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Web Programming Languages Sourcebook

Gordon McComb

with contributions by

Marty Bower and

Mark Robinson

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Dedication

To my dad, for keeping his faith in me.

Acknowledgments

This book turned out to be much more difficult than I had imagined because it's not just on one language, but many. It's a book many of us believed needed to be written, in answer to the endless calls from lost souls who are just getting their feet wet with the Web and programming for it.

I am indebted to the abled assistance of a number of professional programmers who contributed to this book. Marty Bower contributed the chapters on Web programming using Perl and C; Mark Robinson took over the reins on the chapters on Java. Both helped me make my deadlines and greatly enhanced the usefulness of this book.

On the business side, an avalanche of huzzahs for my agent, Matt Wagner, for going out of his way to get the best deal possible, and for Phil Sutherland, Pam Sobotka, Bob Ipsen and Katherine Schowalter of Wiley Computer Books, for being so enthusiastic and supportive of this project.

Finally, had my family—wife Jennifer and children Mercie and Max—not been so understanding, there is no way I could work 'til 2:00 a.m., then sleep until 7:00! I love you all!

Introduction

The World Wide Web comes to life when it's interactive—when it adjusts and conforms based on user input. There are many ways to achieve this interactivity, but in almost all cases, interactivity involves programming of some type. The programming reacts to the user's input and responds accordingly.

Programming requires writing in a language that the computer can understand. A number of programming languages have been developed over the years, with many of them now out of use, either because the computer system they were designed for is archaic or because the language has been replaced by something newer and better.

One reason for the popularity of the World Wide Web is that it does not require the use of any single type of computer. At least three major operating systems provide Web pages. These operating systems are UNIX, Windows, and Macintosh, and different programming languages are available for each. While the choice of computers and operating systems offers variety to those who design and maintain Web pages, it also complicates the issue of programming for the Web.

Web publishers are currently bombarded with a dizzying array of programming language choices. Should you use Perl? Or will a bash or Korn shell script do? Can JavaScript, VB Script, or Java do the job?

This is where the *Web Programming Languages Sourcebook* comes in. This book is your one-step guide to all the popular languages used for Web programming. This unique book describes the important facets of *the most common languages used for publishing on the Internet and World Wide Web*. Each language is covered in enough detail so that you can use that language to build a functional program—even if you are not a professional programmer.

What's Inside the *Web Programming Languages Sourcebook*

This book is about the popular programming languages used for the Internet and the World Wide Web. It is designed to meet the needs of programming "newbies" and those with intermediate experience in programming. You don't need to know

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anything about programming to benefit from this book, but if you do, you'll be able to jump to those chapters of most interest to you. All of the most widely used languages are covered in this book, including:

- UNIX bash shell language
- Perl (under UNIX, Windows, and Macintosh)
- Java
- JavaScript
- VB Script
- C

Why this book is special:

- It takes a unique approach to Web programming by covering all the popular languages.
- It includes chapters on programming fundamentals, in case you're a relative newcomer to the programming scene.
- It details Web progamming for CGI, server-side processes (like counters, shopping carts, user authentication, server maintenance, and databases).
- It covers client-side scripting using the latest versions of JavaScript and VB Script.
- It comes with plenty of examples to show you neat tips, tricks, and secrets that can jazz up your Web pages.

Is This Book for Me?

The *Web Programming Languages Sourcebook* is written for the person already somewhat familiar with the Internet, as well as the general process of electronic publishing of HTML documents on the World Wide Web. But no other special skill or knowledge is assumed. This book can be used by those with little or no programming experience. Of course, the more programming experience you have, the faster you'll be able to learn and use the programming fundamentals covered in this

book. The chapters of this book are organized so that if you already know programming fundamentals you can go straight to learning about the programming language you are interested in. I don't assume you already know programming topics such as expressions, conditionals, variables, and arrays, so I explain these concepts when first introduced. Skip these pages if these topics are familiar to you.

