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Title:

Web 2.0: Redefining & Extending the Academic Library Service Imperative

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Introduction

Web 2.0 advances the capacity for communication, collaboration, and contribution. By promoting social interaction and content exchange, Web 2.0 responds to “human” objectives. People want to be successful. They want things to turn out well and to achieve their personal goals. People want to be happy. They care about their well-being and contentment. People want to be productive, achieving results and realizing benefits. People want progress, a sense of betterment and forward movement. People want relationships, satisfying personal connections and attachments. People want experiences, sometimes as observers and sometimes as participants. People want to have impact, to influence events and people, and to have a significant effect. How can academic libraries tap into these “human” interests and build more responsive and effective service programs?

Web 2.0 advances the focus on the interests of users and the expectations they bring to service environments increasingly dependent on digital and network technologies and tools. Users seek customization and personalization, the ability to shape content and applications to their personal interests and styles. They want enhanced openness, a free flow and exchange of information and ideas

without barriers. They seek a self-service capability to control and act on their needs with minimal intervention by others. They embrace the reality of mutability, of constant change and hybrid approaches and styles. They see the value of collective intelligence and the need to question traditional sources of authority and prerogative. They increasingly understand software not as a product, but as a service, a capability shaped by many for the benefit of all. How can academic libraries leverage these new requirements and embrace the user more actively and iteratively in service conceptualization, development and delivery?

Web 2.0 highlights the shifting requirements that users bring to the technologies that are so integral to their personal and professional lives. Clearly, users want more and better content and access. They want convenience and new capabilities, to do things they never were able to do before. They seek high levels of participation and control over the information and service settings where they work and share. And they expect enhanced levels of individual and group productivity, to get more done with lower and even no cost. Web 2.0 should mean rapid technology development and deployment, never really finalized and always a work in progress. It means perpetual assessment, constantly evaluating and reshaping. It means the erosion of boundaries among creators and consumers and intermediaries, and an expectation of joint and shared jurisdiction and responsibility. How can academic libraries build technology settings and capacities that reflect these values and requirements?

Web 2.0 explodes the user community and extends participation beyond the traditional user base that has governed the work of service organizations like academic libraries. Student diversity abounds, and faculty expectations accelerate. Researchers and the world of users on the Web present extraordinary disciplinary differences and a new majority of content and service consumers. Local communities have

raised expectations, and alumni and supporters seek new relationships and roles. The service interactions of the library combine physical and network spaces, new collecting and application development capacities, new relationships in the classroom and the laboratory, and an anyone, anywhere, anytime, anyhow commitment to support. How can academic libraries extend understanding and resources to an increasingly far-flung and voracious user community?

Evolution of Academic Work

Web 2.0 enables the academic library to be responsive to key trends and technologies which are influencing the work of higher education. An important annual report, the Horizon Report for 2009 prepared by the New Media Consortium and EDUCAUSE, provides invaluable guidance to academic libraries seeking to advance a Web 2.0 service capacity (Johnson, et al. 2009). Among the trends they cite are the following: the rapid globalization of communication and collaboration; the expanding role of collective intelligence with all its ambiguity and imprecision; the participation and interaction promoted by games as learning tools; the meaningful and intuitive nature of visualization tools; the demand for new and enhanced information and visual and technology literacy; the de-formalism and de-structuring of scholarship; and the expanded focus on assessment and the measurement of quality and impact. The Horizon Report also discusses the critical new technologies that will influence the work of higher education, including: the rampant growth in mobile and multi-purpose personal devices, the distributed processing and applications enabled by cloud computing, the power of geo-everything but especially geolocation and geotagging, the importance of the personal web with customized management of online content, the role of semantic-aware applications which increasingly rely on meaning and context to provide answers, and the availability of smart objects which link the physical

world and information. Understanding and applying these trends and technologies will be critical to academic library success in Web 2.0 service development.

The academic library will need to rethink its core responsibilities and the way work and services are organized and delivered. What do libraries in the academy do in support of teaching and learning, and research and scholarship? They select, acquire, synthesize, disseminate, interpret, apply, and archive information. They enable users to navigate, discover, obtain, understand, use and apply information. How will Web 2.0 service capabilities reshape, undermine or extend these roles? As leading academic libraries take on new purposes as aggregators, publishers, educators, research and development organizations, entrepreneurs, and policy advocates, how will this shift relationships with users and extend and enhance the interest and ability to tap into Web 2.0 capabilities? Traditional library values are very much challenged by Web 2.0 developments. The level of communication and sharing enabled by Web 2.0 raises concerns about intellectual freedom, the level of civility in online and virtual interactions, the maintenance of privacy and confidentiality, the stability, integrity and free flow of information, and the subverting of trust in relationships. Where is the durability, where is the authority, where is the community in the face of constant partial attention and massively distributed collaboration?

