Objectives

You will have mastered the material in this chapter when you can:

- Describe the Internet and its associated key terms
- Describe the World Wide Web and its associated key terms
- Describe the types and purposes of Web sites
- Discuss Web browsers and identify their purpose
- Define the Hypertext Markup Language (HTML) and HTML5 standards used for Web development
- Discuss the use of Cascading Style Sheets (CSS) in Web development
- Define the Document Object Model (DOM) and describe its relationship to HTML
- Define Extensible Hypertext Markup Language (XHTML) and describe its relationship to HTML
- Identify tools used to create HTML documents
- Describe the five phases of the Web development life cycle
- Describe the different methods of Web site design and the purpose of each Web site structure
- Discuss the importance of testing throughout the Web development life cycle
- Explain the importance of being an observant Web user
Introduction

Before diving into the details of creating Web pages with HTML5 and CSS, it is useful to look at how these technologies relate to the development of the Internet and the World Wide Web. The Internet began with the connection of computers and computer networks. This connectivity has had a huge impact on our daily lives. Today, millions of people worldwide have access to the Internet, the world’s largest network. Billions of Web pages, providing information on any subject you can imagine, are currently available on the World Wide Web. People use the Internet to search for information, to communicate with others around the world, and to seek entertainment. Students register for classes, pay tuition, and find out final grades via this computer network. Stores and individuals sell their products using computer connectivity, and most industries rely on the Internet and the World Wide Web for business transactions.

Hypertext Markup Language (HTML) and more recently HTML5 and Cascading Style Sheets (CSS) allow the World Wide Web to exist. In order to utilize these technologies effectively, you need to understand the main concepts behind the Internet and HTML. In this chapter, you learn some basics about the Internet, the World Wide Web, intranets, and extranets. You are introduced to Web browsers, definitions of HTML and associated key terms, the five phases of the Web development life cycle, and the tasks that are involved in each phase.

What Is the Internet?

Most people today have had exposure to the Internet at school, in their homes, at their jobs, or at their local library. The Internet is a worldwide collection of computers and computer networks that links billions of computers used by businesses, government, educational institutions, organizations, and individuals using modems, phone lines, television cables, satellite links, fiber-optic connections, and other communications devices and media (Figure 1–1).
The Internet was developed in the 1960s by the Department of Defense Advanced Research Projects Agency (ARPA). ARPANET (as the Internet was originally called) had only four nodes on it and sent its first message in 1969. Today’s Internet has millions of nodes on thousands of networks. A network is a collection of two or more computers that are connected to share resources and information. Today, high-, medium-, and low-speed data lines connect networks. These data lines allow data (including text, graphical images, and audio and video data) to move from one computer to another. The Internet backbone is a collection of high-speed data lines that connect major computer systems located around the world. An Internet service provider (ISP) is a company that has a permanent connection to the Internet backbone. ISPs utilize high- or medium-speed data lines to allow individuals and companies to connect to the backbone for access to the Internet. An Internet connection at home generally is a DSL or cable data line that connects to an ISP.

Millions of people in most countries around the world connect to the Internet using computers in their homes, offices, schools, and public locations such as libraries. In fact, the Internet was designed to be a place in which people could share information or collaborate. Users with computers connected to the Internet can access a variety of services, including e-mail, social networking, and the World Wide Web where they can find a variety of information at many different types of Web sites (Figure 1–2).

What Is the World Wide Web?

Many people use the terms “Internet” and “World Wide Web” interchangeably, but that is not accurate. The Internet is the infrastructure, the physical networks of computers. The World Wide Web, also called the Web, is the part of the Internet that supports...
multimedia and consists of a collection of linked documents. To support multimedia, the Web relies on the Hypertext Transfer Protocol (HTTP), which is a set of rules for exchanging text, graphic, sound, video, and other multimedia files. The linked documents, or pages of information, on the Web are known as Web pages. Because the Web supports text, graphics, sound, and video, a Web page can include any of these multimedia elements. The Web is ever-changing and consists of billions of Web pages. Because of the ease of creating Web pages, more are being added all the time.

A Web site is a related collection of Web pages that is created and maintained by an individual, company, educational institution, or other organization. For example, as shown in Figure 1–3, many organizations, such as the U.S. Department of Labor, publish and maintain Web sites. Each Web site contains a home page, which is the first document users see when they access the Web site. The home page often serves as an index or table of contents to other documents and files displayed on the site.

**Web Servers**

Web pages are stored on a Web server, or host, which is a computer that stores and sends (serves) requested Web pages and other files. Any computer that has Web server software installed and is connected to the Internet can act as a Web server. Every Web site is stored on, and runs from, one or more Web servers. A large Web site may be spread over several servers in different geographic locations.

In order to make the Web pages that you have developed available to your audience, you have to publish those pages. Publishing is copying the Web pages and associated files such as graphics and audio to a Web server. Once a Web page is published, anyone who has access to the Internet can view it, regardless of where the Web server is located. For example, although the U.S. Department of Labor Web site is stored on a Web server somewhere in the United States, it is available for viewing by anyone in the world. Once a Web page is published, it can be read by almost any computer: whether you use the Mac, Windows, or Linux operating system, with a variety of computer hardware, you have access to billions of published Web pages.
Web Site Types and Purposes

The three general types of Web sites are Internet, intranet, and extranet. Table 1–1 lists characteristics of each of these three types of Web sites.

An **Internet site**, also known as a **Web site**, is a site generally available to the public. Individuals, groups, companies, and educational institutions use Web sites for a variety of purposes. Intranets and extranets also use Internet technology, but access is limited to specified groups. An **intranet** is a private network that uses Internet technologies to share company information among employees. An intranet is contained within a company or organization’s network, which makes it private and only available to those who need access. Policy and procedure manuals usually are found on an intranet. Other documents such as employee directories, company newsletters, product catalogs, and training manuals often are distributed through an intranet.

An **extranet** is a private network that uses Internet technologies to share business information with select corporate partners or key customers. Companies and organizations can use an extranet to share product manuals, training modules, inventory status, and order information. An extranet also might allow retailers to purchase inventory directly from their suppliers or to pay bills online.

Companies use Web sites to advertise or sell their products and services worldwide, as well as to provide technical and product support for their customers. Many company Web sites also support **electronic commerce (e-commerce)**, which is the buying and selling of goods and services on the Internet. Using e-commerce technologies, these Web sites allow customers to browse product catalogs, comparison shop, and order products online. Figure 1–4 shows Cengage.com, which is a company that sells and distributes

<table>
<thead>
<tr>
<th>Table 1–1 Types of Web Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Internet</td>
</tr>
<tr>
<td>intranet</td>
</tr>
<tr>
<td>extranet</td>
</tr>
</tbody>
</table>

---

**Intranets and Extranets**

There are many Web sites that discuss ideas for intranets and extranets. Many companies are already using these technologies and share their “best practice” techniques. Many Web sites provide valuable information on building and maintaining an intranet or extranet, along with additional resources.

**BTW**

**E-Commerce**

Today, e-commerce is a standard part of doing business. E-commerce technologies, however, continue to change, offering new applications and potential uses.

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![Figure 1-4](http://www.cengage.com)
textbook-related materials online. Many company Web sites also provide job postings and announcements, a frequently asked questions (FAQs) section, customer feedback links to solicit comments from their customers, and searchable technical support databases.

