# Modeling a Sustainable Future for the Federal Depository Library Program in the 21st Century: Environmental Scan

*Note: Ithaka S+R has been commissioned by the Government Printing Office (GPO) to analyze the Federal Depository Library Program (FDLP) and recommend a sustainable and practical model or models, consistent with its existing vision and mission, for its future. This document provides a draft of the Environmental Scan section that, subject to further substantive revision and copy-editing, will be incorporated into the final report. At this stage, no executive summary or summary of findings is presented, although such instruments will be provided at a later stage.*

*In some cases, we provide several different points of view on a subject, illuminating areas where disagreements exist rather than privileging particular points of view; throughout this document, our discussion of various themes and trends is not meant to represent an endorsement of the points of view stated, but rather a summary of existing thinking that can provide background for our own subsequent analysis. Any omissions of perspectives, or indications of a perspective of our own, is entirely unintentional, and we will welcome the reader's reactions to help us bolster the objectivity of this environmental scan.*

*For more project background or to provide comments, please visit http://fdlpmodeling.net or email the project team at fdlp-modeling@ithaka.org. Reactions provided by December 15, 2010 will be especially helpful in our preparations of findings and the modeling exercise that will result from it, so we will be most grateful for your immediate review. In addition, we expect that any further comments made before January 31, 2011, can be accommodated in the final report.*

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# Environmental Scan

This provides a broad examination of the environment in which the FDLP exists. The purpose of an environmental scan is to identify the broad range of key external issues that can inform planning and decision-making. An environmental scan provides context for planning purposes, rather than an exhaustive treatment of any specific issue. The goal of this exercise is to provide a broad overview of the issues and trends impacting libraries and government publishing, identifying factors to be taken into account in the formulation of appropriate models for the future of the Program.

This environmental scan explores changes in several major areas:

- Broad *societal* changes in the technological and information environment that affect the ways in which users expect to discover and make use of all kinds of information, reflecting a broad shift towards a digital use;
- Environmental pressures on different kinds of *libraries*, and the changing priorities and practices these entail, including refinements and new approaches to collections management, preservation, and public services, leading into a discussion of broad visions for the future; and
- A discussion of broad changes in how the public expects to make use of *government information*, and the corresponding changes that both the government and libraries have made to respond to these changing user needs.

This environmental scan is based on secondary research, and relies principally on citations to available sources. This environmental scan is one of the major research components of this project, and it will lay the groundwork for the development of our recommendations by identifying important factors that must be considered as we seek to chart a sustainable future through which the Program can accomplish its long-standing mission of providing permanent, no-fee public access to government information.

## Societal

Ongoing changes at the broadest level in American society provide important context for other changes in the library and government information communities. The United States has become an overwhelmingly urban nation, with over 80% of the population of the United States living in an urban rather than rural area.[1] It is also an increasingly multi-lingual one; "Among people at least five years old living in United States in 2006-2008, 20 percent spoke a language other than English at home. Of those speaking a language other than English at home, 62 percent spoke Spanish and 38 percent spoke some other language; 44 percent reported that they did not speak English 'very well.'"[2]

[1] "World Urbanization Prospects: The 2009 Revision" (United Nations Department of Economic and Social Affairs, Population Division, March 2010), http://esa.un.org/unpd/wup/doc_highlights.htm.
[2] "United States Population and Housing Narrative Profile: 2006-2008" (U.S. Census Bureau, n.d.), http://factfinder.census.gov/servlet/NPTable?_bm=y&-geo_id=01000US&-qr_name=ACS_2008_3YR_G00_NP01&-ds_name=&-redoLog=false.

## Access to the internet & the "digital divide"

Over the course of the last decade, access to the internet and to broadband connections has become relatively pervasive in the United States. In 2000, the Pew Research Center found that about 50% of American adults used the internet,[3] and only a handful had broadband access in their homes;[4] in 2010, the Pew Research Center's Internet & American Life Project found that 79% of American adults use the internet, and "two thirds (66%) of American adults have a high-speed broadband connection at home."[5]

Although access to the internet and to broadband have continued to grow in the United States, the "'digital divide' separating American information 'haves' and 'have nots'"[6] has remained a persistent concern. In the early days of the public internet, "the Rev. Jesse Jackson, for example, called the digital divide 'classic apartheid,' the NAACP's Kweisi Mfume dubbed it 'technological segregation,' and President Clinton urged a 'national crusade,'"[7] and in 1999, the National Telecommunications and Information Administration (part of the U.S. Department of Commerce) warned that although "access to computers and the Internet has soared for people in all demographic groups and geographic locations," there remained a persistent "digital divide between the information rich (such as Whites, Asians/Pacific Islanders, those with higher incomes, those more educated, and dual-parent households) and the information poor (such as those who are younger, those with lower incomes and education levels, certain minorities, and those in rural areas or central cities)."[8]

Even today, the concern that certain groups systematically lack access to "information tools, such as the personal computer and the Internet, [which] are increasingly critical to economic success and personal advancement"[9] remains, although in recent years, this debate has increasingly focused on access to broadband internet connectivity. This emphasis on broadband connectivity stems from a recognition that "broadband users are significantly different in their approach to the internet than dial-up users. Broadband users are more intense and engaged in their internet experience. They spend more time online and do many more things online. And they report notably happier outcomes from their online experiences. They have woven the internet into the rhythms of their lives in more rich and complex ways than dial-up users."[10]



[3] "Internet adoption over time" (Pew Internet & American Life Project, n.d.), http://pewinternet.org/Trend-Data/Internet-Adoption.aspx.
[4] "Home Broadband Adoption" (Pew Internet & American Life Project, n.d.), http://pewinternet.org/Trend-Data/Home-Broadband-Adoption.aspx.
[5] Aaron Smith, "Home Broadband 2010" (Pew Internet & American Life Project, July 11, 2010), http://pewinternet.org/~/media//Files/Reports/2010/Home%20broadband%202010.pdf.
[6] "Falling Through the Net: Defining the Digital Divide" (National Telecommunications & Information Administration, 1999), http://www.ntia.doc.gov/ntiahome/fttn99/contents.html.
[7] Sonia Arrison, "What digital divide?," *CNET News*, March 13, 2002, http://news.cnet.com/2010-1071-858537.html.
[8] "Falling Through the Net: Defining the Digital Divide."
[9] Ibid.
[10] Leigh Estabrook, Evans Witt, and Lee Rainie, "Information Searches That Solve Problems" (Pew Internet & American Life Project, December 30, 2007), http://pewinternet.org/~/media//Files/Reports/2007/Pew_UI_LibrariesReport.pdf.pdf.

And, demographic gaps remain unresolved. According to Pew, "African-Americans continue to trail whites in their use of broadband technologies. However, the gap between whites and blacks has been cut approximately in half [between 2009 and 2010]."[11] Rural America also trails in access to broadband; in 2010, Pew found that 70% of non-rural adults have broadband at home, while only 50% of rural adults have similar access.[12] Even more stark differences exist between those with higher and lower incomes; although 87% of adults in households with an annual income of over $75,000 have broadband, less than 50% of adults in households with an annual income of less than $30,000 have similar access.[13]

But while there is significant political appetite for investment in addressing this challenge, some research suggests that many current non-users of the internet remain disconnected by choice. Although "one in five American adults (21%) do not use the internet or email from any location… only one in ten non-users (10%) indicate that they would like to start using the internet or email in the future." Of these non-users, "roughly half (48%) … cite issues of relevance when asked why they do not go online. One in five (21%) point to issues related to price while 18% cite usability issues and 6% point to access or availability as the main reason they do not go online."[14] And "not only are most non-users uninterested in getting online, many say that they do not know enough about computers or technology to use the internet on their own. When asked if they know enough about computers and technology to start using the internet on their own, just one in five non-users (21%) say that they do while six in ten (61%) say that they would need someone to help them."[15] Of course, ten years ago, Pew noted that "57% of … non-users are not interested in getting online," which suggested to them "that the booming growth of the American Internet population in the past few years will slow;" history has clearly proven otherwise.[16]

In contrast with trends of home and broadband internet access, "minority Americans lead the way when it comes to mobile access—especially mobile access using handheld devices. Nearly two-thirds of African-Americans (64%) and Latinos (63%) are wireless internet users, and minority Americans are significantly more likely to own a cell phone than their white counterparts (87% of blacks and Hispanics own a cell phone, compared with 80% of whites). Additionally, black and Latino cell phone owners take advantage of a much wider array of their phones' data functions compared to white cell phone owners."[17]



[11] Smith, "Home Broadband 2010."
[12] Ibid.
[13] Ibid.
[14] Ibid.
[15] Ibid.
[16] Lee Rainie et al., "Who's not online: 57% of those without Internet access say they do not plan to log on" (Pew Internet & American Life Project, September 21, 2000), http://pewinternet.org/~/media//Files/Reports/2000/Pew_Those_Not_Online_Report.pdf.pdf.
[17] Aaron Smith, "Mobile Access 2010" (Pew Internet & American Life Project, July 7, 2010), http://pewinternet.org/~/media//Files/Reports/2010/PIP_Mobile_Access_2010.pdf.

# Technological

The internet has not only grown more pervasive in modern American life; the ways in which the public accesses and uses the internet have evolved substantially as the internet has taken on a tremendous range of new roles in daily life.

## Mobile

One fundamental shift has to do with how the public accesses the internet. Until fairly recently, the only practical means most users had to access the internet was via a desktop or laptop computer, at work, at home, in a public library, or elsewhere, connected via dial-up or broadband. Now, however, users are increasingly able to access the internet on the go via a mobile device. Although this experience may be relatively similar for the "roughly half of all adults (47%) [who] go online [with a laptop using a wi-fi connection or mobile broadband card]," [18] it is qualitatively different for the "two in five adults (40%) [who] do at least one of [use the internet, email, or instant messaging on a cell phone]." [19]

Although accessing the internet from a cell phone or other portable mobile device has been possible for some time, the introduction of Apple's iPhone in 2007 substantially shifted the landscape for mobile use of the internet. The advances in the mobile web since then have been startling. In an article from late that year, the New York Times reported on the sad state of the mobile web, stating that "the wireless communications business smacks of a soap opera, with disaster lurking like your next dropped call" and that "[f]or now, widespread use of the mobile Web remains both far off and inevitable."[20] Since then, mobile internet usage has skyrocketed. An AdMob study reported 10 million requests from 92 different countries in May 2010, up from 27 countries in May 2008, with all global regions increasing traffic at least four times in the last two years.[21]

This trend has been accompanied by a significant shift in the way users experience the web today, and accordingly, the way websites are designed. Many popular sites, now recognizing the importance of the mobile space, have separate site designs targeted at mobile users—Google, Facebook, and Youtube (the top 3 accessed sites according to Alexa[22]), for example, all offer versions of their web pages optimized for mobile browsing. The particular constraints of the mobile web that that necessitate these specialized sites has drawn much interest from user experience specialists. The World Wide Web Consortium (W3) even went so far as to say that "[p]eople with disabilities using computers have similar interaction limitations as people without disabilities who are using mobile devices,"[23] and subsequently published guidelines for mobile web best practices in 2008.[24]

The importance of the mobile web, however, extends beyond simply extending desktop use to a different platform. Mobile internet devices often offer sensors uncommon in traditional computing,

[18] Ibid.
[19] Ibid.
[20] http://www.nytimes.com/2007/11/25/technology/25proto.html
[21] http://metrics.admob.com/wp-content/uploads/2010/06/May-2010-AdMob-Mobile-Metrics-Highlights.pdf
[22] http://www.alexa.com/topsites
[23] http://www.w3.org/WAI/mobile/experiences
[24] http://www.w3.org/TR/mobile-bp/

such as GPS systems, cameras, compasses, and gyroscopes, and apply more common sensors, such as microphones, in new settings, offering powerful new functionality. Location-aware services are one of the most prominent categories of such new tools, as companies like Foursquare, Gowalla, Yelp, and Facebook have integrated or based services around *where* the user is. CNN Money, noting this trend, cited an ABI Research study claiming that 335 million North American consumers would be using mobile location-based services by 2012.[25] Other tools take advantage of different mobile device sensors to enable innovative methods of information discovery. Examples include Google Goggles, which "lets you use pictures taken with your mobile phone to search the web … [which is] ideal for things that aren't easy to describe in words… [like] books & DVDs, landmarks, logos, contact info, artwork, businesses, products, barcodes, or text,"[26] and Shazam, a "query-by-example (QBE) music search service that enables users to learn the identity of audible prerecorded music by sampling a few seconds of audio using a mobile phone as a recording device."[27] The application of computing technologies in devices with powerful new sensors and input methods that are used in a much more diverse set of circumstances and venues offers a wide range of new possibilities, which are only beginning to be explored.

Mobile users also may encounter the internet in very different ways than simply accessing a web page via a browser; for many users of recent generations of mobile devices such as the iPhone or Android devices, access to the internet may be mediated through an "app," an "end-user software applications that are designed for a cell phone operating system and which extend the phone's capabilities by enabling users to perform particular tasks,"[28] often drawing on remote networked information in the process. According to Pew, "Of the 82% of adults today who are cell phone users, 43% have software applications or 'apps' on their phones. When taken as a portion of the entire U.S. adult population, that equates to 35% who have cell phones with apps… Yet having apps and using apps are not synonymous. Of those who have apps on their phones, only about two-thirds of this group (68%) actually use that software. Overall, that means that 24% of U.S. adults are active apps users."

## Cloud computing & web applications

A trend away from relying on local applications and locally stored data has accompanied users' increasing shift towards a more mobile, multi-device paradigm of internet use. Users increasingly rely on "cloud computing," "an emerging architecture by which data and applications reside in cyberspace, allowing users to access them through any web-connected device."[29] According to Pew, "some 69% of online Americans use webmail services, store data online, or use software programs such as word

[25] http://money.cnn.com/2007/01/26/magazines/business2/gpsservices.biz2/index.htm
[26] "Overview : Google Goggles (Labs) - Google Mobile Help," n.d., http://www.google.com/support/mobile/bin/answer.py?hl=en&answer=166331.
[27] Avery Wang, "The Shazam music recognition service," *Communications of the ACM* 49, no. 8 (2006): 44-48.
[28] Kristen Purcell, Roger Entner, and Nichole Henderson, "The Rise of Apps Culture" (Pew Internet & American Life Project, September 15, 2010), http://pewinternet.org/~/media//Files/Reports/2010/PIP_Nielsen%20Apps%20Report.pdf.
[29] John B. Horrigan, "Use of Cloud Computing Applications and Services" (Pew Internet & American Life Project, September 2008), http://pewinternet.org/~/media//Files/Reports/2008/PIP_Cloud.Memo.pdf.pdf.

processing applications whose functionality is located on the web."[30] According to Tim O'Reilly, "the potential of the web to deliver full scale applications didn't hit the mainstream until Google introduced Gmail, quickly followed by Google Maps, web-based applications with rich user interfaces and PC-equivalent interactivity. The collection of technologies used by Google was christened AJAX… [and enables] web developers [to] finally able to build web applications as rich as local PC-based applications."[31]

In addition to offering a viable web-based alternative to tasks that traditionally required a desktop application, these cloud computing services offer benefits to both service providers and end users. From the point of view of service providers, cloud computing offers "the appearance of infinite computing resources available on demand … [which] eliminat[es] the need … to plan far ahead for provisioning; … the elimination of an up-front commitment … allowing companies to start small and increase hardware resources only when there is an increase in their needs; [and] the ability to pay for use of computing resources on a short-term basis as needed."[32] For end users, a principal benefit of cloud applications is their ability to "[let] you access all your applications and documents from anywhere in the world, freeing you from the confines of the desktop and facilitating wholesale group collaboration."[33]

Although the cloud computing approach enables the creation of a variety of new tools and services for saving, working with, and sharing content online, "… cloud users show high levels of concern when presented with scenarios in which companies might use their data for purposes users may or may not fully understand ahead of time. This suggests user worry over control of the information they store online. For nearly all of the scenarios shown, most users of cloud applications say they would be very concerned if their data were sold, used in marketing campaigns, not deleted as requested, or used for targeted ads."[34] Furthermore, users may temporarily or permanently lose access to their data during technical difficulties by their service providers; for example, in early 2009, "There was a meltdown at bookmark sharing website Ma.gnolia … [in which] the service lost both its primary store of user data, as well as its backup,"[35]leading to "all of its user data [being] irretrievably lost."[36]

## Mashups, web services, and the semantic web

Another common feature of web 2.0 is the "mashup," a web application that "spreads roots across the Web, drawing upon content and functionality retrieved from data sources that lay outside of its

[30] Ibid.
[31] Tim O'Reilly, "What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software" (O'Reilly Media, September 30, 2005), http://oreilly.com/pub/a/web2/archive/what-is-web-20.html.
[32] Michael Armbrust et al., "A view of cloud computing," *Commun. ACM* 53, no. 4 (2010): 50-58.
[33] Michael Miller, "Cloud Computing Pros and Cons for End Users," *InformIT*, February 13, 2009, http://www.informit.com/articles/article.aspx?p=1324280.
[34] Horrigan, "Use of Cloud Computing Applications and Services."
[35] Michael Calore, "Ma.gnolia Suffers Major Data Loss, Site Taken Offline | Epicenter | Wired.com," *Wired.com*, n.d., http://www.wired.com/epicenter/2009/01/magnolia-suffer/.
[36] Rich Miller, "Ma.gnolia Data is Gone For Good « Data Center Knowledge," *Data Center Knowledge*, n.d., http://www.datacenterknowledge.com/archives/2009/02/19/magnolia-data-is-gone-for-good/.

organizational boundaries."[37] An early example of a web application mashup was HousingMaps.com, "a mashup of the listings from CraigsList.com and Google Maps" that supports searching for housing listings via a map interface.[38] Such tools that draw upon disparate datasources are an increasingly common class of web application, and are dependent on, in the example of HousingMaps, "Google's choice to make its maps application interface open for anyone to use and Craigslist's similar choice to make its data freely available in an open and structured format," which "allowed for an innovation that neither company could have predicted would emerge."[39]

Many such mashups and other innovative uses of the internet rely on the growing prevalence of web services and Application Programming Interfaces (APIs), which "make software functionality available over the Internet so that programs … can make a request to a program running on another server (a web service) and use that program's response in a website, WAP service, or other application."[40] Such web services "represent an industrywide response to the need for a flexible and efficient business-collaboration environment. Technically, it's a way to link loosely coupled systems without binding them to a particular programming language, component model or platform. Practically, it represents a discrete business process with supporting protocols that functions by describing and exposing itself to users of the Web and being invoked by a remote user and returning a response." [41]

But this is not the only approach that can be used to enable information reuse; the "linked data" approach, which builds on the notion of the "semantic web" advocated by Tim Berners-Lee, has grown in popularity in recent years. In a seminal article from 2001, Tim Berners-Lee advocates for the potential and adoption of what he terms "the semantic web," a system in which "information is given well-defined meaning, better enabling computers and people to work in cooperation."[42] By naming and classifying data into discrete categories, the semantic web "enable[s] machines to comprehend semantic documents and data,"[43] aiming to lend greater meaning and purpose to the way machines process information. Associating information with meaningful tags allows computers to process our searches in more intelligent ways—for example, as Berners-Lee states, "an intelligent search program can sift through all the pages of people whose name is 'Cook' (sidestepping all the pages relating to cooks, cooking, the Cook Islands, and so forth…"[44] By associating "Cook" with a name tag, we can indicate to an intelligent computer what sort of information that represents—in a sense, enabling the machine to comprehend the data.

