U.S. Public Libraries and the Use of Web Technologies, 2010

A Closer Look

April 2011

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LRS
Library Research Service

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Improving Academic Achievement

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Executive Summary

This study records the landscape of web technology adoption in public libraries across the country and examines the characteristics of libraries that are leading the way in adopting those technologies.

It's well known that technology is changing at an increasingly rapid pace and that many public libraries throughout the United States are attempting to adopt new technologies to better reach their patrons. In trade journals, blogs, and at library conferences, professionals in the field have continually discussed the best methods for using web technologies to enhance the success of the public library. In keeping with this discussion, in late 2007 the Library Research Service (LRS) designed the first iteration of the *U.S. Public Libraries and the Use of Web Technologies* study. In the midst of a conversation largely focused on best practices, this study was envisioned from its inception as a longitudinal study with several goals. Primarily, it attempts to record the landscape of web technology adoption by public libraries in the United States. While most of the discourse thus far has focused on what should and should not be done to better use technologies, there has not yet been much research examining how and how many libraries actually *are* adopting various web technologies. This study attempts to put that in perspective. Another intention of this study is to examine the characteristics of the libraries that are adopting technology in an attempt to tease out the factors that lead them to try out various tools. We are also interested in determining whether or not the adoption of specific types of technology leads to "success" as traditionally defined in public libraries. This report represents the second iteration, and refinement, of the study. It captures a changing landscape of web technology adoption by public libraries and looks further into the characteristics and successes of libraries that adopt technology.

The first iteration of this study found relatively low adoption levels of more interactive web technologies, despite the popularity of "Web 2.0" themes in the national literature and conference dialog. Depending on the type of technology, the increase in adoption rate for public libraries ranged from very little, if any, to incredible leaps and bounds. The area that was most embraced during the two years between studies was social networking, especially among the largest libraries. Most notably, the social networking site Facebook moved from a relative non-factor to near ubiquity in large libraries: for libraries serving communities of at least 500,000 people, the ratio of those with a Facebook presence jumped from barely one in ten in 2008 (11%) to 4 out of 5 (80%) in 2010. Similar, though less drastic increases were found in libraries serving other population groups, and the estimated percentage of all public libraries in the United States to have a Facebook presence rose nine-fold, from only 2 percent in 2008 to 18 percent in 2010. Libraries' use of other social networking sites, such as the photo-sharing site Flickr, saw large increases also well. During this study, researchers also looked for the presence of a web site directed at mobile users. Very few public libraries were targeting mobile users online at the time of the study, but outreach to mobile technologies seems like an area potentially poised for an explosion similar to that of use of social networking sites. Whereas a few years ago social media was a topic of heavy discussion at conferences and in library literature, the current topic du jour

Facebook presence in libraries serving more than 500,000 jumped from 1 in 10 in 2008 to 4 in 5 in 2010.

tends to be mobile devices. Most notable is a series of virtual conferences, such as Handheld Librarian, dedicated specifically to mobile devices.

More traditional public library web technologies, such as web presence and online account access, seem to have plateaued. Nearly all libraries that serve over 25,000 people already had some of these basic services by 2008, so there was not much room for growth. Based on our research, the smallest libraries did not see much increase in basic online services, either. In fact, a lower percentage of libraries serving fewer than 10,000 people had a web presence at all during this iteration of the survey, as compared with 2008 (73% vs. 71%). Some of the standard but slightly more interactive web technologies, such as email reference and blogs, tell a similar story to that of basic web services in that they showed little, if any, growth among most population groups. One of the few exceptions was in social media, which saw exponential increases across the board; other than that, it was primarily the largest libraries (those serving more than 500,000) that demonstrated substantial increases in their adoption rates. In fact, greater technology adoption among the largest libraries in the country was a general theme in comparing the overall public library web technology landscape between 2008 and 2010. Instead of a flattening of the percentages of libraries adopting certain technologies across the board, it seems that the gap between big and small libraries is growing in terms of the technology offered on their websites.

Most basic web technologies did not show much increase, if any, across the board since 2008. The majority of the growth was concentrated in the largest libraries.

Just as in the first version of the study, libraries that were in the top twenty percent of their population group based on the number of technologies adopted were labeled "Early Adopters." The most recent public library statistical data available (2008) from the Institute of Museum and Library Services (IMLS), indicates that libraries we identified as Early Adopters again fared much better on traditional statistical measures than their peers, both in terms of inputs and outputs. Early Adopters were better funded and better staffed than other libraries and also saw greater outputs in visits, circulation, and programming. The major inference from this analysis is that public libraries that have been successful in the past, when measured by traditional means, have also chosen to put resources into the adoption of new web technologies.

Libraries that top their population groups in web technology adoption report higher revenue and staffing levels than the rest of the libraries. In addition, between 2003 and 2008, these libraries – the Early Adopters – saw greater increases in visits and circulation, even when controlling for expenditures.

Revisiting the observational data from the first iteration of the study, researchers found that libraries identified as Early Adopters in 2008 saw significantly greater increases in visits and circulation between 2003 and 2008 than their peers who had not been as active in the adoption of these technologies. Regression analysis suggests that, even when controlling for staff and collection expenditures, adoption of web technologies is a predictor of these increases.

Introduction

The national sample comprised 584 libraries from across the country, and researchers also studied the websites of the remaining 105 Colorado libraries, for a total of 689.

In 2008, researchers at the Library Research Service (LRS) undertook the *U.S. Public Libraries and the Use of Web Technologies*[1] study, with the intent to document the use of various Internet technologies on the websites of public libraries throughout the nation. The results of that study set a baseline for the adoption of web technologies nationwide by studying a stratified random sample of public library websites throughout the United States, and included a Colorado-specific section, with all public libraries in Colorado analyzed. From its inception, the *U.S. Public Libraries and the Use of Web Technologies* study was conceived as a longitudinal study, with plans to revisit the sample libraries at regular intervals to track the changing nature of technologies on the web sites of public libraries throughout the country and in Colorado. This report constitutes the results of the second iteration of the study.

In the vein of the first study, this version was conducted as a content analysis, as opposed to a survey to the field. Please see the first report for an explanation of the benefits and drawbacks to this methodology. During the spring of 2010, LRS staff members visited the web sites of 689 public libraries in the United States, searching for the presence of various technologies. The national sample was comprised of 584 libraries, while the remaining 105 were Colorado public libraries that had not been selected as part of the national sample.

The results included here represent a "snapshot in time" for each library. It is quite possible that a library adopted a specific technology shortly after we visited its web site. In such a case, for this study it will still be treated as not using the technology in question. Also possible, though less likely, would be libraries which abandoned technologies shortly after we visited their sites.

[1] Lietzau, Z. (2009) U.S. Public Libraries and the Use of Web Technologies (Closer Look Report). Denver, CO: Colorado State Library, Library Research Service.

Literature Review

Libraries and Web 2.0

For several years, the concept of Web 2.0 has been infiltrating the library world, sparking a movement that encourages librarians to reach out to patrons wherever they are and to address tech-savvy users' expectations of greater convenience and interactivity. While numerous variations on the theme of Library 2.0–that is, how libraries can incorporate Web 2.0 technologies and thinking into their services–may lead to perplexity over its successful implementation, many explanations emphasize a dedication to user-centered change, collaboration, and participation (Casey & Savastinuk, 2006; Holmberg, Huvila, Kronqvist-Berg, & Widen-Wulff, 2008; Kwanya, Stilwell, & Underwood, 2009; Maness, 2006; McClean, 2008).

Most descriptions of "Library 2.0" highlight the movement's focus on user-centered services, collaboration, and participation.

Librarians who plan to incorporate Web 2.0 applications on their websites should be ready to continually investigate emerging technologies that promote communication between librarians and users and that offer increased customization of the library experience. In addition, those responsible for maintaining Web 2.0 features must make a point of evaluating those services to ensure that they are offering what is useful to, and actually utilized by, patrons (Harinarayana & Raju, 2010; Kim & Abbas, 2010).

Some critics of the Library 2.0 model have identified it as a trend that represents a popular but impractical idea for many libraries (Crawford, 2006). One librarian even likens the term Web 2.0 to a good joke that is "never completely explicable," saying that the phrase should "not be subject to strict interpretation" (Joint, 2009, p. 169). These contradictory viewpoints have led to a perceived division between library professionals who favor adopting new and perhaps unproven Web 2.0 technologies and those who prefer not to invest resources in experimenting without knowing that their efforts will result in useful outcomes (Kwanya et al., 2009; Rutherford, 2008a). Furthermore, some argue that the central tenets of Library 2.0 are no different from what libraries have always attempted to do (Crawford, 2006; McClean, 2008). In other words, Library 2.0 could be nothing more profound than a "technology-enhanced progression of traditional library services and goals" to connect people and information (Chase, 2007, p. 7). Even if this statement is true, that does not mean Library 2.0 practices are unworthy of use or study.

Library professionals have contradictory views of the usefulness of Web 2.0 technologies for libraries; some see them as passing trends while others are willing to experiment with different tools.

In fact, despite these doubts and disagreements, Library 2.0 has persisted in capturing the attention of librarians and library staff, and increasingly of users as well. While a broader take on Library 2.0 characterizes the movement as a "culture of participation" extending beyond Web applications (Holmberg et al., 2008, p. 677) it is largely through Web 2.0 technologies that the user-library interactivity at the heart of the movement occurs (Casey & Savastinuk, 2007; Holmberg et al., 2008). Joint (2009) acknowledges that librarians cannot ignore the potential improvements that provision of Web 2.0 services could bring to their libraries, but cautions that simply accumulating the tools as they become available and popular could cause difficulties with workload, security, and intellectual property management (p. 173). With dozens of Web 2.0 applications to choose from, however, library

professionals have the option to weigh the necessary investments with the potential benefits before choosing which are appropriate for their purposes.

The continued presence and expansion of Web 2.0 features on library websites have prompted researchers to attempt to measure the extent and impact of their implementation. This endeavor has proven to be as multifaceted as the effort to define Library 2.0, however, and few studies thus far comprehensively describe adoption of Web 2.0 technologies by public libraries across the United States.

Current Research

Several studies reveal that tools such as blogs and RSS feeds—or those that involve more activity on the librarian's part—are most popular on library websites, while social media and other features like tagging, which require more user involvement, are less common.

Since the emergence of Web 2.0, conversation among library professionals has shifted from how these technologies potentially *could* be used in libraries to how they actually *are* utilized by staff and patrons. Nevertheless, the discussion of Library 2.0 has yet to translate into systematic study of what libraries are doing on a large scale. Of all library types, academic appears to be the most active in researching use of Web 2.0 tools in their institutions.

In a 2008 study, Harinarayana and Raju reviewed the websites of 57 of the top 100 university library websites around the world for their application of Web 2.0 technologies. Their findings reveal that RSS feeds and instant messaging are the most frequently utilized tools, while social networking sites are much less common. Another study of 82 academic libraries in New York State produces similar conclusions, adding blogs to the group of commonly used Web 2.0 tools (Xu, as cited in Harinarayana & Raju, 2008). While these and other studies tend to be limited in sample size or by geographic area, a more recent and larger study of U.S. academic library websites yields comparable results. Of 230 academic libraries across the country, nearly 3 in 4 used RSS feeds and 2 in 3 maintain a blog (Kim & Abbas, 2010). As in the aforementioned studies, Kim and Abbas (2010) recognize that the more popular Web 2.0 tools tend to be those primarily initiated and monitored by librarians, like blogs, rather than features that call for more active participation from users, such as tagging and bookmarking.

Most informative are studies that combine the early conceptual discussion about Web 2.0 with information on its current level of adoption. In addition to offering basic quantitative data on the percentage of academic libraries utilizing various Web 2.0 technologies, Kim and Abbas (2010) address other aspects of the Library 2.0 discussion, including evaluation. The authors claim that it is not enough for libraries to simply offer Web 2.0 tools; they must also examine which ones are actually utilized by patrons in order to increase user participation and make it worthwhile for librarians to maintain the Web 2.0 services (Kim & Abbas, 2010). Similarly, Harinarayana and Raju (2008) urge librarians to contemplate how adoption of Web 2.0 tools will improve service quality.

Many studies remind librarians that simply offering Web 2.0 technologies is not enough; they must evaluate their use and determine whether they are improving services.

In addition to these few large-scale studies, the academic literature includes many case studies on individual university libraries' experiences with Web 2.0 technologies. Joint (2010) describes one British university's experiment with virtual reference, detailing the conclusions library staff reached about its effectiveness and how they revised their approach to incorporating Web 2.0

functionality into the library system. Such reports contribute valuable practical information to the field by explaining the potential pitfalls of Web 2.0 services.

In special libraries, the research appears to be more limited. Nevertheless, the subject has caught the attention of medical and health sciences librarians, for example, who recognized early on that by ignoring technologies that have attracted users' interests they risk marginalization and missed opportunities to work collaboratively with both users and colleagues (Connor, 2006). In spite of this interest, most research in special libraries is still limited to theoretical discussion of the pros and cons of different tools and suggestions for implementation (Miranda, Gualtieri, & Coccia, 2010; O'Dell, 2010).

Public Library Research

While the research done in academic and special library settings can certainly offer insight into how libraries can and do use Web 2.0 tools, these institutions have goals quite distinct from those of a public library. Consequently, it is especially important for a study such as this one to investigate adoption of Web 2.0 technologies specifically within public library settings. Unfortunately, the literature in this area is lacking, tending toward case studies and broad narrative accounts that focus on one library's experience, use of a single tool, or annotated descriptions of what various tools do. In addition, few of these studies focus specifically on the United States. Little quantitative evidence is available on the extent to which U.S. public libraries as a whole have adopted various Web 2.0 tools.

One of the more comprehensive studies to date of Web 2.0 use in libraries includes both qualitative and quantitative information about 120 public and academic libraries in North America, Europe, and Asia (Chua & Goh, 2010). The researchers attempt to identify the prevalence of Web 2.0 tools on library websites, how the tools are used, and whether they enhance the quality of the websites. Similar to findings in other studies, blogs, RSS feeds, and instant messaging are the most common Web 2.0 tools, all of which require more involvement on the part of the librarian than the user (Chua & Goh, 2010). North American libraries are significantly ahead of their European and Asian counterparts in adopting Web 2.0 applications, particularly instant messaging and social networking. A slightly higher number of academic than public libraries are using the Web 2.0 tools included in the study, but the researchers found the website quality of public and academic libraries worldwide to be comparable when rated on a scale of 12 quality dimensions predetermined by the researchers, such as usability and ease of access. When split by geographic region, however, North American libraries' websites are of significantly higher quality than those in Europe and Asia, suggesting that the presence of Web 2.0 applications – particularly those enhancing information sharing (e.g. instant messaging, social networking), which showed the greatest degree of difference between libraries in North American and the rest of the world – have a positive influence on the website's overall quality (Chua & Goh, 2010, p. 209).

One study's findings suggest that the presence of Web 2.0 applications have a positive influence on library websites' overall quality.

In their study examining whether Library 2.0 training should be incorporated into LIS education, Mon and Randeree (2009) investigate the use of Web

2.0 technologies in 242 public libraries across the United States. A brief report of their findings notes that blogs, social networking sites, and RSS feeds were the most common Web 2.0 tools and that most libraries using them attempt to train their staff on the new technologies. Though the researchers admit that, due to the small sample size, the data collected cannot be generalized to all public libraries in the United States, they conclude that Web 2.0 technologies are sufficiently prevalent to necessitate "Library 2.0" training in LIS programs (Mon & Randeree, 2009).

Implementation of Web 2.0 technologies is an ongoing process that will likely require staff training, strategic planning, and flexibility in order to successfully manage various tools.

Not uncommon in the literature are accounts such as Cahill's (2009) description of the process the Vancouver Public Library underwent to develop an online presence that would be meaningful and relevant to patrons. In describing the library's decision to prioritize strategic management of its web presence and detailing how it uses and manages its chosen Web 2.0 tools, Cahill (2009) demonstrates how thoughtful implementation allowed the library to "enhance web services without sacrificing quality or control" (p. 140).

McClean's (2008) visits to nine public libraries in the U.S. offers similar, but less detailed descriptions of how the libraries were using various web technologies in 2007, with a brief update on the status of those services the following year. McClean (2008) makes no attempt to compare the libraries but does remark that for all them, investment in Web 2.0 applications is an ongoing process, concluding that "a library never reaches the Library 2.0 pinnacle" (p. 447). Similarly, Cahill (2009) describes a "perpetual beta state" that forces librarians to be flexible, responsive to user feedback, and prepared to adapt their use of Web 2.0 tools based on user needs (p. 148). Such qualitative information was the focal point of Rutherford's (2008b) investigation into public libraries' adoption of social software and the issues it raised. The author, intent on offering insight into how to develop a successful execution plan, discusses interview responses that revealed why librarians decided to implement Web 2.0 tools, how they adapted to the demands the technologies placed on staff and resources, and what hindered their success (Rutherford 2008b). Though Rutherford's observations are helpful for librarians interested in using Web 2.0 applications, her inclusion of just seven public libraries contributes little to an overarching assessment of the web technologies public libraries are actually using on a widespread basis.

