Chapter 1

Exploring Ereading Devices

The first thing to understand about digital publishing is what devices people use to consume digital content, including what types of publications each device class can support, how people use the devices, and where ereading hardware is headed. You will find a startling array of devices on the market, but ultimately there are only four classes of devices on which digital publications are consumed.

In this chapter, you will learn about the following:

- Device Classes
- Ereaders
- Tablets
- Computers
- Mobile Phones
- Hybrid Devices
- Future Devices

Device Classes

There is an ever-increasing variety of devices on which to read electronic publications. And the more devices that are out there, the more frequently those devices are upgraded, competing with one another, forcing each other to innovate and improve, and driving the price of ereader ownership lower and lower while making electronic content more and more accessible to consumers. That's good for consumers and for content producers like you and me; competition in ereader hardware, ereader software, tablets, and other devices does most of the work of opening up markets for us. More of these devices are being devised and released every month. In fact, by the time you've finished reading this sentence, there will be another—BestBuy.com just listed the newest, greatest ereading device to kill all prior devices! And now—the newest, greatest to kill *that* one!

Of course, there's also a downside to the feverish pace of device creation and improvement: Creating content that takes full advantage of, or even just fits perfectly on the screen of, the current or next generation of devices is like trying to shoot a bull's-eye hanging from the flank of a bucking bronco while blindfolded.

As with all media and business revolutions, the bronco will eventually be tamed and set upon a predictable path around the corral, making bull's-eyes easier to land for everyone. That happened with the Desktop Publishing Revolution in the 1980s as well as the Web Publishing Revolution in the late 1990s and early 2000s. For now, the best strategy for landing bull's-eyes in

this Electronic Publishing Revolution lies in understanding *classes* of digital content-consumption devices and the individual characteristics of devices in those classes.

But first, Table 1.1 presents a quick reference of device class capabilities. The specifics of the various publication formats are discussed in Chapter 2.

TABLE 1.1: Device Class Characteristics

	EREADERS	TABLETS	COMPUTERS	MOBILE PHONES
Can display EPUB/MOBI ebooks	☑	☑	☑	☑
Can display interactive PDFs	◪	◪	☑	◪
Can display digital replicas	◪	☑	◪	
Can display digital magazines		☑		◪
Can display HTML5 epublications	◪	☑	☑	☑
Has full-color display	◪	☑	☑	☑
Can display dynamic, server-fed content	◪	◪	◪	◪

Legend: ☑ Yes, the device class supports this option. ◪ The device class supports some but not all features of the option, and/or some devices in the class supports the option while others do not.

STAY UP TO DATE AS THE LANDSCAPE CHANGES

To keep pace with the changes in the digital publishing landscape, I will provide periodic updates on the latest devices (and many other sections from this book) on my website, `http://abbrv.it/DigiPubID`, and at `www.sybex.com/go/epublishingindesign`.

Ereaders

The first class of digital-content-consumption device is handheld ereaders. These devices support the inclusion of imagery and media to one degree or another, but they're built for reading novels, novellas, short stories, newspaper articles, and other text-heavy content. You wouldn't, for example, target ereaders for your coffee-table picture book or image-laden fashion magazine.

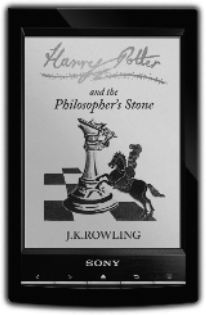
There are more brands and models of handheld ereaders available than most people would imagine—and more are being developed every year. Figure 1.1 shows many ereaders, but the selection goes on well beyond what I've pictured here.

FIGURE 1.1A
A selection of handheld ereaders

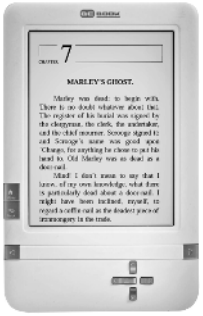
Barnes & Noble NOOK Simple Touch

Kindle Keyboard

Kobo Touch

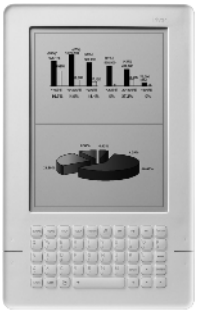


Sony Reader

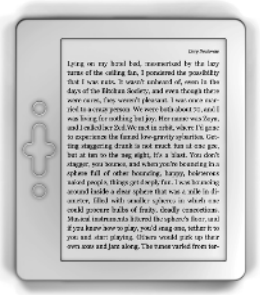


BeBook Club S

Range 3



iriver Story



txtr eBook Reader

Pocketbook Pro

Photos courtesy of the device manufacturers

FIGURE 1.1B
A selection of handheld ereaders (continued)

Aluratek LIBRE | PRO

Bookeen Cybook Opus

ECTACO jetBook mini


Jinke Hanlin eReader V5

Onyx Boox M90

Plastic Logic 100

Photos courtesy of the device manufacturers

The popularity of ereaders lies in their simplicity. They don't play movies or have lots of apps. The most used ereaders don't even have color screens; many of the biggest manufacturers do offer color versions of their ereaders, but those are far outsold by their grayscale or black-and-white counterparts. Instead, using proprietary technology and a lack of backlighting, ereaders provide on a handheld screen a remarkably close replica of a printed book page—one that is no more difficult for, or taxing on, the human eye while reading for extended periods than ink on a novel's pulp page. Of course, ereaders weigh only a few ounces—typically 6 to 8 ounces—and can contain thousands of books, making them far more convenient to tote around than a stack of printed books. Bookmarking, full-text searching, user-defined type size, week- and month-long battery lives, and the ability to browse and purchase a vast array of modern books and an ever-increasing library of older titles round out a list of the top advantages over printed books cited by ereader owners.

Tablets

Tablet computers are the youngest but fastest-growing class of digital-content-consumption device. Contrary to popular belief, the device class was not devised by, and did not originate with, Apple; tablets and slates have existed in several forms, most running the Windows Mobile

operating system, since the turn of the 21st century. They were, however, very low-profile and marketed primarily to industrial, medical, and high-tech enterprise customers, all but completely ignoring the rest of the potential market. It wasn't until the iPad's sleek form factor and consumer-targeted advertising campaign that the general public saw tablets as potential everyday devices. From there, businesses began adopting them, too—an inverse of the way prior tablet devices (also called *slates*) were marketed.