[37] Duane Merrill, "Mashups: The new breed of Web app" (IBM, August 8, 2006), http://www.ibm.com/developerworks/xml/library/x-mashups.html.
[38] Jerry Brito, "Hack, Mash, & Peer: Crowdsourcing Government Transparency," *The Columbia Science and Technology Law Review* 9 (May 14, 2008): 119.
[39] Ibid.
[40] Patrick Cooney, "Understanding Web Services" (A List Apart, January 31, 2002), http://www.alistapart.com/articles/webservices/.
[41] Frank P. Coyle, "Web Services, Simply Put - Computerworld," May 19, 2003, http://www.computerworld.com/s/article/81271/Web_Services_Simply_Put.
[42] Tim Berners-Lee, James Hendler, and Ora Lassila. "The Semantic Web," *Scientific American*
[43] Ibid.
[44] Ibid.

The linked data approach builds on this concept, and is generally a reaction to the way in which "Web APIs slice the Web into walled gardens" via proprietary interfaces.[45] Linked data, "in contrast to the full-fledged Semantic Web vision… is mainly about publishing structured data in RDF using URIs rather than focusing on the ontological level or inferencing. This simplification – just as the Web simplified the established academic approaches of Hypertext systems – lowers the entry barrier for data provider, [and] hence fosters a wide-spread adoption."[46]While "web APIs are accessed using a wide range of different mechanisms, and data retrieved from these APIs is represented using various content formats, … Linked Data commits itself to a small set of standardized technologies: URIs and HTTP as identification and access mechanism, RDF as content format. Using a single set of technologies instead of relying on diverse interfaces and result formats allows data sources to be more easily crawled by search engines and accessed using generic data browsers." [47] Linked data represents an alternate approach to enabling reuse of information on the web, and continues to grow in popularity.

## Web 2.0 & participatory media

Another related shift in how users engage with the internet in recent years is the rise of "web 2.0," a term coined by Tim O'Reilly that describes,

> "an 'architecture of participation' – a constellation made up of links between web applications that rival desktop applications, the blog publishing revolution and self-service advertising. This architecture is based on social software where users generate content, rather than simply consume it, and on open programming interfaces that let developers add to a web service or get at data. It is an arena where the web rather than the desktop is the dominant platform, and organization appears spontaneously through the actions of the group, for example, in the creation of folksonomies created through tagging."[48]

The idea that "applications … literally get better the more people use them, harnessing network effects not only to acquire users, but also to learn from them and build on their contributions"[49] is core to the notion of web 2.0. Benkler coined the term "commons based peer production" to describe this phenomenon, which he describes as "depend[ing] on very large aggregations of individuals independently scouring their information environment in search of opportunities to be creative in small or large increments. These individuals then self-identify for tasks and perform them for a variety of motivational reasons."[50] The increasing popularity of websites driven by this phenomenon, including

[45] Christian Bizer, "The Emerging Web of Linked Data" (presented at the 4th Berlin Semantic Web Meetup, Berlin, Germany, February 26, 2010), http://lumano.de/cms_files/images/content/2010-02-26-meetup/Bizer-Berlin-SW-Meetup-LinkedData-Talk.pdf.
[46] M. Hausenblas, "Exploiting Linked Data to Build Web Applications," *Internet Computing, IEEE* 13, no. 4 (August 2009): 68-73.
[47] Christian Bizer, Tom Heath, and Tim Berners-Lee, "Linked Data - The Story So Far," *International Journal on Semantic Web and Information Systems* 5, no. 3 (2009): 1-22.
[48] Ryan Singel, "Are You Ready for Web 2.0?" (Wired, October 6, 2005).
[49] Tim O'Reilly and John Battelle, "Web Squared: Web 2.0 Five Years On" (Web 2.0 Summit, 2009), http://assets.en.oreilly.com/1/event/28/web2009_websquared-whitepaper.pdf.
[50] Yochai Benkler, "Coase's Penguin, or, Linux and The Nature of the Firm," *The Yale Law Journal* 112, no. 369 (2002).

YouTube, Flickr, Wikipedia, and many more led Time Magazine to declare its Person of the Year for 2006 to be "you… for seizing the reins of the global media, for founding and framing the new digital democracy, for working for nothing and beating the pros at their own game," celebrating the power of the internet to "[bring] together the small contributions of millions of people and making them matter."[51]

The term "crowdsourcing" has been applied to this kind of highly distributed collaborative effort organized via the internet; "crowdsourcing uses social engagement techniques to help a group of people achieve a shared, usually significant, and large goal by working collaboratively together as a group… Crowdsourcing relies on sustained input from a group of people working towards a common goal, whereas social engagement may be transitory, sporadic or done just once."[52] Clay Shirky charts a wide range of examples of how technology is "making it easier for groups to self-assemble and for individuals to contribute to group effort without requiring formal management … [and has] radically altered the old limits on the size, sophistication, and scope of unsupervised effort" in his book "Here Comes Everybody."[53]

At the same time, critiques of various aspects of the web 2.0 environment have begun to appear. Jaron Lanier has been at the forefront of opposition to what he sees as the tendency of many services such as Facebook to enforce conformity rather than allow for three-dimensional person-hood online.[54] Malcolm Gladwell has, somewhat similarly, critiqued Twitter for failing to build the rich relationships that are needed to motivate social action.[55] While both have stirred up a wealth of opinions and much disagreement, something of a debate about the social effects of these new technologies seems to be emerging.

## Libraries

Broad environmental changes driven by the increasing ubiquity of the internet have substantially shifted the ways that libraries (of all kinds) and library resources are used, and consequently, the roles played and services provided by the library.

### Economic challenges

This document will not go into great detail on the broad strokes of the current economic and fiscal crisis, but will instead focus on its impact specifically on libraries.

[51] Lev Grossman, "Time's Person of the Year: You," *Time*, December 13, 2006, http://www.time.com/time/magazine/article/0,9171,1569514,00.html.
[52] Rose Holley, "Crowdsourcing: How and Why Should Libraries Do It?," *D-Lib Magazine* 16, no. 3 (April 2010), http://www.dlib.org/dlib/march10/holley/03holley.html.
[53] Clay Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations* (New York, NY: Penguin Books, 2008).
[54] Jaron Lanier, *You Are Not a Gadget: A Manifesto* (Knopf, 2010).
[55] Malcolm Gladwell, "Small Change: Why the revolution will not be tweeted," *New Yorker*, October 4, 2010, http://www.newyorker.com/reporting/2010/10/04/101004fa_fact_gladwell.

## Public libraries

Despite the growing range of vital community services provided by public libraries, many public libraries face an increasingly dire financial future. According to the American Library Association, "a majority (56.4 percent) of public libraries report flat or decreased operating budgets in FY2010, up from just over 40 percent in FY2009; and about 62 percent anticipated flat or decreased operating budgets in FY2011."[56] Urban libraries have been particularly hard-hit; "… the net effect of these changes is a sizeable drop in urban library operating budgets overall, with few even keeping pace with inflation (the Consumer Price Index rose 2.6 percent in 2009). In fact, they report the greatest dollar losses in expenditures, with an average decline of 29.5 percent, or about $5 million in each library's operating budget in FY2010, and additional average reductions of 5 percent anticipated in FY2011, or more than $600,000 per library." [57]

The sources of this funding are also changing. Local funding has declined, as "expenditures for staff salaries and 'other' expenditures … shifted in FY2010 from FY2009 away from local/county and soft funding sources (fee/fines, donations, etc.) to federal and state sources;" but state funding for public libraries is also declining, as "twenty-four states reported cuts in state funding for public libraries between FY2009 and FY2010. Of these, nearly half indicated the cuts were greater than 11 percent—almost four times the number that reported this was the case in the previous fiscal year." [58]

The impact of these budget cutbacks cannot be understated; in 2010, "13 states reported they were aware of public library closures due to budgetary reasons in the previous 12 months." [59] These cuts have been widespread, and have affected event the traditionally best funded public libraries in the country: "last year, Seattle shut down all its libraries and furloughed staff for two weeks after the city cut the system's budget by five percent. Minneapolis Public Library has eliminated 33 positions and is considering canceling the construction of its new downtown library in anticipation of a $25 million budget shortfall over the next 10 years. Meanwhile, in Queens, N.Y., a 20 percent budget cut led to layoffs for 100 library staffers and reduced operating hours in many branches to only 30 per week."[60] Due to these kinds of cuts, "a vital network of services could be devastated, library officials and employees say, affecting far more than just the hours that people can take out books."[61] Despite its community importance, libraries lack the funding to maintain their existing technology; "cost is the leading factor affecting their ability to add or replace computers and improve bandwidth. Nearly 59 percent of libraries

[56] "Public Library Funding Landscape," *American Libraries*, Summer 2010.
[57] Ibid.
[58] Ibid.
[59] Ibid.
[60] Steve Coffman, "Changing public library funding," *American City & County*, May 1, 2003, http://americancityandcounty.com/mag/government_changing_public_library/.
[61] Anne Barnard, "City Libraries Say Cuts Will Mean Closings and Layoffs," *The New York Times*, May 14, 2010, sec. N.Y. / Region, http://www.nytimes.com/2010/05/15/nyregion/15library.html?scp=1&sq=budget%20cuts%20new%20york%20city%20libraries&st=cse.

report they have no replacement schedule, up significantly from 38 percent last year. Of the 40 percent with a schedule, 26.7 percent report they will be unable to maintain the schedule this year." [62]

### State libraries

State libraries have also faced significant challenges in the current economic climate. According to the Institute of Museum and Library Services, "Funding for state library agencies remained flat from fiscal year (FY) 2004 to FY 2008, but the current economic downturn will likely decrease [State Library Agency] budgets. These resource reductions could play a significant role in determining the quality and quantity of state library agency services in the years to come."[63] For example, in 2009, the governor of Michigan "issued an executive order that abolished the Department of History, Arts, and Libraries, transferring the Library of Michigan to the Department of Education, with a mandate to effect cost savings… [and] a 10% budget cut for FY10 and a proposed 23% budget cut for the year that begins October 1." [64]

### Academic libraries

Severe budget cuts have also hit academic institutions and their libraries. Recent articles have described the funding challenges faced by private and public institutions of higher education alike; while "public higher education in general" is described as "at a point of particular peril,"[65] they are not alone, as "the financial outlook for private colleges will remain 'challenged for at least the next 12 months,' according to Moody's Investor Service.[66] This financial situation is mirrored in academic libraries; "many academic libraries are facing major planned or potential budget cuts as the nation's economic meltdown plays itself out. Online reports and announcements from major U.S. universities show that significant budget cuts are widespread among members of the Association of Research Libraries and other college and university libraries across the country."[67] According to *Library Journal*, "libraries of all types and sizes are bracing for budget cuts the likes of which have not been seen in three generations… Severe losses in endowment revenue, which in the past insulated materials budgets to a degree, have left even larger and wealthier libraries facing cuts."[68]

## Changing research behaviors and use of libraries

Americans have come to rely heavily on the internet to find information and assistance in solving problems; the internet has become the predominant venue that Americans turn to for help and information. The Pew Research Center's Internet and American Life Project asked Americans where they

[62] "Public Library Technology Landscape," *American Libraries*, Summer 2010.
[63] Everett Henderson and Carlos Manjarrez, "State Library Agency Service Trends: 1999-2008" (Institute of Museum and Library Services, March 2010), http://www.imls.gov/pdf/Brief2010_02.pdf.
[64] Norman Oder, "Library of Michigan, Facing Cuts, To Drop Genealogy and Federal Documents," *Library Journal*, March 4, 2010.
[65] Sara Hebel, "State Cuts Are Pushing Public Colleges Into Peril," *The Chronicle of Higher Education*, March 14, 2010, sec. Government, http://chronicle.com/article/In-Many-States-Public-High/64620/.
[66] Goldie Blumenstyk, "Moody's Sees Continued Financial Challenges for Private Colleges," *The Chronicle of Higher Education*, June 10, 2010, sec. Finance, http://chronicle.com/article/Moodys-Sees-Continued/65847/.
[67] Leonard Kniffel and Charles W. Bailey, "Cuts, Freezes Widespread in Academic Libraries," May 13, 2009, http://www.ala.org/ala/alonline/currentnews/newsarchive/2009/may2009/academiclibrarywoes051309.cfm.
[68] Lee C. Van Orsdel and Kathleen Born, "Reality Bites: Periodicals Price Survey 2009," *Library Journal*, April 15, 2009, http://www.libraryjournal.com/article/CA6651248.html.

turn for help in dealing with common questions, on topics such as education, starting a business, or getting information about government aid programs, and found that "nearly three in five adults (58%) say they used the internet for help; 53% say they sought out professional advisors, such as doctors, lawyers or financial experts; just under half (45%) turned to those closest to them, friends and family members, for advice and help; about a third of respondents say they looked to newspapers, magazines and books (36%) or directly contacted a government office or agency (34%); and about one in six looked to television or radio. Just about one in eight (13%) went to the public library."[69] While the public library trails most other types of assistance, this assistance is particularly effective: "among those who received help at the library, 88% say they found a lot or some of what they were seeking, including 38% who say a lot. By contrast, among those who did not seek help at the library, only 53% found a lot or some of what they were seeking, including 29% who say a lot."[70]

Although the public library is often not the first place Americans turn for help in finding information, "most adults still use libraries. Some 53% reported going to a local public library in the past 12 months. The profile of public library users is similar to that of internet users. Those who visited libraries in the past year tend to be younger adults, with higher incomes, who have attended college. There are no significant differences in library usage by race and ethnicity."[71] But the roles and services provided by the public library have changed substantially over time; "more than two-thirds of those who went to the public library (68%) used a computer there," in many cases to "look up information on the internet" or "see what materials the library had to offer." [72] Librarians remain important to Americans' use of the library; "nearly seven in ten library users (69%) say they received some assistance from the library staff on their visits." [73] The kinds of assistance rendered by librarians range widely: "thirty-nine percent of library users report receiving help on reference services and 38% report one-on-one instruction in using computers or the internet. Sixteen percent say they received help using printed materials. Six percent say they used an electronic or interactive help system and 4% say they received tutorials or took classes from library personnel. Seven percent reported using some other kind of assistance." [74]

Librarians also warn about "an illusion being created that all the world's knowledge is on the Web" and that "as more museums and archives become digital domains, and as electronic resources become the main tool for gathering information, items left behind in nondigital form … are in danger of disappearing from the collective cultural memory, potentially leaving our historical fabric riddled with holes."[75] Similarly, for many users, efforts to discover information both begin and end with a general purpose search engine; "the search engine, be that Yahoo or Google, becomes the primary brand that they associate with the internet. Many young people do not find library-sponsored resources intuitive and

[69] Estabrook, Witt, and Rainie, "Information Searches That Solve Problems."
[70] Ibid.
[71] Ibid.
[72] Ibid.
[73] Ibid.
[74] Ibid.
[75] Katie Hafner, "History, Digitized (and Abridged)," *The New York Times*, March 10, 2007, sec. Business / Your Money, http://www.nytimes.com/2007/03/10/business/yourmoney/11archive.html?ex=1331269200&en=b62832ef455385e9&ei=5090&partner=rssuserland&emc=rss.

therefore prefer to use Google or Yahoo instead: these offer a familiar, if simplistic solution, for their study needs."[76]

Just as the general public has shifted towards increasingly exclusive reliance on the internet to address their information needs, the research behaviors of the users of academic libraries have also shifted substantially in an increasingly electronic environment. According to the Ithaka S+R Faculty Survey 2009, a uniquely large-scale survey of faculty members in the United States that has been conducted regularly over the past ten years, "basic scholarly information use practices have shifted rapidly in recent years, and as a result the academic library is increasingly being disintermediated from the discovery process" for scholars.[77] According to CIBER, "[academic] library users demand 24/7 access, instant gratification at a click, and are increasingly looking for 'the answer' rather than for a particular format: a research monograph or a journal article for instance. So they scan, flick and 'power browse' their way through digital content, developing new forms of online reading on the way that we do not yet fully understand (or, in many cases, even recognise)."[78] Generally, users "from undergraduates to professors… exhibit a strong tendency towards shallow, horizontal, 'flicking' behaviour in digital libraries," applying "information seeking behaviour [that] can be characterised as being horizontal, bouncing, checking and viewing in nature. Users are promiscuous, diverse and volatile." [79] "Satisficing" behavior– "choosing decision outcomes that are good enough to suit decision makers' purposes, but are not necessarily optimal outcomes" – is the norm for many users, and "other occurrences as stop rules (physical discomfort onset, boredom onset, preset time limits, and snowballing) … often forces young searchers to select disappointingly inferior outcomes."[80]

## Library services

All different kinds of libraries are seeking to define new roles and services that will sustain their value and best serve their constituents' needs in a rapidly changing environment. Historically, most libraries provided services to help users identify, locate, and make use of relevant materials, as in a pre-digital era most users lacked the ability to perform many of these tasks without the assistance of an expert librarian. As more and more users have become able to perform such basic tasks on their own, many libraries have shifted their emphasis towards providing more targeted or added-value services, often focusing on developing self-sufficiency skills among their users.

