

Practical JavaScript™, DOM Scripting, and Ajax Projects



Frank W. Zammetti

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Dedicated to all the animals I've eaten over the years, without whom I most certainly would have died a long time ago due to starvation. Well, I suppose I could have been a vegan, but then I'd have to dedicate this to all the plants I've eaten, and that would just be silly because very few plants can read.

To all my childhood friends who provided me with cool stories to tell: Joe, Thad, Meenie, Kenny, Franny, Tubby, Stubby, Kenway, JD, dVoot, Corey, and Francine.

To Denny Crane, for raising awareness of Mad Cow disease.

*Hmm, who am I forgetting? Oh yeah, and to my wife and kids.
You guys make life worth living.*

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About the Author

FRANK W. ZAMMETTI is a web architect specialist for a leading worldwide financial company by day, and a PocketPC and open source developer by night. He is the founder and chief software architect of Omnytex Technologies, a PocketPC development house.

Frank has more than 13 years of “professional” experience in the IT field, and over 12 more of “amateur” experience. He began his nearly lifelong love of computers at age 7, when he became one of four students chosen to take part in the school district’s pilot computer program. A year later, he was the only participant left! The first computer Frank owned was a Timex Sinclair 1000, in 1982, on which he wrote a program to look up movie times for all of Long Island (and without the 16kb expansion module!). After that, he moved on to an Atari computer, and then a Commodore 64, where he spent about four years doing nothing but assembly programming (games mostly). He finally got his first IBM-compatible PC in 1987, and began learning the finer points of programming (as they existed at that time!).

Frank has primarily developed web-based applications for about eight years. Before that, he developed Windows-based client/server applications in a variety of languages. Frank holds numerous certifications, including SCJP, MCSD, CNA, i-Net+, A+, CIW Associate, MCP, and numerous BrainBench certifications. He is a contributor to a number of open source projects, including DataVision, Struts, PocketFrog, and Jakarta Commons. In addition, Frank has started two projects: Java Web Parts and The Struts Web Services Enablement Project. He also was one of the founding members of a project that created the first fully functioning Commodore 64 emulator for PocketPC devices (PocketHobbit).

Frank has authored various articles on topics that range from integrating DataVision into web applications to using Ajax in Struts-based applications, as well as a book on Ajax for Apress. He is currently working on a new application framework specifically geared to creating next-generation web applications.

Frank lives in the United States with his wife Traci, his two kids Andrew and Ashley, and his dog Belle. And an assortment of voices in his head, but the pills are supposed to stop that.

About the Technical Reviewer

■ **HERMAN VAN ROSMALEN** works as a developer/software architect for De Nederlandsche Bank N.V., the central bank of the Netherlands. He has more than 20 years of experience in developing software applications in a variety of programming languages. Herman has been involved in building mainframe, PC, and client/server applications. For the past six years, however, he has been involved mainly in building J2EE web-based applications. After working with Struts (pre-1.0) for years, he got interested in Ajax and joined the Java Web Parts open source project in 2005.

Herman lives in a small town, Pijnacker, in the Netherlands, with his wife Liesbeth and their children, Barbara, Leonie, and Ramon.

About the Illustrator

■ **ANTHONY VOLPE** did the illustrations for this book and the K&G Arcade game. He has worked on several video games with author Frank Zammetti, including Invasion Trivia!, Io Lander, and Ajax Warrior. Anthony lives in Collegeville, Pennsylvania, and works as a graphic designer and front-end web developer. His hobbies include recording music, writing fiction, making video games, and going to karaoke bars to make a spectacle of himself.

Acknowledgments

Many people helped make this book a reality in one form or another, and some of them may not even realize it! I'll try to remember them all here, but chances are I haven't, and I apologize in advance.

First and foremost, I would like to thank everyone at Apress who made this book a reality. This is my second go-round with you folks, and it was just as pleasurable an experience this time as the first. Chris, Matt, Tracy, Marilyn, Laura, Tina, and all the rest, thank you!

A great deal of thanks goes to Herman van Rosmalen, one of my partners in crime on the Java Web Parts project (<http://javawebparts.sourceforge.net>) project, and technical reviewer for this book. I know you put in a lot of time and effort in keeping me honest, and I can't tell you how much I appreciate it! Now, let's get back to work on JWP!

A big thanks must also go to Anthony Volpe, the fine artist who did the illustrations for this book. He and I have been friends for about ten years now, and we have collaborated on a number of projects, including three PocketPC games (check 'em out: <http://www.omnytex.com>), as well as a couple of Flash games (<http://www.planetvolpe.com/crackhead>) and some web cartoons (<http://www.planetvolpe.com/du>). He is a fantastic artist, as I'm sure you can see for yourself, an incredibly creative person, and a good friend to boot.

I would also like to thank those that built some of the libraries used in this book, including all the folks working on Dojo, Sam Stephenson (Prototype), Aaron Newton, Christophe Beyls, and Valerio Proietti of the Mootools team; Bob Ippolito of MochiKit fame; all the YUI developers; and everyone working on script.aculo.us and Rico.

Last but most definitely not least, I would like to thank everyone who bought this book! I sincerely hope you have as much fun reading it as I did writing it, and I hope that you find it to be worth your hard-earned dollars and that it proves to be an educational and eye-opening experience.

As I said, I know I am almost certainly forgetting a boatload of people, so how about I just thank the entire world and be done with it?!? In fact, if I had the technology, I'd be like Wowbagger the Infinitely Prolonged, only with "Thanks!" instead of insults.

And on that note, let's get to some code!

Introduction

So there I was, just minding my own business, when along came a publisher asking me if I'd be interested in writing a book on JavaScript. It seemed like a good thing to do at the time, so I said yes.

