Since the turn of the century, one of the hottest topics in the IT world has been the coming mobile revolution. While there’s been some arguing over the details, the fundamental tenet of the mobile revolution is that lots and lots of people will start accessing web content from handheld portable devices instead of using a traditional laptop or desktop. For evangelists of the mobile revolution, this shift is the logical conclusion of market penetration and growth rates. Forrester Research estimates that there are about a billion computers in the world. In contrast, the International Telecommunication Union estimates that there are about 4 billion live cell phones in circulation today. That’s two-thirds of the world’s population. As more of these devices come online, making sure that our own resources—such as our OPACs—are compatible with these devices becomes imperative.

Admittedly, the revolution hasn’t come quite as quickly to North America as the evangelists may have hoped. We have been hearing about it for 10 years, after all. But in the last couple of years, it appears that a number of large companies have started hedging bets that the revolution is indeed near. Apple threw its ten-gallon hat into the ring with the iPhone. Microsoft has been buying big mainstream ads for its Windows Mobile-based smartphones and touting the new mobility features of its Exchange 2007 email server. Google has also poured a great deal of money into making its applications available on a variety of mobile platforms, as well as introducing its own phone operating system. And longtime player BlackBerry has been seducing a new, less-corporate class of users with its newer Pearl and Curve models.

Marketing hype aside, where do we stand on the whole mobile revolution thing? As you might expect, a lot of it has to do with age and class. While estimates of smartphone penetration in the general population tend to hover between 5% and 10%, depending on whom you ask and how the word “smartphone” is defined, a recent EDU-CAUSE study pegged smartphone ownership at 66% for college freshmen.
Revolution
As these kids graduate from school, smartphone penetration will skyrocket. Elsewhere on this issue, others will be talking about ways to leverage these mobile devices to provide more compelling services to the public. But the No. 1 thing we do at my public library is to hook people up with physical objects such as books and DVDs. To do that, there’s often an OPAC transaction involved. How well can people do that on-the-go? In this article, we’ll see how typical OPAC offerings from SirsiDynix; Innovative Interfaces, Inc.; and AquaBrowser appear on BlackBerries, iPhones, and Windows Mobile-compatible devices. We’ll brazenly pass judgment on both the OPACs and the phones involved, we’ll chat about some other systems, and then we’ll look at how you can test your own library’s site.

The Big Players

Canada’s Research in Motion, Ltd. (RIM) is one of the long-running leaders in the smartphone field with its popular BlackBerry line of devices. As you undoubtedly know, Apple has enjoyed a great deal of success with the introduction of its iPhone products. Indeed, the popularity of the iPhone has been responsible for a great deal of the growth in the smartphone market sector over the last year.

True to its typical style, Microsoft is not interested in developing phones directly. Instead, it concentrates on developing the software that runs the phones—Windows Mobile. While Taiwanese-based HTC Corp. is the dominant manufacturer of Windows Mobile-based phones, other popular developers include Sharp, Samsung, LG, Palm, and, most recently, Sony Ericsson.

Google is just getting into the game. It’s taking the Microsoft approach of writing the software that powers smartphones, dubbing its software Android. At the time of this writing, the only Android-based phone available was the HTC Dream/G1, though large electronics conglomerates including Samsung, Motorola, and Sony Ericsson were developing Android-based products that are scheduled for release this year. Like Apple’s Safari browser, Google’s browser Chrome uses the WebKit rendering engine. For our purposes, this means webpages viewed on an Android phone will look virtually identical to pages displayed on iPhones.

Nokia is the 800-pound gorilla in the room. When Nokia’s offerings are counted, they produce nearly 50% of the smartphones sold. Nokia’s devices are problematic for analysts for a couple of different reasons, and, as such, not everyone counts Nokia’s offerings when looking at the smartphone market. But given its market dominance, this is a grave mistake.

The first difficulty with Nokia is that it offers a wide variety of phones for different segments of the market. This has made it historically difficult to define which of Nokia’s offerings constitutes a truly “smart” phone. If the phone can get to the provider’s weather page and check select movie times but can’t get to something on the public internet such as Wikipedia—is the phone smart or merely more clever than average? It’s hard to say. Second, the percentage of people who buy Nokia phones without data plans is significantly higher than with RIM or Windows Mobile devices. Contractually, iPhones must come with data plans. Thus, a significant percentage of Nokia users have a smart device but no access to the internet. That makes the users’ phones not so smart anymore.