Colleges, universities, and other schools use Web sites to distribute information about areas of study, provide course information, or register students for classes online. Instructors use their Web sites to issue announcements, post questions on reading material, list contact information, and provide easy access to lecture notes and slides. Many instructors today use the course management software adopted by their respective schools to upload course content. Using a standard course management product across a university makes it easier for students to find information related to their various courses. Many course management tools allow instructors to write their own Web content for courses. With many systems, instructors can use Web pages to provide further information for their students within the structure of the course management tool provided by the school. In addition to keeping in contact with current students via the Web, universities also provide a variety of Web site functionality to a variety of visitors as shown in Figure 1–5.

In addition to the use of the Internet by companies and educational institutions, individuals might create personal Web sites that include their résumés to make them easily accessible to any interested employers. Families can share photographs, video and audio clips, stories, schedules, or other information through Web sites (Figure 1–6). Many individual Web sites allow password protection, which makes a safer environment for sharing information.
Web Browsers

To display a Web page on any type of Web site, a computer needs to have a Web browser installed. A Web browser, also called a browser, is a program that interprets and displays Web pages and enables you to view and interact with a Web page. Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, and Apple Safari are popular browsers today. Browsers provide a variety of features, including the capability to locate Web pages, to link forward and backward among Web pages, to add a favorite or bookmark a Web page, and to choose security settings.

To locate a Web page using a browser, you type the Web page’s Uniform Resource Locator (URL) in the browser’s Address or Location bar. A Uniform Resource Locator (URL) is the address of a document or other file accessible on the Internet. An example of a URL on the Web is:

http://www.cengagebrain.com/shop/index.html

The URL indicates to the browser to use the HTTP communications protocol to locate the index.html Web page in the shop folder on the cengagebrain.com Web server. Web page URLs can be found in a wide range of places, including school catalogs, business cards, product packaging, and advertisements.

Hyperlinks are an essential part of the World Wide Web. A hyperlink, also called a link, is an element used to connect one Web page to another Web page on the same server or to Web pages on different Web servers located anywhere in the world. Clicking a hyperlink allows you to move quickly from one Web page to another, and the user does not have to be concerned about where the Web pages reside. You can also click hyperlinks to move to a different section of the same Web page.

With hyperlinks, a Web site user does not necessarily have to view information in a linear way. Instead, he or she can click the available hyperlinks to view the information...
in a variety of ways, as described later in this chapter. Many different Web page elements, including text, graphics, and animations, can serve as hyperlinks. Figure 1–7 shows examples of several different Web page elements used as hyperlinks.

What Is Hypertext Markup Language?

Web pages are created using Hypertext Markup Language (HTML), which is an authoring language used to create documents for the World Wide Web. HTML uses a set of special instructions called tags or markup to define the structure and layout of a Web document and specify how the page is displayed in a browser.

A Web page is a file that contains both text and HTML tags. HTML tags mark the text to define how it should appear when viewed in a browser. HTML includes hundreds of tags used to format Web pages and create hyperlinks to other documents or Web pages. For instance, the HTML tags <p> and </p> are used to indicate a new paragraph with a blank line above it, <table> and </table> are used to indicate the start and end of a table, and <hr /> is used to display a horizontal rule across the page. Figure 1–8a shows the HTML tags needed to create the Web page shown in Figure 1–8b. You can also enhance HTML tags by using attributes, as shown in Figure 1–8a. Attributes define additional characteristics such as font weight or style for the HTML tag.

HTML is platform independent, meaning you can create, or code, an HTML file on one type of computer and then use a browser on another type of computer to view that file as a Web page. The page looks the same regardless of what platform you are using. One of the greatest benefits of Web technology is that the same Web page can be viewed on many different types of digital hardware, including mobile devices like smartphones.
What Is Hypertext Markup Language?

HTML

HTML combines tags and descriptive attributes that define how a document should appear in a Web browser. HTML elements include headings, paragraphs, hyperlinks, lists, images, and more. HTML element syntax is as follows:

- HTML elements begin with a start tag / opening tag
- HTML elements finish with an end tag / closing tag
- The element content is everything inserted between the start and end tags
- Some HTML elements have empty content (e.g., `<br />` or `<hr />`)
- Empty elements are closed in the start tag (use space-/ to close as in `<br />`)
- Most HTML elements can have attributes

For example, to specify a paragraph of text on a Web page, you would enter the following HTML code:

```html
<p>This is a paragraph of text.</p>
```
where `<p>` is the start or opening tag, `</p>` is the end or closing tag, and the content is situated between those tags. Table 1–2 shows examples of some HTML elements.

### Table 1–2 HTML Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Purpose</th>
<th>Code and Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Indicates title to appear on the title bar in the browser</td>
<td><code>&lt;title&gt;This is the title text.&lt;/title&gt;</code></td>
</tr>
<tr>
<td>Anchor</td>
<td>Creates a link to a Web page named default.html</td>
<td><code>&lt;a href=&quot;default.html&quot;&gt;This is text for a link.&lt;/a&gt;</code></td>
</tr>
<tr>
<td>Line break</td>
<td>Inserts a line break before the next element (without a blank line); there is no content or closing tag; use space-/as closing tag</td>
<td><code>&lt;br/&gt;</code></td>
</tr>
</tbody>
</table>

**Useful HTML Practices**

When creating an HTML file, it is good coding practice to separate sections of the HTML code with spaces and by using the Tab key. Adding space between sections, either with blank lines or by tabbing, gives you an immediate view of the sections of code that relate to one another and helps you view the HTML elements in your document more clearly. HTML browsers ignore spaces that exist between the tags in your HTML document, so the spaces and indentations inserted within the code will not appear on the Web page. Figure 1–9 shows an example of an HTML file with code sections separated by blank lines and code section indentations. Another developer looking at this code can see immediately where the specific sections are located in the code.
HTML Versions

HTML has gone through several versions, each of which expands the capabilities of the authoring language. To ensure that browsers can interpret each new version of HTML, the World Wide Web Consortium (W3C) maintains HTML standards, or specifications, which are publicly available on its Web site. HTML5 is the newest version of HTML. HTML5 provides a more flexible approach to Web development. For instance, with HTML5, you can combine lowercase, uppercase, or mixed-case lettering in your tags and attributes. Despite the HTML5 flexibility, this book will adhere to good coding practices that would make it easy to convert to XHTML standards if they should one day override HTML5. The coding practices to which the book adheres are: using all lowercase tags and attributes, enclosing all attribute values in quotation marks, closing all tags, and nesting tags properly (see Table 1–3 on page HTML 13). Although HTML5 has become very popular with Web developers, it is still being developed by the World Wide Web Consortium. The challenge for Web developers, therefore, is to know which new tags and attributes are supported by which browser. This book utilizes HTML5 tags and attributes that are currently supported by Internet Explorer. Additionally, we combine HTML 4.01 tags and attributes with HTML5 to create all of the Web pages in the book. Despite the popularity of HTML5 and HTML 4.01, most browsers continue to support HTML versions 3.2 and 2.0. As described later in this chapter, it is important to verify that Web pages are displayed as intended in a variety of browsers during the testing phase of development.