### Public libraries

These general changes have played out very differently in different kinds of libraries. Public libraries "started out in the nineteenth century as 'street corner universities,'" "subsequently… moved into lending fiction books, […] records, tapes, CDs and DVDs, and … to espouse reader development," and

[76] "Information Behaviour of the Researcher of the Future" (CIBER, January 11, 2008), http://www.ucl.ac.uk/infostudies/research/ciber/downloads/ggexecutive.pdf.
[77] Roger C. Schonfeld and Ross Housewright, "Faculty Survey 2009: Strategic Insights for Librarians, Publishers, and Societies" (Ithaka S+R, April 7, 2010), http://ithaka.org/ithaka-s-r/research/faculty-surveys-2000-2009/faculty-survey-2009.
[78] "Information Behaviour of the Researcher of the Future."
[79] Ibid.
[80] Denise E. Agosto, "Bounded rationality and satisficing in young people's Web-based decision making," *Journal of the American Society for Information Science and Technology* 53, no. 1 (January 2002).

most recently "have generated an ever-increasing range of services, including mobile libraries, services for ethnic minorities, children and the elderly, homework clubs, e-government portals, cybercafes, newspapers and health advice, in an attempt to be all things to all people." [81]

One of the most important roles public libraries have assumed in recent years has been the provision of free access to the internet to underserved communities; according to the American Library Association, "two-thirds of library branches report they are the *only* provider of free public computer and Internet access in their communities."[82] This widespread provision of free internet access via public libraries stems in part from the success of the Telecommunications Act of 1996, which "instructed FCC to establish a universal service support mechanism to ensure that eligible schools and libraries have affordable access to and use of certain telecommunications services for educational purposes."[83] The resulting "Schools and Libraries Universal Service Support Mechanism, commonly referred to as the E-rate program"[84] has provided discounted rates for computers and internet service to schools and public libraries nationwide, supporting the development of a rich national network of internet access points in public libraries. While only 28% of libraries offered visitor access to the internet in 1996, "[t]oday, almost all public library branches offer visitors free access to computers and the Internet […] Internet access is now one of the most sought after public library services, and it is used by nearly half of all visitors."[85]

In addition to simply providing access to the internet, public libraries have also taken on a variety of roles in "boosting their patrons' technology proficiency and digital literacy." [86] According to the American Library Association, "nearly 90 percent of all libraries report providing technology training, including point-of-use technology training, formal classes and online tutorials. Urban libraries (59.2 percent) are most likely to provide formal classes. Libraries report providing services to job-seekers is the most vital public Internet service they offer, with 90.8 percent of all libraries reporting it is very important or the most important service available. Providing access to government information follows closely, with 87.6 percent of libraries reporting that this service is important or the most important." [87]

### Academic libraries

The roles of other kinds of libraries have also shifted dramatically. Academic libraries have generally sought to shift away from "warehousing large book collections, 'just-in-case-they're needed', [which] is rapidly becoming redundant as users turn their backs on the library as a physical space," [88] and towards offering higher-value services targeting the particular needs of local constituents. Once, academic

[81] Gobinda Chowdhury, Alan Poulter, and David McMenemy, "Public Library 2.0: Towards a new mission for public libraries as a 'network of community knowledge'," *Online Information Review* 30, no. 4 (2006): 454-460.
[82] "Public Library Technology Landscape."
[83] "Long-Term Strategic Vision Would Help Ensure Targeting of E-rate Funds to Highest-Priority Uses" (United States Government Accountability Office, March 2009), http://www.gao.gov/new.items/d09253.pdf.
[84] Ibid.
[85] Samantha Becker et al., "Opportunity for All: How the American Public Benefits from Internet Acess at U.S. Libraries," Mar 2010
[86] "Public Library Technology Landscape."
[87] Ibid.
[88] "Information Behaviour of the Researcher of the Future."

libraries were a necessary part of the research processes of students and faculty alike, but as these constituents are increasingly able to accomplish their goals online, academic libraries struggle to find new and vibrant roles.

One major trend in academic library services has been the creation of spaces intended to support student learning and group work, called "information commons;" in the eyes of some, "the information commons has in many ways come to substitute for the card catalog as a principal means of defining space as library space."[89] With the emergence of research tools online and the increasingly mobile nature of technology, the centrality of libraries as research destinations has diminished—"once students had the option of using their computers anywhere on campus—in their residence halls, at the local cyber café, or under a shady tree in the quad—why would they need to go to the library?"[90] Even with its decreasing importance in research, however, Freeman claims that libraries occupy an important place in the university community. As a place, "the library also serves a significant social role. It is a place where people come together on levels and in ways that they might not in the residence hall, classroom, or off-campus location. Upon entering the library, the student becomes part of a larger community—a community that endows one with a greater sense of self and higher purpose."[91] From this realization, he argues, "by its architectural expression and siting, [libraries] must continue to reflect the unique legacy and traditions of the institution of which it is part. It must include flexible spaces that "learn" as well as traditional reading rooms that inspire scholarship."[92]

In contrast to efforts to bring students and scholars into the library, many libraries have also begun to experiment with ways to bring library resources to users at their point of need, driven in part by the recognition that "since the advent of the Internet, traffic at reference desks has dropped off considerably, as much as 48 percent since 1991, according to the Association of Research Libraries... Reference services need to get online, get away from the desk, and scale up."[93] For some libraries, this means "that library personnel are embedded in various departments to work with researchers on their own turf," so "researchers benefit from on-site access not only to the library's digital resources, but its human resources as well." [94]

Other academic libraries have sought to develop a variety of new services that support the needs of researchers that focus more on supporting their new needs in a digital environment. One major trend is driven by the idea that "dealing with the 'data deluge,' as some researchers have called it, will be among the great challenges for science in the 21st century." [95] For some, this means "helping developing digital collections that link documents and data, enhancing distributed information systems and repositories,

[89] Scott Bennett, "The Information or the Learning Commons: Which Will We Have?," *The Journal of Academic Librarianship* 34, no. 3 (May 2008): 183-185.
[90] Geoffrey Freeman, "The Library as Place: Changes in learning Patterns, Collections, Technology, and Use," *Library as Place: Rethinking Roles, Rethinking Space* (Feb 2005): 1-9
[91] Ibid.
[92] Ibid.
[93] Scott Carlson, "Are Reference Desks Dying Out?," *The Chronicle of Higher Education*, April 20, 2007.
[94] Steve Kolowich, "Embedded Librarians," *Inside Higher Ed*, June 9, 2010, http://www.insidehighered.com/news/focus/technology/recent/hopkins.
[95] Scott Carlson, "Lost in a Sea of Science Data," *The Chronicle of Higher Education*, June 23, 2006.

designing access via middleware to Web-based systems, and integrating information and technology literacy for end user education."[96]

## Digital availability and the future of print collections

Since the development of the modern research library a century ago, at least some library directors have craved the opportunity to collect with less redundancy across their individual libraries to build greater collections collectively.[97] The gradual shift away from locally built and maintained library collections towards more and more intention interdependence seems to have grown out of library automation and the ability to share information about collections for collection development and interlibrary borrowing purposes. By the mid 1980s, discussions about how to manage the tradeoffs between acquisitions and borrowing were not uncommon.[98] More recently, the shift to an increasingly digital environment for content has had significant implications for the management and preservation of print collections. These issues have become especially acute at a variety of academic libraries, including large research libraries, small college libraries, law, medical, and engineering libraries.

According to Kieft, "a major shift in the local/consortial, owned/accessed balance has occurred, and for an increasing number of users obtaining something fast and picking it up on the run is more important than where it comes from. In Ranganathan's and Farber's times, and even into the new century, having large numbers of printed books, journals, and other analog materials on site was the only way to ensure access to a lot of information fast. Now, driven by the broad communication, publishing, and knowledge distribution changes set in motion by the commercial exploitation of the Internet in the last 15 years, the access vs. ownership debate that started in the 1990s is being won decisively for many libraries and users by the access side, not least because of the affordances of electronic text and the pressures exerted by campuses to reuse library space and by the economic downturn of the last few years."[99]

These environmental shifts have led to a growing interest, especially among academic libraries, in exploring new ways to manage print collections, with the broad goal of "provid[ing] the scholarly community the greatest possible richness and diversity of knowledge resources, minimiz[ing] inadvertent losses, and mak[ing] the most efficient use of available human and financial resources."[100] This paired emphasis on efficiency and effectiveness recurs throughout the literature on new models for

[96] D. Scott Brandt, "Librarians as partners in e-research: Purdue University Libraries promote collaboration," *C&RL News* 68, no. 6 (June 2007).
[97] Roger C. Schonfeld, "The Role of Information-Sharing in Book Survivability in the United States, 1890-1940" (presented at the Society for the History of Technology, Las Vegas, NV, October 2006).
[98] See, for example, Scott Bennett, *Report on the Conoco Project in German Literature and Geology* (Mountain View, CA: Research Libraries Group, 1987); T. Macky, "Interlibrary Loan: An Acceptable Alternative to Purchase," *Wilson Library Bulletin* 63, no. 5 (January 1989): 54-56.
[99] Bob Kieft, "A College Library, Its Print Monograph Collection, and the New Information Ecology," *Against the Grain* 22, no. 5 (November 2010).
[100] Bernard F. Reilly Jr., "Preserving American Print Resources," *Library Management* 26, no. 1 (2005): 102.

print collections management, as libraries seek both "to eliminate unnecessary duplication and [to] improve the depth and breadth of what's available to [patrons]."[101]

This increasing prioritization by many of access over local collections has led many libraries to begin to question the value of maintaining local hard-copy collections of certain types of materials. Many libraries have explored drawing down on their local print collections, moving print collections "to off-campus storage facilities due to space issues and a diminishing need for on-site hard copies. [And] libraries everywhere are eliminating pricey subscriptions to printed academic journals, often opting for less expensive digital versions."[102] Generally, this interest stems from a perception that print collections of these materials are increasingly irrelevant in a world characterized by "the emergence of Web-based reference tools, e-books, digitized and born-digital content, and other technologies that some see as changing essential library functions."[103] In some cases, libraries have simply discarded little-used print materials, but many also "have been developing off-site, high density warehouses where books and other materials can be stored efficiently but delivered quickly to readers who need them."[104]

### Scholarly journals

Much of the community momentum in this area focuses around print journal backfiles. Multifaceted research has confirmed a widespread preference for digital versions of scholarly journals among faculty (with certain disciplinary exceptions such as Art History). The landmark Collections Management Initiative, run by the University of California system, found that "electronic journals are popular, extensively used, and pervasive," and far outweighed by the little use that print journal materials received, concluding that "it is most cost-effective if a group of libraries can share the cost of one print subscription housed in off-site storage… because the stored print copies will be rarely used, this strategy should have a minimal impact on the quality of library service." [105] Faculty usage patterns have clearly impacted librarian attitudes and plans – according to Ithaka S+R's 2006 survey of collection development directors in 2006, over 40% of collection development directors at major research libraries agreed strongly that 'in the near future, it will no longer be necessary for our library to maintain hard-copy versions of journals.'[106]

In addition to a broad although not entirely pervasive user preference for digital versions of journals, journal backfiles "are ideal candidates for space reclamation for reasons that are well-known; large amounts of shelf space can be reclaimed with a relatively small number of titles (and decisions about those titles)… There is an economic sweet spot for consolidating print collections, and it can be found

[101] Jane Lee, "Shared Print: The Patron Perspective" (California Digital Library, January 13, 2006), http://www.cdlib.org/inside/assess/evaluation_activities/docs/2005/sharedPrintReport_nov2005.pdf.
[102] Steve Kolowich, "Bookless Libraries?," *Inside Higher Ed*, November 6, 2009, http://www.insidehighered.com/news/2009/11/06/library.
[103] Ibid.
[104] Jennifer Epstein, "A Win for the Stacks," *Inside Higher Ed*, November 13, 2009, http://www.insidehighered.com/news/2009/11/13/syracuse.
[105] Brian E. C. Schottlaender et al., "Collections Management Strategies in a Digital Environment" (University of California Office of the President, January 2004), http://www.ucop.edu/cmi/finalreport/cmireportfinal.pdf.
[106] Ross Housewright and Roger Schonfeld, "Ithaka's 2006 Studies of Key Stakeholders in the Digital Transformation in Higher Education," August 18, 2008, http://www.ithaka.org/ithaka-s-r/research/faculty-and-librarian-surveys.

where duplication is highest and where holdings can be compared in semi-automated ways for ready decision-making. The extent of possible candidates may be great enough to remedy library and storage facility space problems without dipping into more costly monograph deselection projects or more risky restrictions on collection growth." [107]

Many libraries have undertaken projects locally to reconfigure print collections management; see, for example, Harvard's "Single Copy" project for JSTOR materials, which seeks to reduce campus-wide duplication of print holdings of journals that are widely used in digital form.[108] More broadly, libraries are looking for system-level analysis and decision-support frameworks, in response to which Ithaka S+R developed the *What to Withdraw* approach to assessing print retention requirements in the wake of digitization.[109] Today, libraries are beginning to work together in earnest to develop shared collections that will allow an even greater of local flexibility while maintaining the shared value of print preservation; for example, the WEST project is an ambitious effort to "develop a shared retrospective journals repository among research libraries in the Western Region of the U.S.," which may be brought together with other journal repository projects through the Center for Research Libraries to provide a system-wide backstop of archived print materials.[110]

### Monographs and other books

Although new models for print collections management have taken greatest hold in the area of journals, there is growing interest in broadly reconsidering the role of local print collections in library service provisions; as Kieft suggests, "the idea of a library is not dependent on 'books' (except in so far as information continues to be published only in that printed form), indeed that the library's general collection is now, as it has always been, about interaction with and use of texts, sounds, and images, not about books, discs, film, or paper."[111] In exploring user preferences and behaviors for remotely-held print monograph collections, the California Digital Library found a general consensus that, as one patron put it, "it's not important that the books are here; it's important that they're available and can be here quickly."[112] Predicated on assumptions such as that "robust user-initiated borrowing networks already exist and additional networks can be established; a cooperative regional and national plan for storage/archiving of journals will emerge in the next one to three years and for other kinds of materials in three to five years; the library will continue to grow, but it will grow mostly in electronic resources or through the strength, number, and variety of access partnerships," and more, Kieft charts a course for the print collections of his college library in which "the College's collection of printed books [will] consist of well-used titles of current and, in some fields, classic interest and those that have artifactual value in teaching," emphasizing patron-driven acquisitions and "anticipat[ing] a day in the not-too-distant future

[107] Emily Stambaugh, "Heading West: Circling the Wagons to Ensure Preservation," *Against the Grain* 22, no. 5 (November 2010).
[108] Peter Kosewkski, "Everyone Wins: The JSTOR "Single Copy" Project," *Harvard University Library Notes*, October 2010, http://publications.hul.harvard.edu/ln_1356/everyone-wins-the-jstor-single-copy-project.html.
[109] Roger C. Schonfeld and Ross Housewright, "What to Withdraw? Print Collections Management in the Wake of Digitization" (Ithaka S+R, September 29, 2009), http://www.ithaka.org/ithaka-s-r/research/what-to-withdraw.
[110] Lizanne Payne, "Models for Shared Print Archives: WEST and CRL" (presented at the 156th ARL Membership Meeting, Seattle, WA, April 28, 2010), http://www.arl.org/bm~doc/mm10sp-payne.pdf.
[111] Kieft, "A College Library, Its Print Monograph Collection, and the New Information Ecology."
[112] Lee, "Shared Print: The Patron Perspective."

