Meeting the needs of library users on the mobile web

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Introduction

The Open University (OU) UK is a world leading distance learning institution and has more than 240,000 students currently studying various undergraduate and postgraduate courses. Since 2005 a growing number of students have been accessing the university’s websites on web-enabled mobile devices. In order to meet their requirements we endeavour to ensure that the content and services on the Library website are accessible and render well on smaller screens.

We developed the first mobile version of the Library website in 2007[1], working collaboratively with Athabasca University using their ADR (Auto Detect and Reformat) software. This version was a single column design intended to work on basic mobile phones as well on smart phones such as the Nokia N95. However, in the last couple of years our website analytics have shown an increase in visits from touch screen phones (e.g. iPhone HTC Android and Samsung Galaxy), which has prompted us to redesign the mobile Library website to improve usability, especially on touch screen mobile devices. We are adapting MIT’s open source Mobile Web project which enables the website design to be optimised for three categories of small screen devices: basic, smart and touch screen phones.

In this chapter, we will highlight some of the developments to the mobile Library website and the work being carried out during different stages of the project specifically covering:

- Gathering user requirements for mobile library services through user feedback, focus group consultation and website analytics
- A technical overview of adapting and customising MIT’s open source mobile web software.
- The lessons learnt and key challenges and issues when to designing content/website for smaller screens.

The importance of mobile services for distance learners

An increasing number of Open University students are now equipped with access to mobile technologies such as mobile phones and small screen hand-held devices. These mobile
technologies include anything from basic phones to the latest touch screen phones, small screen tablets and eBook readers. The majority of those mobile devices are web-enabled and thus provide students with always-on access to the Internet. We anticipate this leading to an increasing demand for flexible content delivery and library services that can meet the perceived needs and expectations of students using such mobile devices. Applications of mobile technology in education can provide benefits to both students and educators.

**Mobile Library website development**

In order to meet the needs of our mobile users, we have been actively developing and enhancing our mobile Library services for last few years. The current mobile version of the Library website (see figure 1) was first developed in 2007 in partnership with Athabasca University, Canada using their in-house developed ADR (Auto-detect and Reformat) software. By using the ADR software, it allowed us to enable the Library website and other online content to be suitable for viewing on small screen devices. The ADR software automatically detects if a mobile device has been used to connect to the website and then renders and optimizes the content to fit appropriately on the mobile screen, by changing the layout template and style-sheet. The advantage of this approach has been to use the same content to be rendered on two different display models (one is for the normal screens and the other is for smaller size screens) and has saved content authors from writing two separate versions of the same content.
How users are using the mobile Library Services and website

We have been using Google Analytics since 2007 to track Open University Library website traffic (both for desktop and mobile versions) and to analyse user behaviour. The Google Analytics tool provides a low barrier to entry in terms of allowing inexperienced users to easily create eye catching graphical reports that provide information on the source of traffic (where visitors came from), what pages and areas they visited, how long they stayed on each page, how deep into the site they navigated, where their visits ended, where they went from each page and so on.

Google Analytics statistics have revealed that the most popular areas for the Library website’s mobile users are the homepage, Contact Us, Opening Hours, News, and Events at OU Library and Search the Library collections (see figure 2). These findings have also been confirmed during the Arcadia research project in 2009 [2] when users were asked about the Library services they would most like to access from their mobile phones.
Figure 2: The most popular pages on mobile OU Library website (From early 2007 till Sep 2010)

The analytics data has also revealed that 66% of the total mobile users (see figure 3) accessing the mobile OU Library website are using touch screen phones such as iPhone, Android based phones, Samsung Galaxy and Blackberry. Based on these findings, we are currently revamping the mobile OU Library website and will focus on improving the key areas which users have been accessing most frequently.