Conclusion

Most research into Library 2.0 or libraries' use of Web 2.0 technologies is focused on investigating potential applications of various tools or is limited by scope or sample size.

Studies such as Chua and Goh's (2010) and Mon and Randeree's (2009) provide useful insight into what libraries are doing with various Web 2.0 technologies, but they are few and far between. The majority of the literature on Library 2.0 tends toward descriptions or explanations of Web 2.0 tools and how they might be used in libraries. Most research on the subject is likewise drastically limited in scope, by geographic region, type of library, sample size, or Web 2.0 tools included in the study. Few attempts have been made to identify, on a large scale, how public libraries across the United States are currently using Web 2.0 technologies.

In addition to enumerating the various technologies and discussing their adoption rate within libraries, research on Library 2.0 implementation should consider whether or not noticeable improvements occur in libraries adopting

the technologies. A handful of studies endeavor to address this issue, primarily in a qualitative manner, and none consider analyzing traditional measures of libraries' outputs, such as visits and circulation, in connection with their use of Web 2.0 tools.

The changing–or perhaps still ambiguous–nature of what constitutes Web 2.0 and how the concept relates to libraries provides substantial challenges to systematic study that attempts to identify how libraries are using Web 2.0 technologies and if they are doing so successfully. In many cases it is impossible to gauge actual patron use of these applications, which is just as important, if not more important, than simply identifying their presence on a library's website. For these reasons, continued studies like *U.S. Public Libraries and the Use of Web Technologies* are crucial to understanding what libraries are currently trying. Such a "snapshot in time" is essential to establish the prevalence, and when possible the permanence, of Web 2.0 applications before it is feasible to move on to gauging their use.

A next step in researching Library 2.0 is to measure patrons' actual usage of Web 2.0 tools, but already discussion is reaching beyond that concern to the next generation of web services: "Web 3.0."

It is clear that further research is necessary to assess how libraries have embraced Web 2.0 technologies and how doing so affects library services and use. Before researchers are even able to fill this current need, however, discussion is already turning to the next phase: Web 3.0. This third generation of web services will emphasize "machine-facilitated understanding" of information, with natural language searching, data mining, and artificial intelligence technologies leading to a "more productive and intuitive user experience" (Miranda, 2010, p. 133). Reminiscent of the Web 2.0 debate, experts are divided over how soon—or if—the semantic web will become a reality (Baumann, 2010), but Miranda (2010) posits that when it does, librarians stand to play a pivotal role in its development. Until then, library professionals still have numerous angles of the Web 2.0 movement to explore.

Methodology

Sample

Public libraries of different sizes have vastly different characteristics in terms of inputs and usage, and these differences no doubt appear in the realm of web technology usage as well. To address these disparities, a stratified sample of public libraries was generated for the first iteration of this study based on each library's legal service area population. At that time, sample libraries were randomly selected from the 2005 Public Library Report, as collected and reported by IMLS. One hundred libraries were randomly selected from each of the following service population groups: below 10,000 served; 10,000 to 24,999 served; 25,000 to 99,999 served; and 100,000 to 499,999 served. In addition, all 83 public libraries in the country that served at least 500,000 people were included in the study.

Researchers investigated libraries' use of Web 2.0 technologies by dividing them into five population groups so that comparisons would be more accurate and realistic.

The same libraries were used and expanded upon as the basis of the 2010 edition of the study, which relied upon 2007 IMLS data to group the libraries by legal service area population. Between 2005 and 2007, one library's legal service area population moved from below 500,000 to above that threshold. In addition to the original study libraries, the sample for the 2010 edition of the study included an additional twenty-five libraries from each population group, bringing the total number of libraries in the sample for each population group to 125, as well as all 84 libraries that served at least 500,000 people.

Survey Design

The survey instrument used for this edition of the study built upon the strengths and weaknesses of the tool used during the original incarnation. Many of the data elements used in the initial survey were used again during this iteration with little to no modification. Again, LRS staff looked for the presence of blogs and RSS feeds, virtual reference, and social networking when assessing the web presence of the libraries in the study. A few categories were dropped or significantly changed for inclusion this year, based on difficulties during the first round. For example, researchers did not emphasize personalized online account features, primarily because without a library card it can be difficult to evaluate these features. In addition, some data elements were added during this iteration. A significant addition was the social networking tool Twitter; in 2008, Twitter use among public libraries was nearly non-existent, but this was clearly a social networking site that needed study by 2010. Included in the 2010 study were the following categories of technologies:

This study used as a starting point the survey from the first edition, refining some categories and adding new tools and features that have emerged since 2008.

- Basic Website/Catalog - did the library have an online presence, provide access to the online account, and offer the ability to sign up for a library account online and immediately start using resources?
- Extended Website - did the library's website have a search box and "share this"-type interface, offer an email newsletter, provide audio or video files, and attempt to cater to mobile devices?
- Blogs/RSS - did the library have a blog or blogs or provide RSS feeds for blogs and other content?

- Virtual Reference - which types of remote reference services did the library provide, including instant messaging, email, and text messaging?
- Social Networking - did the library have a presence on various social networking sites?
- Enhanced Catalog - did the library's catalog offer users the ability to review and rate items, add tags, or make recommendations?

During the spring of 2010, LRS staff members examined the websites of the public libraries included in the study for the presence of these data elements. After identifying the percentages of libraries in each population group that adopted a particular web technology, researchers extrapolated the sample results to estimate the total number of libraries across the country that are expected to utilize that tool, based on study results. This process required multiplying the percentage of libraries that used one of the technologies in each population group by the total number of libraries in that population group nationally. The sum of the number of libraries, in all population groups, using a particular tool was divided by the total number of public libraries in the country to yield an overall percent. To determine estimates of the percent of patrons served by libraries with each web technology, the same procedure was used, but instead multiplying by the total population served by each group. Then, the sum of the LSA populations of all libraries using a particular tool was divided by the total population served by all libraries in the country.

In addition to describing adoption rates of each technology by population group, researchers also extrapolated the results to estimate national totals.

Data Analysis

Two types of data analysis were conducted after determining which libraries qualified as Early Adopters, according to their scores on an index defining their level of web technology adoption by the presence of specific tools on their websites. Early adopters are those libraries scoring in the top 20 percent of each population group. A complete description of the index appears prior to the Early Adopter results. In the analysis, first t-tests were performed to determine whether there were significant differences between Early Adopters and all other libraries on the input and output measures. Unless otherwise noted, all comparisons differ significantly at $p < .05$. Second, regression analyses were conducted to determine whether technology adoption remains a significant predictor of various usage measures when controlling for monetary inputs.

National Results

More than 1 in 4 public libraries in communities of fewer than 10,000 people DON'T have a web presence.

As in its first iteration, a primary purpose of the second LRS web technologies study was to examine a sample of public library websites in the United States to determine the prevalence of specific web technologies and the characteristics of the public libraries that were deemed to be "Early Adopters" of these technologies. In addition, the first (2008) study can serve as a baseline, so this second report will include a comparison to 2008 to note how the popularity of the technologies has changed. This edition of the study will also offer a chance to revisit the libraries identified as Early Adopters in the last study and examine whether they have seen increases in more traditional library statistics, using more current data than was available during the last report.

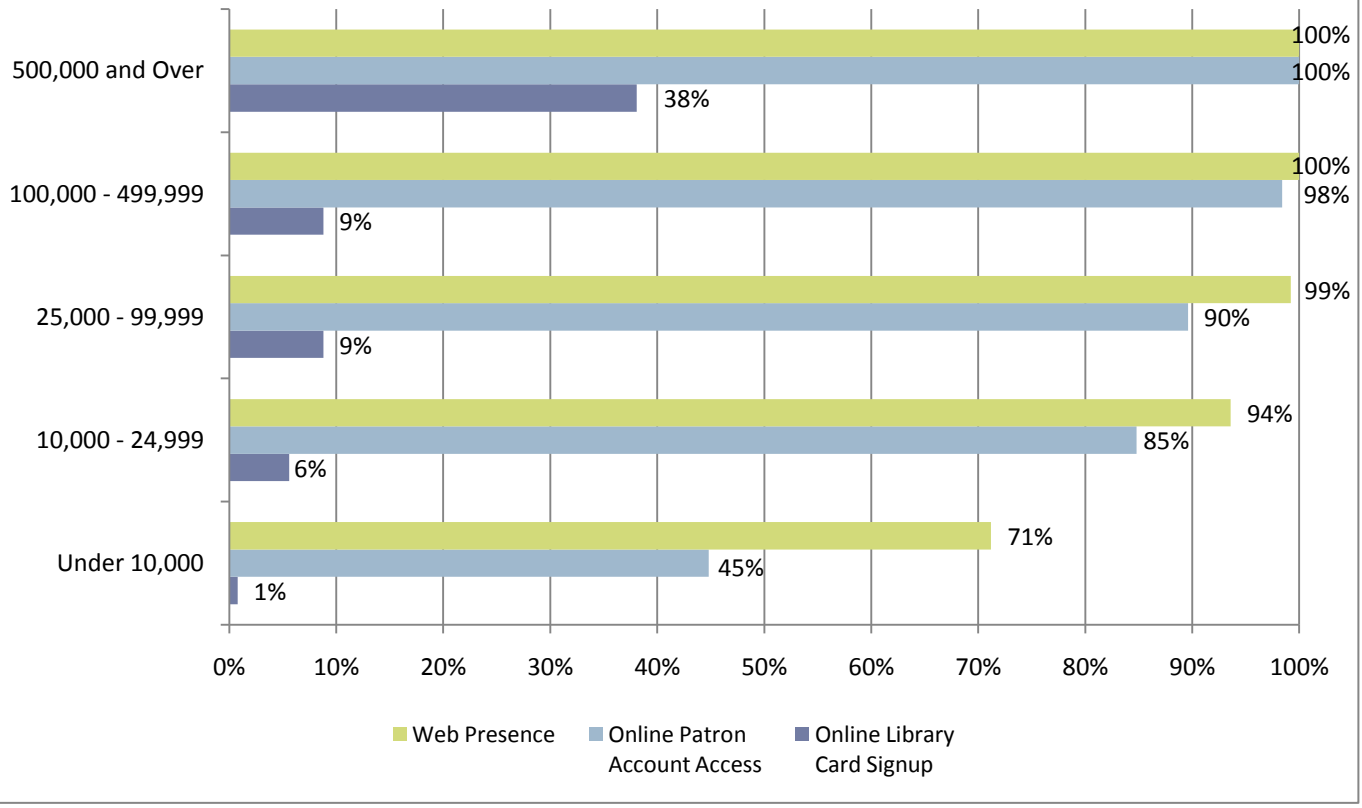
Landscape of Library 2.0 - by size of Service Population

The first piece of this section will examine the rate of adoption of various web technologies by public libraries in the United States and discuss how adoption rates have changed in the two years between studies. Findings will be related based on the size of the libraries' legal service area population.

Web Presence, Patron Access, and Online Card Signup

As was found in the 2008 edition of the study, most libraries in the sample have a web presence; only one library serving at least 25,000 people did not

Chart 1
Percentage of U.S. Libraries with a Web Presence, Online Patron Account Access and Online Library Card Signup in 2010, by Population Group



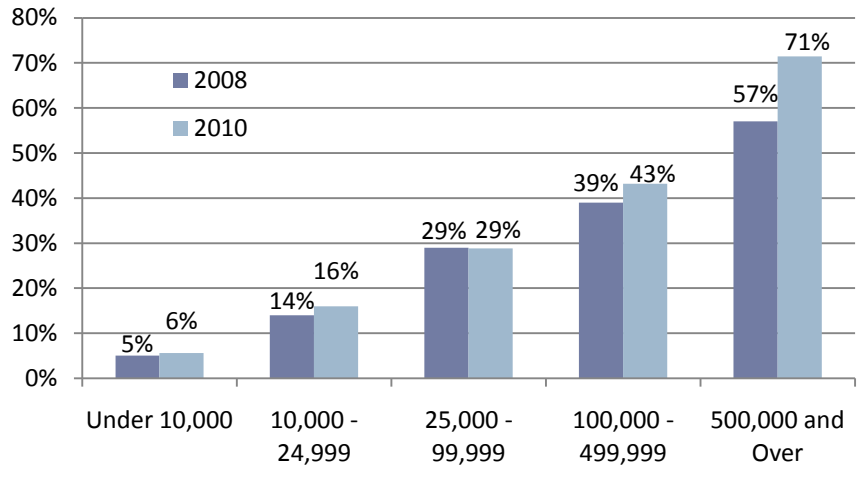
have a website that study authors could find (see Chart 1). Percentages of libraries with a web presence for smaller communities changed only slightly (88% to 94% for libraries serving 10,000 - 24,999 and 73% to 71% for those serving fewer than 10,000). In addition to a web presence, most libraries offer online access to a patron's library card account. All libraries serving at least 500,000 offer this access, and 98 percent of those serving between 100,000 and 499,999 offer this, up from 92 percent in 2008. The percentage of libraries that offer account access has increased across the population spectrum, and now nearly half (45%) of libraries serving fewer than 10,000 have such access. Study authors also searched for the ability to sign up for a library card online and to start using library resources. The percentage of libraries observed to offer this option was greater in 2008 than in 2010, making it seem as though this service was shrinking; however, the requirements for this data element were stricter in the current study than in the previous one. Whereas in 2008 study authors searched solely for the ability to sign up for a card, in 2010 they placed emphasis on being able to start utilizing library resources (such as subscription databases) immediately. More than one-third of the largest libraries (38%) offered such an online card signup. For smaller libraries this was not a common offering - it was found on the websites of less than 1 in 10 public libraries in all population groups serving fewer than 500,000 people.

Nearly all libraries serving more than 100,000 offer online access to patrons' accounts.

Blogs / RSS Feeds

One of the first "Web 2.0" technologies that public libraries used to reach out to patrons was a blog where they could relay information and interact with their communities. In 2008, the study noted that even though this was a

Chart 2
Percentage of U.S. Libraries with Blogs in 2008 and 2010
By Population Group

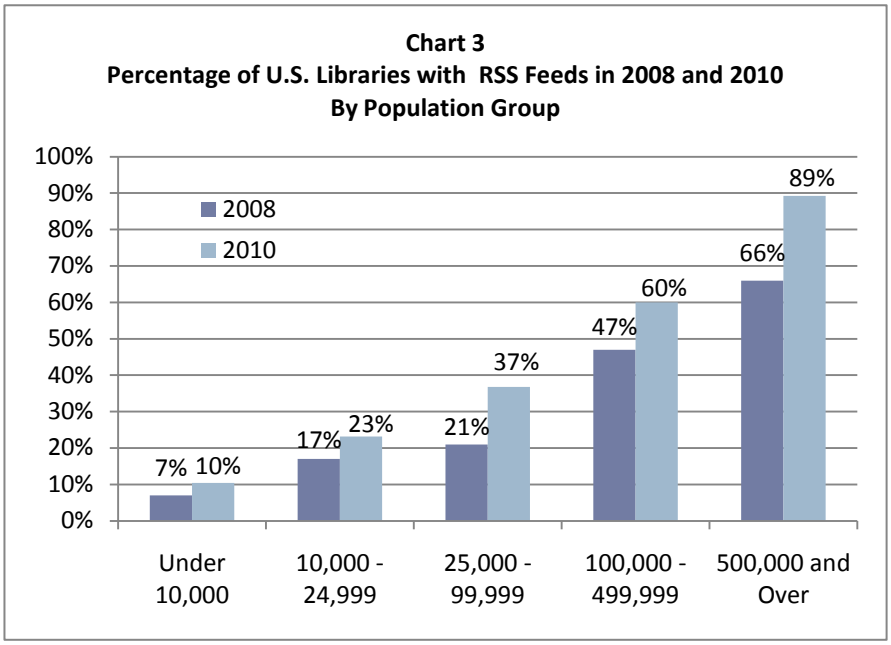


Only libraries serving more than 500,000 showed substantial increase in their use of blogs.

*Please note: due to a database error, during the 2008 study the percentages of libraries serving fewer than 100,000 people with a blog was over-reported. Chart 2 presents corrected numbers.

comparatively basic new technology, overall adoption among public libraries was relatively low. Two years later, there hasn't been much more adoption (see Chart 2). The only group that saw a significant change in percentage of libraries with blogs was those that serve at least 500,000 people, which rose from 57 percent of libraries to 71 percent. For all other population groups, the increase in percentage of libraries with blogs was minimal, if it increased at all, and in none of those groups did over half of the libraries have a blog.

RSS feed use has grown - nearly 9 out of 10 libraries serving at least 500,000 uses RSS feeds.



