Chapter 1

Understanding What Makes the Mobile Web Different

In This Chapter
▶ Getting an introduction to the mobile Web audience
▶ Brushing up with a mobile Web history lesson
▶ Assessing where the mobile Web is now
▶ Planning for the mobile Web future

Trying to predict the future is always dangerous, particularly when it comes to the mobile Web. Experts have been predicting that “this is the year of mobile” pretty much every year for the last decade. Cynics point to this as proof that the mobile Web is merely a mirage — that the iPhone, Droid, and their smartphone brethren are fun little toys, but that they’ll never rival the Internet on a computer screen.

The problem with this pessimism is that it doesn’t take into account all the advantages that come with the mobile Web, just the obvious limitations.

People put up with all the problems associated with the Internet, on top of the uncertain wireless connections, because the power and possibilities of having access to all the information — instantly available wherever you are, whenever you want — outweigh the little inconveniences. Although trying to use most current Web sites on the mobile platform can be an exercise in pain, frustration, and the barely suppressed urge to hurl an expensive device into the nearest junkyard car-crusher, the pace of technology puts the computing power that used to cost $10 million and fill an entire building at MIT into an 8-ounce chunk of plastic that fits in your shirt pocket.

In this chapter, we help you assess your mobile users’ overall needs, recognize the limitations of the platform and the new functions available, and understand how your Web site can deliver the right resources in the right place at the right time — in a way that your visitors can access on any device.
Introducing the Mobile Web Audience

Designing for your audience has always been important, but designing for the mobile Web is even more complex because you have to design for so many different audiences and mobile devices — and do it all in a tiny space.

Your audience is growing

The sheer size of the potential audience for the mobile Web is staggering. Selling the first billion cellphones took 20 years; the next billion sold in 4 years; and the third billion sold in only 2. The next billion will be sold in a year, so that by 2011, more people on earth will have cellphones than those who don’t.

Most of these last billion cellphones will be bought by people living in rural areas of developing countries; people who have never owned any phone in their lives, and for whom the prospect of being connected to the larger world is absolutely life-changing. This part of the audience will probably experience the Web for the first time on the 3-inch screen of a mobile device.

Already, sites like ESPN.com report that on weekends during football season, they receive more traffic to their Web site from mobile phones than they do from computers. Market researchers for Yahoo! find that in sports bars, surrounded by dozens of giant-screen high-definition (HD) TVs with 5.1 Dolby sound, fans had their heads bowed, looking at their cellphones — following the up-to-the-minute point totals of their fantasy football teams.

The convergence of this explosive growth in audience size and the restrictions (and amazing possibilities) of the mobile Web pose a unique challenge for Web designers.

Your audience wants to save time, kill time, or socialize

If the Internet was driven by the ability to access words, pictures, videos, and sounds, the mobile Web is driven by even more immediate needs. Speaking on a panel for the Online News Association, Nick Montes, president of the mobile gaming company VivaVision, told the audience that people are driven to use the mobile Web for three primary reasons:

 ✓ To connect with their friends and social group
 ✓ To save time or money
 ✓ To kill time
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When users come to your site, they’re reacting to one of these needs. If you want them to find you, to be able to use the content that you’ve so painstakingly crafted, and to use the two-way communication of the Web to interact with what you’ve done, you need to have a site optimized for the mobile Web. This means not only offering the right content, but also employing mobile Web design standards to organize that content in ways that mobile Web users will be able to use, which we cover throughout this book.

**Your audience uses different mobile devices**

Our goal is to help you design the best Web site you can to deliver the right resources in the right place at the right time. We say “the best Web site you can” because designing for the mobile Web is still an imperfect science and how far you go in making sure your site is optimized for all the mobile devices that might ever visit will depend on your budget, skills, time, and the return you can expect on your investment. As a result, we include a range of options and approaches in this book with the goal of helping point you in the right direction to make the best choice for you.

For many graphic artists and experienced Web designers, the restrictions imposed to create Web pages that work at the lowest end of the mobile Web can make them feel like Picasso being asked to paint bar charts and pie graphs using crayons.

But today, the biggest challenge of the mobile Web is not just designing within the constraints of the low end, it’s designing mobile sites that take best advantage of both the low end and the high end of the mobile spectrum, which now includes iPhones, and even iPads, capable doing almost everything that works on the desktop Web, as well as many things that are only possible on a mobile device. (We explore some of the design challenges of the mobile Web in Chapter 2.)

**Your audience may be any age**

Never has the divide been more dramatic, or more blurred, among the generations. The Internet generation is made up of people who use the iPhone intuitively and trade instant messages 100 times a day with their friends. But grandparents today are different, too. The baby boomer generation may be slower to the Web and mobile, but they’re catching on. And don’t forget the moms and dads in between those two extremes, or the next generation that’s coming along. Toddlers play games on mobile phones before they can talk.
Part I: Designing for Mobile Devices

Evolving Standards: WAP, WML, and the Mobile Web

The first mobile Internet experience was very slow and came with hideously expensive digital data plans that were available only in certain large markets, and even then only in the densely populated areas with clear wireless signals.

Basically, the early mobile Web looked a lot like Prodigy, if you remember that early online service. Prodigy had eight bland colors, tiny photos, and only a few lines of text per screen. Paging through a story — or, if you were really daring and had a high pain threshold, a photo gallery — took both saintly patience and deep pockets.

Although the mobile Web seems to be forever moving forward, understanding how early mobile Web sites worked and the technology those sites were based on is helpful. You may run into the terms WAP and WML if you’re redesigning an old mobile site, and the technologies in use today have evolved from these early technologies. The following sections explain what you need to know as you begin designing mobile Web sites.

