OurUMD Mobile

Final Report

Alexander Slutsker, Adil Bukhari, Michael Berns, and Matthew Handy

December 2, 2009
Contents

1 Introduction 3
2 Identifying and Addressing the Problem 3
3 Usability Testing and Results 6
4 Creating the High-Fidelity Prototype 8
5 Concluding Thoughts 14
1 Introduction

OurUMD is a website that serves the student population of the University of Maryland with information about their classes and professors. Specifically, the website allows a student to build a schedule and view grade distributions and professor reviews for his or her classes. Many of the functions of the website are valuable to a student during the school day, when a laptop or desktop computer is not accessible. Under these circumstances, many students have the opportunity to use the website from their mobile phone.

The existing OurUMD website had no support for mobile phones. While a user with a mobile device could access OurUMD on his or her mobile phone, the website would appear unchanged and unoptimized, making it unpleasant to use. The OurUMD Mobile project involved creating a mobile-optimized website that would allow users of mobile devices to interact with a version of OurUMD that was optimized specifically for them. This interface had to be consistent both with the established conventions of the OurUMD look-and-feel as well as the user’s expectations for the interface of a mobile application.

This paper will discuss how we addressed the problems of optimizing the OurUMD website for a mobile experience while maintaining the type of design that OurUMD users could be comfortable navigating. It will show how we used the results of a usability study to refine our product, along with a discussion of future goals.

2 Identifying and Addressing the Problem

In order to create this new interface, we started by determining those features that our userbase considered most important. This way we could prioritize the optimization of various OurUMD
features for the mobile device. We created a survey for OurUMD users to fill out, and after careful analysis of the results, we concluded that the most important features for a mobile device were: the ability to view grade distributions, the ability to view professor reviews, the ability to view and plan schedules, and finally the ability to post reviews.\(^1\) Quick information retrieval was a high priority for most users and most of our initial designs focused upon this objective.

To develop the new interface, we started with two low-fidelity prototypes: one sketch prototype drawn on a whiteboard and another wireframe prototype developed on the computer.\(^2\) While the whiteboard model allowed the team to express creativity and flexibility in design, the computer-based low-fidelity prototype imposed a 320x240 pixel iPhone-size frame upon our final goal. Therefore, each prototype had strengths and weaknesses, and we decided to combine the key aspects of both prototypes into a refined high-fidelity coded prototype.

Before actually coding this final high-fidelity prototype, we came upon several conclusions. The first conclusion we reached was that the search bar, which is a primary method of information access for most users, needed to be prominently displayed on the home page as the primary item of interest. It needed to remain at the top of every page so that the user could always quickly search for a class or professor regardless of where he or she currently was on the site. By placing a search bar at the top of every page, we hoped to reduce information access times for most users while retaining the original OurUMD “header” that can be seen on the full site.

The second conclusion we reached was that the graphics and menus, while helpful on a normal computer screen, were wasteful when viewed on a mobile device. To address this problem, we compressed the header and we developed a new method for displaying site links. Furthermore, we deleted the large sidebar entirely because it simply acted as a text substitute for

---

\(^1\)Alexander Slutsker et al., *OurUMD Mobile User Needs*, (CMSC434 Wiki, October 2009).

The new homepage in the initial design of OurUMD Mobile for a logged-in user. The schedule is shown and the next class is identified.

Because OurUMD Mobile was going to be a completely functional version of the full site, the least-important features were moved down into a footer for the page. This confirms with Shneiderman’s Golden Rules in the design principles he laid out, making the most commonly accessed information easy to access, and the less commonly accessed information more difficult to access.³

Another feature that increased the usability of OurUMD on a mobile device was the display of the logged-in user’s schedule on the homepage. The custom Schedule Maker feature is one of

³Ben Shneiderman, *Designing the User Interface*, (Old Tappan: Addison Wesley, 1997).
the most frequently used features of the site; by placing the user’s current schedule on the homepage, we provided an alternative way for frequent users to benefit from the Mobile site with minimal effort. Because the iPhone stores login information as a cookie, a user could potentially visit the OurUMD Mobile homepage when necessary, quickly look at their schedule on the homepage, and then put their iPhone away, thereby minimizing their interaction time with the site while providing a boost to usability.