Kicked off (officially) by the release of Apple's iPad in the spring of 2010, the tablet market has exploded with additional operating systems (see the "Tablet Operating Systems" section) and dozens of different devices being released—and purchased—at breakneck speeds. (See Figure 1.2 for a small sampling of such devices.) In general, tablet devices offer consumers a smaller, lighter device to tote around than a laptop while sacrificing little of the convenience and power of having a laptop on hand. From a tablet device a person can read and compose email, write and collaborate on documents, play games and watch videos, surf the Web and interact with social networks, participate in video conferencing, work with database content such as medical records or pharmacy dispensary systems, manage point-of-sale and retail inventory, edit and organize photographs, and even create and edit new graphic, art, or technical designs. In other words, tablets are becoming a replacement for laptops for many professionals and students and a replacement for *any* standard computer for the average consumer whose computing requirements are limited to these abilities (which is most consumers).

Acer Iconia Tab | Samsung Galaxy Tab | Creative ZiiO

Photos courtesy of the device manufacturers

FIGURE 1.2
Three of the many available tablets and mini-tablets. These three are available in 7-inch and 10.1-inch models.

Of course, tablets are not—at the moment—ready to completely replace computers for everyone. They have their limitations. First, tablets run *apps*, not *applications*. You cannot, for example, run the full version of Photoshop on an iPad or Motorola XOOM. You can, however, run Photoshop Touch, an app built specifically for tablets but lacking much of Photoshop's power, automation, and ability. Creatives and many other professionals still need a desktop or laptop computer to run full applications.

Another big limitation of tablets is their storage capacity—though it's a limitation that is quickly being remedied. The Apple iPad is available with 16, 32, or 64 GB of storage, and that storage capacity is not expandable. Most Android tablets offer the same size internal storage drives but also include SD or MicroSD storage card slots that enable the user to double or even

triple the devices' file and app storage capacities. Still, even a maxed-out Android tablet can only offer a top onboard storage capacity of 128 GB for all apps, data files, media, and work files. The average laptop sold today offers internal hard drive storage of 500 GB and is often augmented by one or more external portable hard drives of similar capacity. Tablets just can't hold a great deal of data, and virtually none of them can interface with an external hard drive.

One notable exception to these specs is the Kindle Fire, which is not expandable and offers a measly 8 GB with roughly 1.5 GB required for the operating system and embedded apps. But the Fire and the similarly limited iPad are the vanguards in a movement that will ultimately nullify the consequence of low onboard storage capacities. The *cloud*, you see, is ready and waiting to hold all those files we nowadays put on our hard drives, thumb drives, and removable media. With the purchase of an iPad or Fire, Apple and Amazon give you 5 GB of free online storage in their iCloud and Amazon Cloud Drive online storage services, respectively. For the average consumer, 5 GB is a lot of space, holding approximately 1,000 MP3 songs; 2,000 photos; 20 minutes of HD video; or about 5,000 Microsoft Word documents. If that isn't enough space, both services offer paid upgrades beginning at $20 annually. All those files stored in the cloud are accessible at any time to one or all mobile and standard computer devices—as long as the particular device has an Internet connection. And Apple and Amazon aren't the only ones offering large, instant access and free or low-cost cloud storage. ASUS includes unlimited online storage with the purchase of its Android tablets and tablet-laptop hybrids. Microsoft has offered SkyDrive for years and has made it an integral part of not only Windows Mobile–powered devices but every computer running Windows 8 and newer. Even nontablet makers such as Mozy, Livedrive, SugarSync, and the venerable Dropbox offer cloud storage for making your files accessible from any device.

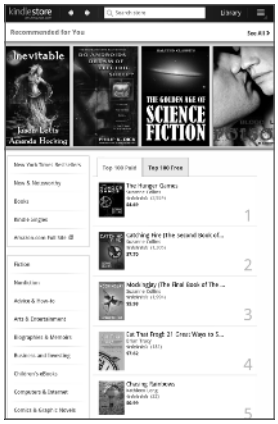
In short, for the average consumer, tablets are today a perfectly reasonable replacement for standard desktop and laptop computers. As time goes on, tablets will be even more common than standard computers because of their portability. The average person will be connected more often and for longer periods because of the power and portability of tablets.

Additionally, tablets offer support for the largest selection of digital publication formats, including those (such as interactive magazines and digital replicas) that were created specifically, and solely, for tablets. (We'll get into the topic of formats in Chapter 2.) Digital publishers who want to compete in today's and tomorrow's worlds need to target their publications to tablets *now*. The early-adopter mind-set ran tablets in 2010 and early 2011; as of fall 2011, though, all of your readers have or are considering tablets. Tablets are one of the biggest sales items of any holiday shopping season, followed closely by handheld ereader devices.

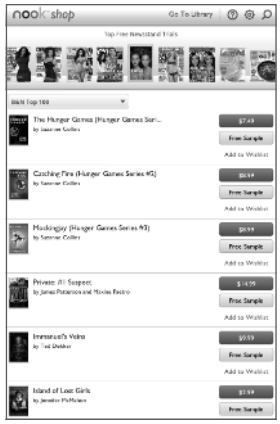
Ereading on Tablets

When compared to handheld ereaders, there are pros and cons to tablets for ereading.

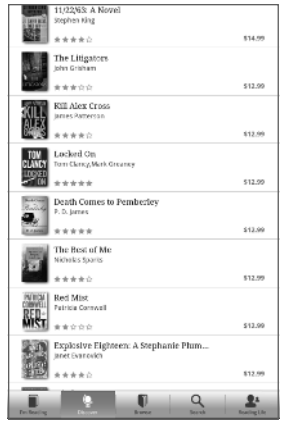
First, tablets support a much wider variety of epublication formats. With installable or preintegrated versions of iBooks, Kindle, NOOK, Kobo, Google Books, and more, the entire world of ebooks is available to tablet owners (Figure 1.3). And tablets can have several of those ereader applications and libraries installed at the same time, putting every ebook for sale at Amazon, Barnes & Noble, Kobo, and so on (and on iPads, iBooks) readily available on one device. Typically users stick with one, though, especially if one is preinstalled when they purchase the tablet, like iBooks is on the iPad, Kindle is on Amazon's Fire tablet, Kobo is on the Vox, and Barnes & Noble is on the NOOK tablets. Thus, if you publish ebooks, make them available for sale in all of those stores and consider carefully whether it's ultimately worth it to participate in an exclusivity program offered by one ebookstore or another.