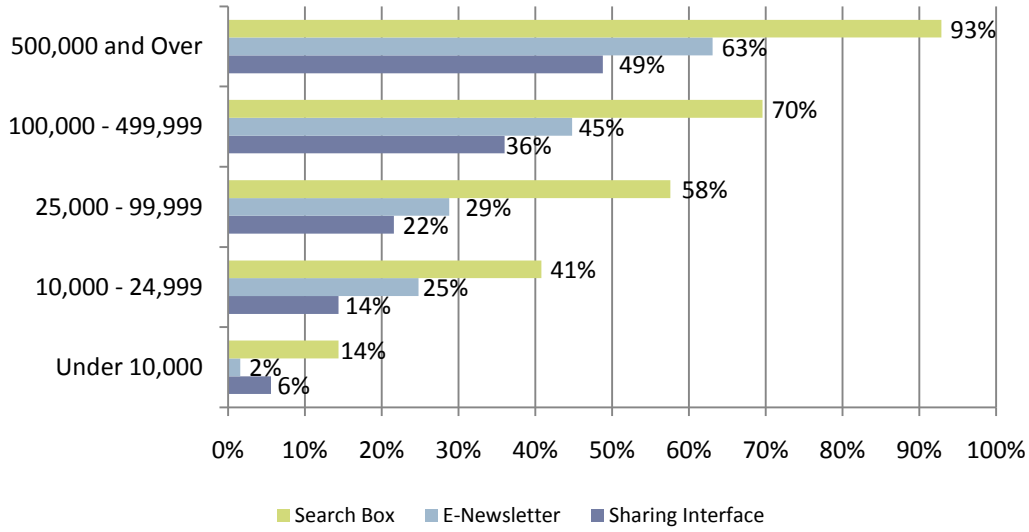
In 2010 an increased percentage of public libraries in this study offered RSS feeds, which can be used to push such content as blog posts and new items in the catalog out to users (see Chart 3). Unlike adoption of blogs, which seemed to stagnate except among the largest public libraries between 2008 and 2010, study authors found an increase in RSS feed usage for each population group. Nearly 9 of out 10 (89%) libraries serving at least 500,000 people provided RSS feeds, as did 3 out of 5 (60%) of those serving 100,000-499,999. On the other end of the spectrum, adoption among the smallest libraries was also growing, rising from 7 percent in 2008 to 10 percent in 2010.

http://www.flickr.com/photos/dullhunk/3541653049/

Search Box / Electronic Newsletter / Sharing Interface

In addition to comparing landscape statistics from the 2008 study, some new variables were added to the 2010 iteration of the survey. Some of these new variables consisted of functions that libraries may have provided in 2008 but were not included in the study, for example, a catalog search box throughout a library's site and the ability to subscribe to an electronic newsletter. Others examined website offerings that were not present or prevalent in 2008, including the option for users to share library content via applications such as ShareThis and AddThis.

Chart 4
Percentage of U.S. Libraries with a Search Box, Electronic Newsletter, and Sharing Interface in 2010, by Population Group



Of these examples, a catalog search box embedded on the home page and on other pages is the feature most likely to have been in place for a number of years, and, as would be expected, this variable had the highest level of adoption across population groups in 2010 (see Chart 4). Researchers found such a search box on the websites of nearly all libraries serving at least 500,000 people. The percentage of libraries with this functionality drops considerably among groups serving smaller populations, with only about 1 in 7 libraries (14%) of those serving fewer than 10,000 providing it.

The electronic, or e-mail, newsletter is another technology that is not entirely recent, but its adoption among libraries is still comparatively low. Even in the largest libraries, the option to subscribe to one or more electronic newsletters was found in fewer than 2 out of 3. Only a handful of the smallest libraries offered this option.

Half of the largest libraries' websites offer a sharing interface that allows users to pass content on to others through their social networking sites or email.

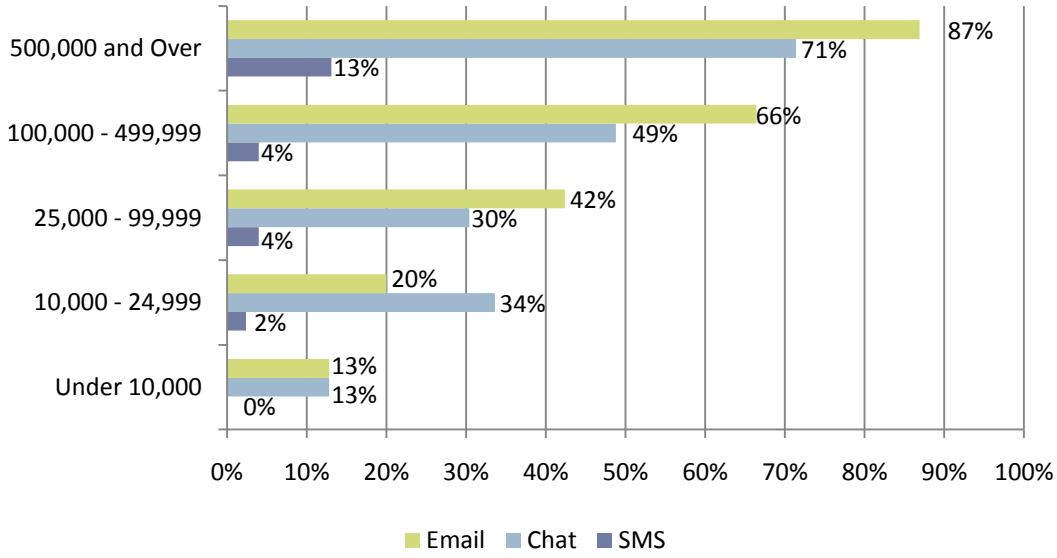
One of the newer technologies researchers targeted was the option to share library content via social networking and an interface such as ShareThis. Though this is a somewhat new phenomenon, it appears that it may be gaining traction. Nearly half (49%) of the largest libraries are already using ShareThis on their sites, and a decent proportion of smaller libraries are using it as well.

Electronic Reference

SMS Reference moved from an offering in only 1 library in the 2008 study to a noticeable presence.

Many public libraries are using the web to bring one of the most traditional library services—reference—online (see Chart 5). Virtual reference is embraced in one way or another by most large public libraries and by a high percentage of smaller public libraries. As in 2008, email continues to be the most popular form of virtual reference, with well over half of libraries in communities of at least 100,000 providing email reference services. This is in spite of the fact that 2010 email reference numbers are lower than those of 2008, due to a stricter definition of "email reference" (i.e., for the 2010 study the email link needed to be explicitly for reference questions, whereas in 2008 a “contact us” link was sufficient). Chat reference is still offered by many public libraries but has not seen significant increases in the two years between studies. The only type of virtual reference that has seen much movement is SMS (text message) reference. In 2008 the presence of SMS reference was found in only one public library in the study, and though it is still quite rare, it seems to have attracted some attention recently.

Chart 5
Percentage of U.S. Libraries with Email, Chat, or SMS Reference in 2010
By Population Group

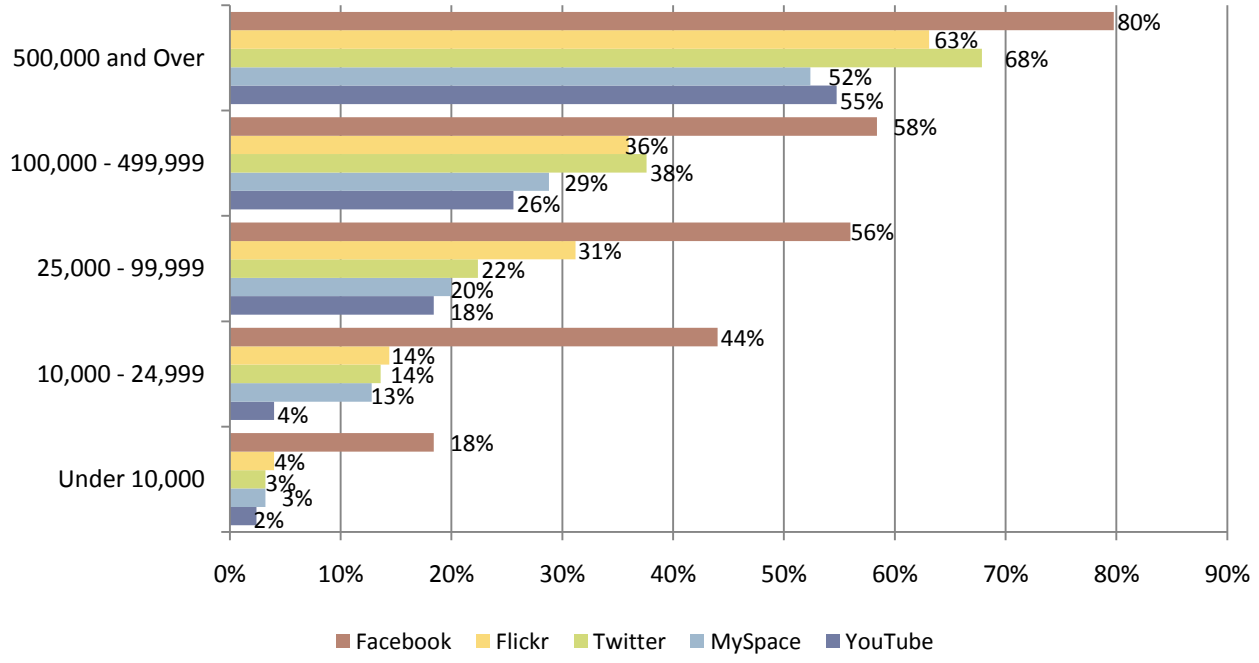


Social Media Presence

Of all the web technologies examined in this study, public libraries have seen the greatest change in social media (see Chart 6). This arena, which was nonexistent a few years ago, and into which very few public libraries had ventured even in 2008, has seen a veritable explosion of growth. Facebook in particular has seen tremendous use – 8 out of 10 (80%) public libraries serving 500,000 or more people had a presence there, and Facebook representation was strong in nearly all population ranges. More than half of the libraries in the study serving 100,000-499,999 people (58%) and 25,000-99,999 people (56%), and nearly half (44%) of those serving 10,000-24,999, had a Facebook presence. Even among the smallest libraries—those in communities with fewer than 10,000 people—nearly 1 in 5 (18%) was interacting with patrons on Facebook. Many libraries were also using Flickr and Twitter, and a fairly large proportion was moving into posting videos with official YouTube presences. Many libraries still had a MySpace presence, though this had not grown much since 2008, and researchers noted that many of the public library MySpace sites appeared to not have been updated since the last study.

Facebook is by far the MOST POPULAR social media site used by public libraries. Flickr held that honor in 2008, but Twitter has emerged as a close rival to the photo-sharing site in 2010.

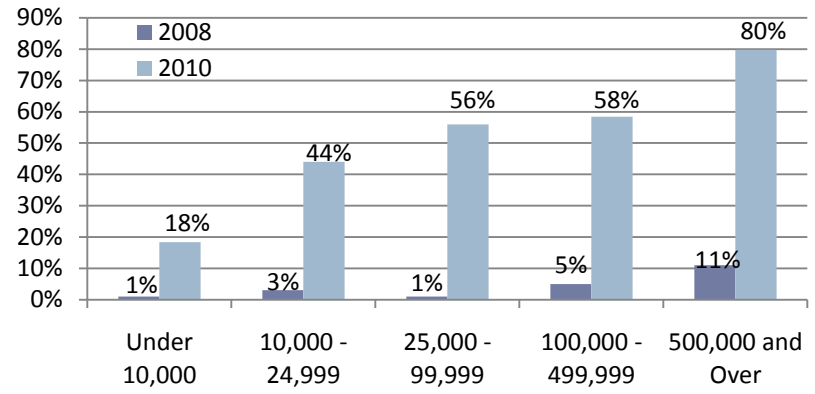
Chart 6
Percentage of U.S. Libraries with a Presence on Various Social Media Sites in 2010, by Population Group



Nearly 1 in 5 libraries in communities serving fewer than 10,000 people have a Facebook presence - a higher percentage than those who have an electronic newsletter. 4 in 5 libraries serving over 500,000 are on Facebook.

As mentioned, Facebook was the social media site with the highest rate of adoption by libraries in the study (see Chart 7), and the increase in Facebook use by public libraries is truly dramatic. In 2008, the only population with more than 5 percent adoption was the group of those serving at least 500,000 people, with 1 in 10 (11%) having a Facebook presence. Just two years later, participation in each population group had grown by a factor of at least seven. In 2010, 4 in 5 of the largest libraries had a presence on Facebook. For libraries serving 100,000-499,999 people, the adoption rate jumped from 5 percent in 2008 to 58 percent in 2010. Fifty-six percent of public libraries serving 25,000-99,999 were on Facebook in 2010, compared with only 1 percent in 2008.

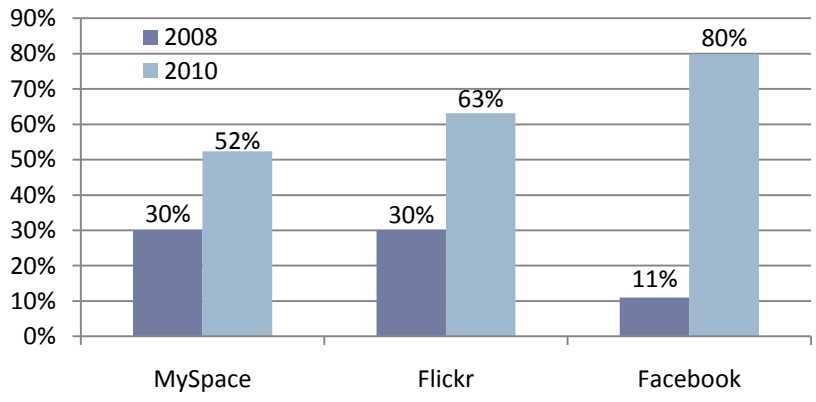
Chart 7
Percentage of U.S. Libraries Using Facebook in 2008 and 2010, by Population Group



While social media adoption by public libraries grew significantly across the board between 2008 and 2010, libraries serving at least 500,000 saw the most dramatic increases. Facebook adoption rose from 11 percent to 80 percent between those years, and these large libraries also were more than twice as likely to have a presence on Flickr in 2010 (63%) compared with 2008 (30%). Although MySpace has seen a general decrease in use, large public libraries are still adopting it; usage rose from 30 percent in 2008 to 52 percent in 2010.

FACEBOOK popularity has grown by almost **700%** in two years. FLICKR use has more than **doubled**.

Chart 8
Percentage of U.S. Libraries with a Presence on Various Social Media Sites in 2008 and 2010, Libraries Serving 500,000+

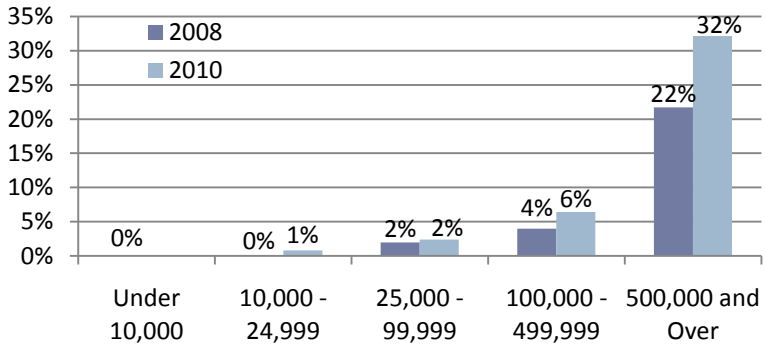


Audio / Video

Researchers also looked for the presence of audio files (e.g., podcasts) and video on websites. The percentage of libraries with audio files on their websites grew slightly between 2008 and 2010 (see Chart 9). Still, these types of files remain a rarity on public library websites, especially those serving small communities. In both years, researchers found no audio files for any library that served fewer than 10,000 people, and only one library that served 10,000-24,999 had such a presence in 2010. As with many other pieces of data collected in this study, the bulk of the movement occurred in the largest libraries. The percentage of public libraries serving at least 500,000 people that provided audio files rose from 22 percent to 32 percent.

The presence of VIDEO files has **surpassed** that of AUDIO files on public library websites.

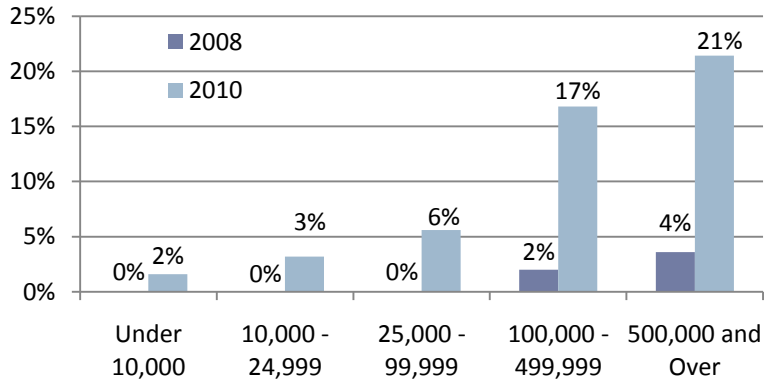
Chart 9
Percentage of U.S. Libraries with Audio Files on their Websites in 2008 and 2010, by Population Group



Based on the trends observed for libraries in this study, it would seem that video is surpassing audio on public library websites. In 2008, researchers found no video presence on websites for any libraries serving fewer than 100,000 people, and even among the largest libraries, the adoption rate was very low (see Chart 10). Though far from ubiquitous, video is making an entrance into public libraries of all sizes. In 2010, more public library websites had video files than audio files for all population groups except the largest, compared with audio files being much more prevalent in 2008.