What do students want, and how can Web 2.0 help libraries to satisfy these expectations? Students want technology and content ubiquity supported by point-of-need information and embedded services. They want sandboxes for fun and experimentation with some balance among anonymity and personal connection. They want social success, academic success, and career success. What do faculty want, and similarly how can Web 2.0 enable libraries to be responsive? They want personal advancement and recognition, achieved through contributions to the scholarly literature and high quality instructional

experiences. They want to work on innovative projects, and the ability to connect and collaborate with interesting colleagues and former students around the world. They want excellent laboratory, library and technology support not limited by time and space.

So in this context of a rapidly evolving academic environment, how do Web 2.0 capabilities fit into a library service program? The opportunities for interacting with users and supplying content in interesting and useful ways are remarkable: social networking, media sharing, social bookmarking and tagging, wikis, blogs, RSS, mashups, chat and instant messaging, virtual worlds, widgets, podcasts, games, mobile devices, virtual communities, and so on. How do libraries move users from a passive receipt of content and services to a new level of action and participation? Or perhaps better, how do users move libraries to radically democratize their content and services, and eliminate technical, proprietary and economic barriers?

Academic Work is Net Work

Describing the evolving behaviors both demonstrated within and enabled by the use of Web 2.0 social computing technologies, Lorcan Dempsey relates how “Users are constructing their own digital workflows and identities out of a variety of network services” (Dempsey, 2008). Scholars grow increasingly reliant on network-based workflows for research and learning; and the entry points to these workflows are becoming increasingly distributed across various platforms and devices. Where academic libraries have concentrated on deploying content and services from a centrally organized web site to users’ desktops, scholars increasingly live and work in online environments distinct from the library web site, utilizing course management systems such as Blackboard and Sakai, social computing platforms like Facebook and LinkedIn, personal web portals such as iGoogle and MyYahoo, content

sharing sites such as Flickr and YouTube, social tagging services like del.icio.us, news aggregators, blogs, locally installed browser plug-ins and widgets, etc., etc. As mobile communications platforms mature, these scholarly workflows will continue to diverge from the desktop and toward the handheld computing environment (think iPhone, Google Android, and netbooks).

Academic library users report using Google, Yahoo, and other non-library search tools far more often than library web sites or physical library facilities. In North American research libraries, 73% of faculty and students report daily use of web-based search engines versus 29% for library web sites and just under 15% for physical libraries (Cook, et al. 2006). In addition to routinely choosing search engines over physical libraries or library web sites to discover and locate information, college students overwhelmingly use search engines as the starting point of their information searches with 89% starting with search engines versus 2% with either library web sites or online databases respectively (De Rosa, et al. 2005).

So what should academic libraries do to respond to their users' move into diffuse network research and learning environments? How do they continue to effectively support scholars and students with high quality content and services when the once well-worn path from the library web site to the user's desktop is decreasingly on the scholar's crowded itinerary? The most obvious response is for academic libraries to proactively move content and services into the network environments where scholars and students live and work. Dempsey describes how "Libraries have always been eager to 'fit in' to their users' lives. In a network-based scholarly environment, this means 'fitting in' with evolving network workflows" by embedding library content and services into the various search, discovery, and

organization tools to which users increasingly turn to manage their scholarly and personal lives (Dempsey, 2005).

Spinning Content into the Web

If academic libraries hope to support current and evolving information-seeking behaviors, they must integrate into their users' network-based workflows by exposing as much content as possible to search engines, making it discoverable where users are most likely to be working. For example, many academic libraries are exposing their holdings data to web crawlers from Google and other search engines through the OCLC Open WorldCat program, generating substantial traffic (or “click-throughs”) back to local library catalogs (Gatenby, 2007). Others are registering the link resolvers they use to manage user access to electronic journal content with Google Scholar’s Library Links Program, thereby creating links in Google Scholar search results back to full-text content provided locally. Still others are exposing digital collections of various types held in local repositories to search engine harvesters, thus improving the discoverability of these collections for scholars and driving a significant increase in usage of this locally held content (Boston, 2005).

