

Ajax FOR DUMMIES®

by Steve Holzner, PhD



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Steve Holzner is the award-winning author of nearly 100 computer books. His books have sold more than 2 million copies and have been translated into 18 languages around the world. He specializes in online topics, especially Ajax, and he has long done commercial Ajax programming.

Dedication

To Nancy, of course!

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Introduction

Making Web applications look and feel like desktop applications is what this book is all about — that's what Ajax does. Although Web development is getting more and more popular, users still experience the nasty part of having to click a button, wait until a new page loads, click another button, wait until a new page loads, and so on.

That's where Ajax comes in. With Ajax, you communicate with the server behind the scenes, grab the data you want and display it instantly in a Web page — no page refreshes needed, no flickering in the browser, no waiting. That's a big deal, because at last it lets Web applications start to look like desktop applications. With today's faster connections, grabbing data from the server is usually a snap, so Web software can have the same look and feel of software on the user's desktop.

And that, in a nutshell, is going to be the future of Web programming — now the applications in your browser can look and work just like the applications installed on your computer. No wonder Ajax is the hottest topic to come along in years.

About This Book

This book gives you the whole Ajax story, from soup to nuts. It starts with a tour of how Ajax is used today, taking a look at some cutting-edge applications (as well as some games). Then, because Ajax is based on using JavaScript in the browser, there's a chapter on how to use JavaScript (if you already know JavaScript, feel free to skip that material).

Then the book plunges into Ajax itself, creating Ajax applications from scratch, from the beginning level to the most advanced. And you'll see how to put many of the free Ajax *frameworks*, which do the programming for you, to work. Because Ajax also often involves using XML, Cascading Style Sheets (CSS), and server-side programming (using PHP in this book), there's also a chapter on each of these topics.

You can also leaf through this book as you like, rather than having to read it from beginning to end. Like other *For Dummies* books, this one has been designed to let you skip around as much as possible. You don't have to read the chapters in order if you don't want to. This is your book, and Ajax is your oyster.

Conventions Used in This Book

Some books have a dozen dizzying conventions that you need to know before you can even start. Not this one. All you need to know is that new terms are given in italics, like *this*, the first time they're discussed. And that when new lines of code are introduced, they're displayed in bold:

```
function getDataReturnText(url, callback)
{
    var XMLHttpRequestObject = false;

    if (window.XMLHttpRequest) {
        XMLHttpRequestObject = new XMLHttpRequest();
    } else if (window.ActiveXObject) {
        XMLHttpRequestObject = new
        ActiveXObject("Microsoft.XMLHTTP");
    }
    .
    .
    .
}
```

Note also that code that's been omitted has been indicated with three vertical dots. That's all there is to the notation in this book.

Foolish Assumptions

I don't assume that you have knowledge of JavaScript when you start to read this book, but you do have to know JavaScript to understand Ajax. Chapter 2 presents all the JavaScript you'll need in this book.

Also, Ajax often involves some server-side programming, and this book, as most books on Ajax do, uses PHP for that. You won't need to know a lot of PHP here, and what PHP there is is pretty self-explanatory, because it's a lot like JavaScript. However, there's a whole chapter on PHP, Chapter 10, and you can always dip into it at any time.

However, you should have some HTML prowess — enough to create and upload to your server basic Web pages. If you feel shaky on that point, take a look at a good book on HTML, such as *HTML 4 For Dummies*, 5th Edition, by Ed Tittel and Mary Burmeister (published by Wiley).

How This Book Is Organized

Here are the various parts that are coming up in this book.

Part I: Getting Started

Chapters 1 and 2 get you started on your tour of Ajax. Here, you get an overview of how Ajax is used today, and what it has to offer. There are many applications available that use Ajax, and you see a good sampling in this part. Then you get a solid grounding in JavaScript, the programming language Ajax is built on. (If you're already a JavaScript Meister, feel free to skip this material.) To use Ajax, you have to use JavaScript, and in this part, you build the foundation that the rest of the book is based on.

