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Understanding Android

In mobile device terms, the word *Android* can refer to either an Android device or to the Android operating system. In very simple terms, an Android device is any device that runs the Android operating system. You might also encounter androids from science fiction films and books, which are robots that resemble people, but that's not the type of Android I discuss in this book.

You don't need to understand what Android is or how it works to use it. You can simply turn your device on and start pressing buttons and tapping icons and you'll probably get along just fine. That approach worked just fine for my 3-year-old daughter; she figured it out pretty quickly, much to my dismay. But in case you want a small peek behind the Android curtain, this chapter is for you . . .

Introducing the Android Operating System

Android is the operating system that powers all Android devices. Much like how the Windows operating system powers laptop and desktop computers, or Apple's iOS (formerly known as the iPhone OS) powers iPhones and iPads. Think of it as the underlying software that instructs your device what to do. When you install an Android app onto an Android device, you are installing an app that was written specifically for the Android operating system. You can't install a Windows app on an Android device, and you can't install an Android app onto a Windows computer.



Actually, that last part isn't exactly true. You actually *can* install Android apps onto a Windows computer — and even on Macs and Linux PCs, for that matter — but only if the computer is running a special piece of software called an Android *emulator*, which creates a virtual Android device on your computer. Developers frequently use such emulators to test their apps.

Speaking of Linux, the Android operating system is actually an offshoot of the Linux operating system. Since its inception, however, Android has developed into a robust, independent operating system designed for mobile devices, and it's not actually directly compatible with Linux.

Android is an *open source* operating system, which means that a large community of companies and developers maintain it and contribute toward developing newer versions of it. This all takes place under the auspices of Google, which bought the company (Android, Inc.) that

first developed the Android OS. Unlike Apple's iOS operating system, the Android operating system's ongoing development isn't hidden behind lock and key. In fact, about 80 companies are members of the group — the Open Handset Alliance — that contribute towards the further development of the Android operating system.

Dealing with Fragmentation

All of this openness allows for innovation from many different sources. This also allows for many different Android devices to come in all shapes and sizes — which is great for you, as it gives you lots of options — but it creates a compatibility problem for the app developers. The compatibility issue is such a big problem with Android devices that it's even got a name: *fragmentation*.

Manufacturers are free to modify the Android operating system as they see fit for their devices. This allows the manufacturers a way to differentiate their Android devices from their competitors' devices, by adding unique features. But this also results in different customized versions of Android running on different devices. An example of this is that mobile phone maker HTC inserts its own HTC Sense user interface into many of its Android phones, whereas Samsung puts its own TouchWiz user interface into its Android devices. Figure 1-1 shows a couple of screens from my Samsung Epic 4G Android phone.

Manufacturers also control which version of the Android operating system powers their devices. For instance, when this book was printed, the latest version of Android was version 2.3, which has the nickname “Gingerbread.” (All versions of the Android operating system are named after desserts. Maybe that explains why I always craved sweets while I was working on this book.)

Android 2.3 arrived at the tail end of 2010, but only a mere five months after the previous version, Android 2.2 (“Froyo” or “Frozen Yogurt”) was released. At the end of 2010, despite that Android 2.2 had been available for months, it's estimated that only about 40 percent of all Android devices were running it, while another 40 percent of Android devices were still running Android 2.1 (“Éclair”). The rest were running even older versions, such as Android 1.6 (“Donut”) or Android 1.5 (“Cupcake”).

Just because an update to the operating system is available doesn't mean that a manufacturer is willing or ready to update a device's operating system. My Samsung Epic 4G was running Android 2.1 until early December 2010, when it finally upgraded to Android 2.2 (ironically, just a week before Android 2.3 was officially released). On the other hand, my HTC Incredible has been running Android 2.2 since August 2010 (see Figure 1-2).



Figure 1-1: My Samsung Epic 4G Android phone's home page (left) and one of the app pages (right).

Device Information	
Build Id	ECLAIR.DI18
Device	SPH-D700
Board	SPH-D700
Item	sprint
Fingerprint	sprint/SPH-D700/SPH-D700/SPH-D700:2.1-update1/ECLAIR/DI18:user/release-keys
Model	SPH-D700
Product	SPH-D700
Host	Sprint12
Id	ECLAIR
Tags	test-keys
Time	Sep 17, 2010 10:46 PM
Type	ks80.kim
User	user
Version	DI18
Release	2.1-update1
SDK	7
Device	Power
Storage	Network

Device Information	
Build Id	FRF91
Device	inc
Board	inc
Item	verizon_wwe
Fingerprint	verizon_wwe/inc/inc/Inc:2.2/FRF91/264707:user/release-keys
Model	ADR6300
Product	inc
Host	HPA003
Id	FRF91
Tags	release-keys
Time	Sep 30, 2010 10:01 AM
Type	root
User	user
Version	264707
Release	2.2
SDK	8
Device	Power
Storage	Network

Figure 1-2: My Samsung Epic 4G running Android 2.1 (left), and my HTC Incredible running Android 2.2 (right).