Kindle Store

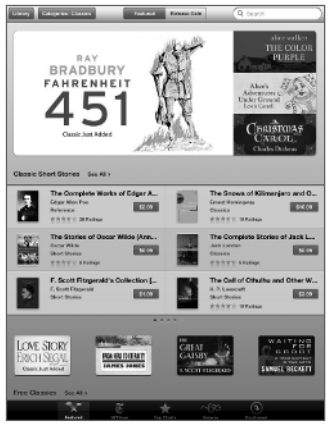


Barnes & Noble NOOK Shop



Kobo Bookstore

Google Books



Apple iBooks

Photos courtesy of the device manufacturers

FIGURE 1.3
Various ebook stores available on tablet devices. (All except iBooks are shown on an Android 10.1-inch tablet. iBooks is shown on an iPad.)

The act of reading for extended periods on tablets is much the same as reading on a computer and nowhere near as friendly as reading on handheld ereaders. Handheld ereaders typically don't include *backlighting*, or illuminated screens; their screens are usually anti-glare, and they use proprietary display technology to simulate the look of real ink on real paper, which enables them to be comfortably read in all the same lighting conditions in which printed books are read comfortably. Computers and tablets *are* backlit, which is why they strain the eyes after a while, and in order to display multimedia, games, and the widest array of content, they use a completely different *anti-aliasing* technology that cannot simulate ink on paper. Tablets, being portable and almost always bearing polished glass faces, often also carry a glare or reflect too much light (or other objects; see Ben Long's "Why the iPad Isn't for Me" in *Macworld*—particularly the "Day Five" section—`http://abbrv.it/150474`) for comfortable reading. Tablets just are not ideally suited to the act of reading long, continuous flows of text like novels and other common ebooks. Despite the science disproving the comfort of reading on tablets, 60 percent of iPad owners report that they read ebooks on the iPad (Simba Information, April 2011 and Imano,

May 2011). Apple, Amazon, B&N, and Kobo are trying to get in on that percentage with their various tablets even though, in the case of all but Apple, the companies also produce handheld dedicated ebook readers.

Magazine, catalog, yearbook, newspaper, and comic book reading is another matter entirely. While the same limitations of backlighting, lack of e-ink–optimized text display, and screen glare still exist no matter what type of publication one is reading on a tablet, these types of publications are not long, continuous, text-only reading experiences. They're usually visually rich layouts augmenting copy with color, imagery, multimedia, and, in the better ones, touch interaction. Tablets are ideally suited for displaying these media-rich publications because the media richness was built specifically for tablets, and consumers adore reading, watching, and interacting with digital magazines, catalogs, yearbooks, newspapers, comics, and even "enhanced" ebooks that go beyond the norm. Figure 1.4 shows a digital replica–format publication (*Redbook*) as viewed landscape; an app-based enhanced ebook (*Rudolph the Red-Nosed Reindeer*) that includes hotspots, read-to-me, and auto-page capabilities; a highly interactive digital magazine-format periodical (*National Geographic*) containing animations, video, hotspots, panoramic pictures, 3D-rotatable imagery, and more; a digital catalog (Brookstone) using TheFind newsstand app, which allows customers to order directly from within the catalog; and an HTML5-based newspaper (*USA Today*) including scrollable and slideshow regions and a preference system that uses the user's desired locations for the weather, sports leagues for scores, and other customizable content. (Go, Bruins!)

If you intend to publish visually rich or media-rich periodicals or other publications, tablets are, and will increasingly be, the primary device class you should target.

Tablet Operating Systems

Just as there are more tablet-class devices for sale than there are web browsers you could possibly install on all your devices combined, there is also a variety in tablet operating systems, which are what drive the tablets and give them their capabilities. I'd like to take a moment to run through what these operating systems are, what devices they drive, and some of the important characteristics of each that a digital publisher should know.

iOS from Apple

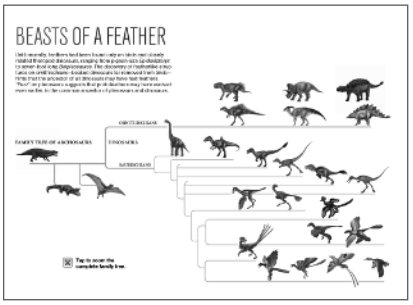
iOS runs all of Apple's mobile products, not just the iPad but also the iPhone and the iPod Touch (which is, for all intents and purposes, an iPhone without dialing and texting capabilities).

Apple tightly controls both the hardware and operating systems on its mobile devices, as with its computers. All versions of iOS and all iOS devices may install apps from the Apple App Store and, beginning with iOS 4, iBooks. All content available through the App Store and iBooks is strictly regulated by Apple. Apps and epublications must pass through a review process prior to being made available to iOS users, and Apple reserves (and has often exercised) the right to remove apps or publications for any reason at any time following their initial release into the App Store and/or iBooks. Rumors abound as to reasons every time Apple denies or removes a particular app or ebook, but in general Apple wants content available through iOS to be "family-friendly," legal, and of "the highest quality." The subjectivity of these descriptions has led to many dissatisfied publishers. Ultimately, iOS is what is called a *walled garden*: Only Apple-approved content gets in, which creates a predictable and consistent user experience.