Cascading Style Sheets

This book has taken a new direction by eliminating deprecated tags and attributes. Deprecation tags and attributes are tags and attributes that are being phased out and therefore no longer recommended in the latest W3C standard. Deprecated tags are still used in many Web pages, however, so it is good to know their purpose from a maintenance standpoint. In Appendix A, deprecated tags and attributes are highlighted with an asterisk. In an effort to eliminate deprecated HTML tags, the projects utilize Cascading Style Sheets (CSS) to alter the style (or look) of a Web page. Although HTML allows Web developers to make changes to the structure, design, and content of a Web page, it is limited in its ability to define the appearance, or style, across one or more Web pages. Cascading Style Sheets (CSS) allow you to specify styles for various Web page elements. A style sheet is a series of rules that defines the style for a Web page or an entire Web site. With a style sheet, you can alter the appearance of a Web page or pages by changing characteristics such as font family, font size, margins, and link specifications, as well as visual elements such as colors and borders. CSS is not used to add any content to your Web site; it just makes your content look more stylish.

With CSS you can specify the style for an element within a single Web page or throughout an entire Web site. For example, if you want all text paragraphs on a Web page to be indented by five spaces, you can use a style sheet to handle the indenting, rather than coding each paragraph with an indentation. And, if you decided you wanted to change the indent to three spaces, you would change just one style sheet line rather than changing the coding for each paragraph. So you can see that using CSS saves a lot of time and makes it much easier to make style changes.

CSS is not HTML; it is a separate language used to enhance the display capabilities of HTML. The World Wide Web Consortium, the same organization that defines HTML standards, defines the specifications for CSS. This book will provide information about CSS3, the newest version of CSS that is currently being developed. We address the new features that CSS3 brings to the world of Web development. Be forewarned that this is a moving target and

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The w3.org Web site has an extensive amount of information and tutorials about Cascading Style Sheets (CSS), Document Object Model (DOM), and Extensible HTML (XHTML). The standards suggested in the W3C Web site are the ones that most Web developers follow.
not all browsers support the latest selector syntax provided by CSS3. Appendix A at the back of this book and available online provides a list of HTML tags and corresponding attributes that will allow you to alter the Web page elements as needed, and Appendix D has complete information on the properties and values associated with different CSS elements.

**Document Object Model (DOM)**

HTML can be used with other Web technologies to provide additional Web page functionality. For example, the term **Document Object Model (DOM)** describes a combination of HTML tags, CSS, and a scripting language such as JavaScript. DOM allows JavaScript and other languages to manipulate the structure of the underlying document to create interactive, animated Web pages. This is a model in which the Web page (or document) contains objects (elements, links, etc.) that can be manipulated. DOM allows a Web developer to add, delete, or change an element or attribute. Web pages enhanced with DOM can be more responsive to visitor interaction than basic HTML Web pages. Not all interactive Web pages require DOM, but if you have a need for extensive interactivity, then this might be a model to consider. CSS, JavaScript, and DOM are covered in later chapters in the Comprehensive (12-chapter) version of this book.

**Extensible Hypertext Markup Language (XHTML)**

As you have learned, HTML uses tags to describe how a document should appear in a Web browser, or the Web page format. HTML is used to display data, whereas **Extensible Markup Language (XML)** is designed to transport and store data. XML provides a set of rules that are used to encode documents in machine-readable form. XML is not a replacement for HTML, but it is a software- and hardware-independent tool that is used to carry information. Chapter 12 discusses XML in depth and is used to teach XML specifics to students. **Extensible Hypertext Markup Language (XHTML)** is a reformulation of HTML formatting so it conforms to XML structure and content rules. By combining HTML and XML, XHTML combines the display features of HTML and the stricter coding standards required by XML.

As mentioned previously, the projects in this book utilize some of the new tags and attributes introduced with HTML5. The XHTML standards do not apply to HTML5, but we will adhere to the XHTML coding practices as per Table 1–3 because these practices create a uniformity of coding styles. Applying the XHTML coding practices together with any new HTML5 tags or attributes will not cause a problem when you validate your code as long as you use the HTML5 <!DOCTYPE> statement:

```
<!DOCTYPE HTML>
<html>
```

at the start of your Web page.

An important step in Web development is to check that your Web pages are compliant with HTML5 standards as defined by W3C. You will validate your Web pages starting in Chapter 2, using the new HTML5 <!DOCTYPE> statement noted above, and continue that process throughout the book. Most Web pages already developed do not validate. However, it is best that you begin your Web development training using the standards recommended by W3C.

Table 1–3 lists some of the coding rules that Web developers should follow to ensure that their HTML code conforms to XHTML standards when using a combination of HTML 4.01 and HTML5 tags and attributes. All of the projects in this book follow XHTML standards (except for the <!DOCTYPE>) and adhere to the rules outlined in Table 1–3. The specifics of each rule are explained in detail when used in a project.
### Table 1-3 XHTML Coding Practices

<table>
<thead>
<tr>
<th>Practice</th>
<th>Invalid Example</th>
<th>Valid Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>All tags and attributes must be written in lowercase</td>
<td><code>&lt;TABLE WIDTH=&quot;100%&quot;&gt;</code></td>
<td><code>&lt;table width=&quot;100%&quot;&gt;</code></td>
</tr>
<tr>
<td>All attribute values must be enclosed by single or double quotation marks</td>
<td><code>&lt;table width=100%&gt;</code></td>
<td><code>&lt;table width=&quot;100%&quot;&gt;</code></td>
</tr>
<tr>
<td>All tags must be closed, including tags such as img, hr, and br, which do not have end tags, but which must be closed as a matter of practice</td>
<td><code>&lt;br&gt;</code></td>
<td><code>&lt;br&gt;</code></td>
</tr>
<tr>
<td></td>
<td><code>&lt;hr&gt;</code></td>
<td><code>&lt;hr&gt;</code></td>
</tr>
<tr>
<td></td>
<td><code>&lt;p&gt;This is another paragraph&lt;/p&gt;</code></td>
<td><code>&lt;p&gt;This is another paragraph&lt;/p&gt;</code></td>
</tr>
<tr>
<td>All elements must be nested properly</td>
<td><code>&lt;p&gt;&lt;strong&gt;This is a bold paragraph&lt;/strong&gt;&lt;/p&gt;</code></td>
<td><code>&lt;p&gt;&lt;strong&gt;This is a bold paragraph&lt;/strong&gt;&lt;/p&gt;</code></td>
</tr>
</tbody>
</table>

### Tools for Creating HTML Documents

You can create Web pages using HTML with a simple text editor, such as Notepad++, Notepad, TextPad, or TextEdit. A **text editor** is a program that allows a user to enter, change, save, and print text, such as HTML. Text editors do not have many advanced features, but they do allow you to develop HTML documents easily. For instance, if you want to insert the DOCTYPE tags into the Web page file, type the necessary text into any of the text editors, as shown in Figure 1-10a and Figure 1-10b on the next page. Although Notepad (Figure 1-10b) is an adequate text editor for Web development, note its differences from Notepad++. Notepad++ is a more robust text editor that uses color schemes for HTML code as it is entered.

