

Making Everything Easier!™

Semantic Web

FOR

DUMMIES®

Learn to:

- Recognize how Semantic Web differs from the traditional Internet
- Decide whether it's right for your business
- Make sense of the technology with simple hands-on exercises
- Identify applications for Semantic Web technology

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Introduction

In the Semantic Web community, there is a distinct feeling of manifest destiny. Here in the early part of the 21st century, the Web is still in its infancy (less than twenty years old) and the scope of unsolved digital data challenges is simply enormous. To many in the software industry, myself included, it seems inevitable that the next great Web revolution must address these universally acknowledged data problems.

In the face of exponentially rising volumes of digital data, our existing software solutions simply fail to provide any meaning or understanding among all that digital noise. Today, many thousands of Semantic Web developers, architects, and visionaries are working to bring meaning to a very messy world of digital data.

Semantic Web is not only a vision, but also a technology, a social phenomenon and a Web-scale architecture. This book aims to describe all these aspects of the Semantic Web.

About This Book

I want this book to be an unimposing yet comprehensive introduction to the Semantic Web. It is not intended to be a programmer's desk reference or exhaustive how-to book. This book is written for savvy technologists and forward-thinking business people who want to see the whole picture, while still being firmly grounded in the fundamentals and reality of an emerging technology.

Because the Semantic Web is a revolutionary path forward for data processing and metadata specifications, it will have an exceptionally broad impact on every aspect of all types of software.

In order to be truly comprehensive, this book explores the social, consumer, business, and purely technical impacts of the Semantic Web. Unlike many programming language books that you may have read before, this book will cover the visionary and architectural aspects of Semantic Web in addition to the specific technology languages and programming specifications.

Conventions Used in This Book

Just about every technical book starts with a little typeface legend, and *Semantic Web for Dummies* is no exception. What follows is a brief explanation of the typographical conventions used in this book:

- * New terms are set in *italics*.
- * When I want you to type something short or perform a step, I use **bold**.

- * You will also see this `monospace` font. I use the `monospace` font for code, filenames, Web page addresses (URLs), on-screen messages and other such things. Also, if something you need to type is really long, it appears in `monospace` font on its own line or lines.
- * You will notice that for many code examples used in this book, some verbose and unimportant syntax items may be omitted or shortened. For example, in an RDF header, an http namespace may appear as `⋈:SomeName`, in this case, the `⋈` is referring to “any namespace” and no particular namespace is important for the example.

Foolish Assumptions

When I wrote this book, I made a few assumptions about you, the reader. If one of these assumptions is incorrect, you should be fine. If all of these assumptions are incorrect . . . well, you should buy this book anyway and give it to someone who fits the profile! (Hey, I need the money for my kids' college fund!)

- * **I assume that you have access to a computer.** This book contains a number of working examples that you can build, validate, and execute using online resources on the Web. A number of chapters in this book provide content or examples that might require to you check a Web site.
- * **I assume that you know little or nothing about the Semantic Web.** This book is not an “all things to all people” book: It is squarely aimed at the technically savvy, curious individual who is a novice to the Semantic Web. If you are brand-new to the world of semantic computing, this is the book for you.
- * **I assume that you can think logically.** You don't have to be a developer for this book to be worthwhile for you, but you have to have some semblance of structured thinking. So much of the Semantic Web is based on formal logic, that although I don't teach math in this book, you better be ready to think in a highly organized manner to keep up with the examples!
- * **I assume that you have some knowledge of the Web, business software systems, or ideally both.** Just because this book is aimed at the Semantic Web novice doesn't mean it is a good book for the average technology-hating Luddite. To get the most out of this book, you should already be pretty familiar with the basic technical aspects of the Web (HTML, HTTP, and so on) and be familiar with the business software systems (databases, XML, transaction systems, and so on). Understanding why the Semantic Web is cool depends on having some of that basic knowledge for why the existing technology isn't perfect.

How to Use This Book

I wish I could say that you can open this book up to any page and immediately begin to be productive coding the Semantic Web. In one sense this is true, the code examples in each chapter allow you to write your own little corner of the Semantic Web, but a significant portion of this book is dedicated to explaining the bigger picture about the Semantic Web. In order to understand why the code you are writing is different and better than the code you could have written with Java or XML, the bigger picture of how things fit together is very important.

