Lesson 1: Markup Language and Site Development Essentials

Objectives

By the end of this lesson, you will be able to:

- 2.1.1: Relate the history of markup languages to current techniques and technologies, including Standard Generalized Markup Language (SGML), previous versions of Hypertext Markup Language (HTML).
- 2.1.2: Identify the format and various versions of HTML, including HTML 4.01, Extensible HTML (XHTML), HTML5.
- 2.1.8: Explain the importance of consistently developing to a single W3C standard (e.g., HTML5).
- 2.6.1: Describe the functionality of XML.
- 2.7.1: Obtain input from stakeholders about acceptable technologies and color combinations.
- 2.7.2: Create an initial Web site diagram (i.e., a story board or prototype), and translate it into a site map.
- 2.7.3: Verify compliance with government and industry accessibility standards, including W3C Web Accessibility Initiative (WAI), U.S. Government Section 508, Americans with Disabilities Act (ADA).
- 2.7.4: Validate Web page design according to technical and audience standards adopted by employers.
- 2.7.5: Verify Web site usability, viewability and browser compatibility.
- 2.12.1: Test and validate Web documents.
- 2.12.3: Test Web pages in multiple browsers.
- 2.13.1: Work as a team member to develop pages and sites.

- 2.13.2: Collaborate with technical (e.g., IT) and non-technical (e.g., marketing) members of the organization to ensure sites meet requirements.
- 2.13.3: Determine information and audience requirements for a site, including stakeholders such as customers, employees, shareholders, suppliers.
- 2.13.4: Document a Web site plan.
- 2.13.5: Communicate the Web site plan effectively, both orally and in writing.
- 2.13.6: Obtain and document feedback, then improve the site, including working closely with sales and marketing to evaluate site effectiveness.
- 2.14.1: Define legal issues related to a Web site, including trademarking, licensing, copyrighting, licensing copyrighted materials, scope of copyright, reach of copyright, copyrighting process, copyright infringement and consequences.
- 2.14.2: Identify fundamentals of project management, including major stages of a Web design/development project cycle.
- 2.14.3: Identify processes of pre-launch site/application functionality testing, including checking links, testing with various browsers, testing against corruption of your e-commerce site, load testing, access to the site, testing with various speed connections.
- 2.14.4: Manage existing sites (e.g., remove dead links and/or upgrade connectivity when necessary).
- 2.14.5: Remove old sites and pages.
- 2.15.1: Identify ways to elicit useful feedback from management and customers.
- 2.15.2: Use presentation aids and support material, including charts, tables, figures, written content, overhead projection.
- 2.15.3: Use presentation software (e.g., slide-based software).
- 2.15.4: Clarify technical concepts for a non-technical audience, and use strategies to retain listener interest.
- 2.15.5: Interpret verbal, non-verbal and written feedback.
- 2.15.6: Address diversity and corporate/organizational culture when communicating your message by customizing meeting and message delivery, and listening for responses.
- 2.15.7: Identify ways to lead meetings (e.g., make introductions, invite questions, set time frames, set action times, monitor time, ensure proper discussion focus, publish minutes).
- 2.18.1: Investigate costs associated with placing and developing your own server.
- 2.18.2: Identify costs associated with using a cloud service provider.
- 2.18.3: Distinguish among dedicated hosting, co-location and virtual servers.
- 2.18.5: Manage information relevant to a site (e.g., account information, passwords, IP addresses).
- 2.19.3: Consider corporate/organizational culture when designing page layout.
- 2.19.4: Demonstrate sensitivity to ethnic and cultural issues in page layout and design.
- 2.20.1: Obtain proper permissions from developers when repurposing content (e.g., other developers' code, images, concepts).
- 2.20.2: Create and sign a Non-Disclosure Agreement (NDA) when necessary.
- 2.20.3: Identify situations in which it is necessary to consult with a legal team.
- 2.20.4: Identify ethical concerns when developing a Web site.

Pre-Assessment Questions

1. Which of the following establishes nationally recognized rules meant to protect the rights of a Web site's author?

   a. Ethics
   b. Copyright
   c. Trademark
   d. Trade secrets

2. Which of the following is an example of an HTML markup interpreter?

   a. Bluetooth device
   b. Proxy server
   c. Text editor
   d. E-mail application on a mobile device

3. What is the latest version of HTML?

   _____

Creating Web Pages

NOTE:
Web page authoring is becoming a standard skill set for many careers. For instance, many human-resources departments post employee benefits, retirement programs and important policy changes on company intranets.

The skills of Web page creation have become vital to many careers. You are likely to need skills with Web-based technologies for various job-related tasks, including:

- Informing colleagues about progress on team projects.
- Using or contributing to the company intranet.
- Working with customers online.
- Posting or retrieving résumés.
- Gathering information from customers or community members about their interests.
- Obtaining information from social networking activities.