The percentage of libraries serving more than 500,000 with audio files on their websites rose from 22% to **32%**, and those with video files jumped from just 4% to **21%**.

Chart 10
Percentage of U.S. Libraries with Video Files on the Websites in 2008 and 2010, by Population Group



Only the larger libraries were beginning to offer mobile-friendly versions of their websites, but this feature is likely to become more common in the next few years.

Mobile

In the 2010 edition of the study, researchers looked for the presence of mobile-friendly versions of the library websites, as well as the presence of library-specific gadgets, such as Firefox plug-ins. While use of web-view mobile devices is skyrocketing, at the time of the study (Spring 2010) there was little evidence of public library websites being styled specifically for mobile devices. Researchers found no such websites for libraries that served fewer than 100,000 people and located the presence of a mobile site in only 3 percent of libraries serving between 100,000 and 499,999 and 12 percent of public libraries serving at least 500,000 people. Just as the presence of public libraries on social networking sites has risen significantly over the last few years, it is likely that the percentage of libraries with mobile sites will increase steadily in the near future. In fact, when researchers revisited the websites of libraries serving more than 500,000 in March 2011, they identified mobile versions for 26 of them, compared to 9 a year ago, which raises the percentage of the largest libraries with mobile-friendly websites from 12 percent to 21 percent.

http://www.flickr.com/photos/babyben/4756710551/

Estimated Results for All U.S. Public Libraries

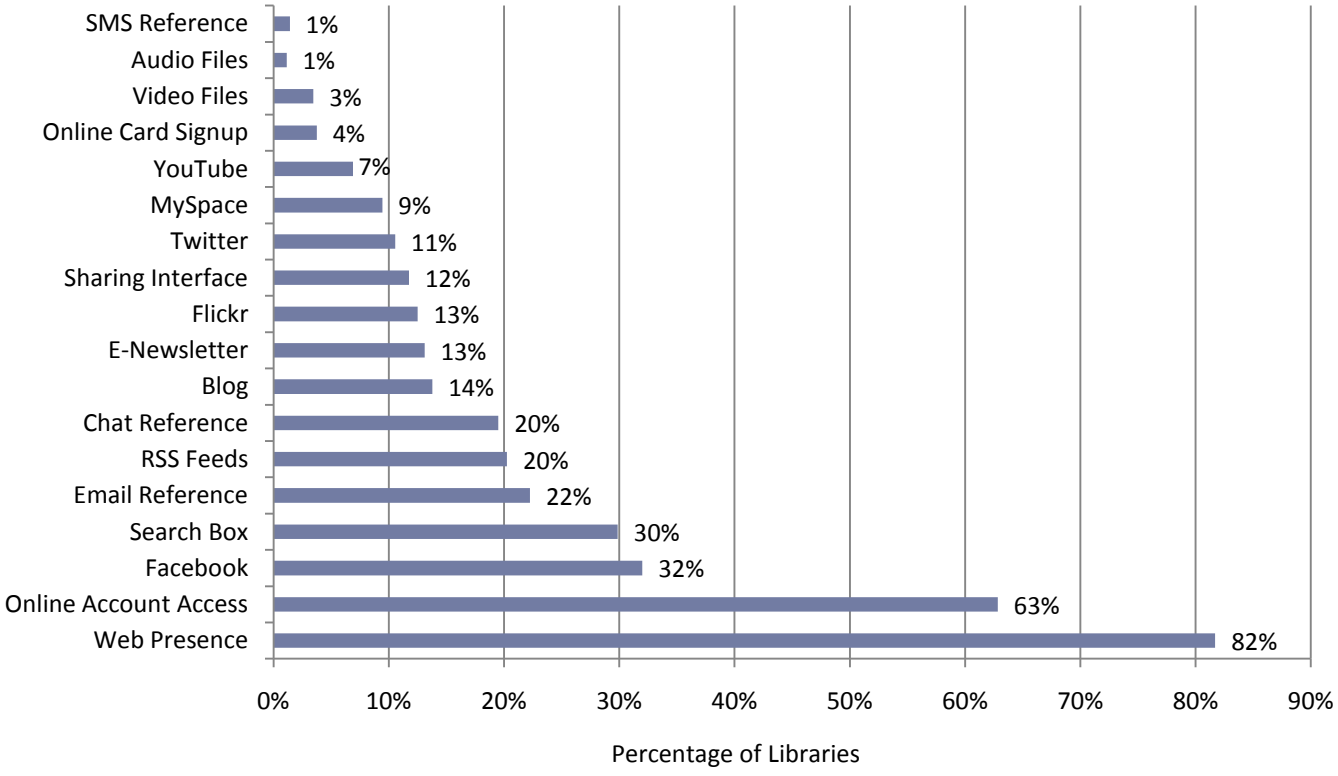
Based on the national stratified sample of libraries included in the study, estimates can be made of the percentage of public libraries overall that are utilizing various technologies on their websites. Chart 11 demonstrates the estimated percentage of all public libraries using a variety of technologies.

As seen earlier in this section, most of these estimates have not changed significantly from 2008. A similar percentage of libraries overall has a web presence, and online account access has risen only slightly (from 56% to 63%). It seems that the other technologies appear on the websites of less than one-third of public libraries in the United States. Even a presence on Facebook, which at the time of this study was adopted by an estimated 32 percent of public libraries, is not typical, especially for the smallest public libraries.

Overall estimates of public libraries' use of various Web 2.0 tools have not changed much since 2008.

Again, these are estimates of the number of libraries that provide each technology, and are heavily influenced by the fact that nearly 60 percent of public libraries in the United States serve fewer than 10,000 people. At the other end of the spectrum, the 84 public libraries serving at least 500,000 people actually serve nearly 30 percent of the country's population (see Table 1).

Chart 11
Estimated Percentage of U.S. Libraries Using Various Web 2.0 Technologies in 2010



Despite somewhat low percentages of the *number* of libraries offering some web technologies, substantially more patrons across the country are served by libraries that use them.

Table 1: Number of People Served by Public Libraries in the United States, by Population Range (2008)

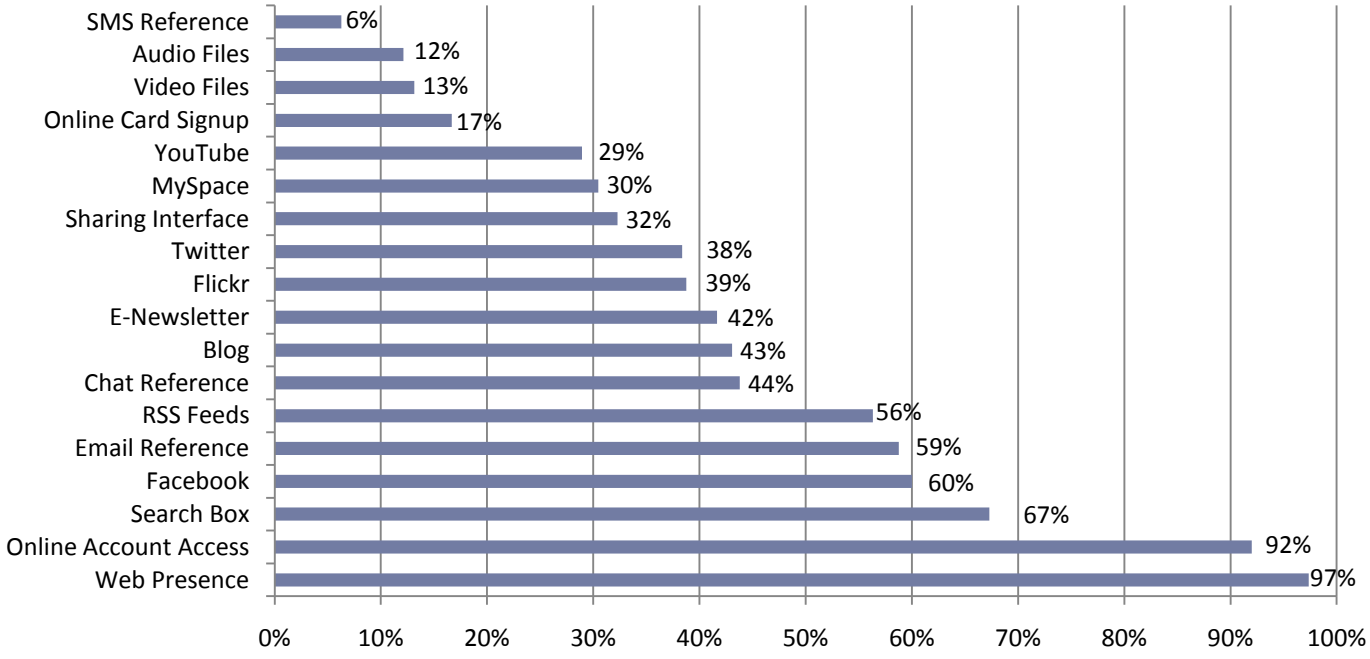
Population Range	Number of Libraries	Number of People Served	Percentage of Total Population
Under 10,000	5,422	18,801,973	6%
10,000 - 24,999	1,764	28,264,701	10%
25,000 - 99,999	1,508	72,448,653	25%
100,000 - 499,999	439	88,286,494	30%
500,000 +	84	87,737,218	30%
Total	9,217	295,529,039	100%

Note: Due to rounding, percentages may not add up to 100

So, while the percentage of libraries adopting various web technologies is relatively low, a much higher percentage of the United States is actually served by libraries with such technologies available (see Chart 12).

Viewed this way, more than half of people in the United States are served by public libraries that offer multiple web technologies, such as RSS feeds and email reference. Three out of 5 Americans (60%) can connect with their libraries on Facebook, and nearly everyone can access their library account online, via their public libraries' web presence.

Chart 12
Estimated Percentage of U.S. Library Patrons Served by Various Web 2.0 Technologies in 2010



Early Adopters

The libraries included in this study fall along a continuum of web technology adoption. Using the technologies examined, researchers developed an index to define the level of web technology adoption for the libraries. Whereas during the 2008 study researchers used a 29-point index that was essentially one point per item in the index, during this iteration of the study researchers developed a different and slightly more complicated index. Some items from the earlier study were not used, and new items were added. In addition, there was more subtlety included in some index items. For instance, during this version of the study researchers looked for a search box on the library's website. If the public library website had a search box on most pages, it was awarded two points, while if it only included the search box on the home page or a few pages, it received just one point.

The 44-point Early Adopter index includes tools and features researchers identified as important indicators of a library's "web savvyness."

There are numerous ways in which public libraries can be defined as "Early Adopters" in terms of adoption of web technologies, and this index has focused on the technologies identified as critical to the study authors. The following table enumerates the items used to define Early Adopter status.

Table 2: Early Adopter Index Items

Index Item/Category	Definition / Points
Basic Web Site / Catalog	
Web Presence	1 point if the library had a web presence
Online Card Signup	1 point if users could sign up for a library card and immediately use library resources (e.g., databases)
Online Card Access	1 point if users could access their library card information
Extended Website	
Search Box	1 point if the library website had a search box on the home page, 2 points if there was a search box on most library web pages
Sharing Interface	1 point if the library website had an interface which allowed users to directly share library content through their social networks, email, etc.
E-Newsletter	1 point if the library offered one generic newsletter, 2 if the library offered an array of newsletters for users to choose from
Audio Files	1 point if the library used podcasts on its site
Video Files	1 point if the library used video files on its site
Mobile Devices	2 points if the library had a website specifically formatted for mobile devices
Blogs/RSS	
Blog Presence	2 points if the library had at least one blog
Blog Subscribe	1 point if users could subscribe to the library's blog(s)
Recent Post	2 points if the library blog had been updated within the previous two weeks
Recent Comment	2 points if the library blog had been commented on in the previous two weeks
RSS Feeds	1 point if the library offered an RSS feed with its blog, 2 points if the library offered multiple RSS feeds

Table 2 Continued: Early Adopter Index Items

Virtual Reference	
Chat Reference	3 points if the library provided chat reference
SMS Reference	3 points if the library provided SMS reference
Email Reference	3 points if the library provided email reference
Social Networking	
MySpace Presence	1 point if the library had a presence on MySpace
Facebook Presence	1 point if the library had a presence on Facebook
Facebook Catalog	1 point if the library had a search box embedded in its Facebook page
Facebook IM Reference	1 point if the library had chat reference embedded in its Facebook page
Facebook Fans	1 point if the library was at or above the median for number of Facebook fans for its population group
Flickr Presence	1 point if the library had a presence on Flickr
Twitter Presence	1 point if the library had a presence on Twitter
Twitter Followers	1 point if the library was at or above the median for number of Twitter followers
YouTube Presence	1 point if the library had a channel on YouTube
Enhanced Catalog	
User Comments / Reviews	1 point if the library's OPAC offered user comments or reviews
User Ratings	1 point if the library's OPAC offered user ratings
Recommendations	1 point if the library's OPAC provided dynamic recommendations based on the user's search
Tags	1 point if the library's OPAC allowed users to look for items based on tags
Tag cloud	1 point if the library's OPAC offered a tag cloud

In an effort to keep these categories relatively balanced, study authors attributed multiple points to some categories, essentially deeming them more important. The most obvious example of this was in virtual reference. There were few data points associated with virtual reference, but authors felt that it was an important piece of web technology on public library websites. Each data element in this category could earn three points, which made the overall weight of the category (nine possible points) in line with the others.

69 libraries reached half of the possible Early Adopter index score in 2010. Only 1 did in 2008.

Based on the number of libraries recording reasonably high scores on this index, it would appear that adoption of various web technologies is increasing among public libraries in the United States. While in the 2008 version of the study only one library scored at least half of the possible index points (Hennepin County Library - http://hclib.org), during this iteration 69 libraries in the sample reached a score of 22 points, or half of the possible index score. As would be expected, most of these libraries were from the largest two population groups (37 from libraries serving at least 500,000, and 20 from those serving 100,000 - 499,999), but there were 12 representatives from libraries serving fewer than 100,000 people, including 3 from communities of under 25,000. These included Rocky River Public Library in Ohio (29 index points, website: http://www.rrpl.org), Keen Public Library in New Hampshire (26, http://www.keenepubliclibrary.org), and Merrick Library in New York (23, http://merricklibrary.org). For all libraries, Sacramento Public Library (http://www.saclibrary.org) led the way with 36

points on this index with New York Public Library (http://www.nypl.org) close behind at 34.

As in the first version of this study, researchers identified the eightieth percentile index score for each population group. Libraries scoring at or above the eightieth percentile (i.e., the top twenty percent of libraries in each group) were labeled as "Early Adopters." These libraries were then compared to the rest of the libraries in the study, using traditional statistics as reported nationally by the Institute for Museum and Library Services (IMLS). Libraries that were classified as Early Adopters had significantly higher per capita measures than their peers for nearly every ratio reported by IMLS.

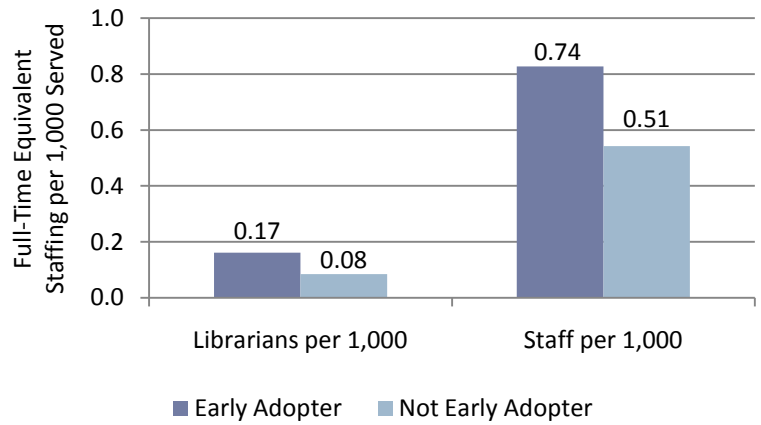
Libraries that scored in the **top 20%** of their population groups on the web technologies index are **Early Adopters.**

Inputs

Similar to the 2008 findings, Early Adopter libraries have significantly higher ratios on traditional input statistics than their peers.

