Designing Low-Cost Mobile Websites for Libraries

by Tiffini Travis and Aaron Tay

EDITOR'S SUMMARY

As smartphone ownership rises, usage patterns are expanding. Libraries face an increasing demand for online content delivered in a mobile compatible format while being constrained by financial and staffing limitations. Solutions are readily available through free and low-cost products to create mobile web pages and existing design models from which to draw inspiration. Platform-specific apps can easily support the kinds of content most commonly delivered on library mobile pages: basic contact information and outbound links to the catalog, databases, and other resources. Two software platforms for creating simple pages were tested, the free software from WordPress with mobile detection formatting enabled and LibGuides' mobile friendly platform in a basic version, free for those with LibGuides accounts, and the more feature-rich MobileBuilder version. Each was found to have advantages and weaknesses. Whichever platform is chosen, usability testing is critical. The authors offer a "Heuristic Checklist for Library Mobile Design," detailing aspects of interface design, user characteristics, and content delivery that should be assessed to determine how well the platform serves a library's requirements for mobile usability.

KEYWORDS

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Tiffini Travis is director of information literacy and outreach services at the University Library, California State University, Long Beach. She can be reached at ttravis<at>csulb.edu.

Aaron Tay is resource librarian at the National University of Singapore. He can be reached at aarontay<at>gmail.com.

With the increase in smartphone ownership by students and faculty there is an expectation for libraries to have a mobile presence to support educational needs. Recent findings regarding use of mobile phones, access to information and information-seeking behavior bolster the argument for creating mobile access points to libraries.

Pew Research reports that 87% of blacks and Hispanics own cellphones and "take advantage of a much wider array of their phones' data functions compared to white cellphone owners" [1, para 8]. With such a large population of mobile users relying on phones for Internet access, it is important for libraries to offer content in a mobile-friendly format. For teens, the numbers are an even more significant indication of this need with 65% of mobile users accessing the Internet and 40% watching videos on their phones. Both of these findings illustrate anecdotally that mobile users may be served well with access to library instruction and content for point-of-need use in addition to services.

The *Library Journal* recently conducted a survey of mobile sites and libraries [2]. Unsurprisingly, 65% of academic libraries said they had or planned to have a mobile web presence. What was surprising, conversely, was how few actually had a mobile site available. The reasons given for not currently offering mobile services included budget, priorities, skills and perceptions. These barriers ring true for many libraries, especially in the wake of severe budget cuts and staff overload.

To overcome the barriers associated with developing mobile sites from scratch, libraries can use low-cost or free products to create a page. Even after a library decides on the product, many do not know where to start on the actual design. Libraries develop their mobile sites in much the same way

they developed their home pages: find other library sites and emulate them. However, even in a mobile environment, what works for one library may not be suitable for another. Using a checklist and usability testing will enable libraries to make sure they are serving the needs of their users as well as making functional, well-designed mobile sites. This article provides an overview of basic design and content considerations, evaluation of two no/low-cost page options and finally a checklist for mobile sites to ensure you meet basic standards of usability.

If We Build It Will They Come? Basic Design Elements and Content Considerations for Library Mobile Pages

The two prevalent mobile design options include native apps specific to particular mobile platforms (typically iPhone, Android, Windows 7, Blackberry) or mobile web pages. The mobile web option is particularly attractive to libraries with few resources in terms of funding or coding expertise as it is relatively easy to exercise with basic or even no HTML knowledge.

Often, libraries create mobile versions of a limited subset of their full websites. There are a few surveys of mobile library sites [3, 4, 5], and in general they find that the following pages or information are typically offered:

- Opening Hours
- Contact Us
- Directions

These pages are essentially static html formatted for mobile usage and are easy to create. In addition, most mobile library pages also have outbound links to the following:

- catalog
- databases
- social media accounts (for example, Twitter, Facebook)
- guides, FAQs and news

It is important to note that while most of the targets of these links are usually (but not always) mobile friendly, they are typically independent of the library page itself and are naturally mobile. For example, library mobile pages that link to their Twitter and Facebook accounts take advantage of the fact that Twitter and Facebook will automatically detect mobile usage and serve up mobile versions.

