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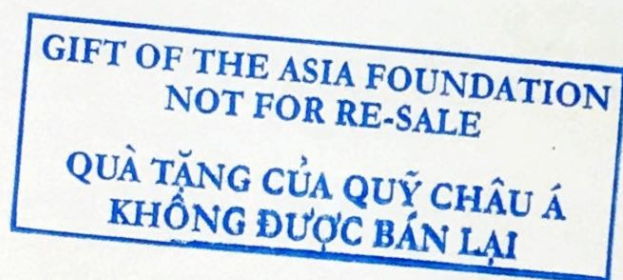
PROGRAMMING THE WEB

USING XML

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Programming the Web Using XML



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Preface

To the Student

This book gives a simple but extensive introduction to XML with its many derivations. The textbook contains everything necessary to learn XML and build on that basic understanding to understand how many different aspects of the Web and other display and nondisplay devices XML encompasses. If you are a Web developer, database administrator, graphic designer, system administrator, or even a computer-science pundit, this book is essential for you to grasp both the subtle and wide reach of XML in today's dynamic and changing technology environment.

Initially the Web dealt primarily with plain text and images through the use of HTML. The necessity for working with data in any form other than straight pages of typed information was an afterthought. XML has taken the art of data in its many forms to a new level. All student levels should be able to comprehend how XML newly defines data and how that data can be put to new and varied uses. After comparing HTML, XHTML, and XML, this book looks at creating Document Type Definitions and schemas and examines checking that information through the use of XML parsers and the expanded role of the multilingual capabilities of Unicode. It examines the role of the Document Object Model and then shows how to style basic XML through Cascading Style Sheets, eXtensible Style Sheets, and the linking of documents. The last section of the book examines the more complex subjects of Scalable Vector Graphics, Synchronized Multimedia Integration Language, databases, and, finally, the expanding use of Web Services. After completing all the chapters, exercises, and projects, you not only should be knowledgeable about XML, but also should be able to begin implementing it in your own projects.

The basic structure of XML and the enthusiasm with which the software development community has welcomed it makes XML certain to be around for many years. Whether you are working with only raw data or sophisticated media presentations, XML is certain to be involved with some part of your project planning. XML statements can be written in a simple text editor or in a sophisticated editor such as XML Spy. Many software vendors are integrating XML into their new releases in new and unexpected ways. The examples, exercises, projects, and code samples in this book will give you a solid foundation to understand any new uses of XML that will show up in the future, knowledge that will not become irrelevant after just a year or two.

To the Teacher

The students do not need a programming background to begin to grasp the concepts and uses of XML, though they do need to understand how to navigate and use the Web. After the core components of elements and attributes are understood, a student can begin to make rudimentary statements. Because XML touches on so many areas, students who are not computer science majors can greatly benefit from this book as well as those starting out in that field.

Each chapter breaks down into fundamental programming concepts about a specific aspect of XML, something that was unimaginable just five years ago, when XML was just emerging as a standard. Using the coding examples, students will very quickly learn how to code and correct their mistakes. The Hands On Projects at the end of the chapters build on the core concepts developed in the chapter and real-world examples are also used to illustrate more sophisticated uses in a business or enterprise environment. This book is an overview of many aspects of XML but does not delve too deeply into the technical side, as there are other texts designed to do that. What it does do is give a thorough introduction to XML and allow students to use that knowledge to build on.

Each chapter leads to the next and there are always examples from real life to reinforce the lessons. Each chapter highlights key vocabulary terms and also asks relevant questions, points out technical tips, and supplies specialized alerts and advice.

Following is a short outline describing the contents of all of the chapters.