FIGURE 1.4
Tablets displaying media-rich publications

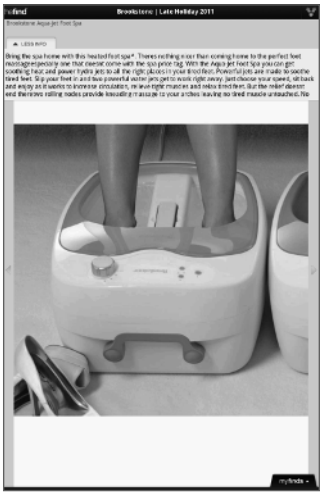
Redbook, August 2011
Creative Director: Amy Dorf

Rudolph the Red-Nosed Reindeer
Developer: Oceanhouse Media



National Geographic, February 2011
Design director: David C. Whitmore

USA Today, January 4, 2012
Developer: Mercury Media



Brookstone Catalog, January 2012

EPUB and PDF digital documents *can* be loaded onto iOS devices without going through iBooks, though the process is too complex for the average iOS device consumer and thus isn't viable for a widespread publication distribution method. Individual users can add EPUB and PDF files to iTunes on their computers, which then pushes those files to the iPad or iPhone iBooks app during device-computer synchronization, that is, of course, if iTunes is used to synchronize the device. iOS 5, recognizing the value of tablets as computer replacements, brought

the ability to use iOS devices completely independently of iTunes and computers, using server-based management software in iCloud to update, upgrade, and synchronize iOS devices.

The iPad (all versions) is the gold standard in tablets and tablet publishing (Figure 1.5). It has the highest market share among all tablets—twice that of all Android tablets combined—and is consistently ranked as being the fastest, most responsive user interface, though several Android tablets are ranked as having more user-friendly and intuitive user interfaces.

FIGURE 1.5
An iPad 2

Photo courtesy of Apple

MERGING OF MAC AND IPAD

Following the initial and stellar success of the iPad, Apple began porting many of the tablet's features to its Macintosh line of computers. A Mac App Store was integrated into Mac OS X version 10.6, bringing the ability to purchase apps *and* full major-label applications directly to the screen rather than forcing users to purchase and load CD or DVD installation discs. When OS X updated to version 10.7, codename "Lion," in 2011, the principal way to purchase the upgrade was through the Mac App Store. "Lion" brought with it other iPad features, including the ability to control the computer and applications through *gestures* such as multifinger swiping, turning, and tapping. These gestures required new Apple hardware, specifically laptop touchpads, peripheral touchpads that could be added to desktop computers in place of or alongside a mouse, and a new touch-sensitive mouse whose surface had more in common with the iPad's touchscreen than with other mice. OS X 10.8, codename "Mountain Lion," brought several popular iPad features and integrated apps to Mac in 2012. And, also in 2012, Apple updated its entire line of Mac laptops and desktop displays to the ultra high resolution Retina display that appeared first in the iPhone 4s and then in the iPad 3. Apple is obviously moving toward combining OS X with iOS in all its computing devices or replacing OS X entirely—there are even possible indications of Apple replacing its line of Mac laptops with more powerful iPad-like devices.

ANDROID OS

Android is the big competitor and would-be "iOS killer" in both the smartphone ("iPhone killer") and tablet ("iPad killer") markets. I could give you numbers of Android devices sold versus iPads sold and market share percentages, but they wouldn't be accurate for long. Things

change too rapidly; for instance, numerous independent studies noted a sharp 1Q2012 decline in iPad sales. This dip corresponded with rises in Android tablet sales, but one doesn't necessarily have anything to do with the other. In fact, in my learned opinion, iPad 2 sales slumped in 1Q2012 because the market knew full well that the iPad 3 was on its way. When it appeared in March 2012 iPad sales once again skyrocketed while Android sales remained the same, proving that Android sales growth was not directly related to iPad sales fall-off.

The big takeaway from any statistical comparison of tablets is that both iOS and Android are popular platforms, with user bases measured in the hundreds of millions.

Created and sponsored largely by Google (as a member of the Open Handset Alliance), Android is an open source operating system that, like iOS, is obviously moving toward becoming a primary computer operating system as well. The difference is that Google has always *said* Android will become a full-blown computer operating system—with computers adapting to be touch-sensitive and mobile—while Apple hasn't actually said it intends to combine or replace OS X with iOS; it's just *doing* it bit by byte. Because Android is an open source operating system free from licensing fees, many tablet manufacturers use it in their devices. In fact, with the exception of iPad, the BlackBerry PlayBook, the defunct HP TouchPad, and some upcoming Windows Mobile devices, *all* current tablets run on Android (see Figure 1.6). Thus, competition in the tablet market is, as of the moment, primarily limited to iPad vs. Android-powered devices, with the various Android tablet manufacturers competing with one another on hardware capabilities and user-interface tweaks.

The Google Play app store (formerly Android Market) is open, enabling any publisher or developer to distribute her creation to all Android tablets and smartphones. This is a double-edged sword. Unlike with iOS-based content, there are no reviewers or censors to clear content through and no issue with releasing apps and publications that may impact the financial interests of the platform maker. However, the openness of the app store can create the impression that the selection of apps and publications is of an inferior quality to those available in Apple's strictly controlled App Store and iBooks. Regrettably, there's some truth in that perception. The Google Play app store has seen a flood of adult-content apps and publications, many included under ambiguous or intentionally misleading names, as well as an avalanche of unwanted, often duplicate ebooks. Public domain classic books such as *A Tale of Two Cities*, *Moby Dick*, *A Christmas Carol*, and hundreds of others are frequently converted to ebook format of varying qualities by unassociated individuals and placed in the Google Play app store in hopes of making a quick, often unearned buck. On the other hand, the openness of Google Play creates more variety in apps, more choice, and access to apps that Apple wouldn't allow on iOS because the apps' functionality might compete with Apple's or its partners' interests. The average Android app also costs significantly less than its iOS equivalent in head-to-head comparisons.

Because Google Play is open to any content a developer wants to publish, and because the Android operating system is being actively improved by so many different device manufacturers and programmers, it has real potential to improve faster and more often than iOS. Thus, it's entirely possible that Android-powered tablets could at any time take top market share from iPad. From the perspective of an epublisher, that means you must take Android seriously, and even if you don't target Android readers right now (a mistake in my opinion because Android tablets typically account for 30–40 percent of the tablet market), you must at least be ready to do so at a moment's notice.