These factors make Nokia difficult to work with and often overlooked in favor of iPhones, which are easier to write about. But if we look strictly at Nokia’s S60 converged devices, we see global sales of roughly 15 million in 4Q 2008—that’s more than the number of iPhones sold over the entire year.

Regardless of who sold more phones, there are a lot of mobile devices out there. And more and more users of those devices are going to use them to check our webpages and catalogs to see if it’s worth their time to come down to the library. Right now, a lot of us are in the dark as to what exactly our patrons see—and that’s what we’re looking to rectify.

The Tests

Let’s start with the tests and boil catalog activity down to the most basic of functions. The patron should be able to find out 1) if the library owns the book in question, 2) if the library has a copy currently available, and 3) the call number of the copy.

We’ll look at the catalog’s homepage, do a search, look at the results, and then click on the details page. Ideally, finding this information should be a straightforward experience. But for our test, we’ll consider finding the information—no matter how painful—a success. A search for a book about computers and libraries would be in order, and Vernor Vinge’s Rainbows End fits the bill. We’ll search two of my favorite libraries—the Carlsbad (Calif.) City Library (SirsiDynix) and the San Diego County Library (Innovative Interfaces). Queens Library (N.Y.) is arguably one of the most popular AquaBrowser sites, so we’ll use it as well. Let’s find some books!
Sirsidynix. SirsiDynix gets off to a rocky start with the BlackBerry (see Figure 1a). The first thing it does is tell us to either enable JavaScript or use a different browser. But we're on a BlackBerry, so that's not exactly an option. That said, we can scroll down and execute a search.

Windows Mobile does a little bit better than the BlackBerry by setting the focus correctly (see Figure 1b). That is to say, the cursor automatically jumps to the search box. The page doesn't appear how we might expect it to, but it is navigable.

By contrast, the iPhone version of the homepage appears exactly how we would expect it to (see Figure 1c). The only difference is that it's been shrunk down to fit the size of the iPhone's screen.

Once we click on the book, the results page on the BlackBerry is very long. Take a look at the scroll bar on the right side of the screenshot (see Figure 1d). There's roughly one book per page displayed. That said, it displays the cover art in a recognizable fashion and provides a clear link to the book's details. SirsiDynix also has the decency to tell you the book's availability and call number directly on the results page.

The Windows Mobile version is a little closer to the version we might expect to see in our web browsers, particularly in terms of layout and coloration (see Figure 1e). The details button, the call number, the publication year, and cover art are nice and distinct. The row striping shows up on Windows Mobile, facilitating differentiation among items.

On the iPhone, the row striping is even more distinct (see Figure 1f). Again, the page renders the way we would expect it to on a desktop. The white space in the right third of the screen is where SirsiDynix provides the user with clickable subject limiters. While this works OK in the desktop context, it provides an excellent example of a design decision that transitions awkwardly into the mobile space.

After clicking on the details page, we get the detailed holdings information (see Figure 1g). This, however, is terribly difficult to read on the BlackBerry. The table is destroyed, and all the text runs together. All the text is there, but it is not easy to parse through. A regular library user might grow accustomed to reading it, but it's certainly not attractive.

Windows Mobile fares a bit better (see Figure 1h). There is a clear delineation among branches, and determining how many copies each branch holds is a fairly straightforward task. But note what it says under Location—“SF VINGE.” Now, glance over at the iPhone version. The location should say “Science Fiction,” but due to the limited screen width on the Windows Mobile device, the text wraps to the next line. This makes it look like the location is “SF VINGE.” That's awkward.