- Chapters 1, 2, and 3 go over the basic structure of XML and show how to write simple XML statements. The chapters then go on to compare and contrast XML, HTML, and XHTML. Chapter 1 discusses the history of XML and how it works with multiple platforms and devices to share content. Chapter 2 shows how XHTML documents differ from HTML and investigates namespaces. Chapter 3 shows the overall structure of an XML document; looks at the difference between well-formed and valid XML; and examines elements, attributes, entities, and comments within the context of Document Type Definitions. After completing these chapters, students will be familiar with SGML, XHTML, DTDs, well-formed and valid XML, simple DTDs, elements, attributes, entities, and comments.
- Chapters 4, 5, and 6 cover how to build a Document Type Definition and related XML Schemas and how these files are parsed through different editors. They also look at XML's multilanguage capabilities through the use of Unicode. Chapter 4 shows the basic function and syntax of a Document Type Definition and its internal and external subsets, how elements work, and when to use them with attributes. Although the book does not

set up universal standards for Document Type Definitions, it enables the student to quickly comprehend and read these statements. Chapter 5 expands on the structure of an XML statement and explores schemas, an expanded alternative to Document Type Definitions. It defines schema namespaces and shows the difference between `simpleType` schema data and `complexType` schema data. It then shows how child elements and minimum and maximum occurrences of those elements are set. Finally, it explains how to make intelligent choices when designing a schema. Chapter 6 illustrates how an XML statement is parsed and looks at a variety of different programs and how they can treat the exact same statement differently. It briefly looks at the multilingual capabilities of Unicode and explores the different character sets and typefaces that are available to use with it. After completing these chapters students will be familiar and comfortable with markup, structure, and editing XML, and will understand the importance of rigorous coding. Students also will have a simple framework to build XML statements and a clear picture of the importance of step-by-step coding.

- Chapters 7, 8, and 9 are primarily concerned with the simple design and linkage of XML, and show how some of the same principles that apply to HTML can be relevant for styling XML. Chapter 7 covers CSS stylesheets and how they are used with XML documents and explains the difference between CSS and XSL formats. Chapter 8 shows how XSL can transform XML documents into HTML and how templates govern these transformations. It also examines the three components of XSL: XSLT, XPath, and XSL Formatting Objects. Chapter 9 explains how to link specific parts of XML documents using XLink and how single-direction and multidirectional links can be built. Finally, it shows how to use XPointer to point to any section of a target document on either a local or remote Web Server. After completion of these chapters, students will have a basic understanding of how to style XML documents with coding and templates, and how to link those documents to each other and to servers. In addition, students will understand how basic styling of XML documents works and how these documents can be linked to themselves and other documents.
- Chapters 10, 11, and 12 increase in complexity and cover scripting with the Document Object Model, as well as introducing graphic and media uses of XML vis-à-vis SVG and SMIL. Chapter 10 shows how elements and attributes can be represented as objects and how XML data can be loaded and displayed using simple JavaScript statements to make a site work with on-the-fly interactive capabilities. Chapter 11 shows the benefits of coding visual objects in SVG to save bandwidth and make editing of visual information simpler than editing in Flash. Chapter 12 shows how SMIL is now being deployed in multimedia presentations and discusses the critical differences between SMIL 1.0 and SMIL 2.0. After completion of these chapters, students will be ready to design, program, and view simple visual examples of the visual representations of XML.

Brief Contents

1	An Overview of XML	1
2	Comparing HTML, XHTML, and XML	19
3	Understanding How XML Works: The Fundamentals	41
4	Creating Document Type Definitions (DTDs)	63
5	Schemas	89
6	Using XML Parsers and Unicode	117
7	Applying Cascading Style Sheets	139
8	Applying eXtensible Style Sheets (XSL)	169
9	Linking XML Documents	201
10	Scripting with the DOM	225
11	Scalable Vector Graphics (SVG)	247
12	SMIL	279
13	Integrating Databases with XML	305
14	Web Services	331
A	ASCII Characters	351
B	International Standards Organization (ISO) English Country Names and Code Elements	357
C	Code for Chapter 14 Figures	367
D	XML Spy	377
	Index	381