Part II: Programming in Ajax

In Chapters 3 and 4, you delve into Ajax programming for real. Here, you see how to grab data from the server — whether that data is plain text or XML — and how to put that data to work. To illustrate how these techniques work, you see plenty of examples using Ajax, Dynamic HTML to update Web pages without needing a page refresh, and even advanced techniques like connecting to Google behind the scenes for real-time same-page Web searches. At last but not least, you find out how to support multiple Ajax requests to your server at the same time.

Part III: Ajax Frameworks

Ajax can involve a lot of programming involved, and Part III takes a look at some of the many shortcuts that are available. Rather than reinventing the wheel yourself, you can use the Ajax *frameworks*. These frameworks are free and do most of the programming for you, so you'll definitely want to check out this part. You can find all kinds of Ajax techniques, such as using Ajax for drag-and-drop operations, pop-up menus, downloading images behind the scenes, and more.

Part IV: In-Depth Ajax Power

Chapters 8 to 10 give you even more of the Ajax story. Chapter 8 is all about working with XML in JavaScript, and that's what you often do in Ajax. In this chapter, you discover how to deal with XML documents that can get pretty complex, extracting the data you want, when you want it.

Chapter 9 gives you the story on Cascading Style Sheets (CSS), which offer all kinds of options (such as creating pop-up menus) to display the data you fetch from the server using Ajax techniques. Because using Ajax means displaying data in a Web page without a page reload, using CSS is a big part of Ajax programming.

Chapter 10 is about another big part of Ajax programming — writing code for the server so that you can send data back from the server to the browser. Like most Ajax books and Ajax samples you can find on the Internet, this book uses PHP on the server. You won't need to know PHP to read this book, but it'll help when you start using Ajax yourself, so Chapter 10 gives you a foundation in writing and working with PHP.

Part V: The Part of Tens

No *For Dummies* is complete without a Part of Tens. Chapter 11 is all about ten Ajax design issues you're going to run into — and what to do about them. For example, working with web pages interactively, as Ajax does, means that the browser's Back button isn't going to work if the user wants to undo a recent update. You'll find some of the solutions that have been attempted discussed in Chapter 11.

Chapter 12 introduces you to ten essential Ajax resources. Knowing where to find these resources, and the Google groups and Ajax discussions on the Internet, will let you join the worldwide Ajax community.

Icons Used in This Book



You'll find a handful of icons in this book, and here's what they mean:

Tips point out a handy shortcut or help you understand something important to Ajax programming.



This icon marks something to remember, such as how you handle a particularly tricky part of Ajax.



This icon means that what follows is technical, insider stuff. You don't have to read it if you don't want to, but if you want to become an Ajax pro (and who doesn't?), take a look.



Although the Warning icon appears rarely, when you need to be wary of a problem or common pitfall, this icon lets you know.



This icon lets you know that there are some pretty cool Web resources out there just waiting for you to peruse. (In fact, one little corner of the Net, www.dummies.com/go/ajax, has the code for this book available for free download.)

Where to Go from Here

Alright, you're all set and ready to jump into Chapter 1. You don't have to start there; you can jump in anywhere you like — the book was written to allow you to do just that. But if you want to get the full story from the beginning, jump into Chapter 1 first — that's where all the action starts. (If you're familiar with what Ajax is and are already quick with JavaScript, you might want to flip to Chapter 3 to start tinkering with the code that makes Ajax go.)

Part I

Getting Started

The 5th Wave

By Rich Tennant



"I can't really explain it, but every time I animate someone swinging a golf club, a little divot of code comes up missing on the home page."

In this part . . .