FIGURE 1.6
A sampling of Android-powered tablets

ASUS Eee Pad Transformer

Lenovo ThinkPad Tablet

LG Optimus Pad

Samsung Galaxy Tab 10.1

Sony Tablet P

Photos courtesy of the device manufacturers

AMAZON TABLETS

Amazon debuted a potent entry into the tablet market with its Kindle Fire tablet (and other tablets are reportedly under development). Fire runs on Android, but it's a modified implementation with a uniquely Amazon user interface hiding all but a few small parts of Android (see Figure 1.7). In fact, Amazon doesn't even promote the fact that Fire uses Android; customers

don't even think about the Fire's operating system, but those who do just think of it as Amazon's original creation unencumbered by the negatives associated with Android. Next, instead of pricing its 7-inch tablet in the then-standard $350–$600 range for similarly sized tablets, Fire debuted at $199 and was positioned as an entertainment device, not the all-around tablet iPad is marketed as, though the Fire lacks none of the functionality of other tablets (with the arguable exception of a camera). It merely focuses on content, offering books, movies, music, and periodicals exclusively from Amazon's library. Amazon also built a custom user interface on top of Android and limited user access to Amazon's *own* app store rather than to Google Play, thus eliminating the flooding of bad content. Thus, the Fire is an Android-powered walled garden like the iPad but backed by a much larger, long-established, curated collection of Amazon-approved apps, ebooks, movies, music, and more.

Figure 1.7
The Kindle Fire: built on Android but with a twist

Photo courtesy of Amazon

Apparently Amazon did everything right with the Fire, because by February 2012, only four months after its debut, the Kindle Fire had captured over 50 percent of the market among all Android tablets (comScore April 2012). Perhaps even more significantly, the cellular provider favorite Samsung Galaxy Tab tablets—all sizes in the line—was the next most popular Android tablet with only 15.4 percent market share.

So significant is Amazon's position in the tablet market that I strongly recommend digital publishers think of it as a completely different operating system. When publicizing that their epublications are available for or "run great on" iPad and Android tablets, I recommend they add Amazon's tablet to the list as if it weren't related to Android at all.

Android 2.2 and Older

The initial batch of Android-powered tablets was based on Android version 2.2 or older, which was an operating system built exclusively for phones. The result was a very slow, very poor, often-crashing user experience on a tablet. Moreover, the fact that Android 2 wasn't built for tablets meant that there weren't many apps available for it that could run on tablet hardware, and most of those that did were designed for a small screen and looked horrible when blown up to a 7- or 10-inch display.

Most such tablets initially were iPad knockoffs, cheap plastic clones of iPads with names like "ePad" and "aPad," though a few big-name manufacturers had early success with Android 2–powered tablets, most notably Motorola with its XOOM and Samsung with the Galaxy Tab. These devices were typically priced far below iPad prices, which is why they sold well.

It wasn't until the release of Android 2.3—better known by its codename "Gingerbread"—in December 2010 that the Android operating system was capable of delivering graphics of decent quality to larger-screen devices such as tablets. With Gingerbread also came apps capable of running on such devices. A surprising number of powerful tablets continue to run on Android 2.3, including the initial release of the Kindle Fire and numerous other devices released well after the Fire's debut.

Unfortunately, there are still Android 2.1 and 2.2–powered tablets in circulation, and new ones sell each week. As of this writing, Bed Bath & Beyond sells one in-store and online for $219.99. BestBuy.com offers 21 different models. Similar units are sold by warehouse clubs and in overstock stores. Average purchasers don't know that they're getting old technology with limited functionality. The boxes for these devices promote their strengths, not their weaknesses; in most cases, the version of Android running on the device is listed only in the fine print on the back—if at all. Pandigital, one of the largest purveyors of this outdated tech in an astonishing variety of big-name online and brick-and-mortar store chains, takes great pains to hide the fact that its line of 7- and 9-inch Novel Multimedia Tablet & Color eReader tablets run on Android 2.1. The product specifications on Pandigital's own site list the operating system as merely "Android," whereas the more expensive Android 2.3–powered devices identify the Android version number in the same place. In fact, the version number of the operating system isn't listed *anywhere* directly. Upon close examination of the product boxes—if you happen to have access to one before you purchase it—you'll see way down on the back of the box it says it "supports…Android 2.0 audio format." And, of course, these devices are not upgradable to any later version of Android.

Digital publishers like you need to know that these devices are out there—that they are being marketed to consumers who (justifiably) don't know any better, even when the operating system version isn't deliberately hidden from them. You must also realize that, well, you can't publish to them. These devices will read ebooks just fine—for now, until the ebook stores upgrade their software and systems beyond the capabilities of these version-stagnant tablets—but they can't read media-rich tablet publications because no one has built a Folio or Issue viewer for them (and never will). The same goes for interactive replica publications—no one is going to build apps for a dead operating system. Even Android *phones* moved up to Android 3.*x* and 4. The

browser and HTML rendering engine in Android 2.2 or older won't fully support HTML5, a feature added as of 2.3, so there goes that otherwise universal format. PDFs *can* be viewed on Android 2 with the installation of Adobe Reader or a similar PDF-reading app, but the features of PDFs supported by these Android 2–compatible PDF readers are not complete; audio and video typically work but buttons, rollovers, and other interactivity features tend to break. Of course, that's assuming Android 2 tablet owners can still find Android 2–compatible PDF reader apps on Google Play or the proprietary app stores included with many of these sub-par tablets.

BlackBerry Tablet OS

The first, and thus far only, tablet running the Research In Motion (RIM) BlackBerry Tablet Operating System is the BlackBerry PlayBook (Figure 1.8). BlackBerry phones held a huge, roughly 11 percent share of smartphone sales worldwide and, as of October 2011, included 70 million subscribers to the BlackBerry Internet Service, through which BlackBerry phones and PDAs access the Internet. BlackBerry is a mainstay brand in mobile computing and communication. Thus, when the BlackBerry PlayBook debuted in April 2011 with 50,000 units sold on the first day, it was obvious the PlayBook would be a righteous competitor to the iPad—some called it the "iPad killer" (note how often that name is bandied about).