Another method for integrating library content into scholarly workflows is to add unique collections to heavily trafficked content sharing sites. For example, The Library of Congress has loaded thousands of historical photos into Flickr and is providing increasing amounts of video content on YouTube. This content can be found by users searching Flickr and YouTube but is also indexed by search engines, thus making it discoverable by Google and Yahoo users as well. The 6,700+ images from the Library of Congress Flickr photo stream receive approximately 800,000 views per month, and one video that had received approximately 20,000 total views in over five years on the library web site received approximately 13,500 views in only five months on YouTube (Kroski, 2009).

Academic librarians, curators, and archivists at some institutions are becoming active content contributors to Wikipedia, the heavily trafficked online, user-generated encyclopedia, and another online location where many users begin their research. By creating entries about special or archival collections, or links within existing entries to unique holdings, libraries can expose previously hidden and underutilized content to users at their point of need. Links can be placed in bibliographic entries in Wikipedia articles, referring back to archival finding aids and local digital content, and thus drive increased traffic to a library's web site (Lally and Dunford, 2007). As with Flickr and YouTube, Wikipedia articles are crawled and indexed by search engines, often appearing at the top of results lists for many Google and Yahoo searches. By exposing as much content as possible to search engines, content sharing services, and other network environments where scholars increasingly live and work, academic libraries are better able to get the high quality content they hold into their users' research, teaching, and learning processes at the point of need, and scholars benefit by gaining the abilities to discover and access information heretofore excluded from their preferred workflows.

Supporting & Integrating with Participatory Platforms

Technology publisher and open source software proponent, Tim O'Reilly describes Web 2.0 in terms of "delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation"... (O'Reilly, 2005). Thriving in this new participatory environment entails providing content in formats that can be easily pushed to, shared with, and reused by users and network platforms. Many academic libraries are enabling users to subscribe to content feeds (news, events, new acquisitions

lists, or any other content that can be divided into distinct parts) using RSS (Real Simple Syndication), Atom or other similar syndication services, most often accessed through the user's news reader application or an RSS-enabled web browser. RSS increases the "portability" of information, "so that it can be read in different places and used in multiple ways (Farkas, 2007)." The portability of RSS-enabled information allows anyone subscribing to a feed to reuse or recycle it in useful ways. For example, some academic libraries use RSS newsfeeds from their web sites to dynamically populate the content found on their institutional Facebook and MySpace profiles. See the Columbia University Libraries' Facebook presence, <http://tinyurl.com/pqzsh5>, for a useful example. Others use RSS feeds to share new acquisitions lists on subject-based research guides and on course pages in course management systems. Expanding on this approach, the University of Texas Libraries uses a combination of RSS and FriendFeed, a popular service that aggregates and enables sharing across various social networking platforms, to automatically populate its Facebook and twitter presences by reusing blog posts and news from the library web site, photos added to Flickr, and video tutorials posted to YouTube (Sitar, 2009). Supporting this new "architecture of participation," some academic libraries have integrated bookmarking and sharing services such as AddThis or ShareThis into their web sites, local digital collections, and library catalogs. Such services provide tools for users to seamlessly add content to their personal profiles on popular bookmarking services like de.lic.ious, social networking sites like Facebook and LinkedIn, to social news services such as digg and Technorati, and to scores of other social computing services and applications. The University of Michigan Library's LibGuides, <http://guides.lib.umich.edu/searchtools>, provides an interesting example.

The flip side to providing content in formats that users can easily recycle and reuse on other network platforms is for academic libraries to combine functionality from multiple external data sources or

services to create hybrid services, or “mashups.” Mashups are usually created using open application programming interfaces (APIs) with which software developers define how external applications can request services or data from network-based applications or databases. Academic libraries have created interesting and useful mashups using APIs from Amazon.com to integrate book cover images and other content into their library catalogs. Search the University of Arkansas Library catalog, <http://library.uark.edu/>, for an example. Others have installed the Google Book Search API in their library catalogs, enabling users to view previews, snippets, and full-text of books scanned by the Google Book Project (see the University of Texas Libraries catalog, <http://catalog.lib.utexas.edu/>). Still others have installed the LibraryThing For Libraries service, thus offering users a book recommender service, reviews, ratings, and the ability to browse using social tags, all integrated into the library catalog (see the San Francisco State University Library catalog, <http://opac.sfsu.edu/>). Rather than developing these interactive applications independently, libraries can tap into the over 42 million cataloged books, 780,000 reviews, 7 million book ratings, and 54 million tags, created by over 800,000 LibraryThing users to assist local users in discovering information from locally held collections (LibraryThing, 2009).