I'm just kidding. No one asked me, I just showed up one day on the doorstep of Apress with a manuscript and some puppy-dog eyes. I'm just kidding again.

Seriously though, JavaScript is one of those kids we all knew when we were young who start out really ugly, but whom everyone wants as their beautiful date to the prom years later. Then they go on to Yale, become a district attorney, and suddenly everyone realizes that they really want to be with that person. Fortunately, unlike the DA, JavaScript doesn't involve crimes and misdemeanors, since you know you don't have a chance any other way with the DA!

JavaScript has quickly become one of the most important topics in web development, one that any self-respecting web developer can't do without. With the advent of Ajax, which I'll talk about in this book, JavaScript has very quickly gone from something that can enhance a web site a little to something used to build very serious, professional-quality applications. It's no longer a peripheral player; it's a main focus nowadays.

There are plenty of books on JavaScript and plenty of how-to articles strewn across the intrawebs, any of which can be of great help to you. Far harder to come by though are real, substantial examples. Oh, you can get a lot of simplistic, artificial examples to be sure, but it's more difficult to find full-blown, real-world applications that you can examine. Many developers learn best by tearing apart code, messing around with it a bit, and generally getting their hands dirty with real, working bits. That's why I wrote this book: to fill that gap.

In this book, you will find two chapters on some general JavaScript topics, including a brief history of JavaScript, good coding habits, debugging techniques, tools, and more. From then on, it's ten chapters of nothing but projects! Each chapter will present a different application, explain its inner workings, and offer some suggested exercises you can do to sharpen your skills and further your learning. The projects run the gamut from generally useful (an extensible calculator) to current ideas (a mashup) to just plain fun (a JavaScript game).

In the process, you will learn about a wide variety of topics, including debugging techniques, various JavaScript libraries, and a few somewhat unique and useful approaches to coding. I believe you will also find this to be an entertaining book, and in fact, one of the exercises I suggest from the beginning is to try to pick out all the pop-culture references scattered all over the place (try to place them without looking at the footnotes that accompany most, but not all!). I tried to make this book like an episode of *Gilmore Girls* in that regard (and if you aren't familiar with the show, there's your first pop-culture reference!).

So, enough babbling (for the time being anyway). You know what's coming, so let's stop dropping hints about numbers, Dharma, and bizarre connections between characters (pop-culture reference number 2!), and get on with the good stuff. Let's get on with the show!

An Overview of This Book

This book is divided into two main parts. Part 1, “Say Hello to My Little Friend: JavaScript!,” contains two chapters:

- Chapter 1 is a brief history of JavaScript, from its humble beginning to its current state of acceptance.
- Chapter 2 goes into the techniques and approaches employed by modern-day “professional” JavaScript developers.

Part 2, “The Projects,” contains ten chapters:

- Chapter 3 starts you off with the first project: an extensible, packaged collection of utility functions.
- Chapter 4 develops an extensible calculator and introduces the first JavaScript library, Rico.
- Chapter 5 introduces the concept of a mashup, one of the hottest topics going today, by way of a working example using the very popular `script.aculo.us` library.
- Chapter 6 uses the Dojo library to deal with an issue that comes up frequently in JavaScript development, that of client-side data persistence.
- Chapter 7 explores the very useful JSDigester component of the Java Web Parts project, which allows you to parse XML and create JavaScript objects from it without tedious coding on your part.
- Chapter 8 develops an extensible validation framework for doing client-side form validation in a purely declarative fashion.
- Chapter 9 introduces the Yahoo! User Interface Library and uses it to create a handy little contact manager application.
- Chapter 10 uses the MochiKit library to develop a drag-and-drop shopping cart for e-commerce applications.
- Chapter 11 is where we get into the fun stuff: a JavaScript game! And not a simple little Tetris clone or tile-matching game, but something a fair bit more substantial.
- Chapter 12 is where we have an in-depth look at Ajax, perhaps the biggest reason JavaScript has taken on a whole new level of importance in recent years, using the relatively new Mootools library.

Obtaining This Book’s Source Code

All the examples in this book are freely available from the Source Code section of the Apress web site. In fact, due to the nature of this book, you will absolutely *have* to download the source code before you begin Chapter 3. To do so, visit <http://www.apress.com>, click the Source Code link, and find *Practical JavaScript, DOM Scripting, and Ajax Projects* in the list. From this book’s home page, you can download the source code as a zip file. The source code is organized by chapter.

Obtaining Updates for This Book

Writing a book is a big endeavor—quite a bit bigger than many people think! Contrary to what I claim in private to my friends, I am not perfect. I make my mistakes like everyone else. Not in this book of course. Oh no, none at all.

Ahem . . .

Let me apologize in advance for any errors you may find in this book. Rest assured that everyone involved has gone to extremes to ensure there are none, but let's be real here. We've all read technical books before, and we know that the cold, sharp teeth of reality bite every now and again. I'm sorry, I'm sorry, I'm sorry!

A current errata list is available from this book's home page on the Apress web site (<http://www.apress.com>) along with information about how to notify us of any errors you may find. This will usually involve some sort of telepathy, but my understanding is that Windows Vista Service Pack 1 will include this feature, so rest easy my friends.

Contacting the Author

I very much would like to hear your questions and comments regarding this book's content and source code examples. Please do feel free to email me directly at fzammetti@omnytex.com (spammers *will* be hunted down by Sentinels and disposed of). I will reply to your inquiries as soon as I can, but please remember, I do have a life (no, really, I do . . . OK, no I don't), so I may not be able to reply immediately.

Lastly, and most important, thank you for buying this book! I thank you, my wife thanks you, my kids thank you, my kids' orthodontist thanks you, my dog's veterinarian thanks you, my roofing contractor thanks you . . .