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Introduction to Android

Objectives

In this chapter you'll be introduced to:

- The history of Android and the Android SDK.
- The Android Market for apps.
- A review of basic object-technology concepts.
- Key software for Android app development, including the Android SDK, the Java SDK and Eclipse integrated development environment.
- Important Android documentation.
- Test-driving an Android app that enables you to draw on the screen.
- The Deitel online Android Resource Centers.

Outline

1.1 Introduction

Welcome to Android app development! We hope that you'll find working with *Android for Programmers: An App-Driven Approach* to be an informative, challenging, entertaining and rewarding experience. This book is geared toward Java programmers. We use only complete working apps, so if you don't know Java but have object-oriented programming experience in another language, such as C#, Objective-C/Cocoa or C++ (with class libraries), you should be able to master the material quickly, learning Java and Java-style object-oriented programming as you learn Android app development.

The book uses an ***app-driven approach***—we discuss each new technology in the context of complete working Android apps, with one app per chapter. We describe the app and test-drive it. Next, we briefly overview the key ***Eclipse*** (integrated development environment), Java and ***Android SDK (Software Development Kit)*** technologies we'll use to implement the app. For apps that require it, we walk through designing the GUI visually using Eclipse. Then we provide the complete source-code listing, using line numbers, syntax shading (to mimic the syntax coloring used in the Eclipse IDE) and code highlighting to emphasize the key portions of the code. We also show one or more screen shots of the running app. Then we do a detailed code walkthrough, emphasizing the new programming concepts introduced in the app. The source code for all of the book's apps can be downloaded from `www.deitel.com/books/AndroidFP/`. Figure 1.1 lists key online Android documentation.

Title	URL
Android Developer Guide	`developer.android.com/guide/index.html`
Using the Android Emulator	`developer.android.com/guide/developing/devices/emulator.html`
Android Package Index	`developer.android.com/reference/packages.html`
Android Class Index	`developer.android.com/reference/classes.html`
User Interface Guidelines	`developer.android.com/guide/practices/ui_guidelines/index.html`

Fig. 1.1 | Key online documentation for Android developers. (Part 1 of 2.)

Title	URL
Data Backup	`developer.android.com/guide/topics/data/backup.html`
Security and Permissions	`developer.android.com/guide/topics/security/security.html`
Managing Projects from Eclipse with ADT	`developer.android.com/guide/developing/projects/projects-eclipse.html`
Debugging Tasks	`developer.android.com/guide/developing/debug-tasks.html`
Tools Overview	`developer.android.com/guide/developing/tools/index.html`
Publishing Your Apps	`developer.android.com/guide/publishing/publishing.html`
Android Market Getting Started	`market.android.com/support/bin/topic.py?hl=en&topic=15866`
Android Market Developer Distribution Agreement	`www.android.com/us/developer-distribution-agreement.html`

Fig. 1.1 | Key online documentation for Android developers. (Part 2 of 2.)

Read the Before You Begin section following the Preface for information on downloading the software you'll need to build Android apps. The Android Developer site provides free downloads plus documentation, how-to videos (Fig. 1.38), coding guidelines and more. To publish your apps to Google's app marketplace—***Android Market***—you'll need to create a developer profile at `market.android.com/publish/signup`. There's a registration fee and you must agree to the Android Market Developer Distribution Agreement. We discuss publishing your apps in more detail in Chapter 2, Android Market and App Business Issues.

As you dive into Android app development, you may have questions about the tools, design issues, security and more. There are several Android developer newsgroups and forums where you can get the latest announcements or ask questions (Fig. 1.2).

Title	Subscribe	Description
Android Discuss	*Subscribe using Google Groups:* `android-discuss` *Subscribe via e-mail:* `android-discuss-subscribe@googlegroups.com`	A general Android discussion group where you can get answers to your app-development questions.
Stack Overflow	`stackoverflow.com/questions/tagged/android`	Use this list for beginner-level Android app-development questions, including getting started with Java and Eclipse, and questions about best practices.

Fig. 1.2 | Android newsgroups and forums. (Part 1 of 2.)