Being Where (and How) Users Are

Social networking environments such as Facebook and MySpace offer participatory platforms where users socialize, share information, content, and build relationships. Creating an active presence in social networking environments offers academic libraries the ability to promote research support and instruction services, news and events, in online environments where students, and increasingly faculty, spend more and more of their time both working and socializing. A recent study from the Pew Internet & American Life Project, reports that 57% of adults 25-34 years of age who use the Internet have a profile on a social networking site, increasing to 75% for adults aged between 18-24 (Lenhart, 2009).

Social networking platforms provide tools for libraries to integrate both content and services directly into the user experience at the point of need. Libraries can create applications that allow users to search library catalogs, article databases, and FAQs, connect to virtual reference services, and view video tutorials. Libraries can add news feeds, photos, video, information about events, and anything else that might create meaningful connections with their users. The Facebook presence for the Olin Library at Washington University, <http://tinyurl.com/15h69t>, provides a useful example. Similarly, web portal platforms such as iGoogle, MyYahoo, and Netvibes, offer academic libraries the ability to create customized applications (known as “widgets” or “gadgets”) that users can include on their personal web start pages with their news feeds, email, calendar, to do lists, and other productivity services. Once installed, these widgets allow users to search library catalogs and article databases, connect to chat reference services, and learn about library events from the comfort of a user’s customized web space. See the University of Texas Libraries’ *LibWidgets* page, <http://www.lib.utexas.edu/tools/>, for examples of widget for iGoogle and Netvibes. Closer to home, academic libraries are actively integrating library services and content into course management systems like Blackboard and Sakai. Students spend large amounts of time interacting with course management systems: accessing syllabi, assignments, and course readings; and communicating with other students in course-specific discussion forums and chat rooms. Academic libraries have responded by locating subject-based research guides, course reserve materials, relevant new acquisitions feeds, and links to virtual reference services directly onto specific course pages.

Scholarly and personal workflows are increasingly becoming network-based, and the primary user interface to the network is the web browser. Whether it’s Microsoft’s Internet Explorer, Mozilla Firefox, or Apple’s Safari, the web browser is *the* tool through which users work and play on the Web.

Recognizing this fact, many academic libraries have created browser plug-ins that users can download and install to enable library catalog searching directly from the browser search box. The North Carolina State University Libraries' Browser Extension page, <http://tinyurl.com/pmfcqj>, offers examples of plug-ins for Internet Explorer and Firefox. Taking browser customization a step further, others offer localized versions of the LibX toolbar, <http://libx.org/>, which enables library catalog and article searches, integration with federated search platforms like ExLibris' MetaLib, and the ability to quickly and easily launch searches in configured databases by simply copying text found on the Web. Many academic libraries are also enabling their users to connect to locally-held electronic resources found in articles on the Web. After a library has registered their link resolver with OCLC, users can download and install the OCLC OpenURL Referrer add-on to their Firefox or Internet Explorer browser; and links from bibliographic citations found in web-based resources like Google Scholar and Wikipedia are created, linking back to locally provided journal articles and other content.

Going Mobile

As Internet-based social computing platforms break down geographical barriers to personal connection and interaction, mobile computing technologies, such as smart phones and netbooks, are breaking the static connection between network-based workflows and the personal computer desktop. The emergence of functional mobile computing technologies enables ubiquitous ("anywhere, anytime") access to email, chat, texting, web-browsing, and an increasing number of useful network services and applications. A growing number of mobile technology users report using the Internet from their mobile devices; in 2009, 23% accessed the Internet daily from their cell phone or other mobile device, up from 14% in 2007 (Horrigan, 2009). As smart phones, personal digital assistants (PDAs), and other mobile devices become more powerful with the subsequent improvement of the mobile web experience, the

