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Academic and Public Libraries' Use of Web 2.0 Applications and Services in Mississippi

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University of Southern Mississippi

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Introduction

Since its creation by Tim Berners-Lee in 1989, the World Wide Web has provided access to information to hundreds of millions around the world. Sodt and Summey (2009) describe Web 2.0 as a "second generation" term to describe the "user-driven, collaborative, participatory, and personalized web" (p. 98). Since these kinds of interactive experiences can attract users to libraries, libraries often feel encouraged to become familiar with Web 2.0 technologies (Dye, 2007). Libraries that have adopted Web 2.0 features are often described as having "Library 2.0" capabilities (Casey & Savastinuk, 2006). Libraries offer options for home users like virtual reference services, databases, catalog tagging, and downloadable media (Maness, 2006). Ranganathan's Law of Library Science (1931) states that the library should be considered a growing organism (Noruzi, 2004) and therefore the implementation of Web 2.0 technologies can be seen as a natural transition from print-based libraries into their more evolved virtual counterparts.

Libraries have guidelines and standards that hold them accountable to be effective institutions (Husid, 2010). The American Library Association's (ALA) "Library Bill of Rights" sets six basic standards for all libraries to follow. Among other things, these standards encourage libraries to resist forms of censorship, grant access to all types of materials, and resist biases (ALA, 2007). However, as libraries have evolved, so have many of these guidelines and standards with respect to technology specifically. For example, the American Association of School Libraries (AASL) *Standards for the 21st Century Learner* requires that the students in today's classroom strive to master technology skills (ALA, 2007). The Young Adult Library Services Association's (YALSA) *Public Library Evaluation Tool* and *The Competencies for Librarians Serving Youth: Young*

Adults Deserve the Best supports the use of social networking and Web 2.0 services like blogs and podcasts in the classroom and library (Husid, 2010). The Association of College and Research Libraries (ACRL) *Standards for Libraries in Higher Education* not only encourages academic libraries to educate students and build a sense of campus community, their principal performance indicator "Discovery" asks libraries to "enable users to discover information in all formats through effective use of technology and organization of knowledge" (ALA, 2011, pg. 9).

At state level, the Mississippi Library Commission's (MLC) supports the Library Services and Technology Act (LSTA), a federally funded act that allows the MLC to offer statewide programs and services such as Learn a Test, MAGNOLIA databases, and classes for employee technology development (MLC, 2011). MLC's 2014 publication *The Packet* shows continuing support of technology in Mississippi; one example, the Teen Zone at the Waynesboro-Wayne County Library, strives to be a hub for gaming and offers a PlayStation, Xbox, and Wii systems (MLC, 2014). The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) is the accreditation commission for higher education institutions in the Southern States. Their mission is to "assure the educational quality and improve the effectiveness of its member institutions" (SACSCOC, 2012, p.1). The Core Requirement 2.9 requires the libraries of an accredited institution to provide services, user privileges, and resources to equip users with sufficient educational support (SACSCOC, 2012).

Arguably, as standards of practice and standards of service evolve, so should libraries and library services. Employing Web 2.0 capabilities in library services are an important part of meeting user needs in the new century. To what extent libraries in Mississippi have heeded the call has yet to be measured, however.

Purpose of Study

This purpose of this study was to determine, by surveying library Web sites, the extent to which Mississippi's academic and public libraries meet

current technological standards and other recommendations set by professional organizations.

Research Questions

R1. What types of Web 2.0 services (mash-ups, blogs, wikis, phone app, QR code, etc.) are available on Mississippi public and academic library systems' Web sites?

R2. Which are the most frequently offered Web 2.0 services overall? Do these differ between library types?

R3. What types of social networking (Twitter, Facebook, YouTube channel, Pinterest, Instagram, etc.) are utilized by Mississippi public and academic library systems' Web sites?

R4. Which are the most frequently used social networking applications overall? Do these differ between library types?

R5. What types of social tagging are available on Mississippi public and academic library systems Web sites?

R6. Which types of social tagging are the most frequently used overall? Do these differ between library types?

R7. Which library Web site participates in responsive design formats? (That is, the ability to adapt to three different platforms: mobile phone, tablet, and computer.)

Definitions

Mash-up - is a Web applications that combines services into a single application with an easy use interface (Techterms, 2007).

Quick response code (QR Code) - this is a two dimensional code that is scanned with mobile technology to locate data on the Web, in SMS text, or make payments (*PC Magazine Encyclopedia*, 2014).