Again, libraries that adopted web technologies had significantly higher staffing numbers than their peers, both in terms of librarians and total staff (see Chart 13). Early Adopter libraries had 45 percent more total staff than other libraries in the study, and more than twice as many librarians per capita, a huge disparity. This gap in librarians appears to be growing, up from 56 percent greater in the 2008 study. It makes sense that libraries with higher staff numbers are more likely to adopt web technologies—it takes people to implement these initiatives, after all—but the difference here is astounding, and potentially growing among the professional ranks.

Chart 13
U.S. Libraries: Average Library Staffing Levels in 2010
By Early Adopter Status



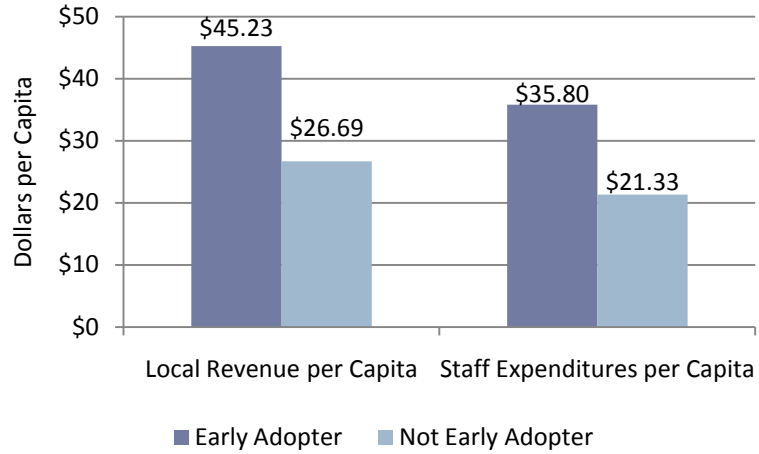
Early Adopter libraries have ***twice as many*** librarians as non-early adopters.

The gap between public library technology haves and have-nots appears to be growing in the financial inputs area as well (see Chart 14). Libraries classified as Early Adopters brought in 69 percent more money in terms of average local revenue per capita, and were able to translate this into 68 percent higher expenditures per capita on staff. As with librarian staffing, this

Early Adopter libraries have a local income 69% higher, and staff expenditures 44% greater, than non-early adopters.

gap appears to be growing—up from 53 percent and 44 percent respectively—during the 2008 study. Again, the expectation would be that Early Adopters have more financial resources, but the size of the gap is dramatic.

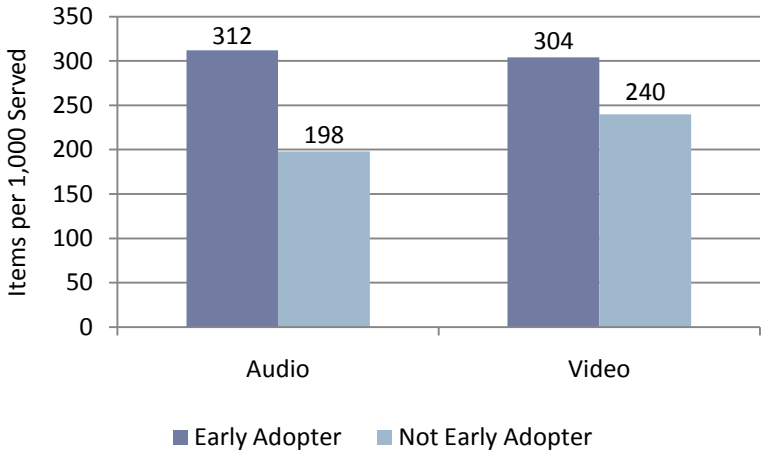
Chart 14
U.S. Libraries: Average Library Local Revenue and Staff Expenditures in 2010, by Early Adopter Status



More funding generally leads to larger collections, and in the case of audio and video materials and Early Adopters this is playing out as well (see Chart 15). Libraries in the study that had done more with their web presence had an average of 312 audio items per 1,000 served in their collection, compared with only 198 for other libraries in the study. Early Adopters also had a video-items-per 1,000 served ratio that was slightly higher than their peers – 304 to 240 – though this difference was not statistically significant.

Libraries that are not early adopters have noticeably fewer audio and video holdings than those that are.

Chart 15
U.S. Libraries: Average Audio and Video Holdings in 2010 By Early Adopter Status



Despite this, and in a continuing trend from the previous study, researchers found that Early Adopter libraries did not house significantly more print titles or computers per capita than their counterparts. In fact, Early Adopter libraries had fewer computers per 1,000 served than other libraries. These two areas of library collections are among the more traditional offered, and as a result most libraries have books and computers. It is possible that the more innovative ones – the Early Adopters – are not investing as much in these areas that are already mature because they are devoting more resources to adopting newer services. As with the previous study, print volumes and computers were among the very few input statistics collected by the IMLS where Early Adopter libraries were not significantly outperforming their peers.

Early Adopter libraries *DO NOT* have significantly more print volumes per capita

Table 3 shows the differences between Early Adopter libraries and their counterparts on other input statistics. Most numbers in Table 3 were up slightly from the previous study, with the trends in differences between Early Adopter libraries and their counterparts remaining essentially unchanged with the exception of computers per 1,000 served, which flipped, more or less. Not surprisingly, Early Adopter libraries spent a far greater percentage of their collection budgets on electronic materials. They also had more subscriptions per capita and higher overall collection expenditures.

Table 3: U.S. Libraries: Input Ratios for Selected Statistics in 2010, by Early Adopter Status

Statistic	Early Adopter	Not Early Adopter	Percent Greater for Early Adopters
Print Volumes per Capita	4.10	3.95	4%
Computers per 1,000 Served	1.13	1.43	-21%
Subscriptions per 1,000 Served*	10.78	7.88	37%
Collection Expenditures per Capita*	$6.90	$3.99	73%
Electronic Expenditures per Capita*	$0.81	$0.37	119%

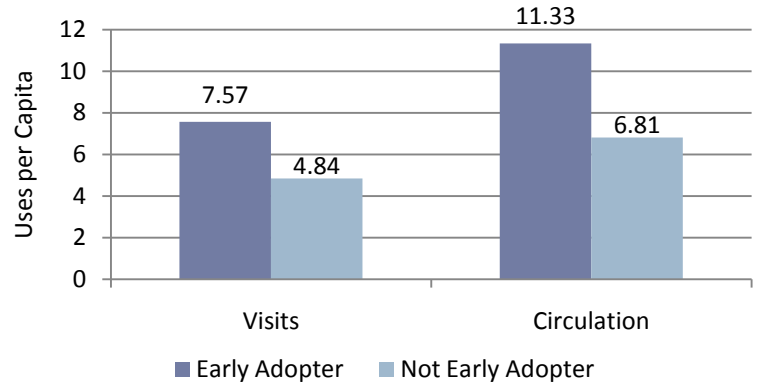
* $p < .01$

Outputs

Generally, as inputs rise, so do outputs, and this trend is seen again with the libraries in our study. Early Adopter libraries, which tended to have higher input ratios, have significantly higher output measures across the board. Most notably, web-savvy public libraries have much higher visits and circulation figures, two measures traditionally used to indicate library success (see Chart 16). Early Adopter libraries had more than 7 visits per capita, versus fewer than 5 for their peers. In terms of circulation per capita, patrons at Early Adopter libraries check out an average of over 4 more items per year (11.33 versus 6.81). Similar to the input measures, the gap between Early Adopting libraries and their counterparts appears to be growing for input measures as well, with Early Adopters outperforming their peers by 56 percent in visits per capita, and 66 percent in circulation per capita during this iteration, compared with 51 percent and 53 percent respectively during the first study.

The gap between Early Adopters and non-early adopters in circulation per capita increased from 53% to 66% between 2008 and 2010.

Chart 16
U.S. Libraries: Average Visits and Circulation per Capita By Early Adopter Status



Early Adopters report higher outputs than non-early adopters in all measures collected by IMLS.

Consistent with the first round of the study, Early Adopter libraries continued to outpace their peers in all output measures collected by IMLS. Table 4 illustrates the differences in other commonly collected output ratios. Interestingly, the only output statistic where the difference between Early Adopter libraries and others has narrowed is Electronic Users per Capita. Other libraries may be beginning to catch up, but Early Adopters still see 33 percent greater use in this area.

Table 4: U.S. Libraries: Input Ratios for Selected Statistics in 2010, by Early Adopter Status

Statistic	Early Adopter	Not Early Adopter	Percent Greater for Early Adopters
Reference Questions per Capita*	1.32	0.83	59%
Program Attendance per 1,000 Served*	511	310	65%
Children's Program Attendance per 1,000 Served*	14.68	9.73	51%
Children's Circulation per Capita*	4.04	2.29	76%
Electronic Users per Capita*	1.64	1.23	33%

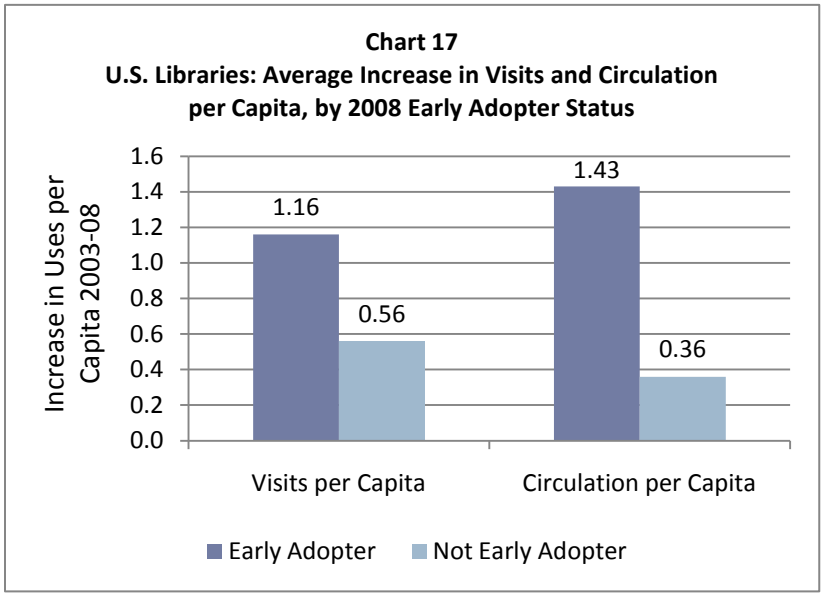
* p <.01

Revisiting 2008 Early Adopters and Output Data

A long-term goal of this study is to try to determine specifically whether and how adoption of web technologies contributes to library success, as measured by traditional definitions. Simply put, does adoption of web technologies lead to greater use of the library (i.e., more visits and higher circulation)? Analysis combining 2008 usage data from IMLS (unavailable when the first iteration of the study was published) and 2008 web technology adoption data suggests that adoption of web technologies may lead to greater outputs such as visits and circulation (see Chart 17).

Early Adopters' average visits per capita increased at a rate twice as great as non-early adopters between 2003 and 2008. Their circulation per capita increased at a rate 4 times as great as non-early adopters.

Chart 17
U.S. Libraries: Average Increase in Visits and Circulation per Capita, by 2008 Early Adopter Status



Public libraries that were identified as Early Adopters during the 2008 version of the study achieved significantly greater increases in both visits and circulation per capita than their counterparts between 2003 and 2008. Early Adopter libraries saw a rise in average annual increase in visits per capita during that five-year span that was twice as great as their counterparts in libraries that did not adopt as much web technology. Even more impressive, average circulation per capita in Early Adopter libraries increased by 1.43, nearly 4 times as great as the 0.36 average increase in other libraries.

Researchers performed regression analysis in an attempt to determine whether technology adoption independently contributed to the higher outputs reported by Early Adopters.

In both years of the study, public libraries that were identified as Early Adopters of web technologies tended to have higher per capita ratios in nearly all statistics, whether input or output by nature. Higher inputs in terms of dollars and staffing lead to greater outputs. A natural conclusion is that better funded public libraries have made that choice to pursue the implementation of web technologies, though it is difficult to determine whether this technology adoption independently leads to greater outputs. In an attempt to tease out some of the subtleties of this relationship, study authors performed regression analysis to determine whether technology adoption remains a significant predictor of various usage measures when controlling for monetary inputs. For this analysis, 2008 data for collection expenditures per capita, staff expenditures per capita, and Early Adopter status served as independent variables, with per capita output measures as the dependent variable. This analysis was performed for both visits and

Controlling for staff and collection expenditures, classification as an Early Adopter was a significant predictor of higher visits, circulation, and program attendance per capita.

circulation per capita, as well as program attendance, a relatively new nationally collected statistic for which 2003 data was not available.

The beta values in the tables below illustrate the relative strength of each predictor in relation to the others included in the analysis. These results suggest that, as would be expected, the financial input variables are strong predictors of output measures. Even controlling for these, however, the identification of being an Early Adopter remains a significant predictor for visits, circulation, and program attendance per capita (see Tables 5,6, and 7). Early evidence suggests that using web technologies to reach out to patrons can pay dividends in terms of traditional output statistics. Refinement of this study in the future might allow researchers to arrive at stronger conclusions.

Table 5: Predictors of Library Visits per Capita (all data from 2008)

	Adjusted R Square[2]	Predictors	Beta
Visits per Capita	0.43	Staff Expenditures per Capita	0.26**
		Collection Expenditures per Capita	0.38**
		Early Adopter	0.12*

**$p < .001$
*$p < .01$

Table 6: Predictors of Library Circulation per Capita (all data from 2008)

	Adjusted R Square	Predictors	Beta
Circulation per Capita	0.64	Staff Expenditures per Capita	0.09
		Collection Expenditures per Capita	0.69**
		Early Adopter	0.10**

**$p < .001$
*$p < .01$

Table 7: Predictors of Library Program Attendance per Capita (all data from 2008)

	Adjusted R Square	Predictors	Beta
Program Attendance per Capita	0.29	Staff Expenditures per Capita	0.20*
		Collection Expenditures per Capita	0.33**
		Early Adopter	0.11*

**$p < .001$
*$p < .01$

[2] Adjusted R square indicates the proportion of variation in the dependent variable accounted for by the predictors. In the case of Table 5, the adjusted R square value indicates that 43% of the variance in visits per capita has been explained by the three predictors—staff expenditures per capita, collection expenditures per capita, and Early Adopter status.

Colorado Results

In addition to the libraries included in the national sample, the study examined all 114 Colorado public libraries. This section discusses the degree to which these libraries have implemented various technologies on their websites, whether use of the technologies has increased or decreased since the 2008 study, and how Colorado libraries compare to the national sample.

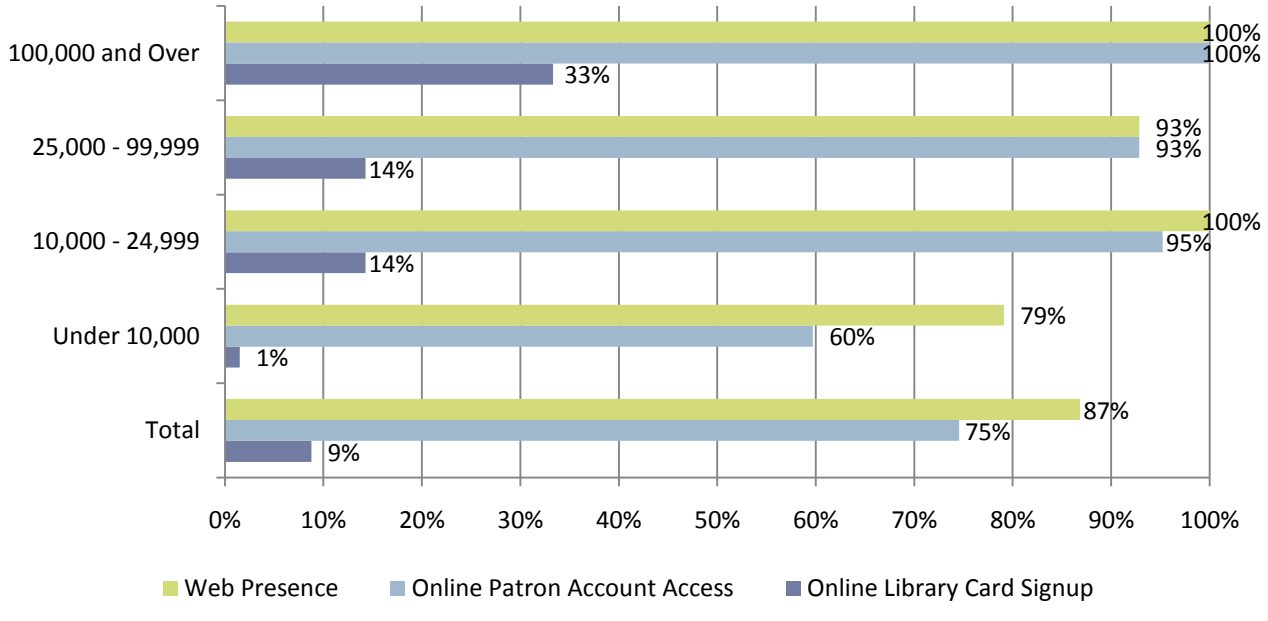
Landscape of Library 2.0

A higher percentage of smaller libraries in Colorado have a web presence than their peers nationally.

