Mobile Computing at Mines
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Campus Computing, Communications, and Information Technologies (CCIT) is exploring ways to present relevant Mines information via a mobile interface, particularly for smart-phone users. Other entities on campus, notably Public Relations and Admissions, are also participating in this process. This document addresses a number of questions of relevance to this project, using statistics derived from Google Analytics for the period 1 Jan 2010 to 30 June 2011 (we have very little data before 1 Jan 2010). See the related document “Mobile Statistics” for specific data on these trends.

1. Is there a need for a Mines mobile website?

Although a large number of universities have developed web sites or applications specifically for mobile devices like smart phones and tablets, is there evidence that dedicated mobile access is a high priority of the Mines community? Maybe this is all just a fad?

Mines currently has no web resources specifically tailored for mobile users. Smart phone users in particular must navigate the full Mines websites – www.mines.edu and inside.mines.edu – on very small screens. This is not a particularly convenient or comfortable way to access our sites. Thus, it is difficult to gauge the extent of interest in a mobile website.

Nevertheless, visits to Mines web pages via mobile devices have almost tripled in the past 18 months, increasing from 1.3 percent of all site visits in the first half of 2010 to 3.5 percent in the first half of 2011. For the marketing and admissions site www.mines.edu, the numbers are higher: 1.7 percent and 4.5 percent, respectively. For the informational site inside.mines.edu, the figures are 1.0 percent and 2.8 percent. This is by far the fastest-growing method for accessing Mines web resources in general. Although that rate of increase comes from a very low base and is unlikely to be sustained, it is important to ask ourselves: What will the numbers look like in a few years? Will current trends continue? And if, say, 20 percent of users one day wish to access Mines data through a hand-held interface, will they have a way to do so conveniently?

Whether or not smart-phone owners really wish to access Mines resources via mobile device, it is clear that there are more and more people who at least have the ability to do so. Smart phones are now the fastest-growing category of cell phones sold worldwide. Sales of relatively expensive smart phones have surpassed sales of cheap, “dumb” cell phones in the US for the first time this year. While tablets are seen by many as luxury items (particularly by non-US users), smart phones have become a “necessity” for teenagers with a certain amount of disposable income – for instance, many prospective Mines students. We expect that smart phones will become ubiquitous over time.

Certainly, the trend for smart-phone ownership is only up. If we believe that www.mines.edu appeals mostly to prospective students, and that inside.mines.edu is used mostly by people already on campus, it would seem from our Google Analytics data that: (a) Younger individuals not yet on campus are seeking mobile access to Mines resources at greater rates than those already on campus; (b) those already on campus are relatively less interested in accessing Mines pages through mobile devices. Perhaps the former are optimistically exploring for mobile-specific resources and the latter have discovered the difficulties of doing so? Or perhaps younger people are simply adopting smart phones in greater numbers than their slightly older peers?

In any case, there is undoubtedly now some interest in accessing Mines information through mobile devices and that interest is increasing quite dramatically in percent terms. At the very least, it is probably wise to plan for a possible explosion in the use of mobile devices to access Mines web pages.

2. What devices are being used now to access Mines web pages?

Depending on the device used to access Mines web pages, different interfaces can and should be made available. Obviously, tablet computers can access the full Mines web space, as is. But smart phones and similar devices (e.g., the iPod Touch) have much smaller screens and benefit from simplified interfaces. So, what is the
trend among the mobile devices used to access Mines resources?

In terms of which particular mobile hardware is being used, the Apple iPhone, iPad, and iPod taken together make up more than 2/3 of all mobile devices used to access Mines pages during the study period. Access by Android smart phones, from a number of manufacturers, has approximately doubled in that period, to around 29 percent.

Taking a weak third place is BlackBerry, whose share of Mines mobile web access was halved during the study period and now stands at about 3 percent overall. Other mobile devices running Microsoft Windows Phone 7, Symbian, and other phone operating systems, retain a negligible presence on Mines web servers. Nokia has abandoned the Symbian platform in favor of Windows Phone 7, so those numbers will vary somewhat in upcoming months and years. But the larger trend is unlikely to change anytime soon. As Information Week reported this week, purchases of smart phones running Windows Phone 7 dropped 38 percent in the past three months alone, making the Nokia and Microsoft phone strategies seem precarious at best.1

In summary, making sure that mobile content is available to users of small-form-factor Apple iOS and Google Android devices is key. While Mines mobile web resources will be available to all smart-phone users, it would seem that, given our finite resources, little extra effort should be expended to ensure such access.