Responsive Web design – is a site's ability to adapt to different viewing platforms: mobile phone, tablet, and computer (Techterms, 2013).

Importance of Study

Study findings aim to measure to what extent Mississippi's libraries are meeting current service standards. Findings will suggest that libraries in Mississippi, generally, are meeting current standards, not meeting them, or perhaps even surpassing them. Findings can inform recommendations for changes in policies or service models.

Literature Review

The literature about Web 2.0 and Library 2.0 is already extensive. Although the term "Library 2.0" is still vague to some librarians, Kwanya, Sitwell, and Underwood (2009) believe that how libraries respond to it will be important for their survival. Anttiroiko and Savolainen (2011) distinguish the two and suggest that "Web 2.0" is a general term for all new user-centered technologies while "Library 2.0" is a general term for all libraries that use the Web 2.0 services. Their work identifies four main uses of Web 2.0 in public libraries: communication, content sharing, social networking, and crowdsourcing.

Already some studies have examined libraries and Library 2.0 capabilities. For instance, Boateng and Lui (2014) examined how many of the US News and World Report's 2013 top 100 colleges in the USA used Web 2.0 services. They searched the school's main Web page, search function, public blog platforms, and social networking sites (SNS). Each school had data being recorded on how they used Web 2.0, trends, and level of participation. Findings indicated that 90 percent or more of the universities' libraries used social networking sites, blogs, RSS feeds and messaging, and 100 percent of them used SNS, while less than 40 percent used wikis and social bookmarking features. Mahmood and Richardson (2011) completed a study of Web 2.0 technologies and members of the Association of Research Libraries (ARL). The study found that all member libraries were using at least one Web 2.0 tool. Then, after separating tools into groups by usage, the study found that while blogs, RSS feeds, messaging, social media sites, and podcasts had a high rate of use among the libraries examined, wikis, photo apps, and virtual worlds had a lower rate of use.

International Studies of Libraries and Web 2.0

The use of 2.0 technologies in libraries is a topic of worldwide interest. For instance, Mirza and Mahmood (2009) examined Web-based services at university libraries in Pakistan. Findings showed that Web-based services are still in the development stages with only two-thirds of libraries examined in the study maintaining at least partial Web sites. Half of the libraries were considered "dynamic" (a Web

site with hyperlinks). Available library services were limited to five or six features, with one or more resources for instruction services, reference services, email, and chat applications. A more recent study by Khan and Bhatti (2012) surveyed attitudes about the use of social media as a marketing tool at universities in Pakistan. The study found that librarians and academics thought the library's use of social media would be an accepted and positive marketing technique. Khan and Bhatti (2012) did suggest, however, that proper training would be needed for this to be an effective tool, something that Ata-Ur-Rehman and Shafique's (2008) study had found four years earlier.

Linh's (2008) study examined the actual use of Web 2.0 at Australasian university libraries and considered, specifically, the type, purpose, and features of each technology used. Linh found that two-thirds of the universities in the study used one or more Web 2.0 resources. Only four libraries in the study used these technologies for a specific and basic purpose. Linh (2008) also indicated that the most popular 2.0 applications used among the Australasian university libraries in the sample were blogs, wikis, RSS, messaging, social networking, and social tagging. Si, Shi, and Chen (2011) conducted a similar study of Chinese university libraries, completing a content analysis of the Web sites of the country's top 30 universities. The results showed a low number of libraries using Web 2.0 services adequately. Two-third of the libraries studied used between one and four Web 2.0 technologies. A similar but older survey conducted by Han and Liu (2010) had yielded nearly identical findings.

Web Analysis of Library Web Sites

Brower's (2004) study of academic health science library Web sites focused specifically on homepages and navigation tools. Forty-one libraries were examined for evidence of Web site aides, library services, and electronic services. Each site was frozen and downloaded with a Web spider so the site could not be changed. Brower concluded that 85 percent of the library Web sites offered some form of navigation tools. Common aides and tools included: feedback forms, site indices, site maps, and search engines. General library information was not apparent outside of education services, hours of operation, and library

news. The study's conclusions suggest that a Web site should contain 50 percent more persistent navigation tools compared to homepage links. This 50 percent increase in navigation tools would allow certain information to be available on every page in the areas of navigation, location to homepage, contact information and identification of current page.