You can also create Web pages using an HTML text editor, such as EditPlus or BBEdit (Mac OS). An **HTML text editor** is a program that provides basic text-editing functions, as well as more advanced features such as color-coding for various HTML tags, menus to insert HTML tags, and spell checkers. An **HTML object editor**, such as EiffelStudio object editor, provides the additional functionality of an outline editor that allows you to expand and collapse HTML objects and properties, edit parameters, and view graphics attached to the expanded objects.

Many popular software applications also provide features that enable you to develop Web pages easily. Microsoft Word, Excel, and PowerPoint, for example, have a Save as Web Page option that converts a document into an HTML file by automatically adding HTML tags to the document. Using Microsoft Access, you can create a Web page that allows you to view data in a database. Adobe Acrobat also has an export feature that creates HTML files. Each of these applications also allows you to add hyperlinks, drop-down boxes, option buttons, or scrolling text to the Web page.

These advanced Web features make it simple to save any document, spreadsheet, database, or presentation to display as a Web page. Corporate policy and procedures manuals and PowerPoint presentations, for example, can be easily saved as Web pages and published to the company’s intranet. Extranet users can be given access to Web pages that allow them to view or update information stored in a database.

You can also create Web pages using a WYSIWYG editor such as Adobe Dreamweaver, Amaya, or CoffeeCup HTML Editor. A **WYSIWYG editor** is a program that provides a graphical user interface that allows a developer to preview the Web page during its development. WYSIWYG (pronounced wizzy-wig) is an acronym for What You See Is What You Get. A WYSIWYG editor creates the HTML code for you as you...
add elements to the Web page, which means that you do not have to enter HTML tags directly. The main problem with WYSIWYG editors is that they often create “puffed-up” HTML code (HTML tags with many lines of unnecessary additional code surrounding them).

Regardless of which type of program you use to create Web pages, it is important to understand the specifics of HTML so you can make changes outside of the editor. For instance, you may be able to create a Web page with Dreamweaver, but if you want to make some minor changes, it is very helpful to know the HTML tags themselves. It is also important to understand the Web development life cycle so the Web pages in your Web site are consistent and complete.

Figure 1–10  With text editors such as Notepad++ or Notepad, you can type HTML tags directly in the files.
Web Development Life Cycle

For years, university and college information technology courses have stressed the importance of following the Systems Development Life Cycle when designing and implementing new software to ensure consistency and completeness. The Web development process should follow a similar cycle. Comprehensive planning and analysis ensure that developers will provide what the users want. If you start to code your Web pages without thorough planning and analysis, you run the risk of missing pertinent information. It is much less expensive to make corrections to a Web site in the early phases of project development than it is to alter Web pages that are completed.

The Web development life cycle outlined in this section is one that can be utilized for any type or size of Web development project. The Web development life cycle is a process that can be used for developing Web pages at any level of complexity. The Web development life cycle includes the following phases: planning, analysis, design and development, testing, and implementation and maintenance. Table 1–4 lists several questions that should be asked during each phase in the Web development life cycle. Throughout this book, you will follow this systematic cycle as you develop your Web pages.

### Table 1–4 Web Development Phases and Questions

<table>
<thead>
<tr>
<th>Web Development Phase</th>
<th>Questions to Ask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>• What is the purpose of this Web site?</td>
</tr>
<tr>
<td></td>
<td>• Who will use this Web site?</td>
</tr>
<tr>
<td></td>
<td>• What are the users’ computing environments?</td>
</tr>
<tr>
<td></td>
<td>• Who owns and authors the information on the Web site?</td>
</tr>
<tr>
<td></td>
<td>• Who decides if/where the information goes on the Web site?</td>
</tr>
<tr>
<td>Analysis</td>
<td>• What tasks do the users need to perform?</td>
</tr>
<tr>
<td></td>
<td>• What information is useful to the users?</td>
</tr>
<tr>
<td></td>
<td>• What process considerations must be made?</td>
</tr>
<tr>
<td>Design and Development</td>
<td>• How many Web pages will be included in the Web site?</td>
</tr>
<tr>
<td></td>
<td>• How will the Web pages be organized?</td>
</tr>
<tr>
<td></td>
<td>• What type of Web site structure is appropriate for the content?</td>
</tr>
<tr>
<td></td>
<td>• How can I best present the content for ease of use?</td>
</tr>
<tr>
<td></td>
<td>• What file naming convention will be employed for this Web site?</td>
</tr>
<tr>
<td></td>
<td>• What folder structure will be used for the Web page files?</td>
</tr>
<tr>
<td></td>
<td>• How do I apply standards throughout the development process?</td>
</tr>
<tr>
<td></td>
<td>• What forms of multimedia contribute positively to the Web site?</td>
</tr>
<tr>
<td></td>
<td>• How can accessibility issues be addressed without limiting usability?</td>
</tr>
<tr>
<td></td>
<td>• Will there be an international audience?</td>
</tr>
<tr>
<td>Testing</td>
<td>• Do the Web pages pass the World Wide Web Consortium (W3C) validation process as HTML5 compliant?</td>
</tr>
<tr>
<td></td>
<td>• Is the Web site content correct?</td>
</tr>
<tr>
<td></td>
<td>• Does the Web site function correctly?</td>
</tr>
<tr>
<td></td>
<td>• Are users able to find the information they need to complete desired tasks?</td>
</tr>
<tr>
<td></td>
<td>• Is navigation clear and easy to use?</td>
</tr>
<tr>
<td>Implementation and Maintenance</td>
<td>• How is the Web site published?</td>
</tr>
<tr>
<td></td>
<td>• How can users be attracted to visit and revisit the Web site?</td>
</tr>
<tr>
<td></td>
<td>• How is the Web site updated?</td>
</tr>
<tr>
<td></td>
<td>• Who is responsible for content updates?</td>
</tr>
<tr>
<td></td>
<td>• Who is responsible for structure updates?</td>
</tr>
<tr>
<td></td>
<td>• How will users be notified about updates to the Web site?</td>
</tr>
<tr>
<td></td>
<td>• Will the Web site be monitored?</td>
</tr>
</tbody>
</table>
Web Site Planning

Web site planning, which is the first phase of the Web development life cycle, involves identifying the goals or purpose of the Web site. The first step in the Web site planning phase is to answer the question “What is the purpose of this Web site?” As you have learned, individuals and groups design and publish Web sites for a variety of purposes. Individuals develop Web sites to share their hobbies, to post résumés, or just to share ideas on personal interests. Organizations create Web sites to keep members informed of upcoming events or to recruit new members. Businesses create Web sites to advertise and sell products or to give their customers 24-hour online support. Instructors publish Web sites, or add information to their courses using the school’s online course management software, to inform students of course policies, assignments, and due dates, as well as course requirements. Until you can adequately identify the intended purpose of the Web site, you should not proceed with the Web development project.

In addition to understanding the Web site’s purpose, you should also understand who will use the Web site and the computing environments of most of the users. Knowing the makeup of your target audience — including age, gender, general demographic background, and level of computer literacy — will help you design a Web site appropriate for the target users. Understanding users’ computing environments will determine what types of Web technologies to use. For example, if most users have low-speed Internet connections, you would not want to create pages with large graphics or multimedia elements.

A final aspect to the Web site planning phase is to identify the content owners and authors. To determine this, you need to ask the questions:

• Who owns and authors the information on the Web site?
• Who decides if/where the information goes on the Web site?