Another big differentiator between devices is the hardware that runs them. Some Android devices have big screens, fast processors, and lots of bells and whistles; other Android devices have tiny displays, slow CPUs, and very few extras. And there are plenty of Android devices that fall in between these two extremes.

All these differences between Android devices wind up creating huge headaches for app developers. They need to try to ensure compatibility on many different devices, using dissimilar hardware, running various versions of the Android operating system, and must take into account any customizations made to the Android operating system by the manufacturers.

The end result, as you might guess, is apps mayhem. In some cases, the apps simply won't run on some devices. Other times, the apps run, but certain features won't work. And in some instances, the apps appear to run fine for a few minutes, but then suddenly stop working. If you read the comments that users leave for the apps in the Android Market, you often see complaints about how some apps won't work on certain devices.

One of the most popular Android apps is the game Angry Birds. It was downloaded over 8 million times in just its first eight weeks. But it didn't come without a hitch. Many users complained that it wouldn't run on their devices, it ran too slowly, or it stopped working. Angry Birds' developer, Rovio Mobile, released several updates to address the compatibility problems, but numerous issues still remained with some devices.

After eight weeks, Rovio Mobile finally conceded on its blog: "Despite our efforts, we were unsuccessful in delivering optimal performance." Rovio Mobile went on to list a handful of Android devices that Angry Birds was known not to be compatible with, but promised that further updates should run better on more devices.

If you want to read more about Angry Birds, check out my review of it in Chapter 7.

Using Android on Devices Other Than Phones

Although the Android operating system is geared for use in mobile devices, this doesn't mean that all Android devices have to be mobile phones. Yes, the majority of Android devices on the market now are phones, but that's starting to change.

Android tablets are becoming increasingly popular, thanks in part to devices such as the 5-inch Dell Streak and the 7-inch Samsung Galaxy Tab (see Figure 1-3). Certainly the popularity of Apple's iPad tablet helped spark some healthy competition on the Android front. In fact, one of the devices I used to evaluate apps for this book was a tablet — the 7-inch CherryPal CherryPad America (C515).



Speaking of fragmentation of Android devices, of the three tablets I mention, the Dell Streak runs Android 1.6 (Donut), the CherryPal CherryPad America (C515) runs Android 2.1 (Éclair), and the Samsung Galaxy Tab runs Android 2.2 (Froyo). If that isn't enough, the Android operating system won't be truly *optimized* to run on tablets until the next version of Android ("Honeycomb"), which is due out sometime in 2011. Is your head spinning yet?



Image furnished by Samsung

Figure 1-3: The Samsung Galaxy Tab Android tablet.

The Android OS powers some portable media players as well, such as the popular Archos 7 home tablet. And let's not forget about e-readers. Barnes & Noble's Nook e-reader device also happens to be powered by the Android operating system.

But before you get too excited about all of these Android devices, I need to reel things back in again, in light of what this book is all about — Android apps. As it just so happens, neither the Archos 7 home tablet nor the Barnes & Noble Nook can access the Android Market. This doesn't mean that it's impossible to install Android apps

on these devices, but doing so involves more convoluted means or outright hacking the devices beyond the manufacturers' intent.

Which brings me to . . .

Shopping at the Android Market

Every app that's reviewed in this book is available from the Android Market. Many of these apps are available from other sources as well, which I get to shortly.

First and foremost, the Android Market is an *app* that comes preinstalled on most Android devices. You can see the icon for the Market app on the home page of my Samsung Epic 4G in Figure 1-1. Fire up the Market app and you can search and browse for apps to install on your device.

Figure 1-4 shows what the Android Market looks like. The image on the left displays what some of the top-paid apps were when I took the screenshot. You can also see the top free apps, apps that were just added to the Market, as well as apps and games by category. Tap the magnifying glass button in the upper-right corner to search for apps by their name, developer, or description.