Web Presence, Patron Access, and Online Card Signup

Nearly 9 out of 10 (87%) Colorado public libraries have a web presence (see Chart 18). Since 2008, web presence for libraries serving more than 25,000 people has not changed, and Colorado lags slightly behind the national sample for libraries serving 25,000-99,999 (93% to 99%). In contrast, Colorado libraries serving smaller communities saw an increase in web presence. All libraries serving 10,000-24,999 now offer a website, and web presence for those serving fewer than 10,000 jumped from 7 out of 10 in 2008 to nearly 8 out of 10 in 2010 (71% to 79%). This has kept web presence of Colorado libraries ahead of the national sample in the smallest population groups. One advantage that Colorado's smaller public libraries have is the opportunity to build a library website through the Plinkit[3] toolkit.

Chart 18
Percentage of Colorado Libraries with a Web Presence, Online Patron Account Access and Online Library Card Signup in 2010, by Population Group



[3] Plinkit is a multi-state collaborative supported by state libraries and consortia to provide libraries in Colorado, Oregon, Illinois, Texas, Michigan, Virginia with a template for creating a website using open source software. For more information on Plinkit, visit http://www.plinkit.org/

Web presence and online account access stayed the same for the two largest population groups, but showed substantial increases in the smallest libraries.

Just like web presence, online access to patrons' accounts remained the same for the largest Colorado public libraries. Libraries serving smaller populations experienced greater growth in offering online account access than they did in web presence, rising from 85 percent to 95 percent for libraries serving 10,000-24,999 and from 48 percent to 60 percent for libraries serving fewer than 10,000. Again, Colorado is keeping up with larger libraries across the country but pulls ahead noticeably when it comes to smaller libraries providing online account access (compare 95% of Colorado libraries serving 10,000-24,999 with 85% nationwide, and 60% of the smallest Colorado libraries with 45% of the smallest nationwide).

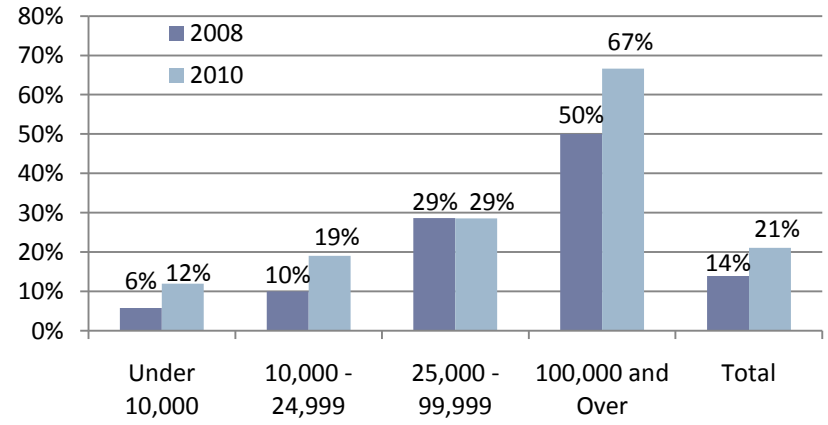
Overall, in 2010, about the same percentage of Colorado libraries offered the option to sign up for a library card online and immediately start using resources as in 2008. By population group, the only increase was for libraries serving 10,000 – 24,999 people (5% to 14%), while all other groups saw a decrease. Even so, Colorado is consistently ahead of the national sample in offering online card signup, with 9 percent of Colorado libraries providing this option, compared to an estimated 4 percent of libraries across the country.

Blogs / RSS Feeds

Since 2008, blogs have grown in popularity among all Colorado libraries except those serving 25,000-99,999, where use of this platform has plateaued at less than one third (29%), just as in the national sample (see Chart 19). The percentage of smaller libraries using blogs doubled (from 6% to 12% for libraries serving fewer than 10,000 and from 10% to 19% for libraries serving 10,000-24,999), and that of the largest libraries rose from 50 percent to 67 percent. These increases keep Colorado libraries ahead of the national curve in their adoption of blogs; interestingly, national adoption rates in 2010 hover close to those of Colorado libraries in 2008.

The number of smaller Colorado libraries with blogs doubled between 2008 and 2010.

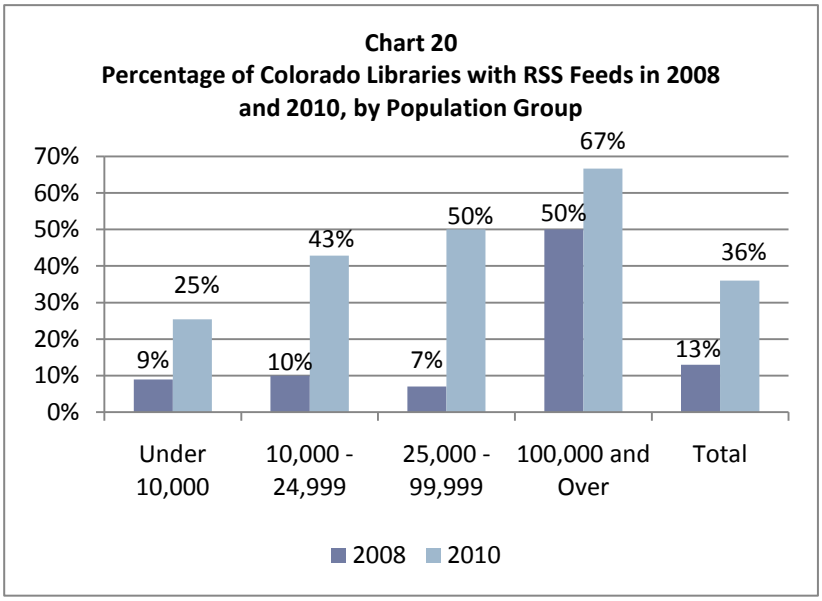
Chart 19
Percentage of Colorado Libraries with Blogs in 2008 and 2010, by Population Group



*Please note: due to a database error, during the 2008 study the percentages of libraries serving fewer than 100,000 people with a blog was over-reported. Chart 19 presents corrected numbers.

RSS feeds were a little-utilized tool in 2008–at least among smaller libraries–but have since escalated into one of the more popular Web 2.0 technologies included in this study. Overall, use of RSS feeds by Colorado libraries has increased by 177 percent since 2008, pushing this technology well past blogs in rate of adoption (see Chart 20). The greatest advancement came in libraries serving 25,000-99,999, with 1 out of 2 libraries now providing RSS feeds, compared to less than 1in 10 in 2008. Even a quarter of the smallest libraries offers RSS feeds while more than 4 in 10 libraries serving 10,000-24,999 have them. All but the largest Colorado libraries are considerably ahead of the national sample in offering RSS feeds.

Colorado libraries' use of RSS feeds increased by 177%. Even 1 in 4 of the smallest libraries offers them.



Search Box / Electronic Newsletter / Sharing Interface

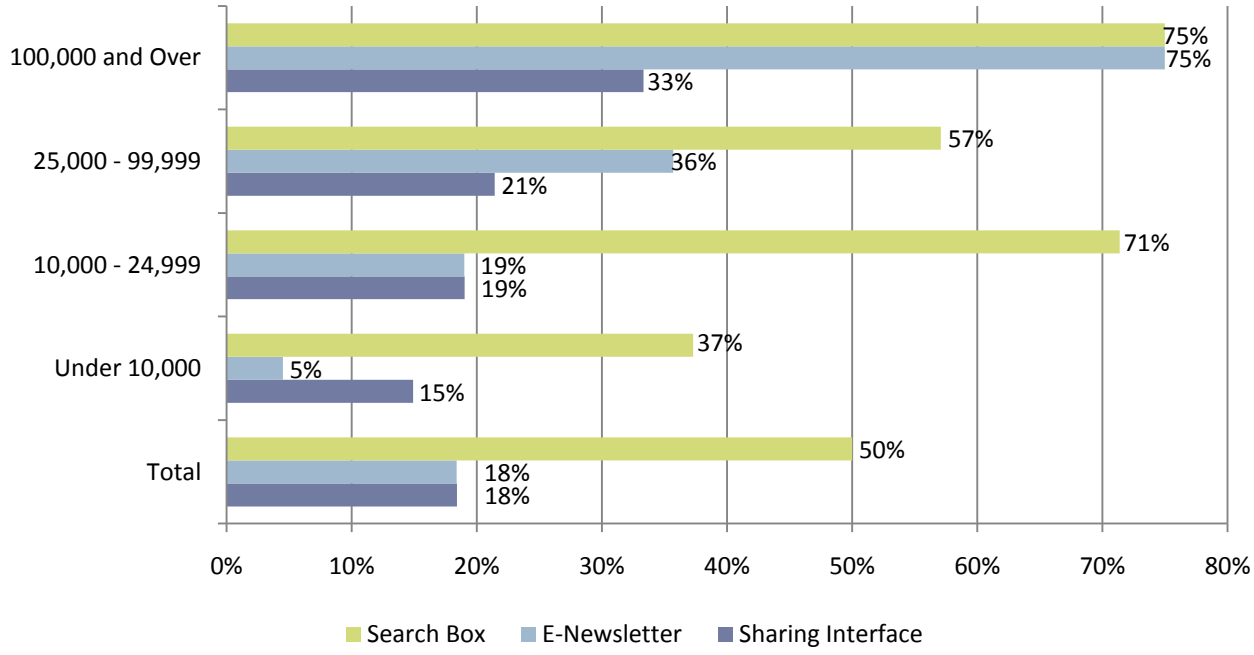
1 in 2 Colorado library websites features a site or catalog search box, while only 1 in 3 libraries does nationally.

Inclusion of a site or catalog search box was apparent on half of Colorado libraries' websites, with 3 out of 4 of the largest libraries and almost as many libraries serving 10,000-24,999 (71%) enabling searching (see Chart 21). Somewhat surprisingly, the percentage of libraries serving 25,000-99,999 – the second largest population group – was notably smaller, with search boxes on less than 3 out of 5 (57%) websites. The search function, likely not a new feature of most libraries' websites, is not nearly as prominent in the national sample as in Colorado, particularly among smaller libraries. While 1 in 2 Colorado library websites features a search box, less than 1 in 3 (30%) libraries nationally has one. Among libraries serving more than 25,000, about the same percentage of Colorado and national libraries offer a search box, but in the smaller population groups, Colorado libraries are noticeably ahead.

Nearly 2 out of 5 libraries in Colorado offer e-mail newsletters and a sharing interface.

Electronic newsletters are as common for the largest Colorado libraries as a search box, with 75 percent offering some kind of bulletin, but their popularity plummets as library size shrinks: just 5 percent of the smallest libraries offer an electronic newsletter. Overall use of electronic newsletters by Colorado libraries (18%) is the same as that of a much newer feature, a sharing interface. Adoption of a sharing interface is more evenly distributed among population groups in Colorado libraries than those in the national sample, with 15 percent of the smallest and 33 percent of the largest Colorado libraries offering a feature such as ShareThis, compared to 6 percent of the smallest and 41 percent of the largest libraries nationally.

Chart 21
Percentage of Colorado Libraries with a Search Box, Electronic Newlsetter, and Sharing Interface in 2010, by Population Group

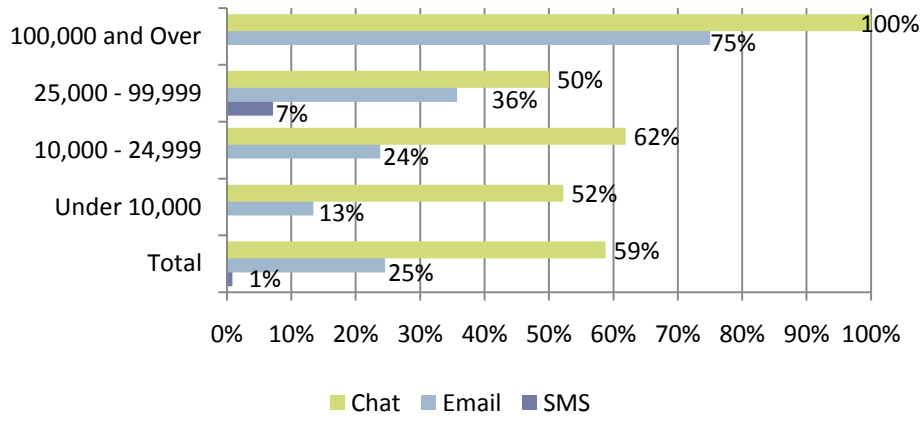


Electronic Reference

One out of 4 Colorado libraries provides email reference (see Chart 22). This is a modest decrease from 2008 percentages due to researchers' stricter definition of what qualified as email reference (i.e., a "contact us" link was not sufficient in the 2010 version of the study). Colorado is consistent with libraries nationally in offering email reference and has the same overall percentage experimenting with SMS reference (1%). That translates to just 1 library in the state of Colorado, but some libraries of all sizes – excluding those serving fewer than 10,000 – nationwide are trying out the technology.

Every Colorado library serving more than 100,000 people offers chat reference, which is more popular than email reference throughout the state, but not nationally.

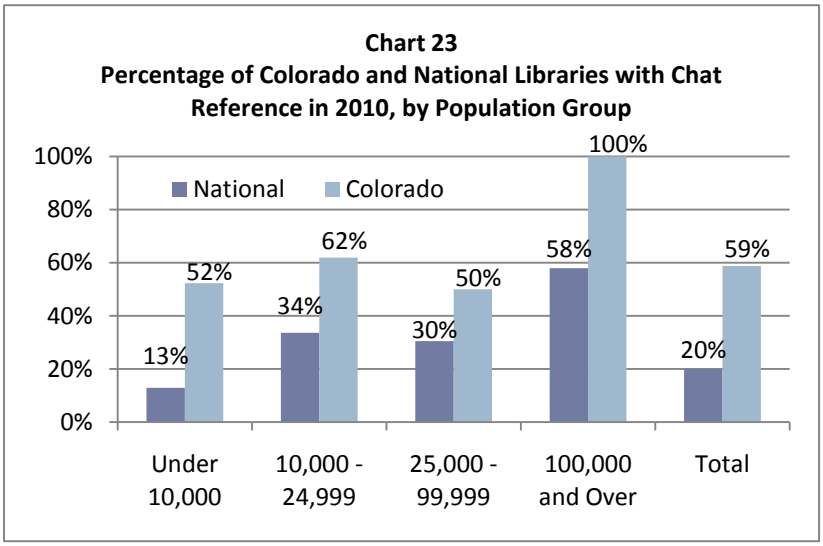
Chart 22
Percentage of Colorado Libraries with Email, Chat, or SMS Reference in 2010, by Population Group



By far, the most popular e-reference tool in Colorado libraries is chat reference. Minor increases since 2008 have resulted in all libraries serving more than 100,000 and at least half of smaller libraries now providing the service. Nationwide, chat reference still takes a back seat to email, but Colorado libraries are well ahead of the curve with this technology (see Chart 23). The prevalence of chat reference in Colorado libraries is due primarily to a statewide service, AskColorado, which is provided by the

Only 1 Colorado library that provides chat reference does not use AskColorado, the statewide chat reference service.

Chart 23
Percentage of Colorado and National Libraries with Chat Reference in 2010, by Population Group



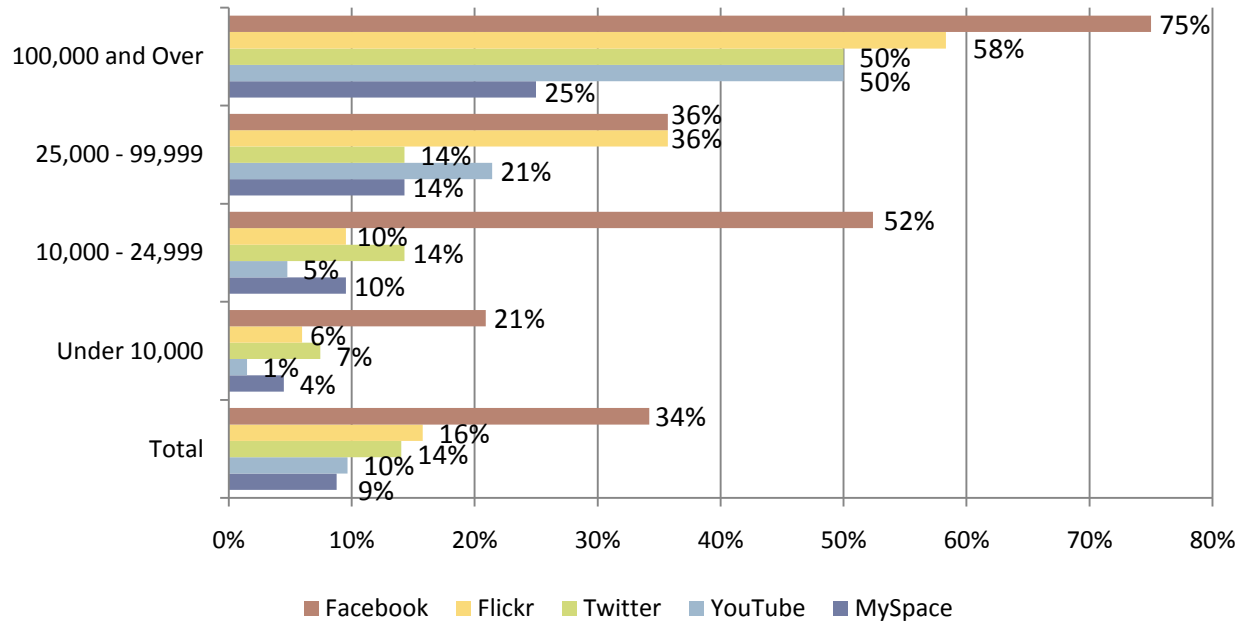
Colorado State Library (only one Colorado library offering chat reference does not use AskColorado). It is important to note that several other states offer similar statewide chat reference services, and researchers noticed that these locations typically had a higher percentage of libraries offering chat reference. In other words, Colorado is likely not the only state to have such high percentages of libraries with chat reference, but the small sample size for other individual states makes it impossible to draw definitive conclusions about them beyond the national level.