Before 2010 very few libraries incorporated instruction and content into their mobile sites. Aldrich [3] found that less than four percent of library mobile sites had links to academic content. With the popularity of apps like Wikipedia, IMDB and various news outlets, there is definitely a proclivity for users to seek content via smartphones when an information need arises. The growth of databases and catalogs in a mobile-ready format make it much easier for libraries to link to content in addition to basic services.

The third class of functionality observed on library mobile sites is a lot less commonly seen. This includes functionality that allows

- checking availability of computers
- webcam views to check how busy lines are
- booking functions.

These features may be most desired by users [6], but they are more difficult to create for obvious reasons.

Low-cost Options for Libraries

While someone with a fair amount of HTML knowledge can create a mobile-friendly page, there are easier options that require little or no programming knowledge. In addition to the two sites explored below, there are several free mobile site builders available on the Internet [7, 8]. We will explore two options to which many libraries have access:

1. WordPress with mobile detection plugin enabled (free)
2. LibGuides platform (free if the library already subscribes to LibGuides)

The first option is the commercial (free) version of WordPress with the mobile detection formatting enabled. The beta version of the California State University, Long Beach (CSULB) library mobile site (http://mobilelib.wordpress.com/) was authored with the free version of WordPress [9]. Each link goes to a page within the blog. The content was copy-pasted from the full library site with very minimal html editing. The page shown in Figure 1 took about an hour to create, with only minor formatting. The page does not utilize plug-ins or advanced features.

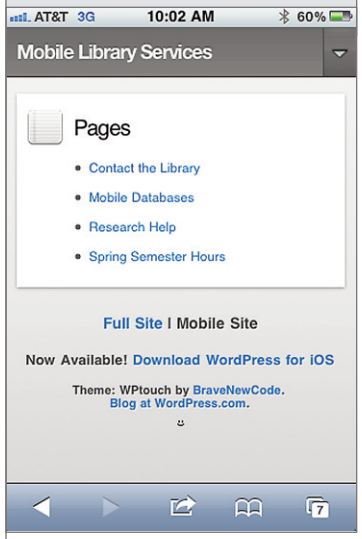

FIGURE 1. CSLUB library mobile site (beta version)

A more advanced example using WordPress can be seen in the mobile efforts of the Nanyang Technological University (NTU) Library at http://blogs.ntu.edu.sg/mlibrary. As shown in Figure 2, the NTU Library uses a combination of WordPress and LibraryAnywhere (which offers a mobile catalog – not a free option) to generate mobile friendly pages.

The next platform tested was LibGuides (http://demo.libguides.com). As of July 2011 the Springshare website lists over 2000 libraries in the world using the LibGuides platform. One of the features of LibGuides is that it is mobile friendly. While it is not a free tool, a great many libraries subscribe to LibGuides and for them it can be a free mobile platform. What is ideal about using LibGuides to create pages is the ability it provides to use other features such as quiz questions and other interactive widgets to enhance the users' experience in the mobile environment. Overall, if you have a current subscription, it is easy to create a mobile site with no additional cost other than the staffing time to add content.

FIGURE 2. The NTU library mobile site

Some libraries such as University of Notre Dame Australia (http://library.nd.edu.au/home), Cornerstone University (http://library.cornerstone.edu/) and Ocean City Public Library (http://home.oceancitylibrary.org/index) have already migrated their full normal websites to LibGuides. Of course, many links on pages on such sites will go to external pages that are not optimized for mobile devices.

The basic pages in both LibGuides and WordPress can be modified by, for example, by adding icons, resizing text for a better fit to mobile screens or creating buttons.

One example of a site using MobileBuilder is the College of North Atlantic-Qatar mobile site at http://cna-qatar.libguides.com/mobile shown in Figure 3.