when most libraries devote less campus space to housing print materials, most materials are delivered or accessed electronically by most users, most print materials are housed cooperatively, and libraries have turned much of their collection development energies to managing collection relationships and to creating and maintaining electronic materials."[113] Although less mature than comparable efforts focusing on journal materials, the library community has begun to come together to "explore development of a framework for collaborative archiving and retention of print monograph collections," most notably under the auspices of an IMLS-funded LYRASIS project that seeks to "design and implement collaborative approaches for long-term retention of… monographs."[114]

Although there is widespread agreement that, in the vast majority of cases, use of scholarly journal materials has migrated almost entirely online, there is less of a research base to suggest whether other types of materials such as monographs will undergo a similar print-to-electronic transition or if print and electronic versions of these materials will have a very different functional relationship. Anticipating space savings, some librarians look forward to a moment when digital versions of monographs will supplant print – "the sooner professors and students embrace e-books, the sooner their libraries can start saving money [by drawing down on print books] … [but] that might not happen for a while." [115] Unlike journals, "with monographs, the ability of a research library to rely on digital collections gets more complex… much content is not yet available electronically, business models are unsettled and multifarious, and universally satisfactory solutions for reading long-form scholarly works on a screen have not yet emerged."[116] Although "some students and faculty are beginning to use e-books… [they often do so] as a complement to rather than replacement of print books."[117] And as the increasing digital availability of monographs in digital form is often driven by "the needs of trade, rather than scholarly, book publishers, and audiences," and the near-term availability of large collections of historical monographs is currently inextricably tied to the complexities of the Google Books project and lawsuits, "it is likely that a dual-format environment will obtain for books for the foreseeable future, forcing libraries to bear the costs of licensing and maintaining access to electronic versions as well as the costs of print."[118] For these reasons, "it is probably premature for most libraries to decide to provide access only to electronic collections, particularly when it comes to monographs."[119]

Compounding the issue for monographs is the role of one outsize digitization initiative. Although historically, most digitization of library materials has proceeded under the auspices of libraries,

[113] Kieft, "A College Library, Its Print Monograph Collection, and the New Information Ecology."
[114] "LYRASIS Awarded IMLS Grant," August 25, 2010, http://www.against-the-grain.com/2010/08/lyrasis-awarded-imls-grant/.
[115] Steve Kolowich, "E-Library Economics," *Inside Higher Ed*, February 10, 2010, http://www.insidehighered.com/news/2010/02/10/libraries.
[116] Lisa Spiro and Geneva Henry, "Can a New Research Library Be All-Digital?," in *The Idea of Order: Transforming Research Collections for 21st Century Scholarship* (Washington, D.C.: Council on Library and Information Resources, 2010), http://www.clir.org/pubs/reports/pub147/.
[117] Ibid.
[118] Roger C. Schonfeld, "Conclusion," in *The Idea of Order: Transforming Research Collections for 21st Century Scholarship* (Council on Library and Information Resources, 2010), http://www.clir.org/pubs/reports/pub147/pub147.pdf.
[119] Spiro and Henry, "Can a New Research Library Be All-Digital?."

publishers, or organizations (both for-profit and non-profit) that digitize materials principally to serve a library audience, mass digitization efforts such as the Google Books project take digitization out of the library and to the general public. According to Darnton, "four years ago, Google began digitizing books from research libraries, providing full-text searching and making books in the public domain available on the Internet at no cost to the viewer… Google also digitized an ever-increasing number of library books that were protected by copyright in order to provide search services that displayed small snippets of the text. In September and October 2005, a group of authors and publishers brought a class action suit against Google, alleging violation of copyright. Last October 28, after lengthy negotiations, the opposing parties announced agreement on a settlement, which is subject to approval by the US District Court for the Southern District of New York."[120] In the event that this settlement is approved, "Google will sell access to a gigantic data bank composed primarily of copyrighted, out-of-print books digitized from the research libraries. Colleges, universities, and other organizations will be able to subscribe by paying for an "institutional license" providing access to the data bank. A "public access license" will make this material available to public libraries, where Google will provide free viewing of the digitized books on one computer terminal. And individuals also will be able to access and print out digitized versions of the books by purchasing a "consumer license" from Google, which will cooperate with the registry for the distribution of all the revenue to copyright holders... Meanwhile, Google will continue to make books in the public domain available for users to read, download, and print, free of charge."[121] While the development of HathiTrust is seen by many community members as the linchpin in the library strategy to rethink book collections following their digitization (see for example the recently completed Cloud Library study[122]), it is unclear what progress could be made in the absence of the settlement agreement being approved.

### Strategy and implications

While many libraries seek to reduce the resources devoted to the acquisitions, management, and retention of general collections in print format, there are suggestions in the professional literature that libraries are increasingly emphasizing local collections of unique materials that serve to differentiate them from their peers. The Association of College and Research Libraries (ACRL) mentions that "increasingly, libraries are acquiring local collections and unique materials and, when possible, digitizing them to provide immediate, full-text online access to increase visibility and use,"[123] In a sense, this perceived trend can be characterized as a reaction to "The McDonaldization process [which] has resulted in the increasing standardization of products and services, so that academic libraries are becoming more similar to one another."[124] While there has been much rhetoric about emphasizing

[120] Robert Darnton, "Google & the Future of Books," *The New York Review of Books*, February 12, 2009, http://www.nybooks.com/articles/archives/2009/feb/12/google-the-future-of-books/.
[121] Ibid.
[122] Constance Malpas, "Cloud-sourcing Research Collections: A Model for Strategic Change," October 15, 2010, http://www.slideshare.net/oclcr/arl-fall-forum-cloud-library-malpas.
[123] ACRL Research Planning and Review Committee, "2010 top ten trends in academic libraries," *College & Research Libraries News* 71, no. 6 (June 2010): 286-292.
[124] Brian Quinn, "The McDonaldization of Academic Libraries?," *College & Research Libraries* 61, no. 3 (May 2000): 248-261.

collections of distinction, not all libraries that would wish to pursue such a strategy have been able to redirect substantial resources in reflection of this priority.

But while such local transitions may offer libraries substantial opportunities to repurpose space towards higher-value uses, "highly fragmented [and] typically not coordinated inter-institutionally" library decision-making has led to "a very real risk that so many copies may be discarded as to threaten the availability of certain materials in their original format."[125]

One reason for this has been the challenges some libraries have faced in taking strategic initiative in these areas. Even deliberate and careful efforts to de-emphasize general collections in print format have often prompted concern from local constituents. For example, at Cal Poly Pomona, efforts to draw down on print journal collections led to accusations of "'an agenda to get rid of print,'"[126] humanities faculty at Syracuse University responded "fury… fueled by what looks like the emptying of shelves"[127] to the proposed move of books to an off-site facility, and "protesters … upset over the culling of printed materials"[128] greeted plans for library renovations that would limit on-site print materials at Ohio State University. Many opponents of a move away from print emphasize "wanting to be able to browse the collection and have easy access to books they know they need or might stumble upon in the stacks,"[129] and "the value of browsing, and the possibility of coming across unexpected materials."[130]

While faculty attitudes and needs at a system or national level may point libraries in one direction strategically, it is quite clear that the complexities of managing these initiatives are non-trivial.

## Digital collections and preservation

In addition to impacting long-standing print collections management priorities and strategies, the library community has also been faced with the challenge of managing and preserving the growing and increasingly important sets of materials available in digital form, either digitized versions of print materials or born-digital content. New questions about the appropriate balances between access and ownership have been raised by this transition, leading to debate in the library community about how to best support local needs and system-wide priorities. Similarly, as digital materials – including both digitized and born-digital content – grow in importance, the library community has faced the increasing challenge of developing sustainable models to ensure the long-term availability of materials in digital form.

[125] Schonfeld and Housewright, "What to Withdraw? Print Collections Management in the Wake of Digitization."
[126] Scott Carlson, "Library Renovation Leads to Soul Searching at Cal Poly," *The Chronicle of Higher Education*, n.d., http://chronicle.com/article/Library-Renovation-Leads-to/33045/.
[127] Jennifer Howard, "In Face of Professors' 'Fury,' Syracuse U. Library Will Keep Books on Shelves - Libraries," *The Chronicle of Higher Education*, November 12, 2009, http://chronicle.com/article/In-Face-of-Professors-Fury/49133/.
[128] Jennifer Howard, "Library Protesters to Ohio State U.: Digital's OK, but Save Our Books," *Wired Campus*, n.d.
[129] Epstein, "A Win for the Stacks."
[130] Scott Jaschik, "The Joy of Stacks," *Inside Higher Ed*, June 9, 2005, http://www.insidehighered.com/news/2005/06/09/stacks.

There is much discussion about various approaches to special collections in a digital environment, such as Lewis's proposed emphasis on the curation of "digital versions of traditional special collections… [and] increasingly… born-digital documents and digital outputs of the research enterprise."[131] In this section, however, we focus exclusively on collections management and preservation considerations for general collections in digitized and born-digital forms.

For such materials, libraries have increasingly served a role in arranging for access to materials in digital form rather than building local collections; a perennial debate in the library community since the early 1990s, however, has focused on whether or not "this shift toward emphasis on access to materials rather than ownership of materials will eventually lead to the demise of the library and librarianship."[132] Some view the model of "libraries without collections" as inadequate, and they think it insufficiently provides for user needs and long term preservation and undermining the independent role of the library "to do what the private sector will not."[133] But despite these concerns, "most libraries have already accepted this [access] model for many classes of digital information by leasing access to databases or electronic journals instead of demanding their own digital copies."[134]

### *Licensed remote access*

One fundamental transformation wrought on the relationship between libraries and publishers by the print-to-electronic transition has to do with the shift from an environment in which "in the print information world, purchasers buy an object and own it outright, its re-use via copying governed by national copyright laws and overarching international intellectual property agreements" and to a model in which "it is current practice for publishers or producers to lease or license information to customers, the use of that information then governed by contracts and contract law."[135]

Through these significant complexities, the "site license" model has become one of the most common relationships between libraries and publishers. This model enables libraries to provide unlimited access to materials for all users at their institution who authenticate with the library's systems, rather than limiting access to only certain access points on the campus, to a limited number of simultaneous users, or requiring the intervention of a librarian to moderate use. This model may pose additional challenges outside an academic context, however, due to a general reliance on IP-based authentication that may not be appropriate for, for example, the physically distributed user community of a public library. Proxy servers and VPNs have, however, extended the breadth of the site license model well beyond the physical site of the library or campus.

[131] David W. Lewis, "A Strategy for Academic Libraries in the First Quarter of the 21st Century," *College and Research Libraries* 68, no. 5 (September 2007): 418-434.
[132] Laura Townsend Kane, "Access vs. Ownership: Do We Have to Make a Choice?," *College & Research Libraries* 58, no. 1 (January 1997): 58 -66.
[133] James A. Jacobs, "Who Do You Serve and What Do You Do?: Defining Your Role to Ensure the Future of Our FDLP," *Free Government Information*, October 7, 2010, http://freegovinfo.info/node/3103.
[134] Ibid.
[135] Ann Okerson, "What Academic Libraries Need in Electronic Content Licenses," October 1, 1996, http://www.library.yale.edu/~okerson/stm.html.

Seeking to maintain a favorable balance in this changing environment, the library community has developed rich sets of model licenses that "[give] a library a template for negotiating a favourable contract point-by-point with a vendor… [and protect] the vendor by clearly defining what the library plans to do with the product, and can also benefit both parties by eliminating unenforceable clauses."[136] The LIBLICENSE project, hosted by Yale University Library and funded by CLIR, originated with the goal of developing an "online, World Wide Web tool to assist academic research libraries in negotiating electronic licensing agreements," and has grown to encompass automated tools, analysis of license terms, and model licenses that aim to "'de-mystify' electronic resources licensing by enabling customers as well as content owners to create their own license, rather than needing to always rely on attorneys to do this work."[137]

### *Local loading*

Although most libraries license access to remotely-held databases of content, some libraries have instead created arrangements that allow them to "locally load" digital materials as the first point of use and to enable new services (deferring a discussion of "local loading" in a cached model for preservation purposes to another section below). For example, the Los Alamos National Laboratory "began to purchase content—articles and metadata—from publishers and store it in the library's own digital archive. Instead of searching the Web for research papers, Los Alamos scientists search this local archive, and their activities remain confidential and secure."[138] Such "local loading maximizes possibilities for integrating resources across publishers … lead[ing] users to journals and articles they may not find when content is disbursed [across multiple remote databases]" and "maximizes opportunities for integrating services and resources with course management applications, with ILL and citation management tools, [and] within research tools."[139] In a modified version, content is sometimes loaded not strictly locally but rather at a consortial level, as has been the model for OhioLINK. Local loading requires investment in library-based servers and systems, seen by its proponents as well worth the cost given the increased services and value that the library can offer its local users.

### *Digital preservation*

Given broad reliance on digital materials, the rise of "born-digital" content that has no print equivalent, and the increasing movement to deaccession print in favor of digital alternatives, widespread concern has also arisen across the library community about the long-term preservation of materials in digital form. In the words of Waters and Garrett, "rapid changes in the means of recording information, in the formats for storage, and in the technologies for use threaten to render the life of information in the

[136] Janet Brennan Croft, "Model Licenses and Interlibrary Loan/Document Delivery from Electronic Resources," *Interlending & Document Supply* 29, no. 4 (2001): 165.
[137] Ann Okerson, "The LIBLICENSE Project and How it Grows," *D-Lib Magazine* 5, no. 9 (9, 1999), http://www.dlib.org/dlib/september99/okerson/09okerson.html.
[138] Jay Schecker, "The Unseen Scholars: Researching Information in the Digital Age," *1663: Los Alamos Science and Technology Magazine*, December 2008, http://www.lanl.gov/1663/files/documents/Item/627/1663_dec08_dialogue.pdf.
[139] Gwendolyn Ebbett, "Building the Case for Local Loading," September 26, 2004, http://www.lib.unb.ca/SEC/ppt/Ebbett.zip.

digital age as, to borrow a phrase from Hobbes, 'nasty, brutish and short.'"[140] Particular attention has been focused on scholarly journals, with the "Urgent Action Needed to Preserve Scholarly Electronic Journals" statement asserting that because "responsibility for preservation is diffuse, and the responsible parties—scholars, university and college administrators, research and academic libraries, and publishers—have been slow to identify and invest in the necessary infrastructure to ensure that the published scholarly record represented in electronic formats remains intact over the long-term… the digital portion of the scholarly record—and the ability to use it in conjunction with other information that is necessary to advance knowledge—[is] increasingly at risk."[141]

Waters and Garrett describe some of the perceived challenges associated with archiving digital information (italics added):

- First, they emphasize that while "digital media can be fragile and have limited shelf life… given such rates of technological change, even the most fragile media may well outlive the continued availability of readers for those media," leaving materials still extant but unable to be used.[142]
- Similarly, materials must remain able to be *discovered* – "for an object to maintain its integrity, its wholeness and singularity, one must be able to locate it definitively and reliably over time among other objects" – and understood in its original context, "the ways in which [materials] interact with elements in the wider digital environment." [143]
- Additionally, they warn "that *owners* or custodians who can no longer bear the expense and difficulty [of maintaining digital materials] will deliberately or inadvertently, through a simple failure to act, destroy the objects without regard for future use."[144]
- Furthermore, digital materials pose unique challenges due to "the way that the content is fixed as a discrete object," as "if an object is not fixed, and the content is subject to change or withdrawal without notice, then its *integrity* may be compromised and its value as a cultural record would be severely diminished."[145]
- Finally, they highlight the challenge of *provenance*, as "to preserve the integrity of an information object, digital archives must preserve a record of its origin and chain of custody."[146]

Across the community, attempts have been made to develop definitions of digital preservation that encompass this variety of concerns, emphasizing the multifaceted efforts required to effectively preserve digital materials. The American Library Association has put forward one definition, which states that "digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of

[140] Donald Waters and John Garrett, "Preserving Digital Information" (Task Force on Archiving of Digital Information, May 1, 1996), http://www.clir.org/pubs/reports/pub63watersgarrett.pdf.
[141] Donald J. Waters, "Urgent Access Needed to Preserve Scholarly Electronic Journals," October 15, 2005, http://www.diglib.org/pubs/waters051015.pdf.
[142] Waters and Garrett, "Preserving Digital Information."
[143] Ibid.
[144] Ibid.
[145] Ibid.
[146] Ibid.

digital preservation is the accurate rendering of authenticated content over time."[147] Portico, a digital preservation service that is also part of ITHAKA, has put forward another, suggesting that "the key goals of digital preservation include: usability – the intellectual content of the item must remain usable via the delivery mechanism of current technology; authenticity – the provenance of the content must be proven and the content an authentic replica of the original; discoverability – the content must have logical bibliographic metadata so that the content can be found by end-users through time; and accessibility – the content must be available for use to the appropriate community."[148] Although these and other definitions emphasize different properties of preservation, they reflect significant system-wide emphasis on the long-term preservation of valued information.