This part introduces you to Ajax. You get a guided tour of the Ajax world here, and you get a chance to see how Ajax is used today. A good sampling of Ajax applications are on view in Chapter 1, just waiting for you to check them out for yourself so you can see what Ajax has to offer. From autocomplete and live searches to Google Maps, I pack a lot of Ajax in here. Next comes Chapter 2, which provides the JavaScript foundation that the rest of the book relies on. If you already know JavaScript, feel free to skip that material, but otherwise, take a look. Ajax is built on JavaScript, so you want to make sure you've got all the JavaScript you need under your belt before going forward.

Chapter 1

Ajax 101

In This Chapter

- ▶ Introducing how Ajax works
 - ▶ Seeing Ajax at work in live searches, chat, shopping carts, and more
-

We aren't getting enough orders on our Web site," storms the CEO. "People just don't like clicking all those buttons and waiting for a new page all the time. It's too distracting."

"How about a simpler solution?" you ask. "What if people could stay on the same page and just drag the items they want to buy to a shopping cart? No page refreshes, no fuss, no muss."

"You mean people wouldn't have to navigate from page to page to add items to a shopping cart and then check out? Customers could do everything on a single Web page?"

"Yep," you say. "And that page would automatically let our software on the server know what items the customer had purchased — all without having to reload the Web page."

"I love it!" the CEO says. "What's it called?"

"Ajax," you say.

Welcome to the world of Ajax, the technology that lets Web software act like desktop software. One of the biggest problems with traditional Web applications is that they have that "Web" feel — you have to keep clicking buttons to move from page to page, and watch the screen flicker as your browser loads a new Web page.

Ajax is here to take care of that issue, because it enables you grab data from the server without reloading new pages into the browser.

How Does Ajax Work?

With Ajax, Web applications finally start feeling like desktop applications to your users. That's because Ajax enables your Web applications to work behind the scenes, getting data as they need it, and displaying that data as you want. And as more and more people get fast Internet connections, working behind the scenes to access data is going to become all the rage. Soon, it'll be impossible to distinguish dedicated desktop software from software that's actually on the Internet, far from the user's machine. To help you understand how Ajax works, the following sections look at Ajax from a user's and a programmer's perspective.

A user's perspective

To show you how Ajax makes Web applications more like desktop applications, I'll use a simple Web search as an example. When you open a typical search engine, you see a text box where you type a search term. So say you type Ajax XML because you're trying to figure out what XML has to do with Ajax. Then, you click a Search the Web button to start the search. After that, the browser flickers, and a new page is loaded with your search results.

That's okay as far as it goes — but now take a look at an Ajax-enabled version of Yahoo! search. To see for yourself, go to <http://openrico.org/rico/yahooSearch.page>. When you enter your search term(s) and click Search Yahoo!, the page doesn't refresh; instead, the search results just appear in the box, as shown in Figure 1-1.

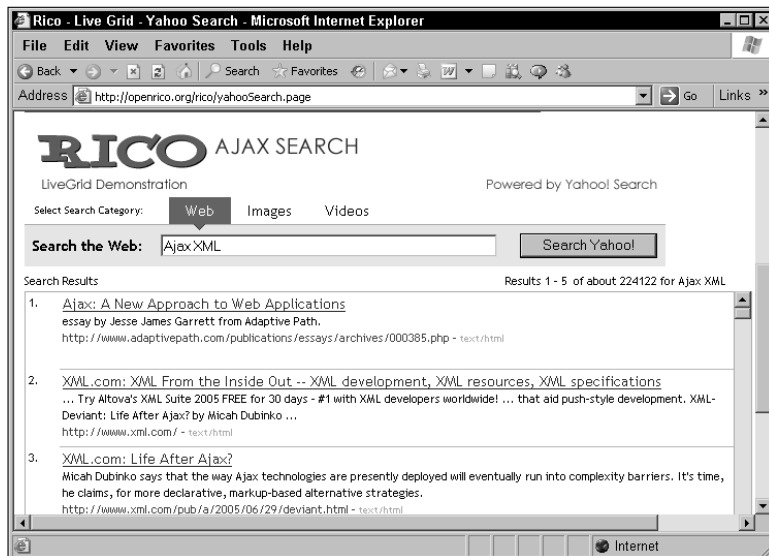


Figure 1-1:
An Ajax-enabled
Yahoo!
search.