Pechnikov and Nwohiri (2012) used webometrics to study Nigerian university Web sites. Using a crawler, the researchers scanned the Web sites and hyperlink pages to create a database of hyperlinks. Around 9500 outlinks were found from 102,000 pages from the 97 universities used for the study. A Web neighborhood was found with 138 sites linked but only 127 were active. Fifty-three out of the 127 Web sites did not have a Web neighborhood. The results showed the Nigerian university Web structure to be small and weakly connected.

Many studies examine library Web sites from a usability perspective. For instance, Black (2009) completed a two-year study on the academic library Web site user using the Ohio State University Libraries Web site. Study findings suggested that Web designers should consider site design from the user's perspective: site maps, for example, not only optimize usability but can also increase site usage. Moreover, analysis of visited pages can help measure the popularity of Web content. Another study by Smith (2014) examined accessibility, complexity, readability, and types of links available on selected public and private library Web sites in Alabama, using criteria selected from the Web Accessibility Initiative, the Web Content Accessibility Guidelines 2.0, and the World Wide Web Consortium. The results showed that the selected sites showed completeness (according to the criteria) and ranked close together in terms of overall accessibility. The study concluded, however, that the overall readability of the sites examined needed improvement.

Last, Qutab and Mahmood's (2009) completed a content analysis of all 52 library Web sites in Pakistan. Using a list of 77 criteria, the researchers sought to identify navigational strengths and weakness, specifically. Findings suggested that, while none of the 52 library Web sites examined lived up to

all 77 criteria, ultimately library type was not a factor in determining overall navigability. The study also found very little evidence of Web 2.0 features on these sites. The present study will use a similar research design and methodology as Qutab and Mahmood's (2009) study, examining the Web sites of academic and public libraries in the state of Mississippi.

Methodology

This study employed a content analysis approach, using a checklist of Web 2.0 features (see Appendix A) compiled using information from Maness (2006) and Mahmood and Richard Jr. (2011).

Not all public and academic libraries were used in this study. Libraries included in the study had to have a working Web site. Moreover, academic libraries of various sizes and levels were included in the sample but had to be part of accredited institution of higher learning to be properly considered an academic library. A list of 78 different library Web sites was compiled using a list (obtained from the Southern Association of Colleges and Schools Commission on Colleges) of accredited academic libraries in Mississippi. This list was then cross-referenced with a similar list obtained from the Mississippi Library Commission (MLC) and ultimately 30 academic library systems in Mississippi were included in the final sample. A list of Mississippi public library systems from the MLC was used to identify public libraries with working Web sites.

Data about what each site contained were recorded and entered in a spreadsheet, delineated by library type. Each site was examined for evidence of Web 2.0 features, including (but not limited to): blogs, wikis, phone apps, QR code, mash-ups, video or audio sharing, and customized Web pages; social media/networking (e.g., Twitter, Facebook, YouTube channel, Pinterest, Instagram, and so forth); and types of social tagging. In order for the 2.0 feature to be counted, it had to be publicly available (i.e., accessible without the use of a password or use of a system library card). All Web pages were active at the time of data collection and most data were collected from the homepage, except for catalog data and any

resources identified to be on a separate page (e.g., phone app links).

Each Web site was also tested for "responsive design"—that is, the ability to adapt to mobile phone, tablet, and computer platforms. To achieve this end, each library Web site in the sample was accessed on three devices (phone, tablet, and computer).

All library Web sites included in the sample were examined in the fall of 2014. Results were analyzed using a descriptive statistical approach.