Figure 3: Range of mobile devices used for accessing the Library website (2010 data)
Revamping the current mobile website

One of the challenges with a single mobile version approach using ADR software is that although it renders well on basic web-enabled phones (and non-touch screen smart phones such as Nokia N95), the user experience on advanced touch screen phones such as iPhones is not optimal due to the larger screens of these phones. For instance, the target size for links is too small to click with the finger, it makes the user experience worse on larger screen phones. On the other hand, the quality of videos being played on larger screen phones gives a much better user experience as compared to basic flip phones. With the expansion of the touch screen phone market and a large number of OU students using the larger screen phones and devices, there is an even greater demand to develop Library services to take advantage of the advanced capabilities and bigger screens of those mobile devices. We are therefore revamping the mobile Library website to develop a three devices model based on the open source MIT’s mobile web project. The key areas of the redevelopment for the website include implementation of mobile interface for the vertical search system using Ebsco Discovery Service API, providing search recommendations, migration from our current Cold Fusion platform to a Drupal/PHP based environment (which is officially supported by our central IT department), an improved help and support channel and development of targeted mobile pages such as the contact us page, web chat plug-in and a mobile optimised list of e-journal databases.

The current version of mobile Library website was first developed and launched in 2007. However based on the Google Analytics data and the feedback provided by our users, we have felt that there is a need for revamping it for a number of important reasons including:

- One size does not fit all (too many devices and different sizes and capabilities) hence we want to develop three devices model based on MIT’s mobile web project
- We have found (through analytics and user surveys) that users are not interested in all the pages – but they want to access targeted pages only
- It would make sense to take advantage of advanced capabilities of touch screen phones (larger screen, better quality a/v and location awareness)

MIT’s mobile web software classify[3] mobile devices in the following three categories:

- High end – large touch screen and with advanced web capabilities (iPhone, HTC, Samsung etc.)
• Smart phones – may lack touch screen function but have decent web capabilities and javascript support (Nokia N95, Windows mobile, Blackberry etc.)

• Low end phones – Small screens and basic web capabilities (web enabled flip phones)

For the re-development of the mobile Library website we have used a combination of Drupal and PHP for the front end development with a mySQL back-end database (see figure 4). The device capabilities detection has been achieved using WURFL (Wireless Universal Resource File - is a community managed configuration file that contains info about all known Wireless devices on earth)

Figure 4: The new homepage(s) of OU Library website based on MIT’s three devices model Mobile web project
The key mobile services in development:

we are working on a number of developments, including:

- A separate homepage for each of the three versions of mobile website

- Based on the feedback and user analytics, the mobile home pages will have links to the pages users access most on mobile devices, such as opening hours, contact us, search, news, the calendar of library induction sessions for students, and Help and support

- A list of mobile friendly databases (e-Journals) – colleagues in several Libraries have tested databases on mobile phones with different capabilities and have drawn up a list [4] of mobile-optimised databases.

- Mobile implementation of ‘Live person’ webchat – so that students can get in touch with our helpdesk staff through their mobile phones.

- A mobile interface to offer integrated vertical search [5] and Amazon style recommendations to e-Resources (see figure 5). The recommendation work has been done under the RISE [6] (Recommendations Improve the Search Experience) project and includes course based, similar article based and similar search term based recommendations.

![Figure 5: Search results (Left) and recommendations (Right)]](image)

Challenges and issues

In terms of developing services for mobile devices, the key challenges we face are:
• Too many different models of mobile devices – it’s difficult to keep up to date with the hundreds of new mobile models coming out every week.

• Getting various authentication methods to work seamlessly for the users to ensure simple single sign on for access to all our subscription resources (see figure 6 for an example).

• The web apps offered by content providers do not work with institutional login. It is difficult for the students/users to remember a large number of user credentials.

Figure 6: A challenge to authenticate via Shibboleth on mobile – too many redirects are preventing students from accessing the full text of online articles

Mobile usability/design principles

Usability is a key element of the mobile development and we try to follow these general usability design principles:

• Know your audience and know what they ’are likely to want to do on a mobile device.

• Design for the type of handheld device most likely to be used to view your web page. Web logs and user surveys can help to determine this. Our analytics show that our
website is accessed far more by touch screen phones than other types.