Continuing with the trend we've already observed, the iPhone page renders a view that is fairly faithful to the author's intent (see Figure 1i). The location (Science Fiction) is also more readily discernable than it was in the BlackBerry or the Windows Mobile renditions of the page, the JavaScript tabs (A Look Inside, Catalog Record) are present, and the book cover appears to the left of the main holdings information along with the circulation options.
COMPUTERS IN LIBRARIES

OPACs and the mobile revolution

continued from page 11

Figure 2a

Figure 2b

Figure 2c

Figure 2d

Figure 2e

Figure 2f

Figure 2g

Figure 2h

Figure 2i
**Innovative Interfaces. Compared to the SirsiDynix homepage, the Innovative home search screen looks significantly cleaner on the BlackBerry (see Figure 2a). It doesn't faithfully reproduce the desktop experience, but it's certainly clean and usable. Frankly, there's not a whole lot to gripe about here.**

Windows Mobile gives us roughly the same experience that the BlackBerry does with three vertically aligned input boxes (see Figure 2b). But with Windows Mobile, we get the aesthetically pleasing color scheme as well. You'll notice that the banner along the top of the page is squished so small that it has become difficult to read. This is because Windows Mobile will take a long graphic and shrink it to fit its screen. The graphic is 700 pixels wide, and the Windows Mobile screen is 240 pixels wide. Bear this factor in mind if your webpage has long navigational headers with `<map>` and `<area>` tags.

As usual, the iPhone looks good (see Figure 2c). The iPhone has also squished things in order to fit it all in. But instead of squishing just the banner, it's squished the whole page. This consistency in resizing (coupled with the fact that the iPhone's screen is wider) makes for a far more readable page.

Like the initial search screen, the results page is fairly readable on the BlackBerry (see Figure 2d). The title appears on the same line as the images, leading to an awkward line wrap of the title. But you can clearly see the title and the cover, so that's a success.

The Windows Mobile device handles the layout a little bit better (see Figure 2e). The "Book Cart" button, the cover, and the title are all on separate lines, leading to the left-justification of the title that makes it easier to read.

Again, the iPhone provides a good analog of the page we would expect to see in our favorite browser (see Figure 2f). The BlackBerry lines up the location and availability nicely for us (see Figure 2g). While we had to scroll past it in the screen shot, the fact that the search string ("rainbows end") is highlighted in red is also notable.

Windows Mobile doesn't display as nicely (see Figure 2h). By default, Windows Mobile will kill the table and line the results up vertically for us. Since there's no visual separator between branches, a long list could get confusing. But this is the default behavior. The user can click on the "Menu" button and switch the view to change this setting.

The iPhone provides the easiest reading (see Figure 2i). Like the BlackBerry, the search string is highlighted in red, but the wider display makes the table far more readable.
AquaBrowser. AquaBrowser is where it really falls apart for the BlackBerry (see Figure 3a). As you can see, it looks as if there's a link to a “high-accessibility version” of the site. But it only looks like a clickable link—you can't actually click on the link to get to a high-accessibility version. In fact, you can't go anywhere. This is where the browsing ends on a BlackBerry. Thinking it may have been a software issue, I tried searching on a hardware BlackBerry 8830 with the same result. I tried a few other AquaBrowser-based catalogs to make sure that it wasn't just something to do with Queens Library, but I had no luck. (See the conclusion for notes about the BlackBerry Storm.)

In Windows Mobile, things get off to a rocky start as well. Instead of getting a redirect, we get a dialog box telling us that our browser is incapable of running the site—not terribly friendly (see Figure 3b). Clicking OK does get us to a search box, but note that the top half of the screen is taken up by the header frame (see Figure 3c).

Thankfully, the iPhone looks almost right (see Figure 3d). If you look in the upper-left-hand corner, you'll see “Flash Not Detected.” As of this writing, the iPhone has no Flash. This means that user interfaces (UI) that rely on Flash are broken on the iPhone. Lucky for us, it's not the UI that's broken but just AquaBrowser's most distinct feature—the animated word cloud.

The results page works on Windows Mobile (see Figure 3e). Yes, the results are confined to the bottom quarter of the screen, but you can scroll down to view them. While relevance ranking is outside the scope of this article, it should be noted that relevance matters more on the mobile platform. On most phones, you can only see one entry per screenful of data; on a typical PC screen, you may be able to see 10 entries that you can quickly scan through. Big screens are great for throwing data sets at users and letting their brains pick out what's relevant—phones ... not so much. At least AquaBrowser has the decency to float the exact title match to the top of the relevance rankings.