Assumptions

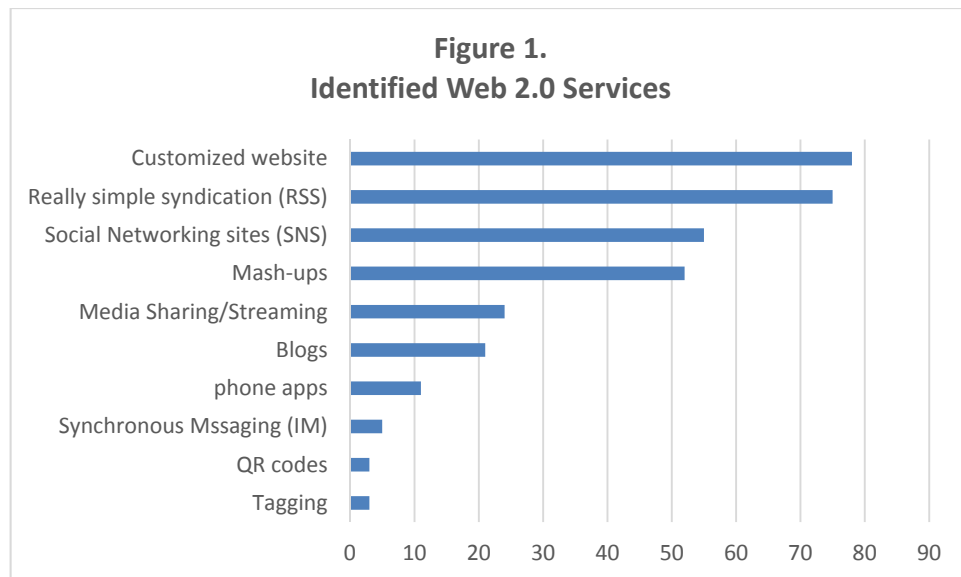
For the purpose of this study, it was assumed that the list of library systems indexed on the MLC's Web site is correct and complete, and that the accompanying information on each library (such as name, Web site, type of library, and location) was accurate at the time of the study.

Limitations

The Web sites included in the study were limited to academic and public libraries located in Mississippi. Moreover, all public library Web sites had to be available through the Mississippi Library Commission, and the parent institutions of the academic library Web sites had to be members of the Southern Association of Colleges and Schools Commission on Colleges. The geographic limitations were chosen for two reasons: first, to make the study feasible (it was completed as a capstone research project by an MLIS Candidate); and second, so that the study could act as a "pilot" for any future studies of broader (i.e., regional or national) scope.

Therefore, although the present study aims to be broad in terms of its examination of library Web sites in Mississippi, its findings cannot be generalized to regional or national levels. Its findings tell us only about the availability of Web 2.0 features on the Web sites of selected libraries in Mississippi.

Moreover, while each library site examined was indeed the "official" Web site of the library in question, there was, understandably, variability in the ownership and maintenance of each library's site.



Not every library included in the sample had its own, standalone site; in some cases, library sites were a part of the larger library system of which the selected library was a part (for example, a county library system of multiple branches). In such cases, the Web site of the larger library system was examined.

Findings

R1. What types of Web 2.0 services (mash-ups, blogs, wikis, phone app, QR code, etc.) are available on Mississippi public and academic library systems' Web sites?

Figure 1 summarizes by type and frequency the Web 2.0 services and features found in academic and public libraries in Mississippi. The following sections will consider each on its own.

Customizable Website

Custom user interface is one of the four essential elements of Library 2.0 (Maness, 2006). This interface is what the user will use to interact in the virtual community of the library's site. Depending on site design, the user can share and save, creating a more personal experience by signing into their account. All 78 Web sites were found to be customizable by signing in to access personal settings. This allows a more in-depth search of the catalog, access to the databases, and so forth.

Real Simple Syndication (RSS)

RSS is the second most frequently adopted Web 2.0 feature. RSS is an XML code that will give users the availability to personalize information on the Web

site (Walia & Gupta, 2012). Nearly all (75 out of 78) of the Web sites in the sample featured an RSS application. Updateable newsletters, calendars, and blog feeds were all found on one or more of the sites. The most common RSS application was used for book updates, whereby libraries posted book covers or summaries of the newly added titles.

Social Networking Sites

Social networking sites (SNS) is a broad term that covers a network of applications. SNS offer a free way to create a personalized Web page within an established online community. SNS sites like Facebook, Twitter, LinkedIn, and Pinterest provide the users with services like blogs, media sharing, tagging, and messaging (Maness, 2006). SNS were found to be the third common used Web 2.0 feature with 55 libraries having one or more account.

Mash-up

"Mash-up services" describe the mixing of 2.0 technologies. Mahmood and Richard (2011) define it as an application that uses content from other Web 2.0 resources and offers the services in a single interface. Fifty-two sites in the sample showed evidence of mash-ups. The most common option was to offer virtual search of the OPAC on the home page or allow a Web search on the topic using a popular search engine. Several sites even offered book list resources with a "buy now" option through Amazon. Shelf Safari was also used to create virtual book lists for books newly added to the library collections.