In an effort to gain a larger market share of the mobile-page generating industry, Springshare recently launched a mobile-site builder that allows customers to create pages specifically for mobile with up to 10 secondary items in a second level hierarchy. Springshare will undoubtedly become the largest provider of mobile sites for libraries as it is a low-cost option that is offered as an inexpensive add-on to current service.

Basic Usability and Testing Strategies

Usability testing usually involves three phases: heuristic evaluation, paper tests and usability testing with users. There is extensive research published on usability and library website design. They reveal a pattern of issues libraries continue to struggle with, including ambiguous library jargon, navigation, too much text and confusing architecture. While the limited landscape of a mobile site alleviates some of these issues, there is still a need to test the chosen mobile layout as one template may not fit the needs of your users. Please note that this testing does not typically include any ADA compliance design considerations, which should be addressed in the coding of the page. As with any other web-authoring tool, designers should verify compliance with federal requirements.

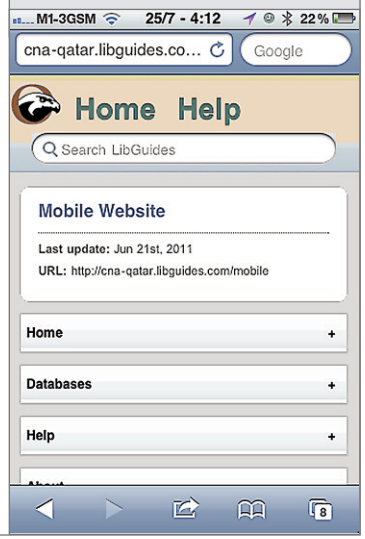

FIGURE 3. College of North Atlantic-Qatar mobile site

With studies describing the usability of many mobile sites as "miserable" [10], it is important that libraries with little experience in usability testing be provided guidance with

a detailed set of usability heuristics specifically tailored for library sites. Based upon an examination of published usability principles including library specific heuristics [11,12,13,14,15], the authors developed a mobile checklist specifically for use with library mobile sites – *Heuristic Checklist for Mobile Library Design* (See sidebar). The need for a simple checklist for library mobile usability is an important element missing from published literature. We tested six mobile library sites against this checklist to validate its ability to evaluate mobile websites. For the purpose of libraries planning or revising mobile sites, the authors synthesized the principles into three categories: interface design, user characteristics and content/purpose.

HEURISTIC CHECKLIST FOR LIBRARY MOBILE DESIGN

INTERFACE DESIGN

- ☐ Full site and mobile site interaction
  - Link from home page
  - Auto-direct script to mobile site
  - Link to the full desktop version
- ☐ Screen Format fits multiple devices (176x220;128x160;320x480)
- ☐ Load Speed (W3C, 2008)
- ☐ Visual Display
  - Text and Background have sufficient contrast
  - Information conveyed with graphics is also described textually
  - Background image does not hinder readability
  - Logo works on multiple screen sizes
  - Links go to other mobile friendly pages
  - Intuitive labels on links
  - Graphics enhance label of link
- ☐ Navigation
  - Descriptive title page
  - Sufficient space between links to avoid "Fat finger problem"
  - Readable recognizable links
  - Horizontal and/or vertical navigation options provided on sub-pages
  - Minimal or no scrolling to see links
- ☐ Input of numbers and letters is easy (library catalogs, password, ID, search boxes etc)
- ☐ Pull down menu and other menu options are mobile friendly

USER CHARACTERISTICS

- ☐ Link labels contain jargon free terminology
- ☐ Links reflect user needs
  - Sites selected based on user feedback (surveys, focus groups etc)
  - Sites are selected based on analytics
- ☐ Effort (tasks are not overly complex)
- ☐ Efficiency (once the user has used the system, a high level of productivity is possible, low error rate)
- ☐ Ease of recognition of linked vs. unlinked text
- ☐ Error notification
  - Pop-up error message
  - Links to error message page
- ☐ Memorability (easy for the user to recall navigation and task navigation)
- ☐ Users are offered the ability to bookmark the site or download app with a visual cue
- ☐ Attitudes (users feel confident in task completion, would use this source more than one time)
- ☐ User can provide feedback/comments