The details page is the heartbreaker for Windows Mobile (see Figure 3g). Do you see that red X that looks like a broken image? That's the holdings, and it won't load. We can't see if our local library has the book we're looking for.

On the iPhone, however, it loads nice and pretty (see Figure 3h).
Test Results

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<tr>
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<td>AquaBrowser</td>
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On the OPAC side, AquaBrowser is clearly the loser, and Innovative is the winner. If we look at it from the phone side of the equation, the iPhone is the winner by leaps and bounds, with the BlackBerry pulling up the rear. To throw a bone to RIM and AquaBrowser, the new BlackBerry Storm does allow you to search for books, but you still can't find holdings information—just gives you a red X like Windows Mobile does.

Other OPAC 2.0 Systems

It seems as if over the last couple of years librarians and LIS vendors have come to terms with the fact that OPACs are, in general, very kludgy and difficult to use. We all point a finger at Amazon and say, “Yes, that’s what the OPAC browsing experience should be!” Established LIS vendors such as Innovative Interfaces and SirsiDynix are rolling out new products (Encore and Enterprise, respectively) that compete with new third-party vendors such as Medialab (AquaBrowser), OCLC (WorldCat Local), and BiblioCommons. Open source alternatives such as VuFind, SOPAC, and Scriblio also exist.

The lack of JavaScript support means Encore is not usable on BlackBerry or Windows Mobile devices—it just pops you back to the classic Innovative interface that we examined earlier in this article.

VuFind uses Ajax calls to show the call number and book status on the results page, but this method does not work in most mobile browsers—the browser simply displays “loading” for all time. Note, however, that if users click on the title, they can retrieve the information. BiblioCommons has the opposite problem: While the results page shows up fine, the Lightbox-esque “holdings” window will not display.

WorldCat Local is not entirely glitch-free, since Ajax calls, such as loading user-created lists, fail. Comparatively, however, it does pretty well. But OCLC has been running a very large-scale system in production for a long time and has undoubtedly learned some lessons.

SOPAC and Scriblio use template-driven CMS engines. As such, the appearance of the page will depend greatly on the style of the templates that are chosen. The Scriblio implementation shown in Figure 4, for instance, is very difficult to read.

Let's double back to Amazon for a moment. Amazon's mobile interface blows away everything in OPAC land. It's simple, clean, and easy to use. To see how clean and simple an Amazon search in Windows Mobile is compared to the OPACs we've reviewed, take a look at Figures 5a, 5b, and 5c.

To me, this tells us that we can't really blame the phone developers. If the OPAC sees “BlackBerry” or “Windows CE” in the user agent string of the device accessing it, it can darn well redirect to a universally readable site. It might not look as good or have spiffy animated word clouds, but at least it would work!

Test Your Own OPAC

In the previous section, we looked at a variety of different phones trying to do different things on OPACs. How did we get those fancy screen shots? More importantly, how can you check your own website and OPAC to see how they will look on a smartphone without buying a dozen different phones (as awesomely cool as that would be)?

The answer is simulators (also known as emulators, depending on the provider). RIM, Microsoft, Apple, Nokia, and Google all provide free simulators for their phones that allow you to run a simulation of the phone on your computer, as illustrated in Figure 6. These simulators are designed for programmers to make software development easier. Instead of having to transfer their applications to a phone each time they compile their code, programmers can just use a simulator. But since simulators also include the phone's web browser, they...
work very well for previewing your webpages on various platforms. Because they need to emulate the environment completely, they do an excellent job of rendering accurate depictions of the page as it will appear on the phone.

The simulators can be downloaded as part of a software development kit (SDK). Unfortunately, the RIM and Microsoft SDKs only run on Windows, and the iPhone SDK only runs on Intel-based Macs.

**Conclusion**

There aren’t clear winners here. What we’ve got is a problem. As mobile devices become more ubiquitous among our patrons, it becomes more and more imperative that we understand how these different devices display our content. We may not be in a position to fix our OPACs, but we’re certainly in a position to fix our own web content. And perhaps we can start to goad our vendors into providing support for a wider variety of devices.


*Vive la révolution!*

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