Sizing up WAP, WML, and XHTML

The earliest mobile sites looked a little bit like pictures drawn on the old dot-matrix printers. The pages were designed within the limitations of Wireless Access Protocol (WAP 1.0) in the late ’90s, when programmers first started thinking about cramming Web page functionality onto the cellphones of the time. (And no, WAP isn’t the sound of designers slapping themselves on the forehead when confronted with the restrictions of the day.)

This is where things get a little confusing. Many mobile Web designers and experts (who should know better) have gotten into the habit of referring to anything related to the mobile Web as WAP. Others use WAP only to refer to the simplest, most bare-bones sites, calling them “WAP sites” because they were designed using the Wireless Markup Language (WML), which was part of WAP 1.0.

Unfortunately, just using the blanket term “WAP site” to refer to all sites designed for the mobile Web is both confusing and inaccurate. WAP is a series of rules and specifications, not design principles. These rules were updated in 2002 with WAP 2.0 to include support for XHTML MP, and just about every phone sold since 2004 supports this more sophisticated markup language. (You find more on the best markup language options for the mobile Web today in Chapter 5.)
To make things even more confusing, very few mobile devices in use today support only WML content. Many mobile phones sold today support both WML and some variation of XHTML. At the high end, sophisticated smartphones like the iPhone display Web pages pretty well even if they’re not designed with WAP standards. You could say that most mobile Web designers now work in a WAP 3.0 environment, but that term hasn’t caught on, and clear standards for WAP 3.0 have not been agreed upon.

In this book, we decided to avoid all the confusion around the term WAP. Instead, when we distinguish between Web sites that are designed for mobile devices and those designed for computer screens, we use the phrases mobile Web and desktop Web, respectively. See the glossary in the “Mobile alphabet soup” sidebar in this chapter for a better explanation of these and some of the other terms we use throughout this book.

The browser wars and WAP

The browser wars on the desktop Web greatly shaped the development of the mobile Web. In the late ’90s, Netscape Navigator leapt out to an early lead in market share — at one point, nearly 80 percent of the people accessing the Internet did so through Netscape. Then Microsoft started bundling Internet Explorer for free with every copy of Windows. The two companies struggled to dominate the market and competed to add features to their Web browsers (“Look! Here’s a command to make the text blink on and off! Obnoxiously! How cool is that?”) without paying attention to the security holes and bugs that often caused the program or the entire operating system to crash. Chaos, wild swings in stock prices, and antitrust lawsuits ensued.

The early mobile Web designers looked upon this carnage and shuddered. If that kind of Wild West mentality were to take hold on the mobile platform, it could strangle this new medium in the crib.

Broadly speaking, WAP 1.0 sites were all about functionality. The WAP 1.0 protocol was invented when phones had a minimum of buttons to use; trackballs or rocker switches were rare, and touch screens like on the iPhone were barely a gleam in Apple’s eye. If you think of the kind of navigation controls you’d find on your ATM screen, well, that’s a pretty good approximation of what early mobile Web design and use is like; there’s a numbered menu, you press on keys to move up and down or input very basic data. Or you can press a 0–9 button to highlight the choices, and then press another button to select and move to the next screen.

Additionally, a lot of sites that were designed under the restrictions of WAP 1.0 were what are known as “walled gardens,” maintained by the wireless carriers. Instead of being able to type a URL into an address bar to access the news site of their choosing, users were restricted to the content that the carriers allowed them to see, usually from content providers that had signed deals with the carrier. So while you’d be able to “Push 3 for Sports News” and get a list of the latest college football scores, you’d never be able to access a smaller, more specialized site like “Mid-Atlantic Hamster Racing Results” that wasn’t part of the content mix the carrier figured would appeal to the widest possible demographic.

These days, nearly all mobile phones, even low-end feature phones, are capable of accessing the World Wide Web, and a growing number can display Web sites with complex features, including e-commerce, multimedia, and so much more.
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Designing low-end mobile Web sites: Like Mozart forced to play a kazoo

Much of the look and feel of the mobile Web was established before touch screens and was designed to work within the limitations of up/down and forward/back navigation options. Unfortunately, there are still quite a few low-end feature phones on the market with these limitations, and although many of us hope they’ll disappear completely in the next few years, it’s too early to give up on them completely if you want to reach the broadest audience.

Navigation menus designed for feature phones often look a bit like the color-coded Homeland Security terror-alert charts. Multicolored bars are stacked horizontally; you either highlight the link you want to follow by pressing the buttons (or use a central rocker switch that you can push right/left or up/down) to move around the screen. If the Web designer was smart enough to use Access Keys (covered in Chapter 5), you might also have the option of pressing a number key to trigger the link you want.

Although the touch screens of today’s high-end phones are vastly superior, the legacy of these early devices lives on. Thus, if you want to reach the broadest audience on the mobile Web, don’t let your iPhone spoil you. Many people on the mobile Web today still suffer with very limited ways of interacting with Web pages.

When you review the statistics from many popular mobile sites today, you find that traffic comes from many different kinds of devices. For example, the Microsoft Cloud Site, featured in the case study in Chapter 6, attracts an audience of relatively high-end users, and not surprisingly, more than 40 percent of the audience views the site on a touch-screen device — iPhone (about 20 percent), iPod (about 10 percent, and nearly 10 percent more arrive via phones that use the Android operating system, which also supports many high-end Web features. After those three devices, however, the numbers drop off sharply and the list of more than 400 devices that represent less than 1 percent of the traffic to the site continues for seven pages of 10-point type, single spaced.

