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Smartphones in the Library: A New Mobile Era

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Abstract

Recent years have led to the adaptation of new mobile technologies. The new mobile, in particular smartphone, capabilities have led many libraries to adapt webpages for use with mobile devices, offer new reference services, and embrace new offerings such as quick response code tagging. The purpose of this paper is to discuss the ways the proliferation of smartphones has changed traditional library services and the new and exciting technologies libraries now should embrace. The paper also discusses the privacy concerns surrounding the ubiquitous nature of smartphones.

Smartphones in the Library:

A New Mobile Era

New technologies often necessitate a change in old practices. Libraries and librarians have needed to adapt to changing technologies ranging from increases in telephone use to internet use. As the internet developed, libraries abandoned the traditional card catalogs in favor of an Online Public Access Catalog, commonly referred to as an OPAC. The past few years have seen a rise in the availability and use of mobile phone technology in general and smartphone technology in particular. The purpose of this paper is to discuss the common uses of smartphones in libraries in traditional services as well as new services that are unique to smartphones and their uses in specific library settings. The paper will close with a discussion privacy concerns surrounding the ubiquitous nature of the smartphone.

Background

According to a 2011 Pew Research Center study, "35 % of American adults own a smartphone" (Smith, p.1), which is defined as a mobile with a computer operating system. Examples include iPhone, Blackberry, or a phone running an Android, Windows, or Palm operating systems. Smartphone adoption has been most prevalent among people under age 45. The majority of smartphone owners use their phones to access the internet, and a smaller subset of this majority use their phones to access the internet for most, if not all, of their internet activity (Smith, 2011). The results of the Pew Research Center study indicate that smartphone adoption is developing rapidly. A mere two years prior, a University of Cambridge report indicated that people were more likely to access library information using short message service, or SMS,

commonly known as text messaging (Mills, 2009). Internet experts agree that by 2020, smartphones will be " 'the primary connection tool' for most people in the world" (Starkweather & Stowers, 2009, p. 187).

The rise in smartphone use has not escaped notice by library associations. The Association of College and research Libraries (ACRL) published a guide (2009) stating that "the expanding capabilities of mobile or 'smart' devices such as phones and other handheld devices are increasing student expectations for services. Some colleges and universities are already creating courses to be delivered on cellphones" (p. 6). The guide went on to state that the increase in mobile technology and the lower cost of such technology will eventually mean that students rely on smartphones for course content and research and abandon traditional computer research.

In 2010, the American Library Association (ALA) issued a policy brief addressing the rise in mobile technologies and patron privacy. The brief notes that the increase in mobile technology changes the relationship between the library and the patron; the relationship is changed not only because of the decrease in face-to-face interaction, but also due to concerns that patrons may have about their privacy in an age where their phones communicate information ranging from what the patron likes to read to where the patron is located at any given moment (Vollmer, 2010).

Additionally, a publication by the ALA, ALA TechSource recently addressed the Pew study in a blog article (2011). The article stated that the study confirmed the trend that librarians have seen in day-to-day observations and mentioned two very important implications for

libraries: the need for a mobile interface as well as the importance of the library as a provider of technology services that patrons might otherwise not be able to utilize.

The need for a mobile interface surely is driven by the numbers of patrons using smartphones; however, Lippincott (2010b) lists a number of goals associated with "going mobile":

- Enhancing the convenience of access to reference services;
- Enhancing the convenience of access to basic library and patron information;
- Encouraging individuals who generally do not use the library's services to access the library;
- Supporting a campus-wide or departmental initiative employing mobile devices;
- Enhancing the library's instruction program, both in the classroom and beyond;
- Providing e-books and readers to users as an alternative to some print publications;
- Delivering easy-to-access key information resources to users in the field;
- Providing campus-related, geographically linked content to enrich the campus experience of users
- Becoming a campus resource for educating users about the features and operation of mobile devices; and
- Raising the profile of the library, its staff, and its services.

Traditional Services "Gone Mobile"

Web Site Design

Viewing a website on a smartphone is not the same as viewing a website on a computer screen. The most obvious reason is that the screen is considerably smaller; however, behind the scenes features of the operating system and browser capabilities impact the way a web page is displayed on a mobile phone. In order to create a seamless integration for patrons, librarians and technical staff must create a second website designed specifically for the mobile interface.