Figure 1.8
The BlackBerry PlayBook

Photo courtesy of Research in Motion

Although the PlayBook was made available for sale to the general public in April 2011, RIM had been demonstrating it since fall 2010 with the help and cooperation of Adobe, whose AIR and Flash application technologies were central to the functionality of the PlayBook. Weighing less than a pound and featuring advanced multimedia hardware and, of course, being from BlackBerry, the PlayBook should have done well. It didn't.

Six months after public launch and that massive initial sales date, RIM announced that it had shipped half a million units in that first quarter but only 200,000 units in the second. Most people

have never heard of the PlayBook. By 4Q2011 it had become a bit player in the big drama of tablets with approximately 3 percent market share; by 2Q2012 that share had dropped to less than 1 percent with no sign of swinging back. Moreover, major app developers stopped developing for the PlayBook or never started. Even Adobe killed development of its Adobe Content Viewer for PlayBook, the technology that allows the display of interactive magazines on the tablet.

For now, digital publishers should recognize that there are close to a million PlayBooks out there and that their owners absolutely love them. The tablet can read ebooks, with available Kindle and Kobo (no NOOK) apps, access the Web for HTML5-based content, and natively read PDF publications, but it can no longer display rich-media app-based publications.

Windows

Microsoft Windows has been powering mobile devices for more than a decade. First there was Windows Mobile, which ran on PDAs (remember those?) and mobile phones, but with the release of Windows 7, the "Mobile" moniker was dropped, leaving a mobile-optimized version of Windows 7, and then Windows 8, just part of the Windows family.

The biggest distinction between Windows-powered tablets and its competitors is Windows's ability to run full applications, not just apps. In fact, at least on the array of tablets sporting Intel chips and possibly those using chips by other manufacturers, Microsoft boasts that if you can run it on a Windows 7 or 8 desktop computer, you can run it on a Windows 7 or 8 tablet. That includes full versions of Microsoft Office applications like Word, Excel, and PowerPoint rather than the limited-functionality Office knockoff apps you'll find available for use on the iPad and Android tablets. Theoretically, you can also run full graphics software like Photoshop or InDesign, though I haven't had a chance to put that to the test because, as of this writing, there are no Windows 7 or 8 tablets available with the necessary hardware capabilities.

Assuming mobile-app developers embrace Windows 8, through the Windows App Store users can install mobile apps, including digital newsstands that would enable them to read interactive magazine- and digital replica–format publications. Therefore, it may come to pass that Windows desktop and laptop computers, which, as of Windows 8, also have access to the Windows App Store, could finally display richly interactive publications formerly available only on tablets.

Combine Windows tablets' full application support with their heretofore unheard-of multitasking and split-screen application-usage features, and you have a tablet operating system ready to grab a significant—even, perhaps, the top—market share.

webOS

I'm including the Hewlett-Packard TouchPad and its webOS here merely for completeness. Yes, webOS is still out there, though you may be more familiar with its previous name, Palm OS, as in Palm Pilot. Hewlett-Packard bought Palm some time ago and, in 2011, renamed the Palm OS to webOS, which makes sense now that just about every device runs from one's palm.

The first webOS-powered tablet was the HP TouchPad (Figure 1.9), released in June 2011 to riotous critical praise. The TouchPad was declared by some as the "iPad killer" *and* the "Android killer!" Sales were abysmal. Best Buy, which marketed the hell out of the TouchPad including top in-store placement ahead of all other tablets except the iPad, still had 80 percent of its inventory by mid-August. Other retailers had the same result. That same month the TouchPad was discontinued, with HP stating that it was dropping webOS entirely. HP then instructed retailers to sell off their remaining units of the TouchPad for $99 for the 16 GB unit and $149 for the 32 GB

unit. They sold like hotcakes with every retailer selling out within hours. HP received so many orders for the cut-rate TouchPad that it had to do another manufacturing run just to satisfy demand. In October 2011 HP officially stopped taking orders, offering its few remaining units of the TouchPad bundled with new HP laptops.

FIGURE 1.9
The HP TouchPad

Photo courtesy of Hewlett-Packard

The inventory sell-off didn't resurrect or, in the long run, really even help the TouchPad or webOS, but it did prove that lower-priced tablets would sell. If Android tablet-makers or RIM pay attention, they might carve out big tablet market shares for themselves.

In December 2011, HP made webOS *open source*, giving it to the world to do something with. To date, the world hasn't done too much with it—remember that Android is also open source and has already been open for quite some time to tinkering by any interested programmer or company.

As far as digital publishing is concerned, the TouchPad is a blip on the radar—here and then gone. There's no reason to think about targeting epublication design for the TouchPad screen or features. Many TouchPad owners have already hacked the devices to run Android OS, giving them access to Google Play and all the other abilities of an Android tablet. Those who haven't hacked them don't expect new development on the TouchPad; besides, they can at least read EPUBS and PDFs and use HTML5-based publications through a web browser.

Tablet Sizes

Another important factor to consider when designing for tablets is their screen sizes. Because there are not yet any standards, screen sizes vary wildly, though two brackets have become common. First you have full-sized tablets, those with screens around 10 inches diagonally, with resolutions ranging between 2048 × 1536, 1024 × 768, and 1280 × 800. The second common bracket is about 7 inches diagonally, with screen resolutions in the range of 1024 × 600 to 800 × 480; I call these mini-tablets, as they strike me in form and observed consumer usage as being halfway between a smartphone and a full-sized tablet (see Figure 1.10). There are some 5-, 6-, 8-, and 11-inch tablets out there, but most manufacturers seem to be concentrating on the 7- and 10-inch sizes.

FIGURE 1.10
Comparing different device screens at scale. Left to right: an iPhone 4S, an HTC Evo 3D, a Kindle Fire, an iPad 3, and an ASUS Eee Pad Transformer.