Once you have identified who will provide and authorize the Web site content, you can include those individuals in all aspects of the Web development project.

Web Site Analysis

During the analysis phase, you make decisions about the Web site content and functionality. To help define the appropriate Web site content and functionality, you should first identify the tasks that users need to perform. Answering that question allows you to define necessary content to facilitate those tasks and determine useful information for the users. Extraneous content that does not serve any purpose should be eliminated from the Web site.

In the analysis phase, it is also important to consider the processes required to support Web site features. For example, if you determine that users should be able to order products through the Web site, then you also need to define the processes or actions to be taken each time an order is submitted. For instance, after an order is submitted, how will that order be processed throughout the back-office business applications such as inventory control and accounts payable? Will users receive e-mail confirmations with details about their orders? The analysis phase is one of the more important phases in the Web development life cycle. Clearly understanding and defining the desired content and functionality of the Web site will direct the type of Web site that you design and reduce changes during Web site development.
Web Site Design and Development

After determining the purpose of the Web site and defining the content and functionality, you need to consider the Web site’s design. Some key considerations in Web site design are defining how to organize Web page content, selecting the appropriate Web site structure, determining how to use multimedia, addressing accessibility issues, and designing pages for an international audience. One of the most important aspects of Web site design is determining the best way to provide navigation on the Web site. If users cannot easily find the information that they are seeking, they will not return to your Web site.

Many ways to organize a Web page exist, just as many ways to organize a report or paper exist. Table 1–5 lists some organizational standards for creating a Web page that is easy to read and navigate.

### Table 1–5 Web Page Organizational Standards

<table>
<thead>
<tr>
<th>Element</th>
<th>Organizational Standard</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titles</td>
<td>Use simple titles that clearly explain the purpose of the page</td>
<td>Titles help users understand the purpose of the page; a good title explains the page in the search engine results lists</td>
</tr>
<tr>
<td>Headings</td>
<td>Use headings to separate main topics</td>
<td>Headings make a Web page easier to read; simple headlines clearly explain the purpose of the page</td>
</tr>
<tr>
<td>Horizontal Rules</td>
<td>Insert horizontal rules to separate main topics</td>
<td>Horizontal rules provide graphical elements to break up Web page content</td>
</tr>
<tr>
<td>Paragraphs</td>
<td>Use paragraphs to help divide large amounts of text</td>
<td>Paragraphs provide shorter, more readable sections of text</td>
</tr>
<tr>
<td>Lists</td>
<td>Utilize bulleted or numbered lists when appropriate</td>
<td>Lists provide organized, easy-to-read text that readers can scan</td>
</tr>
<tr>
<td>Page Length</td>
<td>Maintain suitable Web page lengths</td>
<td>Web users do not always scroll to view information on longer pages; appropriate page lengths increase the likelihood that users will view key information</td>
</tr>
<tr>
<td>Information</td>
<td>Emphasize the most important information by placing it at the top of a Web page</td>
<td>Web users are quick to peruse a page; placing critical information at the top of the page increases the likelihood that users will view key information</td>
</tr>
<tr>
<td>Other</td>
<td>Incorporate a contact e-mail address; include the date of the last modification</td>
<td>E-mail addresses and dates give users a way to contact a Web site developer with questions; the date last modified helps users determine the timeliness of the site information</td>
</tr>
</tbody>
</table>

Web sites can use several different types of structures, including linear, hierarchical, and webbed. Each structure links, or connects, the Web pages in a different way to define how users navigate the site and view the Web pages. You should select a structure for the Web site based on how users will navigate the site and view the Web site content.

A linear Web site structure connects Web pages in a straight line, as shown in Figure 1–11 on the next page. A linear Web site structure is appropriate if the information on the Web pages should be read in a specific order. For example, if the information on the first Web page, Module 1, is necessary for understanding information on the second Web page, Module 2, you should use a linear structure. Each page would have links from one Web page to the next, as well as a link back to the previous Web page. There are many cases in which Web pages need to be read one after the other, such as in the case of training material in which Module 1 needs to be completed before Module 2 can be attempted.
A variation of a linear Web site structure includes the addition of a link to the home page of the Web site, as shown in Figure 1–12. For some Web sites, moving from one module to the next module is still important, but you also want to provide users with easy access to the home page at any time. In this case, you would still provide links from the module Web pages to the previous and next module, but each Web page would also have a link back to the home page. In this way, the user does not have to click the previous link multiple times in order to get back to the home page.

A hierarchical Web site structure connects Web pages in a treelike structure, as shown in Figure 1–13. A hierarchical Web site structure works well on a site with a main

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**User Interface Design**

The user interface design is an important aspect of a Web site. If a site is designed poorly, users may not be able to find the desired information or complete a task, which makes the Web site ineffective.
index or table of contents page that links to all other Web pages. With this structure, the main index page would display general information, and secondary pages would include more detailed information. Notice how logically the information in Figure 1–13 is organized. A Web page visitor can easily go from the home page to any of the three modules. In addition, the visitor can easily get to the Module 3 Quiz by way of the Module 3 link. One of the inherent problems with this structure, though, is the inability to move easily from one section of pages to another. As an example, to move from Module 1 Page 2 to the Module 3 Summary, the visitor would have to use the Back button to get to the Home Page and then click the Module 3 link. This is moderately annoying for a site with two Web pages, but think what it would be like if Module 1 had 100 Web pages!

To circumvent the problems with the hierarchical model, you can use a webbed model. A webbed Web site structure has no set organization, as shown in Figure 1–14. A webbed Web site structure works best on sites with information that does not need to be read in a specific order and with many navigation options. The World Wide Web uses a webbed structure, so users can navigate among Web pages in any order they choose. Notice how the Web site visitor can more easily move between modules or module summaries with this structure. With this model, you most often provide a link to the Home Page from each page, resulting in an additional arrow going from each individual Web page back to the home page (which is difficult to depict in these small figures). Many Web sites today utilize a graphical image (usually the company or institutional logo) in the top-left corner of each Web page as a link to the home page. You will use that technique later in the book.

Most Web sites are a combination of the linear, hierarchical, and webbed structures. Some information on the Web site might be organized hierarchically from an index page, other information might be accessible from all areas of the site, and still other information might be organized linearly to be read in a specific order. Using a combination of the three structures is appropriate if it helps users navigate the site easily. The key is to get the right information to the users in the most efficient way possible.

Regardless of the structure or structures that you use, you should balance the narrowness and depth of the Web site. A broad Web site is one in which the home page...
is the main index page, and all other Web pages are linked individually to the home page (Figure 1–15). By making the other Web pages accessible only through the home page, a broad Web site forces the user to return to the home page to move from one Web page to another. The structure makes navigation time-consuming and limiting for users. A better structure would present a user with navigation alternatives that allow for direct movement between Web pages.

