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### Java™ Development on PDAs: Building Applications for PocketPC and Palm Devices

By [Daryl Wilding-McBride](#)

START READING

Publisher : Addison  
Wesley

Pub Date : June 05,  
2003

ISBN : 0-201-71954-  
1

Pages: 256

With the release of Java 2 Micro Edition (J2ME), Sun Microsystems opened Java to the rapidly expanding Personal Digital Assistant (PDA) market.

This comprehensive tutorial and reference provides an in-depth look at developing PDA software with J2ME and PersonalJava, covering both Palm and PocketPC devices. Succinct and practical, *Java(TM) Development on PDAs* focuses on real-world programming tasks with extensive code examples and an end-to-end PDA application demonstrating techniques for integrating devices with the enterprise via Web services.

This book describes the J2ME platform and PersonalJava and discusses design issues specific to resource-constrained devices. It also provides in-depth coverage of networking and Internet access, the user interface, data storage, and integrating PDAs into the corporation.

You will learn to develop Java applications for PocketPC and Palm devices through in-depth coverage of:

- J2ME configurations
- CLDC and CDC profiles
- Selecting a PDA for development
- PDA development tools

- Designing for constrained computational capability
- Designing for constrained screen and memory size
- PDA user interfaces
- Storing information on the devices
- The Generic Connection Framework
- Internet access from a Java PDA application via a GSM phone and Bluetooth
- Accessing Web services from Palm and PocketPC devices

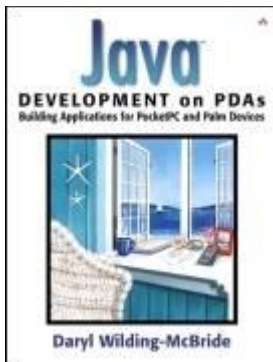
*Java(TM) Development on PDAs* concludes with a look into the future of PDA technology and the expanding role of these devices in the enterprise.

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Visit Addison-Wesley on the Web: [www.awprofessional.com](http://www.awprofessional.com)

*Library of Congress Cataloging-in-Publication Data*

Wilding-McBride, Daryl.

Java development on PDAs : building applications for PocketPC and Palm devices / Daryl Wilding-McBride.

p. cm.

Includes index.

ISBN 0-201-71954-1 (alk. paper)

1. Java (Computer program language) 2. Application software--Development. 3. Pocket computers. I. Title.

QA76.73.J38W54 2003

005.265--dc21

2003050235

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Text printed on recycled paper

1 2 3 4 5 6 7 8 9 10 □ CRS □ 0706050403

First printing, May 2003

## Dedication

*Dedicated to Gemma and Liam, who hope that Daddy doesn't write another book for a*

while.

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## Preface

Java and PDAs are a powerful combination. Although PC sales have arguably peaked, PDAs are very much in a growth phase. In 2003, PDA sales should reach 19.5 million units and go on to reach 35 million units by 2005.<sup>[1]</sup>

<sup>[1]</sup> Source: Info Tech Trends, March 2002, [http://www.infotechrends.com/pda\\_analysis.htm](http://www.infotechrends.com/pda_analysis.htm).

Java is also a huge market, with millions of developers working world-wide in all areas of computing: from mainframes to matchbox-sized Web servers.

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## What This Book Is About

This book is about using Java to develop PDA applications. Having spent many years writing applications initially in C and later in C++, I felt that Java was a giant leap forward when I started using it in November 1995. I wrote this book because I wanted to develop applications for PDAs, but I did not want to go back to writing applications in C. After learning Java and realizing its power for developing a wide range of applications, I did not want to step back. Perhaps you feel the same way.

Aside from one's personal preference for any specific development language, there are numerous business reasons to use Java to develop PDA applications. First, your organization may be already using Java to develop enterprise systems. A large amount of time, money, and effort has probably been invested in building up Java expertise, tools, and resources.

Second, you may be attracted by the ability to write portable applications using Java 2, Micro Edition (J2ME). Just as Java code is portable across platforms supporting the other editions of Java 2 (Enterprise and Standard), applications written for J2ME are portable across platforms supporting the same configurations and profiles. However, it's fair to say that applications written for the Standard and Enterprise editions of Java 2 are more easily portable across platforms than applications written for the Micro edition. This is because, unlike the other editions, Micro edition applications target severely constrained devices. Because the platforms targeted by the Micro edition differ from each other in terms of memory and screen real estate much more than their enterprise and desktop counterparts, configurations and profiles dictate the features that are available on each platform. However, Micro edition applications that are written for one platform that supports a configuration and profile combination are quite portable to other platforms supporting the



same combination. It's a nice feeling to know that an application written for J2ME on a PDA is usable on other devices supporting the same configuration and profile, and vice versa. This is vastly different from writing applications in C or C++ for the same devices. We'll be talking about configurations and profiles in subsequent chapters.