“The long tail is ridiculous when it comes to mobile devices,” said Lee Andron, Director of Creative Development for Ansible Mobile, the company that built the Microsoft Cloud site. “We took the top 10 devices visiting across all of Microsoft sites and tested on those. We can assure you the site will look good on those 10 devices, but after that, you can expect diminishing results.”

In fairness to Lee and the team at Ansible, the site held up quite well across all the devices we used to test it for this book. That’s because Ansible, Interpublic Group’s full-service marketing agency, has been developing
mobile sites for a long time and clearly understands how to create sites that look great at the high end and still work at the low end. (Read the full case study in Chapter 6.)

If you’ve only surfed the mobile Web on an iPhone, iPod, Droid, or other high-end mobile device, you probably can’t appreciate just how challenging it is to surf the Web on a feature phone.

To help you appreciate what it takes to design a site that works within the limitations, consider how the British Broadcasting Corporation (BBC) created a design that is optimized for the limited navigation options of low-end devices. On a well-designed mobile site like the one created by the BBC (shown in Figure 1-1), this is the kind of user experience you can expect:

1. You browse to the mobile version of a site by entering the URL into the device on a number keypad, which means that you have to press most keys multiple times to spell out all the letters in BBC.mobi.
The BBC site is designed with multiple mobile URLs, including bbc.com/mobile/i for the iPhone version. But like many well-designed mobile sites, if you enter the main URL (bbc.com or bbc.co.uk) into a mobile device, the server automatically redirects you to the best version of the site for the phone you’re using.

On the main page of the BBC news site, you find the three top stories of the day/hour with tiny images and links, optimized to fit well, even on the 240-pixel-wide screen of the Motorola RAZR V9 shown in Figure 1-1.

2. Scroll down a little further, and you find a few more links with familiar section names, including More News, Sports, World, and Weather.

Using short words as links and sticking to common, easily recognized terms are good practices on the mobile Web because you need to convey a lot of information in a very small space.

3. Click any section name to summon a submenu with links to a few more items in that category.

4. Clicking those links, in turn, leads you to more links or to the text and photos of each story.

In this way, a well-designed mobile site guides you to the information you seek quickly because you only need to click links to two or three fast-loading pages to reach your destination.

5. If the story is long, you may have to scroll down a page or two or follow a link to continue reading.

The amount of text on each screen is limited because scrolling can be challenging on low-end feature phones, such as the RAZR shown in Figure 1-1. On a RAZR, like many feature phones, you can only scroll a few tedious pixels at a time.

6. To move on to another story or another section, you can click the back button on the handset of most phones (even feature phones) to return to the previous list of links or move on if additional navigation links are provided, as they are on the BBC site.

It’s good practice to offer at least a few navigation options on any mobile page. As the designer, you must find a delicate balance between enabling a visitor to easily find what they want and overloading each page with so many links that users have to wait a long time to load the content when they get to it.

If the desktop Web is the information superhighway, using low-end feature phones, even on sites that are designed for the mobile Web, can feel more like backing out of your garage, driving down your driveway, driving over to your neighbor’s driveway, pulling into his garage, and then backing out into the street again, only to pull into yet another narrow driveway — while being at least partially blindfolded.
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Mobile alphabet soup

Some handy definitions to keep in mind:

iciencies:

✓ **Feature phone**: An industry term that was originally used to distinguish mobile phones that had such advances as cameras or MP3 players built into them from the first wave of mobile phones that were only capable of sending and receiving calls. The term feature phone is now generally used to describe the simplest, low-end phones on the market, those that lack typewriter-like QWERTY keyboards, large display screens, or other more advanced technologies.

✓ **Smartphone**: When technology companies like Palm and RIM (the official name of the company that makes BlackBerry phones) rolled out devices that brought together the mini-computer functions of PDAs like the Palm Pilot with wireless phone functionality, the industry called them smartphones to differentiate them from the more limited feature phones. While the lines between “smart” and “feature” are blurring, broadly speaking, a smartphone is one with strong computer-like capabilities. It has a color screen, a keyboard that looks like a typewriter, and storage for music or video, and it can run applications or “apps” that allow it to do complicated tasks.

✓ **Touch-screen phone**: The most famous example is the iPhone, but in the years since Apple launched this device, many others with a dizzying array of capabilities have hit the market. Their distinguishing feature is that they have large, high-resolution color screens. Also, you can use your fingers to tap on the screen to type on a virtual keyboard, use two or more fingers to click and drag items or pinch and expand images, or flick your fingers to make Web pages scroll.

✓ **Mobile Web**: Anything on the World Wide Web that can be viewed on a mobile device.

✓ **Desktop Web**: Used to describe Web pages designed to be viewed in Web browsers, such as Firefox and Internet Explorer, on desktop computers.

✓ **Open Mobile Alliance (OMA)**: In June 2002, this international organization formed to develop specifications for the mobile Web. One of the things that distinguishes the OMA is that they bring together representatives from every aspect of the mobile industry, including mobile operators, device and network suppliers, information technology companies, and content and service providers. The goal, according to the OMA Web site, is to create “interoperable mobile data service enablers that work across devices, service providers, operators, networks, and geographies.” Essentially, they want to create standards that work across all devices and services, a lofty goal that would definitely make the mobile Web a better place.

✓ **Wireless Access Protocol (WAP)**: WAP basically sets down what a mobile Web browsing session is, how the phone is allowed to talk to the network, how the network is allowed to talk back, and how
that communication is to be kept (reasonably) secure. WAP 1.0, which restricted the mobile Web to very limited technologies, such as WML, has been replaced by WAP 2.0, which supports more advanced technologies, including XHTML.