That's the Ajax difference. In the first case, you got a new page with search results, but to see more than ten results, a user has to keep loading pages. In the second case, everything happens on the same page. No page reloads, no fuss, no muss.



You can find plenty of Ajax on the <http://openrico.org> Web site. If you're inclined to, browse around and discover all the good stuff there.

A developer's perspective

In the article “Ajax: A New Approach to Web Applications” (www.adaptivepath.com/publications/essays/archives/000385.php), Jesse James Garrett, who was the first to call this technology Ajax, made important insights about how it could change the Web. He noted that although innovative new projects are typically online, Web programmers still feel that the rich capabilities of desktop software were out of their reach. But Ajax is closing the gap.

So how does Ajax do its stuff? The name *Ajax* is short for Asynchronous JavaScript and XML, and it's made up of several components:

- ✓ Browser-based presentation using HTML and Cascading Style Sheets (CSS)
- ✓ Data stored in XML format and fetched from the server
- ✓ Behind-the-scenes data fetches using `XMLHttpRequest` objects in the browser
- ✓ JavaScript to make everything happen

JavaScript is the scripting language that nearly all browsers support, which will let you fetch data behind the scenes, and XML is the popular language that lets you store data in an easy format. Here's an overview of how Ajax works:

1. In the browser, you write code in JavaScript that can fetch data from the server as needed.
2. When more data is needed from the server, the JavaScript uses a special item supported by browsers, the `XMLHttpRequest` object, to send a request to the server behind the scenes — without causing a page refresh.

The JavaScript in the browser doesn't have to stop everything to wait for that data to come back from the server. It can wait for the data in the background and spring into action when the data does appear (that's called *asynchronous* data retrieval).

3. The data that comes back from the server can be XML (more on XML in Chapters 2 and 8), or just plain text if you prefer. The JavaScript code in the browser can read that data and put it to work immediately.

That's how Ajax works — it uses JavaScript in the browser and the `XMLHttpRequest` object to communicate with the server without page refreshes, and handles the XML (or other text) data sent back from the server. In Chapter 3, I explain how all these components work together in more detail.

This also points out what you'll need to develop Web pages with Ajax. You'll add JavaScript code to your Web page to fetch data from the server (I cover JavaScript in Chapter 2), and you'll need to store data and possibly write server-side code to interact with the browser behind the scenes. In other words, you're going to need access to an online server where you can store the data that you will fetch using Ajax. Besides just storing data on the server, you might want to put code on the server that your JavaScript can interact with. For example, a popular server-side language is PHP, and many of the examples in this book show how you can connect to PHP scripts on Web servers by using Ajax. (Chapter 10 is a PHP primer, getting you up to speed on that language if you're interested.) So you're going to need a Web server to store your data on, and if you want to run server-side programs as well, your server has to support server-side coding for the language you want to work with (such as PHP).

What Can You Do with Ajax?

The technology for Ajax has been around since 1998, and a handful of applications (such as Microsoft's Outlook Web Access) have already put it to use. But Ajax didn't really catch on until early 2005, when a couple of high-profile Web applications (such as Google Suggest and Google Maps, both reviewed later in this chapter) put it to work, and Jesse James Garrett wrote his article coining the term Ajax and so putting everything under one roof.

Since then, Ajax has exploded as people have realized that Web software can finally start acting like desktop software. What can you do with Ajax? That's what the rest of this chapter is about.

Searching in real time with live searches

One of the truly cool things you can do with Ajax is live searching, where you get search results instantly, as you enter the term you're searching for. For example, take a look at <http://www.google.com/webhp?complete=1&hl=en>, the page which appears in Figure 1-2. As you enter a term to search