percentage of users accessing the Internet via mobile devices will continue to increase. Academic libraries are beginning to take notice of this trend and have begun experimenting with service offerings geared toward the mobile user. Adding to their telephone, email, and chat services, some academic libraries are beginning to offer reference service to mobile users through SMS (Simple Messaging Service) or text messaging. The libraries at Cornell University, <http://www.library.cornell.edu/ask>, and the University of California, Berkeley, <http://www.lib.berkeley.edu/Help/askcal.html>, are examples. Services such as library3lp and Text a Librarian have sprung up to provide the technical infrastructure to support text-based services for mobile library users. Some academic libraries are creating simplified versions of their library catalogs and web sites optimized for use on the small screens found on cell phones and other mobile devices (see the University of Wisconsin-Madison Library's Mobile Web, <http://m.library.wisc.edu/>). OCLC has released an iPhone application (or "app"), enabling users to search WorldCat and locate resources at their local academic or public library. Similarly, a few intrepid libraries are beginning to create customized iPhone applications of their own. For example, the Duke University Libraries, <http://m.duke.edu/>, enable users to access their digital collections from the popular smart phone platform. The Kindle, the portable e-book reader from Amazon.com, is being used in a number of pilot projects in academic libraries, such as Sawyer Library at Suffolk University, <http://www.suffolk.edu/36171.html>, and the Brigham Young University Library, <http://tinyurl.com/p2d7rd>, to supply textbooks and other research and teaching materials to students and faculty. And many academic libraries are loading podcasts of lectures, tours, orientations, and tutorials onto both iTunes U and YouTube which can be downloaded to and accessed from users' compatible devices.

Library Organization 2.0

These illustrations and discussions indicate clearly that academic libraries are stepping up to the challenges and opportunities of Web 2.0 services. Experiments and pilots are important, and will remain a fundamental component of the healthy user program, but how do we mainstream Web 2.0 culture, thinking and action into the core of the library program? A critical element is rethinking organizational structure and purpose. We can think of an organization as individuals and groups carrying out roles and working together to achieve shared objectives within a formal social and political structure and with established policies and processes. Organization is the tool through which goals and priorities are established, decisions are made, resources are allocated, power is wielded, and plans are accomplished. A Web 2.0 organization considers carefully how administrative responsibility and authority are distributed and shared, how operations and procedures are integrated and flexible, how policies and norms are designed and enforced, and how fluidity and vitality contribute to productivity and success. Academic libraries are increasingly embracing organizational models which support Web 2.0 thinking and action. They are moving away from conventional administrative hierarchies and academic bureaucracies to a combination of centralized planning and resource allocation systems, loosely coupled academic structures, and maverick units and entrepreneurial enterprises. The key characteristics which support a Web 2.0 culture are: decentralization, distribution, adhocracy, complexity, informality, innovation, and collaboration. Academic libraries must redefine the physical, expertise, and intellectual infrastructure, while promoting and understanding the geography, psychology and economics of innovation.

Another critical element is rethinking the ways the academic library workforce is attracted and developed. The Web 2.0 library advancing Web 2.0 services needs new skills, but also a new attitude. It is essential that the role of professional education be rethought, and that the recruitment and employment

of staff be reengineered to embrace a wide range of academic and professional credentials and a more fluid definition of job responsibilities. This will have a wide impact on the values, outlooks, styles and expectations of the library organization. And it will influence academic community understanding, recognition, respect and support for the work of the library. We need to redefine our expectations for the professional working in the library, with a particular focus in the following areas: a commitment to rigor, a commitment to research and development, a commitment to evaluation and assessment, communication and marketing skills, political engagement, project development and management skills, entrepreneurial spirit, resource development skills, leadership and inspirational qualities, a commitment to continuous improvement, an embracing of ambiguity, a sense of adventure, and deep subject or technical expertise. An academic library cannot thrive as a Web 2.0 service organization without a staff that is dominated by these essential qualities and characteristics.

The Web 2.0 academic library is focused on the demands of heightened accountability and assessment, involving its users routinely and aggressively in the development and evaluation of services.

Assessment is not just a product of institutional and government expectations and mandates, but also reflecting an energized approach to new measures of user satisfaction, success, impact, cost effectiveness, design for usability and market penetration. The Web 2.0 academic library builds new strategies for marketing products and services, seeking to match the capabilities of the organization with the needs and wants of the communities served. This means not just maximizing support for current users, but also extending the market, and developing new markets, and diversifying the product line. Marketing also assumes the ability of the library to move its capabilities to the places where its current and prospective users work. The Web 2.0 library pursues new arenas for collaboration with other libraries, with other parts of the university, and with new partners in the corporate sector. A new and

sometimes radical focus on the mass production work of the library, on the special centers of excellence, on new technology infrastructures, and on new initiatives like Web 2.0 services requires a new approach to combinations, to sustainability and business planning, to legal and governance structures, to the application of risk capital, and to a competitive spirit. Can the Web 2.0 library of the future be defined in the neat historical context of an individual institution?