This book is *not* for the Internet newbie. If you don't know what the Web is and if you've never seen a document in HTML format, let alone created one, this book isn't for you. Pick up some good introductory books on the Internet and the Web. Then come back to this one.

This book is for you if:

- You are intrigued by the notion of programming for the Web, but don't have the programming experience to know which language is best suited for what you want to do.
- You want to take advantage of enhanced Web page capabilities, like forms and visit counters.
- You'd like to use an existing program someone else wrote and adapt it to your needs, but you don't understand the programming language that was used to be successful at revising it.
- You want to make your pages dynamic—changing day-to-day or even hour-to-hour!—all on their own.

Where Do I Start?

If you wish you may read this book cover to cover, but it is not necessary. Early chapters lead you through the basics of the Web, CGI, and programming fundamentals. Then additional sections of the book deal with specific programming languages. The final section of the book provides advanced information on integrating languages and adopting existing scripts. Throughout this book you'll find lots of *tips, tricks, and great ideas*—plus plenty of working examples—that will help you on the road to becoming a Web programming master; read the partd that are of interest to you and that match your knowledge level.

I	Start Here
Am new to Web programming, CGI, and other topics	Chapter 1
Am somewhat familiar with the Web, no programming experience	Chapter 3
Want to learn how to program with UNIX shell scripts	Chapter 8
Want to learn how to program in Perl	Chapter 10
Want to learn how to program in Java	Chapter 13
Want to use JavaScript or VB Script	Chapter 15
Want to learn how to program in C/C++	Chapter 17
Am interested in additional programming topics	Chapter 19

Where Do I Learn More About Web Programming?

This book teaches you the *fundamentals* of a dozen of the Web's most popular programming languages. Expect to learn enough about a language to write or revise a basic program, but don't expect to learn everything about the language.

The *Web Programming Languages Sourcebook* Web site provides up-to-date information on Web languages, plus scores of free examples and other goodies. You'll also find additions and corrections for this book. Visit us at: http://gmccomb.com/languages/

If a programming language strikes your fancy, you'll find plenty of additional information on it in your local bookstore and on the Web. The *sources.htm* file included on the CD-ROM that accompanies this book lists a number of source for learning more about Web programming languages. If you're looking for printed books, the publisher would like to recommend the following:

- *The JavaScript Sourcebook* by Gordon McComb
- *C and UNIX* by M. Barrett
- *Developing CGI Applications with Perl* by John Deep

- *The HTML Sourcebook Third Edition* by Ian S. Graham
- *The Java Sourcebook* by Ed Anuff
- *Object-Oriented Programming with REXX* by Tom Ender
- *UNIX System Administrator's Companion* by Michael R. Ault
- *Visual Basic Internet Programming* by William Horton
- *World Wide Web Database Programming for Windows NT* by Brian Jepson

These books are published by Wiley Computer Publishing and are probably just a foot or two away from the shelf where you found this one.

An additional source of information on UNIX programming topics (*bash*, *Tkl* and *Tk*, *Perl*, *sed* & *awk*, and others) is the Nutshell book series, published by O'Reilly & Associates.

Copyright Information

By its nature the Internet is a sharing medium. It's always been that way, and it likely will remain so. This book continues in that spirit. You are welcome to incorporate all or parts of the code you find in this book in your Web pages, for whatever purpose—private or commercial—under the following conditions.

- If you use a program from this book in its entirety, please retain the copyright notice that accompanies it (if any). This goes for programs I (or my contributors) wrote and copyrighted, as well as freeware programs contributed by others.
- You may use portions of programs and make revisions to the code in any way you wish, without including the copyright notice as stated above.
- Redistribution of the programs carrying the copyright of the author is prohibited unless you first get written permission from the publisher and author. So, *don't post these programs on your Web or FTP site, include them in your book, or stuff them away on your BBS unless you check with us first.*
- Programs under the GNU copyright (these are so indicated) may be freely distributed in any form, as long as you adhere to the GNU copyright provisions.

