Responsive Web Design for Libraries

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Responsive Web Design for Libraries

A LITA Guide

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Chapter One

A Case for Responsive Web Design

If you are like me, you spend a lot of time looking at your library website's analytics and server logs. Aside from knowing how many visits your catalog had last week and how many folks left your site after a brief glimpse at your optimistically named FAQ page, you can learn a bit about the people that use your library website and their computers. Sophisticated analytics programs will tell you where your visitors live, what kind of computer they have, and which browser they visited from. Other statistics are squirreled away in these reports, and until recently one particular number didn't differ much from website to website: screen resolution.

This was a boon to website designers. By looking at these statistics, we could tell how large the screens were of our sites' visitors, and thus, we concluded, how big to make our sites. If the data said that our users' screens were 1024 pixels wide and 768 pixels tall, then we were determined to use every glorious pixel of that screen.

Then, in 2007, those reports started to look different. The first iPhone was released, and people could finally browse the web on a phone as easily as they could on a desktop or laptop computer. Our screen resolution reports started to get more diverse, adding screens 320 pixels and 480 pixels wide. Then Google released the Android operating system and the smartphone market exploded; tablets became the new must-have digital gadget; and screens for desktops and laptops changed aspect ratio, from 4:3 to 16:9. Our screen resolution reports now show dozens or hundreds of entries.

This has caused some concern, since we designed our library websites for screens 1024 pixels wide. Our sites were, shall we say, not "optimized" for all

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these different screens. This sudden influx of different screen sizes has many of us scrambling for a way to make our websites optimized—or even usable—on all of these devices.

And because so many of these devices are "mobile"—touchscreen iPods, smartphones, and tablets large and small—your gut instinct may be to rush out and make a "mobile website" to serve those users. But I'd like to step back for a moment and take a closer look at the full range of challenges that these changes pose for web designers, and for libraries in particular. Once we understand what we're getting ourselves into, then we can better judge our possible paths forward.

A PROLIFERATION OF SCREENS

By the end of 2013, there will be more active mobile devices on the planet than people.[1] That's one cell phone, tablet, or smartphone for every man, woman, and child, the world over. Since the end of 2010, smartphones have outsold traditional desktop and laptop computers,[2] and nearly half of American adults now own a smartphone, an 11 percent increase in just the last year.[3] And this trend looks to continue. Rather than remaining the tool of wealthier socioeconomic classes, smartphone adoption is growing fastest among adults who earn less than $30,000 a year.[4] Although smartphone data plans are more expensive than typical voice and text plans, with the ubiquity and speed of 3G and 4G service a single smartphone represents a savings over separate cell phone and home broadband Internet service.

Teens present a very different picture. Nearly all American teens own a cell phone, and 37 percent of them own smartphones. But half of teen smartphone owners use their phone as their primary way to connect with the Internet. Even those without smartphones are heavy web users. If we include teens with feature phones, one in four uses the Internet primarily from his or her phone.[5]

While smartphones are gaining market share, their own internal diversity is growing. The iPhone went from a 320-by-480 pixel device to a Retina display, in which the physical screen size remained the same but the pixel density doubled. (Then the screen size changed with the iPhone 5.) Android exponentially diversified the device landscape. There are no hard numbers on just how many devices use Android. But in 2012, OpenSignal Maps published data it had collected on the devices that had downloaded its app. It found 1,363 different devices over a six-month period.[6] That's just the reported devices running Android that downloaded one app over a limited period of time.

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Even without these data, I can look around the café where I am writing this and see device diversity in action. Nearly half of the folks in this busy coffee shop are looking at or gesticulating with smartphones. I can count a half dozen iPhones and twice as many Android devices. There are more varied screens doodling around the Internet than ever before.

And it's not just smartphones. Tablets are projected to outsell desktop and laptop computers by the end of 2013,[7] and more than 30 percent of American adults own tablets now.[8] A third of smartphone owners also own tablets, and fully 13 percent of all American adults own a smartphone, a tablet, and a desktop or laptop computer.[9]

If you've watched your own analytics, you've probably seen at least some increase in mobile device visits. At Grand Valley State University (GVSU), we went from 1.5 percent of all visits being on a phone or tablet in 2010 to 12 percent of visits by the end of 2013. That's a fivefold increase in visits in just two years, and it won't be letting up anytime soon. The way people connect to the Internet is changing, and sooner or later your library will have to address these changing user needs.