A deep Web site is one that has many levels of pages, requiring the user to click many times to reach a particular Web page (Figure 1–16). By requiring a visitor to move through several Web pages before reaching the desired page, a deep Web site forces a user to spend time viewing interim pages that may not have useful content. As an example, note the difference between finding the Module 3 Summary in Figure 1–13 on page HTML 18 as compared to finding the same Web page (Module 3 Summary) in Figure 1–16. Assume that the user went through the Figure 1–13 Web site once to study the Module 3 material. When the user returns to the Web site using the Figure 1–16 structure, however, to review the Module 3 Summary Web page and then take the Module 3 Quiz, the user would have to go completely through the Module 3 material, Web page by Web page, in order to get to the Module 3 Summary page. You probably want to give users easier access to that Web page.

As a Web developer, you must select an appropriate structure for the Web site and work to balance breadth and depth. Users go to a Web site looking for information to complete a task. Good design provides ease of navigation, allowing users to find content quickly and easily. In addition to planning the design of the Web site itself, a Web developer should always plan the specifics of the file naming and storage conventions early on in the design phase. Once you determine the structure of the Web site and the approximate number of pages necessary to fulfill the site purpose, then you need to identify what standards to use with file naming and the folder structure. For instance, saving your Web pages with names such as page1.html and page2.html does not tell you the purpose of those Web pages. A better option would be to name the Oceanside Hotel Web site’s home page oceansidehome.html or oceanside.html, and the Web page with the reservation form could be named reservation.html. Those file names tell the developer, as well as future developers maintaining the Web site, the purpose of those Web pages.
The same principle applies to the folder structure that you use in your Web development. The projects in this book have so few Web page files and graphic files that all content (Web pages and graphics) is stored together in one folder. With a large Web site, however, you may want to put the Web page files in a separate folder from the graphics files. Larger, more complex Web sites might also require a folder just to store video or audio clips. Where you store the files will affect how you access those files in your HTML code. Determining a good folder structure in the planning phase of the Web development life cycle is important. You’ll learn more about effective folder structures in Chapter 3.

During the design and development phase, you should also consider what, if any, types of multimedia could contribute positively to the Web site experience. For instance,
adding a video message from the company CEO might be useful, but if the computing environment of your users cannot accommodate video playback, then the video serves no purpose. In general, do not use advanced multimedia technologies in a Web site unless they make a positive contribution to the Web site experience. Today, more Web sites are using audio and video content. The addition of multimedia can enhance the overall purpose of the Web site, but it sometimes detracts from the message.

Finally, consider accessibility issues and internationalization. A Web developer should always design for viewing by a diverse audience, including physically impaired and global users. A key consideration is that the software used by physically impaired individuals does not work with some Web features. For instance, if you use graphics on the Web site, always include alternative text for each graphic. To support an international audience, use generic icons that can be understood globally, avoid slang expressions in the content, and build simple pages that load quickly over lower-speed connections.

The design issues just discussed are only a few of the basic Web page design issues that you need to consider. Throughout this book, design issues will be addressed as they relate to each project. Many excellent Web page design resources are also available on the Internet.

Once the design of the Web site is determined, Web development can begin. The rest of the chapters in this book discuss good Web page standards, in addition to the actual development of Web pages. You will learn many development techniques, including links, tables, graphics, image maps, and Web forms. The umbrella that covers all of the development techniques taught in this book is the use of Cascading Style Sheets (CSS).

Web Site Testing

Testing should be done on all pages in a Web site. You should also test the links within the Web page, to other Web pages in the Web site, and to external Web sites. Testing is an important part of Web development and assures that your Web pages work as intended.

A Web site should be tested at various stages of the Web design and development processes. The testing process should be comprehensive and include a review of Web page content, functionality, and usability. Web sites with broken links, missing graphics, and incorrect content create a poor impression. You want to attract users to your Web site and maintain their interest. If visitors find that your Web site is poorly tested and maintained, they will be less likely to return. You cannot get your message out if users don’t frequently visit the Web site. Some basic steps to test content and functionality include:

- Validating each Web page by running it through the W3C markup validation service
- Proofreading page content and titles to review for accurate spelling and grammar
- Checking links to ensure they are not broken and are linked correctly
- Checking graphics to confirm they appear properly and are linked correctly
- Ensuring that accessibility and internationalization issues are addressed
- Testing forms and other interactive page elements
- Testing pages to make sure they load quickly, even over lower-speed connections
- Printing each page to check how printed pages look

Usability is the measure of how well a product, such as a Web site, allows a user to accomplish his or her goals. Usability testing is a method by which users of a Web site or other product are asked to perform certain tasks in an effort to measure the product’s ease-of-use and the user’s perception of the experience. Usability testing for a Web site should focus on three key aspects: content, navigation, and presentation.

Usability testing can be conducted in several ways; one effective way is to directly observe users interfacing with (or using) the Web site. As you observe users, you can track the links they click and record their actions and comments. You can even ask the users to explain what tasks they were trying to accomplish while navigating the site. The information gained by observing users can be invaluable in helping identify potential problem areas in the Web site. For example, if you observe that users have difficulty finding the
Web page that lists store locations and hours of operation, you may want to clarify the link descriptions or make the links more prominent on the home page.

Another way to conduct usability testing is to give users a specific task to complete (such as finding a product price list) and then observe how they navigate the site to complete the task. If possible, ask them to explain why they selected certain links. Both of these observation methods are extremely valuable, but require access to users.

Usability testing can also be completed using a questionnaire or survey. When writing a questionnaire or survey, be sure to write open-ended questions that can give you valuable information. For instance, asking the yes/no question “Is the Web site visually appealing?” will not gather useful information. If you change that question to use a scaled response, such as, “Rate the visual appeal of this Web site, using a scale of 1 for low and 5 for high,” you can get more valuable input from the users. Make sure, however, that the scale itself is clear and understandable to the users. If you intend that a selection of 1 equates to a “low” rating, but the users think a 1 means “high,” then your survey results are questionable. A usability testing questionnaire should always include space for users to write additional explanatory comments.

Figure 1–17 shows some examples of types of questions and organization that you might include in a Web site usability testing questionnaire.

![Figure 1–17 Web site usability testing questionnaire.](image-url)
In addition to content, functionality, and usability testing, there are other types of testing. For a newly implemented or maintained Web site, two other types of tests should be conducted: compatibility testing and stress testing. **Compatibility testing** is done to verify that the Web site works with a variety of browsers and browser versions. Initially, test using the browsers that your audience is most likely to use. Different browsers display some aspects of Web pages differently, so it is important to test Web pages in several different browsers to verify they appear correctly in each browser. If you have used technologies that are not supported by older browsers or that require plug-ins, consider changing the content or providing alternative Web pages for viewing in older browsers. If your audience uses both PC and Macintosh computers, you need to test the Web pages using browsers on both platforms. You may also want to test the Web pages in several versions of the same browser (usually the two most recent versions), in the event users have not yet upgraded.

**Stress testing** determines what happens on your Web site when greater numbers of users access the site. A Web site with 100 users accessing it simultaneously may be fine. When thousands of users use the Web site at once, it may operate at an unacceptably slow speed. Stress testing verifies that a Web site runs at an acceptable speed with many users. There are many cases in which companies did not effectively stress test their Web sites. The results of this lack of testing have been disastrous, with Web sites locking up when too many users tried to access the same Web site function. Especially in the case of Web sites used for e-commerce, it is imperative for the Web site to stay online. A crashed or locked-up Web site will not sell products or services, and the company stands to lose a lot of money.

