work in the temple of Athena Pronaia? There are no scholarly articles detailing this. As the visuals are constructed, they will be made available online and to iPods and cell phones, so others can use them as research tools or as images to simply enjoy. Visitors to Delphi can take the reconstruction or the video fly-through with them and compare the standing building with the reconstruction. One of the projects that Flaten's partner, Alyson Gill, is working on with her students at Arkansas State is a reconstruction of a plunge bath, showing how the water would have flowed through the system. These are baths that athletes used after competitions that had to be quickly drained and refilled to accommodate all the competitors.

Beyond finishing the models, the completion of a comprehensive database is in doubt because of copyright and other rights issues. Copyright to all images currently on the Web site belongs to the project, to Archivision, or to the Museum of Fine Arts (MFA), Boston. Archivision and the MFA have generously given permission to allow their images to be shown on the site. However, permission has to be secured from the French School and the Hellenic Ministry of Culture for the archaeological reports that have been published since the excavations started in 1893. The Hellenic Ministry of Culture gave permission to photograph monuments and panoramas at Delphi and many other sites, but it is still considering

Workshop 2: Digital Applications for the Humanities

whether to allow the images to be posted online.

Later, when asked about using laser scanning to capture archaeological artifacts, Professor Flaten replied that it was currently a cumbersome and expensive process (although it gives stunning results) and, given the uncertainty about getting permission to publish images from the site, they were holding off. However, they did have plans to scan the landscape, as topographical detail is crucial to understand the process of the Pythian games (taking place on four different terraces cut into the side of Mount Parnassus,) and Delphi has been blocked from satellite views—not showing up on Google Earth.

In conclusion, Professor Flaten remarked on the layers of collaboration involved in the project: between faculty and students, between two universities, between the Hellenic Ministry of Culture and the French School at Athens, between Archivision and the Museum of Fine Arts, Boston. Overall, despite some difficulties, it was remarkable the project had achieved what it had.

Linda Frueh, Washington, D.C., regional director for the Internet Archive, then spoke about Open Library (www.openlibrary.org), an ambitious project to bring the world's books online, "Free to All," as the inscription over the Boston Public Library reads. Around 100 million books have been published over time; most are out of copyright, and almost all are out of print. The Internet Archive is

a good candidate for running such an initiative to bring the world's books online: It archives the World Wide Web (where Web pages last an average of 44 to 75 days), provides a route to find Web pages from the past via its Wayback Machine (www.archive.org/Web/Web.php), and has some 2.5 million gigabytes of books, Web pages, films, and other media in its collection.

The goal for Open Library is to have a Web page for every book published, with links to the digitized text where available. It uses the Internet Archives' distributed Scribe scanning stations (seven in the United States, one in the UK, and one in Canada) to digitize around 20,000 books a month (at a cost of 10 cents per page). Most books are selected and scanned in collaboration with libraries, but individuals can order and pay for any other books to be scanned through a prototype "Scan this Book" program. For books still under copyright, publishers supply images and other information so the book can be listed and readers directed to libraries or booksellers.

The Open Library's new demo interface has been designed to encourage readers to browse, get recommendations, chat, and make contributions to the catalog.²³ The Internet Archive, often including data from existing digital catalogs in the records, catalogs the digitized books. Search results can be narrowed by author, publication date, publisher, whether the full text is available, and by several other values (a process known as "faceted search"). For a particular book, a user can open the catalog record and add/or edit data to any field. Like Wikipedia, the Open Library retains earlier versions in case of an error.

There are various means to access the books: One is direct reading online, using "Flipbook" software for page turning. Another is Print-on-Demand, using the Espresso Book Machine, made by On Demand Books (www.on-demandbooks.com). Books can be produced in a variety of formats, including searchable PDFs. The archive is working with the One

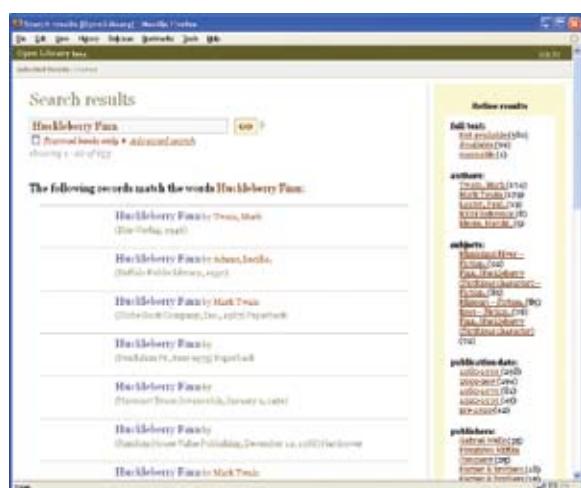


Figure 12. Faceted search results from the Open Library demo interface page.

²³ See the early demo page at <http://demo.openlibrary.org>

Laptop Per Child Project (www.laptop.org), which is distributing \$100 computers to children around the world, to ensure that the Open Library texts are readable on that platform.

Frueh cited three online communities that contribute to the project. One is LibraryThing (www.librarything.com), whose members catalog, discuss, and share book reviews. Another is Open Source, six of whose members volunteer to ensure that the Open Library's interfaces are as up-to-date and intuitive as possible. A third is the bibliophile community, members of which are active in helping check, correct, and complete either digitized text or the catalog data. For example, Distributed Proofreaders (www.pgdp.net/c), an offshoot of Project Gutenberg, proofs 70 digitized and scanned books a week for the Open Library.

The archive also uses the ReCAPTCHA system (recaptcha.net), developed at Carnegie Mellon University, to improve optical character reader (OCR) results by using human readers. Based on the familiar CAPTCHA method used on blogs and other sites to stop automated spamming by using distorted text that is readable by humans but not by machines, ReCAPTCHA challenges a site visitor with word pairs: one that OCR cannot interpret and one that it can. If the visitor recognizes the known word correctly, the system accepts the reading of the unknown word and, after further testing, the word originally unrecognized by OCR is replaced by the correct word in digitized texts, enabling reCAPTCHA, in effect, to "digitize books one word at a time."

Other projects that help expand the Open Library's community include Wikipedia, using Open Library as its official book reference; the Boston Library Consortium, which is making its public domain materials available to Open Library;²⁴ and the Zotero Project, which has added a scholars' information commons, hosted by the Internet Archive, to its online scholarly citation and organization tool, so that when a Zotero user drags-and-drops public domain materials into the Zotero Commons, they will



Figure 13. The ReCAPTCHA challenge box that assists in the interpretation of OCR results.

be uploaded automatically into Open Library. Open Library is also establishing mutual catalog sharing with the Online Computer Library Center (**OCLC**) with the eventual goal of each pointing to the other's records. Frueh concluded her presentation with a call for even more volunteers to help improve the site and make it a truly open public library.

Wrapping up the session, **Bernard Reilly**, president of the Center for Research Libraries, offered three observations and challenges to museums and libraries. The first observation was on how the definition of community was changing. Resources are created by and for communities. In the past, it was easy to identify a community and its traditions: The university library serves its campus; the local library is supported by and serves its local taxpayers. With the Web, this changes. Going beyond geography, institutions are now community aggregators. Serving new communities, they need to generate new forms of support. Sometimes projects generated by one community may find application in another. The challenge in moving forward, Reilly said, is for cultural institutions to continue to collect for the future and stand up for either the locally disenfranchised or for source communities (from which research libraries draw content) that don't have well-developed infrastructures for managing cultural heritage and historical evidence.

The second challenge was fiscal sustainability. While some of the projects presented in the session had designed inventive derivative products and services, from channeling Open Library content through Espresso book machines to broadening the constituency benefiting from a university project,

²⁴ <http://blog.bpl.org/brls/?p=51>

Workshop 2: Digital Applications for the Humanities

others were unclear about how they would survive. Future costs could include copyright-related obligations and the costs of knowledge acquisition (though Reilly admired those projects that managed to incorporate free expertise by using Web 2.0 tools). In many situations, Reilly observed, software was beginning to supplant human effort, whether it was InPhO processing bibliographic cross-references or LexisNexis processing company finances. Finance models Reilly recommended included investing the grant funds from the heady early years of a project to use later on; forming cooperatives to spread project costs across all the user communities of interest; and investigating “big university” largesse. As no mention had been made of licensing, he offered ARTstor as an example of a grant-funded project now sustaining itself through licensing fees.

Reilly’s final observation was on the importance of respecting and remembering the material sources of digital projects and investing in the preservation of those root physical objects: the slave manifest, the philosophy texts, the archaeological sites. All should be protected and maintained. Archives, libraries, and museums have been doing this for centuries but now need to do it more economically and collaboratively. Cultural institutions, he said, were rarely simply repositories; more often they were agents for civil society, looking out for the interests of current and future communities. In brief, Reilly’s coda was, remember your origins.

This session ended with many questions from the audience, falling into two broad categories. The first was on developing business models for supplying digital content that end users expect to be free. Reilly was asked about the ARTstor model that he had mentioned, in which images are licensed through a subscription model to educational institutions for faculty and registered students (the end users) to use without charge. Were equivalent images available for free for anyone to use? Reilly said yes, such images could be found, but the challenge for all aggregators is to discover a particular niche and develop a practical business model around it. For archives, libraries, and museums (including ARTstor), that niche role was a commitment to the integrity of

resources and to supplying them free of charge to the end user.

That may be so, but Brett Bobley raised the example of JSTOR, the digital library of scholarly journals, licensed like ARTstor to educational institutions, which recently exposed its metadata to Google, consequently quadrupling the number of visits to its Web site. Large numbers of taxpayers unaffiliated with JSTOR-subscribing institutions, whose money is indirectly enabling scholars to publish articles later made available on JSTOR, are discovering these journal articles but cannot access them. The Web 2.0 movement is partly responsible for exposing such materials to a wider community, and Bobley said that it is imperative to develop workable business models to broaden access to them.

What was the business model that sustained the Internet Archive? Frueh replied that the archive used the model of segmenting the audience and charging for high-level services but not for basic content. An example was Rick Prelinger’s decision to donate his Prelinger Film Archives to the Library of Congress in 2002, to allow the Internet Archive to enable free public use of some 2,000 of these, meanwhile proposing that Getty Images license the films for commercial and professional use.²⁵ As a result of the films’ visibility on the Internet Archive, demand for authorized legal copies increased dramatically.

Opening the second topic for questions, Brett Bobley asked Colin Allen how he had brought together computer scientists and humanists so successfully on the InPhO project. Was it a formal arrangement or had it been more serendipitous? Allen answered that it had happened more by chance. He had been finding it very difficult to locate people with the right combination of domain and technical knowledge when a graduate student interested in that combination volunteered to collaborate on a proposal with a computer science colleague. Allen said that local university support was crucial in kick-starting the project: they first won an internal competition for start-up funds before going to the

²⁵ See an account of this at www.archive.org/details/prelinger.

NEH. Allen thought universities are looking for ways to make this kind of project sustainable from the outside. Few will make long-time commitments.

In terms of encouraging such collaboration in the future, Professor Allen thought there should be better ways to overcome the negative attitudes that computer scientists and humanists sometimes had about each other, to better demonstrate the benefits of computing in the humanities and to train humanities scholars in technical areas. Mr. Bobley agreed, saying that in his experience, when computer scientists became actively engaged in humanities projects, they often expressed surprise at how challenging and interesting those projects could be, from a computer science perspective. Martin Halbert added to this that Emory University was systematically building a more explicit partnership between the library and the computer science department. This has been helped by the fact that computer science students placed in library projects often find good computing jobs as the result of their library work. Emory has also proposed a certificate in digital scholarship that would bring together skills in computer science and the humanities.

At that point, Brett Bobley, thanking the panel, adjourned the session.



Conference Day One

Keynote Address: Rights and Responsibilities Online: A Paradox for Our Times

Keynote speaker **Dr. Jonathan F. Fanton**, president of the MacArthur Foundation, opened by saying that he thought the conference title, *WebWise 2.0: The Power of Community*, was very apt in focusing attention on an arena where the cultural community could have an impact by making sense of a rapidly changing world through its ability to help shape the information environment. First, however, there are two paradoxes about the online world that had to be addressed if the power of community is to be realized in a just and sustainable way.

The first paradox is that the more technology empowers individuals, the more they need trusted sources of information and guidance in making judgments. Here the role of museums and libraries is comparatively clear. The second paradox is that while the Internet is hailed as a democratic force, there is, in virtual worlds, an absence of the individual rights and protections we have come to expect in a democratic society. Here the role of museums and libraries is less clear, and the theme of Dr. Fanton's address was how to put these protections in place.

In introducing the MacArthur Foundation (best known for its "genius" awards and support of American public radio and television), Fanton emphasized its international reach, awarding \$300 million annually in grants and low-cost loans across 60 countries in pursuit of its mission to help build a more just, sustainable, and peaceful world. Through all the foundation's interests, he said, there runs a "commitment to illuminating patterns and trends that are reshaping our world," chief among which, arguably, is digital media.

Witnessing the first generation to grow up in a digital world, where self-expression and building communities with networked digital tools is becoming the norm, Fanton asked the audience to consider how extensively young people were steeped in digital media, and what the implications might be for individuals, families, institutions, and democracy.

As its response, the MacArthur Foundation has established a \$50 million initiative, Digital Media and Learning, to explore how young people's use of digital media is changing their interaction with the

world. The foundation is working on several fronts, funding researchers, designers, and practitioners in exploring how attitudes and behaviors are changing; how young people are learning; and what skills are being demanded in their work and social lives. Among these projects are a six-volume MIT Press series on Digital Media and Learning, and a new quarterly, the *International Journal of Learning and Media*.

To the list of topics already included in the book series and journal, Dr. Fanton urged the addition of legal and ethical issues that arise as adults and young people increasingly engage in social networks, multi-player games, and virtual worlds. This is a topic that museums and libraries are well qualified to help think through.

Howard Gardner, the Harvard psychologist and 1981 MacArthur Fellow best known for his theory of multiple intelligences, helped initiate the Digital Media and Learning project with the observation that digital media have opened up virtual spaces with no frontiers, no rules, and no regulations. Participants may say what they like on blogs; make connections with people all over the world; make, buy, and sell virtual goods with virtual money in a virtual world; and even sell them on eBay for physical money. In such spaces, all social and ethical norms appear to be up for grabs. What rules, regulations, and rights should apply?

People have strongly held opinions on, for example, whether Facebook represents an invasion of privacy or an essential tool of communication and personal validation; whether Wikipedia is a threat to traditional notions of expertise or a positive way of collaboratively constructing knowledge; whether a musical composition should be owned by its creator or its distributor, and how easy it should be for others to create new works out of it. Such a range of opinions confronts some basic assumptions about identity, privacy, ownership and authorship, credibility, and participation.

Although they may be experienced as public town squares and may evolve to include serious commercial, medical, educational, or other public functions, virtual worlds today are private spaces,

Keynote Address: Rights and Responsibilities Online: A Paradox for Our Times

owned by corporations and individuals. Participants can be denied access and their accounts closed for no reason, with no recourse. In-game behavior and relationships are governed only by user agreements, activated by a click of the "I accept" button and subject to small type that may say that terms and conditions can be changed at any time, without notice. In virtual worlds, if you are "toaded," your **avatar** is eliminated, your identity disappears, and your ability to participate comes to an end.

On the other side of the coin, there are hackers whose intention is to disrupt or change online games and when accused, claim intimidation and harassment. Meanwhile, other users report being taunted or tormented. Should there not be rules and regulations that on the one hand enable owners to operate their sites as designed and, on the other, punish users who abuse their rights?

Disputes in the virtual world are already playing out in the courts and in law journals. However, before this situation grows completely out of hand, Dr. Fanton suggested the issues be discussed in a wider public forum. On behalf of the MacArthur Foundation, he offered to support or host such a debate, which, acknowledging the private, proprietary nature of the ownership and design of virtual spaces, would recognize the increasingly public nature of their use and the consequences both for owners and participants. Was there a reasonable way of extending accepted principles from the physical world into the virtual realm? For example, what fundamentals of due process would make sense when a person is barred from an online world?

Dr. Fanton suggested three principles to begin with:

- Clear guidance about behavior that would cause membership termination, with specific examples of past behavior that prompted expulsion;
- Specific notice about the inappropriate behavior or material, which might include violation of copyright, offensive behavior, or unacceptable language or images in a profile; and
- Opportunity to appeal, which might come in two stages: the first, informal, intended to

clear up factual errors or misunderstandings; and the second, a formal hearing with written procedures, held before a neutral party.

Beyond this, there were other questions, ranging from the nature of online identity and the ownership of an avatar, to whether First Amendment rights apply, and what recourse site owners have against offenders. Legal scholars have raised even more complex issues concerning the blurring of the boundaries between actions in the virtual world and consequences in the physical world.

Dr. Fanton called to move the debate beyond the pages of legal journals and blogs to engage humanists, social scientists, legal scholars, IMLS, and the public at large. He suggested that even before a debate, there could be immediate action on the three principles he had cited (clear warning; specific notice; and an appeal and a fair hearing before a neutral party). As a start, he announced that the MacArthur Foundation will incorporate these principles into the sites that it creates, operates, or funds, and appealed to the audience to help think through the norms and principles that should underlie rights and responsibilities online.

He concluded that throughout the history of the United States, the nation's highest accomplishments have had the effect of bringing people together. Although many online sites are dismissed as entertainment, or as places for teenage gossip, they actually fulfill a larger goal of social integration. Both physical and virtual worlds are "real," and with reality comes responsibility. Behavioral norms and procedural protections are needed both for participants and operators of online social spaces, otherwise our highest aspirations for the power of community online to advance our quest for a just, sustainable, and peaceful world will fall short of its potential.

The first of several questions for Dr. Fanton concerned the international nature of the Web experience and the fact that it was becoming less exclusively English-language oriented. Do young people regard themselves as international citizens? Fanton replied that they did and that this should have deep implications for public policy as young people

become politically active. He added that many countries, notably South Korea and those in Scandinavia, are ahead of the United States in using digital media, and that the MacArthur Foundation wants to take the questions he raised in his presentation to these and other cultures. Fanton also noted that MacArthur was supporting the development of software that will translate between English and Arabic, allowing young people and others to talk across the language boundary. Greater communication on blogs and Web sites could be one way of dissolving some of the division between the Islamic world and the West. However, the issue of working out what the rules are when there are different cultures at play would be paramount.

To a question about the high cost of access to many online activities, Dr. Fanton replied that in the past the "digital divide" referred to inequality of access to a networked computer, whereas the new digital divide will increasingly refer to inequality of access to these virtual spaces and the ability to mix, remix, and create one's own project.

Another participant asked whether online users would bother to appeal a flagrant abuse of their rights. Wouldn't they simply move to another site? Dr. Fanton replied that, while moving would certainly be one likely response, "If you don't like it here, go elsewhere" is not an acceptable position. People get invested in virtual spaces and develop relationships. He was reminded of a parallel situation in the Supreme Court case *Marsh v. Alabama*, concerning the rights of the inhabitants of a company town (which, in many ways, Second Life is). When the citizens went to the town square to protest an injustice, the company told them they had no rights. In his majority opinion, Justice Hugo Black maintained that when private spaces take on a public character they become subject to public rules. Fanton said that he was certain this issue would not disappear, predicting that procedural protections for online activity would soon start appearing in the news.

Session 1: The Power Of Discovery

Professor Paul Marty introduced the first session, "The Power of Discovery," with presentations on a variety of new collaborative tools for research and discovery.

Dan Cohen, assistant professor of history and director of the Center for History and New Media (CHNM) at George Mason University, introduced Zotero, a tool developed to navigate among and manage all the disparate types and formats of online research material (and the tools invented to help with parts of the scholarly process). How can a researcher today effectively pull together into one space documents on the Web, in Word, PDF, or other formats? Some institutions have their own online "bookbag," but these typically work only at the home institution's site. Zotero was conceived as a tool that would roll up all the windows a typical researcher might have open on their computer desktop into a single research tool. It runs in the Firefox browser, with an interface that looks rather like iTunes, with playlist folders.

As a Firefox extension, Zotero works both online and offline. It can sense scholarly, museum, or library objects in the browser, and, with a click on the article icon on the toolbar, add them to a researcher's Zotero workspace. Because museums typically have many more kinds of cataloging software than libraries do, Zotero works less seamlessly in a museum environment, but Professor Cohen offered to make a free translation to any institutional catalog that was not currently working with Zotero.

Zotero has a variety of Web 2.0 features allowing users to take and add notes, attach files and tags, use tags to sort through collections of documents to discover connections, and publish documents in a Web format (annotated online syllabi are a great boon for faculty). Zotero is integrated with Word and Open Office; references and notes can be drag-and-dropped from Zotero into Google Docs; and bibliographies can be formatted automatically. The key to success is in making all these operations as fluid and seamless as possible.

With several software awards to its credit, and 700,000 "Zoterons" using the program in more than 100 countries, Zotero is doing a good job in managing the Web environment for scholars and

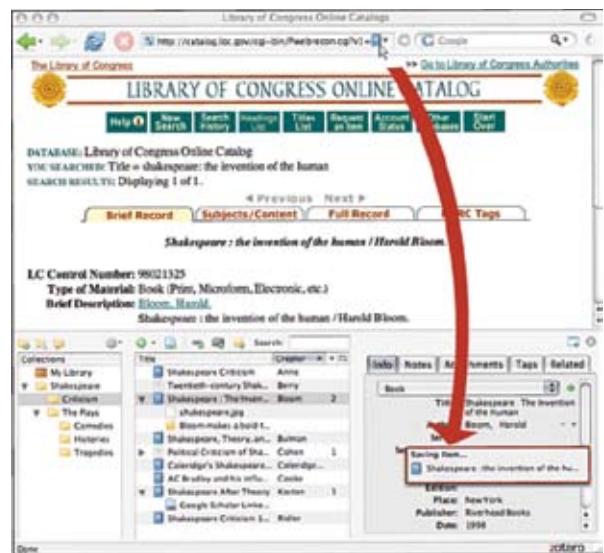


Figure 14. The Zotero workspace at the foot of a browser window, showing how material is moved from a resource into the workspace..

students. So what's next? One challenge is to think through what students do with digital objects online. What are the possibilities for sharing digital objects and for new modes of research? Once a scholar has a body of documents sorted on Zotero, what are some creative opportunities? The Zotero team conducted one experiment with the 150,000 digital objects aggregated in the Sept 11 Archive (911digitalarchive.org), including tens of thousands of stories of what people were doing on September 11th. How might researchers mine such a collection? One possibility is to map where people were reported to be at prayer, giving an instant picture of patterns of religious practice in the United States. The next phase of Zotero will be to create a library of Firefox plug-ins or tools that can be used to articulate the digital material collected. One of the first is MIT's time line tool from the SIMILE project (<http://simile.mit.edu/timeline>) that automatically populates a time line with objects from any collection with which it is connected.

Cohen then returned to the issue of social computing as a way of approaching the problem of resource abundance and how the community itself could to sort through and assess digital objects and make collaborative discoveries. He thought people found it hard to conceptualize the scale of the scholarship that can be aggregated. For example, the

one million dissertations in the Library of Congress represent some four billion hours of dissertation research and many discoveries and observations that didn't make it into the final thesis. Phase 2 of Zotero will enable scholars to share information, research notes, and public domain documents much more extensively. Researchers could participate in recommendation systems that could scan personal online libraries and suggest documents or institutions relevant to the subject of inquiry. As Linda Frueh had mentioned earlier, Zotero recently partnered with the Internet Archive to create the Zotero Commons, where visitors can contribute public domain materials, which would then be added automatically to the Open Library.

One questioner, worried that Zotero could distribute his entire personal digital library, was assured that Zotero users have complete control over their material, what is exported into Zotero, and where it will be indexed and sorted. Cohen added that Zotero can sync material between computers and devices and that many people carry around their Zotero collection on a USB drive.

Robert Stein, chief information officer of the Indianapolis Museum of Art, then spoke on "Listening to Our Visitors: Steve Museum and the Impact of Social Tagging for Access to Online Collections." Steve is a collaboration of 10 art museums, several other institutions, and many individuals, exploring the effectiveness and relevance of "social tagging" for museum content. Three reasons to care about this, Stein suggested, are to discover whether tagging can help visitors find art more easily; whether taggers can give museums new and valuable information; and whether tagging can change the way we look at art.

The Steve collaborative is halfway through the second of a two-year IMLS grant to analyze and assess the quality of information that comes from the public as it tags artworks on the Steve tagging site (<http://tagger.Steve.museum>). There are two deployments of Steve: one with nine art museums, which has 4,100 taggers who have given more than 35,000 tags to 1,700 artworks; and the other, the Metropolitan Museum of Art, which has 850 users who assigned 51,000 tags to just 252 artworks. The

project collects and analyzes considerable detail on its taggers. One of the first questions was whether observers tag differently if they have an affinity with the institution owning the works. Do they contribute more or different tags, and do they spend more or less time doing so?

In one set of experiments, three sets of variables were tested. First, whether seeing the metadata, the information associated with an image, affected the tagger or not. It turned out that it did: those not seeing any information about a painting gave 28 percent more tags than those who saw it. Next taggers would see objects in related groups or jumbled up. Those who saw works in groups (such as all European paintings) tagged 26 percent more than those who saw mixed objects.

The second set of experiments considered whether seeing other people's tags affected the results. Those seeing others' tags increased their tagging by 24 percent. The third experiment, still under way at the time of Stein's presentation, investigates whether giving users a choice in what they tag affects their tagging. While there were no final results, it appeared that people spend a shorter time tagging when they have this choice, leaving less tags on less objects.

Mr. Stein then pulled up the tagging page and proceeded to do a collaborative live tagging session. The newest experiment is to see whether the social aspect of social tagging will really make any difference, by working through Facebook and e-mail. In this case taggers will be asked if they want to invite any of their Facebook friends to tag the image they themselves had just tagged. Perhaps users may think longer and harder if they see that their friends have opinions different from their own. They can see their own tagged images on their Facebook page and share with friends.

New analysis includes Term Review, an assessment by museums of how useful the tags that have been applied appear to be in describing or finding an artwork. Terms are classified as to whether they are useful or not in finding or describing an artwork; contain positive or negative opinions; are a misperception (factually incorrect); contain a

Session 1: The Power Of Discovery

foreign-language term; are misspelled; or contain a very personal meaning. Some tags may be factually wrong (describing an item as Persian when it is Indian, for example) but the terms are still recorded, as they may be useful in object discovery. Another analysis explores how many terms are new to museum documentation, finding matches between common terms used by taggers and the more professional terms used in museum metadata.