✓ Wireless Markup Language (WML): The first of many programming languages used to design mobile Web pages. Documents in WML are known as decks, and the data in each deck is broken down into cards (or pages). WML allows information in a Web page to interact with the mobile phone, such as clicking a phone number on a WML page causes the mobile phone functions to wake up, kick in, and call that phone number. (You find more information about WML and other mobile markup languages in Chapter 5.)

✓ eXtensible Markup Language (XML): A set of rules governing how documents are encoded, with the goal of allowing documents created by different programs on different platforms to share data (such as Excel on a Mac sharing data with Word on a PC).

✓ Wireless Universal Resource File (WURFL): A configuration file that contains information about the capabilities of nearly every mobile device on the planet. You can download the WURFL file for free from www.SourceForge.net and use it to help you direct mobile phones to the best version of your site. (You learn more about WURFL and developing for multiple devices in Chapter 6.)

✓ eXtensible Hypertext Markup Language (XHTML): This is a stricter standard for HTML, which is the language that Web pages are created in. The goal of XHTML is to organize the chaos of the Web into a stricter set of standards that prevent pages from displaying so differently across browsers. (You find an introduction to XHTML and CSS in Chapter 3.)

✓ XHTML Mobile Profile (XHTML MP): A variation of XHTML designed specifically for mobile phones. (You learn more about XHTML MP and other mobile markup languages in Chapter 5.)

Assessing the Current State of the Web

If the early years of the mobile revolution were marked by a kind of bemused dazzlement that had people using early cellphones to call from unusual places (“Hey, I’m standing in the surf on the beach!”), the massive adoption of cellphones since then has made people regard them as essential to their survival. More than 40 percent of Americans have said that “they could not live without” their cellphones; these little devices are integral to life as we know it.

There’s only one choice for the device most responsible for taking the mobile Web from the Nerds Only Clubhouse into the popular consciousness. And this device is the elephant in the room in any discussion of the mobile Web.

So here goes: In the mobile Web world, the iPhone changed everything. There. We said it.
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Understanding the iPhone factor

From the moment Apple CEO Steve Jobs strode out on stage to introduce the iPhone (shown in Figure 1-2), a kind of over-the-top techno-frenzy enveloped the mobile phone industry. Lines of eager Mac fans crawled around city blocks waiting for Apple stores to open and sell iPhones on June 29, 2007. Before iPhones became available outside the United States, enterprising travelers could buy the iPhone for $300 and sell it on the streets of Moscow or Bangkok for $2,000 or more.

Figure 1-2: The iPhone deserves credit for driving the popularity of the mobile Web.
Within weeks of the iPhone’s launch, copycat HiPhones appeared in the gray-market stalls all over China. Later models, such as the SciPhone shown in Figure 1-3, adapted Apple’s design to the Chinese market, putting in slots for two SIM cards so that the owner could have, in essence, two separate phone lines in his pocket — one for business and one for personal use. The SciPhone costs a fraction of what the iPhone costs; however, like many other phones, dubbed “dumphones” by developers, it suffers from uneven quality.

Although those who style themselves to be true “mobile Web purists” often sneer at the iPhone as being more hype than substance, the iPhone really kick-started the mobile Web revolution into high gear. Apple applied for 200 patents for new technology for the iPhone. Obviously, something was breaking new ground.

Compared to the clunky navigation of early mobile sites, the iPhone creates a new and delightful user experience for mobile content:

- The multi-touch screen wows people with game-changing interactive features, such as the ability to use pinching or opening motions with your fingers to shrink or enlarge Web pages, photos, and text.
- Scrolling is a breeze. Zipping your finger down a Web page or a list makes the contents spin past like the wheels in a slot machine.
An accelerometer (a tiny gyroscope) can tell when the phone was moved, and in what direction, so shaking the phone can be used to do things, like randomly changing the song you listen to on the built-in iPod. The accelerometer also determines whether the phone is being held in portrait or landscape mode.

The iPhone doesn’t come with a manual. It’s so easy to use, that most people learn by just playing around with it and figure out things as they go along.

The iPhone can be credited with a 500 percent increase in traffic to the mobile Web. It was the first mobile device that could display desktop Web pages as well as most desktop computers (except for the inability to play Flash or other rich-media video technologies). According to AdMob, by November 2009, the iPhone and iPod touch accounted for more than 40 percent of mobile data traffic worldwide — this despite the fact that the iPhone still wasn’t available in most markets, and even in the United States, it accounted for less than 10 percent of the total phones in use.

Every other month, Apple’s competitors roll out a phone that’s billed as “the iPhone killer,” with about as much success (so far) as the challengers to the iPod in the digital music-player space. If imitation is the sincerest form of flattery, the efforts to replicate Apple’s success are almost embarrassingly fawning.

What this means to Web designers is that the other phone manufacturers, who have already copied the touch-screen format of the iPhone, want to replicate its browsing capabilities, in the hopes of draining some of its market share. And, as is inevitable in the technology world, what was once prohibitively expensive quickly becomes affordable — and eventually cheap.

Cellphone technology is a perfect example of this class-to-mass movement because the early “brick” phones (so called because the clunky things were the approximate size, shape, and weight of a brick) that were such rarities in the early ’90s and cost a relative fortune have given way to disposable phones that are half the size of a deck of cards and so cheap you can throw them away when you’re done with them. Most disposable phones are feature phones with shoddy construction that can be purchased without a service plan.

