sites that are Mobile Accessible\textsuperscript{5}, which the New York Times site is, can still be challenging to navigate with a mobile handset.

The second challenge is conceptual. Mobile users seek different types of information and access it in shorter time spans.\textsuperscript{6} One must consider in what context the mobile user will be accessing the information. Consider the two New York Times’ web sites:

![Figure 2 New York Times desktop site displayed in iPhone browser](image1)

![Figure 3 New York Times mobile site displayed in iPhone browser.](image2)

A mobile user sitting in a coffee shop, relaxing and having coffee, would feel comfortable using the New York Times desktop site, shown in figure 2. However, a mobile user riding standing up on a bus, with only one hand available for holding the phone and navigating, would more likely use the New York Times mobile site, shown in figure 3, to quickly check the latest sports scores.

In the mobile space, user location, and time, are now main design factors. The designer must now be aware that the user location will be “Anywhere”, and the user has a finite amount of time to access information. A well designed mobile site should reflect these additional factors.
Campus Mobile

Given this environment of continuing Mobile web use and acceptance, I felt that ISU could benefit by having a mobile presence. Campus Mobile is a concept site created to address this need. For ISU, creating a Mobile web site for current students is a logical first step.

Main Features

- It is a mobile optimized site, designed for mobile device screens and input devices.
- The interface is designed so the user can hold the mobile device and navigate with one hand.
- Content is derived from the existing Current Students Site located in the ISU web site.
- Content is organized and prioritized for use in a mobile context.
- Site is created using standard HTML, CSS, and JavaScript.
Site was developed using the W3C Mobile web Best Practices as a guide in an effort to create a site accessible to as many different types of mobile devices as possible.

Mobile optimized Site

Campus Mobile was designed from the beginning to be a mobile optimized site, meaning it's exclusively for mobile use.

Interface Design

The interface is designed to be easy to use as possible. The text and navigation buttons are large and easily readable, so the user can hold the phone in one hand and navigate the site using their thumb.

Subset of ISU's Current Students Site

Content for Campus Mobile comes from the existing Current Students site, a site with information about student services, academic services, and campus life. All of this information is essential to students, and having it available on mobile devices increases that accessibility.

Content is organized and prioritized for Mobile use

What a user needs as they are mobile on campus will most likely be different than what they need when they are sitting at a desktop. Therefore the content from the existing site has been re-organized and prioritized according to what a mobile user would most likely need first. For example, if a student wanted to make a payment at the controller's office,
they would first want to know the location, next the hours. Contrast this with the information that is currently on the controller’s office home page. On the existing site it explains the function of the Bursar’s Office. This type of content would be given lower priority as mobile content and would be placed elsewhere within the site.

**Created using standards-based technology: HTML, CSS, JavaScript**

The site is intended to be inclusive, not exclusive, therefore it was created using formatting readable by all browsers on all operating systems, making it accessible to as many users as possible, regardless of the kind of cell phone or smart phone they are using.

It was tested in the real world using an Apple iPod Touch running a Safari browser, and on an HTC Droid Eris, running the Android Web Browser. It was tested on the desktop using Adobe Device Central, a program that runs simulations of phones from different manufacturers. It ran well on all phones tested.

**Assembled using basic layout techniques, styled with CSS, navigation supplemented by JavaScript**

The site is built using basic HTML. Only Titles, subtitles, lists, paragraphs are used to create the content. These elements are positioned, sized, and colorized using CSS. The site navigation menu uses a free open-source JavaScript script to expand and contract when clicked. It works on every platform that was tested.

**Presented site to CIRT**

I presented my site to the Center for Instruction, Research, and Technology. The concept was well received, and I was encouraged to continue with my work. Kelley Wilkerson
planned to contact the Marketing Department see if they would like to advance the project.

**Why campus mobile?**

The incentive to create Campus Mobile arose out of my own frustrations from walking around campus while trying to use Current Students to find information. Using my HTC Droid Eris, Touch, I tried navigating the site to find information. Navigating the site proved difficult, mainly because the site is not mobile accessible. It requires two hands to navigate; one to hold the mobile device, and one to press the screen. Even under the best conditions, as shown in figure 7, the site is small and difficult to navigate. Add to this the additional environmental factor of full sunlight, as shown in figure 8, and it becomes nearly impossible to use in a timely fashion.
Finding information is made more complex because of the fact that content owners design the sites individually with no consistency of the location of information between sites. The user must search within the site to find the information they seek. Finally, overall, the site layout and content is designed and created for a desktop experience. It simply does not translate well in a mobile context.

After this experience I simply felt frustrated by the lack of availability of this information as I was traveling around on campus.

During my research I watched a video in which designer Ted Forbes, Multimedia Producer of the Dallas Museum of Art, gives an overview of his experience creating a mobile web site for the Museum. The Site, designed to look like an iPhone App, provided the user information about the Museum Exhibits, and the Museum property. After seeing this short video it occurred to me that a similar type of site could be created for ISU. Instead of a Museum, a University, and instead of Museum patrons, University students. A mobile optimized web site was logical because it would place the information students seek where they are “located:” on their mobile devices; Smartphones, Multimedia phones, and iPod Touch’s.

Is the mobile web still relevant?