Stein concluded by inviting museums to use the Steve software and experiment with social tagging themselves. While Stein warned that it might be difficult for museums to integrate visitors' tags with their own ways of thinking about their online collections, he said the project was continuing to think of ways to make this integration easier, including assisting museums without IT staff to post and tag their works online. At the Indianapolis Museum of Art (www.imamuseum.org), Steve was driving the tagging of some 65,000 works in its collection. Visitors can add their own tags and see all the works associated with any one tag.

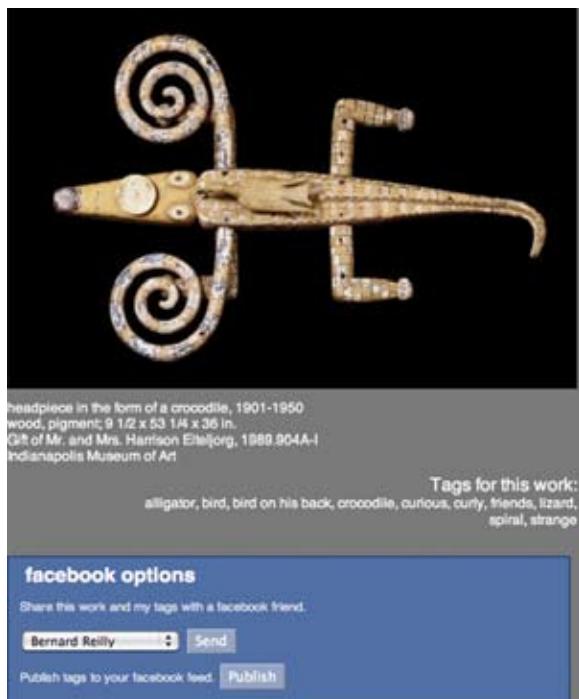


Figure 15. Example of an object tagged on the Steve page with a Facebook invitation to friends to tag the same piece.

Figure 16. The Steve Term Review form evaluating the usefulness of tagging terms.

One audience member asked if the system could be used for natural history or history collections. Stein replied that Steve was still a research project with analysis tools focused on art museum documentation, but that it would be fairly easy to extend this to other museum collections. When asked to summarize the value of social tagging for museums, Stein replied that visitors come to the museum Web sites in various ways and, although museums often have elaborate search capabilities, the language they use doesn't always match the language of the visitors. The museum search logs show that people often don't quite know what they are looking for and the language that they use to talk about art is not the language that museums use to catalog in their collection management systems. Tagging has the potential for bridging the gap between natural language and the terms in the catalog.

Holly Witchey, of the Cleveland Museum of Art, commented that museums often do well in person. That is, the person at the front desk may be able to help more than a database can. If a visitor says, "I was here 20 years ago; I don't remember the name of the artist but I know the woman wore a red hat," the chances are the person sitting at the front desk would know the answer, partly because the question had been asked many times before.

The next speaker, **Boyce Tankersley**, director of living plant documentation at the Chicago Botanical Gardens, discussed the project Plant Collections: A Community Solution, initiated

by the growing awareness both of accelerating climate change and the lack of communication and exchange among the 6,000 botanical gardens around the globe with their three centuries of plant record data. As Tankersley put it, the project was essentially a mashup between 300 years' worth of global botanical data and how plants were observed responding to climate change.

Earlier attempts at such a mashup had failed, according to Tankersley, because of a lack of preparatory community building. This time around, the Chicago Botanic Garden first stepped forward to put together a partnership with IMLS, the North American Plant Collections Consortium of the American Public Gardens Association, the University of Kansas Biodiversity Research Center and National History Museum, Google Base, and the Florida State University School of Computational Sciences. These primary partners also included BG-Base, producers of collections management software for botanical gardens, and the Beijing Botanical Garden. Beijing subsequently brought in three other Chinese gardens (Nanjing, Shanghai, and Chenshen) as the government agreed to emulate the project with its own network of plant databases, a pattern that has now extended to Australia, Canada, South Africa, Russia, and New Zealand. The British National Trust is also set to bring 70 gardens into the project.

Project goals included expanding the types of data gathered to include the needs of a wider range of users; to grow over time; to be open-source driven; to be freely available on the Internet; and to be simple enough for any plant recorder with a horticulture background to install and implement it. Many of the functions of the database would have to be automatic, notably the data flow from the institutions up to the Google Base and into the portal.

Wanting to expand the range of individuals entering data and using the database beyond curators to include taxonomists, educators, horticulturalists, ecologists, population biologists, weed scientists, and even gardeners, and wanting to expand the types of information to be included, project staff researched institutions, taxonomies, geospatial references, commercial sources, event locations,

book references, plant characteristics, and more. Partners were asked what fields they currently had, and users were asked what information they needed but couldn't access. Eventually, the partners came up with some 400 fields, which they agreed to whittle down to 161 fields in a federated schema.

After trying a variety of systems, the project chose Google Base as the main data store. The portal prototype is now in place, enabling keyword and expert searches on many variables (plant name, location, year, for example) with results linked to MorphBank (a database of some 100,000 biological images with taxonomies), Wikipedia, and Google. Tankersley demonstrated the database at work, showing the value of being able to map data with a graphic representation of the spread of the disease, sudden oak death, over time. Supercomputer analysis of the ecological niche data using key variables of temperature, vapor pressure, elevation, precipitation, and insolation was used to create a map of potential outbreaks of the disease across North America, which is now being used by a consortium of 18 botanical gardens assembling a nationwide oak collection, to ensure that samples come from outside these danger areas.

Keynote Address: The Power of Trust: Forging Interconnections Between Virtual and Physical Worlds

Keynote speaker José-Marie Griffiths, dean and professor of the School of Information and Library Science at the University of North Carolina at Chapel Hill, presented the initial results of Interconnections, the IMLS study of the intensity of use of libraries, museums, and the Internet. (For further information consult the project Web site at www.interconnectionsreport.org.)

Opening with a discussion of trust, Dean Griffiths noted that libraries and museums have proved to be *the* most trusted information institutions, partly because of their demonstrated ability to collect, catalog, archive, and disseminate information successfully for centuries; their adherence to principles of integrity, honesty, and fairness; and, as community-based institutions, their record of watching out for the best interests of their patrons.

Such trust, Dean Griffiths proposed, is the power that can forge interconnections between the physical world of brick-and-mortar institutions and the virtual worlds of the World Wide Web. The Interconnections study showed that libraries and museums were doing just that.

At the heart of the study is the question of whether Internet resources will replace or enhance museums, public libraries, and their resources and services. In order to bring solid evidence into the debate, a national survey was designed to gather statistics on the information needs of users and potential users of online information, with a primary focus on museums, public libraries, and the Internet, but placed in the broader context of other information sources, such as professionals, people's relatives, books, newspapers, and government agencies. Although research results exist on the use of specific information sources and systems, little was known about the underlying information needs that drive people to those sources, nor about the outcomes resulting from access to the information provided.

To tackle these objectives, the consultants designed the survey to identify key information needs and how they were met by different resources, how those resources were rated for quality and trustworthiness, how effectively they

solve problems and lead to new learning, and what alternatives exist and at what cost.

The survey (conducted by household, using random digital dial) was broken down into five separate instruments, each with between 1,000 and 1,600 respondents. Some questions were common to all, others were directed more toward information user, and others to the uses of information sources. The surveys examined, in turn, general information resource use and how museums, public libraries, and the Internet fit into the overall picture; in-person and remote online use of museum and public library resources; use of Internet resources; and use of other information resources, such as books, journals, newspapers, and Internet use in nonpublic libraries. There were also 1,500 "overflow interviews" with people who had not used a museum, public library, or the Internet in the previous 12 months. Some questions focused on which resources were chosen to make decisions or solve problems in order to determine why some resources were chosen over others.

The first of three key conclusions from the survey results is that libraries and museums do still evoke consistent, extraordinary public trust among all adults. They received the highest average ratings among all information sources, with in-person, physical access ranking higher than access via the Internet, and remote online access to library and museum resources ranking higher than access to other content available on the Internet.

The second conclusion is that the Internet, far from having a negative impact, appears to enhance access to, and use of, libraries and museums. First, Internet users are *more likely* to visit museums and public libraries in person (91 percent and 50 percent, respectively) than non-Internet users. Second, Internet users visit museums 2.6 times more often in person than non-Internet users. The Internet is thus responsible for increasing visits to libraries and museums and these institutions have done well in using the Internet to present their resources and services to broader audiences.

Museums had 1.2 billion adult visits in 2006 (56 percent in person and 44 percent online), and public libraries 1.3 billion visits (58 percent in person

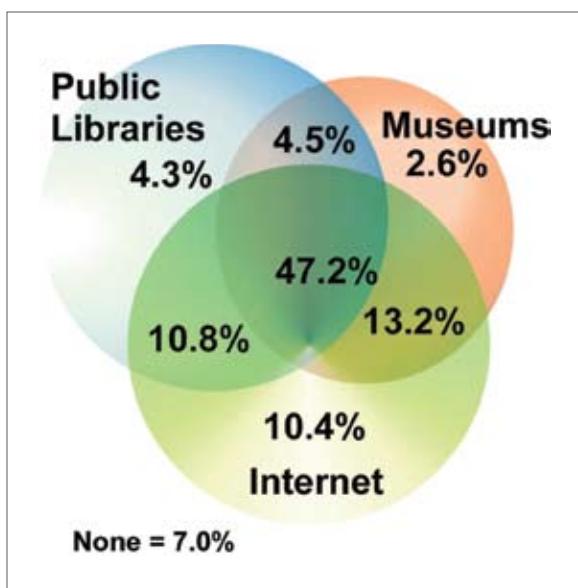


Figure 17. Percentage of adults using public libraries, museums, the Internet, and combinations of all three.

and 42 percent online). The total of 2.5 billion visits translates into 11 visits for every adult in the United States (or about 15 for every museum and public-library patron). While in-person visitation has grown over the years, Internet access increased the total visitor level in 2006 by 73 percent (museums) and 75 percent (public libraries). Dean Griffiths expressed confidence that these figures would continue to grow—online visits at a faster rate than in-person visits, especially as more resources and services are brought online.

Are museums and libraries still needed today, when the Internet presents us with so much information of all kinds? Introducing the third and last major conclusion of the study, Dean Griffiths answered that museums and public libraries *are* increasingly needed; they physically and virtually serve important, complementary roles in supporting a wide variety of information needs. Individuals today no longer use just a single source of information: using one will lead to another (on average, the study showed 2.4 sources are consulted for each important piece of information need). Thus, museums, public libraries, and the Internet complement each other rather than compete. The one important differentiating factor is the very high level of public trust in museums and

public libraries, which will lead people to favor them over other sources.

Examining how museums and libraries serve informal learning and formal education needs, the study also found that these needs are complementary. Nearly 90 percent of museum visits serve an educational purpose, while they are also overwhelmingly social events, with 91 percent of visitors going with others. Meanwhile, online library visits are used more for formal education and work-related needs, while in-person visits are used more for recreation or entertainment.

Overall, Dean Griffiths pointed out that there was much data in the survey results still to mine, but that it was quite clear from the material to date that libraries and museums are still ranked as the most trusted information sources available and that the Internet has only served to increase their use. To date, the Internet, libraries, and museums coexist in a complex interconnected Web, in which each stimulates access to the others.

The challenge for libraries and museums is to build on the extraordinary public trust they evoke and ensure that they continue to provide both in-person and remote access to quality resources and services. The enormous trust that they embody can interconnect the physical and virtual information worlds and create strong bridges of knowledge we can travel together.

Session 2: The Power of Presentation

Priscilla Caplan, associate director of the Florida Center of Library Automation, introduced this session by noting that the salient fact about her was that her daughter appeared to be a poster child for “the Google Generation,” who would rather text than talk on the phone, rather talk on the phone than see her friends in person, and doesn’t know how to e-mail. One of the challenges for museums and libraries is how they reach this Google Generation. This session was about the power of communication in the world of Web 2.0: how virtual environments can be used to open communication channels with institutions’ target populations, and how students’ native behaviors can be leveraged to include learning activities.

Ilene Frank, reference/instruction librarian at the University of South Florida, started the proceedings with a talk on why librarians are in the virtual world of Second Life (SL; <http://secondlife.com>). Librarians are just some of the 35,000-60,000 people (or at least their avatars) who are at any one time to be found at play on Second Life. To find out something of what people are doing there, she recommended some of the demographic studies by Nick Yee at the Palo Alto Research Center.²⁶

Gartner estimates that 80 percent of those online will be participating in virtual worlds by 2011,²⁷ and Frank reported figures for other online virtual spaces: ten million people worldwide playing the World of Warcraft and four million preteens on Club Penguin. There are many other multiuser virtual environments being built, and many open-source systems are being developed at universities.

²⁶ See especially “The Demographics, Motivations and Derived Experiences of Users of Massively-Multiuser Online Graphical Environments,” *PRESENCE: Teleoperators and Virtual Environments*, 15, 309-329, www.nickyee.com/pubs/Yee%20-%20MMORPG%20Demographics%202006.pdf, and also in his general papers, www.nickyee.com/index-papers.html.

²⁷ See “Gartner Says 80 Percent of Active Internet Users Will Have a ‘Second Life’ in the Virtual World by the End of 2011,” *Gartner 2007 Press Releases*, April 24, 2007, (www.gartner.com/it/page.jsp?id=503861).

However, Frank recommended SL as a good initial entry point to a three-dimensional virtual environment. Visitors can build whatever they can imagine, and can interact with others internationally (voice capability is also now available).

Second Life actively encourages educational use of the site. The Second Life Education Discussion List (SLED) is often used by educators to find online space, which is often shared and sometimes donated. Buying an “island” on Second Life is like buying space on a server. Islands typically cost \$1,000 for 16 acres, plus a monthly fee of \$150. The New Media Consortium (NMC) specializes in helping educational institutions build their sites.

What are educators doing on SL? They’re creating classrooms, some like the real ones we know, some completely imaginary. Some students are given the opportunity to create their own environments. Many simulate experiments that might be dangerous or impossible in the real world. Some teachers encourage role-playing with costumes, for example, exploring what it was like to be an immigrant in different times as people moved across the United States. One English teacher has students touch her portrait of Shakespeare, which links to the text of some of his sonnets, or bookshelves, which connect students to homework assignments out on the Web. Another teacher organized a Bunny Farm to teach genetics through some practical heredity tests. The NMC produces a “Teachers Buzz” forum every two weeks for teachers to talk about their activities on Second Life.

With all this educational activity, librarians started to think they should get involved. The first official meeting of librarians in SL took place in April 2006. The enthusiasm of pioneer “virtual librarian” Lori Bell was mostly responsible for Ilene Frank’s decision to attend her first virtual librarians’ meeting in April 2007. There are now 650 librarians in the Alliance Library Google group, some 800 librarians from around the word and some 1,400 friends of libraries. What are they doing? Some are building libraries and book collections, although Frank thought reading text was best done elsewhere. Others are organizing conferences and events,



Figure 18. A view of Info Island on Second Life.

mostly on Info Island (<http://infoisland.org>). Frank showed examples of a physical library, Clearwater Public Library, and the library it was building on Second Life, complete with exhibition areas and screens for showing streaming video.

Libraries are very active in SL's teen grid, where librarians are welcomed. For example, librarians helped create exhibits about different kinds of authors who write for young people for a teen grid festival of authors. Libraries will often have a gallery where they show art from around Second Life. Frank's favorite virtual artwork is Adam Ramona's sound sculpture. Ramona is an Australian artist who received \$20,000 from the Australian Arts Council to continue working in Second Life.

Info Island has a library reference desk that librarians staff, and this has become a good spot to meet people. Ironically, a social space had to be built away from the reference desk as the librarians were talking too much. Alliance Libraries recently compiled a report on questions asked at the desk: One-third of the 6,769 patrons had SL reference questions, with a slightly smaller number asking for directions.

Frank's own University of South Florida Library has a minimal presence on SL, and the librarians mostly talk to library science students. Outside SL, USF librarians have made several presentations to faculty and have addressed an engineering class on 3-D imaging about Second Life. Some of those engineers will be incorporating Second Life into their academic projects for the year.

Overall, Ilene Frank advised the audience to start

slow on Second Life: Be patient, and use the NMC Orientation Island to get your bearings.

Larry Johnson, chief executive officer of the New Media Consortium, spoke about Pachyderm Services, (<http://pachyderm.nmc.org>), a multimedia-authoring tool that resulted from collaboration between five university research libraries and five museums, all of which were convinced there should be an easy way for people to be able to publish stories about art on the Web.

Peter Samis and his team at the San Francisco Museum of Modern Art had produced a prototype of Pachyderm in 2002 as an in-house local authoring tool to produce the Making Sense of Modern Art program (www.sfmoma.org/MSoMA). When Johnson, who had been working on producing learning objects for universities, discovered the Pachyderm prototype, he immediately recognized its potential as an authoring tool for learning objects of all kinds for a much larger community. With a three-year IMLS grant, the development process involved collaborating with more than a thousand institutions but, five years later, the initial \$500,000 grant has borne rich fruit and Pachyderm 2.0 has been successfully self-sustaining for the last two years, and appears on track to remain that way.

Pachyderm's tag line is "A Multimedia Offering for Peanuts." The software is free and is server-based. After logging in, a client has access to essentially a mini content management system that can ingest new material from other databases as well as upload the client's own assets. The system's two hundred standards-based metadata sets allow ample population of any database. Designed for those with no multimedia experience, Pachyderm allows authors to simply select images they want, add video, write the text, and then paste what they have into a form to create their projects. As an example, Johnson showed the audience "New Art in Austin" (www.amoainteractive.org/newartinaustin2008), a showcase of local artists made by the Texas Digital Art Education project, a collaboration of all 36 Texas art museums.

Although the project started at SFMoMA (www.pachyderm.org is the original site), it has now

Session 2: The Power of Presentation

passed into the open-source world with a fresh set of developers, programmers, and Pachyderm Council members. Pachyforge is the name of the developer site, where the software can be downloaded for free if you install it yourself, otherwise it costs \$99 a year to be hosted. Pachyderm will run on Mac and Windows platforms, but not yet on Linux. Using a very simple but effective business model, all development is by volunteers and all revenue pays for the help desk and the hosted server. Today, there are some 100 servers established by institutions and several thousand individual accounts.

Johnson's overall message was that Pachyderm was able to develop from a funded grant project to a sustainable enterprise only by being able to create a community of people who cared enough about the product. For this kind of project, community really makes a difference, and building that community has to be the immediate goal at the beginning of the project.

Answering a question from the audience about Pachyderm's software components, Johnson said that it uses a combination of the proprietary Flash animation software and html. However, he noted that there are now efforts underway to put Pachyderm into SMIL (Synchronized Multimedia Integration Language, a recommended XML markup language for describing multimedia presentations). He added that he also wanted to develop templates for use in kiosks on gallery floors.

One participant wanted to clarify what open source was. Johnson replied that with software, one important consideration is always "Who owns the code?" With proprietary software, the code, or programming, is hidden. With open source, everyone can see and have access to the code, and can copy, add to, and change its functionality. However, although open-source software is free of charge, it doesn't typically come with the kinds of quality assurance processes that come with commercial code. So a CIO needs to know whether a given open-source program is a stable platform or whether it needs to be nursed and tended by technical staff, which is why hosting is often a good solution for smaller institutions.

Bill White, the last speaker on the panel, is director of educational program development for the Colonial Williamsburg Foundation. He presented its new Virtual Republic project, which had recently received IMLS funding. He noted that Colonial Williamsburg was consciously expanding its reach to K-12 students and that the Virtual Republic is the latest addition to its "The Idea of America" program, designed as a set of high school American history materials that can apply the central ideas of the republic to contemporary civic situations. The Virtual Republic is designed to use current events to explore how lessons from the past can inform the present, and, through an interactive component, give students the opportunity to debate the issues with their peers across the country.

The Virtual Republic is innovative in its focus on the continuous debate throughout U.S. history on the core values of the republic that are typically in constant, dynamic tension with one another. Consider, for example, freedom and community, law and ethics. The course will introduce these values through curricular material, often through stories of individuals who embody the conflicts, but also through primary material, censuses, and demographic maps, for example. Students will connect the debates over values in historical case studies to current news events and create their own policy statement. As young citizens of the republic, students will both analyze the values under debate and engage in the debate themselves.

Although White initially wanted the project to be more virtual, he said that he was reminded that this was designed as an instructional site to be run by teachers, although they will be able to take advantage of interactive social networking tools. The plan is that after posting policy statements about a specific civic situation, students caucus online with their peers, who respond with their own briefs, and then all debate the issues in a national conference. The original class would refine its original policy statement through this process of caucus, conference, and debate and then, the designers hope, would take the proposal to school boards or state representatives, write editorials for

newspapers and blogs, and engage with local advisory or advocacy groups. This could bridge the gap between textbook civic learning and actual engagement in the community.

One question from the audience concerned the core democratic skill of being able to critically evaluate any information source. Would students be taught to critically engage with news sources, asking questions about, for example, how a census was created, what it might have omitted, and for what reasons? White replied that he agreed that the questions asked about a set of materials were as important as the materials themselves, and would be encouraged.

Another question was prompted by the sense that the materials might be too prescribed: what opportunities would there be to ensure more of a free-form analysis of documents? White replied that there was an accepted methodology called document-based questioning, designed to help students read documents and lead them to critical discussions about the key issues. The project hadn't been designed to lead students to specific conclusions but rather to direct them to uncover what the issues are that need to be discussed and put into the context of current events.

Asked if the project would leverage existing social networks, White said that while Colonial Williamsburg would be building the curriculum materials and the learning management system, it would probably use existing social networking tools that were available on the market.

The last question addressed the "tough stuff" of racial history: How can teachers be sufficiently prepared to equip students to debate, say, issues of slavery, when in many communities there can be a strong attitudinal paradigm for students to cross? White replied that while the teacher development program was still being put in place, he agreed this was a critical issue for teachers and students. He hoped the program would be one in which students would be talking about issues without teachers leading them to any foregone conclusions. For example, a student in a Bible Belt Texas classroom debating a Moslem student

in Detroit on the role of religion in the Republic might be talking about prayer, but it would be a different kind of prayer. Project staff recognized that teachers would need the right tools and training to deal with some of the most sensitive issues of race and religion.

Session 3: The Power of the User

Marsha Semmel, deputy director for museum services and strategic planning at IMLS, introduced the third session, “The Power of the User,” in which she said the speakers would delve further into the subject of the user and shared authority. She was particularly interested in the question of how willing institutions might be to cede authority to users, balancing their roles as institutions with this expanding community of collaborators and knowledge creators.

Cathy De Rosa, vice president for the Americas and global vice president of marketing at OCLC Online Computer Library Center, spoke on “Privacy, Trust, and a Billion Patrons.” She opened by showing a 2003 IBM ad for Linux,²⁸ in which IBM dramatized the potential of the open-source sharing model for users taking control of the network. What might the consequences be for museums and libraries if they really did get users involved? De Rosa cited Kevin Kelley’s 2005 article “We Are the Web,” which predicted that by 2015 the Web would be controlled not by mass media and mass audiences but by “messy media and messy participation.”²⁹ Her only disagreement with Kelly was with the date: She thought the shift would happen much before 2015.

Through her work with OCLC on a series of reports on the information landscape that focus on the user, De Rosa said she was surprised by how quickly everyone has become interested in participating in the Web rather than just in browsing. In the most recent of these reports, “Sharing, Privacy, and Trust in Our Networked World” (www.oclc.org/reports/sharing/default.htm), 30 percent of users report regularly creating Web pages and 70 percent say they take part in social networking sites at least once a week. Meanwhile, only 1 percent visit library sites. What are the implications for libraries of these figures?

De Rosa pointed out some changing trends in

people’s trust of the Web. In a 2005 OCLC study,³⁰ undertaken before large numbers of people were directly contributing, most said that they “just knew” whether information is trustworthy or not; it was just common sense. Taking another look at this issue in the slightly different world of higher user participation, the latest OCLC study revealed that, although 70 percent *said* they needed privacy and valued it highly, in practice, there was a very high degree of active sharing of names, addresses, sexual preferences, and more online, apparently with little thought of the privacy implications. Across the United States, the UK, Canada, Germany, France, and Japan, the most trusted sites, according to OCLC, were Amazon and eBay, trusted by 48 percent; with 32 percent trusting their favorite social networking site, YouTube. The lesson she drew from this were that the most trusted sites were sites that let you contribute and build. Although the “Interconnections” report (see José-Marie Griffiths’ talk above) and others have reaffirmed that libraries are the most trusted information institutions, De Rosa suggested that the situation is changing online.

One area where people were generally more reticent in sharing information was health. In this respect, De Rosa was somewhat surprised to hear Google chairman Eric Schmidt announce earlier this year that the most important search area in the future will be health: Both Google and Microsoft want to build trusted sites where health information can be stored and accessed. “Let’s do it together” is the tagline for Microsoft’s HealthVault. How many people really are willing to trust their health information to such a site?

Half of the respondents to the “Sharing, Privacy and Trust” survey said they thought the Internet was more secure and their information was more private than it was two years earlier. This means that, as people contribute to social networking and other sites, they are doing so on what they believe to be a trusted platform, in a trusted environment. Asked what kinds of information they believed were private,

²⁸ www.youtube.com/watch?v=EwL0G9wK8j4

²⁹ Kevin Kelly, “We Are the Web,” *Wired*, August 2005, www.wired.com/wired/archive/13.08/tech.html

³⁰ *Perceptions of Libraries and Information Resources*, 2005, www.oclc.org/reports/2005perceptions.htm

78 percent thought their government ID and their Internet searches were private. However, only 19 percent thought items checked out from their public library were private (30 percent did not know that the library keeps that information private).

Library directors, who had to be pressed to respond to the survey in sufficient numbers, proved to be significantly more wary about sharing information about themselves (except about their book-reading habits, which they very enthusiastically share), and also differed significantly from other respondents by giving a harsher judgment on the security and privacy of the Internet.

Overall, De Rosa emphasized that those responding to the OCLC surveys were most concerned about keeping their personal space private and felt most in control when they are able to contribute to sites and can decide whether and when they open or close their privacy windows. De Rosa's final message was that libraries appeared to be getting left behind in the trust and interactivity stakes and that they should do their best to invite, as Kevin Kelley put it, "messy participation" into the library space.

The next speaker was journalist, scholar, writer, and poet **Paul Jones**, who directs ibiblio.org, a contributor-run digital library of public domain and creative media, now in its fifteenth year at the University of North Carolina. Dedicated to the goals of open source, open information, and open access, ibiblio runs on the philosophy that by adopting both open-source tools and open-source philosophy (encouraging community interaction and contributor involvement), digital libraries can open new information horizons to communities as well as greatly improve traditional services. Ibiblio is also an archive, and actively looks for interesting people with interesting collections with whom it can collaborate. Jones summarized ibiblio's activity in a thumbnail profile: 12 million to 15 million transactions per day; 2,500 collections of material, other than software, totaling some 12 terabytes, which is streamed on demand at about 500 megabytes per second.