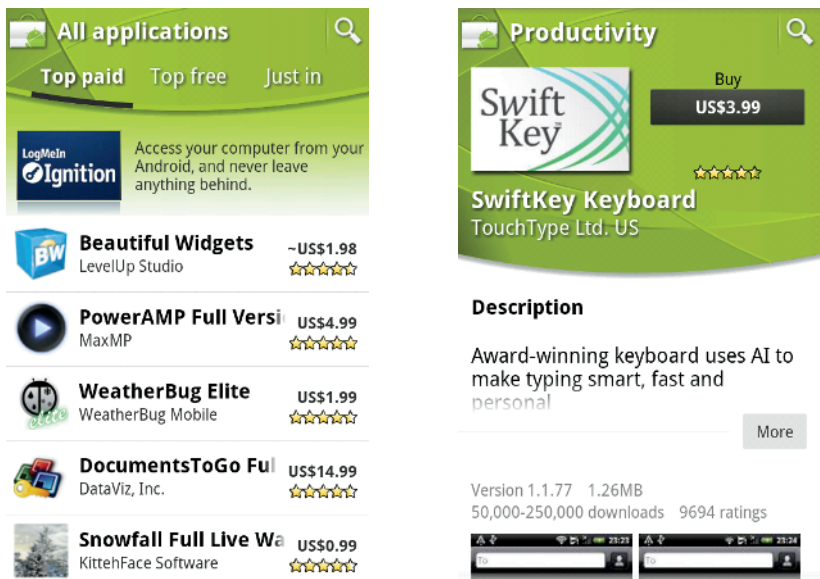


Figure 1-4: Top-paid apps in the Android Market (left); the description page for the SwiftKey Keyboard app (right).

Look closely at the image on the left and you see a tilde character (~) in front of the price for the Beautiful Widgets app. The tilde means that the listed price is approximate. Some apps are sold in currencies other than the U.S. dollar. In the case of Beautiful Widgets, its actual price is €1.49 (1 euro and 49 cents). The Android Market automatically converts the prices of paid apps to your native currency.

Tap the entry of an app in the list to open the description of the app, such as is in the image on the right in Figure 1-4. The description page for an app usually includes an explanation of what the app does, some of its key features, and a couple of screenshots of the app in action. Sometimes you also see information about recent changes or updates, and mentions of other versions of the app, such as trial and pro versions. The version number of the app is provided, as are the size of the app (in KB or MB), and how many times the app has been downloaded. You also find links to see more apps in the Market from the developer, the developer's Web page, and the developer's e-mail address. The very bottom of the page includes a link for you to flag the app as inappropriate, if you feel it contains objectionable content.

There's also a reviews section where you can see comments that users have posted about the app, such as in the image on the left in Figure 1-5. The most recent comments appear at the top of the page; scroll down to see older comments. Every comment also includes a user rating from one to five stars. The average of all the user ratings appears at the top of the page.

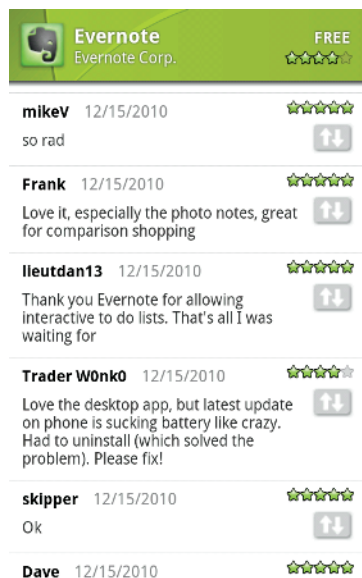


Figure 1-5: The user comments page for the Evernote app (left); the parts of your device that the Facebook can access (right).

Installing apps

If you come across a free app that you want to install, tap the Install button that appears at the top of the app's description page. A new page appears, which lists your device's services that the app can access. For example, the image on the right in Figure 1-5 shows that the Facebook app can access a device's system tools, Internet access, stored personal information, and account information. If you're okay with all this, tap the OK button and the app will install. If not, tap the back button and go find another app.



Before you can access the Android Market, you first have to link your device to a Google account — even if all you want to do is install only free apps. If your device isn't already linked to a Google account and you try to launch the Market app, a page appears that will walk you through linking your device or creating a new Google account. To create a Google account, you need to provide your first and last names and pick a username and password.