3 Usability Testing and Results

Our usability test was run over two days and involved twenty-three different people who were seated in the Baltimore Room in Stamp Student Union at about 6:00 P.M. We went about the room and asked for participants; we offered pizza and the opportunity to test out a new version of OurUMD as incentives. We had fifteen males and eight females respond to our queries and three of our subjects were freshmen, eight were sophomores, nine were juniors, and three were seniors. Though all of our usability test subjects came to us with varying levels of experience with the OurUMD site and with the iPhone device in general, each of them gave us valuable feedback that we considered for our next steps.

We were able to derive several important issues from the results of our usability testing. After some thought, we ranked each issue in terms of increasing severity from one to five; by our ranking, a more severe issue interfered with the usability of the site in a more integral manner than a less severe issue did. We planned to fix these issues from the most-severe to the least-severe:
<table>
<thead>
<tr>
<th>Issue</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links and text too small</td>
<td>5</td>
</tr>
<tr>
<td>Links are not obvious enough</td>
<td>4</td>
</tr>
<tr>
<td>The Schedule Maker feature is unintuitive</td>
<td>3</td>
</tr>
<tr>
<td>Information clutter confuses users</td>
<td>3</td>
</tr>
<tr>
<td>Schedule outline is difficult to read</td>
<td>2</td>
</tr>
<tr>
<td>Registration and Login links are tough to see</td>
<td>2</td>
</tr>
<tr>
<td>Users cannot find the Schedule Maker feature</td>
<td>1</td>
</tr>
</tbody>
</table>

Many of our issues deal with the use of space on the OurUMD Mobile site. While performing the usability test tasks, many subjects had difficulty in processing important links or even entire features. For example, one subject was completely oblivious to the existence of the “Schedule Maker” feature and proceeded to search for all of his classes one-by-one. These tests drew our attention to the simplification of OurUMD Mobile’s interface: we needed to clarify links, increase the size of text, and implement some form of abstraction, making sure that the user only had as much information as he or she needed at all times. These usability issues were preventing the full and consistent use of the OurUMD Mobile site, and we needed to fix them first.

There were several other minor ‘irritations’ that our test subjects reported when using the OurUMD Mobile interface. Subjects would often fail to wait until the iPhone had completely loaded a page and were subsequently annoyed when an on-page-load function ran and deleted some of their entered input. Additionally, although OurUMD Mobile was designed to be a zoom-less interface with iPhone-sized pages, some subjects still requested the ability to zoom into individual page elements, stating that the text was still too small for their needs. Finally, many
users were unable to reliably click on certain links because of their size or spacing. These issues were all analyzed from our notes, observations, and interactions with the test subjects.

The results of our usability testing provided us with valuable insights and took us to the second part of our problem. We would have to meld all of our subject input together in order to create an OurUMD Mobile interface that was both usable and aesthetically pleasing to most of our users.

4 Creating the High-Fidelity Prototype

After considering all of our test subject feedback and prioritizing our fixes, we began working on the high-fidelity prototype. We began our redesign by focusing on the site’s hyperlinks: they needed to be larger and easier to click. We began with the “header,” which caused considerable difficulty for many subjects during the test. We increased the font size of the register link and the four navigation links under the sign in boxes. In addition, we added padding around each of the links, increasing the area of each link and making it easier to touch via the iPhone interface. By making these changes, we hope to reduce the number of erroneous clicks made on the header section of the Mobile site.4

A logged-in user should see their credentials on the header of the Mobile site; we made some changes to this logged-in header as well. The first change was to add padding above the “namemsgs/logout” links, thereby creating a larger area to click. Then, we made similar changes to the navigation links on the logged-out header: we made the font size larger and increased the

4Not putting enough space would be an example of us not correctly applying Fitt’s law to this situation. Fitt’s law provides that we need to a button bigger to make it easier to click. While his law was not specifically designed for iPhone applications, we think it applies here as well. See William Lidwell and Kritina Holden, Universal Principles of Design, (Beverly, Massachusetts: Rockport Publishers, 2003), p. 82.
padding around each link. In addition, we moved the “Reviews” link down a line and shortened it from “View Reviews” to just “Reviews” and changed the “and” in the first link to an ampersand. These changes let us use the header space more effectively, making the links larger without actually taking up much more room on the iPhone’s screen.