Digital materials pose "a new set of challenges for libraries and archives," due to "the problem of obsolescence in retrieval and playback technologies" as well as the fact that "new recording media are vulnerable to deterioration and catastrophic loss, and even under ideal conditions they are short lived relative to traditional storage media."[149] Further issues arise given the shifting expectations of digital expectations—while "for some purposes, a preserved digital object must be a perfect surrogate for the original, replicating the full range of functionality, as well as the original 'look and feel' … for other purposes, intensive preservation of this kind is unnecessary: perpetuating the object's intellectual content alone, or even a diminished approximation of the original object, is enough."[150]

Issues of permanence also play into the challenges of digital preservation. Technological changes contribute to "the fragility of digital storage media [which] considerably shortens the 'grace period' during which preservation decisions can be deferred. Issues of long term persistence can arise as soon as the time digital materials are created."[151] Formats popular at one point in time can become obsolete later—the challenge of digital preservation, then, is not only to preserve the integrity of the file itself, but also to ensure that it is able to be interpreted later. Some argue, however, that translators and emulation software will enable access to historic documents, and that thus format transformations are unnecessary. For example, Rosenthal argues that as "there are few, if any, formats in wide use in 1995 that are difficult to render with current tools" and that "it is easy to emulate 1995 PCs, and quite possible to emulate most other architectures current in 1995 using virtual machine technology," format obsolescence is not a significant concern; rather, "the only question is, did someone keep the bits for the operating system and the application as well as the document?"[152]

[147] "Definitions of Digital Preservation" (American Library Association, ALCTS Preservation and Reformatting Sections, Working Group on Defining Digital Preservation, June 24, 2007), http://www.ala.org/ala/mgrps/divs/alcts/resources/preserv/defdigpres0408.cfm.
[148] "Preservation Approach – Portico," n.d., http://www.portico.org/digital-preservation/services/preservation-approach/.
[149] Margaret Hedstrom, "Digital Preservation: A Time Bomb for Digital Libraries," *Computers and the Humanities* 31, no. 3 (May 1997): 189-202.
[150] Brian Lavoie, Lorcan Dempsey. "Thirteen Ways of Looking at…Digital Preservation." *D-Lib Magazine* 10, no. 7/8 (July/August 2004). http://dlib.org/dlib/july04/lavoie/07lavoie.html
[151] Ibid.
[152] David Rosenthal, "Spring CNI Plenary: The Remix" (dshr's blog, April 10, 2009), http://blog.dshr.org/2009/04/spring-cni-plenary-remix.html.

Further adding to the complexity of digital preservation is the ephemeral nature of many digital resources. Unlike physical resources, whose content does not change once printed, digital resources are capable of changing dramatically (or disappearing entirely, for that matter) over the course of their lives. According to a 2003 study, about 13% of Internet references in articles 27 months old were inactive.[153] Internet references accounted for 2.6% of all references in that study, and the number has likely risen since then, making obsolete webpage references a serious concern. The Internet Archive, founded in 1996, aims to present one solution to this problem by archiving text, audio, moving images, software, and entire web pages—"prevent[ing] the Internet – a new medium with major historical significance – and other 'born-digital' materials from disappearing into the past."[154]

One component of digital preservation is the assurance of the integrity of the digital object, so that a user can have sufficient trust that the materials they are using have not been inadvertently or maliciously altered. In the absence of many of the physical cues that can be used to evaluate integrity of physical objects, Lynch argues that "virtually all determination of authenticity or integrity in the digital environment ultimately depends on trust. We verify the source of claims about digital objects or, more generally, claims about sets of digital objects and other claims, and, on the basis of that source, assign a level of belief or trust to the claims."[155] As "validating a claim that is associated with an object ultimately means nothing more or less than making the decision to trust some entity that makes or warrants the claim,"[156] some in the library community have suggested the need for materials to be hosted independently from their original producer, maintained by a trusted party.

Several major initiatives also exist in the library community to preserve important materials for posterity. One of the longest-running initiatives to secure long-term access to digital materials is LOCKSS ("Lots of Copies Keeps Stuff Safe"). LOCKSS "is an open source, peer-to-peer, decentralized digital preservation infrastructure" that focuses on bit preservation of delivery files through a distributed network of inexpensive hardware to keep down costs while providing for an "on the fly" format migration as needed. [157] LOCKSS itself is a technology platform; a variety of organizations and trust networks have employed the LOCKSS technology to support their collaborative goals of maintaining various kinds of digital materials. For example, the LOCKSS Alliance "preserves materials that are generally available on the web, including subscription-only material. Anyone can participate in this network for free. Sufficient replication is ensured because the materials preserved in the public network are those that the wider community has agreed they wish to preserve."[158] Several other collaborations make use of the LOCKSS technology to support "private LOCKSS networks" that "hold material for

[153] Robert P. Dellavalle et al. "Going, Going, Gone: Lost Internet References." *Science* 302, no. 5646 (Oct 2003): 787-788.
[154] http://www.archive.org/about/about.php
[155] Clifford Lynch, "Authenticity and Integrity in the Digital Environment: An Exploratory Analysis of the Central Role of Trust," in *Authenticity in a Digital Environment* (Council on Library and Information Resources, 2000), http://www.clir.org/pubs/reports/pub92/lynch.html.
[156] Ibid.
[157] "Home - LOCKSS," n.d., http://www.lockss.org/lockss/Home.
[158] "Private LOCKSS Networks - LOCKSS," n.d., http://lockss.stanford.edu/lockss/Private_LOCKSS_Networks.

smaller communities."[159] These different networks may target different kinds of materials, have a wide range of organizational structures, and be supported by diverse sustainability models; whatever their organization, "to make LOCKSS function there must be at minimum six full sets of content."[160]

While LOCKSS emphasizes distributing digital preservation roles and responsibilities across the library community, other initiatives take a more centralized or coordinated approach. Building on the LOCKSS approach, "CLOCKSS (*Controlled* LOCKSS) is a not for profit joint venture between the world's leading scholarly publishers and research libraries whose mission is to build a sustainable, geographically distributed dark archive with which to ensure the long-term survival of Web-based scholarly publications for the benefit of the greater global research community."[161] While LOCKSS "is about libraries preserving their local collections, including thesis, images, AND subscription content from participating publishers," CLOCKSS is a "closed system" that distributes published content to "geographically, politically, and geologically disparate" institutions around the world and makes them freely available to the world in the case of "trigger events" such as a publisher going out of business or ceasing to provide access to materials.[162] CLOCKSS has been funded by a network of libraries and publishers.

Another centralized digital preservation effort is Portico,[163] a non-profit "centralized repository of tens of thousands of e-journals, e-books, and other electronic content, replicated to ensure security."[164] Portico emphasizes "long-term content management," including an ingest and normalization process for source files.[165] Like CLOCKSS, Portico focuses on "e-journal titles," additionally including "e-book titles, and d-collections," and makes these materials available to participants for usage following trigger events. Portico has been funded by a combination of library and publisher participants, along with a number of grants. In 2009, the Center for Research Libraries "certified Portico as a trustworthy digital repository" according to the "criteria included in the Trustworthy Repositories Audit and Certification checklist, and other metrics developed by CRL on the basis of its analyses of digital repositories."[166]

HathiTrust, "a digital repository for the nation's great research libraries," has also prioritized digital preservation, stating a commitment "to preserving the intellectual content and in many cases the exact appearance and layout of materials digitized for deposit" and "to bit-level preservation and format migration of materials created according to these specifications as technology, standards, and best

[159] Ibid.
[160] "LOCKSS for Government Documents: Brief Overview of the Needs Assessment Workshop," May 5, 2003, http://lockss-docs.stanford.edu/LOCKSSsummary.pdf.
[161] "Home - CLOCKSS," n.d., http://www.clockss.org/clockss/Home.
[162] "FAQ - CLOCKSS," n.d., http://www.clockss.org/clockss/FAQ.
[163] Portico is, like Ithaka S+R, a part of the ITHAKA not-for-profit organization.
[164] "The Archive: Content & Access – Portico," n.d., http://www.portico.org/digital-preservation/the-archive-content-access/.
[165] "Preservation Step-by-Step – Portico," n.d., http://www.portico.org/digital-preservation/services/preservation-approach/preservation-step-by-step/.
[166] "Center for Research Libraries - Portico Audit Report 2010," n.d., http://www.crl.edu/archiving-preservation/digital-archives/certification-and-assessment-digital-repositories/portico.

practices in the digital library community change."[167] Unlike CLOCKSS and Portico, HathiTrust does not ingest materials from publishers, but rather the digitized materials from its member libraries (including significantly the Google book digitization project), including a large and growing number of government documents.

In addition to these community-driven efforts, many countries have invested in national-level digital preservation efforts. For example, the National Library of the Netherlands (Koninklijke Bibliotheek) has a dedicated Digital Preservation department for its e-Depot, which was originally "designed to preserve the electronic publications of the Dutch publishers, in agreement with the Dutch voluntary deposit scheme," and has since ingested materials from a wider range of publishers as well as preserving "masters resulting from major Dutch digitisation programmes, the contents of the Dutch institutional repositories and the Dutch national web archive."[168] In addition to performing local migration and emulation practices aimed at preserving these resources for the long term, the KB also participates in the PLANETS project and other collaborative efforts to build shared preservation infrastructure. Closer to home, the Library of Congress "is putting a variety of digital stewardship resources into action… [to support] the Library's mission to sustain and preserve a universal collection of knowledge and creativity for future generations"[169] and has spearheaded the National Digital Information Infrastructure & Preservation Program with the goal of developing "a national strategy to collect, preserve and make available significant digital content, especially information that is created in digital form only, for current and future generations."[170] Many other national-level structures have been created to preserve digital information for the long term, often managed by a country's national library.

GPO has also been a leader in efforts to digitally authenticate and preserve government publications. Recognizing "that as more Government publications become available electronically, confidentiality, data integrity, and non-repudiation become more critical," GPO has implemented "a Public Key Infrastructure (PKI) initiative to ensure the authenticity of its electronically disseminated content," initially on the GPO Access platform and more recently through FDsys.[171] Through digital signatures and tracking of chains of custody, GPO provides users with information about a document's "official" or "authentic" status. In addition to this valuable work on certifying the authenticity of materials made available in digital form, GPO has a long history of working to maintain the long-term availability of materials it makes available digitally. GPO is an "affiliated archive" of the National Archives and Records Administration, a formal agreement which "ensures that the documents available on GPO Access, the GPO web site that provides free online public access to more than 250,000 federal government titles, will be available permanently. Although other affiliated archive agreements evolved over time to include

[167] "Preservation | www.hathitrust.org," n.d., http://www.hathitrust.org/preservation.
[168] Marcel Ras, "The KB e-Depot: Building and Managing a Safe Place for e-Journals," *Liber Quarterly* 19, no. 1 (April 2009), http://liber.library.uu.nl/publish/articles/000276/article.pdf.
[169] "Digital Preservation Inside the Library of Congress - Digital Preservation (Library of Congress)," n.d., http://www.digitalpreservation.gov/library/inside_library.html.
[170] "About the Program - Digital Preservation (Library of Congress)," n.d., http://www.digitalpreservation.gov/library/.
[171] "Authentication" (U.S. Government Printing Office, October 13, 2005), http://www.gpoaccess.gov/authentication/authenticationwhitepaperfinal.pdf.

electronic records, this agreement was the first of its kind between NARA and another government agency to specifically address electronic government records."[172] More recently, GPO has built on this commitment to preservation, pursuing certification by the Center for Research Libraries that FDsys meets the Trustworthy Repository Audit & Certification (TRAC) checklist, described below.[173]

As digital preservation repositories grow more important to addressing system-wide collections management challenges, there has been increasing interest in developing protocols to audit and certify these repositories. Two major approaches to this process are the TRAC (Trustworthy Repositories Audit & Certification) and DRAMBORA (Digital Repository Audit Method Based on Risk Assessment) protocols. DRAMBORA is "a methodology for self-assessment" in which "digital curation is characterised as a risk-management activity; the job of digital curator is to rationalise the uncertainties and threats that inhibit efforts to maintain digital object authenticity and understandability, transforming them into manageable risks."[174] Unlike DRAMBORA, which is a tool for self-reflection, TRAC is conceived of as an audit framework, to be applied by a third party to certify an archive. TRAC "represents best current practice and thought about the organizational and technical infrastructure required to be considered trustworthy and capable of certification… [and] establishes a baseline definition of a trustworthy digital repository and lays out the components that must be considered and evaluated as a part of that determination."[175] Building on these TRAC criteria, several organizations have taken on responsibility for performing digital repository audits and certifying repositories based on their results; "the CRL will take on the US activities related to audit and certification. In the UK, the DCC will execute plans to be the audit and certification managing agency for UK repositories and archives; and in Germany, the second phase of the nestor project, funded by Germany's Federal Ministry of Education and Research, will move forward with building the audit and certification program for Germany using their Criteria Catalogue."[176]

## Visions for the future

As libraries face tremendous environmental change and widespread budget pressures, "librarians are increasingly called upon to document and articulate the value of academic and research libraries and their contribution to institutional mission and goals."[177] A recent ACRL report documents a broad range of ways in which libraries can assess and explain their value to stakeholders, emphasizing that

[172] Diane Vogt-O'Connor, "NARA's Oldest Partnerships," *Prologue* 38, no. 2 (Summer 2006), http://www.archives.gov/publications/prologue/2006/summer/affiliates.html.
[173] David Rapp, "GPO Hires First Preservation Librarian," *Library Journal*, July 19, 2010, http://www.libraryjournal.com/lj/community/academiclibraries/885931-419/gpo_hires_first_preservation_librarian.html.csp.
[174] "DRAMBORA: About," n.d., http://www.repositoryaudit.eu/about/.
[175] "Trustworthy Repositories Audit & Certification: Criteria and Checklist" (OCLC and CRL, 2007), http://www.crl.edu/sites/default/files/attachments/pages/trac_0.pdf.
[176] Ibid.
[177] Megan Oakleaf, "The Value of Academic Libraries" (Association of College and Research Libraries, September 2010), http://www.acrl.ala.org/value/.

"Community college, college, and university librarians no longer can rely on their stakeholders' belief in their importance. Rather, they must demonstrate their value."[178]

This emphasis on value to a host institution is not limited to academic libraries; Rodger emphasizes that "value is not about the library but about its host system," pointing out that "libraries exist as parts of larger systems. Public libraries are part of cities, towns, and counties; school media centers are part of a school system; academic libraries are part of colleges and universities; special libraries are part of organizations, institutions, or corporations."[179] Rodgers argues that it is important that "we not stray too far from our understood importance to the host system. We can do more things, but we are in trouble if we stop doing those things that are understood to be part of our legitimizing story," and stresses that "[and] libraries need host systems more than host systems need libraries… [because] libraries receive resources and continuing legitimacy from host systems in return for creating value for them."[180]

Housewright echoes this theme, extrapolating about the potential future of academic libraries from changes that have occurred in corporate libraries in recent years. Housewright suggests that "the case of the corporate library offers us a parallel example in which many of the academic library's roles are performed in a very different organizational context," and that thus "corporate libraries [can] act 'as bellwethers of change' for the library world at large."[181] The importance of implementing a "value-based, demand-driven mindset" is suggested to deal with a "scenario of disintermediation and financial pressure."[182]

In addition to this movement to encourage a more value-focused conception of the library, there has also been community-wide interest in charting broad strategic directions for libraries in a digital age. This section presents a sampling of these visions.

### Academic libraries

Many visions focus on a particular sector of libraries; for example, much has been written about the future of the academic library. Lewis predicated his "Strategy for Academic Libraries in the First Quarter of the 21st Century" on the concern that "if libraries could not make a strong and clear case for their role, the money would go to the new student recreation center because that is what students and their parents asked about on the campus tour."[183] To chart a more successful path forward for academic libraries, Lewis presents a five-point model: "1) complete the migration from print to electronic collections; 2) retire legacy print collections; 3) redevelop library space; 4) reposition library and information tools, resources, and expertise; and 5) migrate the focus of collections from purchasing materials to curating content."[184] More recently, Lewis offered a more radical "thought experiment" imagining a future in which libraries "radically rethink their fundamental approach to providing

[178] Ibid.
[179] Eleanor Jo Rodger, "What's A Library Worth?," *American Libraries* 38, no. 8 (September 2007): 58-61.
[180] Ibid.
[181] Ross Housewright, "Themes of Change in Corporate Libraries: Considerations for Academic Libraries," *portal: Libraries and the Academy* 9, no. 2 (2009): 253-271.
[182] Ibid.
[183] Lewis, "A Strategy for Academic Libraries in the First Quarter of the 21st Century."
[184] Ibid.

documents to users," leading to a "User-Driven Purchase Giveaway Library" in which pervasive digital access and print-on-demand obviate the need for standing library collections.[185]

Daniel Greenstein, vice provost for academic planning and programs at the University of California System, suggested a more radical and pessimistic vision in which "the university library of the future will be sparsely staffed, highly decentralized, and have a physical plant consisting of little more than special collections and study areas."[186] Economic stresses, he suggests, may make library administrators "more likely than ever to explore the dramatic restructuring of library operations," focusing on "shared print and digital repositories" and increased outsourcing, leading to an overall downsizing of the library.[187]

The Association of Research Libraries recently released a set of "scenarios" for the future of research libraries, developed using "a strategy-related methodology many organizations can use to explore the uncertain landscape of the future external environment in which they may operate. The process is designed to make deeply held assumptions and beliefs explicit, and to test those beliefs and assumptions against the critical uncertainties facing the organization."[188] Although these scenarios range widely in their visions of how researchers will perform their work in the year 2030, with radically different implications for libraries, a common thread among many scenarios is an emphasis on the continuing decline of traditional funding models for universities and libraries, suggesting a belief that the current financial crisis is only the tip of an iceberg that will grow increasingly prominent in years to come.