In 2008, librarians at the University of North Carolina at Chapel Hill (UNC) began to receive reference questions regarding the library's website as it appeared on patrons' phones. After some limited testing by librarians themselves, they discovered that the way the website was rendered on a smartphone was not user friendly. The library launched a project to create a mobile website and development took five months (Haefele, 2010).

Based on survey responses, the UNC task force decided to develop a webapp, "a webpage optimized for display on mobile devices . . . written in virtually any standard web coding language" (Haefele, 2010, p. 119-120) for the iPhone/iPod Touch platform. Conveniently, the relative simplicity of UNC's library webpage and the fact that many web browsers are alike meant that the webapp also worked correctly on Android devices. UNC librarians used an open source framework hosted on Google Code to develop the webapp. A framework is "a collection of tools designed to simplify the development process" (p. 121). The framework is called iUI, and it works correctly on Apple's iOS devices as well as Android, Palm, and some Blackberries (iUI, n.d.). Further customization was done in-house and was created using simple HTML (Haefele, 2010).

After a mobile website has been created, it is important to adapt the catalog to a mobile-friendly format as well. UNC's librarians originally had not planned on incorporating the catalog into the mobile site, but users continued to request that it be integrated while the webapp was in beta testing (Haefele, 2010). There are three ways to build a mobile catalog according to Haefele (2010). The easiest options are to purchase a "vendor-supplied interface" (p. 124) or to purchase a product supplied by a third party. A third option is to build the catalog interface in-house, which is time consuming but also is the least expensive.

UNC geared its development toward the Apple iOS because a majority of survey respondents indicated that they used Apple mobile products (Haefele, 2010); it was convenient that the relative simplicity of their design and the utilization of the iUI open source code meant that the webapp worked relatively seamlessly across platforms. This is not always the case, as there are striking differences among operating systems. For example, Apple's products do not support Flash. On the other hand, Apple supports QuickTime movies, but Blackberry only supports Windows Media Video (Ragon, 2009). If a library website contains video media content, these issues must be taken into consideration when designing the mobile website.

Reference

Reference in the traditional sense is provided through face-to-face interaction. A patron walks up to a librarian who is seated at a reference desk, and the patron asks a question. Throughout the years, new technologies have altered the way reference transactions take place. For example, the telephone arguably was the first instance of virtual reference, with reference taking place in a medium outside the traditional interaction (Lippincott, 2010b). As technology has grown, the ways we, as a society, interact with each other has changed – from telephones, to email, to text messaging and instant messaging. In this day and age, patrons use their smartphones to access library materials and query the reference librarian. Many mobile websites offer a contact or reference page that features easily accessible phone numbers that can be automatically dialed by touching the number on a touchscreen device, or text and IM services that are equally accessible to the mobile user. Patrons tend to expect instant information, so many libraries have implemented a 24/7 reference service. The libraries that cannot staff this service alone are often part of a consortia which provides continuous reference services from

member institutions, such as QustionPoint, an OCLC product, or provide IM reference through free software such as AIM or Meebo (Meulemans, Carr, & Ly, 2010).

Mobile reference has become an increasingly large part of librarianship. The Reference and User Services Association (RUSA) division of the ALA published guidelines for virtual reference (2004). The RUSA guidelines were created before the boom of smartphone usage, but they are still applicable today. The five main areas of focus in the guidelines are approachability, interest, listening/inquiring, searching, and follow-up. These five areas each have sub-categories for general reference, in-person reference, and remote reference (RUSA, 2004), and are discussed in more detail below.

Approachability: The RUSA guidelines state that a remote reference librarian must be accessible. They state that information about "chat, email, telephone, and other services" must be in a prominent place so that patrons know how to access the reference service (Part 1.0). This information should be placed on the library's home page and should be jargon free so as not to confuse the patron (RUSA, 2004).