Purchasing apps

Remember, some apps cost money. If you want to purchase a paid app, tap the Buy button that appears at the top of the app's description page (refer to Figure 1-4). If the app accesses any services on your device, you'll next see a page informing you what the app will have access to (refer to Figure 1-5). Tap OK on this page and the next page you see is the Google Checkout page (see Figure 1-6)



When this book was printed, the *only* way you could pay for apps in the Android Market was to use the Google Checkout payment service. In the U.S., Google Checkout links your Google account to an American Express, Discover, MasterCard, or Visa account. (If you are a T-Mobile customer, you can also link your Google Checkout account to bill you through T-Mobile.) Outside the U.S., you can link Google Checkout to Solo and Visa Electron accounts. The rumor mills were whispering, however, that it's just a matter of time before additional payment options, such as PayPal, get added to the Android Market.

If your payment information isn't already in Google Checkout, enter it from this page. If your payment info is already in Google Checkout, then as soon as you tap the Buy Now button, you authorize the purchase and the app will be downloaded and installed to your device. If the app is priced using a currency other than your native currency (see the image on the left in Figure 1-7), you see the *actual* price here — be it in U.S. dollars, pound sterling, or euros (see the image on the right in Figure 1-7).

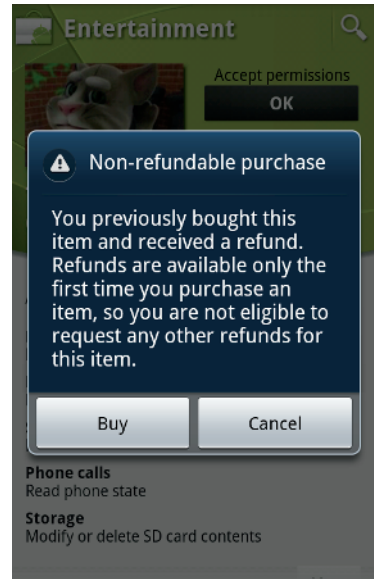
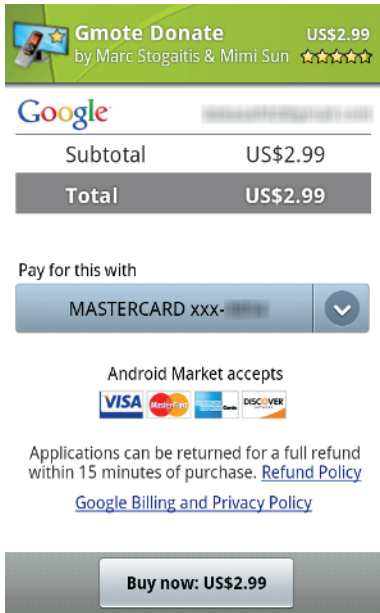


Figure 1-6: Google Checkout (left). Purchase an app a second time (after a refund) and no more refunds are allowed (right).

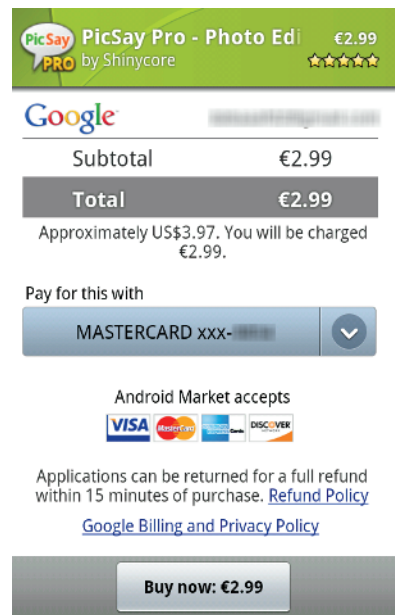
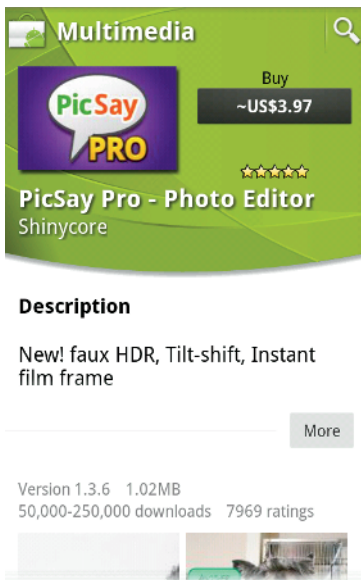


Figure 1-7: The estimated price for the PicSay Pro app listed in U.S. dollars (left); app prices show in their native currency (right) at time of purchase.



One nifty feature of the Android market is that you can choose to return an app for a full refund. Google recently reduced this grace period from 24 hours to 15 minutes, however, so you better decide quickly if you want to keep that app you just purchased.



If you return a paid app for a refund and then later decide that you want to install it again, you no longer are eligible for the grace period (refer to Figure 1-6). If you buy an app for a second time, it's going to be a keeper.