Some visions target particular types of libraries even within the academic library community, recognizing that different kinds of academic libraries face very different priorities and pressures. For example, Robert Kieft builds on Evan Farber's concerns that college libraries avoid "the university-library syndrome" (of focusing on collections-centric roles over teaching-centric roles) to suggest a new model for a small college library. In this model, Kieft significantly de-emphasizes local print collections, "regard[ing] much of what we buy as consumables rather than long-term investments" and imagining a future in which "libraries have turned much of their collection development energies to managing collection relationships and to creating and maintaining electronic materials," thus enabling "the college library … both to spend more time on its teaching mission with students even as it offers them the array of resources that has been, until the digital age, the province of the university library." [189]

On the other hand, Luce focuses on the changing role of the academic research library, and ties suggested changes to the library's focus to perceived changes in the way that scholars – especially scientists – perform their work. Citing "a convergence of exponential increases in computing, storage, online sensors, and bandwidth enabling collaboration in new ways," Luce points to "eScience" as a field

[185] David W. Lewis, "The User-Driven Purchase Give Away Library: A Thought Experiment," *EDUCAUSE Review*, October 2010.
[186] Steve Kolowich, "Libraries of the Future," *Inside Higher Ed*, September 24, 2009, http://www.insidehighered.com/news/2009/09/24/libraries.
[187] Ibid.
[188] "The ARL 2030 Scenarios: A User's Guide for Research Libraries" (Association of Research Libraries, October 2010), http://www.arl.org/bm~doc/arl-2030-scenarios-users-guide.pdf.
[189] Kieft, "A College Library, Its Print Monograph Collection, and the New Information Ecology."

of growing importance that "will require a corresponding disruptive change in the ways in which libraries serve scientists' needs."[190] According to Luce, "a grand challenge now faces [research libraries]: the next generation of research infrastructure requires dynamic data repositories;" Luce suggests several roles – "supporting creation," "connecting communities," and "curation" – as avenues through which libraries can most effectively support the needs of scholars and establish new and important roles for themselves in a rapidly changing digital environment.[191]

Luce, among others, has also been a leader in advocating for "local loading" of digital scholarly content at libraries, rather than relying on remotely-accessed materials. Some librarians have argued that without locally loaded content they cannot effectively provide, metasearch ("the ability to search and receive results in more than one database through a single interface"). They suggest that a local index of metadata records can enable the development of a richer tool to support users.[192] Some have argued that without replicating the approach utilized by Google Scholar (i.e.loading local metadata records), libraries are at a disadvantage in supporting user needs, Projects such as the Ontario Scholars Portal have licensed metadata from publishers and data providers.[193] Some vendors are also taking this approach, centralizing collection of metadata or full text to create a shared index that can be licensed by libraries without managing a local discovery interface; SerialsSolutions Summon tool is perhaps the most prominent example. Beyond just discovery, some argue that it is essential for libraries to "obtain copies of digital information so that they can provide services for that information rather than trying to provide services for collections that they do not hold. This model also fits the OAIS preservation model which requires that an archive 'obtain sufficient control' of information in order ensure long-term preservation."[194] And others argue that the ownership of collections is central to libraries, asserting that "the library is, at root, a collection of information selected for use of, and made useable for, a particular community," arguing that libraries are uniquely interested in serving as cultural custodians and warning against "abandoning their role as collection builders and managers."[195]Some suggest that "digital deposit" of government documents could be "the canary in the library coal mine" for a shift in this direction for library collections more broadly, believing that "if government information librarians work on and solve the digital ingest/preservation/access issues for government information, their libraries will be able to generalize those solutions to other digital library collections."[196]

The "informationist" model, as implemented at Johns Hopkins' Welch Medical Library, focuses more on human interactions between librarians and scholars, and is predicated on the idea "that researchers

[190] Richard E. Luce, "A New Value Equation Challenge: The Emergence of eResearch and Roles for Research Libraries," in *No Brief Candle: Reconceiving Research Libraries for the 21st Century* (Council on Library and Information Resources, 2008), http://www.clir.org/pubs/reports/pub142/luce.html.
[191] Ibid.
[192] Jonathan Rochkind, "(Meta)search Like Google," *Library Journal*, February 15, 2007, http://www.libraryjournal.com/article/CA6413442.html.
[193] Ibid.
[194] Jacobs, "Who Do You Serve and What Do You Do?: Defining Your Role to Ensure the Future of Our FDLP."
[195] Michael A Keller, Victoria A Reich, and Andrew C Herkovic, "What is a library anymore, anyway?," text, May 5, 2003, http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/1053/973.
[196] James A. Jacobs, "Questions and answers about the future of FDLP," October 13, 2010, http://freegovinfo.info/node/3108.

benefit from on-site access not only to the library's digital resources, but its human resources as well."[197] In this model, "library personnel are embedded in various departments to work with researchers on their own turf," out of a belief that "being on the ground with researchers — sharing spaces, attending meetings, casually bumping into them in the hallway — allows librarians to develop a better understanding of what the researchers need, while the researchers learn more about what sorts of assistance the erstwhile librarians can offer."[198] Purdue University offers a similar program targeting undergraduates, in which "Purdue [embeds] librarians in different undergraduate departments, where they hold office hours and often co-teach courses."[199] Generally, the goal of this model is to "have the library be wherever you are," both in the form of electronic information resources and human assistance.[200] At Johns Hopkins, this model has been taken to an extreme; according to the dean, Nancy Roderer, "'we don't really need to have a central service point anymore… By 2012 we do expect to be out of the building.' The library will be 'recycling' much of its print collection, and storing other books offsite; faculty and students will be able to send away for the hard copies via snail mail — like Netflix."[201]

This growing interest in removing print collections, however, is not shared by all libraries; for example, "the University of Chicago challenges the all-too-common belief that great collections of books are becoming obsolete. We believe, instead, that scholarship will thrive in an environment where print and electronic coexist, now and in the future."[202] Emphasizing the belief that "the off-site stuff doesn't get used… people go to work where books are easily available,"[203] the University of Chicago is "erecting a new facility that will store collections on campus. The new Mansueto Library will bridge the print and digital worlds by featuring high-density shelving for 3.5 million additional print volumes, an automated storage-and-retrieval system, a grand reading room with seating for 150, a conservation laboratory, and a digital technology laboratory."[204] This vision reaffirms the centrality of print collections in the library even in a world where materials are rapidly becoming pervasively available in digital form, believing that "mass digitization leads users to collections; it does not take their place… search results will increasingly point the way to our rich print collection, fueling scholarly demand for access to these materials. Effective research depends on ready access to such materials and hospitable spaces in which to use them."[205] This echoes a faculty priority that "this building is supposed to be the research center of one entire wing of intellectual life at the campus, and we can't afford to let it turn into an Internet cafe."[206]

### Law libraries

Other visioning exercises focus on evaluating the future of law libraries. In 2002, the American Association of Law Libraries brought together a Special Committee on the Future of Law Libraries in the

[197] Kolowich, "Embedded Librarians."
[198] Ibid.
[199] Ibid.
[200] Ibid.
[201] Ibid.
[202] Judith Nadler, "Director's Message," n.d., http://mansueto.lib.uchicago.edu/director.html.
[203] Scott Carlson, "Thoughtful Design Keeps New Libraries Relevant," *The Chronicle of Higher Education*, September 30, 2005, Volume 52, Issue 6 edition, sec. Libraries.
[204] Spiro and Henry, "Can a New Research Library Be All-Digital?."
[205] Nadler, "Director's Message."
[206] Carlson, "Thoughtful Design Keeps New Libraries Relevant."

Digital Age with the goal of "considering the implications of electronic publishing for the future of law libraries, including those serving law firms and corporations; federal and state courts and agencies; and law schools."[207] This group set out a number of different scenarios for the future of different kinds of law libraries, envisioning how different aspects of the law library, "including the facility, the collections, staffing, services offered, training and implications for that library's budget" might evolve in a digital environment and imagining a collaborative future in which law libraries of all kinds would evolve traditional roles and take on new roles to manage and provide services around an increasingly digital set of resources.[208] More recently, the president of the AALL described a vision of the future centered around "more remote access and use of [resources by] employees from around the world. We will have professional library functions performed off-site and centralized. These functions will encompass all areas of librarianship including research, cataloging/technical services, purchasing and the use of consortia."[209]

Other visions for the future of the law library include the predictions of Danner, Kauffman, and Palfrey about "The Twenty-First Century Law Library."[210] Again, this exercise is predicated on the perception that while "questioning the role of the library, particularly the role of the law library, might have been unthinkable fifteen or twenty years ago… it's now a common question… Why should we care about books and libraries when so much of the information that lawyers, law students, and legal scholars use and need is online, accessible anytime, anywhere, and in many instances to anyone?"[211] In this vision, law librarians from the Duke, Yale, and Harvard law schools emphasized the importance of the library as "a third place that speaks to individual study and research," helping to teach students "how to find that faculty scholarship and distinguish between a source that's online from another kind of source," "research collaboration… [on] questions that require much more assistance than in the past," and substantially greater involvement of the law librarian in faculty research projects.[212]

Elsewhere, Palfrey has suggested that law libraries must collaborate, "not just within, but across countries. And the collaboration must include nonlibrarians, whose work can have a positive impact on the legal information ecosystem."[213] Palfrey envisions a "digital-plus" future for law libraries, "a hybrid of yesterday's predominantly print-based world and tomorrow's primarily digital world" in which libraries "perceive our primary function as serving communities rather than building collections," "alter the design of our own systems over time, as our goals and the needs of our users change, "coordinate the digitization of legal materials," "put our collection policies in writing and to share them with others

[207] "Future of Law Libraries in the Digital Age - Scenarios," n.d., http://www.aallnet.org/committee/scenarios.asp.
[208] Ibid.
[209] Alvin Podboy, "Embracing Intangible Law Libraries," *Law Technology News*, July 6, 2007, http://www.law.com/jsp/lawtechnologynews/PubArticleLTN.jsp?id=1183626388950.
[210] Richard A. Danner, S. Blair Kauffman, and John G. Palfrey, "The Twenty-First Century Law Library," *Law Library Journal* 101, no. 2 (2009): 143-156.
[211] Ibid.
[212] Ibid.
[213] John Palfrey, "Cornerstones of Law Libraries for an Era of Digital Plus," *Law Library Journal* 102, no. 2 (2010), http://www.aallnet.org/products/pub_llj_v102n02/2010-11.pdf.

publicly," makes "systems more efficient using back-office technology improvements," and librarians are "change agents who listen and respond, all the while having a backbone."[214]

### Public libraries

A variety of important roles are imagined for the public library in a digital age. Wooden describes "four specific areas where civic leadership, public citizens, and library leaders all seem to agree that there is a major opportunity for public libraries to step in and address community needs: (1) developing better programming and services for teens, (2) addressing illiteracy and poor reading skills among adults, (3) offering ready access to information about government services (including making public documents and forms quickly and easily available), and (4) permitting much greater access to computers for all."[215] But, as described above, despite substantial enthusiasm for important future roles for the public library in American society, "venturing into these areas would likely require financial resources that many libraries do not currently have."[216]

Many visions for the future of the public library emphasize the sorts of public technology support roles described above, in which the library prioritizes offering access to technology and the internet to the broad public. The Seattle Public Library has continued to react to a perception that "what the public really wanted was more computers," and has emphasized the importance of being "attuned to user needs… everything we do must be customer-focused," leading to the need to "balance the needs of people who want online services with those who want traditional print resources."[217]

In addition to providing access to technology, other opportunities to leverage the library's physical space are also viewed as critical to the future of the public library, with an ALA policy brief suggesting that "the future of bricks-and-mortar libraries will be less about what products a patron obtains at a library and more about the experiences the patron has while visiting. This notion is a more evolved version of what is seen today: libraries increasingly emphasizing their role as community centers with creative spaces suitable for a number of activities, only one of which is seeking and accessing information."[218] According to this report, "already public libraries across the country are embracing new trends in technology and community building in an effort to provide relevant, useful, and flexible spaces in which local populations can congregate and interact. The future public library is one of multiple destinations—a place for patrons to experience the world of information in a variety of new ways."[219]

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[214] Ibid.
[215] Ruth A. Wooden, "The Future of Public Libraries in an Internet Age," *National Civic Review* 95, no. 4 (Winter 2006), http://www.ncl.org/publications/ncr/95-4/0107libraries.pdf.
[216] Ibid.
[217] Donald T. Hawkins, "Seattle Public Library: Keeping the Focus on the Customer," *Information Today*, September 1, 2008.
[218] Jennifer C. Hendrix, "Checking Out the Future: Perspectives from the Library Community on Information Technology and 21st Century Libraries" (American Library Association Office for Information Technology Policy, February 2010), http://www.ala.org/ala/aboutala/offices/oitp/publications/policybriefs/ala_checking_out_the.pdf.
[219] Ibid.

Others visions of the future emphasize the library's role as the crossroads of their community, imagining that "collaboration with other community institutions and organizations will result in educational opportunities and experiences beyond traditional services such as literacy skills and technology training. Shared resources will allow libraries to devote more energy and space to services designed to improve community participation and cohesion, including e-government, arts and culture, and health and wellness programs."[220]

Although print collections management has been less of a priority concern for public libraries than academics, in large part due to the general custom of public libraries to maintain regularly weeded working collections to support changing local needs, some imagine that print may no longer be a key feature of the local branch library. Other roles – reference services, assistance using technology, and more – are imagined to become the principal role of the local branch library, emphasizing broad coverage through "storefront library service points," and providing only on-demand access only to print collections.[221]

One potential future for the American public library would be the extension of the outsourcing of public libraries to private vendors that has become increasingly common. A recent article described "an intense and often acrimonious debate about the role of outsourcing in a ravaged economy" sparked by Library Systems & Services, "A private company in Maryland [that] has taken over public libraries in ailing cities in California, Oregon, Tennessee and Texas, growing into the country's fifth-largest library system… [and] has been hired for the first time to run a system in a relatively healthy city."[222]

## Government information

Alongside these broad environmental changes, the ways that Americans engage with government information, either directly or through various intermediaries such as the library, have changed substantially.

### Digital availability of government information

Today, the vast majority of current government publications are made available in digital form; in 2009, it was estimated that "about 97% of materials disseminated to depositories [have] an online equivalent."[223] This widespread digital availability of current government information is the result of a long history of efforts by the federal government, building on a rich set of "statutory and regulatory

[220] Ibid.
[221] Nate Hill, "Library Outposts, a new service model for urban public libraries," *Catch and Release*, March 15, 2008, http://natehill.wordpress.com/2008/03/15/library-outposts-a-new-service-model-for-urban-public-libraries/.
[222] David Streitfeld, "As L.S.S.I. Takes Over Libraries, Patrons Can't Keep Quiet," *The New York Times*, September 26, 2010, sec. Business, http://www.nytimes.com/2010/09/27/business/27libraries.html?_r=2&ref=business&pagewanted=all.
[223] Depository Library Council, "Federal Depository Library Program Strategic Plan, 2009-2014 (Draft Discussion Document, 04/17/2009)" (Government Printing Office, April 17, 2009), http://www.fdlp.gov/component/docman/doc_download/37-fdlp-stratigic-plan-2009-2014-draft-3?ItemId=45.

frameworks that serve to make government processes somewhat more accountable, that regulate public access to government-held information."[224]

McDermott describes the shift towards widespread online availability of government information as beginning with the Paperwork Reduction Act of 1980, which "gave the Office of Management and Budget (OMB) the authority and responsibility for a broad range of responsibilities related to information management."[225] McDermott characterizes OMB's initial implementation of this act, through the 1985 Circular A-130, as "epitomiz[ing] the Reagan-era OMB attitude that information held by the government was government information—and not information to which the public necessarily had a right (other than disclosure through the Freedom of Information Act)," but suggests that the 1994 update to this circular "is a sea-change from the 1985 Circular, … significantly changing information policy and practices across the Executive Branch."[226] Notably, the 1994 Circular A-130 emphasized the importance of "the availability of government information in diverse media, including electronic formats, [which] permits agencies and the public greater flexibility in using the information." [227]

Providing digital access to government information has also been a priority of GPO, growing out of the 1993 passage of the Government Printing Office Electronic Information Access Enhancement Act of 1993 (Public Law 103-40), which instructed GPO to: "maintain an electronic directory of Federal electronic information," "provide a system of online access to the Congressional Record, the Federal Register and other appropriate publications," and "operate an electronic storage facility for Federal electronic information,"[228] which lead to the creation of GPO Access. Shuler et al characterize this act as "a clear sign from both the program's participants and others that FDLP needed to adapt to an increasingly digital public exchange of government information."[229] Shuler et al also suggest that "additional alterations in the U.S. federal policy environment during the Reagan, Bush, and Clinton administrations encouraged agencies to rely less on FDLP to make information available."[230] More recently, GPO introduced the Federal Digital System (FDsys), the successor to GPO Access, which has the mission to "organize, manage and output authenticated content for any use or purpose and to preserve the content … for the benefit of future generations."[231] FDsys is being implemented in a phased process, with "Release 1," which will "establish the foundational infrastructure; Establish [a] preservation repository; Replace [the] current public site; Perform large scale data migration; [and] Provide