Contents

CHAPTER 1

An Overview of XML 1

Learning Objectives 1

Learning the History: The Many Incarnations of SGML into XML 1

Creating One Document for Multiple Platforms and Devices 5

Using XML for Data Exchange 8

Content Sharing with XML 10

Key Terms 16

Review Questions 16

Case Study 17

Hands on Project 17

CHAPTER 2

Comparing HTML, XHTML, and XML 19

Learning Objectives 19

From HyperText to XHTML 19

The Limitations of HTML 20

The Emergence of XML 21

Taking the Mid-Road with XHTML 23

Creating an XHTML Document 24

XML Declarations 26

DOCTYPE Declaration and Document Type Definition (DTD) 26

XML Namespaces 27

Reformulating an HTML Document into XML 28

Choosing to Use XHTML or XML 31

Going Further with Namespaces 31

Data and Metadata 34

Summary 35

Key Terms 35

Code Summary 35

Alerts and Advice 37

Review Questions 38

Case Study 38

Hands on Project 39

CHAPTER 3

Understanding How XML Works: The Fundamentals 41

Learning Objectives 41

Well-Formed and Valid XML 43

Well Formed 43

Valid 44

Tagging an XML Document 45

Very First Example 46

Character References 47

Thinking Through XML 48

Understanding the Tree Structure of a Document 49

Creating a Root Element 51

Comments 52

Elements 52

Empty Element Tags 53

#PCDATA 54

CDATA 55

Attributes (!ATTLIST) 56

Entities 57**How to Decide: Attribute versus
ELEMENT 57**

Key Terms 58
 Code Summary 58
 Review Questions 60
 Case Study 60
 Hands on Project 61

CHAPTER 4**Creating Document Type
Definitions (DTDs) 63****Learning Objectives 63****Introducing DTDs 64**

Imposing Grammar and Structure 64
 Checking for Validation 64

Using DTD Syntax 67**Writing Element Declarations 67**

Model Groups 69
 Free Text 72

Writing Attribute List Declarations 73

Attribute Name 73
 Attribute Type 73
 Required or Default Values 74

**Writing Parameter Entity
Declarations 76****Writing Notation Declarations 77****Referencing DTDs 78**

Creating External DTD Subsets 81
 Using Internal DTD Subsets 81

**Using Conditional Sections
with Entities 82**

Key Terms 83
 Code Summary 83
 Review Questions 85
 Case Study 85
 Hands on Project 85

CHAPTER 5**Schemas 89****Learning Objectives 89****DTDs versus Schemas 90**

Some Problems with DTDs 91
 Thinking of Speed 91

Developing Schemas 92

Namespaces 92

Elements and Attributes 93

Simple and Complex 93
 A Little Schema 94
 Thinking About Validation 94
 Complex Types 99
 Deep Schema 103
 Grouping 106
 Making a Choice 108
 Importing Elements 109

Key Terms 110
 Code Summary 110
 Review Questions 114
 Case Study 115
 Hands on Project 115

Using XML Parsers and Unicode 117

Learning Objectives 117

Parsers 118

Difference between an XML Parser and an HTML Parser 119

The Basic Microsoft Parser 119

Creating Your Own Valid Document 123

A Word about Errors 125

Using XML Spy 126

Other XML Editors 129

What Is Unicode: The Development of a Global Standard 130

xml:lang Attribute 131

UTF-8 and Beyond 132

Character Sets and Typeface 133

Key Terms 134

Code Summary 134

Review Questions 135

Case Study 135

Hands on Project 136

Applying Cascading Style Sheets 139

Learning Objectives 139

Developing XML Styles 140

How CSS Has Evolved 141

CSS1 141

CSS2 141

CSS3 142

Introducing CSS Syntax 142

Properties and Values 142

Getting Literal: Display, List, and

Whitespace Properties 143

More Basic CSS Formatting 149

Backgrounds 149

Text 150

Fonts 154

Borders 155

Margins 157

Padding 158

Advanced CSS Formatting 159

Dimension 160

Classification 160

Positioning 162

Comparing CSS to XSL 163

Ensuring Your CSS Is Valid 165

Key Terms 166

Code Summary 166

Review Questions 167

Case Study 167

Hands on Project 168

Applying eXtensible Style Sheets (XSL) 169

Learning Objectives 169

Understanding XSL 170

Using XSLT to Transform XML Documents with XSL 171

Learning the Details of XSL Stylesheets 172

Using XSLT to Transform an XML Document 173

How XSL Uses Templates 175

Filtering 177

- Sorting 177
- Creating Conditional Statements 178
- Styling the Appearance of XML Elements with XSL 182