Full-sized tablets include the iPad line (9.7 inches), Samsung Galaxy Tab 10.1 (10.1 inches), ASUS Eee Transformer line (10.1 inches), and Motorola XOOM (10.1 inches); they offer a pretty comfortable reading experience for media-rich digital publications. Even with interactive replicas, which are basically print magazines displayed on a tablet screen and don't reflow to fit the screen, reading one page displayed full-screen is comfortable for most people. Reading is almost impossible without pinch-zooming when a full spread is shown on the tablet screen, though. In my experience, full-sized tablets are viable replacements for most tasks formerly handled by laptops, which is what makes them marginally more popular than mini-tablets.

On the other hand, mini-tablets like the original Samsung Galaxy Tab, the Kindle Fire, the NOOK Tablet, the Dell Streak, and the HTC Flyer—all 7 inches—are even more portable than full-sized tablets. Many people love the small form factor, easily deposited in a purse, backpack, or large coat pocket. Typically mini-tablets are used for media viewing (Netflix, YouTube, Hulu, and so on) and general Internet usage (browsing, social media, email), but owners of these devices just as often will read digital publications on them. Naturally, ebooks work great as mini-tablets and are about the size of handheld ereaders, which are themselves about the size of paperback books. Although many digital replicas are available on mini-tablets, media-rich digital publications don't often do great on these devices because such publications tend to be designed specifically for larger screens and resolutions. This leaves mini-tablet owners feeling left out by many publications. As an epublisher, that presents an opportunity for you. Given the popularity of smaller tablets, I strongly suggest designing a version of your publication specifically to fit 7-inch screens—especially in light of the dominance of the very successful 7-inch Kindle Fire.

In seeming opposition to the Kindle Fire's hold of more than half the Android tablet market are figures from comScore measuring web page impressions. In findings released by the digital business analytics in April 2012: "10″ tablets have a 39-percent higher consumption rate than 7″ tablets and a 58-percent higher rate than 5″ tablets."

Computers

You might be tempted to skip this section, thinking it's a no-brainer that standard computers would support all the digital publication classes and be ideally suited to display any type of digital publication you might want to publish. If that's what you're thinking, you'd be in error.

True, there are software-based and in some cases even web-based ereaders available. You can download the Kindle, NOOK, or Kobo ereader software free for Windows, Mac OS X, and even for many flavors of UNIX. You can also read many ebooks directly in your web browser, without installing any software, such as with Amazon's Kindle Cloud Reader. Dozens of other ebook readers—some commercial, most free or open source—abound as well. Adobe even makes one, called Adobe Digital Editions; this ebook reader was bundled with other Adobe software and made available as a standalone download, though it hasn't seen widespread use. Despite the selection of ereader software, the big stores like Amazon's Kindle, Barnes & Noble's NOOK, and Kobo dominate ebook reading on desktop, laptop, and netbook computers just as they rule the handheld ereader class (see Figure 1.11).

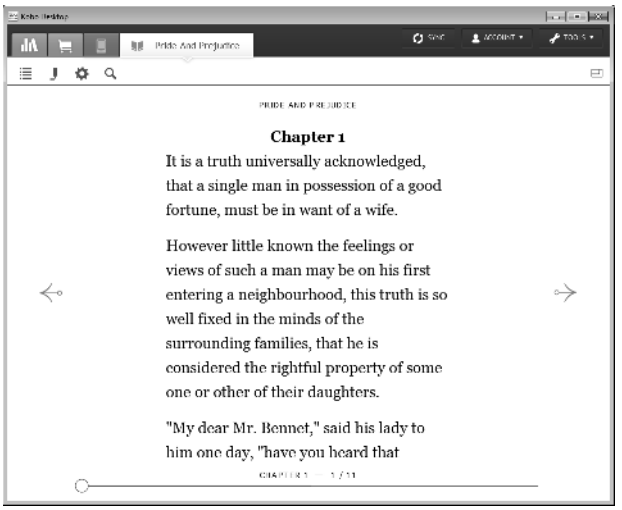


FIGURE 1.11
Kobo Desktop ereader software displaying an ebook (Jane Austen's *Pride & Prejudice*) on a Windows computer

As reading ebooks becomes more popular in general, so does the portion of consumers reading ebooks on computers. This is deceptive, however, because that's the smallest and slowest-growing segment. More and more people are reading ebooks, true, and naturally many of them start out using their office, school, or home computers for that purpose. However, computer monitors are not built to comfortably accommodate extended periods of reading (trust me, I have to write and edit this book on standard monitors). Eventually, the majority of consumers who read more than the occasional ebook tend to purchase either a handheld ereader or a tablet, doing the bulk of their reading on those devices. Thus, as you begin to create ebook content, you may be tempted to design for the flexible, high-resolution, full-color world of computer-based ereaders, but the reality is that only a small portion of your audience is likely to view your publication within that environment. The rest will be using, in order of frequency, the following: handheld ereaders, tablets, and mobile phones.

The shift away from standard computers for reading digital content is being sped along by the fact that app-based interactive magazines are completely unusable on computers. *Sports Illustrated*, *Oprah Magazine*, *Maxim*, *Popular Science*, *Wired*, and a host of other big-brand magazines publish digitally only or primarily in formats that work on tablets, as *folios* or *apps*. To date there are no applications or technologies (beyond previewers as you build your own richly interactive publications) to view media-rich digital magazines (and catalogs, enhanced books,

and so on) or even most digital replica–format publications on standard computers. The fact that hundreds of popular periodicals are available electronically only on tablets increases demand for, and usage of, tablets while simultaneously reducing demand and usage, at least with respect to consuming epublications of all types, on desktop, laptop, and netbook computers.

As a publisher of electronic content, if you want to include computer-based reading in your publications' reach, you have two choices. First, you can create multiple-format editions of your publication, such as app-based for tablets and PDF- or HTML5-based for computers. Alternatively, you could publish exclusively in PDF or HTML5, relying on those formats' almost universal support across devices to present a single edition to a variety of devices. Of course, there are pros and cons to each option, which we'll get into in Chapter 2, "Learning about Digital Publishing Formats."

Mobile Phones

Because one of the main characteristics of EPUB-format ebooks is their ability to reflow and adapt to the size of any screen, many people choose to do some or all of their ebook reading on mobile smartphones. (Personally I can't; I read rather fast, and with so little text fitting on a phone screen, the result is that I'm nearly constantly swiping to advance pages.)