[224] Patrice McDermott, "Building Open Government," *Government Information Quarterly* 27, no. 4 (October 2010): 401-413.
[225] Ibid.
[226] Ibid.
[227] Ibid.
[228] "Status Report: GPO Access: A service of the U.S. Government Printing Office" (Government Printing Office, June 30, 1994), http://www.gpoaccess.gov/biennial/1994/report.pdf.
[229] John A. Shuler, Paul T. Jaeger, and John Carlo Bertot, "Implications of harmonizing the future of the Federal Depository Library Program within e-government principles and policies," *Government Information Quarterly* 27, no. 1 (January 2010).
[230] Ibid.
[231] "A Strategic Vision for the 21st Century" (Government Printing Office, December 1, 2004), 4, http://www.gpo.gov/pdfs/congressional/04strategicplan.pdf.

operational continuity for the system"[232] due for completion in December 2010, at which point "FDsys will completely replace GPO Access and become the new system of record."[233]

Following the GPO Access Act, the E-Government Act of 2002 "was the most comprehensive piece of legislation on e-government to date," aimed at meeting the public's expectation of "ever better and more user-friendly access to its government."[234] In part, this act emphasized improving "the methods by which government information, including information on the internet, is organized, preserved, and made accessible to the public," requiring agencies to "determine which Government information the agency intends to make available and accessible to the public on the internet … [and] develop priorities and schedules for making that Government information available and accessible."[235] In implementing this act, the OMB instructed agencies "when disseminating information to the public-at-large [to] publish your information directly to the internet. This procedure exposes information to freely available and other search functions and adequately organizes and categorizes your information."[236]

But while digital accessibility is now relatively ubiquitous for current digital information, significant amounts of historical collections remain only available in print form (or, in some cases, only be available digitally through a third-party subscription product), and "given the poor state of the discovery environment for the pre-1976 historical collection, the aphorism 'if it's not online, it doesn't exist' holds even more strongly for government information than it does for almost all other library collections. As a result, the valuable historical collections of government information that exist only in print have gone increasingly underutilized."[237] Although "in 2004, GPO proposed digitizing all retrospective Federal publications back to the earliest days of the Federal Government… [and] issued an RFP in 2008 for a cooperative relationship with a public or private sector participant or participants where the uncompressed, unaltered files created as a result of the conversion process would be delivered to GPO at no cost to the Government, for ingest into GPO's Federal Digital System (FDsys)," GPO was unable to award this contact.[238] Subsequently, GPO stated that its "focus for digitization will be on coordinating projects among institutions, assisting in the establishment and implementation of preservation guidelines, maintaining a registry of digitization projects, and ensuring that there is appropriate bibliographic metadata for the titles in the collection."[239]

[232] Selene Dalecky and Lisa LaPlant, "FDsys Update" (presented at the Depository Library Council Meeting & Conference, Arlington, VA, October 19, 2010), http://www.fdlp.gov/home/repository/doc_download/1767-fdsys-update.
[233] "GPO Access to FDsys Migration" (Government Printing Office, October 18, 2010), http://www.fdlp.gov/home/repository/doc_download/1740-gpo-access-to-fdsys-migration.
[234] McDermott, "Building Open Government."
[235] Ibid.
[236] Clay Johnson III, "Improving Public Access to and Dissemination of Government Information and Using the Federal Enterprise Architecture Data Reference Model (OMB Memorandum M-06-02)," n.d., http://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2006/m06-02.pdf.
[237] Roger Schonfeld and Ross Housewright, "Documents for a Digital Democracy: A Model for the Federal Depository Library Program in the 21st Century," December 17, 2009.
[238] FDLP Listserv, "GPO & Digitization of Historical Depository Collection," October 7, 2009.
[239] Ibid.

Several libraries – individually or in collaborative efforts – are leading their own efforts to digitize historical government publications. For example, the TRAIL (Technical Report Archive and Image Library) project is a collaboration of the Greater Western Library Alliance and the Center for Research Libraries to digitize a substantial number of historic federal technical reports.[240] GPO lists many such projects in its "Registry of U.S. Government Publication Digitization Projects" (http://registry.fdlp.gov).

In addition to these targeted programs, "the libraries of the CIC universities are partnering with Google to digitize a comprehensive collection of U.S. Federal Documents. It is believed this collection will comprise between 1 and 1.5 million volumes. Digital facsimiles of successfully scanned Federal Documents from CIC institutions will be accessible through Google Book Search, with copies also being returned to the HathiTrust Digital Repository, where public domain material can be universally accessed."[241]

Finally, several government agencies, including the National Agricultural Library and the U.S. Geological Survey, themselves are undertaking programs of digitization of their own historic publications.[242]

## Other sources of government information

Some materials made available through the FDLP are hosted outside FDsys through content partnerships with agencies or other content providers. Although typically this takes the form of an agreement with an agency to maintain certain materials on the agency's web site and provide them to GPO in the event of their removal, some materials are hosted under other kinds of arrangements. For example, in 2009 GPO announced a "new partnership with the Association of Schools of Public Health (ASPH) to provide electronic access to Public Health Reports. Public Health Reports is the official journal of the U.S. Public Health Service but is published by ASPH;" under this partnership, Public Health Reports is made freely available to registered depository libraries (via a set of login credentials), but carries a fee for non-depository users.[243]

In addition to the FDLP, there are several other federal depository programs that focus on specific categories of government information. For example, the National Network of Libraries of Medicine coordinates with medical libraries nationwide to "advance the progress of medicine and improve the public health by providing all U.S. health professionals with equal access to biomedical information and improving the public's access to information to enable them to make informed decisions about their health,"[244] and the US Patent and Trademark Office coordinates a network of depository libraries that "receive and house copies of U.S. patents and patent and trademark materials, to make them freely

[240] Maliaca Oxnam, "Capturing America's Scientific History through Technical Report Literature," *Focus on Global Resources* 30, no. 1 (Fall 2010), http://www.crl.edu/focus/article/6780.
[241] "CIC-Google Government Documents Project," n.d., http://www.cic.net/Home/Projects/Library/BookSearch/Govdocs.aspx.
[242] "Federal Agencies Digitization Guidelines Initiative," n.d., http://www.digitizationguidelines.gov/stillimages/organizations.html.
[243] "Electronic Access to Public Health Reports," n.d., http://www.fdlp.gov/component/content/article/45-partnerships/503.
[244] "NN/LM: About Us," n.d., http://nnlm.gov/about/.

available to the public, and to actively disseminate patent and trademark information."[245] Many or all of the materials disseminated through these programs may also be distributed through the FDLP, but these sorts of more targeted programs allow libraries with more focused needs to play a part in a more specialized arrangement for facilitating access to certain types of government information. The organization and structure of other depository library programs will be covered in the existing library networks research paper, which is a subsequent stage of this project.

Supplementing these depository programs, there are a number of independent sales programs that package and sell certain types of government information to the public broadly, serving non-depository libraries as well as a wider range of non-library clients. For example, the National Technical Information Service supports a sales program that sells individual reports and other publications to clients worldwide, enabling end users to purchase their own copies of desired publications if a library copy is insufficient for their needs.[246] Several other targeted sales programs exist, aiming to fill niches of demand not addressed by the FDLP or other depository or dissemination programs.

Although the FDLP is the formal mechanism through which government publications are made available to the public, "fugitive documents" – materials self-published by government agencies without going through GPO – have been identified as a perennial problem that have been exacerbated in the digital age. According to Durant, "the FDLP has never encompassed the entire universe of government publications. In fact, it has been estimated that up to 50% of print government publications are 'fugitives,' i.e., not distributed by the FDLP. Typically, tangible fugitive documents were a result of government agencies making their own printing arrangements without going through GPO. Many executive branch agencies, in particular, have long believed that they have no need to respond to the dictates of GPO."[247] The LostDocs project enables "federal publications which have NOT been cataloged and/or disseminated through the Federal Depository Library Program (FDLP)" to be reported to GPO so they can be "cataloged and archived so their contents are not lost to history."[248] Today, many new government publications never make it to GPO but are instead self-published by the producing agencies in digital form, hosted on their own websites according to their own policies and procedures and without a partnership agreement with GPO.[249]

In addition to the several ways in which the government itself directly makes information available to the public, both formally via the FDLP or informally via self-published "fugitive documents," there also exist a variety of third-party, non-governmental sources which provide government information to the public, often tailored to a specific audience and with supporting tools for discovery and use. This ecosystem includes both commercial and non-profit programs. Such external service providers have long

[245] "History and Background," n.d., http://www.uspto.gov/products/library/ptdl/background/index.jsp.
[246] "Ordering Methods," n.d., http://www.ntis.gov/help/ordermethods.aspx.
[247] David Durant, "The Federal Depository Library Program: Anachronism or Necessity?," *North Carolina Libraries* 62, no. 1 (Spring 2004): 30-39.
[248] "About « Lost Docs Blog," n.d., http://lostdocs.freegovinfo.info/about/.
[249] Linda D. Koontz, "Government Printing Office: Technological Changes Create Transformation Opportunities" (General Accounting Office, April 24, 2004), 11, http://www.gao.gov/new.items/d04729t.pdf.

played a role in the government documents ecosystem, although they are outside the scope of the FDLP.

Because of the high value of legal information, and the presence of a well-funded corporate law sector, legal information offers a particularly vivid example. A number of firms have built businesses around value-added legal information services for the professional and academic law communities, including especially LexisNexis and WestLaw. In this context, the Legal Information Institute has dedicated itself to the vision that "everyone should be able to read and understand the laws that govern them, without cost."[250] More recently, the leadership behind Public.Resource.Org has coordinated discussions about a proposed law.gov initiative, which would be a "distributed repository of all primary legal materials in the United States."[251] In addition to making both historical and present-day legal information available freely online, in some ways these services could function as building blocks for new value-added services of the type provided by Lexis and West.

Beyond the legal landscape, there has been a significant amount of private-sector digitization of government documents, including Readex's Serial Sets product, LexisNexis's Congressional service (which includes the Serial Set and many materials from the last several decades), and ProQuest's Monthly Catalog of US Government Publications 1895-1976. While these digitization projects are often licensed by FDLP members (albeit differentially relative to their resources), they cannot be considered components of the FDLP because they are not freely available.

## Open & transparent government

Making the workings of government accessible to the public has long been a priority in the United States, reflecting a belief that "in order to hold government accountable for its actions, citizens must know what those actions are."[252] In recent years, however, interest in "open and transparent government" has grown substantially, both within government and within the broader community.

This movement has not only focused on increasing the amount of government information made publicly available, but has emphasized the importance of making government information not just theoretically accessible but actually useful. Brito catalogs several ways in which "statutory requirements for disclosure do not take Internet technology into account,"[253] listing examples of government information that is made public only to those who visit a certain office during business hours or mail in a formal request, arguing that in a digital age it should be a reasonable expectation that this information "be just a web search away."[254] Furthermore, there is an increasing emphasis on making government information "available in an easily accessible form."[255] This reflects both a point of view that "if data is difficult to search for and find, the effect might be the same as if it were not online" and that "to allow users to exploit the full potential of the Internet–to subscribe to data streams and to mix and match

[250] "Legal Information Institute at Cornell Law School," n.d., http://www.law.cornell.edu/.
[251] "Law.Gov: America's Operating System, Open Source.," n.d., http://resource.org/law.gov/.
[252] Brito, "Hack, Mash, & Peer: Crowdsourcing Government Transparency."
[253] Ibid.
[254] Ibid.
[255] Ibid.

data sources–data must be presented in a structured machine-readable format."[256] Open government advocates have developed "ten principles that provide a lens to evaluate the extent to which government data is open and accessible to the public: … completeness, primacy, timeliness, ease of physical and electronic access, machine readability, non-discrimination, use of commonly owned standards, licensing, permanence and usage costs."[257]

President Obama has made transparency in government a major emphasis for his administration, calling for an end to the "culture of secrecy in Washington, where information is locked up, taxpayer dollars disappear without a trace, and lobbyists wield undue influence."[258] Obama's "Transparency and Open Government" memorandum, one of his first acts as president, committed his administration to "work together to ensure the public trust and establish a system of transparency, public participation, and collaboration," out of a belief that "openness will strengthen our democracy and promote efficiency and effectiveness in Government."[259] The White House later issued an "Open Government Directive," which instructed executive department agencies to take "specific actions to implement the principles of transparency, participation, and collaboration set forth in the President's Memorandum."[260]

For example, this directive tasked agencies with identifying datasets they could make available via the administration's data.gov platform for making government data publicly accessible. Data.gov is a major administration effort "to improve access to Federal data and expand creative use of those data beyond the walls of government by encouraging innovative ideas (e.g., web applications). Data.gov strives to make government more transparent and is committed to creating an unprecedented level of openness in Government. The openness derived from Data.gov will strengthen our Nation's democracy and promote efficiency and effectiveness in Government."[261] Although data.gov principally emphasizes supporting the innovative reuse of government information, other government data transparency efforts are more focused on supporting accountability; for example, recovery.gov is meant to "give taxpayers user-friendly tools to track Recovery funds – how and where they are spent – in the form of charts, graphs, and maps that provide national overviews down to specific zip codes. In addition, the site offers the public an opportunity to report suspected fraud, waste, or abuse related to Recovery funding."[262]

GPO has embraced the Obama Administration's initiative, with the Public Printer proposing various ways that GPO could serve to support it.[263] Soon thereafter, a very high-profile White House announcement

[256] Ibid.
[257] "Ten Principles for Opening Up Government Information" (Sunlight Foundation, August 11, 2010), http://sunlightfoundation.com/policy/documents/ten-open-data-principles/.
[258] "About Open Government," n.d., http://www.whitehouse.gov/open/about.
[259] Barack Obama, "Transparency and Open Government," January 21, 2009, http://www.whitehouse.gov/the_press_office/Transparency_and_Open_Government/.
[260] Peter R. Orszag, "Open Government Directive" (Office of Management and Budget, December 8, 2009).
[261] "Data.gov - About," n.d., http://www.data.gov/about.
[262] "Recovery.gov - About Recovery.gov," n.d., http://www.recovery.gov/About/Pages/Recoverygov.aspx.
[263] http://www.gpo.gov/pdfs/news-media/letter_030909.pdf

launched the "Federal Register 2.0," available in re-mixable XML format from data.gov as well as gpo.gov.[264]

Although the government has made significant strides in making government information more broadly accessible, many outside actors have also taken steps to make government information of all sorts more accessible and useful to a broader audience. For example, the Legal Information Institute, hosted at the Cornell University Law School, "believes everyone should be able to read and understand the laws that govern them, without cost," and "[carries] out this vision by: Publishing law online, for free; Creating materials that help people understand law; [and] Exploring new technologies that make it easier for people to find the law;"[265] other efforts like Public.Resource.Org exist "with the broad intent of building 'public works' accessible via the network, and with the specific plan to force the federal government to make information more publicly accessible."[266]

In some cases, initiatives emphasize adding structure to available government data in order to make it more useful. Brito catalogs a number of examples of such added-value services that aim to make government information that is already available more useful, including the Washington Post's U.S. Congress Votes Database, GovTrack.us, LOUIS, MetaVid, and OpenSecrets.org.[267] These initiatives stem from the fact that much government information is only available in difficult-to-use formats, and their "most important contribution … may not be the accessibility they provide to individual users, but the fact that their hacked data is offered in a structured and open format. This allows yet other third parties to tap into the now useful data and create new applications."