Interest: The librarian must maintain "word contact" with the patron (Part 2.6) especially in the case of remote reference. Since the very nature of the remote reference encounter is virtual, the patron may be left alone in cyberspace for a period of time. Adequate word contact will help to keep the patron from feeling lost or abandoned (Platt & Benson, 2010). A remote reference librarian should also answer emails with reference questions in a timely manner (RUSA, 2004). Answers to text messages should be quick; if the question is not answered within minutes, the patron most likely will have found the answer in another way or will not need the answer any longer (Peters, 2010).

Listening/interest: The RUSA guidelines suggest that the reference librarian conduct a reference interview in order to clarify the patron's question and gather as much information regarding the query as possible. It is important that the librarian gather as much information as possible without compromising the patron's privacy.

Searching: As in face to face encounters, the reference librarian should ask the patron what they have already tried and also communicate the steps of the search process. The librarian should guide the patron through the search as much as possible using available technologies such as scanning and faxing (RUSA, 2004). Screen sharing software that allows the librarian to take a screen shot and IM or email it to the patron could also be used (Meulemans et al., 2010).

Follow-up. This final area in the RUSA guidelines states that "the reference transaction does not end when the librarian leaves the patrons" (2004, Part 5). The librarian should make sure that the question has been answered to the patron's satisfaction and also suggest other resources. For remote services in particular, the librarian should suggest that the patron follow-up in person at the library (RUSA, 2004).

The University of Manitoba libraries recently implemented a "roving reference" project to decrease the number of reference queries in the queue at peak times. The pilot began with wireless-enabled netbooks but eventually moved to smartphones. The first smartphone used by the roving librarian was an Android device. The Android device was unable to connect to the secure wireless and defaulted to a 3G connection which incurred data charges. This problem was eliminated when the library switched to the iPod Touch; however, in some areas of the library, the roving librarian was unable to access the catalog. In the end, the roving librarian was able to use the iPhone's 3G connection to access the catalog in those areas where the iPod touch's

wireless connection failed (Penner, 2011). This study demonstrates that the capabilities of smartphones allow for their use in providing forward-thinking solutions to traditional reference problems.

Some librarians are concerned that the proliferation of mobile reference causes the actual reference transaction to lose something in translation because the transaction lacks verbal and body language cues. Librarians are concerned with the ability to answer very complex questions and there is a perception that the demand for fast and convenient information replaces what some view as a higher-quality interaction. Barnhart and Pierce (2011) argue that librarians should be mindful of finding ways to improve the mobile transaction. . Through mobile reference transactions, librarians might discover services that would be helpful to incorporate, such as mobile-compatible journal articles that they can direct a smartphone user to without requiring a different medium (Lippincott, 2010b). Emerging technologies will also improve, and librarians will be able to integrate better video and audio capabilities, such as Skype or Face Time on the iPhone (Barnhart & Pierce, 2011). Combining mobile-accessible content with smartphone-wielding librarians and patrons will enable easy, quick remote reference that will satisfy the digital generation's need for instant information and increase the quality of the transaction.

New Technologies

Quick Response Codes

Quick response codes (QR codes) are two-dimensional codes that can be scanned by a smartphone's camera. By scanning the code, a user can be directed to an electronic resource, such as an embedded website or an email address (Hoy, 2011). In order to scan a QR code, the

user needs a smartphone with a camera and QR scanning software, usually available as an app free of charge (Walsh, 2010). Furthermore, QR codes can be created for very little cost to a library. As Jackson (2011) notes, QR code generators are available for free online, so the main expense is staff time.

QR codes can be very useful in libraries. They can be used to promote events or collections or to give users easier access to services and information such as podcasts or websites about a particular item in the collection (Pulliam & Landry, 2010). When using QR codes for promotion, it is useful to be able to see how much traffic the QR code is getting. Sites such as bit.ly will shorten the URL that is embedded in the QR code and will also track how many times the code is scanned (Viner, 2011). Hoy (2011) lists some other popular uses of QR codes in libraries:

- Placing QR codes on shelving and end-caps that link to subject guides.
- Linking online study room reservation calendars to the physical room by placing a QR code on the door. . . .
- Placing QR codes on posters and other promotional materials that link to online video tours and training videos.
- Displaying QR codes that link the user to the "text a librarian" service. Scanning the code automatically begins a text message to the correct number.
- Embedding QR codes in the online catalog that provide key information about an item. . . .
- Mounting QR codes on shelving, linking to the online versions of print materials.
- Attaching QR codes to CD/DVD cases that link to online trailers or reviews.
- Mounting QR codes on equipment like debit card stations and fiche readers that link to video tutorials explaining how to use the equipment

(p. 297).