In 2008, no Colorado libraries had a Facebook profile; now, 1 in 3 uses the social networking site to reach patrons. Flickr and Twitter are the next most popular social media tools.

Social Media Presence

In 2008, less than 5 percent of Colorado libraries were experimenting with any social media and they used only MySpace and Flickr. Two years later, the popularity of social media has skyrocketed and expanded to include a greater variety of options. In particular, libraries' use of Facebook has exploded; whereas in 2008 researchers found no Colorado libraries on the social networking site, more than 1 out of 3 (34%) now have a profile for their organization. Three out of 4 (75%) of the largest libraries, 1 in 2 (52%) of those serving 10,000-24,999, and 1 in 5 (21%) serving under 10,000 have a Facebook presence, making it by far the most popular social media site for libraries of all sizes except those serving 25,000-99,999, which use Flickr as much as Facebook (both at 36%). The photo sharing site, followed by Twitter and YouTube, has found favor with at least 1 in 10 Colorado libraries, while MySpace – once the most common social media tool for libraries – is the least preferred. Colorado libraries' social media presence reflects that of libraries nationally, with Colorado libraries just edging ahead in use of Facebook, Flickr, Twitter, and YouTube.

Chart 24
Percentage of Colorado Libraries with a Presence on Selected Social Networking Sites in 2010, by Population Group

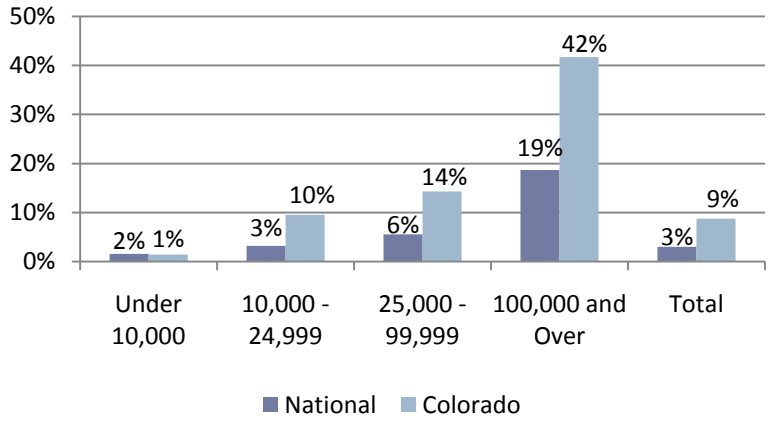


Audio / Video

Colorado libraries have made a notable leap forward in incorporating audio and video files into their websites. In 2008, only 5 libraries included audio files and just 3 featured video; now, nearly 1 in 10 (9%) libraries includes video files on its website (see Chart 25). Colorado libraries outpace the national sample in video files, with twice as high of a proportion (42% compared to 19%) of the largest libraries' websites offering them. Audio is less popular, with just 4 percent overall adoption (25% among the largest libraries). As service population decreases, use of audio and video files also drops. No libraries serving fewer than 25,000 people offered any kind of audio file on their websites.

Nearly 1 in 10 Colorado libraries includes video files on its website, compared to 1 in 3 nationally.

Chart 25
Percentage of Colorado and National Libraries with Video Files on their Websites in 2010



Mobile

In the 2010 national sample, less than 1 percent of libraries – and only those serving more than 100,000 people – attempted to make their websites compatible with mobile devices. Not many more Colorado libraries attempted to offer mobile access (less than 3%), but in contrast to the national sample, smaller libraries within the state seem to be experimenting with the option. While just 7 percent and 5 percent of Colorado libraries serving 25,000-99,999 and 10,000-24,999, respectively, cater to mobile devices, they are ahead of the national curve for libraries their size in adopting this latest technique to reach out to patrons.

Across population groups, slightly more libraries in Colorado than nationwide provide a mobile-friendly version of their website.

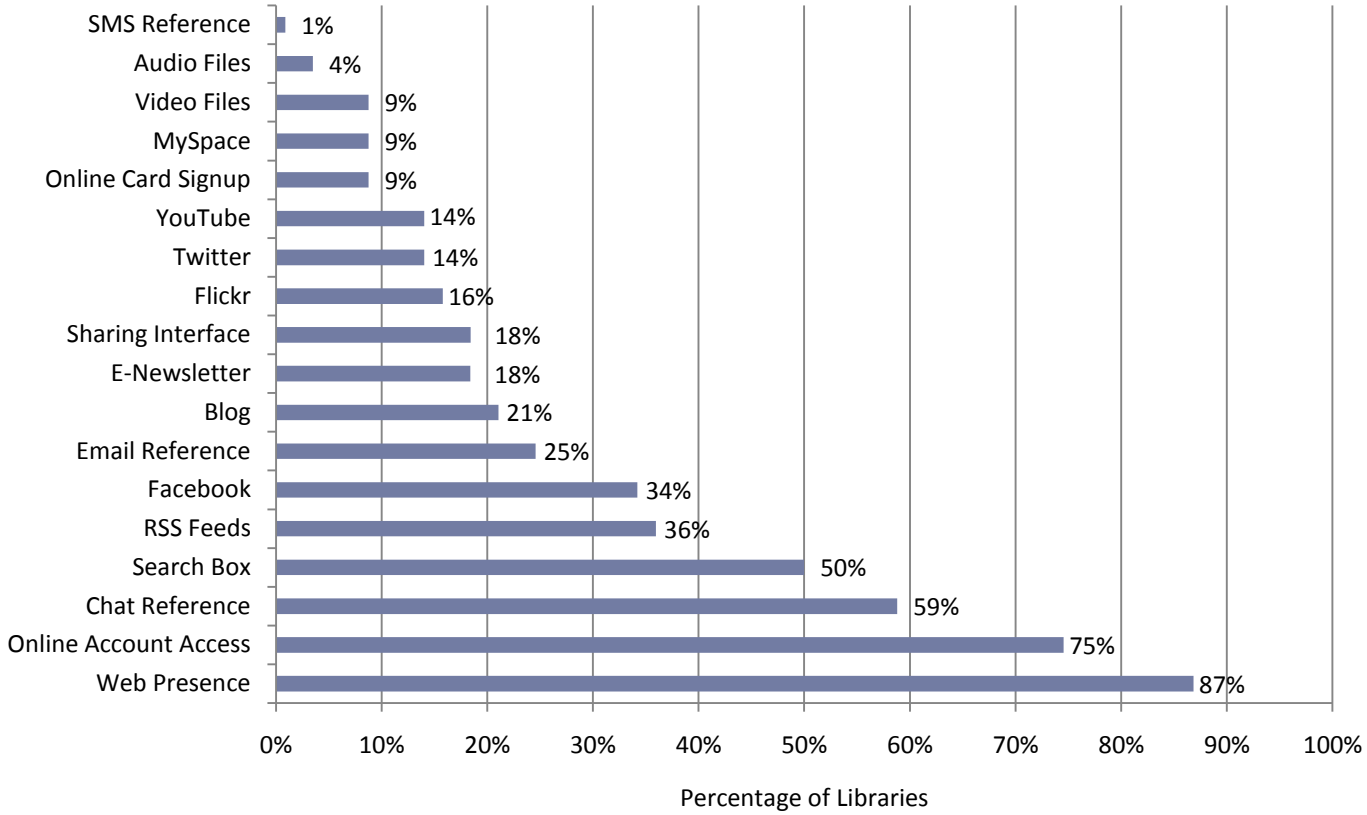
Just 4 web tools and features included in the study have been adopted by more than 1 in 2 Colorado libraries.

Colorado: All Libraries

The majority of Colorado public libraries have websites that offer patrons online access to their accounts, and at least half have a site or catalog search box and offer chat reference services (see Chart 26). About a third of Colorado libraries use RSS feeds or Facebook, but beyond that, implementation of various Web 2.0 technologies drops to just 1 in 4 libraries or less. National estimates follow a similar curve, but Colorado libraries maintain a higher percentage of use for all technologies except MySpace and SMS reference.

By summing the LSA populations of all Colorado libraries utilizing each Web 2.0 tool, it was possible to determine an estimated percentage of Colorado library patrons served by the various technologies. While some Web 2.0 technologies were relatively uncommon on library websites, all but 1 included in this study reach at least 1 in 4 Colorado library patrons (see Chart 27). Although fewer than 9 out of 10 (87%) Colorado libraries have a website and 3 in 4 (75%) offer online access to accounts, nearly 100 percent of Colorado patrons are served by a library with a website and online account access (99% and 98%, respectively). Almost 9 out of 10 (88%) Colorado patrons have access to a chat reference service – twice the estimated percentage of patrons nationwide (44%).

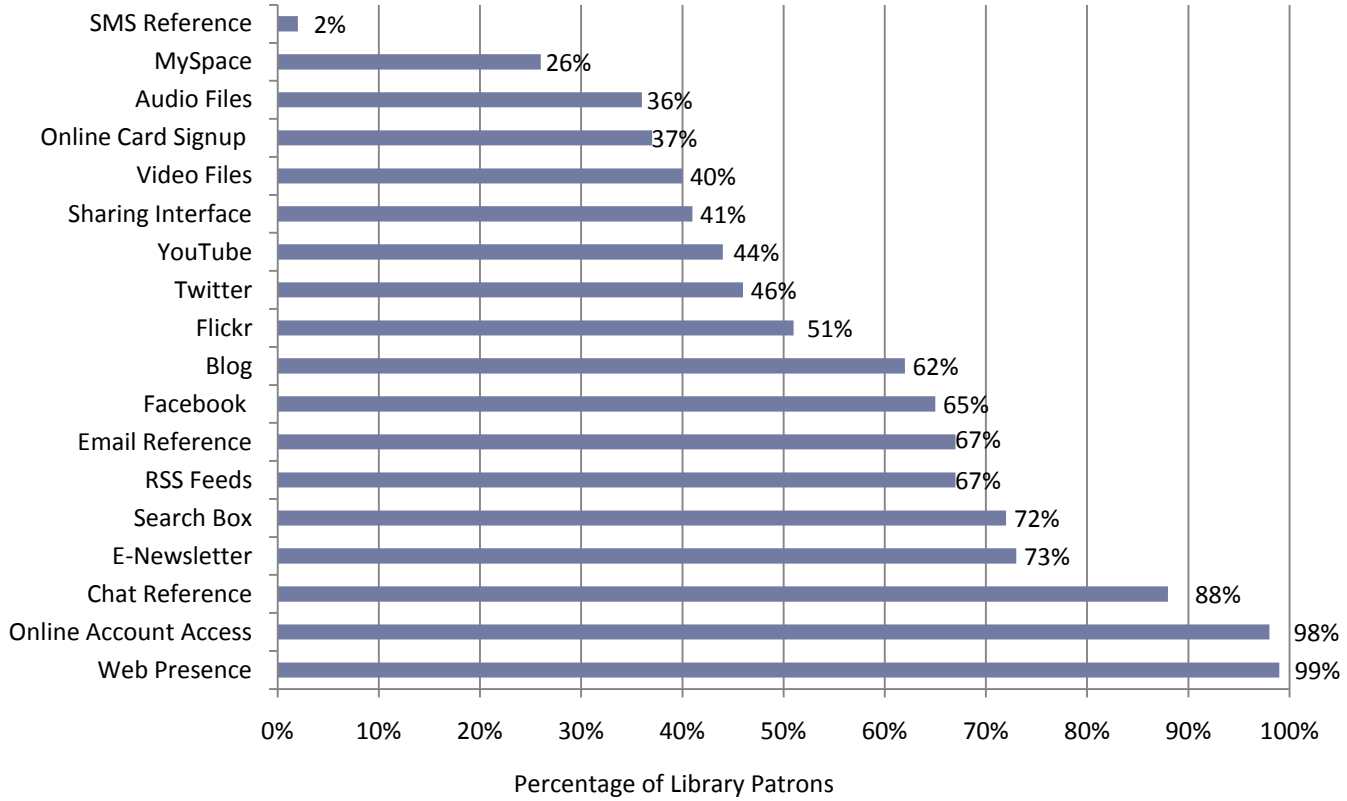
Chart 26
Percentage of Colorado Libraries Using Various Web Technologies in 2010



Since 2008, the largest increases in Colorado library patrons served by any Web 2.0 technologies came with Facebook (0% to 65%), RSS feeds (50% to 67%), blogs (48% to 62%), and Flickr (18% to 51%). A large majority of Colorado patrons also have libraries offering email reference (67%) and a search box (72%). In addition, electronic newsletters are among the Web 2.0 tools serving a considerable percentage of Colorado library patrons, but they are much less available to library-goers nationwide. Three out of 4 (73%) Colorado patrons can access an electronic newsletter through their libraries, while just 2 out of 5 (42%) nationwide can do the same. The statistics for video and audio files and online card signup tell a similar story: while less than 4 in 10 Colorado library patrons have access to any of these on their library websites, the nationwide estimates hover around half that amount. SMS reference is the only Web 2.0 technology that a higher percentage of patrons nationwide than in Colorado can access through their libraries' websites (2% of Colorado patrons compared to 6% nationally).

All but 1 of the tools in the study reach at least 1 in 4 Colorado library patrons, and nearly 100% of patrons can visit their libraries and access their accounts online.

Chart 27
Estimated Percentage of Colorado Public Library Patrons Served by Various Web 2.0 Technologies in 2010



Colorado Early Adopters

Nearly 1 in 10 Colorado libraries scored at least half of the possible points on the Early Adopters index.

Ten Colorado libraries, or nearly 1 in 10 (9%), scored at or above the half-way point on the Early Adopters index, compared to just slightly more libraries in the national sample (12%) that scored at least 22 points. This was a noticeable improvement over 2008, when no Colorado libraries scored half the index points. Not surprisingly, 6 of the 10 highest scorers in 2010 serve more than 100,000 patrons. Two libraries serving at least 25,000 and one library from each of the two smallest population groups made the cut.

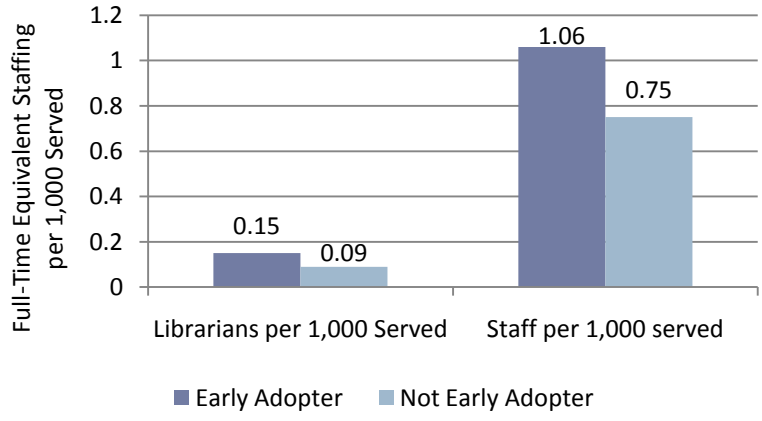
Colorado public libraries identified as Early Adopters boasted higher per capita ratios than non-early adopters for all but one of the key measures included in this report. In 2008, the differences were statistically significant for only 4 input statistics and no outputs; this time, the differences in 7 inputs and 4 output measures rated as statistically significant. In most cases, the gaps between Colorado libraries that are Early Adopters and those that are not have widened since 2008.

Inputs

Colorado Early Adopters employ 67% more professional librarians per 1,000 served than non-early adopters.