Media Sharing and Streaming

Twenty-four library Web sites featured some form of media sharing or streaming, the most common types being audio/video streaming and document sharing. Video streaming was most popular; libraries used it to create tutorials for database searching and to showcase library services. Eleven of the 24 libraries in the sample showed evidence of maintaining a YouTube account. Document sharing was also recorded on the sites. Many libraries had a prescribed area to find a downloadable handout to study and research helps. Several of the libraries linked to video streaming applications and movie on-demand databases.

Blogs

Twenty-one libraries in the sample maintained at least one blog and promoted it on their Web site. Many of the blogs had RSS feeds directly tied to the homepage. Six of the libraries that maintained blogs were academic; the remaining 15 were public.

Wikis

Wikis are collaborative programs used to create content for a Web site (Rouse, 2006) whereby users create and edit content using a simple interface. None of the libraries in the sample appeared to use wikis on their sites.

Mobile Applications

Mobile applications can be used to offer mobile access to Web applications or be specifically designed for your mobile device (2013). Eleven out of seventy-eight of the evaluated libraries offered some form of mobile applications. Eight of those eleven were academic libraries in the study and three of the libraries were public. The applications were mostly phone applications to conduct catalog searches, database searches, or listing the resources the library offered.

Synchronous Messaging

Synchronous messaging, or instant messaging (IM), “allows real time text communication between librarians and users” (Maness, 2006, pg. 2). Five libraries in the study offered an IM function on their

sites to allow users to communicate in real time with librarians. Four of these were academic libraries. Most of the remaining libraries in the sample offered only email communication for reference questions or other queries.

Quick Response Code

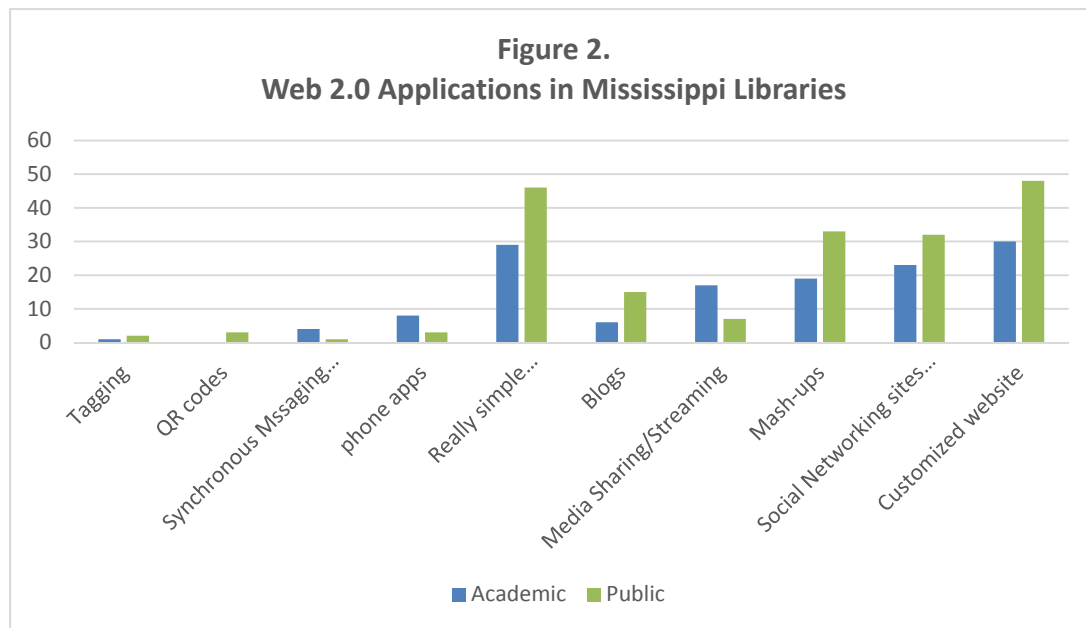
Quick response code (or, QR code) is a two-dimensional barcode used to share information in a digital format. They can be scanned by a smartphone with mobile tagging application installed (PC Mag, 2014). Only three libraries in the sample showed evidence of using QR codes to connect users to news, phone apps, and promotional activities.

Tagging

Tagging is a web-based tool that allows users to create headings (using names and keywords) and attach them to items. Maness (2006) suggests that tagging is the user’s ability to add and change not only data but metadata as well. Tagging, or social bookmarking specifically, are “excellent resource discovery tools” according to Waila and Gutpa (2012, pg.10). When combined, tags create a list of searchable resources. Only 3 libraries in the sample showed evidence of tagging.