- Leave space around buttons and links to ensure they have a big enough “target size” (1cm x 1 cm)
- Minimize the number of clicks and the volume of downloads
- Save state – expect bad connectivity and ensure users will be returned to the page they were on if their connection drops temporarily – especially for forms
- Include search so the users also have the option to discover resources based on key words
- Reduce clicks, scrolling and time needed to complete a task

### Mobile websites/apps versus native apps

There are advantages and disadvantages to each approach. According to ComScore’s Mobile Year in Review 2010 report [7] mobile internet browsing is far more popular than app use. However, the Neilsen Norman Group suggests that apps are better for regular or loyal users. Table 1 provides a brief comparison of the three approaches:

<table>
<thead>
<tr>
<th>Mobile website</th>
<th>Native or proprietary app</th>
<th>Web app [HTML 5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform independent</td>
<td>Platform specific</td>
<td>Platform independent</td>
</tr>
<tr>
<td>Use existing staff skills</td>
<td>Staff need new skills</td>
<td>Build on existing skills</td>
</tr>
<tr>
<td>Limited access to device</td>
<td>Access to device hardware</td>
<td>Access to device hardware</td>
</tr>
<tr>
<td>hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easy to find</td>
<td>Hidden in app store</td>
<td>Can be used on desktop</td>
</tr>
<tr>
<td>Under your control</td>
<td>May be regulated by App store owner</td>
<td>Under your control</td>
</tr>
<tr>
<td>Storage is server side</td>
<td>Limited memory on device</td>
<td>No need to develop separate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>platforms</td>
</tr>
<tr>
<td>Difficult to personalise</td>
<td>Inherently personal</td>
<td></td>
</tr>
<tr>
<td>Can only be used online</td>
<td>Can be used offline</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expensive to maintain</td>
</tr>
</tbody>
</table>

### Table 1: Comparison of mobile websites and apps

**Conclusion and tips/recommendations**
The landscape in the use of mobile phones is changing rapidly and with a sharp increase in the use of touch screen phones. Users now expect to have richer mobile experience due to advanced capabilities, faster Internet connections and bigger screens offered by these phones. With this increasing number of advanced mobile users, the demand for m-library services increases as well which puts pressure on universities and libraries to improve their Internet based systems and develop multiple versions of the mobile websites which are fit-for-purpose and offer rich experience for advanced phone users but also a reasonable experience to the users with basic web enabled phones.

In terms of developing the mobile Library websites and services, here are some tips and recommendations:

- One size doesn't fit all – develop separate mobile versions for different categories of devices
- Collaboration between organizations is important as it saves time. It is also important to ensure you’re aware of other mobile development work taking place at your institution as it may save you some work in terms of developing mobile-optimised templates or brand compliant headers and footers and ensuring that your mobile library services are linked to from other mobile services
- We have always ensured that our mobile library services tie-in with the university’s overall mobile service delivery strategy
- Don’t reinvent the wheel – Re-use the code or use open source code!
- We have also ensured that our mobile library services tie-in with the university’s overall mobile service delivery strategy
- HTML5 based web apps if there isn’t a specific need for a native app
- Don’t just shrink the pages - but mobilize the relevant and useful content
- Rapid and iterative development – include regular feedback from users into the development

References


[3] Developing the MIT Mobile web
http://www.slideshare.net/shubeta/developing-the-mit-mobile-web-presentation

[5] Vertical search is a specialised web-based discovery engine and it unifies search across multiple library (especially print and electronic) resources indexed in a single data harvest. We at the Open University are using Ebsco’s vertical search system which is also known as Ebsco Discovery Solution (EDS)

[6] RISE is a project at the Open University Library that has been funded by JISC as part of the Infrastructure for Education and Research Programme, and aims to exploit the unique scale of the OU (with over 100,000 annual unique users of e-resources) by using attention data recorded by EZProxy to provide recommendations to users of the recently introduced EBSCO Discovery Solution.

[7] ComScore, Inc. The 2010 Mobile Year in Review.