Third, you may wish to re-use simple business logic in your devices applications that has developed for other applications. You may want to check for a valid credit card number on the PDA application, and you may have a corporation-wide standard class for card number validation.

Any or all of these are good reasons to be interested in Java on PDAs.

Once you want to develop PDA applications using Java, you are faced with the secondary decision about which Java to use. There are several options. This book focusses on options that conform to the J2ME and PersonalJava standards because these are open standards for Java on resource-constrained devices. The standards are open because specifications are created as part of the Java Community Process, which is open to all developers for contributions and review of drafts.

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## Scope

The scope of the book includes developing Java applications for the Palm and PocketPC PDAs using J2ME and PersonalJava, respectively. Strictly speaking, PersonalJava is part of the Java 2 Standard Edition (J2SE) family rather than J2ME, but it is included in the book's scope because most PocketPCs come with PersonalJava installed. Additionally, as I write, implementations of the J2ME replacement for PersonalJava (the Personal Profile, which we will discuss in subsequent chapters) have not yet arrived for the PocketPC.

Although the applications presented in this book will run on other platforms, such as mobile phones, the specific intent is to focus on applications that run on PDAs and the considerations a PDA developer should keep in mind.

In the book, we will consider the end-to-end solution for integrating a PDA into the enterprise. As such, the book does include some server-side code.

Not included is coverage of other PDAs, such as the Sharp Zaurus. To make the book manageable, I decided to concentrate on the two dominant products in the PDA market. Also not included is coverage of PocketPCs running operating systems other than WindowsCE, such as iPags that run Linux.

The book does not cover Java-like languages for PDAs such as Waba, since they are not based on the open Java standard.

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## Audience

This book is written for developers who already know Java and who want to write Java applications for PDAs, in particular PocketPC and Palm devices. It is my intention to present the necessary concepts in practical terms, so that a Java developer can pick it up and start writing PDA applications in Java quite quickly. It assumes that you already have some Java experience with the Standard and/or the Enterprise editions.

This is not a book for people interested in learning Java. If that applies to you, I suggest buying an introductory Java book and downloading J2SE from [java.sun.com](http://java.sun.com). Learning Java with J2SE is a much better way to get started.

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## Conventions

Before we get started, I will explain some conventions followed in the book that hopefully make it easier to read and use.

Source code fragments, class and package names, and command-line interactions are displayed in a different typeface and appear *like this*.

Rather than bulking up this volume with page after page of source code listings, I have made the source code available for download from the book's companion Web site at [www.javaonpdas.com](http://www.javaonpdas.com). This allows me to ensure that the most up-to-date code is available. Likewise, I also prefer that the book is taken up with truly useful information. I hope you agree that this is a good idea.

The package naming convention in the source code uses a base name of `com.javaonpdas`, followed by a logical subgrouping based on the purpose of the class.

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## Development Environment

The chapters are intended to be independent of any particular development environment. In [Chapter 3](#), "Setting Up the Development Environment," we discuss the options for a development environment. Whichever environment you initially choose, or to which you subsequently switch, the source code in other chapters will remain useful.

The development platform used in all the examples is Windows. This is not intended to imply that the examples will only work on Windows. The tools Ant, Tomcat, and Axis work on multiple platforms. The J2ME Wireless Toolkit from Sun is also available on Solaris and Linux, and the Palm OS Emulator is available on the Mac and Unix in addition to Windows. Generally, it is noted where tools run on other platforms, but I have not tried to run the

tools on other platforms. I have tried to be platform-neutral as much as possible though, so if you are running a desktop operating system other than Windows the book is hopefully still useful to you.

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## Acknowledgments

I would like to thank Mike Hendrickson at Addison-Wesley, who was enthusiastic about my proposal for this book and decided to take it on. I am grateful to editors Julie Dinicola, Ross Venables, and Ann Sellers for getting me through the writing process and to the A-W production team—Marcy Barnes-Henrie, Scott Dissano, Jacquelyn Doucette, Rob Mauhar, and Sara Connell—for their patience in turning my manuscript into a book.

I appreciate reviewers taking the time to read drafts of the manuscript and provide feedback. In particular, thanks to David Cittadini, David Cuka, Eric Freeman, Brad Jarvinen, Jacob Magun, Louis Mauget, Dan Podwall, and Michael Talley.

Thanks to Paul Manze at Insignia, who provided me some insights into Insignia's view of the PDA market.

Finally, while this book was conceived at about the same time as our second child, it was a much longer labor. A special thanks to my wife Jasley, who supported me through the final push.

Daryl Wilding-McBride  
April 2003

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