**Web Site Implementation and Maintenance**

Once Web site testing is complete and any required changes have been made, the Web site can be implemented. Implementation of a Web site involves the actual publishing of the Web pages to a Web server. Many HTML editors and WYSIWYG editors provide publishing capabilities. You can also use FTP software, such as WS_FTP or CuteFTP, to publish your Web pages to a Web server. After you publish a Web site, you should test the Web pages again to confirm no obvious errors exist such as broken links or missing graphics.

After a site is tested and implemented, you need to develop a process to maintain the Web site; users will undoubtedly request changes and timely content will require updates. You need to ensure, however, that updates to the Web site do not compromise the site’s integrity and consistency. For example, if you have several different people updating various Web pages on a large Web site, you might find it difficult to maintain a consistent look on pages across the Web site. You should plan to update your Web site on a regular basis to keep content up-to-date. This could mean hourly, daily, weekly, or less often, depending on the site’s purpose. Do not allow your content to become stale, outdated, or include broken links to Web pages that no longer exist. As a user looking for information related to a specific topic, how likely are you to believe the information found on a Web site that says “Last update on December 10, 1998” comes from a reliable source?

To help manage the task of Web site maintenance, first determine who is responsible for updates to content, structure, functionality, and so on. Then, limit update responsibilities to specific users. Be sure the implementation is controlled by one or more Web developers who can verify that the Web pages are tested thoroughly before they are published.

As updates and changes are made to a Web site, consider notifying users with a graphic banner or a “What’s New” announcement, explaining any new features and how the features will benefit them. This technique not only keeps users informed, but also encourages them to come back to the Web site to see what is new.
Finally, Web site monitoring is another key aspect of maintaining a Web site. Usually, the Web servers that host Web sites keep logs of information about Web site usage. A log is the file that lists all of the Web pages that have been requested from the Web site. Web site logs are an invaluable source of information for a Web developer. Obtaining and analyzing the logs allow you to determine such things as the number of visitors, browser types and versions, connection speeds, pages most commonly requested, and usage patterns. With this information, you can design a Web site that is effective for your targeted audience, providing visitors with a rich and rewarding experience.

Be an Observant Web User

As you embark on this course, and perhaps start your Web development career, one useful practice is to be an observant Web user. Most of us use the Web several times a day (or more often) to complete our daily tasks. As a Web developer, you should review the Web pages that you access with an eye on functionality and design. As described in the first In the Lab exercise at the end of the chapter, you can bookmark Web sites you think are effective and ineffective, good and bad, and use them as references for your own Web development efforts. Watch for trends on the Web as you search for information or make online purchases. For example, blinking text and patterned backgrounds used to be very popular on the Web, but now other design techniques have taken over. Being an observant Web user can help you become a more effective Web developer.

Chapter Summary

In this chapter, you have learned about the Internet, the World Wide Web, and associated technologies, including Web servers and Web browsers. You learned the essential role of HTML in creating Web pages and reviewed tools used to create HTML documents. You also learned that most Web development projects follow a five-phase life cycle. The items listed below include all the new concepts you have learned in this chapter.

1. Describe the Internet (HTML 2)
2. Describe the World Wide Web (HTML 3)
3. Define Web servers (HTML 4)
4. Describe the Internet, intranets, and extranets (HTML 5)
5. Discuss Web browsers (HTML 7)
6. Define Hypertext Markup Language (HTML 8)
7. Describe HTML elements (HTML 9)
8. List useful HTML practices (HTML 10)
9. Explain HTML versions (HTML 11)
10. Describe Cascading Style Sheets (HTML 11)
11. Define the Document Object Model (HTML 12)
12. Define Extensible Hypertext Markup Language (XHTML) (HTML 12)
13. Describe tools for creating HTML documents (HTML 13)
14. Discuss the Web development life cycle (HTML 15)
15. Describe steps in the Web development planning phase (HTML 16)
16. Explain the Web development analysis phase (HTML 16)
17. Discuss Web design and development (HTML 17)
18. Describe various Web site structures (HTML 17)
19. Discuss the importance of Web site testing, including usability testing, compatibility testing, and stress testing (HTML 22)
20. Discuss Web site implementation and maintenance (HTML 24)
21. Explain the importance of being an observant Web user (HTML 25)
Apply Your Knowledge

Reinforce the skills and apply the concepts you learned in this chapter.

Understanding Web Page Structures

Instructions: Figure 1–18 shows the Web site of OnGuardOnline.gov. As you learned in this chapter, three common Web site structures include linear, hierarchical, and webbed. Based on that information, determine the structure used in the OnGuardOnline.gov Web site. Review other similar Web sites and determine which Web site design features are beneficial to a user. Incorporate those ideas into a new Web site design for OnGuardOnline.gov. Use paper to sketch the new Web site design for the OnGuardOnline.gov Web site.

Perform the following tasks:
1. Start your browser. Open the OnGuardOnline.gov Web site in your browser. Print the home page by clicking Print on the File menu or by clicking the Print icon.
2. Explore the OnGuardOnline.gov Web site, determine the structure that the Web site utilizes (linear, hierarchical, or webbed), and then write that on the printout.
3. Find two other government Web sites. Print the home pages for each of those sites.
   Navigate these Web sites to identify any design features that are beneficial to a user.
4. Using ideas from the government Web sites that you found in Step 3, sketch a new Web site structure and design for the OnGuardOnline.gov site on paper.
5. Submit your answers in the format specified by your instructor.
Extend Your Knowledge

Extend the skills you learned in this chapter and experiment with new skills.

**Evaluating a User Survey**

*Instructions:* Start your word-processing program. Open the document extend1-1.docx from the Chapter01\Extend folder of the Data Files for Students. See the inside back cover of this book for instructions on downloading the Data Files for Students, or contact your instructor for information about accessing the required files. This sample Web site survey shows various questions that could be asked in gathering feedback on Web site usability. It is important to assess the usability of your Web site, as mentioned in the chapter.

You will evaluate the user survey and modify the questions or add new questions that apply to the Web site that you have chosen. Then you will ask five people to take your survey.

*Perform the following tasks:*

1. Determine if the survey questions would provide you with valuable information about a Web site. Why or why not?

2. Identify what you can do to improve the Web site survey. Using a word processor, type your analysis into a new file, and save the file as extend1-1solution.docx.

3. Once you have analyzed the questions in the original survey, make changes to the user survey by following some of the guidelines provided in Figure 1–17 on page HTML 23. Type your new
survey questions into the new extend1-1solution.docx file after the analysis completed in step 2. Add questions to the survey that will help you determine a user’s opinion of the selected Web site. Remember that the purpose of using surveys is to improve a Web site. Your questions therefore have to provide you with information that can help you achieve that goal.

4. After you have completed these steps, submit the extend1-1solution.docx file in the format specified by your instructor.

**Make It Right**

Analyze a document and correct all errors and/or improve the design.

**Correcting the Web Site Type Table**

*Instructions:* Start your word-processing program. Open the file makeitright1-1.docx from the Chapter01\MakeItRight folder of the Data Files for Students. See the inside back cover of this book for instructions on downloading the Data Files for Students, or contact your instructor for information about accessing the required files. The document, shown in Table 1–6, is a modified version of Table 1–5 (on page HTML 17). The table, which intentionally contains errors, lists the Web page organizational standards discussed in this chapter. Without referring to Table 1–5, make the necessary corrections to Table 1–6 by identifying the correct organizational standard and reason for each of the seven elements listed. Save the revised document as makeitright1-1solution.docx and then submit it in the form specified by your instructor.