Librarians also may encounter QR codes on print materials sent from the publisher. For example, the journal of *Neurosurgery* released an issue that featured a QR code on the cover and

stated that the journal would be using QR codes in future issues to direct readers to online content (Hoy, 2011).

There are a number of issues to take into consideration when planning QR code implementation in a library. First, it would be helpful to already have a mobile version of the library's website available for the smartphone to link to; otherwise, users will struggle with trying to read a traditional website on a smartphone screen (Hoy, 2011). Second, since QR codes are relatively new, not all targeted users will be familiar with the technology. Walsh (2010) conducted a pilot study of QR codes in an academic library. Prior to the study, users were surveyed, and the results indicated that only 8% of the respondents knew what a QR code was. Furthermore, students considered the need to download and install a QR code reader app onto their phones a barrier. Walsh concluded that students needed to be assured that taking this step will allow them quicker, easier access to online materials (2010).

E-Books

E-books are becoming increasingly popular with the wide availability of readers such as Amazon's Kindle and Barnes & Noble's Nook. Recently, the ALA conducted a survey of e-book lending in libraries and mapped out results. The study noted that "66 percent of public libraries report offering free access to e-books to library patrons- up from 38 percent three years ago" (Emery, 2010, p. 88). Libraries typically are able to lend e-books to patrons using the OverDrive console. Some academic libraries even lend e-books with preloaded content (Lippincott, 2010a). In April 2011, Amazon announced that libraries would be able to loan Kindle compatible books (Kelley & Blumenstein, 2011) and launched its library partnership with OverDrive to the public in September 2011 (Bosman, 2011).

School libraries have also joined the e-book movement, partnering with OverDrive's School Library Download program. To start up, a school can pay $4,000 per 2,000 students, with $4,000 as a minimum cost. Half of this cost is put toward hosting the school's electronic collection, and the remaining is used for purchasing titles. OverDrive's web version of a school's collection can later be integrated with the school library's website and customized. Libraries can also include audiobooks in the collection. After a patron has borrowed an e-book, the book will disappear or no longer be accessible on the device when the loan period has expired (Hastings, 2011).

For attorneys and law librarians, there are a number of electronic books available for reference. For example, *Black's Law Dictionary* is available in electronic form for download in the Apple app store (Apple, n.d.). The Center for Computer Assisted Legal Education (CALI) recently partnered with the Legal Information Institute (LII) at Cornell to provide Federal Rules books in ePUB and Mobi (Kindle) formats (CALI, n.d.).

Apps & M-Web

There are a number of uses for apps in libraries. First, as previously mentioned, there are QR code reading apps that can be downloaded and used in libraries. Second, some libraries have created apps for patrons to use to access the catalog and reference desk. These apps are much like a mobile website, except they are launched directly from the application. Third, vendors are beginning to offer apps and mobile websites to users to access online content.

The District of Columbia Public Library (DCPL) was the first public library to introduce a library application. Using this app, patrons are able to check library hours, locate an item in the catalog, and place holds on items (Kendall, Nino, & Stewart, 2010). Universities such as

Duke University and the University of Rochester also have apps with similar capabilities. The University of Rochester's mobile app, called UR Mobile, can be used on an iPhone or an Android device and is a mobile app for the university. The library component is one part of the larger application that allows students to access resources like the University's course management system, the library's catalog, and campus maps, to name a few (University of Rochester, n.d.).

The Philadelphia City Archives, under the Department of Records (DOR), has a number of photographs of the city from the late 1800s to present day. These photographs document the growth and expansion of the city. After the DOR implemented a digitization project that allowed the pictures to be available to users through the internet, they developed a mobile site for iPhone and Android devices. The mobile site allows users to not only view photographs from a specific neighborhood or based on location on a map, but also to utilize their phone's GPS features to find a photo based on current location (Boyer, 2010). The Philadelphia Archives is not the only archival institution to undertake such a project. The National Archives created a mobile app that allows users to browse selected documents and photographs from the collection (National Archives, 2010).