A REALIZATION ABOUT SCREEN DIVERSITY

Although it is certainly true that the diversity of smartphones and tablets has brought the need for better cross-device support to our attention, the problem isn't exactly new. In fact, it's a problem that has been with us all along. When Tim Berners-Lee posted the first HTML page to the Internet, he wasn't concerned with screen size. The text of the page, which is still online today, simply wraps to the width of the user's screen (figure 1.1).[10] The idea of creating a page design based on a minimum width was imported to the web later from the print world, where designers knew how large a finished document would be and designed to fit that size.

The Irish web developer Jeremy Keith, channeling *Neuromancer*, calls our belief that all users view a site at the width of their screen a "consensual hallucination."[11] There has never been a guarantee that anyone viewed our websites at the width of their screens. As the designer Ethan Marcotte pointed out, designing for a screen size is "one step removed from our *actual* canvas: the browser window."[12] We chose to ignore that our sites were viewed at whatever width our patrons set their browser windows until the number of screen sizes simply made this diversity too hard to ignore.

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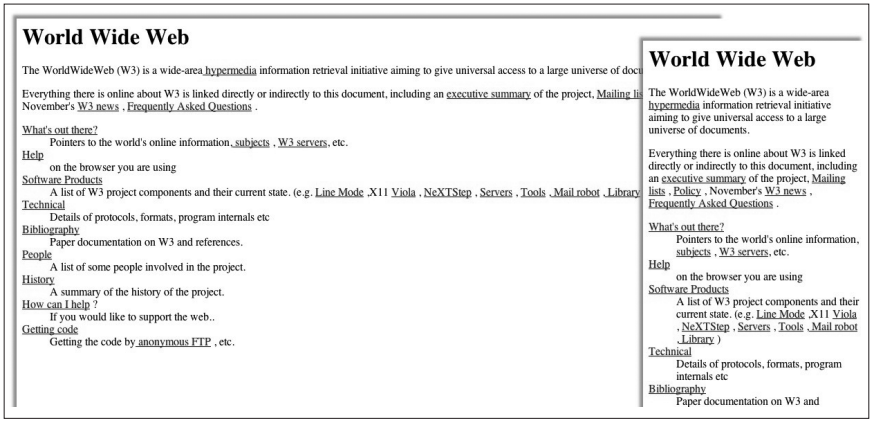

FIGURE 1.1
Tim Berners-Lee's first Web page is naturally fluid, adapting to any screen.

Back in 2000, the designer John Allsopp was already warning us about designing for fixed widths on the web: "The control that designers know in the print medium, and often desire in the web medium, is simply a function of the limitation of the printed page. We should embrace the fact that the web doesn't have the same constraints, and design for this flexibility."[13]

The web is inherently fluid and flexible. We made it fixed and rigid. Rather than trying to deal with more screens by making more rigid, fixed-width mobile sites, what if we worked with the web's nature and thought about it in fluid, flexible terms?

Thankfully, there is a way to build standards-based websites in HTML and CSS that can adapt to any device by thinking responsively.

RESPONSIVE WEB DESIGN DOES NOT MEAN MOBILE WEB SITES

Responsive web design (RWD) differs from creating a "mobile site" in a few ways. A responsive site delivers the same content to all users on the same URL, regardless of the device. Rather than making assumptions about what users on phones, or tablets, or even televisions want to do on your site, serving only the content you *think* they might want, with RWD you serve the same content to everyone.

This may at first go against the prevailing ideas about how people on mobile devices use the web: the rushed businessperson with one eye on the road and the

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other on his or her phone. Because this mythical mobile user is on the go, logic states that we should assume that the user has a slow network connection and just wants directions to our library or today's hours. But making assumptions about how an entire group of people uses a device is absurd, as designer Mat Marquis pointed out on Twitter: "Mobile users want to see our menu, hours, and delivery number. Desktop users definitely want this 1mb png of someone smiling at a salad."[14]

We seem to accept without reservation that folks browsing on desktop computers all have a variety of needs and desires. Why wouldn't that be true of mobile users? If we look at the data, it turns out that mobile users are as varied as those who are browsing on desktops and laptops.

Rather than using our mobile devices primarily as tools to get point-of-need information when we are on the go, studies show that phone and tablet use is much more diverse. According to a pair of studies from 2010 and 2011, 84 percent of smartphone owners use their devices to browse the web at home, where it is more likely they would be on a high-speed connection.[15] The studies show how well smartphones are at filling downtime, no matter where we are. (Google found that 39 percent of smartphone owners admitted to using them in the bathroom, which might tell us that 61 percent of smartphone owners are liars.)

And far from idle browsing, mobile devices are becoming a tool for getting real work done. In 2011, PayPal handled more than $4 billion in mobile payments,[16] and eBay did more than $5 billion in sales to mobile devices.[17] And eBay isn't tacking up a few billion $1 sales. Each month, the company reports, three to four Ferraris are sold to buyers on mobile devices.[18]

Although separate library mobile sites (or apps) seem attractive, they often don't meet the needs of the users or the teams maintaining them. While a responsive site has one set of content with a single URL, adapting fluidly to fit any device, mobile sites often create additional content management problems. If your hours change, for instance, you might have to update them in two places: one for your desktop site and another for your mobile site. That's a recipe for out-of-date information and unhappy patrons. Even if your CMS can generate templates from a single content source, you'll be generating multiple URLs for each bit of content, depending on whether you are on a mobile device or a desktop computer.

In addition, separate mobile sites often rely on detection scripts to determine whether a visitor should be shown the mobile or the desktop site. These libraries check for mobile-specific browsers or whether the device shows up in a large library of known mobile devices. But with dozens of new mobile devices released each week around the world, keeping these device libraries up to date is a full-time job. What's more, these scripts can't catch every mobile device. When OpenSignal

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Maps analyzed its usage data, it found that slightly more than a third of the devices recorded were represented only once, either because they weren't popular or because users had customized the device enough to make its identification unique.

Browser detection is even less reliable. It is trivially easy for browsers to identify themselves however they wish, and because of some bad practices that were common on the web even a few years ago, it is often necessary to trick sites into thinking that your browser is something it is not. These scripts make it hard to be sure the right users are getting to the right site.

RESPONSIVE WEB DESIGN IS FUTURE-FRIENDLY

Maintaining scripts, multiple URLs, templating systems, and various content pools takes staff time, advanced technical skills, and infrastructure—all things in short supply in today's libraries. If you're short on any of these things, than RWD is probably a good solution. Your staff can build one site with the web skills they have now, just semantic HTML and CSS, and focus on making improvements to the services you have rather than fiddling with infrastructure.

Not to mention that mobile-only sites serve a very particular problem that is common now: a proliferation of small screens. But these mobile sites do nothing for devices that will be released in the future with screens or interfaces that aren't small touchscreens. Will we build TV-only sites next year? Google Glass–only sites? Someone in an audience where I recently spoke told me that his new water heater connects to the Internet and has a display. Should we all start building water heater–only sites?

READY OR NOT, THEY ARE ALREADY HERE

The most common response I hear from librarians when I talk about making our sites more accessible to mobile devices is that "no one wants to search the library on their phone." They say this from a place of expertise. I usually remind them of Cliff Stoll, the Internet pioneer who wrote in 1995 that no one in his or her right mind would ever buy anything online.[19] He, too, was an expert, but he wasn't a mind reader.

It is true that buying sports cars and searching for books or articles are different activities. We shouldn't assume that just because some folks are content spending

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the equivalent of your entire library's technology budget on a car through their phone that this tool is equally as good for research. But the data say that they are already trying.

In 2011, the most common activity smartphone owners reported doing online was searching,[20] so it's not that searching is incompatible with the devices. But general-purpose searching is different from doing research (or at least that's what we've been trying to convince our patrons of for the past century). The good news is that despite the dire predictions of many librarians, people *are* using library websites on mobile devices, or at least they are trying.

I already mentioned that at GVSU traffic from mobile devices accounted for more than 12 percent of visits for 2013. But we aren't an isolated case. According to a Pew Internet and American Life Project study, 39 percent of Americans older than age sixteen have visited a library website at least once, and 25 percent have used a library website in the past year.[21] But more important, 13 percent of Americans older than age sixteen have used a library website on a mobile device in the past year. That's over half of your library's website users in the past year who have at least *tried* to use a phone or tablet to access your online services.

Of course, half of our visits are not coming from mobile devices. Frankly, for many of these users, trying our sites on a mobile device once was enough. Library websites are difficult to use on desktops and laptops, and they are often impossible to use on phones or small tablets. If we want to see an increase in mobile traffic, we're going to need to make it easier for patrons on all devices to use our online services. Would you wait to install a barrier-free entrance until visits from patrons in wheelchairs or walkers increased?

USER EXPECTATIONS ARE CHANGING

The changing landscape of web-enabled devices is causing a shift in the expectations of our users. Most of our library patrons now have the ability to connect to the Internet in their pockets. Where once they might have waited until they were home or at the office to log in and put a hold on an item in the catalog, they can now do this on their phone while on the bus or while waiting at the doctor's office.

When our patrons use our sites in new situations like this, it often highlights the challenges we might have overlooked before. Is your site hard to navigate on a small screen? Patrons might not be able to find their way around while browsing on the phone. Does your catalog require that you log in with your library card

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barcode? That will be tough to remember while on a crowded bus. These devices are changing the context in which our patrons are interacting with our services, and our websites need to accommodate these quick tasks as well as long research sessions, no matter the device.

In a 2012 survey, Google discovered that 61 percent of smartphone owners will quickly leave a site if it isn't optimized for mobile devices. Forty-eight percent said that websites that weren't optimized for mobile made them feel like the company didn't care about them.[22] In addition, our patrons expect our sites to be faster on mobile devices than on computers. Never mind the slower cellular connections and limited processing power in even the fanciest new smartphone, 60 percent of smartphone owners expect sites to load in three seconds or less on their phones, and 75 percent won't wait more than five seconds.[23]

Needless to say, library websites are not always optimized for speedy performance. But serving up a clunky site meant for a desktop computer to a phone on a slow connection is a recipe for disappointment.

MORE TO DO WITH FEWER RESOURCES

At precisely the time that our patrons are demanding more from our online services, libraries are struggling with budget cuts and staffing shortages. These strains on our libraries are affecting the way we are able to serve our patrons as more and more of our library services come online.

From 2010 to 2012, twenty-three states cut budgets to public libraries, and 40 percent of states have had public library funding cut three years in a row or more.[24] Academic libraries have suffered, too, despite increased enrollments and a nearly 9 percent increase in gate counts since 2008.[25] It takes money to develop and maintain the systems that libraries provide, and shrinking budgets are but one hurdle to overcome. Staffing cuts, particularly at academic libraries, have made it more difficult to add new or improve existing services. Since 2008, academic library staffing levels have fallen by nearly 5 percent.[26]

What's more, many library schools aren't teaching the kind of programming skills necessary to address serious infrastructure problems, and dropping library salaries are sending the talented developers we do have into the private sector.

The challenge, then, is to find a way to make our online services optimized for all of these different devices and contexts while working within shrinking budgets and the restrictions of staff time and skills. Rather than build multiple different interfaces for different devices while maintaining the kind of complex infrastructure

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to direct each of these users to the right site, we need a way to use our limited time and skills to make our systems work for everyone. Responsive web design lets us build one site for all devices—now and in the future—with just HTML and CSS, skills many of us already have.

SOMETIMES A SEPARATE MOBILE SITE MAKES SENSE, BUT PROBABLY NOT FOR YOU

The case I am making for using responsive web design to build our online services sounds a lot like rainbows and unicorns, so why would anyone build a separate mobile site?

There are times when a separate mobile site makes sense, but generally only when the experience a mobile user needs is completely different from what a desktop user might want. The design firm Happy Cog used to host a karaoke event at the festival South by Southwest called Cog'aoke. The desktop site allowed users to sign up to perform and learn more about their competition. The mobile site, however, had a completely different purpose. The idea was that folks would use the mobile site to vote while at the competition. Because mobile use was seen as a completely different context, the separate mobile site made sense.[27]

But that's probably not what your library needs. If your goal is to serve all of your users with all of the same services, than you need to give everyone the same opportunity to connect to the library online, whether they are visiting on a new MacBook, a nine-year-old Nokia flip phone, or a new water heater.

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