<table>
<thead>
<tr>
<th>Element</th>
<th>Organizational Standard</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titles</td>
<td>Use these to separate main topics</td>
<td>These provide graphical elements to break up Web page content</td>
</tr>
<tr>
<td>Headings</td>
<td>Use simple ones that clearly explain the purpose of the page</td>
<td>These provide shorter, more-readable sections of text</td>
</tr>
<tr>
<td>Horizontal Rules</td>
<td>Utilize these in bulleted or numbered format when appropriate</td>
<td>Web users do not always scroll to view information on longer pages; appropriate page lengths increase the likelihood that users will view key information</td>
</tr>
<tr>
<td>Paragraphs</td>
<td>Maintain suitable Web page lengths</td>
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</tr>
<tr>
<td>Lists</td>
<td>Insert these graphical elements to separate main topics</td>
<td>These provide organized, easy-to-read text that readers can scan</td>
</tr>
<tr>
<td>Page Length</td>
<td>Use these to help divide large amounts of text</td>
<td>Titles help users understand the purpose of the page; a good title explains the page in the search engine results lists</td>
</tr>
<tr>
<td>Information</td>
<td>Emphasize the most important information by placing it at the top of a Web page</td>
<td>These make a Web page easier to read; simple headlines clearly explain the purpose of the page</td>
</tr>
</tbody>
</table>
Design and/or create a document using the guidelines, concepts, and skills presented in this chapter. Labs are listed in order of increasing difficulty.

**Lab 1: Evaluating Web Sites**

**Problem:** In this chapter, you learned the importance of being an observant Web user, which can help you become a more effective Web developer. To further develop that concept, find and then discuss “good” and “bad” (“effective” and “ineffective”) Web sites. Start your browser and your word-processing program. Open the file lab1-1.docx from the Chapter01\IntheLab folder of the Data Files for Students. See the inside back cover of this book for instructions for downloading the Data Files for Students, or contact your instructor for information on accessing the required files for this book.

**Instructions:** Perform the following steps using your browser and the file listed.

1. Browse the Internet and find one “good” (i.e., effective) and one “bad” (i.e., ineffective) Web site. Determine, based on your own opinion, what is “good” and what is “bad” in these Web sites. You will identify the specific reason for your opinion in Step 2 below.

2. Using the lab1-1.docx file, rate the usability of the good and bad Web sites that you selected. Be sure to add additional comments in the survey to specifically identify your positive or negative feelings about the Web site. Save the documents using the file names lab1-1goodsolution.docx and lab1-1badsolution.docx.

3. Team up with one other student and discuss your survey results while reviewing the Web sites that you selected. Also review your student partner’s Web sites and surveys.

4. Open the word-processing document named lab1-1comparison.docx and note any differences of opinion in your survey results and the opinion of your student partner. Make sure to include the URLs of the four Web sites that you and your partner reviewed in this new document. Save the document using the file name lab1-1comparison.docx.

5. Submit your own solutions (lab1-1goodsolution.docx and lab1-1badsolution.docx) and the team document (lab1-1comparison.docx) in the format specified by your instructor.

**Lab 2: Designing a Web Site for a Flower Shop**

**Problem:** Your neighborhood flower shop wants you to design a Web site that will give visitors access to a full range of information. To do this, you must complete the planning and analysis phases by answering such questions as:

- What tasks do flower shop visitors want to complete on the Web site?
- What tasks will the flower shop owner want to complete on the Web site?
- What types of information should be included?
- Who will provide information on the Web site content?

Interview several friends or relatives who have visited flower shops in the past and determine the answers to these questions. Based on that information, you will draw a sketch of a design for the home page of the flower shop’s Web site, such as the design shown in Figure 1–19 on the next page.

Continued >
Instructions: Perform the following tasks using your word-processing program and paper.

1. Review the questions in the planning and analysis phases of the Web development life cycle, as shown in Table 1–4 on page HTML 15.

2. Assess the value of those questions listed in the table. Add other questions that you think are relevant to the planning and analysis of a flower shop Web site.

3. Start your word-processing program. If necessary, open a new document. Enter the questions you will use for planning and analysis. Save the document using the file name lab1-2solution.docx. Print the document.

4. Using the questions that you developed, interview friends and family who have visited flower shops to determine what information should be included in the Web site, who will provide the information, and so on.

5. After gathering the required information, sketch a design for the home page of the Web site on paper.

6. Share your design sketch with the people who you interviewed to get their opinions on your design.
7. Redraw the design on paper, making any changes based on the input from the friends and relatives with whom you have worked.
8. Write Original Design on the first design sketch.
9. Write Second Design on the second design sketch.
10. Submit your solution (lab1-2solution.docx) in the format specified by your instructor.

Table 1–7 Planning Phase Questions

<table>
<thead>
<tr>
<th>Type Of Business</th>
<th>Planning Question</th>
<th>Internet</th>
<th>Intranet</th>
<th>Extranet</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the purpose of this Web site?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Who will use this Web site?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are users’ computing environments?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who owns and authors the information on the Web site?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who decides if/where the information goes on the Web site?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cases and Places

Apply your creative thinking and problem-solving skills to design and implement a solution.

Note: To complete these assignments, you may be required to use the Data Files for Students. See the inside back cover of this book for instructions on downloading the Data Files for Students, or contact your instructor for information about accessing the required files.

1: Create a Usability Survey

Academic
Your school recently updated its Web site. The school administration has selected a team to develop a usability survey or questionnaire that you can give to a group of users (including students, parents, and teachers) to evaluate the new Web site. What types of information do you hope to gain by distributing this survey or questionnaire? How can you convey information on the survey or questionnaire so it clearly identifies what you are asking? Create a usability survey using your word-processing program. Give the survey or questionnaire to at least five people, including at least one from each group identified above. Allow participants to complete the survey or questionnaire and then look at the results. If possible, ask the users what they thought the various questions conveyed. Is that what you wanted to convey? If not, think of clearer, more relevant questions and redistribute the survey to another group of participants.

2: Learn More About HTML5

Personal
This chapter introduced the use of HTML5 in Web development. You will utilize HTML5 throughout this book, so it is important that you become familiar with it. Visit the W3Schools Web site (w3schools.com) to learn more about HTML5. Find three other sources of information about HTML5 on other Web sites. Using a word-processing program, create a document that briefly describes the Web sites that you found and an explanation about how you could utilize these three Web sites for Web development.

3: Learn More About Web Access Issues

Professional
Your company wants to offer online courses to employees. Several employees have physical challenges, and it is imperative that the online courses be accessible to everyone. Your manager has asked you to learn more about accessibility guidelines to determine what changes are needed to make the company’s online courses accessible to those with physical challenges. Research accessibility issues on the Web and determine what needs should be considered to satisfy accessibility requirements. Make sure to visit the w3.org Web site. Consider the following questions when doing your research: What types of physical challenges do you have to consider when developing Web pages? What recommendations do the Web sites make for accessibility? Why is this important to you as a Web developer?