By 2011, the prediction is that more than half the cellphones in the United States will be the equivalent of smartphones — that is, phones that can browse the Web and run stripped-down versions of applications, such as Outlook, Excel, Word, or Apple’s App Store.
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The siren song of “apps”

Apple’s ubiquitous marketing campaigns have ensured that anyone more connected than a Patagonian llama herder has heard of its App Store (www.apple.com/iphone/apps-for-iphone); no matter what you want to do, you hear, “There’s an app for that.” These commercials promising near-divine powers were even successfully parodied by the tourism board of Nova Scotia, which faked a Web site for its Pomegranate phone that purported to include a video projector, live voice translator, harmonica, coffee maker, and shaving razor (see Figure 1-4 or visit the site at www.pomegranate.com). Although the phone was completely fictitious, it’s not hard to image that all these features are in some stage of development in some mobile testing lab even as we write this.

An app is a small computer program that runs on your cellphone and causes it to do things that the phone normally can’t do. For instance, you can play games, use light versions of software programs (such as Word, Excel, or Photoshop), or use any of the more than 200,000 apps and counting to wow your friends and kill time.

Developers can give away apps for free, hoping to pay for the development cost through advertising, or they can charge for it. One early iPhone app — I Am Rich — cost $1,000 and did . . . nothing. Well, other than serve to prove that you had enough money to be able to waste $1,000 just to brag to other people that you could. Apple quickly killed the application but not before the developer raked in thousands of dollars from status-crazed app buyers.

Figure 1-4: The Pomegranate phone Web site was created as a publicity stunt by the tourism board of Nova Scotia to show how the phone could brew coffee and even give you a shave.
Still, the media has been alight with stories about 14 year olds making a million dollars in a month from the sale of quirky apps. The iFart prank application made $10,000 a day, and it spawned other apps, such as Pull My Finger, and a long list of updates, including the Rock Band Fart Pack, which features the sounds of Fartwood Mac.

The revenues are no laughing matter. Within the first nine months of opening the App Store, Apple had 1 billion downloads, of which they take a hefty 30 percent cut.

The Android Market (www.android.com/market) and BlackBerry App World (http://na.blackberry.com/eng/services/appworld) app stores are hot on Apple’s heels, and you can expect to hear a lot more about apps for the next year or so as developers chase this brand-new revenue stream.

But already there’s backlash against apps; advertising agencies host How to Talk Your Client Out of Wasting Money on an App seminars. More than 200,000 apps are swimming around the App Store, with the number growing exponentially. This means that as the novelty factor wears off, people will realize that they’re paying a premium to build what’s essentially a Web-based experience that works only on one kind of phone. Similar to software programs that can work only on a Mac or PC, separate apps must be designed for each kind of phone. Thus, if you want to reach a broad audience with an app, you need to create one for the iPhone, another for the BlackBerry, another for Droid, and so on.

If you work the numbers, you quickly realize that it’s much more cost-effective to create one Web site than to have an app or apps, even if you design different versions of your Web site for each phone. The bottom line is this: Apps are great for games and other highly complex programs, such as Photoshop for the iPhone, but for just about anything else, you’re almost certain to get a better return on investment by creating a mobile version of your Web site.

Seizing the power of geolocation

One of the things that differentiates the mobile environment from the desktop Web is that location sensitivity is increasingly becoming part of the mix. From 2008 to 2009, local searches from mobile phones grew by more than 50 percent, as about 20.7 million users per month started using mobile browsers to find products and services near them. One of the buzz words of 2010 is geolocation, used generally to mean the act of assessing a location. It is a promising capability that is making smartphones smarter and more aware of their surroundings.
Now that GPS receivers are becoming as standard in cellphones as cameras are, the business opportunities inherent in local searches are exciting. One of the most persistent examples of what this could mean is the scenario in which a Web-enabled cellphone user walks through a mall, and her phone lights up and shows her special offers from stores nearby. Dozens of mobile consultants have trotted out footage from the movie *Minority Report* where the character played by Tom Cruise walks through a shopping mall and video screens in the shop windows start calling to him by name, telling him about specials tailored to his shopping history, his needs, and other data that is stored in a big database. The mobile consultants like to say that this is a preview of how the stores of the future will send ads, directly to your mobile phone, that use your name and mention that they noticed you were looking at new shoes recently. Groups concerned with consumer privacy and governmental agencies like the FCC have held hearings about the dangers of having companies know who you are, where you’ve been, who you’ve been with, and how long you spent with them. All this information is available to mobile carriers, who have solemnly promised that they will safeguard its use.

At this time, leveraging GPS data is a pretty advanced feature, and one that the iPhone, for example, has restricted by allowing only native apps to use this data. However, the much-anticipated HTML5 standards do include a `<location>` tag to take advantage of this function. It is expected that the next few years will see mobile device manufacturers rush to ensure that their products will be able to work with this advanced function.

The ability to add geolocation features is one of the most exciting additions of the latest markup language, HTML5, covered in Chapter 5. But even if you’re not pushing the bleeding edge of Web design with the not-yet-fully-supported HTML5 specification, you can take advantage of the fact that most people with mobile devices are on the move, and many have maps in their pockets thanks to the basic features of their phones and Google Maps. In Chapter 2, you discover how even if you only create one simple mobile design, you should make sure to include your address and a link to a Google map.

**Offering deals and data with QR codes**

In Japan, the mobile advertising models are years ahead of the U.S. market, and they employ sophisticated technologies, such as *Quick Response (QR)* codes. These are 2-D bar codes — you may have seen them on FedEx packages — that look a little bit like a randomized checkerboard. They can contain up to 4,296 characters of information in them. Scan or photograph a QR code and it can launch a browser and navigate to a Web site, add contact information to an address book, or dial a phone number, among many other things. Putting thousands of characters of data or commands into a little picture means that advertisers can add rich detail and interactivity to print ads (you can find QR codes in a growing number of magazines already). In addition to enhancing an advertiser’s message, mobile Web designers should take...
note of QR codes because they can free up users from having to type in complex and lengthy data on the small keypads of mobile devices. You can create your own QR code quickly and easily via free Web sites, such as http://qrcode.kaywa.com, shown in Figure 1-5, or Microsoft Tag, which provides similar functions, and is covered in Chapter 10.