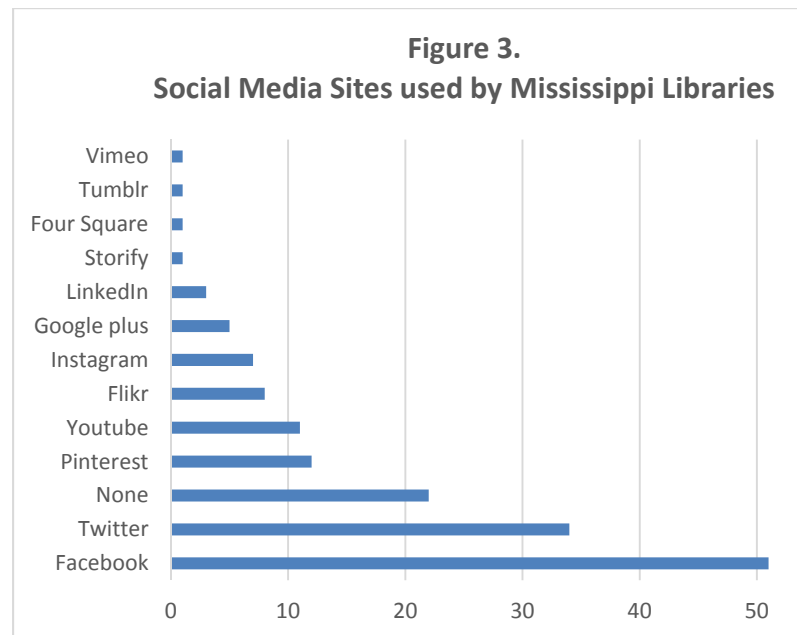
R2. Which are the most frequently offered Web 2.0 services overall? Do these differ between library types?

As depicted in Figure 2, the data showed that the two most frequent types of Web 2.0 features were RSS and Customized Web sites. This was the case for the entire sample, and also individually per library type. All 78 libraries make use of the Customized Website resources; for example, each page requested that the user log into their account to access a more personalized library site. RSS was found on 75 of the 78 library sites; libraries normally used RSS to promote monthly calendars, blog posts, new books, and so forth. Twenty-nine of the 30 academic libraries in the sample and 46 of the 48 public libraries used RSS. So, there was no reason to conclude that RSS was more popular among libraries of one type over the other.

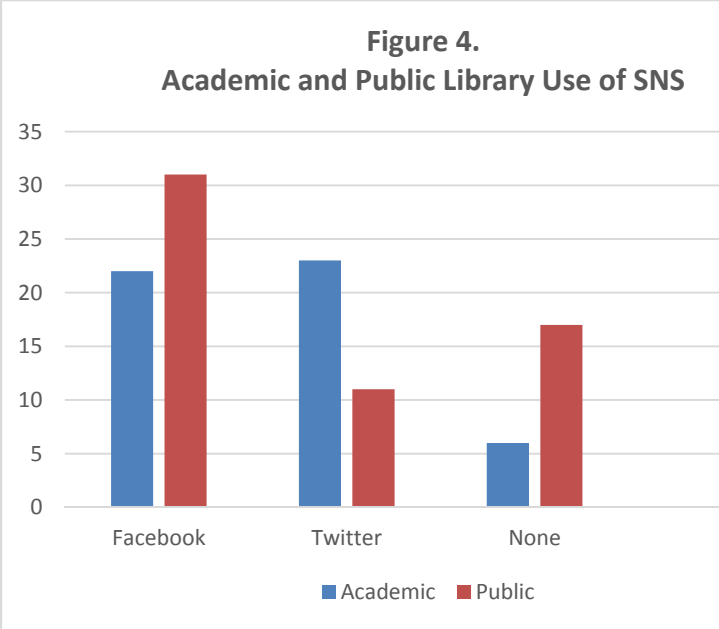


R3. What types of social networking (Twitter, Facebook, YouTube channel, Pinterest, Instagram, etc.) are utilized by Mississippi public and academic library systems' Web sites?

Aside from customization and RSS feeds, social networking sites (SNS) were the most commonly used 2.0 feature in the sample. SNS are perhaps the best examples of 2.0 functionality: they allow for messaging, blogging, streaming media, tagging, and Web site customization. All sites in the sample were checked for icons ("buttons") or links leading to social media applications such as Facebook, Twitter, and so forth. Most buttons could be found on the library's homepage or on a media tab. Figure 3 shows that 51 library Web sites had links to social media applications: 32 public libraries and 23 academic libraries showing links to at least one social media application or site associated with the library.