The electronic database platform EBSCO*host* launched an app entitled EBSCO*host Mobile* in 2009. This mobile app allows users to access EBSCO*host* content as if they were using a regular computer; users are also able to view documents on their smartphones in HTML or PDF format (Hegarty & Wusteman, 2011). The full-text electronic journal vendor JSTOR created a webapp for iPhone, Blackberry, and Android devices. However, JSTOR, in beta testing, is more limited. The support and training website states that "JSTOR Mobile Beta is best

used for searching JSTOR when you're on the go, and then emailing the citations to yourself so you can read the articles later on a computer" (ITHAKA, n.d.).

The National Library of Medicine (NLM) designed a mobile version of the popular reference site PubMed. When tested by a reference librarian at St. John Fisher College, the librarian found that PubMed for Handhelds was not a user-friendly mobile site because it returned many unrelated results for natural language searchers and did not include enough limiters (Price, 2009). Price found a third-party app called PubMed on Tap to be superior for general use because it was familiar to users and also because it contained limiters to restrict results (2009).

Special librarians, such as those in the fields of medicine and law, need to be up-to-date on those smartphone apps that professionals in their respective fields may utilize in addition to library-specific apps. For example, Evernote is a multi-platform note-taking app. A user can take notes and store and share these notes and other documents (Jewell, 2011). Dragon Dictation is a speech-to-text app for those professionals who are frustrated with small keyboards. Dragon offers a special health care package for health care professionals that includes medical vocabularies and electronic health record compatibility. A final app that may be of interest to librarians is Dropbox. Dropbox allows users to drop documents into the cloud, store them remotely, and access them from anywhere (Jewell, 2011).

Privacy Concerns

The increase smartphone and cloud computing does not present itself without issues. Foremost, there is a concern for patron privacy. Librarians have traditionally been defenders of patron privacy. Patron records hold a wealth of information about the user, such as the

individual's reading/circulation history, address, and phone number. Libraries take care to make sure that their wireless and internet services are secure, but patrons sending emails or texting from outside the library may be operating over unsecured networks (Vollmer, 2010).

There is some concern about third-party vendor issues with privacy. For instance, e-readers are able to report the user's "reading habits and search queries" (Vollmer, 2010, p. 4). Whereas a library will only release patron information under a court-issued warrant, a third party is often free to sell information to another party, for instance, a data mining vendor. This may affect a user's willingness to take advantage of the services that libraries can provide via mobile technologies; if a patron feels as if his queries are being monitored, he may be less inclined to use those technologies to ask a reference librarian for assistance (Vollmer, 2010).

Librarians should embrace this new technology and understand the privacy ramifications. Libraries should have a privacy policy in place that discusses the use of mobile technology and addresses concerns that a patron might have regarding his privacy. In the end, the implementation of mobile technology and the concerns that come with it are only slightly different than concerns that came before with the advent of the telephone, the internet, and email.

Conclusion

The past few years have brought an increase in mobile technologies, including smartphones and e-readers. These new technologies have changed the way librarians operate in reference services and technical design services. Librarians should implement mobile sites for smartphone users and, if possible, create native applications for smartphones. Doing so will keep the library up-to-date with patron usage. Apps, QR codes, and e-books are three emerging technologies that cannot be ignored. However, with the implementation of such technologies,

some patrons may have concerns regarding privacy. Librarians should maintain the traditional role of safeguarding patron records by updating privacy policies to reflect mobile technologies.

Since smartphone technology and usage are rapidly evolving areas, there is not sufficient data on the effectiveness and long-term use of apps and e-books in libraries. The availability of e-books, such as the Federal Rules books available for attorneys, law students, and law librarians through CALI should be studied to determine the effect the electronic version has on use of the print product. Furthermore, students at libraries that currently use a mobile site and not a native application should be queried to determine what the favored medium is. Finally, the privacy concerns patrons may have with e-book lending technology should be surveyed and addressed. For instance, as more details about the Kindle library loan program emerge, privacy should be a primary concern. Librarians are faced with new technologies and the challenges that they bring every single day; it is critically important to fully understand the uses, advantages, and disadvantages to adequately serve patrons.

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