It may seem that the World Wide Web, even the mobile web may no longer be relevant. Apple states they have "tens of thousands of Apps" available for the iPhone. The Apps are programs that offer targeted content, or functionality to users. You may have heard the phrase; "There’s an App for that" The down side to Apps, whether they are for the iPhone, a Blackberry, an Android phone or some other operating system, is that they are specific to the phone on which they are running. Each phone uses a different operating
system, and because of this it requires developing separate apps for each. For example, Apple’s Apps are created using the Apple Software Development Kit (SDK) and will only run on Apple’s iPhone or iPod Touch devices. From a development point of view, in order to reach audiences on multiple devices, you must develop and test your App using separate SDKs for each mobile platform. In order have an App for the iPhone, an Android based phone, a Windows Mobile phone, and a Blackberry phone, you would need to develop and test your App four times. This is practical only for large entities such as news or entertainment organizations. One of the goals in creating Campus Mobile is that it is accessible to any user with a smart phone or phone with a web browser. So I chose not to pursue creating an App because of their exclusive nature.

Brian Fling, author of Mobile Design and Development, sums up the arguments for the mobile web well:

"The mobile web is the only platform that is available and works across all mobile devices, sharing the same set of standards and protocols with each other as well as the desktop web. The mobile web is also the only mobile distribution channel available to developers that they can control. It is the best way to bridge short, context-based mobile interactions with longer, desktop-based tasks. The mobile web is the easiest platform to learn, the cheapest to produce, the most standardized, the most available, and the easiest to distribute. I call this the Ubiquity Principle: easier-to-produce quality content and services for the largest available market will always win."
Notes.

1 Morville, Peter, Ambient Findability, 2005 O’Reilly Media, Inc., Sebastipol, CA
5 Mobile Accessible (MA); a desktop site that has design elements that make it easy for mobile handsets to use the site. The site is subdivided on the page into columns and rows that can be zoomed and navigated. Examples of MA sites: www.apple.com, www.nytimes.com, www.bbc.co.uk.
Thesis: Mobile web Design: Campus Mobile

Jeffrey Scott Miller

Beginnings: 2007

In 2007, two things happened that set me on the course I am on today: first, I read
Ambient Findability\textsuperscript{1}, by Peter Morville, in which he explains that information can be
accessed via not just laptops, but handheld mobile devices. If the user was truly mobile,
they could now access information anywhere, anytime. Second, Apple introduced the
iPhone. Though it was not the first phone to display the Internet, it was hyped as the
beginning of the next generation of the Mobile web. At the time, Walt Mossberg,
respected technology writer for the Wall Street Journal, wrote about the iPhone:

"We have been testing the iPhone for two weeks, in multiple usage scenarios, in
cities across the country. Our verdict is that, despite some flaws and feature
omissions, the iPhone is, on balance, a beautiful and breakthrough handheld
computer. Its software, especially, sets a new bar for the smart-phone industry,
and its clever finger-touch interface, which dispenses with a stylus and most
buttons, works well, though it sometimes adds steps to common functions."

Information was available for the Mobile web. Now Apple Inc.’s iPhone made it
effortless to access.

Inspired by these two developments, I decided to enter graduate school to study mobile
web design. At the time, I didn’t even have a smart phone, I had a Motorola cell phone
with an LCD interface that could load a simplified text version of the Web. But I was
intrigued by the challenge designing for mobile devices presented: small screen size,
limited browser capabilities, slower download speeds, and by the rewards it promised: the ability to access information everywhere, all the time.

**Mobile Landscape:**

In 2007 the Mobile web was still somewhat of a novelty. Today, the Mobile web is now mainstream. It is no longer the domain of early adopters and smart phone users. A Pew Internet and American Life Project survey shows that 32%, or approximately 96 million Americans, have used a cell phone or Smartphone to text, email, or find information on the Internet.³

And Mary Meeker, analyst from Morgan Stanly, shows that mobile Internet use has doubled, from 2007 to 2010, from 400 million to 800 million users. She also calls the Mobile Internet the 5th Major Technology Cycle of the past 50 years. And she predicts that within 5 years, more users will access the Internet on Mobile devices than on desktop PCs.⁴

A visit to AT&T, T-Mobile, Sprint, and Verizon shows together they offer 60 Smart phone models ranging in price from free to $299 with a 2 year service contract. The median price for a smart phone is $129. And they offer a combined total of 75 multimedia phones capable of displaying the mobile web, ranging in price from free to $199 with a 2 year contract. The median price for the multimedia phones is $79.

Single phone/data plans range in price from $79 to $99. A student can get a fully web-capable phone free, with a monthly data plan costing under $100 per month.

The mobile web is easily within the reach of most people, including students. Now that they are equipped to use the mobile web, they will expect it to be there when they want it.
Content choices constantly being added, modified for mobile space

A number of major media outlets realize the value of the mobile web, and have created mobile versions of their sites, for example: CBS, NBC, MSNBC, Weather.com, have mobile optimized sites. If more users are browsing the Internet on their mobile devices, then the logical course of action is to move your content to where the users are accessing it.

Challenge: bring the desktop to the mobile handset.

Figure 1 Comparison of New York Times in desktop browser with the same site in iPhone browser.

The first challenge is physical; you are going from a desktop screen size of 20 inches diagonally with a resolution of 1680x1050 to a mobile screen size of 3 inches diagonally with a resolution of 480x320.

One look at most desktop web sites, such as the New York Times site shown in figure 1 in the lower left, and you will see that they do not display well on a mobile device. Even