Again, as with computers, Kindle and NOOK dominate these platforms—with one exception. On iOS-based devices such as the Apple iPad, iPhone, and iPod Touch, Apple's own iBooks is the top ebook reader and store. Its library isn't quite as large as Amazon's or Barnes & Noble's, but iBooks offers support for nonstandard epublication formats such as fixed-layout and picture books as well as other unique features.

Of course, anything but fully reflowable ebooks is harder to read on the small screen of a mobile phone than on any other device. Consequently, very few people will use a mobile phone, even if they don't have ready access to a larger-screened device, to read more advanced, more interactive, or fixed-layout publications. Even Apple's own fixed-layout ebooks are almost impossible to read on an iPhone. Thus, the only two viable formats to use in targeting mobile phone readers are EPUB and liquid layout HTML5 (for a discussion of the latter, see my website, `http://iampariah.com`).

Hybrid Devices

A number of hybrid devices out there merge handheld ereader with tablet or tablet with laptop. Ever since their debut, iPads have been the target (victim?) of attempts to create hybrids. The Crux360 pictured in Figure 1.12 is only one of numerous such insert-iPad-to-make-instant-netbook devices. Tablet-laptop hybrids like the ASUS Eee Pad Transformer line are proving quite popular. They are built with rugged, rounded metal backs and, once attached to the optional keyboard dock, complete the transformation into clamshell-style netbook or laptop. The ASUS Eee Pad Slider harkens back to pre-iPad slates by incorporating the keyboard, USB ports, and other standard laptop and netbook features into a device that can be used as a tablet or slid open to function as a netbook. Similarly, Lenovo's IdeaPad was built to easily slip in and out of a clamshell cover to become a netbook. The ThinkPad line of Android tablets, also by Lenovo, some of which include a built-in precision stylus for drawing and writing on-screen with the familiar feel of using a pencil or pen, come with a docking station into which you can connect a full-sized keyboard and mouse, external speakers, microphone, and other devices; the ThinkPad devices are therefore suggesting themselves as replacements to desktop computers, but replacements you pick up and interact with on the go, like slates. Figure 1.12 shows various hybrid devices.

FIGURE 1.12
Numerous tablets are tasked as hybrid devices, either by design or with after-market add-ons.

The Crux360 iPad case with iPad inserted

The Acer Iconia Tab W500 with its keyboard dock

The ASUS Eee Pad Slider

The ASUS Eee Pad Transformer

The Lenovo IdeaPad

The Lenovo ThinkPad with keyboard

Photos courtesy of the device manufacturers

Other hybrid devices fall squarely in one class but borrow features or characteristics from another. One example of the latter is the appearance of crossword puzzles, sodoku, and other games, as well as EPUB-based periodicals, on ereaders. Another example, going the other way, is tablets from ereader manufacturers. The Amazon Kindle Fire, an Android-based 7-inch touchscreen device, is definitely a tablet but one with ebook reading enhancements drawn from the venerable ereader models in the Kindle product line. Amazon built a custom user interface on top of Android, integrating its Kindle store and ereader into nearly every facet of the device's use and encouraging Fire owners to think of the device as an ereader as well as a tablet. Barnes & Noble did much the same with its NOOK Tablet, as did Kobo with its 7-inch Vox tablet, also based on Android (see Figure 1.13).

Kindle Fire | Barnes & Noble NOOK Tablet | Kobo Vox

Photos courtesy of the device manufacturers

FIGURE 1.13 Tablets marketed as more powerful, not-just-reading ereaders, all about the same size as a typical handheld ereader

Future Devices

In the future of digital-publication–delivery devices, we'll see slimmer, lighter devices; devices without practical internal storage; and devices with not just touch interaction but possibly distortion interaction, too. About a dozen different companies, from LG to MIT splinter foundations, have epaper concepts gradually coming to market. These are one-, two-, or full-color displays ranging from about 4 × 6-inches (the average size of a handheld ereader) up to 11 × 17, and they are flexible, rollable, and even foldable. The idea is that content will live in the cloud (yeah, I'm a little sick of that phrase, too, but what can we do?). Instead of storing publications on the device, epaper readers will function more like handheld ereaders do now, with an always-on, dedicated wireless connection similar to today's Kindles, NOOKs, and other ereader devices.

With current ereaders you have to download books, stories, articles, and so on to the device, which are kept in internal storage. Epaper will keep your books and more in the cloud—out on the Internet—and download to the epaper device one page at a time via an always-on background connection. The process will be quick; you won't notice a delay between pages. Some of

the epaper solutions under development actually hold the next page in cache so it's already there when you swipe to it. And most epaper is being developed to be as thin as just a few sheets or even a single sheet of regular copier paper. Some can be rolled up and stuck in your back pocket, while others can be folded and slipped into a wallet. Either way, when you want the latest book, magazine, catalog, or even newspaper, with up-to-the-minute article updates, you just have to open the page again.

These ereaders are coming, and they'll become not only the handheld ereaders of the future but also the tablets. LG Philips debuted its first full-color epaper device in 2007 (the black-and-white version demoed a year earlier). At the Consumer Electronics Expo in 2011, Nokia demonstrated the Kinetic, a full-color smartphone device that includes the obligatory touchscreen but also—pardon the pun—a kinetic interface. Users actually bend the phone to zoom in or out on pictures, web pages, and other content and twist the flexible phone to scroll or move through a list such as a photo album, an email inbox, or the pages of a digital magazine. Blow the Kinetic up to 7 or 10 inches, and you have a flexible tablet—Nokia is already working on that.

These devices are coming—some are here already—but fortunately the operating systems seem to have stabilized for now, with iOS, Android, custom-covered Android a la Amazon's offerings, and Windows 8 being the big four. Given the experience of HP's webOS-based TouchPad and RIM's BlackBerry PlayBook, it's not likely that we'll see other whole mobile operating systems debuting for quite some time. What we will see are improvements and refinements of the ones we already have, more makers following Amazon's lead in creating custom user experiences built atop existing operating systems, and expansions of those mobile operating systems to more and more areas of our lives, with less reliance on standard computers.