Conclusion

What are Web 2.0 academic libraries focused on as they confront the extraordinary current context of rapidly shifting users behaviors and expectations, redundant and inefficient library operations, a mandate to achieve scale and network effects through aggregation, the new economic and fiscal realities, and the urgency of systemic change? How do they build Web 2.0 services as they construct the digital library, a combination of quality content and functionality, create content management portals and virtual disciplinary communities, assess the role of the massive search engine libraries, preserve and archive the content, support the course management system and expansion of online learning, support the needs of big science and enrich research through text and data mining services, transform scholarly communication, advance the open access and repository movements, support the globalization goals of the university, rethink library space planning and identity, and develop and attract new resources?

Web 2.0 is not a panacea for academic library service programs. It does not solve inherent weaknesses or limitations, or turn around a service culture which is not focused on the user.

Web 2.0 is not an appendage, a suite of activities that can be layered on top of traditional service capabilities. It is a fundamental and integral component of a service program in constant development, and in continuous conversation and interaction with the user. Web 2.0 is not a fad,

a temporary vogue that will pass until the next cliché takes over. It represents a fundamental and exciting rethinking about how we work with our users in academic libraries. Web. 2.0 is not a risk, a threat to a library's health and vitality, or an undermining of core values. In fact, it is a peril for any academic library not to embrace these enhanced capacities for communication and collaboration. Web 2.0 is about innovation and responsiveness, about agility and healthy disruption, about dismantling barriers and advancing academic library relevance, impact and success.

References

- Boston, Tony (2005) *Exposing the Deep Web to Increase Access to Library Collections*, <http://ausweb.scu.edu.au/aw05/papers/refereed/boston/paper.html>.
- Cook, Colleen, et al. (2006) *LibQUAL+® 2006 Survey: ARL*, Association of Research Libraries, 166.
- Dempsey, Lorcan (2008) Stuck in the middle..., *Lorcan Dempsey's Weblog: On libraries, services and networks*, <http://orweblog.oclc.org/archives/001700.html>.
- Dempsey, Lorcan (2005) In the flow..., *Lorcan Dempsey's Weblog: On libraries, services and networks*, <http://orweblog.oclc.org/archives/000688.html>.
- De Rosa, Cathy, et al. (2005) *Perceptions of Libraries and Information Resources*, OCLC, 1-17.
- Farkas, Meredith (2007) *Social Software in Libraries*, Information Today, 50.
- Gatenby, Janifer (2007) Accessing Library Materials via Google and Other Web Sites, *BiD: textos universitaris de biblioteconomia i documentació*, **19**, http://www2.ub.edu/bid/consulta_articulos.php?fichero=19gatenb.htm.
- Horrigan, John (2009), *Wireless Internet Use, Pew Internet and American Life Project*, <http://www.pewinternet.org/Reports/2009/12-Wireless-Internet-Use.aspx>.
- Johnson, Laurence, Levine, Alan, and Smith, Rachel (2009) *2009 Horizon Report*, The New Media Consortium, <http://www.nmc.org/pdf/2009-Horizon-Report.pdf>.
- Kroski, Ellyssa (2009) The Library of Congress Talks Digital Initiatives, *Library Journal Online*, <http://www.libraryjournal.com/article/CA6675049.html?rssid=191>.

Lally, Ann and Dunford, Carolyn (2007), Using Wikipedia to Extend Digital Collections, *D-Lib Magazine*, **13** (5/6), <http://www.dlib.org/dlib/may07/lally/05lally.html>.

Lenhart, Amanda (2009) Adults and Social Network Websites, *Pew Internet and American Life Project*, <http://www.pewinternet.org/Reports/2009/Adults-and-Social-Network-Websites.aspx?r=1>.

LibraryThing (2009) *LibraryThing Zeitgeist*, <http://www.librarything.com/zeitgeist>.

O'Reilly, Tim (2005) Web 2.0: Compact Definition, *O'Reilly Radar*, <http://radar.oreilly.com/2005/10/web-20-compact-definition.html>.

Sitar, Meghan (2009), Social Networking at the UT Libraries, *TIS Lab Blog*, <http://blogs.lib.utexas.edu/tis/?p=144>.