Colorado public libraries that qualify as Early Adopters employ 67 percent more professional librarians per 1,000 served and 33 percent more staff members overall than libraries that are not early adopters (see Chart 28). These differences have grown since 2008, indicating that Early Adopter libraries in the state are increasing their staff sizes more quickly than libraries that are not web-savvy. Colorado libraries – regardless of Early Adopter status – employ considerably more staff per 1,000 served than all libraries nationwide.

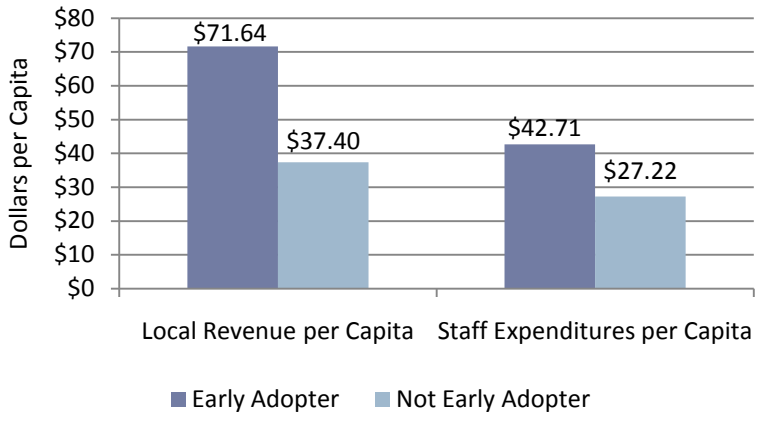
Chart 28
Colorado Libraries: Average Staffing Levels, by Early Adopter Status



Since 2008, Colorado Early Adopters have surged ahead of other libraries in the state – not to mention Early Adopters nationwide – in local revenue per capita, generating 92 percent more money than non-early adopters in Colorado (compared to 64% more in 2008) (see Chart 29). In contrast, the gap between the two groups' staff expenditures per capita remained steady, at 57 percent more for Early Adopters. Notwithstanding their Early Adopter status, Colorado libraries are spending 7 more dollars per capita on staff expenditures than their peers nationwide.

Colorado Early Adopters reported 92% more local revenue per capita than non-early adopters.

Chart 29
Colorado Libraries: Average Local Revenue and Staff Expenditures, by Early Adopter Status



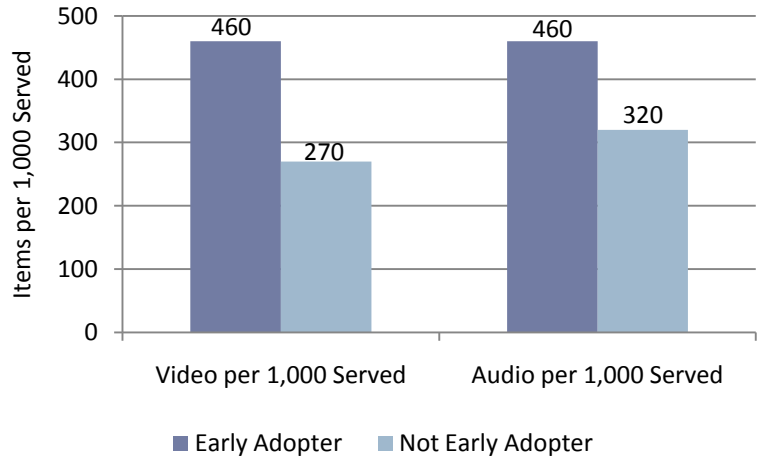
It does not appear that the increased revenue brought in by Colorado Early Adopters went toward collection expenditures. In fact, the gap between Early Adopters and other libraries shrank in total collection expenditures (from 64% to 55% greater for Early Adopters) and electronic expenditures (from 194% to 116% greater for Early Adopters) between 2008 and 2010. Even so, Early Adopters remained considerably ahead of other libraries in the state, spending nearly 3 more dollars on collections expenditures per capita and more than twice as much on electronic expenditures per capita (see Table 9 below).

Colorado Early Adopters spend nearly twice as much on electronic expenditures per capita than non-early adopters.

Not surprisingly, then, Early Adopter libraries also had more audio and video holdings (see Chart 30). The gap for video increased drastically from 16 percent more for Early Adopters in 2008 to 70 percent more in 2010 (compared to 27% more for Early Adopters nationally). Though the difference in audio was not statistically significant, Early Adopters gained notable ground in this area. In 2008, non-early adopters held 12 percent more audio volumes, and by 2010 Early Adopters had not only caught up with but surpassed other libraries, reaching 44 percent more audio items per 1,000 served.

Just as in the national sample, Colorado Early Adopters have considerably more audio and video items in their collections than non-early adopters, and the gap is widening.

Chart 30
Colorado Libraries: Average Audio and Video Holdings, by Early Adopter Status



A similar scenario occurred with computers per 1,000 served. Two years ago, Colorado libraries that were not Early Adopters owned 33 percent more computers per 1,000 served than Early Adopters, but by the time of this study Early Adopters had taken the lead with 13 percent more (see Table 8). In addition, Colorado Early Adopters noticeably outpace their peers nationwide, reporting twice as many computers per 1,000 served than national Early Adopters. Although these numbers did not emerge as statistically significant, they nevertheless fall in line with the predominant trend of Early Adopters reporting higher input ratios than other libraries. The only instance in which this is not true is print volumes per capita, for which Early Adopters trail their counterparts, though by a smaller percentage than in 2008.

Colorado Early Adopters have twice as many computers per 1,000 served as Early Adopters nationwide.

Table 8: Colorado Libraries: Input Ratios for Selected Statistics, by Early Adopter Status

Statistic	Early Adopter	Not Early Adopter	Percent Greater for Early Adopters in 2010	Percent Greater for Early Adopters in 2008
Collection Expenditures per Capita*	$8.04	$5.18	55%	73%
Electronic Expenditures per Capita*	$0.80	$0.37	116%	194%
Computers per 1,000 Served	2.84	2.51	13%	- 33%
Subscriptions per 1,000 Served	13.61	10.8	26%	14%
Print Volumes per Capita	5.35	5.81	- 8%	- 21%

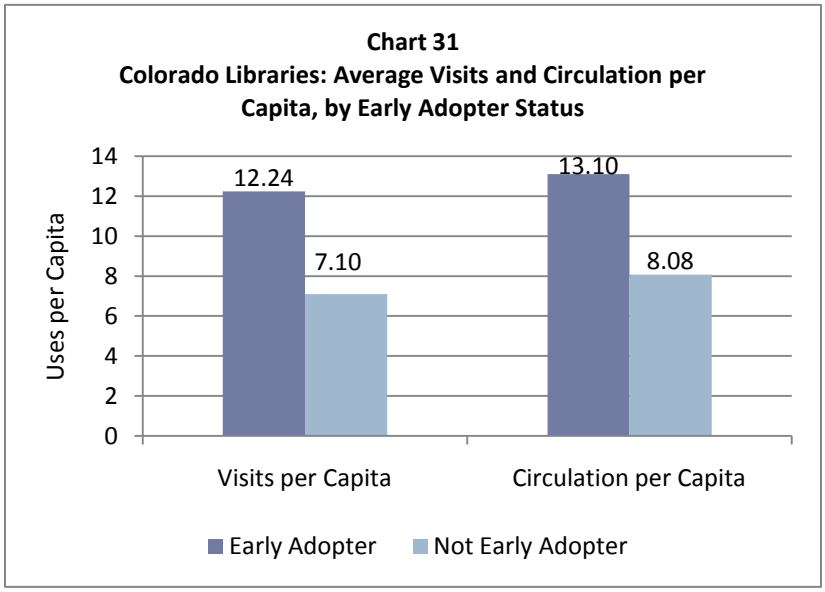
* p <.01

Outputs

In 2008, Colorado Early Adopters reported higher numbers than non-early adopter libraries for every output measure included in the study. The same held true the second time around; however, while none of these differences were statistically significant in the previous study, half of them were in 2010. Perhaps the most common output statistics referenced as measures of library success are visits per capita and circulation per capita. In these two areas, Early Adopter libraries in Colorado far outpaced their counterparts, reporting more than 12 visits and 13 items circulated per capita to non-early adopters' 7 visits and 8 circulations (see Chart 31). The discrepancy between the two groups has increased drastically since 2008 – quadrupling for visits per capita (from 18% to 72% in 2010) and more than doubling for circulation (from 26% to 62%).

Colorado Early Adopters report higher visits and circulation than non-early adopters, with the difference increasing since 2008.

Chart 31
Colorado Libraries: Average Visits and Circulation per Capita, by Early Adopter Status



In addition to attracting more users to their physical library buildings, Colorado Early Adopters are drawing more users to their virtual presences (see Table 9). This makes sense, as libraries that invest in enhancing their websites have more to offer users electronically. The disparity between Early Adopters and non-early adopters in electronic users per capita is twice what it was two years ago (63% in 2010, compared to 32% in 2008), but even so, non-early adopters in Colorado report more electronic users than Early Adopters nationwide. Colorado libraries also reported considerably higher program attendance and children's program attendance, with non-early adopters in the state again edging out nationwide Early Adopters.

Even *non-early adopters* in Colorado report more electronic users than Early Adopters nationwide.

Table 9: Colorado Libraries: Output Ratios for Selected Statistics, by Early Adopter Status

Statistic	Early Adopter	Not Early Adopter	Percent Greater for Early Adopters in 2010	Percent Greater for Early Adopters in 2008
Reference Questions per Capita	1.15	0.83	39%	48%
Program Attendance per 1,000 Served	687.76	518.25	33%	22%
Children's Circulation per Capita	4.42	3.03	46%	15%
Children's Program Attendance per 1,000 Served*	24.8	15.95	55%	19%
Electronic Users per Capita*	3.16	1.94	63%	32%

* p <.01

Although not all are statistically significant, the differences between Early Adopter and non-early adopter libraries in Colorado have increased for program attendance, children's program attendance, and children's circulation since 2008 (see Table 9). The only measure that shows non-early adopters closing the gap is in reference questions per capita. In all others, Early Adopters have jumped ahead by leaps and bounds.

Summary

Reflecting trends seen in the national sample, Colorado Early Adopter libraries reported higher inputs and outputs than did non-early adopters for most IMLS measures used in this study. While the same was largely true in the 2008 study, few of the differences were actually statistically significant. This time around, the majority were statistically significant, adding weight to the previous observation that Early Adopters of web technologies rate higher in various measures traditionally used to quantify library success. Perhaps unsurprisingly, the statistical significance of these differences tends to appear in more input than output measures, but that has begun to change. While it may seem obvious that Early Adopter libraries are more likely to have larger staffs or higher expenditures, the differences between their outputs and those of non-early adopters is growing, revealing that there is in fact a connection between increased use of web technologies and service deliverables that was not so apparent for Colorado libraries in 2008. It could be that it simply took some time for the implementation of these changes to impact outputs.

Overall, Colorado Early Adopters report higher statistics that are traditionally used to measure libraries' success than non-early adopters, but in contrast to 2008, the majority of those differences are statistically significant in 2010.

Conclusion

Since the first *Web Technologies* study, public libraries across the United States have made varying degrees of progress in adopting Web 2.0 tools. Using the 2008 results as a baseline, the 2010 study was an opportunity to identify new web technologies and track changes in what libraries are adopting, as well as identify characteristics of those libraries.

In general, the results of the 2010 study reveal that most web technologies are increasing in use on public libraries' websites, with some tools gaining in popularity rather quickly and others appearing to stagnate. For example, libraries' use of social media sites took off while adoption of earlier tools including blogs has slowed, and new options such as SMS reference have not yet had a chance to gain much traction. Regardless of the tool in question, most growth was concentrated in the largest libraries, where adoption of new technologies increased at a faster rate than in smaller libraries.

Perhaps most telling is the increasing number of libraries scoring higher on the Early Adopters index. It's no longer just a handful that stands out as experimenting with web technologies, and as a result the standards for qualifying as an "Early Adopter" have risen. The libraries that are identified as Early Adopters tend to be better staffed and better funded, and continue to report higher outputs that are traditional indicators of success, such as visits and circulation. Furthermore, regression analysis revealed that over time, Early Adopters reported greater increases in these areas than non-Early Adopters; even when controlling for staff and collection expenditures, adoption of web technologies was a strong predictor of such increases. What remains unclear is whether these libraries are successful because they have invested in services such as new web technologies, or if they adopted the Web 2.0 tools because they had the staff and resources—as a result of their previous success—to maintain them.

Obviously, web technologies will continue to evolve, and with them, libraries' use of such tools. In the coming years it is probable that libraries will abandon some of the original web technologies in favor of new ones that better respond to users' changing interests and information seeking habits. Areas to watch include social media, which has already exhibited massive growth, SMS reference, and mobile compatibility of libraries' websites, which is likely to become more common as the general popularity of web-enabled mobile devices increases. In addition to monitoring the mere presence of various web tools and the number of libraries that use them, a next step is to evaluate *how* the libraries—and their patrons—utilize the tools and whether they contribute to increased value in services.

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Appendix A

Public Libraries and the Use of Web Technologies, 2010

* indicates required question

Basic Website

Library Name

*1. Does this library have a web presence?

Yes ○ No ○

2. What is the library's web address (if different from the address provided)?

Look for the presence of a catalog and/or site search box on the library's site. If found, determine if it's on most (or all) pages, or primarily just available from the home page.

3. The library's website has a search box...

- ○ On most pages
- ○ On the home page
- ○ Not on home page

4. Does the library's website offer a "share this" type interface (from the library site only)?

Yes ○ No ○

Patron Communication

5. How does the library offer an email newsletter?

- ○ 1 newsletter for all
- ○ Focused / Customizable newsletter
- ○ No newsletter

6. Does the library have at least one blog that you can find?

Yes ○ No ○

7. Does the library have a blog that you can subscribe to via RSS?

Yes ○ No ○

8. What is today's date?

9. What is the date of the most recent blog post you can find?

10. What is the date of the most recent blog comment that you can find?

11. How does the library offer RSS feeds for non-blog content?

- ○ Customizable feeds
- ○ Non-customizable feeds only
- ○ No non-blog feeds

Online Catalog

Search for something popular in the library catalog and respond to the next questions based on those search results.

To answer this question:
User comments/reviews are text reviews by patrons of specific items
User Ratings are numeric/star ratings of specific items in the catalog
Recommendations are system-created recommendations based on the user's search (ideally matching it with other users' searches - "others who liked this...")
Tags are user-generated tags applied to specific items in the catalog

12. Does the online catalog offer the following?

	Yes	No
User comments/reviews	○	○
User ratings of items	○	○
Recommendations	○	○
User-generated Tags	○	○

13. If the library catalog has tags, does it incorporate them in any of the following ways?

	Local (library-based)	General (e.g., LibraryThing)	Yes, but can't tell which	None
Tag cloud	○	○	○	○
Recently added tags	○	○	○	○
Most popular tags	○	○	○	○

Patron Account

14. Does the library offer online access to the patron's account?

Yes ○ No ○

15. Can you sign up for a library account online, and start using library resources?

Yes ○ No ○

For the following question, look for evidence that the library is marketing specific "my library card" features by searching on the library's home page, the catalog page, and the online card signup area.

16. Which of the following "my library card" features does the library market?

- ☐ Reading History
- ☐ Wish List
- ☐ Recommendations
- ☐ RSS Notifications
- ☐ SMS (text) Notifications
- ☐ Email Notifications

Virtual Reference

For the following question, please include only those services where the library is actively soliciting questions - e.g., a "contact us" email link is not sufficient.

17. Which of the following types of reference services does the library provide?

- ☐ Chat
- ☐ SMS (text messaging)
- ☐ Email

18. *For Colorado Libraries* - could you find the presence of AskColorado on the library's website?

Yes ○ No ○

Social Networking

For "Number of members", in MySpace use friends, Facebook use Fans or Members (for groups), Flickr use Contacts, YouTube use Channel presence and number of Subscribers, Twitter use followers - don't use commas in your numbers!

19. Describe the library's presence in the following:

	Presence	Embedded Catalog	Embedded IM	Number of contacts
MySpace	☐	☐	☐	
Facebook	☐	☐	☐	
Flickr	☐	☐	☐	
Twitter	☐	☐	☐	
YouTube	☐	☐	☐	

A/V files

20. On the library website, could you find the presence of the following?

- ☐ Audio Files (e.g., podcasts)
- ☐ Video Files

Gadgets

For the purposes of this question, "gadgets" is defined as a piece of software that users can put on their computer that makes the public library's resources more useful. Examples of this are library-specific Firefox add-ons, Libx plugins, iGoogle gadgets, and bookmarkets.

21. Were you able to locate any library-specific "gadgets" that the library was marketing?

Yes ○ No ○

Mobile

Very vague question here - check out the site on a mobile device and determine whether the library's site was readable on the mobile device. Leave blank for now if you don't have access to a mobile device.

22. Did the library attempt to cater to mobile devices?

Yes ○ No ○ Can't tell ○