R4. Which are the most frequently used social networking applications overall? Do these differ between library types?



Rouse and Dean (2014) identifies five features that libraries can use these features to connect, educate, and promote themselves: marketplace, groups, events, pages, and presence technology. Of the 78 library Web sites examined, 24 of them did not identify the use of a social networking site. Six of the academic library sites showed no evidence of SNS promotion, and 17 public library sites showed no evidence of SNS promotion. Facebook was by far the most frequently used form of social media among the libraries in the sample: fifty-one Web sites featured links to a Facebook account (22 academic libraries and 31 public libraries). Twitter was the second most frequently used form of social media, with 34 libraries showed evidence of using the application.

While many libraries showed evidence of using two or more social media applications, identified two or more accounts in social media sites, a much larger number of academic libraries in the sample have social media accounts than the public libraries in the sample (see Figure 4).

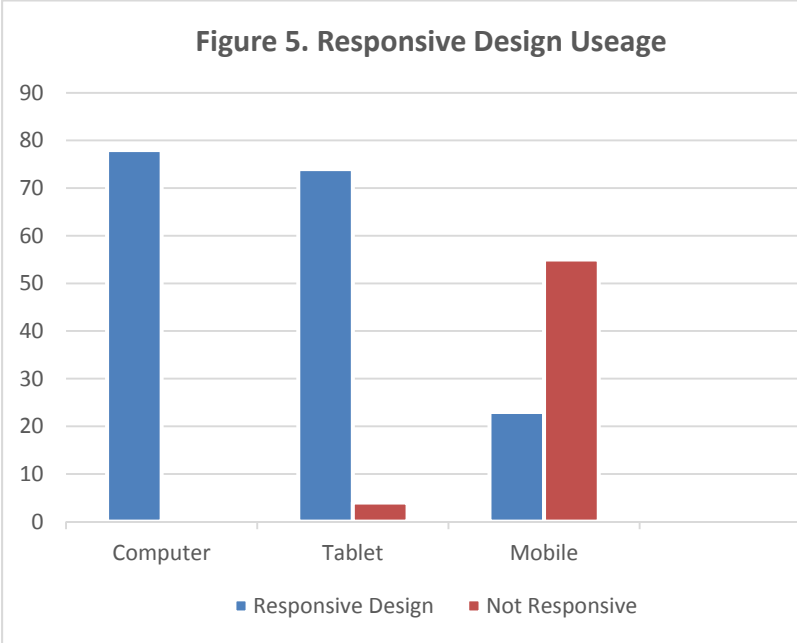
R5. What types of social tagging are available on Mississippi public and academic library Web sites? Tagging was found in two forms: social bookmarking, and catalog tagging. Two of the Web sites in the

sample showed evidence of social tagging while only one showed any visible catalog.

R6. Which types of social tagging are the most frequently used overall? Do these differ between library types?

Social bookmarking was the most used form of tagging among sites in the sample. Two public libraries offered the option of tagging the library in social bookmarking applications. One academic library in the sample was a member of Open Library, which gave all users the ability to add tags to books, videos, and other forms of media to use as a search option. While most forms of SNS offer tagging through hash tags or naming, these three sites were the only sites in the sample to offer (in the open parts of their Web pages) social tagging independently of social media sites.

R7. Which library Web site participates in responsive design formats?



All Web sites in the sample were accessed three ways: by computer, tablet, and mobile phone. Figure 5 shows the results of this test. None of the sites in the sample required additional programs to open in a Web browser.