3. How about tablets? What does increased use of tablet computers imply for our mobile plans?

Tablet access to Mines web pages has increased from about 5 percent of all mobile access a year ago to approximately 22 percent today. Tablets, it appears, are here to stay. In particular, the iPad has increased its penetration markedly in the past 18 months. Only in the last six months do we begin to see Android tablets accessing Mines pages – about 2 percent of mobile accesses of inside.mines.edu in the first half of 2011. That will undoubtedly increase.

However, given the “luxury” status of tablets relative to phones, and the ubiquity and superior portability of smart phones, we must assume that smart phones will remain the main method to access Mines pages via mobile device. Thus, a small-farm-factor mobile interface is necessary to satisfy the needs of smart-phone users. Tablet users may be satisfied to continue using our full-featured web interfaces, but would be able to access a simplified interface as well.

4. What is our current mobility strategy?

In general, web content is delivered to smart phones in one of two ways: Via specially-tailored simplified web pages, or via a downloadable application.

Web pages designed for mobile devices often use “mobile cascading style sheets” (mCSS) to take a current web page and remove extraneous formatting and graphics for presentation on a handheld device. Specially crafted mobile web pages may be used to further simplify – and speed up – the mobile interface. Generally, such simplified websites (e.g., at right) concentrate on providing information that is both of particular interest to mobile users and that may be presented advantageously in mobile format. Breaking news stories, images, video, maps, and bus schedules are often presented this way. Dedicated web pages require the part-time services of a webmaster and web programmer and so have some cost.

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1 Information Week, 5 August 2011, “Windows Phones Down 38% Since ‘7’ Launch”: http://mobile.informationweek.com/80256/show/49def0b9cc2f53e41e16826e9c4ae14/
Special-purpose mobile applications are also commonly deployed. Users of iPhones or Android phones have “app stores” from which they can download applications for free or at nominal cost. Such applications can often be more complex, powerful, and fast than purely web-based interfaces. However, programming and updating such applications can take the full-time attention of one or more programmers. Applications (e.g., below right) are a relatively powerful, but expensive, way to deliver mobile content.

**CCIT currently does not have sufficient FTEs to pursue either method of mobile-content delivery in-house.** However, we are currently working with a third party to develop (1) a simplified mobile web interface to deliver content to smart phone web browsers, and (2) an iPhone application for installation by iOS users. An Android application may also be on the horizon, but no further operating systems are likely to be supported directly with dedicated applications. This project is in an early stage of development. There is no cost to Mines for initial development of this web resources or for use of basic features. However, a budget for ongoing maintenance and the programming of higher-level mobile-web features may be requested in the future.

This project is at a very preliminary stage. But if all goes well, implementing a mobile web presence this way will be relatively quick (completion in 4th quarter 2011). The presence of a mobile-specific interface will then allow us to gauge the interest of the Mines community mobile computing. New mobile features will be developed based on our experience with the initial project.

5. **What features are likely to be offered in a Mines mobile-friendly interface?**

Mobile interfaces, with few exceptions, do not provide access to all aspects of a university's larger web space. However, mobile interfaces excel when delivering certain kinds of information – information that “fits” the mobile form factor, and information that is particularly useful when one is not in front of a standard computer (i.e., when one is mobile). What kinds of information do we have in mind?

Mobile interfaces typically piggyback off larger websites and take content from them in the form of “feeds.” So, for instance, the News and Events listings at www.mines.edu can be fed to a mobile interface quite easily as an RSS or iCal feed, as can the sports feed from Athletics. Using different protocols, photos (stored on Flickr, for instance), or videos (via YouTube), or campus maps (from Google Maps) can be brought into a mobile interface relatively easily. We expect to see these features, and others, in the first version of the Mines mobile website and iOS application.

6. **What features could be offered in the future?**

Anything that is offered via a full-sized interface may, in theory, be offered through a small-form-factor interface. Blackboard and Trailhead, to name two resources, could be made available to mobile users. The Mines Help Center Helpdesk (Footprints) and Banner could be made accessible via mobile device. Students could be allowed to access grades and register for classes. With connections to campus Lightweight Directory Access Protocol (LDAP) servers, campus directory information might be made available. The Arthur Lakes Library already has a catalog online in mobile interface – http://catalyst.coalliance.org/vwebv/searchBasic?sk=mobile – and we may be able to link directly to that resource.

That said, there are many financial, technical, and security questions to be resolved when accessing these particular resources. Custom programming would be needed to implement these features – at fairly substantial cost. As we move forward with our Mines mobile experiment and get more feedback from users, we will explore the possibility of adding the most-requested and most-useful mobile features. In the meantime, a basic mobile web presence will provide valuable data for planning this long-term and ongoing project.