CONTENT

- ☐ Sufficient Help (FAQS, navigation cues, prompts)
  - Staff contact information
  - What's New/Events
- ☐ Contact with librarians provided via email, texting, IM
- ☐ Links to a variety of mobile friendly information sources are provided (databases, catalog, websites, guides, etc)
- ☐ Basic information provided
  - Hours
  - Directions
  - Phone numbers
- ☐ Mobile friendly reference services via mobile site
  - Librarians know if users are using mobile devices
  - Reference responses take into account mobile devices

Interface Design. This category encompasses the basic characteristics needed for users to navigate the site. Criteria include the ability to format for major mobile devices, acceptable load time, consistent design and ease of learning. For libraries, which are notorious for horrible site design, the lack of physical space on a mobile interface is a blessing. Very few pages we examined had too many links or text-to-space ratio problems.

User Characteristics. Another element of design is making sure your users can use the site. Intuitive labeling of links, learnability, predictability, use of clear and concise language and features that minimize user error are important. A high error rate during formal usability testing with users is a key indicator of the need to revise site design. The second phase of our research will explore this category in more detail when we test usability with students.

Content/Purpose. This last set of principles is extremely important for libraries as it directly relates to what we do: provide content. This part of the checklist will help determine what content libraries should link to and is integral to a user-centered design model. User needs should be the driving force determining what links occupy the valuable landscape on a mobile page. Criteria include which links are selected and the usefulness of the information provided as well as how libraries define interaction between mobile users and librarians.

WordPress vs. LibGuides

The most obvious limitation for both options is the redundancy of maintaining two pages. Until databases and catalogs auto-detect mobile access, libraries have to maintain a separate page of mobile-only access points. The advantage of a LibGuides site over WordPress is its ability to be updated as the entire suite of guides is updated, thereby reducing workload. Any changes in WordPress, on the other hand, will require duplicating content from the library website.

Another disadvantage of the free version of WordPress is that it is not locally maintained. Using the paid version of WordPress allows the library to maintain the site as well as use plug-ins like MobilePress to create a truly mobile site.

Evaluated against our *Heuristic Checklist for Library Mobile Design*, both sample sites had disadvantages and advantages that were easy to determine:

- *Interface Design.* WordPress was more flexible in terms of coding and font size adjustment. The ability to adjust for font size meant less "fat finger syndrome" and easily allowed links to fit on the screen. WordPress, on the other hand, didn't have intuitive vertical or horizontal navigation while LibGuides can easily fall prey to excessive scrolling. The mobile test page above had minimal scrolling; however, any research guide would probably have it, and the scrolling problems would increase as the mobile site contained more of the tabs on the full site. LibGuides had more formatting issues, as some of the boxes don't allow you to change font size.
- *User Characteristics.* Many of the user characteristics in the checklist are best measured by usability testing and librarian knowledge of usability research. The titles selected in our evaluation of the two products fortunately used little library jargon, and the text copied into WordPress automatically hyperlinked previously linked text. LibGuides surprisingly did not have this feature. The hyperlinks of both sites were a different color than the unlinked text. Neither offered the ability to bookmark the sites. Because both sites contained very few links and links could be annotated, these sites should allow the user to recall task navigation. WordPress's lack of intuitive horizontal or vertical navigation, mentioned above, may lead to user error.
- *Content/Purpose.* Again, this portion of the checklist is best evaluated by designers or analysis of full site statistics. Both sites included all of the content delineated by the principles.

Conclusion

Regardless of the type of site you use (low-cost or commercial) having a checklist can quickly ensure that you are designing a site that meets the needs of your users. It can be used as a first step in the cycle of usability. Using the checklist for any site planning will ensure that your free version meets mobile usability standards. To ensure that you continue to offer an optimal mobile site it is also important that you constantly monitor trends in mobile technology and monitor user behavior on your site. ■

Resources on next page

Resources Mentioned in the Article

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