Debugging XSLT 183

XSL Element References 184

- Key Terms 195
- Code Summary 195
- Alerts and Advice 198
- Review Questions 198
- Case Study 198
- Hands on Project 199

CHAPTER 9

Linking XML Documents 201

Learning Objectives 201

Introducing XML Linking Language (XLink) 202

Writing an XLink Statement 208

- Simple Links 208
- Extended Links 209

Creating XLinks in DTDs 213

Introducing XPointer 217

- Key Terms 220
- Code Summary 220
- Alerts and Advice 222
- Review Questions 223
- Case Study 223
- Hands on Project 223

CHAPTER 10

Scripting with the DOM 225

Learning Objectives 225

An Overview of the DOM 226

- DOM-Based Parsers 226
- DOM-Based Parsing versus SAX-Based Parsing 228
- The DOM's Design Levels 228

The Node Interface 229

Parsing the DOM 232

Browser Support for the DOM 239

- Summary 241
- Key Terms 241
- Code Summary 241
- Review Questions 243
- Case Study 243

CHAPTER 11

Scalable Vector Graphics (SVG) 247

Learning Objectives 247

Advantages of SVG 248

SVG versus Flash 249

- SVG Versions 250

SVG Viewer 250

Introducing SVG Syntax 251

- The SVG Viewport 253
- Basic Shapes 262
- More Element Shapes: Circle Element 268
- SVG and CSS Stylesheets 269

Ensuring Your SVG Is Valid 271

Key Terms 272
 Code Summary 272
 Review Questions 275
 Case Study 276
 Hands on Project 277

CHAPTER 12**SMIL 279****Learning Objectives** 279**A Brief History of SMIL** 281

SMIL 1.0 281
 SMIL 2.0 281

How to SMIL 282

Other Ways to SMIL 283
 Another Way to View SMIL 283

Basic SMIL 283

Core Elements 283
 Media Elements 284
 The <layout> Module 289
 The <body> Element 292
 Linking Module 295

Key Terms 298
 Code Summary 298
 Review Questions 301
 Case Study 301
 Hands on Project 302

CHAPTER 13**Integrating Databases with XML 305****Learning Objectives** 305**An Introduction to Using Databases with XML** 306

Data-Centric XML 306
 Document-Centric XML 308
 Going from Data and Documents to Databases 309

Transferring Information between Traditional Databases and XML 311

Relational Databases 311
 A Brief Introduction to SQL 312
 What's Next: Mapping and Querying 314
 Mapping Document Schemas to Database Schemas 315
 Querying XML Documents to Transfer Data to Databases 320
 Directly Transferring Data to Databases 321

Transferring Information between Native XML Databases and XML Documents 322**Database Vendors** 322

Using XML with Oracle 323
 Using XML with Microsoft's SQL Server 2000 323
 Using XML with IBM's DB2 323

Key Terms 324
 Code Summary 324
 Review Questions 326
 Case Study 326
 Hands on Project 327

Web Services 331**Learning Objectives 331****What Are Web Services? 332**

A Simple Web Services Model 335

A Little Bit of SOAP 337**UDDI 339****WDSL 341**

Simple Sample of WDSL 342

Building a Real Web Service 345

Key Terms 345

Code Summary 346

Review Questions 348

Case Study 349

Hands on Project 349

A ASCII Characters 351**B International Standards Organization (ISO) English Country Names and Code Elements 357****C Code for Chapter 14 Figures 367****D XML Spy 377****Index 381**