Proceeding to a more expansive overview of ibiblio's overall approach to collecting online, Mr.

Jones presented what he called "the three laws and five big ideas" that not only help ibiblio succeed but that are true for any information-based Web site.

The first of the three laws is Moore's Law, which maintains that the numbers of transistors on a chip will double every 18 months, implying faster computers. The second, Metcalfe's Law, is named after Ethernet inventor, Robert Metcalfe, who said the real value of a network is not in its speed but in the number of computers connected to it: The power of a network is the number of computers in the network, squared. Third is Reed's Law, named after David P. Reed, one of the architects of Croquet,³¹ the open source 3-D environment, who stated that the real power of a network is the intelligence of each node (or site) and the people driving that node.

Regarding these laws, Jones maintains that, although many attest that "content is king," and that the value of a site lies in its content, that is not true. People come for content, but they come slowly, at the value of, say, N . It's also accepted that a site will increase its value with as more people visit it (which would be Metcalf's network law, N^2). But, in Jones's formulation, to achieve the highest value a site needs to follow Reed's Law and provide what the most successful sites (such as Facebook, Amazon, eBay, and YouTube) offer, which is very active facilitation of services within the context of their content and members (2^N).

How to achieve the intelligent facilitation of Reed's Law? In answer, Jones turned to the "five big ideas," encapsulated in five books. First, Joachim Benkler's *Wealth of Networks*, which shows how changing the means of social production changes the markets. That is, when people work together to make new materials, annotate them, and add new knowledge, it changes the way markets work. Having grown up in a kibbutz, Benkler understands social value. It's not the bottom line; it's what happens when people work together for a social good, which is not necessarily an economic good.

How do you get people to do this and how do you effectively manage open-source communities?

³¹ www.opencroquet.org

Session 3: The Power of the User

In *Democratizing Innovation*,³² Eric von Hippel argues that by identifying the lead users who do most of the work in any community project, you can create a high level of normative behavior. This will then help to define what is good practice and what is unacceptable in a group effort. Jones affirmed that it was crucial to make clear to all participants what the normative behavior was for any online group—one of the themes of Dr. Fanton's keynote address.

Of all of Lawrence Lessig's books, including *Code*, *Laws of Cyberspace*, and *The Future of Ideas*, Jones chose for his purposes what he called the polemic, *Free Culture*.³³ To be receptive to open-source and free software and the idea of sharing, Lessig maintains, we have to have the idea of free and remixable culture. Big Media, in Lessig's formulation, is locking down our access to the tools to build a new culture, largely by using digital rights management software. The ibiblio site is an expression of the alternative: It provides material that people can use, reuse, remix, and translate into other forms. Now, with the Creative Commons³⁴ framework (unbundling the many rights packaged together within copyright law, allowing creators to choose how many rights, on a sliding scale, they want to reserve), there is a legal framework. What Creative Commons quickly discovered is that attribution is what everybody wants—more than privacy, compensation, or control—so all the licenses address that.

The fourth book, Chris Anderson's *The Long Tail*,³⁵ identified the market strategy of online stores like Amazon that make a significant profit from selling small volumes of hard-to-find items to many customers, instead of only selling large volumes of

a tiny number of popular items. A power law graph demonstrates the 80-20 law (80 percent of sales comes from 20 percent of clients). However, Amazon, Netflix, and others do well from the inverse of this: the long, slow, but consistent 80 percent, the "long tail." This phenomenon also works for ibiblio. There are no 15 greatest titles but rather a long, sustained interest in a wide range of material.

The last book in this pantheon was Seth Godin's *Small Is the New Big*,³⁶ on the virtues, success, and profitability of smaller organizations online. To illustrate, Jones cited as examples Craigslist, the online classifieds now in 150 cities, which with a staff of 23 has effectively replaced the classifieds business of most newspapers; Wikipedia, which has a staff of six; and YouTube, a \$1.5 billion company, which has a staff of 56. Comparably, ibiblio has 75 servers, 2,500 collections, processes 15 million transactions a day, and employs two people.

Jones concluded simply by summing up that these five really big ideas (that social networks can produce real "social wealth"; that online normative behavior can be modeled by a few lead users; that people want to remix and reuse material; that there is a market in the long tail—the persistent interest in a wide range of material; and that small organizations can be very effective in large markets) contributed to the success of ibiblio over its 15-year history and he recommended them to all participants.

Bryan Kennedy, senior exhibit developer at the Science Museum of Minnesota next spoke about his museum's Science Buzz, both an exhibit in the museum and a Web site (www.smm.org/buzz), the main goal of which was to engage visitors in discussions of contemporary issues of science.

The Science Museum of Minnesota is a hybrid natural history museum and science center with a large collection of interpretive natural history and interactive exhibits on topics in current science. Most science centers, Kennedy proposed, are quite good at

³² Eric von Hippel, *Democratizing Innovation*, Cambridge, Mass.: MIT Press, 2005, <http://web.mit.edu/evhippel/www/democ1.htm>

³³ Lawrence Lessig, *Free Culture: The Nature and Future of Creativity*, New York: Penguin Books, 2005, www.free-culture.cc/freecontent/

³⁴ <http://creativecommons.org>

³⁵ Chris Anderson, *The Long Tail: Why the Future of Business Is Selling Less of More*, New York: Hyperion, 2006

³⁶ Seth Godin, *Small Is the New Big: And 183 Other Riffs, Rants, and Remarkable Business*, New York: Portfolio, 2006, http://sethgodin.typepad.com/seths_blog/2005/06/small_is_the_ne.html

engaging visitors and explaining traditional concepts like gravity, or showing how electricity works by having visitors pedal bicycles and light up bulbs. It's rarer to find an exhibit on very contemporary topics like nanotechnology, with discussions about what happens when you rub sunscreen with nanoparticles on your face, or on the issues surrounding cloning, or on the scientific perspective on current events, from Hurricane Katrina to shooting down a spy satellite.

Science Buzz is the museum's response to this defined need to deal with these kinds of contemporary issues. It is both a physical exhibit in the museum, with traditional as well as digital exhibits, and kiosks that can be replicated in other museums. These kiosks are linked to the Science Buzz Web site, allowing visitors to follow discussions either on the museum floor or on the Web. The linking together of the two spaces is an integral part of the project's design and, although Kennedy had to work hard to convince his colleagues that a dynamic Web site would in fact drive people into the physical space, he has since been proved right.

The online component of Science Buzz is built as a community blog, which, beyond prohibiting anonymous posts, is mostly unmoderated. The site often uses a blog poll, such as one recently asking people's opinions on genetically modified carrots. The site also features an "object of the month," related to contemporary scientific issues (such as a skull from the longnose gar displayed for the opening of Minnesota's fishing season) on which bloggers are invited to write a label, tell a story, or compose a poem. Kennedy related his amazement, on the occasion of displaying a massive 300-pound drill head from a geological drilling vessel, to see a visitor on the museum floor write a page-and-a-half piece on the history of drilling and Howard Hughes's invention of that particular kind of drill head.

When discussion about a topic heats up, "micro-experts" from the community are invited to contribute. For example, the topic of how and why chickens lay unfertilized eggs was turned over to a local poultry researcher at the University of Minnesota, who was able to answer people's daily questions about rearing roosters in their backyard

or sexing chickens. Turning over the blog to the local expert made it both a more interesting and authoritative discussion.

Realizing the potential of trusting the community to responsibly treat controversial subjects, Science Buzz staff recently extended some of the issues from a museum exhibit on the scientific basis of race into the online space. One of the issues not treated in the exhibit was the relationship between race and sports performance and there was very good, active discussion in response to a Science Buzz poll on the issue, which included scholars who had worked on the exhibit.

Kennedy concluded with some lessons on social networking for the museum field from his experience with Science Buzz. First, try indiscriminately, but implement judiciously. By this Kennedy meant that it pays to first try out social networking tools to see how they work out (many of the Minnesota Science Museum's projects, Kennedy said, did not work out). Second, many social networking tools, such as blogs, require active participation in order to be understood.

Small museums can not only succeed with these technologies but also be leaders for others to follow. Small museums generally have greater flexibility than larger institutions in trying new projects, and many social networking tools are free.

In the question-and-answer period, the first question came back to Kennedy's last point: How could a small institution develop an online presence like that of the Minnesota Science Museum? The key, said Kennedy, is to share the work: Many hands make light work. Moderating a social Web site is key, but the moderator doesn't have to be one person; the task can be shared among many people. The important thing is to experiment.

Paul Jones agreed that success in this arena was heavily dependent upon enabling participants to be creative. But he also stressed the importance, in creating any kind of blog or bulletin board service, of establishing a code of behavior, with consequences for good and bad behavior. Kennedy suggested another strategy: tightly controlling the look of a site's front page, while allowing everything behind it to be open and more free-form. All the large social Web sites follow this pattern, he said.



Conference Day Two

Keynote Address: Animating the Archive

Keynote speaker, Dr. Jeffrey Schnapp, director of the Stanford Humanities Lab (SHL; <http://shl.stanford.edu>), developed the thesis that Web 2.0 technologies and practices offer a tremendously rich suite of opportunities and challenges for “memory institutions” to bring archives to life by extending them into the community in radically new ways.

He proposed that the word “archive” today leaps beyond the earlier meaning of “official public records” to include the entire “corpus” of the remains of the past and the buildings that house them. While the past always inhabits the present in one form or another, the new set of tools in the space between Web 2.0 and Web 3.0 (including **virtual worlds**, **Web3-D**, and the **Semantic Web**) will animate the archive in many ways, including the following:

- By bringing radically new approaches to conservation and preservation, based upon *multiplying* rather than restricting access to the remains of the past;
- By invoking new models of producing content, conducting research, and exercising curatorship through collaborative participation with audiences;
- By mixing physical and virtual-reality approaches to programming and informal education that will change the makeup of those audiences; and
- By producing radically new forms of engagement with both past and present.

Museums and libraries have always operated with the often-conflicting impulses both to protect and to share: as repositories, they place historical objects in the vault, or under glass; and as educational institutions, they create imaginative forms of access and presentation. That access, because of objects’ frailty, rarity, or value, has been subject to hierarchical discrimination between specialists and nonspecialists, and institutional identities are often built around physical access to objects with “aura.”

But physical presence is no longer the unquestioned norm. The Web and Web 2.0 are substantially modifying notions of audience and community. Web 1.0 was a revolution in its own right as institutional Web sites offered new equivalents to the paper

brochures, guides, and catalogs that institutions used to pursue their missions. However, as the reach of these Web sites extended, the Web presence started to chip away at the solidity of library and museum walls. Web 2.0 is accelerating the process and radicalizing the consequences.

The virtual is now becoming arguably more important than the physical as museums and libraries sit next to one another on a universal town square: an institution’s virtual footprint is ubiquitous, and its audience is global, or rather “glocal,” local and global at the same time.

To substantiate and root these claims in some real examples, Dr. Schnapp proceeded to make five points, followed by three examples of work done at the Stanford Humanities Lab, a “hybrid new media/technology lab and arts/humanities research center,” which he has directed since founding it in 2000.

1. Change is already here. No matter how they shape their own physical spaces, museums and libraries also operate in a virtual environment in which audiences expect increased access and the ability to shape and change their experience. Open-source resources are becoming the norm, off-site audiences expect fluid access to and reuse of digital surrogates for their own online communities, and on-site visitors expect augmented forms of access to the physical originals. This changing environment will bring change to memory institutions, as they have done to the music industry.

2. There will be new norms for institutional collaboration and teamwork. Web 2.0 tools connote not only expanded notions of community but also new forms of internal and cross-institutional ways of working. These tools will invoke less hierarchical, flatter organizational structures, in which the “core” activities such as conservation, curation, and publication will embed themselves more directly with outreach, communications, and education activities. Curating an exhibition may intrinsically demand a wiki, where audiences interact directly with artists, scholars, and curators, not to mention with one another. Building repositories and programming across institutions should be logical corollaries, as should the online linking of physical exhibits

Keynote Address: Animating the Archive

separated by continents. This could lead to radical collaboration between organizations, where geography becomes shockingly irrelevant.

3. "Mixed" or "augmented" reality will prove to be as significant as the purely virtual; the memory palaces of the 21st century will have much more porous walls than their predecessors.

Believing in the "distinctive magic of experiencing original objects in real time and space," Dr. Schnapp also believes we have a responsibility to exploit the medium-specific qualities of both the physical and the digital in ways that enrich our experiences of the physical originals. We can manipulate virtual representations in ways that would be impossible with their physical originals, rotating and scaling Michelangelo's David as we please; peering into the layers of a painted canvas, then flipping it to examine the stretcher; surveying millions of books in seconds for an exact reference; be present in multiple locations and media at once instead of visiting them sequentially. With Google Earth and 3-D virtual worlds, ubiquitous GPS-equipped computing devices, and abundant wireless bandwidth, we will increasingly experience the embedding of the virtual within the real. The challenge for museums and libraries is to build out from their physical operations into this hybrid world and establish new models of innovative quality and rigor.

4. Libraries and museums will become more process- than product-oriented.

In the past, institutions have adapted well to the finitude of print with the product orientation of their exhibits and catalogs. The digital world, especially in its Web 2.0 manifestation, brings a greater emphasis on process and more distributed forms of content generation as well as a more open and less risk-averse attitude toward issues of ownership and content control. Dr. Schnapp believes that the payoffs for this new approach are considerable. Any research project or exhibition development, if exposed to comment and broader input, multiplies the opportunities for building bridges outside the institution and expands the programming opportunities. Memory institutions will be less like publishers of finished product and more like laboratories, where, as is visible at almost

any hour at San Francisco's Exploratorium, "stuff happens," activities occur that invite observation and participation: thinking, commentary, conversation, construction, and play.

5. Tools are only tools.

In themselves, tools provide no answers for our institutions. These new technologies of opportunity and of sharing bring with them clear responsibilities for us, as historians, museum and library directors, curators, artists, and communicators to stay in the driver's seat. It is this community, not just technologists, who should be driving us forward. Tools are not something separate from us but are socioculturally embedded. It is we who must devise the uses—often not those for which the tools are first devised.

Getting practical, Dr. Schnapp illustrated these perceptions with three project examples: *Archive You*, *Augmented Virtualities*, and *Memory Palaces with Porous Walls*.

Archive You

The first example Schnapp offered, proposes a radically new approach to the archiving and processing of very large holdings of nonunique items, such as a hundred thousand posters gathered from around the world over a half-century, or vast holdings of documentary audio, film, and video recordings. Conventionally, such collections would require a decade's worth of work, during which time the materials would be inaccessible while experts process them. However, the expertise informing such materials usually lies within the community and the sheer volume of material suggests an alternate approach.

One such approach is to build open-architecture resources, like the collaborative time line of the Cabrinety collection of video games (<http://caseyalt.com/timeline.html>) or the collaborative genealogy of the Stanford biochemistry department (<http://caseyalt.com/works/genealogy>), both developed by Casey Alt at the Stanford Humanities Lab. Representing an archive in its own right, the collaborative time line invites the community involved in the videogame development lifecycle (technologists, animators, storyboard designers, managers, game **modders**, players, etc.,) to document, edit, and

annotate key events across several categories. Links in the time line demonstrate relationships among people, events, and individual artifacts. Similarly, the collaborative genealogy, which used *PubMed* data, automatically linked to faculty-authored abstracts and full-text versions of publications, allows a professional community to narrate and reflect upon its own history in kaleidoscopic form, allowing for vertical and horizontal representations of interconnections. In both cases the technology enables communities of practitioners and end users to document their history within an architecture established and maintained by expert researchers.

Augmented Realities

Preserving and presenting nonobject-based artworks is a challenge the lab confronted with the issue of what to do with the archive of the pioneering digital artist Lynn Hershman (later known for interactive avatars and film projects such as *Teknolust*). What to do with the 90 boxes filled with the remains of much of this work (papers, photographs, tapes, movies, sound recordings)? Hershman's early work included site-specific installations, such as *The Dante Hotel*, a 1973 collaborative project with Eleanor Coppola, in which she furnished a rented hotel room with objects evoking traces left by previous occupants: clues to their identities. Rather than curating documents relating to the piece, the lab decided to collaborate with Hershman to remix the remains into a new piece, *Life Squared*, set in Second Life. A visitor, in the role of detective, can uncover clues about the

work, exploring historical, archival narrative, and archaeological uses of documentation. The experiment/exhibit bridges the physical/virtual worlds with parallel exhibit spaces in Second Life and at the Montreal Museum of Fine Arts, where it was part of a larger show celebrating the 10th anniversary of the Daniel Langlois Foundation for Art, Science, and Technology. The museum space devoted to Hershman's *Dante Hotel* work has been cloned adjacent to the regenerated *Dante Hotel* on SHL's island in Second Life. The Humanities Lab thus produced a literal animated archive that was then embedded in a physical gallery space (Montreal), which, in turn, was re-embedded in the animated archive (Second Life). The next iteration? SFMOMA in October 2008.³⁷

Memory Palaces with Porous Walls

Schnapp concluded by guiding the audience on a live visit to Second Life—first to view the virtual surrogate of the Montreal Museum of Fine Arts' *Life Squared* exhibit on the Stanford Lab's island in Second Life (one of four sites in a Library of Congress Preserving Virtual Worlds project) and then to see the early outlines of an ambitious collaborative venture between the Stanford Lab and the Canadian Center for Architecture, the Wolfsonian–FIU, and the Danish Bornholms-Kunstmuseum. SPEED limits is a "mixed reality" exhibit marking the centenary of the Italian futurists (whose manifesto famously proclaimed "that the world's magnificence has been enriched by a new beauty: the beauty of speed") but which will also examine the pivotal role of speed in modern life, from art, architecture, graphics, and design to the material culture of the industrial and information ages. While the centenary will be celebrated in more conventional ways by institutions such as New York's Museum of Modern Art and the Pompidou Center, SPEED limits will be more critical and speculative, weaving actual physical exhibitions in distant locations into a single virtual platform that will include five virtual galleries, curated by artists, critics, and



Figure 19. Lynn Hershman Leeson, "Life Squared." Mixed media and interactive installation, courtesy of Gallery Paule Anglim, San Francisco, and bitforms gallery, New York, © 2008 Lynn Hershman Leeson.

³⁷ See <http://presence.stanford.edu:3455/LynnHershman/261> and www.sfmoma.org/press/pressroom.asp?do=exhibitions&id=337

Keynote Address: Animating the Archive

scholars, and a further five reserved for visitor-generated content and curatorial concepts (there will be guidelines for visitors to generate content and a competition for producing the best of these). All 10 galleries will be designed as experiments in the form of the “virtual gallery” (i.e., a container unbounded by the temporality or spatiality of physical exhibition spaces). The point is to combine traditional notions of curatorship and exhibit design with more experimental participatory curation. While the process and product are experimental, not to mention tentative, both seem well suited to the recollection of a movement whose foundation stone was the destruction of all foundation stones. Dr. Schnapp admitted that while few today would affirm the destructive element of the futurist credo, he was sure that many would affirm the cause of animating museums, libraries, and archives.

In answering questions from the audience, Dr. Schnapp indicated that the time line tool he had discussed was being rethought so that it could be made more easily usable as a public tool (the Flash component is powerful but constricting and difficult to maintain). When asked what Second Life’s “carbon footprint” might be, Schnapp said he couldn’t venture a guess, but indicated that the current iteration of Second Life is a very crude alpha release of a kind of program he believed would be a very significant part of the Internet in the future. Second Life is what is currently commercially available and it is where the people are. Sometimes it seems under- or depopulated, with 100 to 150 avatars attending events, but that’s its limit. More advanced work was under way and glimpses of that work could be seen in programs such as Croquet, which unfortunately also have restrictions for public programming. Second Life’s current biggest defect, he ventured, was not the weakness of the graphics but its inability to import and export “out of world” modeling tools. University’s Computer Science Department, for one, is building a more robust environment that does have the ability to import and export standard graphics and digital objects and media.

Finally, to a question about the comparable amounts of time spent in physical and virtual

exhibits, Schnapp said that the SPEED Limits show would reveal some of the differences in the ways people explore virtual 3-D spaces from physical ones. It would have in it a tool built by computer scientists that can compare the way people build a series of experiences from visiting a physical show versus people exploring a virtual version of the exhibit online. When a show then presents both physical and virtual experiences that intersect one another, the data should show some very interesting results on the factors that affect the dynamics of audience response. This, Dr. Schnapp thought, is a very promising area of research that could be well used in serving the ambitions and missions of archives, libraries, and museums in the hybrid digital-physical world in which they are increasingly operating.

Session 4: The Power of Collaboration

Moderator **Bernard Reilly**, president of the Center for Research Libraries, opened the final session dedicated to considering how new digital technologies can be used collaboratively to create cultural and educational resources.

The first speaker, **Roger Bruce**, director of interpretation at George Eastman House, spoke about "Capturing Connoisseurship: A Wiki for Expertise in the Evaluation of Photographs," which he explained was a small but vital tool for the identification of photographs. This project is a collaboration growing out of an *ad hoc* photographic materials research group that developed the idea of creating and maintaining a tool to compare and contrast characteristics of photographic prints. The first of its kind, the wiki will include documentation on cameras, print materials, chemical processes, and other imaging devices and materials from the entire history of photography. The final product will be freely distributed as a searchable database, providing a dynamic and authoritative online resource.

Founded in 1950, George Eastman House is the world's oldest photography museum, renowned for its photograph and motion picture archives, as well as its expertise in film and photograph preservation

and conservation. However, Bruce commented on the growing awareness that little was known until very recently about the proper care of photographs as objects. Young photographers, exploring the aesthetics and craft of the medium, and researching the formulas of 19th-century imagemaking, now know a great deal about the making of collodion and albumen prints, and daguerreotypes. With photographs selling at auction for \$3 million, there's motivation to forge early prints—and it's easy. Bruce showed his own forged Lewis Hine, clearer and "better" than the original.

In assembling the wiki, the first problem to confront was that there were so many variables that it might be hard to keep the project focused, and experts would be frugal with their time. Granularity of information would have to be balanced against scope. So the key was to provide some guiding editorial management and to start with a core set of information. Rather than extract from existing collections, they decided to grow a set of information from examining five samples, one of them Lewis Hine's *Powerhouse Mechanic* series.

One set of information to be targeted would be the kinds photographic materials available. However, as useful as it might seem to be able to take sample paper to the confocal microscope and be able to demonstrate that this was a certain grade of Kodak paper available in 1958, Bruce said the question came up, "How many institutions nationwide would have access to such tools to give this depth of information?" On the other hand, showing examples of the range of a photographer's signatures might be more practically useful for more institutions.

The users of this resource, when it is eventually made available, will presumably include photographers, archivists, scholars, and students, but may very well include others. In that case, the skills of "connoisseurship" would be more widely distributed. The wiki would probably be used in the authentication of photographs, and would at least aid in narrowing down the possibilities by defining the key characteristics to be considered in judging authenticity. Eventually, conservators may be the greatest users of the resource.

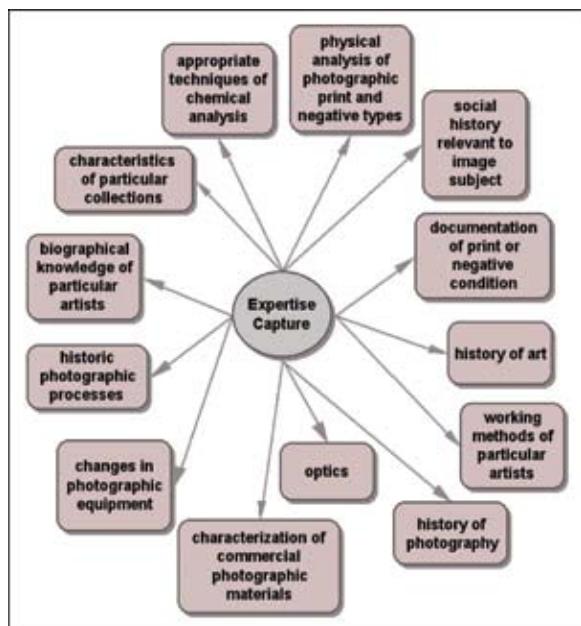


Figure 20. Capturing Connoisseurship:
Controlling Project Scope.

Session 4: The Power of Collaboration

To a question about whether the project would make large photography files available via the wiki on the Web, Bruce replied that high resolution was of course important to parse the questions and provide the evidence needed, but there were split opinions about the advisability of sharing high-resolution images. Interpreters and educators generally like the idea of making images available in as high a spatial resolution as practicable, but also in high bit depth. While there is the concern about spoiling the possibilities of earned income, Bruce himself felt there was no conflict between making high-resolution images available for educational use while still maintaining a thriving commercial-use business.

Mark Kornbluh, professor of history and director of MATRIX at Michigan State University, spoke next about “The Quilt Index, H-Net, and MATRIX: From Digital Repositories to Information Habitats.” He opened by explaining that MATRIX was one of a new breed of digital humanities centers bringing together the best of computer science, information technology research, and the humanities. These centers are increasingly working together, and Professor Kornbluh thought there was rich partnership potential for these university-based centers to work with cultural heritage institutions.

Professor Kornbluh made the point that collaboration by communication online didn’t start with Web 2.0: it started with the birth of the Internet itself (10 years before the Web) and with projects such as H-Net, now 15 years old and the largest virtual scholarly network in the world (www.h-net.org). Wikis, avatars, and the like are building on that foundation. As Professor Kornbluh sees it, the big opportunity now is to use the Web 2.0 technologies to link scholar communities more closely to the objects they study, as well as to museums and libraries. H-Net can be seen as a story of moving from creating communities to adding tools, and now adding the connections to cultural heritage resources.

Professor Kornbluh has worked on the Quilt Index (www.quiltindex.org) for the decade since it was first funded by IMLS and the NEH. It is a quintessential digital library project, with a core of scholars and librarians building a single digital repository to

capture everything the community wants to know about this one complex cultural object. For a digital humanist, it is a perfect testbed: take one class of object across many institutions, put together all the available information on that object type, and then create the tools for a broad range of people to use it.

The project has evolved through several phases. First, there was the basic curation and collaboration needed to produce a standardized vocabulary that was submitted to the Getty Art and Architecture Thesaurus. Then, a searchable database and Web interface was built with four partners. This was subsequently expanded and built as a second-generation trusted digital repository, with crosswalks so that museums could inject further information. By its conclusion, this stage of the project will have gathered together 23 partners and 60,000 quilts. More exciting, Professor Kornbluh said, was Phase 4, the current IMLS-funded project, which would open the project to anyone to add or edit information, although an editorial board will oversee which collections should be added. Also associated materials will be added—journals, images, oral history, etc.—so all the connecting tissue that a scholar may want about the object will be available.

With the digital library built, Web 2.0 tools can be added, such as an exhibition or lesson-plan builder, easily pulling material together from the 23 museums. With an integrated database, scholars will be able to link straight from the article in the journal to the primary material. Personalization features will allow visitors to choose their favorites and social networking will enable different communities to compare quilts across this massive collection (60,000 now, increasing to around 250,000 quilts by 2013).

Essentially, the Quilt Index is now what Professor Kornbluh calls an “information habitat,” where different knowledge communities can come and find the information they need and contribute what they have in a given topic. For example, with access to this representation of quilts that have been made in the United States over 200 years, and knowing whether they were made by men or women, by African Americans, Laotians, or Native Americans, a scholar could use the Index to answer questions

about racial integration. Knowing, for example, that many African Americans moved north in the middle of the 20th century, Professor Kornbluh could use the index to discover whether the quilts of migrating African Americans came to resemble those of their white neighbors.

One of the principles emerging from this kind of examination is “more is better.” **Cyberinfrastructure** introduces the notion that with radically increased storage and communication capabilities, scholars will be able to work in very different ways in the future. New tools, technologies, and network capabilities can bring huge volumes of material under control, but, Professor Kornbluh warned, it is essential to curate and preserve the information. Without the right metadata, information is worthless, which is why the Quilt Index is being built on top of the best librarianship that exists. Change here is being pushed forward by new data sets and new capabilities, but the scholars and the knowledge communities who want to address increasingly complex issues are also pulling it. We need resources, but we also need creativity to take up the challenge.

In answer to a question on whether digital humanities centers were working together, Professor Kornbluh replied that they were collaborating via several working groups, a wiki and a discussion list (see www.digitalhumanities.org/centernet). In terms of the relationships of these centers with cultural institutions, Kornbluh observed that many digital humanities centers began as totally text-oriented institutions but now were increasingly working with the more complex objects that museums curated. He expected that these centers would stay at the interdisciplinary intersection between information technologies and the humanities. However, he thought that the humanities as a whole would eventually become much more digitally based.

To a question about the vocabulary standardization process in the first phase of the Quilt Index project, Professor Kornbluh replied that, as the project had the advantage of working with very committed members of the American Quilt Alliance, it was relatively easy to bring together curators, editors, and scholars to talk through the project. One

compromise was an agreement to allow the addition of fields to the record so everyone could enter the information they thought was most important, on the condition that there would be an essential core of fields that everyone was required to complete. Some collections have information on backings and borders, others won’t; still others will have more data on the quilters than the quilts. Beyond the minimum required set of metadata for each record, what each institution fills in for each quilt can be quite different. Such flexibility that could embrace compromise Professor Kornbluh thought was essential for a project as wide-ranging as this.

Cathy Norton, director of the marine biology lab at Woods Hole Oceanographic Institute, opened the last part of this panel by heralding the great biologist E. O. Wilson as the visionary behind the Encyclopedia of Life (www.eol.org), an “audacious” project with the goal of creating a Web page for each of the 1.8 million species living on earth today. Wilson launched the project in his TED Prize acceptance speech at the 2007 TED conference (www.ted.com/index.php/talks/view/id/83), where he described it as “the key tool that we need to inspire preservation of Earth’s biodiversity.”

The important informatics component of the Encyclopedia of Life is based at the Marine Biological Laboratory, Woods Hole, Massachusetts, whose library is internationally recognized as defining current trends and practices in marine information sciences and bioinformatics. The EOL is building an online Biodiversity Heritage Library (BHL) to provide open access to all the core biodiversity literature. With the ultimate goal of having 5.4 million digitized books online and a five-year plan of scanning one million volumes in partnership with the Internet Archive and the Northeast Regional Scanning Center, the project already has 4,000 texts available on its Web site.³⁸ Many major museums and research libraries, (from the United States, the UK, Australia, Europe, and China) are participating, often scanning works themselves and contributing texts to which

³⁸ See www.mbl.edu/news/press_releases/2007_pr_10_17.html and www.biodiversitylibrary.org

Session 4: The Power of Collaboration

they own the copyright. Publishers and other rights holders are being asked to contribute copyrighted works and, perhaps surprisingly, many have agreed. The project has been able to scan materials for small associations that do not have their own funds for digitization.

One of Norton's favorite examples of the benefits of digitization is the important *Biologia Centrali-Americana* (1879-1915) a 52-volume encyclopedia on the natural history of Central America, of which only eight copies exist in the United States.³⁹ Once digitized, this information will be available much more broadly. Norton found it paradoxical that 90 percent of the biodiversity literature is in North America and Europe and about 95 percent of biodiversity is in South America and Africa.

Books bound for the Biodiversity Heritage Library are scanned using OCR and name recognition tools linked to taxonomic intelligence, and geotagged by subject, so they can be displayed on a map. Progress on this and other features can be followed on the project's blog.⁴⁰ Taxonomic intelligence is semantic software that, using taxonomic expertise, can identify and disambiguate scientific names. These are critical to biological knowledge, acting as the link between what has been learned in the past and what we know today (as Linnaeus put it in his *Philosophia Botanica*, "If you do not know the names of things, the knowledge of them is lost too").⁴¹

Unlike medical literature, for example, taxonomic information has a very long life. Names can go back as far as a thousand years and are found in many languages, in books, journals, surveys, and museums. With just 1 percent of names changing every year, there will be big differences over 300 years. Norton said that in 2007 someone called, perplexed because they couldn't find bluefish on the EOL Web site. It turned out that not only had the scientific name

just been changed from *Pomatomous saltator* to *Pomatomous saltatrix*, but also it had changed 27 times over the years. Such name changing clearly has repercussions for scholars. For example, looking up the salamander, *Notophthalmus viridescens*, will produce 349 articles in the PubMed publications database, and 281 in JSTOR. However, if researchers know all the earlier names of the species, they would find 474 articles in PubMed and 672 in JSTOR. Looking at species distribution maps, four different scientific names would yield four different distribution patterns for the same organism.

To solve this critical problem, the Marine Biological Laboratory set up the uBio project with a disambiguating name bank (a thesaurus, that makes no judgments) as well as a classification bank (where taxonomists can discuss which names should be used). The lab also built a scaleable name-finding algorithm that can search and identify these binomial Latin scientific names in old texts and link them back into the uBio name bank server (www.ubio.org), which now has 10.7 million names, and then into the Encyclopedia of Life.

Answering a question about where the data are kept, Norton replied that currently the Internet Archive is serving all the pages, that the Missouri Botanical Gardens manages the metadata, and that Woods Hole holds all other data sources. As the network crashed when 15 million people tried to access the site on opening day, the project will also be using Amazon's cloud computing network (<http://aws.amazon.com>) for greater flexibility and security.

To a question on the project's approach to copyrighted material, Norton said that although some publishers were not interested in contributing to the project, others understood the value of having publications placed in a trusted digital repository, especially with the rolling-wall arrangement whereby recent publications will be included only after a period of time has elapsed.

Answering a question on the project's encoding of text, a colleague of Norton's responded that while they were doing some structural encoding of data, they were looking into using one of several semantic markup initiatives, including TaxonX from

³⁹ www.sil.si.edu/DigitalCollections/bca/explore.cfm

⁴⁰ <http://biodiversitylibrary.blogspot.com/2008/04/better-maps-more-bibliographic-detail.html>

⁴¹ www.linnean.org/index.php?id=293

the American Museum of Natural History and the Smithsonian's INOTAXA project, both of which capture an organism's habitat, description, taxonomic key, etc.

Conference Wrap-Up: What Does It Mean and Where Are We Going?

In his wrap-up of the conference, **Robert Semper**, executive associate director of the Exploratorium, said that he thought the meeting was unusual in its inclusion of so much of the diversity of the museum and library worlds. Not pretending to be able to include all that diversity in his closing remarks, he said his words would rather reflect his own personal agenda.

First, reviewing the three keynote addresses, Semper said that Jonathan Fanton's comments on the legal issues raised by the paradox of the Internet's democratic promise and lack of democratic protection had led him to consider the terms of service imposed by online commercial entities. Reviewing Google's six-page online contract that to which he'd recently clicked his agreement, he said he wanted to compare it to the terms on the back of an Exploratorium entry ticket, only to find that there were no such terms. This dramatized for him the difference between commercial entities and museums, which really were social institutions that had already handed over a lot of power to their audience.

Turning to José-Marie Griffiths' presentation on how museums and libraries continue to be the information sources most trusted by the public, he wondered if this would be the case 20 years from now. Scientists had also been highly trusted by the public until, with just a few scandals in the scientific community, their reputation plummeted. He advised museums to be careful as they too could lose the public's trust just as quickly.

Jeffrey Schnapp's address, discussing various forms of mashups (a form that brings together at least two different sets of data), inspired Semper to think about some really large-scale mashups. He thought that at the heart of Dr. Schnapp's presentation, and of his vision of what Web 2.0 technologies could offer the community, was the idea of a mashup of library space, museum space, and cyberspace. Determining the shape of that mashup was perhaps the biggest challenge for the whole community.

Meanwhile, Semper said he thought museums still had a long way to go before they would be

comfortable with Web 2.0 technologies and such a large-scale kind of mashup. First, museums were still "push" institutions, putting on shows of what they think people want, while Web 2.0 is more about "pull," about what the audience wants. In this regard, museums need to think more about whether audiences will actually use what museums produce. Second, museums still couldn't decide whether Web 2.0 is a core activity or a sidelight to what they do. He would argue it was core, but some administrators are not so sure. Third, there was still unresolved thinking about the "social contract" museums had, both with their collections and their visitors.

As for where we are going, Semper said prognostications are very difficult. All he could say with confidence is that Internet technology is still rapidly evolving. He referred back to the slide he'd used during the pre-conference on the different periods of time that different technologies have taken to capture 25 percent of the market share of the U.S. population (radio, for example, took 22 years, while the Internet took seven years). Whenever these technologies are introduced, historically, people are always convinced that the new technology will eliminate some physical activity: that we'd no longer have live concerts, that we'd no longer read books, etc. However, the social space is still with us and is still very important. This led him to two considerations.

First, physical social spaces are more important than ever. People still want safe, social spaces, where they can go with friends. Attendance at theme parks is up; museums are holding steady; library attendance and physical use is up. Libraries and museums are not going to lose their franchise on places that people are going to want to go to. It's just that what they want to do when they get there may be somewhat different.

Second, Semper wanted to consider what would follow Web 2.0. Web 3.0 has been discussed as the **Semantic Web** and as a 3-D Web, among other things. He wanted to think about it more in terms of Chris Anderson's article for *Wired* on how

"free" the next economy might be.⁴² Anderson's examples were that high bandwidth in many cases is getting very cheap; much software is free; memory is getting closer and closer to free; many companies are giving away free storage; searching costs nothing; and libraries and museums do well in a free economy and operate in a more fluid economy.

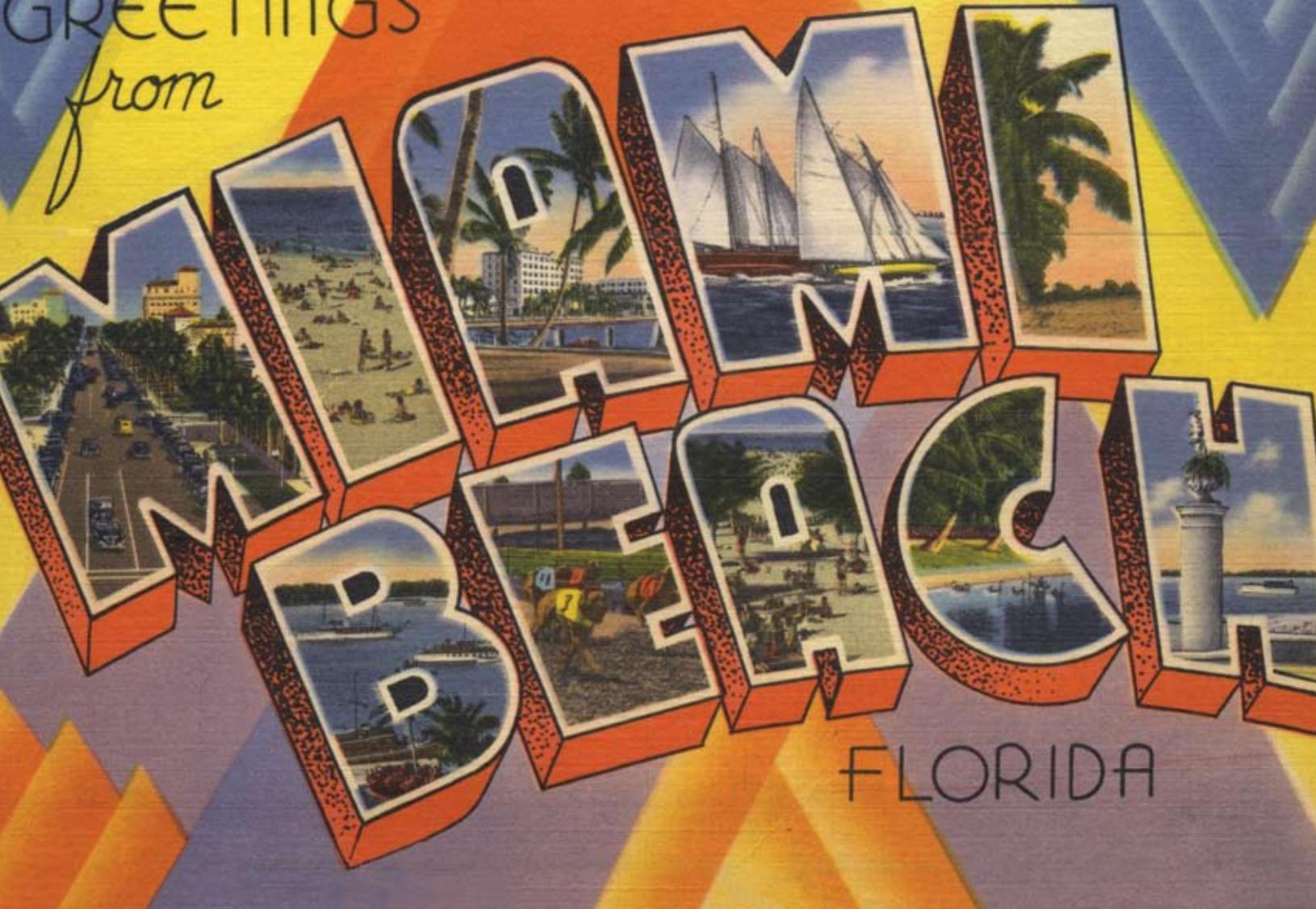
Semper thought the library and museum community needed to know a lot more about the social networking world, especially about how museums can turn from a push strategy to a pull strategy. Rather than think about the materials they have and are trying to "push," museums might do well to think more about creating institutional equivalents to the APIs (for example, the hooks that Google Maps puts into place for other data to grab onto) that make different forms of information interoperable. What are those hooks that people might want to use?

He was also particularly interested in the relationship between physical and cyberspace, which he saw as becoming increasingly blended. How will the community deal with the simultaneity of physical and cyber activities in institutions? Mr. Semper thought that if the community could understand more about being an institution in a deinstitutionalized world it might understand something about the widespread fear behind letting go of the sense of control and authority over collections.

Following on from these thoughts, Mr. Semper proposed that for WebWise 2009 the community prepare a research agenda and invite experts in from outside the cultural world to talk about these issues on a broader scale. Finally, he pointed out that this couldn't be done institution by institution. Web 2.0 shows us that we can only do this as a community. Its lesson is that distributed cognition works: Multiple brains work better than one person thinking alone. And, he said, *WebWise 2.0: The Power of Community* really showed us that.

⁴² Chris Anderson, "Free! Why \$0.00 is the Future of Business," *Wired*, 16.03, February 25, 2008, www.wired.com/techbiz/it/magazine/16-03/ff_free

GREETINGS
from



Conference Resources

Full Text of Keynote Address: Dr. Jonathan F. Fanton

It is a pleasure to be here and to learn firsthand about the WebWise conference. I have watched the evolution of WebWise over the past eight years with admiration. It speaks directly to the challenges articulated on the Web site of the Institute of Museum and Library Services: "As stewards of cultural heritage, information and ideas, museums and libraries have traditionally played a vital role in helping us experience, explore, discover and make sense of our world. That role is now more essential than ever." I commend you for the experimentation underway in your institutions across the country, for thinking hard about new tools and environments that motivate, deepen, and sustain learning.

And you have made a good choice of a cohost for this year's conference. The Wolfsonian's mission, to tell the story of social, political, and technological changes that have transformed our world, makes it the ideal partner for the Institute.

The topic of this conference, *WebWise 2.0: The Power of Community*, strikes me as quite different from past themes on the Digital Divide, Sharing Digital Resources, and Teaching and Learning with Digital Resources. The Power of Community speaks to the active engagement of people in shaping their environment, sometimes mediated by institutions, sometimes not. How to keep institutions—schools, museums, libraries—central to providing information people need "to make sense of our world" is a challenge worthy of our collective exploration.

Like you, I believe that the more technology empowers individuals, the more they need trusted sources of information, guidance for how to cope with overabundance of information, and help in making judgments.

There is another paradox that I want to reflect on with you this morning. The Internet is hailed as a democratic force freeing people from inherited orthodoxies and hierarchy. Yet its use has raised vexing ethical and legal questions. Indeed, a debate has arisen about the absence in virtual worlds of the individual rights we have come to expect in a democratic society. This paradox of the Internet's democratic promise and lack of democratic protec-

tions must be addressed if the power of community is to be realized in a just and sustainable way.

First, however, a few words about MacArthur and what brought us, like you, to issues of digital media, learning, education, and changing institutions. MacArthur is best known for "genius" grants that recognize individual creativity and for its support for public radio and television. But the foundation does much more, here in the U.S. and in 60 countries around the world. This year, we will award nearly \$300 million in grants and low-cost loans from our headquarters in Chicago and offices in Mexico, India, Nigeria, and Russia.

Our mission is to help build a more just, sustainable, and peaceful world. Our interests include strengthening urban communities, affordable housing preservation, juvenile justice reform, population, conservation, and human rights. Throughout it all runs a search for what is new. We are committed to illuminating patterns and trends that are reshaping our world, opening opportunity but also posing challenges.

Technology—specifically digital media—is one of those forces. We are witnessing the first generation to grow up digital—coming of age when the use of computers, the Internet, video games, and cell phones is widespread. For members of this generation, expressing themselves and building communities with networked digital tools is becoming the norm. Consider these facts:

- On a typical day, 60 percent of U.S. teens use a computer;
- Eighty-three percent of young people play video games regularly;
- Fifty percent of young Internet users have created media content, many sharing it online;
- Popular virtual worlds are growing, with over three million 10- to 12-year-olds active in Whyville, four million preteens in Club Penguin, and 10 million adults in Second Life;
- Fifty-three percent of all youth are projected to be active in a virtual world within two years; and
- MySpace has more than 100 million regular monthly users.

Full Text of Keynote Address: Dr. Jonathan F. Fanton

We see this activity, but do not yet understand all that it means—for individuals, families, institutions, and even our democracy.

That is why, in December 2006, MacArthur announced a \$50 million initiative to explore the premise that digital media use is changing how young people think, learn, play, make judgments, and relate to others. If this is true, there are profound implications for schools, libraries, museums, and other institutions charged with preparing young people for the future.

Through grants to researchers, designers, and practitioners, we are asking important questions about young people and digital media. How do young people reason and confront ethical dilemmas? How do they judge the credibility of vast amounts of information? How do they acquire content and analytical skills? How do they interact with each other and relate to adults and authority? How does technology affect their sense of identity and notions of community, their attitudes toward civic participation, and their awareness and understanding of other cultures? Finally, the digital world fosters and demands new skills—collaborative problem solving, collective intelligence, performance simulation, negotiation, discernment of and respect for multiple perspectives. How do these skills prepare young people for the economic and political imperatives of the 21st century's more complex and connected world?

Of course, these questions do not apply to young people alone. Many adults also face challenges as they navigate, judge, and use digital media and information. Might we all be changing in important ways as well?

Grants in our new initiative range across research, media literacy, game design, and early efforts to create the new interdisciplinary field of digital media and learning. They include a large-scale ethnography at the University of Southern California, collecting information about young people's social networks and peer groups, family life, how they play, seek information, and learn.

We already know that children should be learning more than reading and math to prepare

them for productive adulthood in a digital world. With funding from MacArthur, MIT professor Henry Jenkins has developed a new framework for media literacy. He focuses on the skills needed to succeed in what he calls participatory culture—skills in experimentation, performance, teamwork, and skills to navigate, negotiate, and synthesize across multiple sources of information. A pilot application is underway in after-school digital media programs at the University of Chicago's charter school.

We have also made a set of grants related to games and learning. A team at the University of Wisconsin has created "Gamestar Mechanic" (www.gameslearningsociety.org/macarthur.php), which is designed to promote young people's media literacy through participation—by making games themselves.

We reached an important milestone in December, when MIT Press published the six-volume MacArthur Foundation Series on Digital Media and Learning. Topics include identity, credibility, race and ethnicity, the ecology of games, civic engagement, as well as unintended and unexpected consequences. At the same time, we announced a call for papers for a new quarterly journal, the International Journal of Learning and Media, which will be enhanced by a robust online community to probe, challenge, and expand on articles in the journal.

I am urging that a new volume in the series and early articles in the journal grapple with the legal and ethical issues that are the topic of my remarks today. Many of these issues arise as adults and young people engage in increasing numbers with social networks, multiplayer games, and in virtual worlds. I raise these issues with you because of your role at the forefront of adapting our social institutions to the realities of a changing world.

MacArthur funded Harvard professor Howard Gardner to explore ethical issues, particularly for young people, online. He has suggested that digital media have opened up new and perhaps limitless frontiers—open spaces without rules and regulations that offer both promise and peril. In a posting for MacArthur's Spotlight blog on digital media and learning, he wrote, "The laws, rules, regulations, and

implicit [ethical] norms that have developed gradually over time are all vulnerable in the era of new digital media, and it remains unclear which of them will remain intact, which will have to be reformulated, and which may need to be scuttled."

For example, the online world offers new and greater levels of participation. Blogs give people voice on issues they care about. Games like World of Warcraft invite players to modify them as play proceeds. Through social networking sites Facebook and MySpace, millions of people establish connections with others—beyond the reach of physical world friendships, schools, communities, even countries. In the virtual worlds of Second Life or the Sims, participants can make, buy, and sell virtual artifacts, using the local currency Linden dollars or simoleans. These artifacts also are available on eBay, in exchange for real money. What rules, regulation, even rights should apply?

Some see the activity in MySpace and Facebook as an alarming invasion of privacy; many young people see it as an essential tool of communication, learning, and personal validation. Some view Wikipedia as a threat to traditional notions of credibility, authority, and expertise; others see it as an exciting new approach to sharing knowledge and authorship. Many believe that music is "owned" by a musician or production company; others, including perhaps most young people, experience digital music and images as resources for creating or remixing new material.

Gardner suggests that these different perspectives challenge us to reconsider basic assumptions about identity, privacy, ownership and authorship, credibility, and participation. Each of these could be the topic of an entire speech, but let me raise questions today about just one of them—participation—that is at the center of an emerging debate.

Social networking sites and virtual worlds can invite or deny access to anyone. No one has a right, under the Constitution, in common law, or by statute, to enter Second Life. Facebook accounts can be terminated without notice for any reason. Relationships between participants, players, and site owners are governed only by use agreements, acti-

vated by a click of the "I accept" button and subject to small type that may say that terms and conditions can be changed at anytime without notice.

Participants or players may experience social networking sites and virtual worlds as traditional meeting sites, town squares, or local communities. They are indeed this, but with one important difference. These sites are private spaces, designed, owned, and operated by individuals and corporations. While they are gamelike, private spaces today, over time, they are likely to be used for much more serious purposes—commerce, education, training, medical consultation, therapy, and for social and economic experimentation. Again, what rules, regulations, and rights should apply?

Blogs contain anecdotal reports of accounts closed, access denied, or use agreements altered. Recently, a member of the British Parliament's Facebook account was suspended when the operator decided he was an imposter, requiring him to prove that he was indeed "himself." A comedian and author found himself cut off from his fan base when the social networking site terminated his ability to send a group message about upcoming events to a thousand people.

YouTube recently suspended the account of a prominent Egyptian human rights activist who had uploaded videos portraying police brutality and antigovernment demonstrations. In virtual worlds, words take on new meanings. If you are "toaded," your avatar is eliminated, your identity disappears, and your ability to participate comes to an end.

Game site operators decry hackers who make money modifying the game and selling access to prize levels or virtual goods. In virtual worlds, attacks have repeatedly come from "griefing" groups organized specifically for disruption, including a shadowy group of individuals, whose motto is "ruining your second life since 2006." How should site operators respond when accused members defend their actions as "for laughs" while others make claims of intimidation, harassment, or even terrorism? On social network sites, there have been numerous reports of people using the sites' tools to taunt, torment, or prey on other users. Should there be

Full Text of Keynote Address: Dr. Jonathan F. Fanton

rules and regulations that protect owners who wish to operate their sites as designed? Should there be sanctions for individuals whose actions diminish the online experience for others?

Discussions abound in law journals. Disputes between site owners and participants about copyright, ownership, and authorship are already being fought in court. The legal battle will likely extend to questions of identity, privacy, and participation. Calls for regulation of virtual space are beginning. But it will take time for the courts or legislatures to sort through these complex issues, as they play out online.

A better approach may be to convene a forum for a reasoned debate of the issues before the battle lines are set. What are the rights and responsibilities of owners and users of digital media, profilers on social network sites, game players, and participants in virtual worlds of all types? MacArthur would be willing to support, perhaps even convene, such a forum.

A thoughtful discussion would acknowledge the increasing importance of media in people's lives and their reliance on digital media for information, commerce, community, health, entertainment, and creative expression. That forum would accept the private and proprietary nature of ownership and design of virtual spaces. At the same time, it would recognize the increasingly public nature of their use and the consequences of such use for owners and participants. It would look for reasonable ways to extend already well-accepted principles from other domains into the online world.

That forum would consider, as do many legal scholars, the ACLU, and others, what fundamentals of due process make sense, such as specific notice of offense and the right to appeal when an individual is barred from a site.⁴³ I would start with three principles:

- **Clear guidance** about what constitutes behavior for which participation would be terminated,

with specific examples of past behavior that prompted expulsion.

- **Specific notice** about the inappropriate behavior or material, which might include violation of copyright, offensive behavior, or unacceptable language or images in a profile.
- **Opportunity to appeal**, which might come in two stages. The first, informal, would be intended to clear up factual errors or misunderstandings. A second stage would have a formal hearing, with written procedures, before a neutral party. While appeals are underway a participant's identity and data would be preserved.

Beyond these three basic points there are many, many interesting questions.

What is an identity online? Should there be protections from alteration and destruction by operators? Should First Amendment protections apply to speech or behavior, even though a private operator has no legal requirement to be neutral to the viewpoints or actions of users? Who owns identity? Is it quintessentially you? Or, as a database entry, is it the intellectual property of the operator? Is it reasonable that the right to exit is the only route away from operators with objectionable practices?

Finally, what about the rights of site owners and operators? They control what goes on in two ways—through software code and end-user contracts. They write and rewrite the software that defines the space, grants powers to users, supports social interactions, and even tracks what is going on. They also control what goes on through a contract with users, covering issues of behavior and decorum that cannot be written into code. Should they have recourse against participants who gain unfair advantage, use the platform for illegal, offensive, or harmful activities, or diminish the pleasure of participation for all?

These are just a few of many questions that have arisen with the use of digital media and their many platforms.

Legal scholars have identified many more complex issues—the blurring of the boundaries between actions in the virtual world and actions and consequences in the physical world, and the chal-

⁴³ I am indebted to a thoughtful paper by Christopher Calabrese of the ACLU on the topic.

lenge of country-specific regulations of a space that is by its very nature accessible throughout the world.

Solid ground has been laid for the kind of thoughtful debate that will help us rethink assumptions related to identity, privacy, ownership and authorship, credibility, and participation. It is time to move the discussion from the pages of legal journals, from blogs and online chat, to a more organized debate that engages humanists, social scientists, legal scholars, and the public.

The forum I have proposed could make a useful contribution. But voluntary action to implement the three basic protections I articulated earlier need not await a larger philosophical discussion. The principles of clear warning, specific notice, appeal, and a fair hearing before a neutral party are so basic they should be implemented without delay.

In fact, MacArthur will incorporate them into the basic operating framework of sites that the foundation creates, operates, or funds—in fields as diverse as digital media and learning, juvenile justice, and affordable rental housing preservation.

I know I have only scratched the surface of a profoundly complex and important topic. But in the spirit of the Institute's mission "to help make sense of our world," I ask your help in thinking through the norms and principles that should underlie rights and responsibilities online. I welcome your thoughts on the three principles I propose, the idea of an ongoing forum, and thoughts on the questions for the forum.

Throughout history, our highest accomplishments have had the aim of bringing people together.⁴⁴ Though many online sites are dismissed as entertainment or places for teenage gossip, Second Life, Facebook, MySpace, and other tools are the places that bring more and more people together today. We talk about physical and virtual worlds, both real. With reality comes responsibility. We need to address the gap in norms for behavior and procedural protections for both participants and platform operators. Otherwise our highest aspirations for the power of community online to advance our quest for

a just, sustainable, and peaceful world will fall short of its potential.

MacArthur stands ready to work with you to unleash the power of community guided by norms and protected by procedures that reflect America's best values.

⁴⁴ To paraphrase Antoine de Saint-Exupéry.

Full Text of Keynote Address: Dr. Jose-Marie Griffiths

In this conference we are talking about power and the Web. I'd like to take a few minutes to look at the power of trust, and the way that trust can forge interconnections between the physical and virtual world, between the world of the Internet and the Web, and the world of brick-and-mortar libraries and museums.

The Power of Trust

Before I talk about libraries, museums, and the Web, I'd like to think for a moment about the concept of trust. C.S. Lewis said, in essence, that you never know the power of trust in anything until its truth or falsehood becomes a matter of significance to you personally. It is easy to say that you trust a rope to be strong and sound as long as you're using it as a clothesline to hang up wet laundry. However, suppose you had to walk on a bridge across a deep rocky chasm made of that same rope. The issue of trust is suddenly much more important to you.

As this quote suggests, the most important component of trust is a strong belief—a hanging-over-the-precipice belief—in the complete integrity of another party or thing, whether it is the integrity of a piece of rope or the integrity of the string of promises that we make to one another. On a continuing basis, trust is impossible without integrity. It can only exist in the presence of the highest standards of conduct.

Trust has been defined as “an individual’s belief in, and willingness to act on the basis of, the words, actions, and decisions of another.” The need for trust arises from our interdependence with others. We often depend on other people and organizations to help us obtain, or at least not to frustrate, the outcomes we value. Around the world, libraries and museums are trusted institutions.

Our trust in another is grounded in our evaluation of their:

- **Ability** - An assessment of the other’s knowledge, skill, or competency. This dimension recognizes that trust requires some sense that the other is able to perform in a manner that meets our expectations. Through the years libraries and museums have demonstrated

ability to collect, catalog, archive, and disseminate information for hundreds of years.

- **Integrity** - The degree to which the trustee adheres to principles that are acceptable to the trustor. This dimension leads to trust based on consistency of past actions, credibility of communication, commitment to standards of fairness, and the congruence of the other’s word and deed. Again, libraries and museums stand as beacons of integrity in an often compromised and politicized world.
- **Benevolence** - Our assessment that the trusted organization is concerned enough about our welfare to either advance our interests, or at least not impede them. The other’s perceived intentions or motives of the trustee are most central. Almost all libraries and museums are community-based, whether a physical, colocated community or a virtual community of interest.

Albert Einstein once said that “Creating something new is not like destroying an old barn and erecting a skyscraper in its place. It is rather like climbing a mountain, gaining new and wider views, discovering unexpected connections between our starting points and its rich environment.”

And this is what we set out to look at in our study—climbing the mountain to gain some new and wider views in order to discover the interconnections between libraries, museums, and their evolving environment, that of the electronic Information Age. So I am here today to introduce you to Interconnections, the IMLS study of the use of libraries, museums, and the Internet.

Overview

Museums and libraries have long been sources of learning, recreation, and information for personal, family, educational, and work-based purposes. However, the Internet Web and other technologies have become an increasingly used source of information that some believe will largely replace their physical counterparts. On the other hand, some have speculated that the Internet and related technologies and services will actually enhance and increase museum and library use.

Until now there has been no solid evidence to support either assertion, particularly considering the wide range in types of museums and libraries. The primary purpose of this study was to conduct a national survey of the information needs of users and potential users of online information. This is a huge scope—think of all the current users and then the potential users of online information—it encompasses just about everyone.

So, in consultation with IMLS, we determined that the primary focus of the study would be on museums, public libraries, and the Internet as the sources of information, but placed in the context of the use of a broader array of sources, including people—like doctors, accountants, family members, etc.—publications, books, newspapers, journals, organizations, government agencies, professional associations, and so on.

We also determined that there was quite a lot of research about the use of specific information sources and systems (on journals, digital libraries, databases, and so on), but that little was known about the underlying information needs that drive people to specific information sources; nor was much known about the outcomes resulting from access to the information provided by those sources.

Surveys

We designed a national survey to identify the following:

- Important information needs and their frequency of occurrence;
- Sources of information used to address the information needs and why those sources were chosen;
- Ratings of the attributes of information found from the sources such as quality, trustworthiness, etc.;
- The outcomes of the information use such as solving a problem, learning something new, completing an assignment; and
- The usefulness and value of the sources in terms of the time spent using the sources what users would do if the sources were not available

and what it would cost in time and money to use alternative sources.

The survey was implemented as a national household telephone survey of adults 18 and over, using random digit dial.

Surveys	Interviews
1. General information	1,557
2. Museum in-person and remote visits	1,047
3. Public library in-person and remote visits	1,049
4. Internet use	1,607
5. Use of specific resources (e.g., books, newspapers, etc.)	1,361
6. Overflow interview	1,500

Figure 1. Surveys conducted in the “Interconnections” project.

The questions were organized into five separate surveys with some questions common to all surveys. As you can see, each survey had between 1,000 and 1,600 respondents.

1. A general information survey focused on a broader picture of all sources of information used to make decisions or solve problems. In so doing we learned why sources were chosen and how museums, public libraries, and the Internet fit into the overall picture.
2. A museum survey covered both in-person and remote, online visits to museums.
3. A public library survey covered both in-person and remote, online access to public libraries.
4. An Internet survey covered Internet use related to important situations.
5. A survey on the use of specific information resources: books, journals, newspapers, etc., and Internet use of libraries other than public libraries.
6. The overflow interviews were those respondents who had not used a museum, public library, or the Internet in the previous 12 months.

Full Text of Keynote Address: Dr. Jose-Marie Griffiths

So some questions were related to the users, and some to the uses of information sources.

Some of the questions focused on a critical incidence of use. We asked people to describe an important situation that caused them to need information to make a decision or solve a problem. That allowed us to probe more deeply into which information source they chose to use first, why they chose that source, what other sources were used, how they rated of various aspects of the source, and of the information obtained from that source, the outcomes resulting from having the information, and so on.

What did we find?

Libraries and Museums Are the Most Trusted Sources of Information

Our first key conclusion is that libraries and museums evoke consistent, extraordinary public trust among adults—across all demographics.

Survey respondents were asked to rate the trustworthiness of information sources on a scale of 1 to 5, with 1 being “not at all trustworthy” and 5 being “extremely trustworthy.” Not only did libraries and museums receive the highest average ratings among all sources by over 1,700 adults but the traditional knowledge institutions—libraries, museums, archives fared much better than any Web-based information source (see Figure 2).

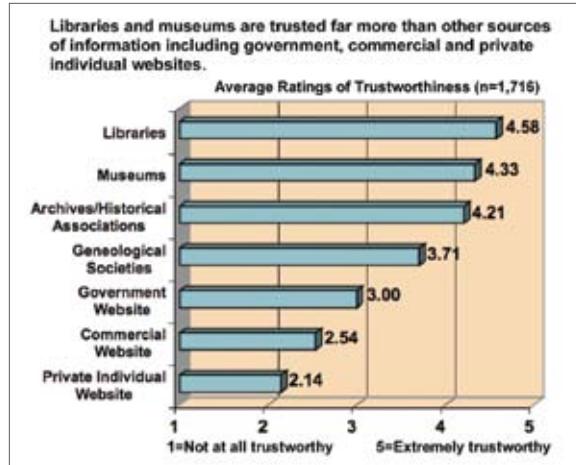


Figure 2. Libraries and museums are the most trusted sources of information.

I should add that we have conducted numerous studies (in the hundreds) that include similar rating scales for information systems and sources—it is very rare for us to have average ratings that fall below 3.0 on the five-point scale.

We also know that people gave higher trust ratings to in-person access to libraries and museums than to remote online access. They rated trust for remote access to library and museum content higher than general Internet access and content.

The Internet Does Not Kill Libraries and Museums

Our second key conclusion is that the Internet has not had a negative effect on libraries and museums. In fact, it seems to enhance access to, and use of, libraries and museums.

Our data refute the idea that the Internet with its vast and continually growing array of information will replace the need for museums and libraries. Internet use is positively correlated with in-person visits to museums and libraries. In other words adults who use the Internet are more likely to visit libraries and museums in person.

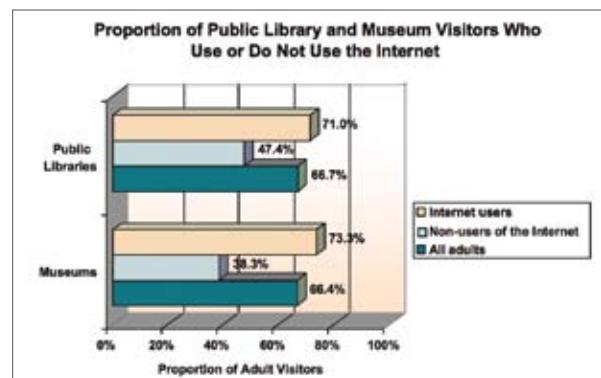


Figure 3. Adults who use the Internet are more likely to visit libraries and museums.

First, our data show that Internet users are about 91 percent more likely to visit museums and 50 percent more likely to visit public libraries in person than non-Internet users. Second, adults who use the Internet visit libraries and museums in-person more often than non-Internet users. Internet users visit museums 2.6 times more often in-person and public libraries slightly more often than non-Internet users.

Also the amount of use of the Internet is positively correlated with the number of in-person visits to museums and has a positive effect on in-person visits to public libraries. In other words, people who use the Internet more frequently tend to visit museums and public libraries in person more frequently too. Trends in increased in-person visits to museums and public libraries are much more positive with adults who use the Internet than with those who do not.

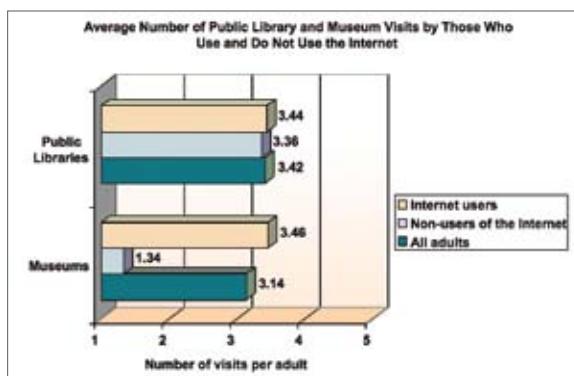


Figure 4. Adults who use the Internet visit libraries and museums more often (slide 13).

All these results indicate a strong positive relationship between Internet use and use of museums and public libraries. The Internet is not in any way eroding use of museums and libraries and the public is clearly benefiting by the presence of museums and libraries on the Internet.

This study presents compelling evidence that museums and libraries have leveraged the availability of the Internet to present their resources and services to a broader audience and offered an additional mode of access to them.

Figure 5. Total Number of Visits to Museums and Public Libraries by Adults, 2006		
	Museums	Public Libraries
In-Person Visits	701 million	762 million
Remote Online Visits	542 million	558 million
Totals	1.2 billion	1.3 billion

In 2006 there were 1.2 billion visits to museums by adults—701 million or 56 percent in-person visits

and 542 million or 44 percent remote, online visits. There were 1.3 billion visits to public libraries in the same year—with 762 million or 58 percent in-person visits and 558 or 42 percent remote, online visits.

Putting this into context, that is 2.5 billion museum and public library visits in 2006—11 visits for every adult in the United States, or about visits per adult who uses museums and public libraries. This is the first time we've had such numbers for both museums and public libraries.

Internet Access Increased Adult Visits

In 2006, Internet access increased adult visits to museums by 75 percent and to public libraries by 73 percent, while in-person visits to public libraries increased 26 percent over the thirteen-year period, 1992 to 2005.

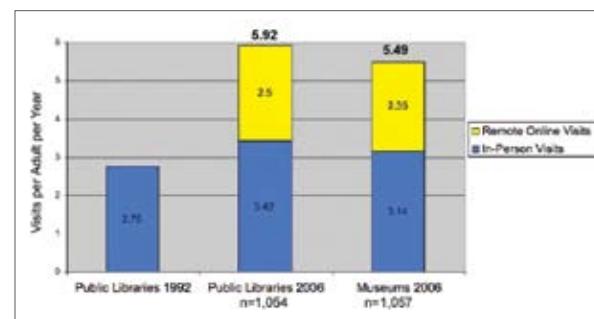


Figure 6. In 2006, Internet access increased adult visits to museums and libraries (slide 16).

Our data indicate that in-person visits will continue to increase and remote online visits will increase at a much faster rate especially as more online resources and services are developed and implemented.

Remote Visitors to Museums and Public Libraries Are Also In-person Visitors

Ninety percent of remote, online visitors to museums and 91 percent of remote visitors to public libraries are also in-person visitors. The number of remote, online visits is positively correlated with the number of in-person visits to museums and public libraries. So the more frequently adults visit remotely the more frequently they visit in-person or vice versa.

Thus there is a positive effect of the Internet on

Full Text of Keynote Address: Dr. Jose-Marie Griffiths

libraries and museums generally but a second positive effect from the availability of library and museum services through the Internet.

If We Have the Internet Why Do We Need Museums and Libraries?

So this leads us to the question of why we need museums and libraries if we have the Internet? The answer lies in the theme that emerged from our study, Interconnections.

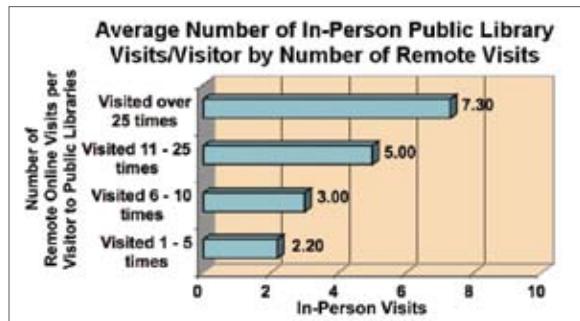


Figure 7. Average number of in-person public library visits/visitor by number of remote visits.



Figure 8. Average number of in-person museum visits/visitor by number of remote visits.

Our third key conclusion is that museums and public libraries physically and virtually serve important and complementary roles in supporting a wide variety of information needs.

To Fulfill Their Need for Information, Most Adults Use Museums, Public Libraries, and the Internet

An explosion of available information inspires the search for even more information: it seems to whet people's appetite. Over recent decades people have been exposed to this explosion of information and the number of sources from which information can be obtained has increased dramatically. We found that people use multiple information sources to meet their information needs.

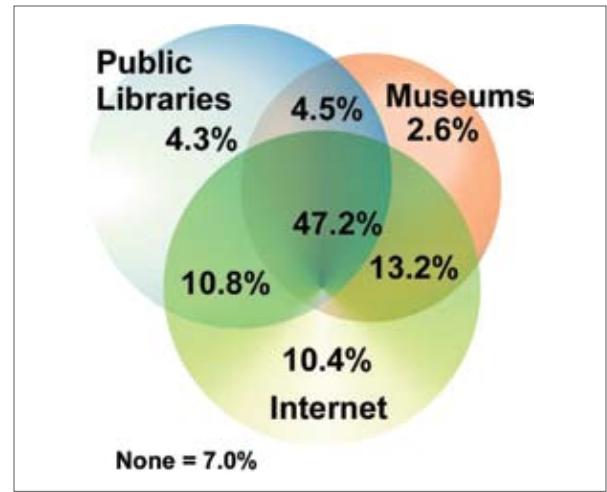


Figure 9. Most adults use museums, public libraries, and the Internet.

Since the use of one source leads to others, museums, public libraries, and the Internet do not compete but rather complement each other in this information-rich environment. As information consumers become more aware of the broad array of information sources to choose from, they will likely become more discriminating in their selection based on their experiences with them over time.

The very high public trust in museums and public libraries will tend to favor them in this equation. To fulfill their needs for information most adults continue to use museums, public libraries and the Internet:

- Seventy percent of U.S. adults use museums and public libraries.
- Eighty-three percent use the Internet.

- Nearly half (47 percent) use all three.
- Only 7 percent of U.S. adults do not use any of the three sources we studied in depth.

Clearly from the diagram (Figure 9), there is considerable overlap in the uses of resources.

Most Museum and Public Library Visitors Visit In-Person

The vast majority of visitors, 95 percent of museum visitors and 96 percent of public library visitors, visit in-person. Forty-five percent of museum visitors and 42 percent of public library visitors visit both online and in-person. Only a very small proportion of visitors visit only remotely online—5 percent of museum visitors and 4 percent of public library visitors. This reinforces our conclusion that remote use is not replacing in-person use.

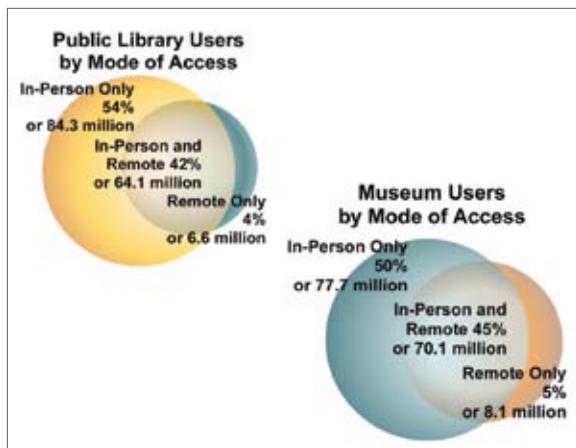


Figure 10. Public library and museum users by mode of access.

Interconnections

People's choices of information sources and modes of access are driven by different information needs and by factors such as trustworthiness, quality, convenience, importance, and cost. The use of any one source often leads to others. In fact, on average, 2.4 sources are consulted for each important information need.

The Internet seems to function not only as a source of information itself but also as a stimulus to identify additional resources. The study gathered data about the three key sources—museums,

libraries, and the Internet—and also about people, organizations, publications, and other kinds of information sources, and traced the interconnections among them. What emerged was a rich and complex Web of resources that support people's information needs and that link to other available resources.



Figure 11. "Interconnections."

For example we found that:

- Nine percent of museum visits lead to publications
- Twenty-three percent of museum visits lead to the Internet and 1 percent of Internet uses lead to museums
- Nine percent of museum visits lead to sixty-five million library visits and 4 percent of library visits lead to twenty million museum visits, and
- Forty-two percent of museum visits lead to planning more museum visits.

These are significant numbers.

Full Text of Keynote Address: Dr. Jose-Marie Griffiths

Information Needs Addressed by In-Person and Remote Visits to Museums

Both museums and public libraries serve informal learning and formal education needs well in complementary ways. Museums are overwhelmingly used to address informal learning and recreational needs (in fact, 89 percent of visits are serving those needs). Museum visits, especially in-person visits, are shared experiences occurring in social groups:

- Nine percent of in-person museum visits are by oneself (which means 91 percent are people going together).
- Sixty-nine percent are with family.
- Twenty-eight percent with friends or colleagues.
- Ten percent are as part of a tour group.

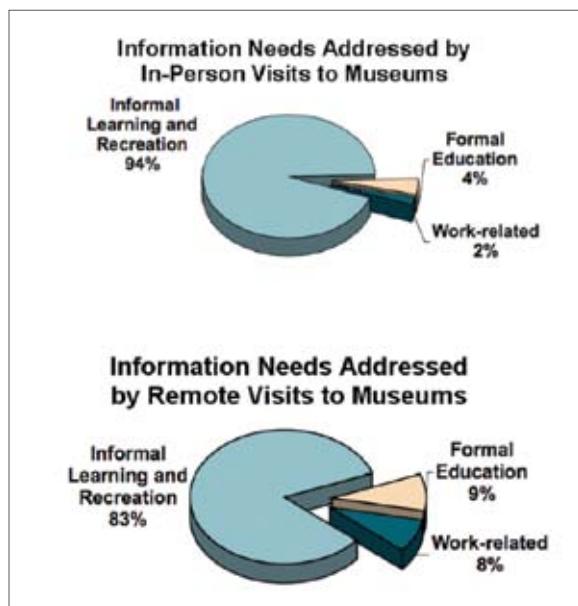


Figure 12. Information needs addressed by in-person and remote visits to museums.

Remote visits to museums are used more than in-person visits to support or extend formal education by students and teachers (9 percent versus 4 percent) and for work-related needs (8 percent versus 2 percent).

Types of Learning Experiences by In-Person and Remote Visits to Museums

Both in-person and remote visits to museums are learning experiences with adults indicating they learned something new in 87 percent of in-person visits and 86 percent of remote visits.

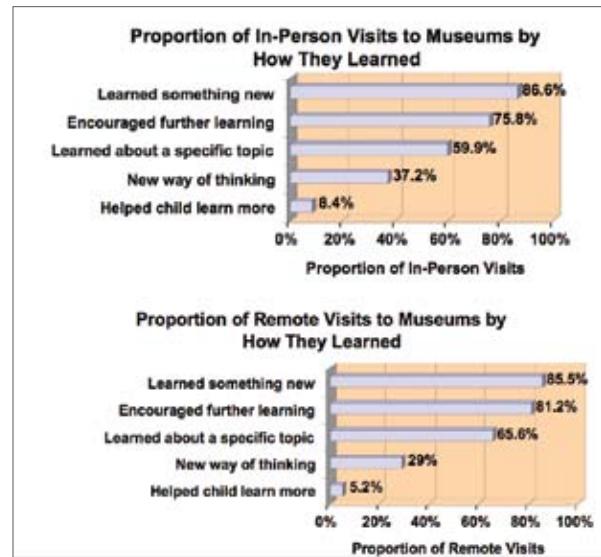


Figure 13. Proportion of in-person and remote visits to museums by how they learned.

Children accompanied by adults to museums were helped with learning in more than 8 percent of in-person visits and 5 percent of remote visits. Note that our study was of adults—so we do not include school or other group visits by children to museums or to public libraries.

Different Modes of Access to Public Libraries Tend to Address Very Different Distributions of Information Needs

The different modes of access to public libraries tend to address very different distributions of information needs. Online visits (both remote and using workstations in the library) are used much more for formal education than in-person visits are (43 percent versus 26 percent).

The same holds for work-related needs: 18 percent of online visits versus 6 percent of in-person visits; while in-person visits are used much more for recreation or entertainment purposes: 47 percent versus 14 percent for online visits.

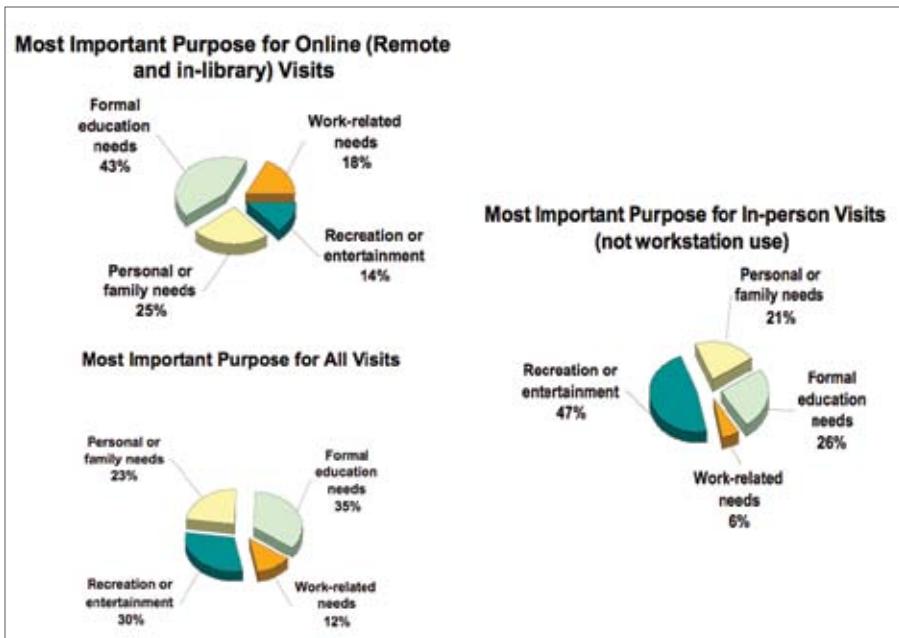


Figure 14. Most important purposes for visits to libraries.

Conclusion

In conclusion, this study has collected a large amount of data, which we will continue to mine over time. The study set out to develop a better understanding of the information needs currently and potentially satisfied through online information sources.

We found that libraries and museums and the resources and services they offer are the most trusted information sources; that the Internet has not replaced the need for museums and libraries but has significantly increased their use through increased exposure of museum and library resources and services and through an additional access mode to them; and that the Internet libraries and museums coexist in a complex interconnected Web of information sources that stimulate access to each other.

Libraries and museums must build on the extraordinary public trust they evoke and ensure that they continue to provide both in-person and remote access to quality resources and services.

New technologies like the Internet and the World Wide Web and emerging applications like social networking enable museums and libraries to extend their exposure and influence while continuing to

fulfill their respective niches in an ever-expanding information universe.

The power of trust can interconnect the physical and virtual information worlds and create strong bridges of knowledge we can travel together.

Thank you for giving us this opportunity to present you the highlights of our study. More information can be found on the project Web site at www.interconnectionsreport.org, where you will see a number of reports, the conclusions, and the survey results organized by about every which way you want to see it.

Full Text of Keynote Address: Dr. Jeffrey Schnapp

Derived from ancient Greek *ἀρχεῖον* ("government") and the late Latin word *archivum*, the English derivative "archive" has come in the modern era to refer not just to public records but also to the entire corpus of material remains that the past, whether distant or close, has bequeathed to the present: artifacts, writings, books, works of art, personal documents, and the like. Its semantic field also encompasses the institutions that house and preserve such remains, be they museums, libraries, or archives proper. In all of these meanings, "archive" connotes a past that is dead, that has severed its ties with the present, and that has entered the crypt of history only to resurface under controlled conditions.

My presentation today will explore the ways in which the emerging media domains and practices loosely grouped under the umbrella Web 2.0 offer new challenges and possibilities for institutions of memory like libraries and museums: novel approaches to conservation and preservation based not upon restricting but multiplying access to the remains of the past; participatory models of content production, research, and curatorship; mixed-reality approaches to programming and informal education that promise to alter and reshape traditional library and museum audiences; and enhanced means for vivifying and for promoting active or experientially augmented modes of engagement with both past and present. The past was never really dead, of course; it always already belonged to the present. And Web 2.0 and toolkits that lie in the space between 2.0 and 3.0, including virtual worlds, Web3D, and the Semantic Web, provide some distinctive avenues for investing the present's ownership of the past with the attributes of life. In short, they promise to *animate* the archive.

Embedded within the constellation of possibilities just evoked is a sort of Copernican revolution with respect to the roles performed by libraries and museums in the modern era. The latter institutions have long led a double existence. On the one hand, they have served as repositories entrusted with responsibilities of storage and preservation: a task they have accomplished by placing historical objects at a remove—in the vault, in storage, under glass, at

or beyond arm's length. On the other hand, they have no less nobly served as sites of access and presentation, with the latter missions subordinated to the higher calling of conservation and with distinctions drawn regarding the degrees of access granted specialists vs. nonspecialists, insiders vs. outsiders. Their institutional identities have long been built around the notion that *physical presence is the norm*: the belief that a unique aura that emanates from the objects that they grant access to, whether originals or multiples; that they are defined by the physical edifice that supports their storage, retrieval, display, and educational activities; that work carried out and programming experienced on-site are primary. Their models of community have, likewise, been based upon the sociability of the reference desk, the reading room, the café, the gallery, the after-hours event, and the bookstore. Their models of service privilege local and regional ties, whether in the form of memberships or use statistics, as primary indicators of institutional impact.

None of these roles or models of institutional identity formation will vanish with the wave of a digital wand branded 2.0 or 3.0. But they are already undergoing substantial modification and bringing in their train challenges to conventional ideas of ownership, restricted use, storage and display, content creation, and curatorial control. Web 1.0 allowed museums to imagine Web sites as the functional double of the paper remains with which they have traditionally supported visitor experiences: the pamphlets that lure visitors to shows; the catalogs or postcards that they take home. It allowed libraries to develop electronic descendants of paper-based card catalogs and to expand their outreach programming. But as the Internet footprint of these institutions expanded to meet the upsurge in Web visitor numbers and the exponential growth in all sorts of virtual repositories, it began to chip away at the solidity of library and museum walls.

Web 2.0 accelerates the process and radicalizes the consequences. It shifts the focus from data retrieval to active working or reworking of content, whether in the form of texts, still or moving images, or sound files. Not only does it place every library and

museum adjacent to one another on a public square as big or small—your choice—as the entire world, but it also marks the beginning of an inversion which some will welcome and others will decry: namely, of the relative priority granted to the physical over the virtual. Whereas the virtual was once subordinated to and cast in a supporting role with respect to the physical, Web 2.0 points toward new couplings in which an institution's virtual footprint tends to predominate over its physical edifice and the community that it serves is potentially worldwide, overlapping only in small part with potential or actual physical visitor/user populations. In the Web 2.0 era, every public institution has *already* been transformed into a *glocal* enterprise, local and global at the same time.¹ Glocalization will only accelerate over coming decades.

It is easier to theorize such a future than to describe its intimate workings. But concrete examples offer the sharpest instrument for exploring the potential contours. So, I will be structuring these remarks around specifics that are, so to speak, close to home: experiments connected with the Stanford Humanities Lab, the hybrid new media/technology lab and arts/humanities research center that I founded in the year 2000 and have directed ever since. Neither comprehensive nor necessarily representative, this sampling will point toward five broad conclusions that I here anticipate so as to devote my remaining time to walking you through some case studies:

First, that due to such factors as the sheer quantitative abundance and media heterogeneity of archival materials from our own era, due to the pervasiveness of copying, transforming, and sharing devices, and due to expanding global access to bandwidths that facilitate the rapid and unrestricted circulation of data, many of the changes I have already alluded to will *impose themselves* on bricks-and-mortar libraries

and museums, much as file sharing, remixing, and mashups practices have imposed themselves on the music industry. By this I mean to say that, irrespective of how libraries and museums shape their own Web 2.0 policies and practices, they are likely to find themselves operating in an environment in which (a) open source resources and cultural repositories are increasingly the norm; (b) audiences expect ever increasing degrees of off-site access as well as freedom to distribute, use, and modify materials within the shifting topography of the multiple online communities to which they belong; and (c) on-site visitors require and/or expect augmented modes of access to and experience of cultural objects, whether familiar or remote.

Second, that the participatory media grouped under the umbrella of Web 2.0-3.0 stand not only for an expanded notion of community and service on the part of museums and libraries, but also for a research, development, and communicational landscape in which collaboration within and across institutions are likely to become increasingly central. This implies a shift away from top-down models of content ownership, authorship, and management toward flatter organizational structures: structures that knit together far more closely so-called "core" activities with outreach, communications, and education and involve parties that no longer share the same physical space or time zone. Under these altered operating conditions, for instance, the act of processing of an archive may now become identical with its publication; the staging of an exhibition with the opening of a wiki space in which on- and off-site audiences interact directly with artists, scholars, and curators, not to mention with one another. Platform sharing, repository building, and programming across institutions (pioneered long ago by research libraries), whether on a regional or a global scale, represents the logical corollary, particularly as www footprints expand in scale and cost. There is nothing "natural" about the coupling between a given "location" on the Web and a physical edifice or institutional brand name. Nor is there any reason why physical exhibitions separated by continents and oceans can't become coterminous via a virtual world.

¹ The neologism "glocal" was apparently coined by Manfred Lange, who, in his work for the May 1990 Global Change Exhibition, sought to capture the complex interplay between the local, the regional, and the worldwide.

Full Text of Keynote Address: Dr. Jeffrey Schnapp

Third, the emerging informational landscape associated with Web 2.0-3.0 will be defined at least as much by the substitution of physical experiences by virtual or remote ones, as by the intermingling of the physical with the virtual and the virtual with the physical. So-called “mixed” or “augmented” reality, in other words, will prove at least as significant as the purely virtual to the future of museums and libraries. And it demands modes of innovation that exploit medium-specific features of both the physical and the digital in ways that enrich experiences of physical artifacts, rather than distracting or impoverishing. It seems to me that the best way to defend the distinctive magic of experiencing original objects in real time and space—I am a believer in this magic—is to attack questions like the following ones: What can one do with a digital object that one can’t do with a physical counterpart and vice versa? Rotate and scale Michelangelo’s David up and down in order to view him from angles barely visible even to the sculptor? Peer into a canvas to see the layerings that compose it and then flip it on its back to examine the stretcher? Survey three million books in a matter of seconds to embed a recondite reference in an essay you are writing? Be present in multiple locations and media at once instead of visiting them sequentially? These are more or less straightforward instances where, though perhaps sacrificing certain qualitative aspects of physical experience, the digital has the edge.

But no less interesting is a world in which a visitor looking at the actual glass-encased papyrus remains of Demosthenes’ *Oration on the Crown* can also maneuver a digital double or elect to see a nonintrusive pop-up overlay with a transcription and translation of the orator’s text as well as live, ongoing debates among members of the global community of expert papyrologists regarding the meaning of every word and those that are missing. Or a world in which a visitor experiences the landscape of contemporary Rome with a hand-held time machine that allows for the viewing of rigorously researched visualizations of ancient, Byzantine, medieval, and Renaissance Rome layered over the contemporary cityscape. Or a world in which photographic archives

of the WPA are directly annotated by individuals who were directly involved in its unfolding, with every photograph pinned to the landscape of Google Earth, inserted into interactive timelines, and situated in a learning environment, all supported by a touring show of vintage photographs? Imagine a thousand regional history projects structured by professional historians and coordinated by regional museums and research libraries, but in which the vast bulk of contents are assembled and piped in by members of the public only to then be organized into constellations of micro-exhibitions in which digital artifacts are wedded to material remains.

My point is that the memory palaces of the 21st century will have much more porous walls than their 19th- and 20th-century predecessors. Which is to say that they will be *much bigger*. Thanks to mirror worlds like Google Earth and 3-D virtual world counterparts, thanks to ubiquitous computing devices equipped with GPS technologies that can calculate locations within a few inches, thanks to the ever increasing availability of wireless bandwidth, the future of knowledge, culture, and social and political practice will emphasize embeddings of the virtual within the real, actual physical landscapes curated just as if they were an art gallery, the collaborative and distributed building of annotations on and overlays of the physical world. This is a future that is already with us. The challenge for museums and libraries? To build their physical platforms and collections out into these and other domains of intersection between the virtual and the real in ways that reinforce not only access and outreach but also establish new models of quality, rigor, and success.

Fourth, whether by tradition or by inclination, libraries and museums have tended to be more *product* than *process*-oriented when it comes to delivering programming and content to the public. The finality and finitude of print have therefore suited them better than the volatility and infinite expansibility of the digital. Opening oneself up to the sorts of distributed or multidirectional content-generation and sharing models enabled by Web 2.0 implies a stronger emphasis upon process and

a loosening of attitudes toward ownership and content control, the boundary line between inside and outside. It implies a culture that is less risk averse and greater challenges as regards maintaining high standards of quality control. But I believe the payoffs could be considerable.

A process orientation means a number of different things: placing a research project in public view even as it is underway; transforming the development process of exhibitions into sites for market testing as well as learning by exposing the process to online commentary; allowing for resources to be built collaboratively within and outside a single institution's walls. The common thread here is that a turn toward process both *multiplies* opportunities for building bridges between the intra- and extramural realms, and *expands* the nature of programming. It contributes to the transformation of institutions of memory into not just producers and deliverers of finalized contents, but also into laboratories where, much as at the San Francisco Exploratorium, my favorite Bay area museum, stuff is always happening that anybody can watch: stuff that invites observation and participation—thinking, commentary, conversation, construction, play.

Fifth: finally, though perhaps obvious, I suppose it bears repeating that, like any toolkit, the technologies grouped under the Web 2.0 umbrella and, more broadly, everything from wikis to virtual worlds to immersive caves to semantic Webs, in and of themselves, provide few if any *answers* as regards the present or future of institutions of memory. One can do more or less rigorous or sloppy things, things that replicate the roles performed by print supports or that fundamentally alter them, that expand knowledge and enrich experience, or that contract and impoverish both. The burden of placing the toolkits available to us to interesting and innovative uses is ours alone: as historians, museum and library directors, curators, artists, and communicators.

I work with technologists a fair amount these days and greatly admire their powers of mind. But I am routinely struck by their surprise at the sorts

of demands that I make of the widgets that they create. You want a screen to convey the tactile qualities of parchment? You want digital pages to turn with the friction and sound of 16th-century paper? You want to be able to record, archive, and study the body language of avatars interacting with physical persons? You want to be able to preserve an entire virtual world so that it can be visited one hundred years from now? Yes, I want all of the above because each is interesting from the distinctive vantage point of a cultural historian. As it happens, each also poses distinctive technological challenges that are interesting from the perspective of computer science. In short, tools are not something separate, whether ahead or behind, culture or learning, but are themselves so socioculturally embedded that it is we who, in our own domains of expertise, must devise appropriate uses and repurpose them.

Apologies for this bit of philosophizing with a hammer. Now let's come down from on high and settle into some examples that I would like to place under three broad rubrics: *Archive You*, *Augmented Virtualities*, and *Memory Palaces with Porous Walls*. In the first case I'd like show an online demo; in the second a five-minute film; in the third we will fly across the SHL island in Second Life to have a quick peek at the bare beginnings of a mixed-reality museum project.

Archive You

What can one do with 100,000 political posters gathered from all over the world over the course of half a century? The traditional answer would be to put them into deep storage and then process them one by one as a precondition to access: a decade's work even for an army of expert cataloguers. But how to justify such an investment when the objects themselves are neither unique nor extremely valuable?

How might one deal with the vast sea of audio recordings and film and video footage encompassing everything from industrial training films to historical events captured from multiple viewing positions to outtakes? What about archives composed of computers and video games? What about repositories of site-specific artworks, documentation of

Full Text of Keynote Address: Dr. Jeffrey Schnapp

happenings, interactive avatars from the early history of artificial intelligence and digital art?

To organize such corpora into boxes and stash them away for hypothetical future use neither solves the legion of conservation issues nor addresses the probability that much of the knowledge that renders these objects intelligible and interesting (a) lies outside the standard communities of expertise (universities, research institutions, etc.) and (b) that the sheer abundance of materials being produced and collected means that traditional processing and conservation approaches must be necessarily restricted to very limited sets of documents and cultural records.

One promising approach is to build open-architecture resources like the collaborative time line that my former colleague Casey Alt devised for the SHL "How They Got Game" project back in 2000. The project was developed around an actual physical archive, the Cabriniety collection—the world's largest collection of video game software and hardware—and it was accompanied by two physical exhibitions.

The collaborative time line represented an archive in its own right. It sought to involve the community that participated in the genesis and afterlife of this collection of objects—technologists, animators, storyboard designers, managers, game modders, even player groups and students—by means of a data-driven, Web-based interface that permitted collaborative mappings of historical events onto a multiplicity of categories. The events in question could be generated, edited, documented (by means of uploaded files), and annotated by any member of the user community. The resulting time line was fully searchable on all levels, with colored links indicating relationships among persons, events, and individual artifacts. As you can see, the time line in question was never completed. But the core idea remains sound: to allow the communities of practitioners (and even end users) to write and document their own histories within an architecture established and maintained by expert researchers. The same approach was carried over to the development of a second tool (<http://caseyalt.com/works/genealogy>): a collaborative genealogy of the Stanford biochem-

istry department that maps relationships among researchers by means of a Flash interface that relays XML requests to Java servlets that communicate in turn with a free-standing MySQL database, largely composed of PubMed data that has been automatically linked to faculty-authored abstracts and full-text versions of publications. Fully searchable, the tool provides the framework for a professional community to narrate and reflect upon its own history in kaleidoscopic form, but allows for a multitude of vertical and horizontal perceptions of interconnections. A model of what one might call participatory archiving: archive yourself or, as I'd like to call it here, Archive You.

Augmented Virtualities

Some moments ago I mentioned the special challenges that nonobject-based forms of art pose with respect to preservation and presentation. It was precisely such a challenge that captured my lab's imagination when the archive of the contemporary artist Lynn Hershman was acquired by the Stanford University Libraries in 2003. Members of the lab had already been experimenting within Second Life as a development platform and several were personally acquainted with Hershman whose early work consisted in site-specific installations. (Hershman went on to become a pioneering digital artist known for interactive avatars and film projects such as *Teknolust*.) A partnership was born that gave rise to a quite literal animated archive that was then embedded in a physical gallery space which, in turn, was re-embedded in the animated archive. The experiment, slated to move next to SFMOMA in October, is documented in this five-minute film, which it is now my pleasure to present.

Memory Palaces with Porous Walls

By way of a conclusion, we will revisit the experiment that you have just viewed, so to speak, "live" on the SHL island in Second Life, where a virtual replica of the Montreal Museum of Fine Arts installation sits in the company of an open-air theater and cinema, several virtual-only galleries of bots and photographs, and an overall critical apparatus that situates the Dante Hotel within Hershman's

larger oeuvre. This same location has been the site of numerous parallel world events, including the Sundance premiere of the film Strange Culture with the Second Life audience sitting face-to-face with the festival audience and participating in a live post-showing discussion. Along with the NASA-sponsored International Spaceflight Museum, it is one of four sites selected by the Library of Congress for its "Preserving Virtual Worlds" project.

But the SHL Island is also a perpetual work in progress and a laboratory test bed. So I would like to close by launching us beyond Life Squared toward the rough beginnings of a collaborative venture with the Canadian Center for Architecture, the Wolfsonian-FIU, and the Bornholms-Kunstmuseum in Denmark. The project in question is a mixed-reality exhibition titled SPEED limits, concerned with the pivotal role played by speed in modern life: from art to architecture to graphics and design to the material culture of the eras of industry and information. It is intended to mark the centenary of the foundation of the Italian futurist movement, whose inaugural manifesto famously proclaimed that "the world's magnificence has been enriched by a new beauty: the beauty of speed."

Whereas shows at MOMA, the Pompidou Center, and the MART will be commemorative in spirit and more tightly focused on futurist production in the visual arts, SPEED limits will be critical and speculative. Broadly exploring a single futurist thematic, it will weave physical exhibitions in distant locations into a single comprehensive virtual platform consisting in:

- Virtual recreations of the physical exhibitions that can be navigated either in bodily avatars or vehicles from any location in the world;
- A virtual workshop furnished with "press kits" (including guidelines for the development of visitor generated content [technical specs, genres, curatorial aims] and the rules governing a series of design competitions); renderings of all physical objects that are likely to be included in the show; and an in-world modeling toolkit; and
- Ten virtual galleries that have no physical

equivalent, five curated by artists, critics, and scholars; five reserved for visitor-generated content and visitor-generated curatorial concepts on the basis of the design competitions. All 10 will be designed not according to architectural conventions, but as experiments with the very notion of the "virtual gallery" (i.e., a container unbounded by the temporality or spatiality of physical exhibition spaces).

Both the process and product are experimental, not to mention tentative, but both seem well suited to the recollection of a movement whose foundation stone was the destruction of all foundation stones. "We will destroy the museums, libraries, and academies of every kind," promised futurism's creator F.T. Marinetti.

I am certain that few in this audience would embrace such a fiercely purgative credo, but I feel no less certain that the cause of animating museums, libraries, and academies of every kind will find more than a handful of champions.

Pre-Conference Workshop Speaker Biographies

Colin Allen is professor of history and philosophy of science and professor of cognitive science at Indiana University, Bloomington, where he has been a faculty member since 2004. His main areas of research concern the philosophical foundations of cognitive science, particularly with respect to cognition in nonhuman animals, but he has also published on topics in the philosophy of mind, philosophy of biology, and artificial intelligence. He directs the Indiana Philosophy Ontology project (InPhO), and is associate editor of the Stanford Encyclopedia of Philosophy, associate editor of the Noesis Philosophy Search Engine, and codeveloper of two logic instructional sites on the Web. He is currently completing a book with a coauthor, titled *Machine Morality: Teaching Robots Right from Wrong*, to be published in 2008 by Oxford University Press.

Helene Blowers is the director of digital strategy for the Columbus Metropolitan Library (CML) in Columbus, Ohio. Previous to her recent move to CML, she worked for the Public Library of Charlotte & Mecklenburg County (PLCMC), Charlotte, North Carolina, as public services technology director, where she provided leadership for many groundbreaking and award-winning library services, including the widely adopted discovery learning program Learning 2.0: 23 Things, which has been duplicated by hundreds of libraries worldwide. In 2007, Blowers was named a Mover & Shaker by *Library Journal*. She is the coauthor of the book *Weaving a Library Web: A Guide to Developing Children's Websites* and a frequent presenter at library conferences. When Blowers is not busy trying to keep CML from falling off the ever-surging technology wave, she enjoys travel and spending time with her husband and two young daughters. Finally, in addition to balancing motherhood and career, she blogs at LibraryBytes.com.

Brett Bobley (moderator) serves as the chief information officer for the National Endowment for the Humanities (NEH) and is also the director of the agency's Digital Humanities Initiative (DHI). Under DHI, Bobley has put in place new grant programs aimed at supporting innovative humanities projects

that utilize or study the impact of digital technology. Bobley has a master's degree in computer science from the Johns Hopkins University and a bachelor's degree in philosophy from the University of Chicago. In 2007, Bobley was recognized by the President for his exceptional long-term accomplishments with a Presidential Rank Award.

Arne Flaten is assistant professor of art history at Coastal Carolina University. Professor Flaten's research focuses on the Italian Renaissance, and recently his interests have expanded to include virtual environments. He is codirector of the project Ashes2Art: Digital Reconstructions of Ancient Monuments, which is currently focused on the fourth-century BCE Greek sanctuary at Delphi and received a Digital Start-Up grant from the NEH in 2007. Professor Flaten has published numerous articles, essays, book reviews, and catalog entries. His book, *The Middeldorf Collection: Medals and Plaquettes 15th to 20th Centuries*, is expected in 2008. Professor Flaten earned a BA at St. Olaf College, and an MA and PhD from Indiana University at Bloomington. Professor Flaten's research has been funded by the Fulbright Commission, the Center for Advanced Study in the Visual Arts, the Renaissance Society of America, the Samuel H. Kress Foundation, the J. Paul Getty Research Institute, and the NEH.

Linda Frueh is the Washington, D.C., regional director for the Internet Archive. Her mission is to support and grow archive's presence on the East Coast, with particular emphasis on partnerships for collaborative projects. She is the Internet Archive's representative on the Steering Committee of the Open Content Alliance, a collaboration of approximately 90 cultural and academic institutions working to build joint online collections. Prior to joining the Internet Archive, Frueh spent 18 years in partnership development and strategic planning with Internet, networking, and other technology companies in Silicon Valley. She was formerly vice president for business development and strategy at Lexar Media, Inc., and Network General, Inc., and was a partner in the Global Accelerator, LLC, an incubator and equity investment partnership for early-stage Internet

companies. Frueh has worked extensively with federal agencies as both an employee and a consultant. Frueh holds a BS in physics from MIT and an MBA from the Stanford Graduate School of Business.

Alyson Gill is an assistant professor of art history at Arkansas State University, specializing in ancient Greek and Roman art and architecture. She received a BA from Trinity University, spending her final undergraduate year in Athens, Greece. She later returned to Greece as a Fulbright Scholar, receiving an MA in art history at the University of California, Irvine, and a PhD through the University of Memphis, writing her doctoral dissertation on Greek baths and bathing from the Archaic through the Hellenistic periods. She was recently awarded a Getty Research Institute grant, and is preparing her sourcebook on Greek baths, *Balaneia*, for publication. Gill is codirector of Ashes2Art, which was awarded Digital Humanities Start-Up Grant by the National Endowment for the Humanities in 2007. Ashes2Art is currently studying Panhellenic sites in Greece, focusing on the Greek sanctuary of Apollo at Delphi.

Martin Halbert is a nationally recognized leader in digital libraries. His doctoral research and subsequent research projects have focused on exploring the future of research library services. As director of digital programs and systems at Emory University, he is responsible for researching and leading library information technology initiatives, including all digital scholarly communication projects of the MetaScholar Initiative (www.metascholar.org). He provides a leadership role within the library for computer systems operations, development, planning, and integration. He led the campus-wide effort to establish the Emory University Information Commons in 1998. Martin has served as principal investigator for grants and contracts totaling more than \$4 million during the past five years, sponsored funding that enabled more than a dozen large-scale collaborative projects between Emory and other institutions. He established the MetaArchive Digital Preservation Network (www.MetaArchive.org), a consortium of universities acting in concert with the Library of Congress to preserve our cultural heritage

as part of the National Digital Preservation Program. Martin has led many interinstitutional committees, including the National Science Digital Library Policy Committee and the Digital Library Federation Aquifer Services Working Group. He has previously worked for Rice University, the University of Texas at Austin, and the IBM Corporation.

Paul F. Marty (moderator) is assistant professor in the College of Information at Florida State University. He has a background in ancient history and computer science engineering, and his PhD is from the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign. Before arriving at FSU, he was director of information technology at the University of Illinois's Spurlock Museum. Professor Marty's research and teaching interests include museum informatics, computer-supported cooperative work, information behavior, and usability engineering. He specializes in the study of museums as sociotechnical systems, and is particularly interested in the social implications of introducing new technologies into the museum environment. His current research focuses on the evolution of sociotechnical systems and collaborative work practices in museums, the usability of museum Web sites, the evolving roles of information professionals in museums, and the digital museum in the life of the user.

Bernard F. Reilly (moderator) is president of the Center for Research Libraries, a partnership of 238 U.S. and Canadian universities, colleges, and independent research libraries. Reilly was principal investigator for two digital preservation projects funded by the Andrew W. Mellon Foundation: the Political Communications Web Archiving investigation (2002-2004) and the Auditing and Certification of Digital Archives project. Reilly was previously director of research and access at the Chicago History Museum (1997 to 2001), where he directed digitization and dissemination of the CHM library, archives, architecture, sound, and pictorial collections; and head of the curatorial section in the Prints and Photographs Division of the Library of Congress (1987-1997), which provided curatorial and policy support to the early development of the National Digital Library.

Pre-Conference Workshop Speaker Biographies

Rob Semper is executive associate director of the Exploratorium in San Francisco and is responsible for leading the institution's work in developing programs of learning and teaching for the public and educators using exhibits, workshops, media, and Internet resources. Dr. Semper is the principle investigator on numerous science education, media, and research projects, including leading the National Science Foundation-sponsored Center for Informal Learning and Schools, a research collaboration between the Exploratorium; the University of California, Santa Cruz; and King's College, London, which studies the relationship between museums and formal education. He is also co-principal investigator on the NSF-funded Nanoscale Informal Science Education Network, a national network of science centers designed to foster engagement of the public with the nanotechnology field. He leads numerous research and development projects in new media, including wireless networks, handheld computing, and advanced Internet applications. Over the past 15 years, Dr. Semper has guided the development of the award-winning Exploratorium Web site, which has explored the role of museums in the online world, including the development of online field trips to locations of scientific research. He has been executive producer for a number of NSF and NASA-supported Webcast/Web site projects including Origins, which provides online field trips to science observatories worldwide, four solar eclipse Webcasts, and the Ancient Observatories project that originated live from Chaco Canyon and Chitzen Itza. Before this, Dr. Semper was a Schumann fellow at the Harvard Graduate School of Education and director of the creative collaboration between Apple Computer and Lucasfilm Ltd., formed to develop interactive multimedia education projects. Previous to this, since joining the Exploratorium in 1977, he has led numerous exhibit development, teacher enhancement, and media development projects focused on science education for the public, teachers, and students. Dr. Semper was elected to be a 2006 American Association for the Advancement of Science (AAAS) fellow and was the recipient of the 2006 NSTA's Faraday Award for Science

Communication, the 1994 NSTA's Informal Educator of the Year award, and the 2000 Association of Science Technology Center's Award for Innovation for the Exploratorium's leadership in developing online media. He has served on numerous advisory boards, including the George Lucas Educational Foundation National Advisory Board and the AAAS Committee on the Public Understanding of Science.

Holly Witchey is currently director of new media at the Cleveland Museum of Art. In addition, she serves as a member of the board of directors of the Museum Computer Network, and is an American Association of Museum-appointed member to the National Committee for Archives, Libraries, and Museums (CALM). From 2002 to 2007, she served as a member of and, eventually, chair of the American Association of Museum's Media and Technology Standing Professional Committee. She has a PhD in 15th-century Italian painting and sculpture. As associate curator of European Art at the San Diego Museum of Art, she began developing content-rich projects for museums using new technologies. In 2000 she left the curatorial world to start the New Media Department at the Cleveland Museum of Art. Dr. Witchey writes and speaks about museum ethics, accessibility, and issues that have arisen as a result of the use of new technologies in museum settings.

Elizabeth Yakel is an associate professor at the University of Michigan School of Information, where she teaches in the Archives and Records Management Specialization and coordinates the Preservation of Information area. Her research interests include analyzing archival user needs and improving access to primary sources, particularly in the digital realm. This presentation reports on the "Next Generation Finding Aids Project," an ongoing research project to improve and re-envision the look, feel, and functionality of archival access systems. She has published widely on many aspects of archival use and user services in archival journals including *American Archivist*, *Archivaria*, and *Archival Science*.

Conference Speaker Biographies

Ronald M. Berkman received a PhD from Princeton University in 1976. Prior to coming to Florida International University, he taught at the Woodrow Wilson School at Princeton University, the University of California at Berkeley, Brooklyn College, the City University of New York (CUNY) Graduate Center, New York University, and the University of Puerto Rico. As the dean of urban affairs at the CUNY, he was responsible for developing research and technical assistance partnerships with all facets of New York City, New York State, and federal government agencies and nongovernmental organizations. In 1994, he was named founding dean of CUNY's first School of Public Affairs, located at Baruch College. He served as university dean of academic affairs at CUNY from 1992 to 1994. Dr. Berkman has authored, coauthored or coedited five books and numerous articles on urban issues. He has directed former New York City Mayor David Dinkin's Workforce Commission and authored a report and analysis of public/private partnerships for the U.S. Conference of Mayors. At CUNY, he directed a comprehensive review and strategic plan for health programs at all 18 campuses and participated in the Governor's Health Policy Task Force. He has served as chair of the Dean's Council for the National Association of Schools of Public Affairs and Administration as well as various committees of the Association of Public Policy and Management and has an impressive history of service awards and fellowships, as well as foundation grants. As a commentator on urban and public affairs, he has frequently appeared on CNN and other major television and radio networks. Effective January 2007 he serves as the executive vice president, provost, and chief operating officer of Florida International University.

Roger Bruce is director of interpretation for George Eastman House in Rochester, New York, where his duties include supervision of information management, the museum's education department, and other educational initiatives. Mr. Bruce came to Eastman House as guest curator in 1993, joining its senior management staff in 1994. He is especially interested in special challenges of photographic

archives—exemplified by the mire of searching among unsteady meanings and references captured in the photographic image. Prior to coming to the museum, he served with the National Endowment for the Arts and was founding director of the New York State Artists' Fellowship Program, providing grant support to artists of all disciplines throughout New York State.

Priscilla Caplan is assistant director for digital library services at the Florida Center for Library Automation (FCLA). Previously she worked at the Office for Information Systems in the Harvard University Library, and as assistant director for library systems at the University of Chicago. At FCLA she is responsible for the PALMM (Publication of Archival, Library, and Museum Materials) program of the state university libraries, and for the Florida Digital Archive, a long-term preservation repository. She is the author of the book *Metadata Fundamentals for All Librarians* and of numerous articles on metadata, standards for digital libraries, and digital preservation.

Daniel J. Cohen is an assistant professor of history and the director of the Center for History and New Media at George Mason University. He is the coauthor, with Roy Rosenzweig, of *Digital History: A Guide to Gathering, Preserving, and Presenting the Past on the Web* (University of Pennsylvania Press, 2005), author of *Equations from God: Pure Mathematics and Victorian Faith* (Johns Hopkins University Press, 2007), and has published articles and book chapters on the history of mathematics and religion, the teaching of history, and the future of history in a digital age in journals such as the *Journal of American History*, *The Chronicle of Higher Education*, and *Rethinking History*. He is an inaugural recipient of the American Council of Learned Societies' Digital Innovation Fellowship. At the Center for History and New Media, Professor Cohen has codirected, among other projects, the September 11 Digital Archive and Echo, and has developed software for scholars, teachers, and students, including the popular Zotero research tool. He received a bachelor's degree from Princeton, a master's degree from Harvard, and a doctorate from Yale.

Conference Speaker Biographies

Bruce Cole is the eighth chairman of the National Endowment for the Humanities. As NEH chairman, Cole has launched We the People, an initiative to encourage the teaching, study, and understanding of American history and culture. Under Cole's leadership, the endowment is also spearheading the application of digital technology to the humanities through its Digital Humanities Initiative, begun in 2006. Cole came to the endowment in December 2001 from Indiana University in Bloomington, where he was distinguished professor of art history and professor of comparative literature. Appointed by President George W. Bush, Cole was chosen for a second term in 2005, a reappointment unanimously approved by the U.S. Senate. Cole has written 14 books, many of them about the Renaissance. His most recent book is *The Informed Eye: Understanding Masterpieces of Western Art*. Cole was born in Ohio and attended Case Western Reserve University. He earned a master's degree from Oberlin College and a doctorate from Bryn Mawr College. He is a corresponding member of the Accademia Senese degli Intronati, the oldest learned society in Europe, and a founder and former copresident of the Association for Art History. He and his wife Doreen live in the District of Columbia and have two grown children.

Cathy De Rosa is vice president for the Americas and global vice president of marketing for OCLC Online Computer Library Center. De Rosa joined OCLC in 2001, and is responsible for global marketing, library services and support, and library advocacy programs. De Rosa leads library market research initiatives for OCLC. She is principal contributor to the 2003 OCLC Environmental Scan, *Pattern Recognition*, an industry report that has driven strategic planning discussions and new programs at libraries worldwide. She also coauthored *Perceptions of Libraries and Information Resources*, an international study of library use, awareness, and brand recognition in the age of the Internet-savvy information consumer. The most recent report in this series, *Sharing, Privacy and Trust in Our Networked World*, was released last fall. De Rosa has more than 20 years of experience in marketing, new product deployment,

and marketing education. Prior to joining OCLC, De Rosa served on the faculty of the Fisher College of Business at the Ohio State University, where she taught e-business marketing and branding. De Rosa has also held management and executive management positions at Symix Systems, Price Waterhouse, and Texas Instruments. De Rosa received a bachelor's degree in accounting from the University of Arizona and a master's of business administration from the Harvard Business School.

Jonathan F. Fanton became president of the John D. and Catherine T. MacArthur Foundation on September 1, 1999. Previously, he had been president of the New School for Social Research in New York City for 17 years. With assets of more than \$6 billion, MacArthur is one of the nation's largest foundations. It makes grants and program-related investments in the United States and abroad totaling more than \$225 million annually. Domestically, its programs encompass community development, housing, juvenile justice, and education, with a focus on digital media and learning. Internationally, it works in the fields of human rights and international justice, biodiversity conservation, population and reproductive health, international peace and security, and migration and human mobility. The foundation works in 65 countries and has offices in India, Russia, Nigeria, and Mexico. The foundation also funds public radio and television and the making of independent documentaries. The foundation is well known for its support of exceptionally creative individuals through the MacArthur Fellows Program. At Yale University, Fanton earned a baccalaureate degree in 1965, a master's in philosophy in 1977, and a doctorate in American history in 1978. At Yale, he taught American history, was special assistant to president Kingman Brewster from 1970 to 1973, and was associate provost from 1976 to 1978. From 1978 to 1982, he was vice president for planning at the University of Chicago, where he also taught American history. As president of the New School for Social Research from 1982 to 1999, he led the integration and enhancement of the seven divisions of the university, expansion of the Greenwich Village

campus, and development campaigns that increased the university's endowment ten-fold. During his tenure, the New School merged with the Mannes College of Music, established a drama school in partnership with the Actor's Studio, merged with the World Policy Institute, added a jazz and contemporary music program, a teacher education program, a creative writing program, and an architecture department at Parsons School of Design. Dr. Fanton is a board member of Human Rights Watch (HRW), the largest U.S.-based human rights organization, which operates in 70 countries. He served as chair of HRW's board for six years, stepping down at the end of 2003. He is also an advisory trustee of the Rockefeller Brothers Fund, and the founding board chair of Security Council Report. He is cochair of Chicago's Partnership for New Communities. He served as chair of the New York Committee on Independent Colleges and Universities and as cochair of the 14th Street/Union Square Local Development Corporation. Dr. Fanton is the author of *The University and Civil Society, Volumes I and II*, and coeditor of *John Brown: Great Lives Observed* and *The Manhattan Project: A Documentary Introduction to the Atomic Age*.

Ilene Frank has been a reference/instruction librarian at the University of South Florida since 1974. She has also taught courses both face-to-face and at a distance for the University of South Florida's School of Library and Information Science and for University of Maryland University College. She offered her first distance-learning course in 1996, which spurred her interest in the use of technology for teaching and learning including the use of new avenues such as the virtual world Second Life for reaching distance learners and remote library users. Frank has both an undergraduate degree and a master's degree in painting, in addition to a master's in library science.

José-Marie Griffiths is the dean of the School of Information and Library Science at the University of North Carolina at Chapel Hill. Dr. Griffiths has a research and leadership career that spans more than 30 years. Recently appointed to the United States National Science Board, she has held two previous presidential appointments, one to the President's

Information Technology Advisory Committee from 2003 to 2005, and the other to the U.S. National Commission on Libraries and Information Science from 1996 to 2002. Dr. Griffiths also has served on blue-ribbon panels and committees for agencies including the National Academy of Sciences, NASA, the Department of Energy, U.S. Geological Survey, and the U.S. Navy. Her research spans information science, technology, and leadership. She has done groundbreaking work in return on investment analysis of information systems and libraries, including multiple approaches to cost/benefit assessment; the influences of the digital revolution on the conduct of research, especially focused on similarities and differences among researchers in different countries, sectors, and disciplines, and the implications for providing resources and support to research efforts; success criteria and best practices for information technology in higher education; and the development of protocols and policies for resource sharing across organizations on local, state, and regional levels, including both public and private institutions. At the University of Michigan (1996-2001) Dr. Griffiths was university chief information officer, with strategic and operational responsibility for the university's information technology activities totaling more than \$200 million in annual expenditures, executive director of the Information Technology Division, founding director of the Collaboratory for Advanced Research and Academic Technologies (CARAT), and professor in the School of Information. She was instrumental in the development of the Ann Arbor IT Zone, a community organization to encourage the recruitment and retention of high-tech companies and talent to the southeastern Michigan region, and was founding chair of its board. Dr. Griffiths was previously the Doreen E. Boyce Chair and Professor in the School of Information, director of the Sara Fine Institute for Interpersonal Behavior and Technology, and associate of the Learning Research and Development Center at the University of Pittsburgh (2001-2005). She served in several capacities at the University of Tennessee (1989-1996), including professor and Oak Ridge National Laboratories Collaborating Scientist, director of the

Conference Speaker Biographies

School of Information Sciences, and vice chancellor for computing and telecommunications/information infrastructure. Dr. Griffiths' accomplishments have been recognized by several prestigious appointments and awards. She was elected fellow of the American Association for the Advancement of Science, was named one of the Top 25 Women of the Web, and received the American Society for Information Science and Technologies Award of Merit and Research Award, to name a few. She has a BSc in physics and a PhD in information science from University College London.

Laurence F. Johnson, PhD, is chief executive officer of the New Media Consortium (NMC), an international consortium of more than 200 world-class universities, colleges, museums, research centers, and technology companies dedicated to using new technologies to inspire, energize, stimulate, and support learning and creative expression. He is an acknowledged expert on the effective application of new media in many contexts, and has worked extensively to build common ground among museums and universities across North America and in more than a dozen other countries.

Paul Jones is the director of ibiblio.org, a contributor-run digital library of public domain and creative commons media, now in its fifteenth year, at the University of North Carolina at Chapel Hill. A faculty member of the School of Journalism and Mass Communication and of the School of Information and Library Science at Chapel Hill, Jones holds a BS in computer science from North Carolina State University (1972) and an MFA in poetry from Warren Wilson College (1993). A journalist, scholar, writer, and poet, Jones has published articles, books, including an award-winning poetry chapbook, and academic papers in *Communications of the ACM*, *Library Trends*, and elsewhere. He is author of *The Web Server Book* (Ventana, 1995), a contributor to *Best American Erotic Poems: 1800 to Present* (Scribners, 2008), and a member in good standing of the Luxuriant Flowing Hair Club for Scientists.

Bryan Kennedy's main passion is connecting real-world spaces and experiences with the unique beauty of the Internet. After studying geology, Bryan moved into the museum field to find a space where he could explore his interest in science education. His experience in Web and media technology led him to the museum's Learning Technologies Center, where he taught teens how to combine traditional craft and art projects with electronics, robotics, and computer programming. In the Learning Technology Center, Bryan also began developing online and exhibit-based multimedia experiences for museum-produced Omni films—such as Jane Goodall's *Wild Chimpanzees*—as well as exhibit projects, such as *Robots and Us* and *Mysteries of Çatalhöyük*. In 2005, Bryan joined the Exhibits Division to work on Science Buzz, the Science Museum's "current science" exhibits and program. Science Buzz builds a bridge between the active world of science research and the Science Museum's exhibit spaces through a series of mini exhibits linked up to a community driven Web site (www.smm.org/buzz). Bryan is still working on Science Buzz, while also developing exhibits, media, and Web resources for the Nanoscale Informal Science Education Network (NISE Net), an initiative to get exhibits about nanotechnology into 100 museums over the next five years. Kennedy regularly speaks on the use of technology in museums and can be found on the museum's media and technology blog, Beyond the Button (www.smm.org/blogs)

Mark Lawrence Kornbluh is chairperson and professor of history and director of MATRIX, the Center for Humane Arts, Humanities, and Social Sciences Online, at Michigan State University. One of the largest humanities technology center in an American university, MATRIX's research focuses on multimedia digital repositories, teaching, and learning in the digital age, cultural heritage, and the use of the Internet for democracy and development. Kornbluh is the principle investigator on a wide range of research and education projects. A specialist in modern American political history, whose historical scholarship focuses on political participation in the United States, Kornbluh is the author of *Why*

America Stopped Voting: The Decline of Participatory Democracy and the Emergence of Modern Electoral Politics, 1880-1918. His interests in democracy have involved him in a wide range of digital projects to bridge the digital divide worldwide, including online projects in South and West Africa and in Detroit.

Since 1996, **Cathy Leff** has served as director of the Wolfsonian–Florida International University, an internationally recognized museum and research center in South Miami Beach. The museum promotes the examination of modern material culture to enhance the understanding and appreciation of objects as agents and reflections of social, political, and technological change. The organization focuses on its extraordinary collection of North American and European decorative, design, propaganda, and fine arts of the 1885-to-1945 period, donated to Florida International University in 1997 by Mitchell Wolfson, Jr. Leff was responsible for negotiating the gift agreement with Florida International University and worked with the university to secure annual recurring support from the Florida Legislature. She is responsible for the successful transition of what originally began as a private initiative into a fully public and reputable cultural and educational resource. The institution now enjoys broad-based support, and its collection has been strengthened by private donations and curatorial acquisitions. For the past 16 years, Leff has served as publisher and executive editor of the critically acclaimed *Journal of Decorative and Propaganda Arts*, which fosters scholarship in the same pivotal period as the Wolfsonian collection. This publication was founded by Mitchell Wolfson Jr. Now in its 21st year, it is published by the Wolfsonian-FIU. Prior to joining the Wolfsonian, Leff was vice president of the Wolfson Initiative Corp., and from 1976 to 1987, assistant director of the City of Miami Community Development Department. She received a BA from Sophie Newcomb College, Tulane University, and studied one year at the University of Madrid. She did graduate coursework at the University of Miami School of Business, and has taken executive education courses at both Harvard and Stanford's University's Graduate Schools of

Business. Leff speaks Spanish, French, and Italian, and studies Japanese. She serves on the boards of the Louis Wolfson II Media History Center and Cintas Foundation. She is a member of the Association of Art Museum Directors and the International Conference of Museums.

Paul F. Marty is assistant professor in the College of Information at Florida State University. He has a background in ancient history and computer science engineering, and a PhD from the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign. Before arriving at FSU, he was director of information technology at the University of Illinois's Spurlock Museum. Dr. Marty's research and teaching interests include museum informatics, computer-supported cooperative work, information behavior, and usability engineering. He specializes in the study of museums as sociotechnical systems, and is particularly interested in the social implications of introducing new technologies into the museum environment. His current research focuses on the evolution of sociotechnical systems and collaborative work practices in museums, the usability of museum Web sites, the evolving roles of information professionals in museums, and the digital museum in the life of the user.

Since the late eighties **Cathy Norton** has been involved in building the network infrastructure for the laboratory and the electronic library that serves affiliates worldwide via high-speed networks. She has served as principal investigator on an HHMI grant for building a virtual library; she had received a Andrew W. Mellon Foundation grant for building taxonomic information services, tools, and communities; an NIH contract for outreach in Medical Informatics; National Oceanographic and Atmospheric Administration and U.S. Geological Survey contracts for library services; and a Sea Grant for digitizing the Woods Hole herbarium collection. Currently she is serving as the chair of the digitization committee for the Boston Library Consortium and the deputy director and vice chair for the BioDiversity Heritage Library. She is on the Members' Council for OCLC and the

Conference Speaker Biographies

Literature Technical Advisory Committee at the National Library of Medicine and has recently been appointed to the BioOne Board. She is the director of the MBLWHOI Library.

Anne-Imelda Radice, a distinguished art and architecture historian, museum professional, and administrator, was nominated on December 13, 2005, by the President of the United States to be director of the Institute of Museum and Library Services. The U.S. Senate confirmed Dr. Radice's nomination on March 13, 2006. IMLS, an independent U.S. government agency, is the primary source of federal support for the nation's 122,000 libraries and 17,500 museums. Dr. Radice was most recently the acting assistant chairman for programs at the National Endowment for the Humanities. She assisted the chairman in the overall program administration of this federal agency dedicated to supporting research, education, preservation, and public programs in the humanities. Before joining the National Endowment for the Humanities, Dr. Radice was chief of staff to the Secretary of the U.S. Department of Education from 2003 to 2005. She was a member of the secretary's executive team and worked closely with the secretary to fulfill the department's mission to promote excellence in American education. From 2001 to 2003, Dr. Radice served as executive director of the Appeal of Conscience Foundation in New York City. Begun more than 35 years ago by Rabbi Arthur Schneier, the foundation promotes religious freedom, tolerance, and human rights throughout the world. From 1998 to 2001, Dr. Radice was executive director of the Friends of Dresden, Inc., an organization devoted to the reconstruction, restoration, and preservation of Dresden's artistic and architectural legacy. Her fundraising responsibilities included Friends of Dresden's two largest campaigns, the restoration of the Dresden Synagogue set ablaze during Kristallnacht in 1938 and the reconstruction of the Frauenkirche (Our Lady of Sorrows Cathedral), which dominated the city's skyline from 1794 until 1945. From 1993 to 1995, Dr. Radice consulted for New River Media, World Affairs Television Production

in Montreal and Washington, D.C., and Grey and Company II. Appointed by President George H. W. Bush in May 1992 to serve as the acting chairman of the National Endowment for the Arts, Dr. Radice oversaw the development, congressional approval, and management of a \$175 million budget and 273 employees. Prior to becoming acting chairman, Dr. Radice was senior deputy chairman, the number-two spot at the agency, where she developed substantial private funding and partnerships for a variety of projects. From 1989 to 1991, Dr. Radice was chief of the creative arts division of the United States Information Agency (USIA). There she supervised the presidentially appointed Cultural Property Advisory Committee. The committee, formed in response to the 1970 UNESCO Convention, promotes long-term measures to safeguard cultural heritage artifacts. She also managed the USIA's international planning of fine arts, museum technology, art conservation, and cultural tourism. As the first director of the National Museum of Women in the Arts (1983-1989), the only museum in the world dedicated exclusively to displaying works by women artists of all periods and nationalities, Dr. Radice participated in the renovation of a 78,810-square-foot historic Washington landmark. Redesigned with the highest museum and security standards, the former Masonic Temple near the White House reopened as the National Museum of Women in the Arts (NMWA) in 1987 and has won numerous architectural awards. By the end of her directorship, the NMWA's budget had grown to \$4 million and its membership had reached 100,000. From 1976 to 1985, Dr. Radice worked in the Office of the Architect of the U.S. Capitol, first as architectural historian (1976 to 1981), then as curator. While there Dr. Radice developed an information and conservation system for the 55,000 historic drawings in the collection. She initiated art restoration and conservation programs for the U.S. Capitol and other buildings under its jurisdiction. She also supervised the research, archives, records management, and architectural history divisions. She began her career in arts administration in 1971 at the National Gallery of Art as assistant curator and staff lecturer. While there (until 1976) Radice wrote educational materials

for such blockbuster exhibitions as King Tutankamen and Treasures from China. She also initiated the first-ever foreign-language lecture and tour service and was cited by *The Wall Street Journal* for introducing the National Gallery to a wider audience. Dr. Radice has authored numerous publications on art and architecture including *The Original Library of Congress: The History (1800-1814) of the Library of Congress in the United States Capitol* (1981), a seminal architectural study of the West Front of the U.S. Capitol that resolved a controversy during the restoration of the façade and led to its successful completion. Dr. Radice has a PhD in art and architectural history from the University of North Carolina, Chapel Hill (1976), an MBA from American University (1985), and a BA in art history from Wheaton College, Norton, Massachusetts (1969). Dr. Radice has an MA from the Villa Schifanoia in Florence, Italy (1971) and did graduate coursework in northern Italian architecture at the Massachusetts Institute of Technology. Dr. Radice succeeds Dr. Robert S. Martin, a library professional, as director of IMLS, and will serve for a four-year term. Deputy Director for Libraries Mary L. Chute served as acting director since the end of Dr. Martin's term in July 2005. The directorship alternates between individuals from the museum and library communities.

Bernard F. Reilly is president of the Center for Research Libraries, a partnership of 238 U.S. and Canadian universities, colleges, and independent research libraries. Reilly was principal investigator for two digital preservation projects funded by the Andrew W. Mellon Foundation: the Political Communications Web Archiving investigation (2002-2004) and the Auditing and Certification of Digital Archives project. Reilly was previously director of research and access at the Chicago History Museum (1997-2001), where he directed digitization and dissemination of the CHM library, archives, architecture, sound, and pictorial collections; and head of the Curatorial Section in the Prints and Photographs Division of the Library of Congress (1987-1997), which provided curatorial and policy support to the early development of the National Digital Library.

Jeffrey T. Schnapp has been the director of the Stanford Humanities Lab (<http://shl.stanford.edu>) since its foundation in 2000. He occupies the Pierotti Chair in Italian Studies at Stanford University, where he is professor of French and Italian, comparative literature, and German studies. He has played a pioneering role in several areas of transdisciplinary research and led the development of a new wave of digital humanities work. His research interests extend from antiquity to the present, encompassing such domains as the material history of literature, the history of design and architecture, and the cultural history of engineering. He is the author or editor of eighteen books and over one hundred essays on authors such as Virgil, Dante, Hildegard of Bingen, Petrarch, and Machiavelli, and on topics such as late antique patchwork poetry, futurist and dadaist visual poetics, the cultural history of coffee consumption, glass architecture, and the iconography of the pipe in modern art.

As deputy director for museums, **Marsha L. Semmel** manages the Institute of Museum and Library Services' portfolio of grantmaking programs that support capacity-building and leadership projects for all types of museums, including art, history, science, historic houses, children's museums, aquaria, arboreta, botanical gardens, and zoos. As director for strategic partnerships, Semmel maintains oversight of federal-state partnership activities, initiates and implements collaborations with other federal agencies and organizations, and manages special projects and initiatives. From 1998 to 2002, Semmel was president and CEO of the Women of the West Museum, in Denver, Colorado. Prior to that, she was president and CEO of Conner Prairie, a living history museum in Indianapolis, Indiana. From 1984 to 1996, Semmel worked at the National Endowment for the Humanities, in Washington, D.C., serving as program officer; assistant director for humanities projects in museums and historical organizations; and director of its division of public programs. She began her museum career as curator and educator at the Taft Museum in Cincinnati, was deputy director of the B'nai B'rith National Jewish Museum in Washington,

Conference Speaker Biographies

D.C., and program coordinator for the resident associates program at the Smithsonian Institution. In 1979, Semmel was a fellow in the museums program of the National Endowment for the Arts.