We also made several changes to the schedule on the main page that is displayed for a logged-in user. We separated the “Next Class” label into two lines instead of one so that the second line contained all of the class information because we felt that this kept the class time and location closer together, making it easier to understand the most important information on the schedule. In the schedule, we removed the sections numbers from each of the class blocks.
because they seemed to cramp the schedule and were not relevant for a quick glimpse at the schedule itself.

Based on our User Needs Analysis,\(^5\) we could single out those less-used features and make them less prominent. To maintain the full site functionality, we moved the least-used Book Exchange feature to the footer of the page and therefore were able to save space. Because the footer includes the least-used features on the Mobile site, it is displayed in a smaller font but is still distinctly click-able by users who need to access its features.\(^6\)

For the class pages we decided to add a “Jump To” link that will jump down to the

\(^5\)Slutsker et al., ‘OurUMD Mobile User Needs’ (as in n. 1).
\(^6\)This is partially based on the principles behind Fitt’s law. See Lidwell and Holden (as in n. 4), p. 82.
historical grades. In the usability test we noticed that users had to scroll a lot in order to reach what they were looking for so we hope that the link will help remove some of the scrolling for frequent users.\footnote{Alexander Slutsker et al., \textit{OurUMD Mobile Usability Study}, (CMSC434 Wiki, November 2009).}

On the professor page, we added the same “Jump To” link as on the class page, again to help with scrolling. In addition many users had problems finding the reviews link so we decided to move it next to the professor’s name, making it more visible and easier to access.\footnote{Lidwell and Holden (as in n. 4).}

We made few changes to the Schedule Maker feature. The main issue with this feature was that users did not understand how to operate the “Courses” textbox correctly. In order to address
(a) The first prototype’s class page for CMLT280.

(b) The final product’s class page for CMSC434.

(c) The first prototype’s Professor page for John Aloimonos.

(d) The final product’s Professor page for Fawzi Emad.
To address this issue, we gave them a sample set of courses that disappear when the text box is clicked on. This explanation should make it easier for new users to understand how to use the textbox, without significantly hampering experienced users.

The final change we made after the usability study was to edit the book exchange feature - while this was not present when we conducted the usability survey, it will be included in the final product. While the feature is rarely used and rarely requested, we wanted to let those who did use it to have a pleasant iPhone experience.

In order to make the information for the Book Exchange visible, we decided to only keep what we viewed as the most important information (Title, Course, and Price.) The font size remains large enough that most users should not need to zoom in to read it. To view detailed
(a) The first prototype’s Book Exchange feature.

(b) The final product’s Book Exchange feature.

information, the user can simply click on the title of the book. By using Progressive Disclosure,\(^9\) we were able to port the feature over to the mobile version without overburdening the user with too much text.

5 Concluding Thoughts

The design process and the usability test helped us develop an application that responded to the needs of users in a real way. The current permutation of OurUMD Mobile was created not only based on well-researched design principles, but also based on the specific user needs and user

\(^9\)Lidwell and Holden (as in n. 4), p. 160.
feedback we received during our design process. This helps us ensure that the OurUMD Mobile is carefully tailored to the needs of users, and that it is designed for them rather than for the designers.

One issue on which we are still undecided is the issue of zooming. During our usability study, some users complained about the inability to zoom into elements of the page. However, most iPhone-optimized applications do not need to allow zooming, and if we make the links more clickable, it is our hope that a user should never have to zoom. However, if some users still want to zoom further, this would create a conflict between the need for a simple non-zoomable interface and the desire to allow these users to zoom. In fact, the Apple iPhone Developer Guidelines suggest that zooming should be disabled and most other web applications also go along with this idea.\textsuperscript{10} In order to determine if our user interface is “good enough” to allow us to disable zooming, we should do more usability testing on this key point.

We developed and tested this application on the iPhone, but it should work without issue on other devices - another next step would be to test the application and ensure that it works on the Blackberry, Droid phones, Nokia phones, the Palm Pre, and other mobile devices. We can release phone-specific versions of OurUMD Mobile as we determine if the interface works on those phones as well.

The development process for OurUMD Mobile has taken us through many stages of refinement and testing. We carefully stepped around many issues including visibility, information clutter, and link size in order to produce a final product that is both organized and useful to a majority of the mobile campus population.

References


Shneiderman, Ben, Designing the User Interface, (Old Tappan: Addison Wesley, 1997).


Slutsker, Alexander et al., OurUMD Mobile Usability Study, (CMSC434 Wiki, November 2009).