To use a QR code, you generally have to download a small application capable of interpreting the data. Then just point your phone’s camera at the QR code and the application on the phone reads the code and automatically connects to the Web to unlock special content. Here are a few examples of how people use QR codes around the world:

- In Japan, QR codes are printed on escalator handrails in malls; you can point your phone at any code and get messages and discounts, like an offer for 20 percent off a haircut at a salon a couple of floors up.

- QR codes are huge, literally. In Figure 1-6, you see a QR code that was printed on the side of a skyscraper so you can easily access the Web site of the company that owns the building.

- In San Francisco, restaurants put the QR codes in their windows. Passers-by who are interested in the restaurant can point their phone at the code, click, and then receive reviews of the restaurant, descriptions of the menu, and a link to make a reservation.
In England, Ford organized a mobile campaign to publicize its new Ka car. They printed stickers with QR codes on them, and when users pointed their phone cameras at them, up popped an image of the car on the phone’s screen. As the users twisted and turned the phone, the car on the screen rotated and eventually revealed a secret code that led users on a scavenger hunt.

You learn more about QR codes and a similar technology by Microsoft called Tags in Chapter 10.

**Watching video anywhere, anytime**

The mobile phone has been termed the *third screen*, with television as the first and the computer monitor as the second. Already ads promise seamless experience of movies and TV shows from one screen to another — so that you can start watching a TV show on your big-screen HD monitor at home, walk out the door, keep watching it on your phone, and finish by gazing at the computer screen in your office or on your laptop at a coffee shop.

The growth of video on the mobile phone is something akin to the Loch Ness Monster — long rumored, but it somehow never quite shows up. Until now, that is.
Chapter 1: Understanding What Makes the Mobile Web Different

In the last year, the growth in online video has been phenomenal. Forty-five percent of college students now shoot, send, and receive video on their mobile devices, and almost half the videos on Facebook are now coming in from mobile device uploads. This video production used to require $20,000 video cameras, control rooms full of technicians, and fenced-in yards of satellite dishes. Now, you can shoot video with your phone and stream it live to a worldwide audience, from anyplace that has a robust wireless signal.

Researchers measure time spent using media to see how popular various forms of media are with the public. As of 2009, college students spend about 2.5 hours per day watching TV — an amount that might seem low to parents of teenagers. But those same students spend 2.4 hours per day interacting with their mobile phones — texting, calling, surfing the Web, listening to music, watching video, playing games, or using apps.

Designers who want to add video to their sites have two basic choices:

- Rely on an online video-hosting site like Vimeo or YouTube that has carefully built up transcoders and detection scripts that allow it to serve up the appropriate format of video to the users’ devices.
- Customize the video into formats appropriate for the most popular devices that will access the site, and use sophisticated detection scripts to route users to the appropriate version of the video for their devices.

You find more on adding video to your mobile Web designs in Chapter 8.

Appreciating privacy issues

The mobile phone is a very personal medium for each user. For instance, most people don’t share their mobile phones, they take them everywhere they go, and their phones become an essential part of their lives. Research shows that users notice that they’ve left their phone behind in a restaurant or at a friend’s house within an hour; in contrast, it usually takes about half a day before they realize that their wallet is missing.

Take a second and think about all the things that a modern cellphone knows about you:

- It knows who all your friends are — they’re in your phonebook — how often and what time of day you call them, and how long you talk.
- If your phone has GPS, your phone knows where you live, where you work, how long your commute is, where you like to go out for lunch, and whose house you go to on weekends to watch football.
If you use it to browse the Web, your phone knows what sites you like to visit and where you are when you access them.

Like to take photos with your phone? It sees everything you see through the camera lens.

If you use your phone to communicate, it knows what kinds of instant messages (IMs) and e-mails you send, and who you send them to.

With advanced sensors in phones that allow you to talk via Bluetooth to your cars, your home entertainment systems, and even your shoes, your phone can tell what kind of car you drive, what movies or TV shows you like to watch, and how often you really go to the gym.

If you use mobile coupons to shop, it knows your favorite brands and what kind of a discount it takes to make you change your mind and try a new product.

If you’ve used the phone to check on your bank accounts, with the ever-more-popular mobile-banking applications, your phone knows what bank you’re with, how much money you have in your accounts, what your passwords are, and what the routing and transfer numbers for your accounts are. Your phone even knows what stocks you follow, where your IRA or 401(k) is, and how involved you are in planning for your retirement.

Just listing all these data points that are trackable and recoverable from your phone should make you take a second look at the possible little snitch in your pocket.

Web designers will find that the next couple years are critical for privacy — the breaches of information security that lead to users’ credit card numbers, Social Security numbers, and medical records leaking onto the Web are nothing compared to the damage that can be done with a hacked phone. Because the phone is connected to all kinds of information about you, identity theft is much more devious and harder to counter; it also makes it possible for governments, business rivals, or obsessed ex-spouses to track your every move and intrude on your life — to cyber-stalk you with ruthless efficiency.