Title	Subscribe	Description
Android Developers	*Subscribe using Google Groups:* `android-developers` *Subscribe via e-mail:* `android-developers-subscribe@googlegroups.com`	Experienced Android developers use this list for troubleshooting apps, GUI design issues, performance issues and more.
Android Market Help Forum	`www.google.com/support/forum/p/Android+market`	Ask questions and find answers regarding Android Market.
Android Forums	`www.androidforums.com/`	Ask questions, share tips with other developers and find forums targeting specific Android devices.

Fig. 1.2 | Android newsgroups and forums. (Part 2 of 2.)

1.2 Android Overview

The first-generation Android phones were released in October 2008. According to Gartner, North American sales of Android-based phones increased 707% in the first quarter of 2010 over the previous year.[1] By March 2011, a Nielsen study showed that Android had 37% of the U.S. smartphone market share, compared to 27% for Apple's iPhone and 22% for Blackberry.[2] In August 2010, more than 200,000 Android smartphones were being activated each day, up from 100,000 per day only two months earlier.[3] As of May 2011, more than 400,000 Android devices were being activated daily. There are now over 300 different Android devices worldwide.

The Android operating system was developed by Android, Inc., which was acquired by Google in July 2005. In November 2007, the Open Handset Alliance™—a consortium of 34 companies initially and 81 now (Fig. 1.3)—was formed to develop Android, driving innovation in mobile technology and improving the user experience while reducing costs. Android is used in numerous smartphones, e-reader devices and tablet computers.

Open Handset Alliance Members		
Mobile Operators		
Bouygues Telecom	China Telecommunications Corporation	KDDI Corporation
China Mobile Communications Corporation	China United Network Communications	NTT Docomo, Inc.
		Softbank Mobile Corp.
		Sprint Nextel

Fig. 1.3 | Open Handset Alliance members (`www.openhandsetalliance.com/oha_members.html`). (Part 1 of 2.)

1. `www.gartner.com/it/page.jsp?id=1372013`.
2. `blog.nielsen.com/nielsenwire/online_mobile/u-s-smartphone-market-whos-the-most-wanted/`.
3. `www.wired.com/gadgetlab/2010/08/google-200000-android-phones/`.

Open Handset Alliance Members		
T-Mobile	Telefónica	Vodafone
Telecom Italia	Telus	
Semiconductor Companies		
AKM Semiconductor Inc.	Freescale Semiconductor	Qualcomm Inc.
Audience	Gemalto	Renesas Electronics Corporation
ARM	Intel Corporation	
Atheros Communications	Marvell Semiconductor, Inc.	ST-Ericsson
Broadcom Corporation	MediaTek, Inc.	Synaptics, Inc.
CSR Plc.	MIPS Technologies, Inc.	Texas Instruments
Cypress Semiconductor Corporation	NVIDIA Corporation	Via Telecom
Handset Manufacturers		
Acer Inc.	Haier Telecom (Qingdao) Co., Ltd.	Motorola, Inc.
Alcatel mobile phones	HTC Corporation	NEC Corporation
ASUSTeK Computer Inc.	Huawei Technologies	Samsung Electronics
CCI	Kyocera	Sharp Corporation
Dell	Lenovo Mobile Communication Technology Ltd.	Sony Ericsson
Foxconn International Holdings Limited	LG Electronics, Inc.	Toshiba Corporation
Garmin International, Inc.		ZTE Corporation
Software Companies		
Access Co., Ltd.	Myriad	PacketVideo (PV)
Ascender Corp.	Motoya Co., Ltd.	SkyPop
Cooliris, Inc.	Nuance Communications, Inc.	SONiVOX
eBay Inc.	NXP Software	SVOX
Google Inc.	OMRON Software Co., Ltd.	VisualOn Inc.
LivingImage Ltd.		
Commercialization Companies		
Accenture	Sasken Communication Technologies Limited	Teleca AB
Aplix Corporation	SQLStar International Inc.	Wind River
Borqs	TAT—The Astonishing Tribe AB	Wipro Technologies
L&T Infotech		
Noser Engineering Inc.		

Fig. 1.3 | Open Handset Alliance members (`www.openhandsetalliance.com/oha_members.html`). (Part 2 of 2.)

Openness and Open Source

One benefit of developing Android apps is the openness of the platform. The operating system is *open source* and free. This allows you to view Android's source code and see how its features are implemented. You can also contribute to Android by reporting bugs (see `source.android.com/source/report-bugs.html`) or by participating in the Open Source Project discussion groups (`source.android.com/community/index.html`). Nu-