In this book, I have divided the content into manageable chunks. You can jump straight to the programming parts of the book, or read about the social implications of the Semantic Web in business and on the Web. Most chapters are very modular, meaning that you can skip around to the chapters that interest you, or you can read

it from front to back. When I need to refer to content from another chapter, I include a note for you to reference where you can find more details.

In general, my recommendation is

- * If you already know something in one of the chapters, don't bother reading about it.
- * If you are curious or impatient, don't feel bad about skipping ahead, you can always back up and skim an earlier chapter if you need to.

How This Book is Organized

Writing a book about the Semantic Web in 2008 is like writing a book about the Internet in 1995 – in addition to the details about technology at a moment in time, a substantial part of the book needs to explain how vastly different the future will be, and how to prepare for that future.

The impact of the Semantic Web will be felt for decades to come. This book is organized in such a way to help the reader understand just how much the world of data will soon change, why the technology enables these changes, and exactly how to use the programming languages to make those changes.

This book is divided into the following Parts:

Part I: Welcome to the Future of Data and the Web

The chapters in Part I introduce you to the full scope and potential of the Semantic Web. Chapter 1 is a comprehensive introduction to the vastness of the Semantic Web focusing on the differences between consumer and business adoption styles. Chapter 2 explores how the typical Internet user will feel the effects of the Semantic Web, while Chapter 3 stresses the variety of ways businesses will change when Semantic Web data becomes more pervasive.

Part II: Catch the Wave of Smart Data Today

This part shows you today's Semantic Web technology with some easy examples and then explains why the new languages are so powerful for Web sites and businesses. Chapter 4 is a quick primer on Semantic Web technology specifications. Chapter 5 provides detailed examples of how the technology is different than anything that came before and Chapter 6 describes in detail why Semantic Web metadata is the key enabler for massive software benefits.

Part III: Building the Semantic Web

Sometimes the Semantic Web can seem very complicated. In this part of the book I will simplify the Semantic Web by breaking it down into manageable steps that are easy to learn. Chapter 7 and 8 help you learn how to program RDF and OWL, while Chapter 9 describes how business rules fit into the picture.

Part IV: Putting the Semantic Web to Work

There are a myriad of ways the effects of Semantic Web will be felt in the workplace. New kinds of jobs will appear. New business processes, technology architectures, and procurement strategies will evolve as a consequence of Semantic Web adoption. Part IV looks at some of the managerial, architectural and lifecycle challenges to prepare yourself for in the coming years. I will also introduce some of the definitive case studies of early Semantic Web success.

Part V: The Part of Tens

The Part of Tens is where you can easily find answers to those common questions about the Semantic Web. Chapter 15 clarifies some of the most prevalent misconceptions about the Semantic Web. Chapters 16 and 17 provide guideposts for finding today's state of the art Semantic Web examples and also for gauging where the future advances will lead us.

Icons Used in This Book

A big part of writing a Dummies book is the style and simplicity of how the content is presented. As such, there are some elemental icons used in this book to help you scan and dissect the key parts of the book. Here's a list of the icons used in this book:

<Tip>

A tip is an extra piece of information – something helpful that the other books may forget to tell you.

<Warning>

Everyone makes mistakes. Goodness knows that the Semantic Web is easier than most things to make mistakes with. When I think of a mistake that people are especially prone to make, I mark it with a Warning icon.

<Remember>

I am as forgetful as anybody. Keys, names, addresses – I forget them all. There are lots of details in the Semantic Web that ought to be remembered, especially compared to other technologies. When I want to stress a point to be remembered, I use the Remember icon.

<TechnicalStuff>

Sometimes it is easy to dive too deep into the technical stuff, especially in an introductory book like this. For the more advanced readers, these may be the most interesting parts, or for the real novice, you might want to skip on by. In either case, the technical commentary is denoted with the Technical icon.

<Soapbox>

I've been working in the Semantic Web area for a long time, so my thoughts and opinions are certainly worthwhile (in my humble opinion, of course!) but I want to provide you the reader with some interesting thoughts from other experts too. The Soapbox icon signifies a part of the text where an industry expert sounds off about a particular topic. This will be a fun and useful place for you to get a range of different ideas about a topic.

Where to Go from Here

If you've gotten this far, it is time to start reading about the Semantic Web. Think of me as your personal guide through this complex topic. I will do everything I can to simplify your experience, keep you interested and entertained, while still giving you the useful information that you want (or I presume you wouldn't be reading this book!). If you like what you read and want to send me a note, please send me an e-mail at jeff@semanticwebfordummies.com.