Rob Semper is executive associate director of the Exploratorium in San Francisco and is responsible for leading the institution's work in developing programs of learning and teaching for the public and educators using exhibits, workshops, media, and Internet resources. Dr. Semper is the principle investigator on numerous science education, media, and research projects, including leading the National Science Foundation-sponsored Center for Informal Learning and Schools, a research collaboration between the Exploratorium, UC Santa Cruz, and King's College, London, which studies the relationship between museums and formal education. He is also co-principal investigator on the NSF-funded Nanoscale Informal Science Education Network, a national network of science centers designed to foster engagement of the public with the nanotechnology field. He leads numerous research and development projects in new media including wireless networks, handheld computing, and advanced Internet applications. Over the past 15 years Dr. Semper has guided the development of the award-winning Exploratorium Web site, which has explored the role of museums in the online world including the development of online field trips to locations of scientific research. He has been executive producer for a number of NSF and NASA-supported Webcast/Web site projects including Origins, which provides online field trips to science observatories worldwide, four solar eclipse Webcasts, and the Ancient Observatories project, which originated live from Chaco Canyon and Chitzen Itza. Before this, Dr. Semper was a Schumann fellow at the Harvard Graduate School of Education and director of the creative collaboration between Apple Computer and Lucasfilm Ltd., formed to develop interactive multimedia education projects. Previous to this, since joining the Exploratorium in 1977, he has led numerous exhibit development, teacher enhancement, and media development projects focused on science education for the public,

teachers, and students. Dr. Semper was elected to be a 2006 American Association for the Advancement of Science (AAAS) fellow and was the recipient of the 2006 NSTA's Faraday Award for Science Communication, the 1994 NSTA's Informal Educator of the Year award and the 2000 Association of Science Technology Center's Award for Innovation for the Exploratorium's leadership in developing online media. He has served on numerous advisory boards including the George Lucas Educational Foundation National Advisory Board and the AAAS Committee on the Public Understanding of Science.

Robert Stein is the chief information officer and director of museum information systems at the Indianapolis Museum of Art. Stein has been heavily involved in developing and deploying public uses of technology in the museum and online as a way of informing and engaging museum visitors with art. A longtime proponent of unique interface technology, Stein joined the museum in 2006 after spending several years as the assistant director of the Visualization and Interactive Spaces Lab, one of the Pervasive Technology Labs at Indiana University. His research there involved the integration of scientific visualization practices with novel human computer interface technologies in support of the communication of information from a variety of scientific and artistic domains. Prior to joining Indiana University, Stein served as a senior visualization specialist at the National Center for Supercomputing Applications at the University of Illinois. There, Stein developed custom visualization software for domain specialists. Over the years, Stein has been actively involved in both creating and deploying a variety of open source software systems for use in his work. He currently serves as project director for the steve. museum open source project, supported by a National Leadership Grant from the Institute for Museum and Library Services. The project's research examines the use of social tagging for art museums and its benefits for increasing access and engagement to online collections of art. In addition, in 2007 Stein was selected as a finalist for the Indy's Best and Brightest award by Junior Achievement. Also in 2007,

Stein was picked by *Indianapolis Business Journal* as one of their 2007 Forty under 40 awardees. The award recognizes professionals who have made their mark in the Indianapolis business community prior to their 40th birthday.

Boyce Tankersley is director of living plant documentation at Chicago Botanic Garden (CBG) and principal investigator of the Institute of Museum and Library Services Building Digital Resources National Leadership grant titled Plant Collections—A Community Solution. He holds a Bachelor of Science degree in horticulture from New Mexico State University and a Master of Science in floriculture from Texas A&M University. He has worked in botanic gardens in the United States, Scotland, and Costa Rica. He is currently involved with research projects as the American principal investigator on a Civilian Research Development Foundation grant with Bakuriani Alpine Botanical Garden in the Republic of Georgia focused on creating sustainable revenue streams; project director of experiments evaluating the use of radio frequency identifiers in living collections. He directs the activities of three full-time staff members, 1.5 grant-funded full-time equivalents, and 75 volunteers focused on documenting the scientific, ecological, and ornamental characteristics; mapping; and labeling 2.5 million plants at CBG.

Bill White is the Theresa A. and Lawrence C. Salameno Director of Educational Program Development for the Colonial Williamsburg Foundation. He leads the Colonial Williamsburg Teacher Institute, the Emmy-winning Electronic Field Trip series, and an extensive publishing initiative that provides lesson plans, primary sources, and activity kits for the classroom. Dr. White wrote and produced the *Colonial Williamsburg Primary Sources* CD-ROMs for grades 1-3 and 4-6 with Pearson Scott Foresman, which won awards from *Media and Methods* and *Technology and Learning* magazines. He also authored Pearson Scott Foresman's *History-Social Science for California* for grades K-5, and writes a monthly column linking history and current events for the *Newsweek Education Program* (www.NewsweekEducation.com). Dr. White received a PhD

from the College of William and Mary and a BA in history from Christopher Newport University.

Project Demonstrations

George Mason University Center for History and New Media

Omeka: Exhibit Collections Online in the Age of Web 2.0
The Center for History and New Media at George Mason University project is creating OMEKA, a next-generation Web publishing tool that will enhance the ability of museums to showcase their collections and content online. OMEKA is designed specifically for smaller history museums, heritage societies, and historic sites that may not have the resources or expertise to create and maintain their own online tools. This open-source Web tool will offer an easy, professional, and state-of-the-art way for museums to display their content online. It will provide a standards-based interoperable system to share and use digital content in multiple contexts.

Contact:

Sharon Leon, Director of Public Projects,
Center for History and New Media
George Mason University
4400 University Drive, MSN 1E7
Fairfax, VA 22030
Phone: 703-993-3831
E-mail: sleon@gmu.edu
Project Web site: www.omeka.org

Rochester Institute of Technology Image Permanence Institute

Web-Based Environmental Risk Analysis for Museums and Libraries (WEBERA)
The Rochester Institute of Technology's Image Permanence Institute is investigating a Web-based system for environmental risk analysis called WebERA. The study and tool together respond to the IMLS-supported Heritage Health Index study, which found that more than 60 percent of collection-holding institutions report damage to collections from inadequate environmental storage conditions. Using a pilot group of 10 museums and five libraries, the project shows how museum and library environments can be evaluated and monitored through Internet connections. The goal of the project is to determine what features in the environmental risk management system are most valuable and, ultimately, to offer WebERA as a public service to the museum and library community.

Contact:

James Reilly, Director
Image Permanence Institute, RIT
70 Lomb Memorial Drive
Bldg. 7B, Room 2000
Rochester, NY 14623
Phone: 585-475-2306
E-mail: jmrpph@rit.edu
Project Web site: www.myclimatedata.org

CDP@BCR

University of Denver/Collaborative Digitization Program (CDP), now merged with the Bibliographical Center for Research (BCR)

Point, Click, Listen: Sound Model Demo

Managed at the University of Denver, a CDP project team of library and museum professionals developed an adaptable sound model for a shared statewide infrastructure for audio resources. The program provides central streaming services for participating institutions and centralized storage of audio files for institutions lacking their own capacity. Users can enter a search term in a traditional metadata catalog and receive a list of audio files containing search terms and listen to the entire piece. Alternately, search terms will generate transcripts on the fly to help users locate and listen to specific occurrences within the audio file. Teacher resources were also created for audio files within the collection. The demonstration will include discussions of best practices, lessons learned, sample worksheets, processes for submitting files, file naming conventions, and workflow.

Contact:

Leigh Grinstead, Projects Coordinator

CDP@BCR

14394 East Evans Avenue

Aurora, CO 80014

Phone: 303-751-6277, ext. 111

E-mail: lgrinste@bcr.org

Project Web site: www.cdpheritage.org/project/soundmodel

Digital Audio Best Practices: www.cdpheritage.org/digital/audio/documents/cdp_dabpv2_1.pdf

Florida Center for Library Automation*DAITSS Preservation Repository*

Cultural memory organizations providing online access to their collections must also preserve their digital content as part of their responsibility for collection stewardship, whether these resources are “born” digital, converted from at-risk formats such as sound recordings, or serve as security copies in the event of loss or damage of originals. DAITSS (Dark Archives in the SunShine State) is an open-source, OAIS-conformant preservation repository application that implements the preservation strategies of normalization and format migration and is suitable for the long-term preservation archiving of text, image, audio, and video materials. It is a “dark archive” with no public user interface, usable as a preservation back-end to digital library or institutional repository systems. DAITSS has been in use by the Florida Digital Archive since 2005; the DAITSS software is now freely available for implementation as Web services and for integration with externally developed preservation tools.

Contact:

Priscilla Caplan, Assistant Director

Florida Center for Library Automation

5830 NW 39th Avenue

Gainesville, FL 32606

Phone: 352-392-9020

E-mail: pcaplan@ufl.edu

Project Web site: daitss.fcla.edu

Project Demonstrations

University of Missouri-St. Louis

Build a City

The University of Missouri-St. Louis partnered with three museums in St. Louis—Campbell House, Old North St. Louis Restoration Group Museum, and Museum of Westward Expansion—to develop a toolkit that enables nontechnical users to employ three-dimensional imaging technology to create interactive museum exhibits. The technology enables the creation of virtual cities, buildings, streets, and similar settings. Museums can use these 3-D representations to help visitors understand the historical context of places represented in their collections and exhibits. Each of the museum partners presented a different need that the toolkit had to address, and each of these applications will be described in the demonstration. The tool kit allows museum staff to create presentations on a Web site or within an exhibit space as a stand-alone display.

Contact:

Louis Gerteis, Professor
University of Missouri, St. Louis
One University Blvd.
St. Louis, MO 63121
Phone: 314-516-5701
E-mail: gerteis@umsl.edu
Project Web site: <http://vcities.umsl.edu>

Virginia Polytechnic Institute and State University, University Libraries

Developing Customized Browser Plug-ins with the LibX Edition Builder

LibX is an open-source browser plug-in for Internet Explorer and Firefox that allows users to search library resources from anywhere. LibX includes features such as a toolbar for direct access to the library catalog, context menus that dynamically adapt to what the user has selected on a page, OpenURL support, COinS support, support for off-campus proxying, automatic behind-the scenes Google Scholar integration, custom catalog and database configurations, and Web localization functionality that enrich user pages with local library information and links. LibX places access to library resources in a user's "Webflow" and makes it easy for users to discover resources in the library.

This demonstration will focus on the LibX Edition Builder, funded by a National Leadership Grant. The Edition Builder provides an interface for librarians to effortlessly build a customized LibX edition for their library's user community. As a result, any library, with a minimal investment of time, can integrate its resources into the user's browser for seamless access. In the first four months after the Edition Builder was released in 2007, the number of libraries who have created a LibX edition using the LibX Edition Builder has grown to more than 240.

Contacts:

Annette Bailey, Digital Assets Librarian
Virginia Tech, University Libraries
P.O. Box 90001
Blacksburg, VA 24061
Phone: 540-231-9266
E-mail: afbailey@vt.edu

Godmar Back, Assistant Professor
Virginia Tech
2202 Kraft Drive
Blacksburg, VA 24061
Phone: 540-231-3046
E-mail: godmar@gmail.com
Project Web site: www.libx.org

Minnesota Historical Society

The Truth North Project: Mapping Minnesota's History with Online GIS

The Minnesota Historical Society provides geography teachers with the tools they need to meet the state's graduation standards for geography through True North, a Web site that uses a GIS application to integrate history and geography. It integrates more than 200 Minnesota map layers and remote databases into a free online tool. The layers include modern demographic, environmental, and economic maps as well as historical maps and data-based representations of historic events, such as Dakota War battle sites and regions devastated by the 1870s grasshopper plagues. Users can view, create, overlay, recolor, and print maps, while the site automatically links thematic maps to additional historic resources such as photographs and archival material. To tie these resources together comprehensively for teachers, True North offers lesson plans for grades 4-8 and lesson guidelines for grades 9-12. The demonstration will cover (1) the institutional context and business case that made the project possible, attractive, and sustainable, and (2) the online application and its audience, including the content, technology, and users. While the site is customized for teachers of grades 4-12, the content and tools can be widely applied by users with a variety of needs.

Contacts:

Robert Horton, Director
Library, Publications and Collections
Minnesota Historical Society
345 Kellogg Blvd. W
St. Paul, MN 55102
Phone: 651-259-3240
E-mail: robert.horton@mnhs.org

Lesley Kadish, GIS Curator
Minnesota Historical Society
345 Kellogg Blvd. W
Saint Paul, MN 55108
Phone: 651-259-3265
E-mail: lesley.kadish@mnhs.org
Project Web site: www.mnhs.org/truenorth

Red Butte Gardens and Arboretum

From Signs to Satellites: A High Tech Interpretation System for Botanic Gardens

Red Butte Garden is developing a handheld interpretation system for the public that for the first time provides visitors a window into our collections data, a vehicle for delivering stories about our living museum objects, and a GIS-powered navigation system with which to explore our garden's treasures.

Contact:

John E. Dawson
Information Technology Manager
Red Butte Garden & Arboretum
285 Connor Road
Salt Lake City, UT 84113
Phone: 801-585-0984
E-mail: edawson@redbutte.utah.edu

Project Demonstrations

Stephen F. Austin State University

TIDES (Teaching, Images and Digital Experiences)

The Texas Tides Digital Learning Consortium (Texas Tides) increases access for educators, students, and other researchers to primary resources related to east Texas, with emphasis on history, science, and multicultural resources. The TIDES Program weaves Web 2.0 conventions, Web design, project imaging, project metadata, streaming video, resource translation, K-12 curriculum creation, and information literacy resources into a useful resource for K-16 teachers, students, and other users. The project demonstrates how regional projects can integrate resources with larger state or national projects through compliance with current imaging and metadata standards.

Contact:

Rachel Galan , Associate Director
Stephen F. Austin State University
Ralph W. Steen Library
P.O. Box 13055, SFA Station
Nacogdoches, TX 75961
Phone: 936-468-1590
E-mail: rgalan@sfasu.edu
Project Web site: <http://tides.sfasu.edu>

University of California, Berkeley, School of Information

Bringing Live to Light: Biography in Context: Browsing and Searching Biographical Information and Events with a Metadata Infrastructure

This demonstration will show how a metadata infrastructure composed of gazetteers, biographical dictionaries, and a "time period directory" can help searchers navigate through multiple Web-based resources and display these in context with related information about "who, what, where, and when," thus providing dynamic searches of those external resources. The demonstration will show both a Web-based interface and a Google Earth-based geotemporal browser. Chronological, geographical, and biographical data lend themselves naturally to being connected: an event is associated with a place, a time, and potentially with particular people; places are associated with different events and people; and individual people are also associated, in a variety of ways, with different places and events. The prototype time period directory is a metadata infrastructure for named time periods linking them with their geographic location as well as a canonical time period range, in conjunction with other local databases and Web-accessible data.

Contact:

Ray Larson, Professor
UC Berkeley, School of Information
102 South Hall #4600
Berkeley, CA 94720-4600
Phone: 510-642-6046
E-mail: ray@ischool.berkeley.edu
Project Web site: <http://ecai.org/imls2006>

**University of California, Irvine,
Humanities Research Institute****T-RACES: Testbed for the Redlining Archives of
California's Exclusionary Spaces**

In collaboration with the San Diego Supercomputer Center, the UCHRI is making use of a new "humanities grid" to preserve, analyze, and make publicly accessible online documents relating to the practice of "redlining" neighborhoods in eight California cities in the 1930s and 1940s, in which minority neighborhoods were flagged as undesirable for home loans. The Testbed for the Redlining Archives of California's Exclusionary Spaces (T-RACES) project will allow a central catalog to manage the preservation metadata for each city's electronic file of neighborhoods and will be accessible from any personal computer. The infrastructure will make the redlining documents accessible alongside a rich array of relevant information drawn from census tract data, municipal ordinances, and insurance protocols, allowing researchers to ask broader questions about the context, origins, and legacy of redlining. The demonstration will explore various interfaces to facilitate the reuse of this data in community settings, enabling users to discover history from different points of view by browsing the documents themselves, viewing maps, querying databases, and linking components of the collection. The demonstration includes Google Earth-type interfaces in which users can blend their own layers of interest with the official project content.

Contact:

Richard Marciano, Lead Scientist
San Diego Supercomputer Center
9500 Gilman Dr., MC#0505
San Diego, CA 92103
Phone: 858-534-8345
E-mail: marciano@sdsc.edu
Project Web site: <http://salt.sdsc.edu/T-RACES>

Walker Art Center**ArtsConnectEd 2: A Process for Partnership**

The Walker Art Center and the Minneapolis Institute of Arts are collaborating to redesign the ArtsConnectEd Web site. The first version, created in 1998, was highly successful but required updating to respond to new technologies and needs. The project is transforming the site into a dynamic open-source site that allows museum educators to create and manage the content of the site's educational material and respond more directly to teacher needs. It also gives teachers the resources and flexibility to revise the content for their own classroom needs. The new ArtsConnectEd will launch in early 2009.

Contact:

Susan Routilie, Program Manager, School Programs
Walker Art Center
1750 Hennepin Avenue
Minneapolis, MN 55403
Phone: 612-375-7614
E-mail: susan.rotile@walkerart.org
Project Planning Web site:
<http://ace2.artsconnected.org>

Glossary: Web 2.0 Terminology

Avatar - A visual representation of a user. An avatara is a female representation.

Blended reality - The combination of the real and virtual worlds. An example is the real world inspired Everyscape (www.everscape.com).

Blog - Derived from "Weblog," a blog is a Web site that stores and organizes entries. Displayed on-screen in reverse chronological order, entries may consist of text, audio, video, photos, or a combination of these features. Entries may be submitted by a single person (such as an online diary) or may be open for submissions from the general public. Typically, users are able to comment on previous entries. Check the 2008 WebWise blog (Webwise2008.fcla.edu/blog).

Blogging - The act of maintaining or submitting information to a blog.

Blogosphere - The virtual community of blogs, bloggers, and the interconnections between them.

Cyberinfrastructure - Beyond fiber-optic cables, storage area networks, or basic communication protocols, cyberinfrastructure is the collection of information, expertise, standards, policies, tools, and services that are shared broadly across many disciplines and communities of inquiry.

Folksonomy - The collaborative practice of creating and managing tags used to describe content. Synonym for social tagging.

Handle - User name.

Mashup - Web-based software that combines two or more pre-existing tools to create a new service. An example of a mashup is Panoramio (www.panoramio.com), which combines photo sharing software with Google Earth technology to allow viewers to view a virtual map of the location where photos were taken.

Metaverse - A fictional virtual world, described in Neal Stephenson's 1992 science fiction novel *Snow Crash*, where humans, as avatars, interact with each other and software agents, in a three-dimensional space that uses the metaphor of the real world.

Modder - (derived from "modify") Someone, usually within the open-source-software or the computer game communities, who creates new or altered content that is then shared via the Web.

Online community - A collection of users who interact via the Internet. An online community may be very specific (i.e., members of a particular Web site, such as MySpace) or very broad (i.e., consumers on Amazon.com).

Podcast - A digitalized audio file that can be distributed and downloaded via the Internet. The term podcast is derived from the words "iPod" and "broadcast."

Portal - A Web site that links users to many other Web sites. A portal may be a collection of links or may be provided via a search engine.

Semantic Web - Sometimes referred to as Web 3.0, an extension of the Web in which the semantics, or meanings, of terms and phrases are understood, enabling more intelligent search results.

Social bookmarking - Allows users to save, manage, and organize preferred Web sites by using Web-based software. Users can tag saved Web sites, which can be used to search and share sites among users. An example of a social bookmarking site is del.icio.us (<http://del.icio.us>).

Social networking service - A Web-based application that allows users to upload personal information, ranging from hometown to hobbies. This information can be searched and used to connect with other users. Social networking services often allow users to interact via blogs, chat services, e-mail, etc. MySpace and Facebook are two examples of social networking services.

Social tagging - the collaborative practice of creating and managing tags used to describe content; a synonym for "folksonomy."

Tag - Keywords used to describe content.

Twitter - Blogging lite! A social community that lets users share short messages, limited to 145 character per posting. Great for sharing links, ideas, etc.

Virtual world - A computer-based simulated environment intended for its users to inhabit and interact via avatars.

Web 2.0 - A term used to describe a theoretical "second generation" of users and user-interfacing applications, which allow for interaction on a participative platform. Technology and information systems that allow for a community-based, collaborative approach to the creation of content, design patterns, and evaluation relate to the Web 2.0 phenomenon. Blogs, Web-based social communities, and wikis are all examples of Web 2.0 applications.

Web 3.0 - (see "Semantic Web")

Web 3-D - A display of real-time 3-D computer graphics, the successor to Virtual Reality Modeling Language (VRML).

Wiki - A Web site that uses computer software to allow users to add, edit, or attach content.

Wiki gnome - A person who corrects and edits spelling and grammar mistakes on Wikipedia.

Glossary: Web 2.0 Software and Projects

del.icio.us - A social bookmarking Web site that allows users to store, manage, and organize Web sites. Users create their own tags to describe saved Web sites. Using folksonomies, multiple Web sites saved by multiple users with the same tags are linked.

Dryad - Created by the Stanford Virtual Worlds group, Dryad software enables users to create trees in a virtual space. Using 3-D technology and social networking, the software is a technological advancement in how users interact within virtual worlds.

Everyescape - Using 3-D mapping software, Everyscape allows users to virtually travel to cities online. Visit The Wolfsonian-FIU on Everyscape's blended reality world of Miami Beach!

Facebook - A social networking Web site with 42 million members, Facebook was founded by Mark Zuckerberg in 2004. Although membership was originally limited to Harvard University students, Facebook gradually expanded to include students from colleges and universities across the country, and is today open to the general public. Facebook allows users to create a profile containing personal information and/or incorporating applications such as video features. Facebook users can communicate and exchange information with other users. If you create or already have a Facebook account, please join the "WebWise Conference" Facebook group.

Flickr - Launched in 2004, Flickr is a photo-sharing Web site that allows users to post and share their photos online. Photos are tagged and can be searched using folksonomies.

Google Earth - Geospatial software distributed by Google that creates virtual maps of the earth using satellite, aerial photography, and GIS 3-D imagery.

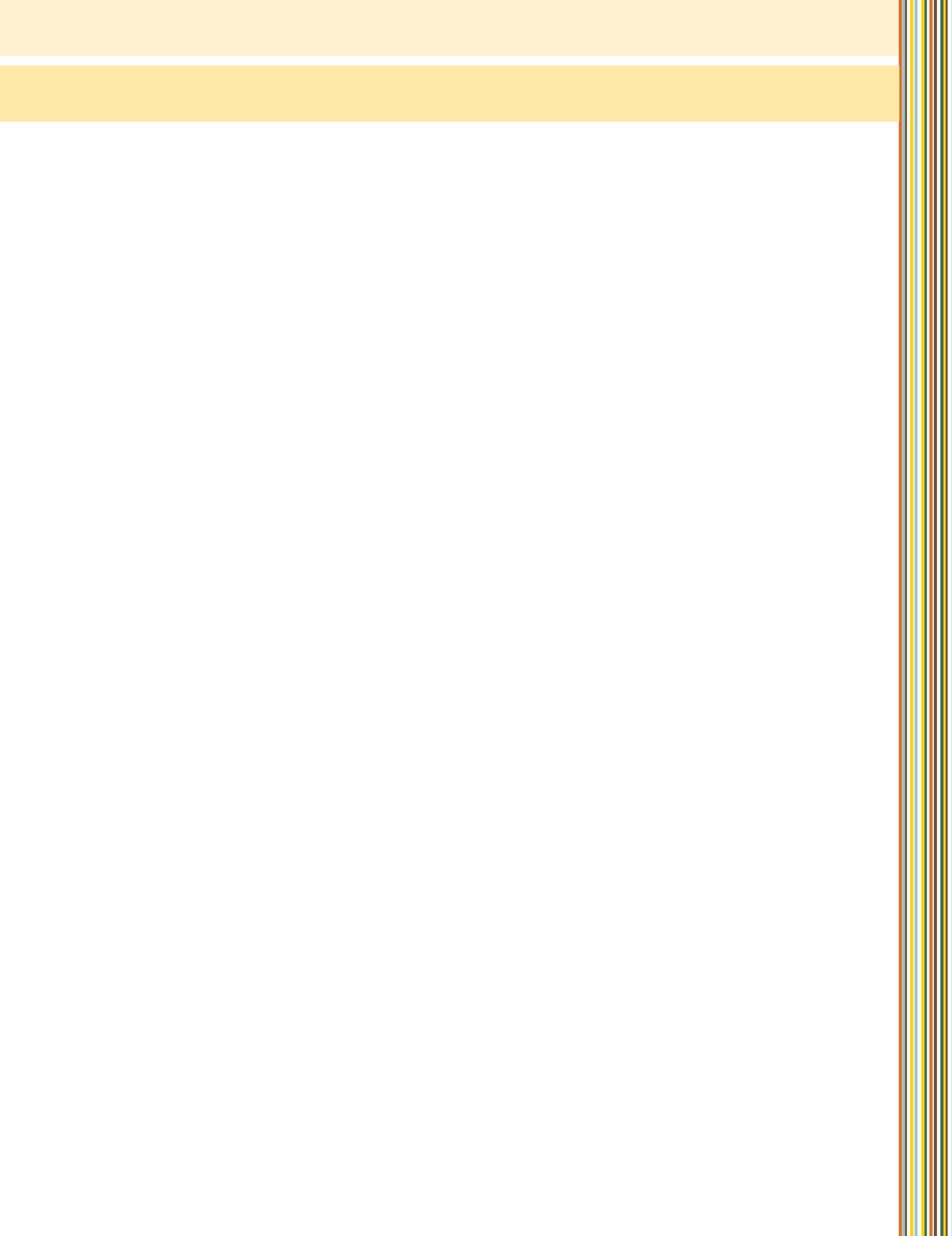
MySpace - With more than 200 million member accounts globally, MySpace is the largest social networking Web site. Created in 2003, MySpace allows users to create profiles, post blogs, music, photos, and videos, and manage a network of friends.

Second Life - Developed by Linden Research Inc., in 2003, Second Life is a virtual world accessed via the Internet. SL users are represented in this virtual world by an avatar, which can be used to interact with others. Teen Second Life is an alternate form of Second Life limited to people 13 to 17 years old.

TIDES - Funded by a previous grant from IMLS, TIDES (Teaching, Images, and Digital Experiences) is a free online education resource created and maintained by the Digital Projects department at Ralph W. Steen Library, located on the Stephen F. Austin State University in Nacogdoches, Texas. Through partnerships with various museums, schools, and libraries in both Texas and Mexico, TIDES offers users access to more than 16,000 copyright-free primary source documents, virtual expeditions, and lesson plans created by educators currently in the classroom.

Wikipedia - Derived from the words "wiki" and "encyclopedia," Wikipedia is an online, collaborative encyclopedia that allows users to add, edit, or update its entries. Wikipedia was founded in 2001 and is one of the biggest and most popular Internet reference tools. Look up "IMLS WebWise" when you next visit the Wikipedia site!

YouTube - A Web site that allows viewers to upload, view, and share video clips online. Videos are linked by tags, and viewers can post comments. YouTube was launched in 2005.





INSTITUTE OF MUSEUM AND LIBRARY SERVICES
1800 M Street NW, 9th Floor
Washington, DC 20036
202-653-IMLS (4657)
www.imls.gov