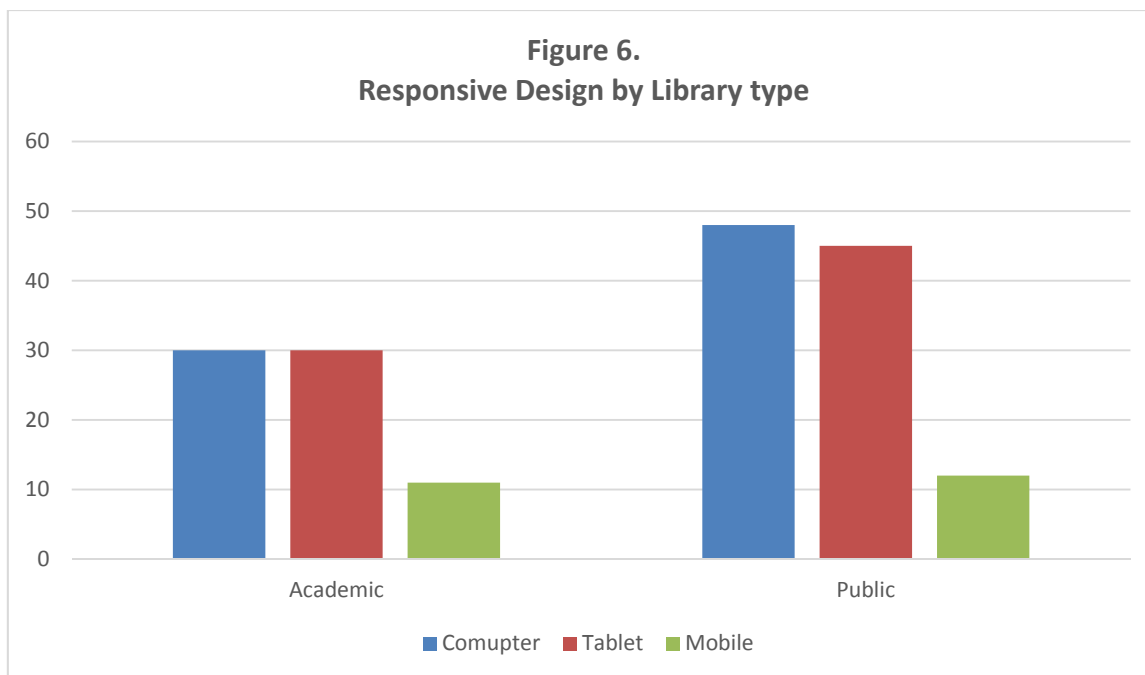


Figure 6 shows the results of the responsive design test by library type. All academic library sites could be used and were easy to read on a tablet. However, 19 of these sites did not show a great deal of usability when accessed on a mobile phone, and required zooming to read and use. Three public library sites did not show reasonable additivity to the tablet platform. One of these sites required the download of additional applications for viewing on a mobile device.

Discussion and Conclusions

Recent surveys on the use of Web 2.0 technologies on library sites are being supported by associations that create and maintain guidelines and standards for the use of such applications on library Web sites. While some libraries choose to “wait and see”, and thus adopt Web 2.0 rather slowly or even reluctantly, it is clear that “Library 2.0” is no a passing fad. Libraries are using these applications and features to do what they have always done, but in newer ways: meeting users’ needs. As such, this growth is not just technological but also service-based, and is becoming invaluable to libraries with users that live at a great geographic distance from the library itself.

The summative findings of this study are twofold: First, if the patterns shown in the study are of any indication, it is clear that Mississippi libraries are embracing Web 2.0. Many of these technologies and

applications are free, require little training to use, and are becoming integral aspects to these libraries’ online presence. Second, however, is the finding that libraries’ adoption of 2.0 technologies and applications are not uniform between libraries of each type, or even among libraries of the same type. Such patterns can be easily explained by differences in funding, differences in size of library, and also differences in available related resources (i.e., staffing, training) required. It can also likely be explained by the fundamental differences between library types (academic versus public) and their users’ informational needs. For such reasons, these patterns will likely always persist, as no two libraries can ever be the same or carry out their missions the same way.

Further research could be conducted on the use of Web 2.0 on Mississippi library Web sites, especially among special and school libraries, which would help give an even broader picture of Web 2.0’s adoption overall. Another possible study would be to examine academic libraries in Mississippi (or any state) that use Web 2.0 and the success of online and distance-learning students at those schools. In any event, it is hoped that, by showing our progress to date, this study’s findings will encourage the further adoption of Web 2.0 in the state’s overall library program as well as further discussion about new and innovative ways of reaching our users.

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Appendix A

Web 2.0 Checklist

Name: _____

Type of Library: _____ Date Reviewed _____

Web site design		Observation	Notes
	Customized Website		
	Responsive Design		
Services			
	RSS	Type:	Use:
	SNS	Type:	Use:
	Mash-up	Type:	Use:
	Media Sharing and Streaming	Type:	Use:
	Blogs	Type:	Use:
	Wikis	Type:	Use:
	Mobile Applications	Type:	Use:
	Synchronous Messaging	Type:	Use:
	Quick Response Code	Type:	Use:
	Tagging	Type:	Use:
	Other:	Type:	Use: