THE ART OF REDIRECTION: ONE LIBRARY'S EXPERIENCES AND STATISTICAL

RESULTS FROM THE DEPLOYMENT OF MOBILE REDIRECT SCRIPT

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ABSTRACT

While institutions have produced a proliferation of mobile websites to respond to the increased demand for mobile resources, getting mobile device users to those sites has proven to be an issue. One simple method involves the use of script which automatically redirects mobile devices from an institution's regular website to a mobile site. This paper documents the experience of the University of New Mexico's Health Sciences Library and Informatics Center with its mobile redirect strategy. The strategy will be presented here in its evolving entirety, along with statistics of website usage to evaluate the success of the effort.

INTRODUCTION

While they are continuing to improve in their capabilities, mobile devices still have many limitations compared to a full-scale computer. They have less memory, making it difficult for them to handle larger web pages. They use scaled down browsers that render sites differently than their full-fledged counterparts due to the limitations of the processing and system resources available through a mobile device. In addition, mobile devices often suffer from bandwidth limitations as they are forced to use many different networks of widely varying quality. All of this is, of course, in addition to the obvious limitations of small screen and keyboard sizes. As such, it is often useful for institutions to mirror their more conventional web presence with a site

that is designed for smaller, touch interface screens. Such sites ideally require less memory and simpler rendering, allowing them to load swiftly and display correctly on mobile devices.

There are some problems with this strategy, however, the most obvious one being the problem of getting visitors to the mobile version of a site. Since the regular site is usually the one that appears first in search engine results, the regular site may often be the destination that users select, regardless of format. Many visitors may be unaware of the existence of a mobile version of an organization's site. A common strategy is to supply a prominent link to a mobile site on the institution's conventional page . . . a strategy that relies upon the visitor noticing the link and which still requires at least one full-scale web page to load in the visitor's mobile device before they even have a chance to move to the mobile site.

Another strategy is to employ some sort of scripting (light-weight coding languages used for web programming) to detect a mobile device and redirect it to a mobile site. This strategy has several advantages: it requires little or no action on the part of the visitor, it makes mobile use of a site simpler and more intuitive, it requires at best a partial loading of a conventional website before the redirect takes effect, and it potentially gives visitors the impression that the institution is mobile-friendly.

This strategy also has some problems, however. If, for example, javascript is employed for the redirect script, devices with javascript disabled will not be redirected (a particular problem with Android devices). Another problem with using redirect script is deciding how to deal with tablet computers. Some tablet users prefer the full version of a site, even if their tablet, with its mobile browser, has difficulty rendering or interfacing with that site. This approach also leaves the web author with the question of how to detect the mobile device. There are a number

of ways to accomplish this, including operating system detection, browser detection (since

mobile devices use different browsers than desktop computers), and detection of device features.

MAKING DECISIONS

In confronting the issues discussed above it is of vital importance that the web author

takes into account the resources at their disposal. As previously noted, javascript, which runs in

the user's browser (this is what is known as "client-side" script) can be turned off on a device.

However, "server-side" script, like PHP, which runs on a remote server, cannot be turned off in

the same way. In the case of the redirect used by the University of New Mexico's Health Science

Library and Informatics Center (UNM HSLIC), javascript had to be employed because the

institution's servers only employed ASP on a limited access basis.

This factor also influenced the decision about what property to use as a means to detect

incoming mobile devices. While javascript has the disadvantage of being vulnerable to

deactivation by the user, it has the advantage of providing more seamless access to the Document

Object Model (a model which describes the web document and how it is viewed) than server-

side script can. In practice, this meant that screen-size detection could be readily employed.

Screen size detection offers several advantages over other alternatives. Given the number

of mobile operating systems and mobile browsers currently in use, writing a redirect to address

all of them, or ensuring access to updated definitions from sources such as the WURFL Project,

can become onerous. In addition, such systems are subject to change, requiring the web author to

maintain a careful vigil over their redirect script to make alterations as needed. Another consideration is detection accuracy. With server-side script, detection of the operating system or browser is accomplished by examining the HTTP "User Agent" sent by the client, which can sometimes be inaccurate for various reasons. By using screen size as the determining factor in the redirect script, this script becomes a "set and forget" project, requiring little or no maintenance. It also simplifies the creation of conditional statements for the redirect.

Tablets pose a challenging conundrum, since they possess more processing power, more memory, and larger screens than smartphones, making them generally (but not comprehensively) more competent than smart phones at handling conventional websites. Because mobile sites offer a simpler interface and usually feature fewer options than a regular website, some tablet owners may dislike being mandatorily redirected to a mobile website. One solution to this problem is to redirect users to a selector screen which allows them to choose between the mobile site and the regular website. When creating the selector screen, web authors should use a mobile template. If the selector screen strategy is employed, the web author must be careful to attach a condition to the redirect that checks the "document.referrer" object to ensure that, if the mobile user selects the regular website, they are not simply shunted right back to the selector screen by the redirect script.

Testing redirects scripts can be problematic. An organization may need to purchase at least some mobile devices for testing purposes. Just as it is best to test a web app on as many browsers as possible, the more types of mobile device and operating system a mobile app or site can be tested on, the less likely an institution is to face an unpleasant surprise stemming from their mobile efforts.

INAUGURATING THE REDIRECT

HSLIC first activated a mobile site in January of 2010. The library homepage had a prominent link to the Health Science Center Mobile Site which then had a corresponding link to the library's mobile site. Usage was steady. At the end of March of 2011, the new Emerging Technologies/R&D Librarian, influenced by a mobile technologies presentation he had recently attended, decided to employ a mobile redirect script on the library homepage. The initial javascript he deployed was simple, keyed off of device screen size, and automatically redirected all mobile devices to the mobile site. This script was:

```
if (screen.width <= 800)
 {
window.location = "http://m.health.unm.edu/";
}
```

At first the script targeted even devices with a tablet sized screen, but the decision was soon made to exclude tablets. However, after consulting with members of the Health Sciences Library and Informatics Center Web Team, the Emerging Technologies Librarian opted for another approach entirely. Under the new approach, mobile users were routed to a selector screen where they could choose between the mobile site and the regular web page. This required a reworking of the redirect script. Not only was the screen size parameter reset to include tablets, but an additional parameter was added to the "if" statement in the redirect to keep those users

who opted for the regular page from entering an infinite loop with the selector screen. The script

that resulted was:

```
if ((screen.width <= 800) && (document.referrer !=

"http://m.health.unm.edu/library/landingsite.html") )

 {

window.location = "http://m.health.unm.edu/library/landingsite.html";

}
```


This is the current selector screen used at UNM HSLIC:

This new approach was effective, but another problem soon presented itself. The head of

the Web Team reported that the redirect was somehow also redirecting mobile devices from a

new page that had been recently added to the HSLIC website. After examining the page, the

Emerging Technologies Librarian discovered that the authors of the page had cloned the HSLIC

homepage for use as a template, thus including the mobile redirect script on the new page. After

the redirect was removed from this new page, an additional clause was added to the redirect "if"

statement which checked the page location, returning "false" if "window.location" did not read

as the HSLIC homepage. This caused the script to become effectively inactive should the page

be cloned again. The new script that resulted was:

```
if ((screen.width <= 800) && (document.referrer !=

"http://m.health.unm.edu/library/landingsite.html") &&

(window.location == "http://hsc.unm.edu/library/ "))

{

window.location = "http://m.health.unm.edu/library/landingsite.html";

}
```

Shortly after the beginning of 2012, HSLIC moved its website to a content management system

and the window.location check was removed from the redirect as it was no longer needed given

the low likelihood of the homepage being cloned as it had been in the past.

NEW IPADS MEAN A NEW PROBLEM

The newest version of the iPad utilizes a retina display, packing more pixels into its small

screen that some desktop monitors. As a result, using screen size detection through javascript

(which detects pixels) may be inadequate. To preempt this problem, HSLIC added an additional

check to the if statement of their redirect script which examines the User Agent string. Despite

overall shortcoming of using this method, as detailed earlier, using it in combination with screen size detection makes User Agent string text checking a less problematic solution. In addition, Apple products tend to use very consistent User Agent strings, making this solution more palatable since it is primarily intended to detect the new iPad model. This new script has tested as good with current iPad models, indicating no reduction in script efficacy, but HSLIC has yet to have the opportunity to test it with a retina display equipped iPad. The latest redirect script utilized by HSLIC is:

if (((screen.width <= 800) && (document.referrer

!= "http://m.health.unm.edu/library/landingsite.html"))

|| ((navigator.userAgent.indexOf('Mobile') != -1) && (document.referrer

!= "http://m.health.unm.edu/library/landingsite.html")))

{

window.location = "http://m.health.unm.edu/library/landingsite.html";

}

ADVICE FOR DEPLOYING THIS SCRIPT

Any institution that wishes to use the same script as UNM HSLIC should, if at all possible, add the script to the header of the affected web page so that it loads as soon as possible. Javascript should always be enclosed by html script tags, like so:

```
<script type="text/javascript">

if (((screen.width <= 800) && (document.referrer

!= "http://m.health.unm.edu/library/landingsite.html"))

|| ((navigator.userAgent.indexOf('Mobile') != -1) && (document.referrer

!= "http://m.health.unm.edu/library/landingsite.html")))

{

window.location = "http://m.health.unm.edu/library/landingsite.html";

}

</script>
```

LOOKING AT THE NUMBERS

UNM HSLIC uses Google Analytics to collect usage data. As figure 1 below clearly indicates, visits to the mobile site evidence a significant increase from April of 2011 onwards, with a small, but significant bump in March (which seems to reflect the introduction of the redirect near then end of the month). The number of visitors, which came in at 356 and 302 in January and February respectively, increased to 439 in March before reaching 715 in April. This increase is sustained and consistent through October of 2011. While some of the increase could be attributed to the redirect initially routing all mobile devices to the mobile site, the redirect was refashioned into a selector-screen based modality by the end of the first week of April of 2011. As such, the numbers seem to indicate that, while the redirect is bringing the mobile site to the
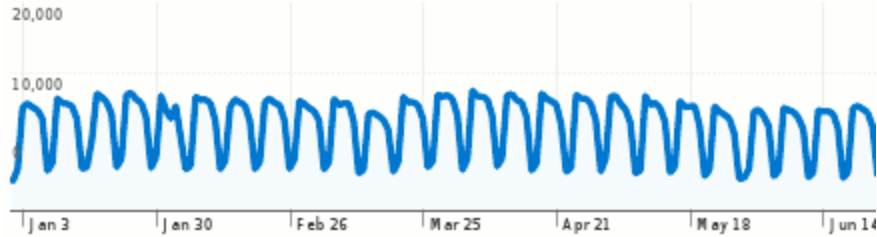
attention of visitors with mobile devices, those visitors are making the conscious choice on their

own to use the mobile site rather than the conventional site.

Figure 1

As shown by figure 2, the number of visits to the HSLIC site over this time period has remained relatively stable, eliminating the possibility that the increase in mobile site traffic was simply the result of a higher level of site traffic overall.

HSC Production
Custom Title October 28, 2011 by operating system and month

This custom dimension resulted in 2,367,754 Visits

New tab

Visits	New Visits	Entrances	Exits
2,367,754	713,736	2,367,754	2,367,754
% of Site Total: 100.00%	% of Site Total: 100.00%	% of Site Total: 100.00%	% of Site Total: 100.00%

Month	Visits	New Visits	Entrances
Oct 1, 2011 - Oct 28, 2011	211,980	72,932	211,980
Sep 1, 2011 - Sep 30, 2011	226,890	79,399	226,890
Aug 1, 2011 - Aug 31, 2011	238,115	77,956	238,115
Jul 1, 2011 - Jul 31, 2011	218,320	63,983	218,320
Jun 1, 2011 - Jun 30, 2011	230,779	64,337	230,779
May 1, 2011 - May 31, 2011	241,184	67,190	241,184
Apr 1, 2011 - Apr 30, 2011	255,357	72,488	255,357
Mar 1, 2011 - Mar 31, 2011	260,681	75,282	260,681
Feb 1, 2011 - Feb 28, 2011	231,931	65,685	231,931
Jan 1, 2011 - Jan 31, 2011	252,517	74,484	252,517

Figure 2

FUTURE DIRECTIONS FOR HSLIC

While the mobile site and its associated redirect have been effective in their role, in many ways they are still are problematic solution to the mobile issue. Besides requiring a duplication of web efforts, they force mobile users (many of whom were attracted to the convenience of mobile technologies) to make a series of choices that interferes with their ease of use. What is needed is a more seamless, layered approach to web design that allows for a single site with the flexibility to support a wide range of devices.

This approach is finally coming of age through Responsive Web Design[1], a method currently being explored by the UNM HSLIC Web Team for deployment with some of the organization's log in forms[2]. By using screen size detection coupled with Cascading Style Sheets designed around the limitations imposed by changes in screen size, Responsive Web Design allows a single site to have the adaptability to be deployed successfully on many types of device[1].

In addition to its general utility, Responsive Web Design has drawn attention to the concept of "mobile up" web design, in which sites are built around the needs of mobile devices first, with additional features added later for more conventional computing devices[2]. Most thought in mobile site development and modification has worked in the opposite direction, with designers trying to find ways to pare down sites designed around traditional models of web access. By working in the opposite direction, designers are forced to author more focused sites, with greater attention paid to core utility. In much the same way that librarians first learning

cataloging are urged to carefully consider the essential subject matter of materials, web designers

employing the "mobile up" approach must ask questions about the fundamental purpose of

individual pages. As such, this may be a design approach that helps avoid the wasteful clutter

that often characterizes the longstanding sites of many organizations.

CONCLUSION

The logical conclusion seems to be that the mobile redirect is doing its job effectively,

despite the inherent limitations of a javascript based redirect tool. As a result of the redirect

script, mobile users are finding and using the mobile site in much greater numbers than when the

site was accessible only through a web link from the homepage. Given the results experienced by

UNM HSLIC, other institutions which offer mobile sites may wish to investigate the deployment

of mobile redirect scripts on their websites. The author feels that more statistics from other

institutions that have adopted this strategy would be helpful in producing a more complete

picture of the usefulness of mobile site redirect scripts. In addition, it would be useful to contrast

the decisions and experiences of this author with other mobile redirect programs that have made

different choices, such as institutions employing scripts that detect and use device operating

system types instead of screen size as a determining parameter in the redirect script.

1. Knight K. Responsive Web Design: What It Is and How To Use It. Smashing Coding [Internet]. [cited 2012 Jan 14]:[about 2:30 p.]. Available from: http://coding.smashingmagazine.com/2011/01/12/guidelines-for-responsive-web-design/

2. Colasurdo G. Responsive Web Design. Powerpoint presented at: Meeting of the UNM HSLIC Mobile Technologies Working Group; 2011 November 8; Albuquerque, NM.

Figure 1: This Google Analytics reports describes visitors to the UNM HSC mobile site (the site which linked from the UNM HSLIC homepage and which was the destination of the redirect) over the Jan 1- Oct 28 2011 time frame.

Figure 2: This Google Analytics reports describes visitors to the UNM HSLIC homepage over the Jan 1- Oct 28 2011 time frame.