Though certainly not a requirement for using the examples in this book, feel free to provide a link on your page to my Web page at http://gmccomb.com/languages/.

Stuff You Can Probably Skip

Book introductions are notorious for overstating the obvious, and I've probably done that enough already. But it's a good place to put all the "housekeeping chores" necessary when presenting a book. If you're itching to start learning Web programming, then by all means stop reading now and proceed directly to Chapter 1. Otherwise, for the interminably curious here's some semi-useful information you may want to know.

Conventions Used in This Book

Example code is displayed in a special type style, like this:

```
var CurrentRoom = 0;
var TextFrame = parent.frames["text"];
var ResultFrame = parent.frames["result"];
var CtrlFrame=parent.frames["ctrl"];
var Doc = ResultFrame.document;
var RoomVisited = new Array(5);
```

A Note About the CD-ROM

This book comes with a CD-ROM. It contains all the example files and applications detailed in this book, as well as a number of useful Internet tools and utilities. See the Appendix for full details on using the CD-ROM.

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Chapter

1

Programming for the World Wide Web

Technology has a way of changing business. As an example, in the middle 1800s the technology of the train and the Transcontinental Railroad expanded commerce across America. The train connected distant parts of the country, and that link increased the markets for companies that had concentrated until then on only business east of the Mississippi.

With rail service came towns, many of which existed only to service the trains passing through the area. The new towns created local businesses—there were the saloons, of course, but also the village blacksmith, the innkeeper, the livery owner, and more.

Technology once again changed business in the early twentieth century with the advent of the automobile. By the 1940s, cars were commonplace, used for commuting, vacationing, and shopping. More and more roads were built to handle the increased traffic. The United States quickly became a country totally dependent on the automobile and the many businesses it created, including the manufacturing of the car itself, automobile service, gas stations, and road building and maintenance—in short, tens of thousands of new kinds of businesses that hadn't existed before.

You've probably heard this before, but it's likely true: The Internet is poised to change business—and our entire way of living—just as the train and automobile have done. Using the train and automobile as metaphors for the Internet is not accidental. Both the train and automobile are a means of transportation—a way of getting something (goods, produce, people)—from one place to another. Likewise, the Internet is a means of getting something from one place to another. Only this "something" is data. This data can take many forms, all the way from simple text to images, sounds, and movies. There is no piece of information that cannot be transported by the Internet.

Aiding the importance of the Internet is its global reach. The Internet currently uses the telephone network to connect computers from all around the world. This network ensures that almost anyone with phone access can connect to the Internet. (I say almost anyone: because there are still countries in the world where the phone service is too poor to accommodate the high-speed data transfer the Internet requires. Additionally, some countries, for one reason or another, restrict or forbid Internet access to most or all of its citizens.)

The Internet is not one single means of transporting data, but many. E-mail is one of the Internet's most important data transport methods. Every day, millions of electronic messages are shuttled through the Internet's connections. In fact, e-mail has become such a staple of Internet life that in 1996, more e-mails were delivered via the Internet than first-class letters delivered by the United States Post Office!

Another important Internet data transfer method is the World Wide Web, or the Web for short. This relatively recent innovation permits users from all over the world to view documents containing text, graphics, and other multimedia content. People can view "pages" using a Web browser program, such as Netscape Navigator or Microsoft Internet Explorer.

The Web is a virtual magazine or book. Everything is electronic, so no paper, ink, or trucks are needed to deliver heavy books or magazines. Publishers can update their works at a moment's notice, so nothing has to become outdated. Already, the Web has begun to change the way print media are produced and distributed. In the very near future, for example, newspapers and magazines may blur—the traditional role of the newspaper having been overtaken by the almost immediate dissemination of news possible with the Web.

Publishing is only one business opportunity of the Web. Others include catalog sales, real estate sales, visitor or business information, and much, much more. In

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