If you keep an app for longer than the grace period, it's yours forever. You can uninstall it and choose to reinstall it months later — even if your device gets completely reset or replaced by a new device. To do this, however, the device must be linked to the same Google account that you used to initially purchase the app.

Buying from Other App Stores

The Android Market isn't the only Android app store in town. Here's a handful of Web sites from which you can also download and install free and paid Android apps directly onto your device. For some, you can download apps directly from the sites using your device's Web browser, whereas for others you need to download the sites' own app-store apps:

- ✓ **AndroidPit:** androidpit.com
- ✓ **Appoke:** appoke.com
- ✓ **GetJar:** m.getjar.com (see Figure 1-8)
- ✓ **Handango:** m.handango.com
- ✓ **SlideMe Marketplace:** m.slideme.org

Many sites enable you to download Android apps onto your computer first and then transfer them to your Android device. Installing an app this way is commonly referred to as *sideloading*. This topic is a bit too advanced for this book, but you can find plenty of details and instructions online for how to do this.



Before you can install Android apps that come from sources other than the Android Market onto your device, you must set your device to permit the installation of non-Market apps. Configure this in your device's settings under Applications (see Figure 1-8).

Android vs. iPhone

Would any discussion of Android be complete without drawing a comparison of it to the iPhone and related devices (such as the iPad and iPod touch)? At their cores, they are similar devices. They're both mobile platforms with infrastructures in place to run free and paid third-party apps that greatly increase the functionality of the devices.

I'm frequently asked which is better, the iPhone or Android? Despite my obvious allegiance to Android, I don't necessarily declare Android the hands-down winner. The way I see it, it's a matter of personal preference — much like how some folks prefer Windows computers and some prefer Macs. Being the uber-geek that I am, I have Android devices *and* I have an iPhone. I also have both Windows and Mac computers. You can call me the *techno-diplomat*.

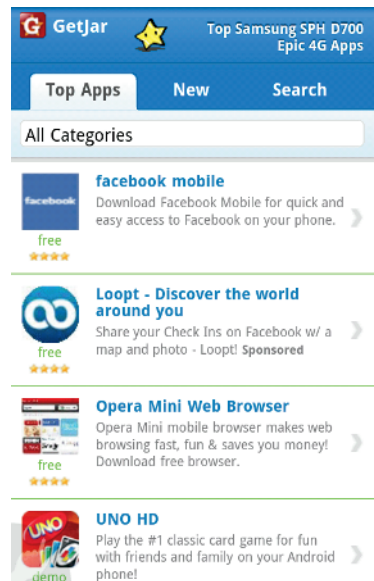
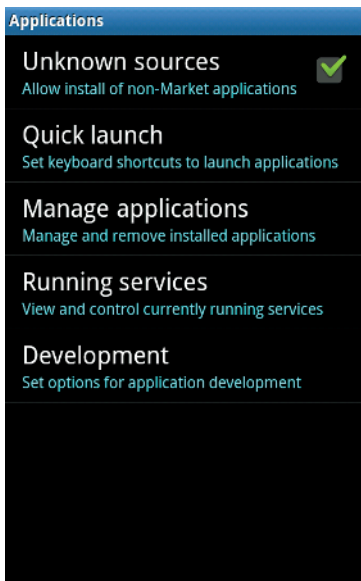


Figure 1-8: Enable the installation of non-Market apps in your device's settings (left). GetJar is an excellent non-Market source for Android apps (right).



Figure 1-9: The iPhone version of WeatherBug Elite app (left), and the Android version (right).

Of course, there are some inherent differences between the iPhone and Android devices, and advocates for both sides will be quick to launch a smear campaign against the other camp. Some accuse Android of not being as secure a platform as the iPhone. Some accuse Apple of stifling innovation by taking such a heavy-handed approach with policing its App Store. Some think Google is far too liberal with how it manages the apps allowed into the Android Market. Some argue that limiting the iPhone to specific service providers is tantamount to giving Apple a virtual monopoly. And so on . . .

You also find many apps that are available for *both* platforms. In some cases, the two versions look and act very similarly. In other cases, the differences are obvious. For instance, the iPhone and Android versions of the WeatherBug Elite app are side-by-side in Figure 1-9. They look different, but which one is better?

So, no, I'm not going to answer any of the questions about which platform, or which app, or which operating system, or which device is better. They're both pretty darn amazing if you ask me! But don't take my word for it—get your hands on an iPhone and try it out. Then spend some time with an Android device and put it through the paces. And while you're at it, why don't you try some of the apps in this book?