The complexity associated with making government information into a useful structured format and the wide range of potential uses to which such data could be put has convinced some advocates that "the federal government's primary objective as an online publisher is to provide data that is easy for others to reuse, rather than to help citizens use the data in one particular way or another."[268] This approach demonstrates a belief that "Government must provide data, but … Web sites that provide interactive access for the public can best be built by private parties," especially given the rapidly shifting nature of technological innovation.[269]

Transparency advocates have built a variety of innovative services on top of government data for a variety of purposes. For example, MAPLight.org "mashes together congressional voting data from GovTrack.us and campaign finance information from OpenSecrets.org, in addition to information from other sources. The result is a searchable database that highlights the connections between campaign

[264] http://www.whitehouse.gov/the_press_office/White-House-Announces-Federal-Register-20-Transforming-the-Chronicle-of-the-Executive-Branch-for-the-21st-Century/
[265] "LII | Legal Information Institute at Cornell Law School," n.d., http://www.law.cornell.edu/.
[266] John Markoff, "A Quest to Get More Court Rulings Online, and Free," *New York Times*, August 20, 2007, http://www.nytimes.com/2007/08/20/technology/20westlaw.html.
[267] Brito, "Hack, Mash, & Peer: Crowdsourcing Government Transparency."
[268] David Robinson et al., "Government Data and the Invisible Hand," *Yale Journal of Law & Technology* 11, no. 160 (2009), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1138083.
[269] Ibid.

contributions and how members of Congress vote."[270]Other services emphasize making existing materials more useable, such as "OpenCongress.org … [which] takes bill and vote data from GovTrack.us and mashes it with data feeds from blogs and mainstream news sources; so that one can pull up a page for a bill or a legislator and see news stories and blog posts that mention the bill and/or legislator."[271]

There is some skepticism about the value of the "naked transparency movement," as constitutional scholar Lawrence Lessig terms it; although recognizing that "there is no questioning the good that transparency creates in a wide range of contexts, government especially," Lessig warns that "we should also recognize that the collateral consequence of that good need not itself be good." Lessig emphasizes that "not all data satisfies the simple requirement that they be information that consumers can use, presented in a way they can use it," and suggests that information without interpretation or context may lead to "ignorance [which] produces predictable and huge misunderstandings," and "will simply push any faith in our political system over the cliff."[272]

In addition to the broad movement to encourage transparency in government, the burgeoning "Government 2.0" movement suggests that web technologies may also help to more directly engage the public in the work of government. This concept, which builds on the idea of web 2.0, is that the government would become "a platform for innovation … supply[ing] raw digital data and other forms of support for private sector innovators to build on top of."[273] In addition to using web tools to increase government transparency and access to government information, some feel that web tools can "[help] policy makers in our government take advantage of the expertise of their fellow citizens," resulting in "a government that uses the web not just to talk to citizens, but to listen to them."[274] Although "crowdsourcing" government has had "mixed results,"[275] the notion that "government does not have a monopoly on the best ideas" has grown increasingly entrenched in Washington.[276]

## The internet, American government, and the public

As Americans have come to integrate the internet more deeply into all aspects of their daily lives, they have also come to expect the internet to play a major role in their engagement with their local, state, and federal government. According to Pew, "most Americans expect their government to make information and services available online. Seven in ten (70%) say they expect to be able to get information or services from the government agency website when they need it. Only 23% do not expect that."[277] The shift towards more online interactions with government also drives concerns about

[270] Brito, "Hack, Mash, & Peer: Crowdsourcing Government Transparency."
[271] Ibid.
[272] Lawrence Lessig, "Against Transparency: The perils of openness in government," *The New Republic*, October 9, 2009, http://www.tnr.com/print/article/books-and-arts/against-transparency.
[273] Marshall Kirkpatrick, "How Tim O'Reilly Aims to Change Government" (ReadWriteWeb, August 20, 2009), http://www.readwriteweb.com/archives/how_tim_oreilly_aims_to_change_government.php.
[274] "Expert Labs," n.d., http://expertlabs.org/.
[275] John M. Kamensky, "Crowdsourcing Government Reform" (ICM Center for the Business of Government, July 15, 2010), http://www.businessofgovernment.org/blog/crowdsourcing-government-reform.
[276] Alex Howard, "Collaborative innovation in open government: Is there an app for that?," August 30, 2010, http://gov20.govfresh.com/collaborative-innovation-in-open-government-is-there-an-app-for-that/.
[277] Estabrook, Witt, and Rainie, "Information Searches That Solve Problems."

the digital divide, and the impact of lack of access to the internet on ability to engage with government; "29% of Americans believe that lack of broadband is a 'major disadvantage' when it comes to using government services. Some 27% think lack of access is a 'minor disadvantage' and 37% think it is 'not a disadvantage.'"[278]

Americans make heavy use of the internet to seek out government information. In 2010, Pew found that "fully 82% of internet users (representing 61% of all American adults) [had] looked for information or completed a transaction on a government website" in the previous year.[279] Most relevantly, "fully 40% of online adults went online in the preceding year to access data and information about government;" more specifically, "23% of online adults looked online to see how money from the recent stimulus package was being spent; 22% downloaded or read the text of legislation; 16% visited a site that provides access to government data, such as data.gov, recovery.gov or usaspending.gov; 14% looked for information on who contributes to the campaigns of their elected officials."[280] According to Pew,

> "nearly four in five internet users (78%) have visited government websites to seek information or assistance. They most commonly visit a local, state or federal government website: a total of 71% have done this, including 66% in the past year. About two in five (38%) have gone online to research official government documents or statistics, including 35% who have done it in the past year. About one in four (24%) have gone online to get advice or information from a government agency about a health or safety problem and 22% have gone online to get information about, or apply for, government benefits."[281]

In addition to seeking government information, Americans also use the internet to engage with and discuss their government; "nearly one third (31%) of online adults use online platforms such as blogs, social networking sites, email, online video or text messaging to get government information," and "nearly one quarter (23%) of internet users participate in the online debate around government policies or issues, with much of this discussion occurring outside of official government channels."[282]

## Government information services

In this rapidly changing environment, the government information services provided by libraries have also shifted, as libraries develop new roles and seek to form new partnerships to more effectively serve the needs of the public.

[278] Smith, "Home Broadband 2010."
[279] Aaron Smith, "Government Online" (Pew Internet & American Life Project, May 27, 2010), http://pewinternet.org/~/media//Files/Reports/2010/PIP_Government_Online_2010_with_topline.pdf.
[280] Ibid.
[281] Estabrook, Witt, and Rainie, "Information Searches That Solve Problems."
[282] Smith, "Government Online."

Public libraries in particular have taken on an important set of new roles "different from traditional government documents provision,"[283] filling important roles in "e-government." For example, Jaeger and Bertot list six major categories of e-government activities performed by libraries: "formal and informal e-government training;" "e-government web resources;" "e-government support services;" ""librarians hired specifically to coordinate and oversee e-government services and education;" "e-government partnerships through which libraries and agencies work together;" and "e-government development for local government agencies." These roles are highly valued by Americans – even those who have are technically able to reach government information independently often "not only seek access to e-government at the public library because access is available, but also because they know that they can get help using it and they trust the help that they will receive there."[284]

But as Jaeger and Bertot point out, "the process of moving government service provision, such as completing forms, from the government agencies to libraries is a tremendous shift in the social roles of both government agencies. Further, the new role of libraries to ensure that citizens can communicate with government agencies via email and other electronic means is a second major responsibility added to libraries by e-government."[285] As public libraries take on more and more multi-faceted roles in supporting the government information needs of their patrons, the library community will need to develop new strategies that go beyond "the public library's traditional role as a provider of government information."[286]

One major trend in library government information service provision in recent years has been the "mainstreaming" of government information, as libraries increasingly move away from offering access to government documents and support services via a discrete service point and towards integrating government information into their existing reference infrastructure. Although "in theory, government publications should be treated like any other resource and integrated into the collection by subject… economic necessity often required segregating government documents collections and reference services due to the high volume of publications distributed through the FDLP throughout the twentieth century." More recently, studies indicate that "the majority of FDLP institutions now provide government information reference assistance as part of an integrated service point."[287]

The underlying goal of mainstreaming – bringing government information into normal workflows rather than requiring users to seek it out independently – also underlies a recent movement to make government information services available more broadly across the library community, building awareness and expertise on the topic among libraries that may not have historically considered government information a part of their purview as non-participants in the FDLP.

[283] Paul T. Jaeger and John Carlo Bertot, "E-government Education in Public Libraries: New Service Roles and Expanding Social Responsibilities," *Journal of Education for Library and Information Science* 50, no. 1 (Winter 2009).
[284] Ibid.
[285] Ibid.
[286] Ibid.
[287] Joseph A. Salem Jr., "The Way We Work Now: A Survey of Reference Service Arrangement in Federal Depository Libraries," in *The Changing Face of Government Information: Providing Access in the Twenty-Frist Century* (The Haworth Information Press, 2006).

Helping constituents access government information and services, which includes both assistance in connecting with government online as well as via more traditional means, is a very important role for public libraries; "almost 88 percent report that access to government information and services is either very important or most important, rising in importance by nearly 27 percent from last year… About 89 percent of suburban, 88.5 percent of rural, and 82 percent of urban libraries report that access to government information and services is either very important or most important."[288] Specifically, "88.8 percent [of libraries] provide as-needed assistance to patrons for understanding how to access and use e-government Web sites. Libraries (78.7 percent) provide assistance to patrons applying for or accessing e-government services. About 63.3 percent indicate that staff provide assistance to patrons for completing government forms." [289] But relatively fewer public libraries have staff with significant expertise in this area; "nearly 32 percent of urban libraries indicate that at least one staff member has significant knowledge and skills in the provision of e-government services, and 26.4 percent of urban libraries indicate that they are partnering with government agencies and others to provide e-government services," suggesting that the majority of these libraries lack staff devoted to this topic.[290] And "nearly 59 percent of libraries report that they do not have enough staff to effectively help patrons with their e-government needs and 52.7 percent report that their library staff does not have the necessary expertise to meet patron e-government needs." [291]

This skills gap is widely recognized, and many in the library community view it as an increasingly important challenge in a digital era. Recognizing that "library patrons do not think in terms of 'government information.' They simply want information and do not care about the source," a forum at the American Library Association 2009 Annual Conference concluded that "knowledge of government information and services is crucial for all librarians. Government information is no longer the province of 'government information specialists' or of any one segment of the American Library Association. Nor can government information remain defined as the print publication distribution of the Federal Depository Program."[292] Efforts such as the IMLS-funded "Government Information in the 21st Century (Gi21) project, a continuing education program to train reference and public service librarians in Arizona, Colorado, New Mexico, Utah and Wyoming in the use of electronic government information"[293] – including both non-specialist librarians at FDLP member libraries as well as librarians at non-member libraries – have sought to raise awareness of government information and develop skills among non-specialist librarians, in order to provide a first line of assistance with government information to a broader swath of the public and to help librarians understand where to turn for specialist assistance.

[288] "Public Library Technology Landscape."
[289] Ibid.
[290] Ibid.
[291] Ibid.
[292] "Government Information: A Topic for All Librarians," July 10, 2009, http://www.cosla.org/documents/kb/Government%20Information%20Forum%20report%20gaw%20corr3%20sep%204%202009.pdf.
[293] "Government Information in the 21st Century - IMLS Final Report," December 22, 2008, http://www.webjunction.org/gi21/-/articles/content/35603072.

In addition to such training efforts, a set of organizations has partnered with GPO to offer "a virtual reference desk for government information."[294] This is conceived both as a model to connect "patrons with questions and government libraries than can supply the answers" and as a set of important future roles for government information specialists; as project founder John Shuler put it, "anybody can figure out what's going to happen with the GPO…it's moving to a depository system that isn't based on collections but on service."[295]

### Local digital initiatives in government information

In addition to participation in the FDLP, many libraries and library organizations have launched innovative digital services and built essential digital collections around government information. In some cases, these efforts seek to address materials that would otherwise fall through the cracks of more formal programs, and in other cases, to bring together government information in the creation of value-added services.[296]

One critical concern shared by many libraries about the transition of the FDLP to a principally digital model for new publications has been that digital publications, held centrally in FDsys, would lack the tamper-resistance and tamper-evidence of a distributed network of print publications held independently. Drawing on the argument that digital integrity is ultimately dependent on trust, some in the library community lack trust that GPO will be able to adequately secure the integrity of the digital materials it hosts, preferring redundant independent collections in the hands of trusted entities, arguing that "there are myriad reasons why a distributed digital preservation system for government information is necessary. Among them are: protection from natural disaster, server outage, etc.; assurance of authenticity; prevention of surreptitious withdrawal or tampering of information; and building local services for local collections."[297] Although GPO has developed technical measures to preserve and maintain the integrity of its collections, some have argued that the risks of government information being altered or withdrawn are too high to allow GPO to be exclusively trusted with maintaining the integrity of these collections.[298]

Responding to these concerns, in June 2010, GPO joined the LOCKSS Alliance, and "has put LOCKSS permission statements … throughout the FDsys.gov site in order for LOCKSS-USDOCS to harvest GPO content."[299] This enables the "USDocs" private LOCKSS network to store government information published via FDsys "in geographically distributed sites and replicated many times. Citizens have

[294] Michael Rogers, "Illinois Libraries/OCLC Tackle Government Information Online," *Library Journal*, June 1, 2005, http://www.libraryjournal.com/lj/ljinprint/currentissue/868416-403/illinois_librariesoclc_tackle_government_information.html.csp.
[295] Ibid.
[296] Several of the initiatives profiled here were first suggested to us by James A. Jacobs in a blog post. Jacobs, "Who Do You Serve and What Do You Do?: Defining Your Role to Ensure the Future of Our FDLP." http://freegovinfo.info/node/3103
[297] Daniel Cornwall and James R. Jacobs, "Distributed Globally, Collected Locally: LOCKSS for Digital Government Information," *Against the Grain* 21, no. 1 (February 2009).
[298] Ibid.
[299] James R. Jacobs, "GPO joins LOCKSS: digital deposit a reality" (Free Government Information, June 15, 2010), http://freegovinfo.info/node/3017.

oversight and responsibility for the long-term care and maintenance of the content. All these characteristics mean the content will be preserved so that any alteration of the content (either deliberate or accidental) will be detected and repaired."[300] Given its emphasis on the distribution of digital content to libraries, LOCKSS is frequently cited as a mechanism for providing "digital deposit" of government publications in FDLP member libraries (not currently a formal provision of the Program), although some also see the need for a more fully developed infrastructure between GPO and depository libraries to bring "digital deposit" into fruition.[301]

Many libraries have focused on building and providing access to collections of materials that would either otherwise be lost or unavailable in digital form. A significant amount of government information does not find its way into official channels for dissemination and preservation – "fugitive documents," in the parlance of the FDLP, or simply materials that are of continuing public interest but do not fit within formal parameters of programs for long-term preservation – and many libraries have taken upon themselves the responsibility of capturing and maintaining these at-risk materials. Glenn highlights two major preservation-oriented rationales for such collections development: "to capture materials in danger of disappearing" and "to capture a particular event, or moment in time" (as well as "to build a collection of similar or related materials," which will be discussed later).[302] The Legal Information Archive of the Chesapeake Project, hosted by Georgetown Law School, shares a common motivation with many other projects of this type, recognizing that "the average lifespan of a Web site is 44 to 75 days;" this project has tracked "link rot" in its captured legal/government information, finding significant amounts of government information that is no longer readily available from its original source online.[303]

The CyberCemetery project, hosted by the University of North Texas Libraries, has performed efforts in both categories, capturing "government websites that have ceased operation (usually websites of defunct government agencies and commissions that have issued a final report)" [304] that might otherwise be lost to history as well as assisting in the performance of "end-of-term" harvests that capture government websites that might be lost in the transition to a new administration or Congress.[305] In 2003, the California Digital Library pursued an in-depth investigation of the challenges associated with the capture and archiving of digital government information, concluding that "no institution is able or willing to capture the entire government domain" and thus "redundant archiving practices promise to extend the breadth of web-based materials that are brought into persistently managed collections" and

[300] "U.S. Government Documents Private LOCKSS Network," n.d., http://lockss.org/lockss/Government_Documents_PLN.
[301] James A. Jacobs, "Questions and answers about the future of FDLP," October 13, 2010, http://freegovinfo.info/node/3108.
[302] Valerie D. Glenn, "Preserving Government and Political Information: The Web-At-Risk Project," *First Monday* 12, no. 7 (July 2007), http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/1917/1799.
[303] Anne Cassidy, "The Chesapeake Project: Preserving the Digital Future," *Res Ipsa Loquitur: Georgetown Law Alumni Magazine*, Fall/Winter 2009, http://www.law.georgetown.edu/alumni/magazine/2009-fall/feature-articles/chesapeake-1/.
[304] "UNT Libraries: CyberCemetery Home," n.d., http://govinfo.library.unt.edu/.
[305] Glenn, "Preserving Government and Political Information: The Web-At-Risk Project."

"meet a broader range of user requirements."[306] This conclusion underlies both CDL's later creation of the Web Archiving Service, which enables librarians and other curators to "capture, analyze and archive web sites and documents" and supports a number of captures of government information from the federal to the local level,[307] and the Internet Archive's Archive-It service,[308] through which a number of librarians are building collections such as Stanford's collections of local and state government information, Congressional Research Service reports, and more.[309]

Other libraries have prioritized efforts to bring online materials that would otherwise only be available in print form and so might be underutilized. For example, the Thurgood Marshall Law Library at the University of Maryland has begun a major project to "create a complete electronic record of United States Commission on Civil Rights publications held in the Library's collection and available on the USCCR Web site" through the digitization of historical documents. Many other libraries, alone or in groups, have similarly tackled the digitization of retrospective collections that would otherwise remain only accessible in print form.[310]

Other initiatives target state or local information, as in the case of the North Carolina Digital Repository, with the goal of "support[ing] instructional and research needs related to the history and culture of North Carolina by making many of the unique and valuable holdings of the State Archives and State Library of North Carolina accessible and searchable online."[311]

## Findings

[At this stage, we have intentionally omitted any treatment of findings or implications derived from the Environmental Scan, pending community contributions about omissions or mischaracterizations that we might want to take into account.]



[306] "Web-Based Government Information: Evaluating Solutions for Capture, Curation, and Preservation" (California Digital Library, November 2003), http://www.cdlib.org/services/uc3/docs/Web-based_archiving_mellon_Final.pdf.
[307] "Web Archives: yesterday's web; today's archives," n.d., http://webarchives.cdlib.org/.
[308] "Archive-It.org," n.d., http://www.archive-it.org/.
[309] "Archive-It.org - Partner - Stanford University, Social Sciences Resource Group," n.d., http://www.archive-it.org/public/partner.html?id=159.
[310] "Registry of U.S. Government Publication Digitization Projects," n.d., http://registry.fdlp.gov/.
[311] "North Carolina Digital Repository: About Us," n.d., http://digitalstatelibnc.cdmhost.com/cdm4/about.php.

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