Mobile Web designers need to be aware of the tightrope they walk with their users’ privacy. While making Web sites as efficient as possible by tailoring them to a user’s needs and preferences — time of day, place, situation, behavior and searches, contextual awareness (that is, searching for cardinals in a football stadium, in the Vatican, or in a forest) — designers must also ensure that all that information is safeguarded. Abusing your user’s trust is the quickest way to get a whole bunch of people mad at you, and quite possibly a whole bunch of lawyers suddenly very interested in suing you.
Mobile Web designers should keep in mind that their users may lose their device or have it stolen, and, in response, they should build sites that don’t automatically allow whoever currently has the device to log in to secure sessions without having to input a password. As you design Web sites, make sure you use a secure Web server, and if you collect personal data, include a privacy policy that informs visitors to your site how you may use their data.

**Planning for the Future**

Futurists, like Ray Kurzweil, have extrapolated the exponential increases in computing power and decreases in size. They predict that in 20 years computers will be as powerful as laptops and the size of blood cells, allowing Olympic athletes to run for 15 minutes without having to take a breath.

Although having a phone hardwired directly into your brain appeals to certain readers of cyberpunk science fiction stories, back in the real world, very few people are likely to want to have prank calls beaming into their frontal lobes at 4 a.m.

That said, the next generation of phones coming out stretches the limits of designers’ imaginations. Just consider these examples:

- **A phone that’s also a wristwatch**: Thought up by Japanese phone company NTT DOCOMO. To answer the phone, you snap your fingers and stick your finger in your ear. The sound vibrations are sent via the bones in your wrist and hands, through your fingers, and directly into your eardrum. You talk into your pinkie and hang up by snapping your fingers twice.

- **A phone with a screen that stretches like stiff Silly Putty**: If you want the image you’re looking at to get bigger, you just grab the sides of the phone and pull.

- **Waterproof phones**: Designers apparently forgot that it’s hard to say more than a sentence underwater without choking. Perhaps they’re chasing the mermaid market segment.

- **Perfume dispensers**: The phone shown in Figure 1-7 looks like a melting bar of chocolate, and you can buy a perfume pack that makes it smell like one, too. These are nice in theory. The problem with this convenient design wasn’t that women didn’t want to be able to re-apply perfume before a hot date, it was that too many users hit the wrong key while texting and accidentally spritzed themselves in the eyes.
Part I: Designing for Mobile Devices

Figure 1-7: NTT DOCOMO’s F-02B phone smells as yummy as it looks.

✓ **Built-in tasers**: See unfortunate accidents mentioned in the preceding bullet.

✓ **Phones built into the grip of a Glock semiautomatic pistol**: Again, see the earlier bullet.

✓ **A recyclable phone made out of organic components**: The phone was made out of hay sprayed with resins, but it dissolved into green goo when it rained, when users’ hands were sweaty, or when it was humid.

✓ **A phone that extended little metal legs and used its camera, GPS, and face-recognition imaging to chase you around when people called**: Thought up by a Japanese company, the design was dropped when users reported epic nightmares of their phone coming to life, only to find that their phone had, in fact, come to life and was hunting them down like the Terminator.

Although no one can predict the future, by keeping up with the latest trends in mobile phone development (we’ll let the aforementioned experiments speak for the themselves), you can identify some of the larger trends and extrapolate how these trends may impact what users want to accomplish on the mobile Web and start planning now how best to design sites that take advantage of these new features in the future.

**Saving time or money with targeted searches**

Even though the mobile Web is still in its infancy, the early adopters are quickly discovering that having a connection to all the information and entertainment on the Internet is changing their behaviors in fundamental ways. For example, people used to have arguments and just throw out facts or ask unanswerable questions. But so many people have taken to just whipping out their Web-enabled phone and looking up the facts on Google that newspaper columnists have written to decry the death of good arguments. Minor points
that once formed the foundation for long disputes — say, “Who played 3rd base for the Dodgers in 1937?” — are now no longer the stuff of a good couple rounds of discussion at a sports bar.

Basically, people are turning into a nation of fact-checkers. If you want to know the answer to any question right now, right here, just pull out your phone and check it out.

This becomes especially important when you consider a growing function for the phones — that of price-checker and deal-finder. Indeed, the next big demographic group that marketers and politicians want to focus on is already being dubbed the iPhone mom (the latest in a series of mom-focused marketing campaigns that started with soccer mom). Blessed with both disposable income and purchasing power, the iPhone mom (or dad) stalks the aisles of any supermarket, pulling out a phone and using its bar-code reader to check whether the price on arugula is really a good deal. Enter that information into the Web and consumers are better armed than ever before to find mobile coupons and comparison shop until they save a few more bucks at the cash register.

If people find that the mobile Web can actually save them time and money, that’s the strongest possible inducement to adoption. Users will rationalize away the costs of a slightly more expensive data plan as long as they can see the benefits in their daily lives.

**Killing time with multimedia**

If your site is dedicated to amusing people or has quirky information that helps people while away the time, mobile Web definitely figures large in your future.

All those hours spent waiting in line at the bank, the DMV, or doctors’ offices, or for a chronically late friend are no longer exercises in counting the dots on the ceiling tiles or leafing through 10-year-old issues of *Aggregates and Roadbuilding* magazine.

Already, many hairdressers keep their patrons happy by placing a smartphone on the counter next to their stations, right next to the scissors and comb. The patron then can browse the latest celebrity gossip or watch the top-ten college slam-dunks of the week.

One overlooked space is the increasingly sophisticated entertainment systems included in many SUVs and minivans. Currently, most of these systems allow kids in the backseat to watch DVDs or play video games. But a simple connection to a fast wireless data network will allow kids to poke each other on Facebook, update their Twitter feeds, and play a *World of Warcraft* death match with the carload of kids in the adjacent lane.
Meanwhile, as data rates get faster, more and more video is consumed. In 2009, more than 25 percent of cellphone users reported watching video on their devices — much of this is snacking videos, or videos less than 5 minutes in duration. These are usually the kinds of things that your friends e-mail you to say, “Can you believe this? It’s a roller-skating giraffe!”

With the growth of Webisodics (short video programs that appear at regular intervals) on the desktop Web, you can expect to see a rise in soap-opera-type programming for video for the mobile Web as well. Long and involved storylines tracking the trials and tribulations of long-suffering characters who look like they’ve just run a marathon and are panting for breath are sure to attract a following.

Again, this kind of rich content may be driven by the willingness of the audience to pay a subscription rate for this kind of entertainment on the mobile platform because it offers something worth paying for.

Connecting with people on social networking sites

We doubt you’re surprised that the number-one most popular usage of smartphones is for Facebook. Rounding out the top ten are MySpace, Twitter, blogging software such as WordPress, and so on.

Just as the early Internet was dominated by users flocking to bulletin boards to trade insults on dialup modems, share Grateful Dead trivia, or express their inner poet, so too are early mobile Web users participating in the popular social sites in which they connect with their friends.

People naturally want to reach out and connect with others — well, the cellphone already made that possible through its voice services. But the mobile Web makes it more powerful for people to come together to do complex tasks, such as the street protests in Iran after the disputed election in June 2009. The crowds of protesters warned each other through Twitter updates sent from their cellphones where the police were massing and what kinds of violence were being used against them. The cellphone video shots of Neda Agha-Soltan dying in the street made her into an international symbol and martyr.

For mobile designers, this means the power of organic searches is growing. That is, rather than a user typing a query into Google, he asks a question on Twitter or his Facebook profile to see what his friends and social group have to say on the matter.

Word-of-mobile referral is a powerful force that can drive traffic to your Web site. Designers want to make it as easy as possible for users to share the content on their sites via social networking.
Having some kind of community/interactivity functionality in mobile Web sites is as important as ever because users are becoming accustomed to adding their input to what appears in the content.

Because the GPS capabilities of phones are growing, it’s not hard to imagine that sites that allow users to see which of their friends are nearby or what other people have said about the restaurant they’re about to enter, the park they’re about to walk their dog in, or the office they’re about to apply for a job in are going to see explosive growth.

Find out more about blogging and social media in mobile Web designs in Chapters 9 and 10, respectively.

**Using smartphone functions in unexpected ways**

Putting technology into the public’s hands has always had unexpected consequences. The human impulse to tinker, modify, soup up, re-imagine, and tear apart can’t be denied and will always result in usages that the original designers never could have anticipated. For instance, microwaves were born when scientist Percy Spencer walked past a radar emitter and noticed that the Hershey bar in his pocket melted.

The same kind of exploration is happening now with phones — and the products are as impossible to predict as the lunar rover would have been to Henry Ford. Here are a few examples of people finding novel uses for smartphone technology:

- **Medical diagnostics:** Scientists at UCLA recently discovered that when they removed the little glass lens from above the sensor in a cellphone’s built-in digital camera, all kinds of exciting possibilities opened. When they put a droplet of blood directly on the sensor, they could then generate a microscopic 3-D image of the blood, showing whether viruses or parasites were present.

  Efforts are underway to perfect this application because phones equipped with this functionality will be powerful diagnostic tools in remote areas; doctors in countries with shortages of medical devices could track disease outbreaks in real time and send medicine to head off outbreaks before they turn into pandemics.

  It’s not hard to foresee a time when your cellphone will constantly monitor your vital signs — like having TV’s Dr. House in your pocket, constantly monitoring your heart rate and blood sugar levels, and calling an ambulance for you if you have a heart attack or are knocked unconscious.
Paying for goods: Meanwhile, the money to pay for all these goods and services is also starting to migrate to the mobile platform. In Japan, commuters pay for their subway train rides by swiping their phone over sensors installed above the turnstiles and buy food out of vending machines by waving their phone over the control panel.

Taxi drivers in Indonesia accept payment via phones and report that they are far happier this way because they’re no longer at risk of being mugged for cash.

Transferring money to remote areas: Manual laborers in Africa faced special challenges trying to support their families when they moved from the rural countryside to cities to find jobs. The village they came from didn’t have any banks, and the amounts of money they earned weren’t enough to open an account anyway. They could take a bus back home, but the ticket would pretty much eat up all their savings. They could pool the money and give it to a courier, but there was always the possibility that he’d disappear with their money or be robbed on the way.

Under these pressures, they hit on an elegant solution — sente, or sending money via airtime. The worker buys a prepaid phone card and calls the person in his home village who has the mobile phone kiosk and reads the code on the phone card — usually about 10,000 Ugandan shillings or about $6.

The owner of the phone verifies that the code works, checks to see that all the minutes are there, and then pays the man’s family the money, minus a 10–20 percent charge. It’s like an offshore bank account for people without the means to have an offshore bank account.

We don’t know what the effects of this kind of radical innovation are going to be, but keeping up with the latest trends will obviously help mobile Web designers adapt their sites to take advantage of these kinds of advances.

The biggest imminent change in the United States is the rollout of 4G data connections to mobile devices. This means that users have Internet connection speeds in excess of 100 megabits per second (Mbps; by means of reference, the average top speed for a business-level cable modem is only about 8 Mbps). Uncompressed HD video requires about 10 Mbps.

Even the most technically savvy mobile analysts pale at the thought of the changes that such connectivity is going to cause. “We don’t know what it’s going to do, but it’s going to be big,” said Montes at a meeting of the Online News Association in Los Angeles.