You may also want to work as a Web developer or site designer, with responsibility for the Web pages of an entire company or organization. Whatever job role you choose, this course will teach you how to create Web pages using text editors and graphical development applications. Each tool creates similar pages, but the creation processes are quite different.

markup language
A series of commands used to format, organize and describe information on a Web page.

It is important to understand that Web pages are no longer viewed only through standard Web browsers. Your smartphone, tablet, smart TV and gaming console are all capable of reading **markup languages**. In fact, many Web design professionals refer to HTML as "markup," simply because many of their pages will be viewed using applications other than Web browsers. Because markup languages are becoming more common in the workplace, it is important for you to understand how to use them.

Hypertext Markup Language (HTML)

Hypertext Markup Language (HTML)
The traditional authoring language used to develop Web pages for many applications.

Web page creation by any method requires a working knowledge of **Hypertext Markup Language (HTML)**. It is the standard markup language on the Web, and in other settings. HTML is standardized by an organization called the World Wide Web Consortium (W3C). You can learn more about the W3C at *www.w3.org*.

HTML is the markup language that defines page structure, hyperlinks, graphics and more to enable pages to render in Web browsers and other devices. You will learn about HTML in detail throughout this course. You can type HTML code manually into a text editor, use a graphical user interface (GUI) editor program to create the code automatically (by pointing and clicking your mouse), or combine both methods.

Cascading Style Sheets (CSS)

Cascading Style Sheets (CSS)
A technology that allows greater style definition and formatting control of HTML elements. Formatting can be placed within the HTML or called remotely from an external style sheet.

Cascading Style Sheets (CSS) are rules in an external text file that determine how to display HTML elements in your Web pages. CSS contain formatting instructions that can define the font, color and phrase elements used on a particular markup page.

If all pages on your site are linked to the same external style sheet, then one simple change to the style sheet will change all elements across the site. If you then want to change those instructions (for example, the size of a document heading), you need not change every page manually. You need only change a line in the style sheet file, then all your headings will change their appearance to conform to the style sheet. This technology can save a great deal of development and maintenance time, as well as make a more consistent, accessible interface.

Additional Web page elements

NOTE: Smartphones have had a large impact on Web design. What are the differences between viewing a Web page on a PC versus on a smartphone? How would that impact a Web designer?

Web pages can incorporate more than just HTML and CSS. You can use other languages to enhance a page, such as JavaScript, Jscript and VBScript. You can also enhance Web pages by inserting specialized content created with programs and technologies such as Java (*www.java.com*), ActiveX (*www.microsoft.com*), Microsoft Silverlight (*www.microsoft.com/silverlight/*) and Flash (*www.adobe.com/products/flash/*). You will learn about all these technologies throughout this course.

CIW Online Resources – Movie Clips

Visit CIW Online at http://education.Certification-Partners.com/CIW to watch a movie clip about this topic.

Lesson 1: Markup Language and Site Development Essentials

Mobile and Cloud Issues

Web site development has been impacted by smartphones, tablets and other mobile devices. Smaller screens are used to view Web pages previously viewed only on much larger PC monitors. This limited screen size has caused Web site designers to modify their existing sites or create alternative sites for these mobile devices.

cloud computing Software, infrastructure and platform services that are hosted by a remote data center and provided to organizations or individuals over the Internet.

Cloud computing has also impacted Web design. Cloud computing is software services that are provided over the Internet, rather than at a company site. For instance, in the past, companies had to have a server room with Web, e-mail, file and database servers. These servers can now be located in the "cloud" (i.e., a remote data center that is accessed over the Internet).

Cloud services include social networks and blogging sites. These sites do not require knowledge of HTML to create Web pages. Users simply "point and click" the available Web site tools to design a personalized page.

You will learn how to create both mobile and cloud Web pages (as well as traditional Web sites) in this course. These methods will demonstrate how Web designers must design their sites and Web pages for users who will view them on different types of devices.

Text Editors and Markup Languages

NOTE: You must save all markup as simple text files.

You do not need to use a special editor application to create HTML. You can use a simple text editor. A text editor is any program that allows you to type simple text and edit it, such as Microsoft Notepad and WordPad, or UNIX-based programs such as Vi and Pico. However, you must save your code files as plaintext. Any formatting instructions embedded in a file by a word-processing program, for example, can prevent the file from functioning properly.

Multipurpose Internet Mail Extensions (MIME) A protocol that enables operating systems to map file name extensions to corresponding applications. Also used by applications to automatically process files downloaded from the Internet.

After you save the Web page code as a text file, you should save it with the .htm or .html file name extension. Many operating systems and Web browsers are configured with **Multipurpose Internet Mail Extensions (MIME)** to automatically process files with these extensions. Figure 1-1 shows a text editor with HTML code. You will use Notepad as your HTML text editor in the first part of this course. You will then use a simple GUI-based editor application later in the course.

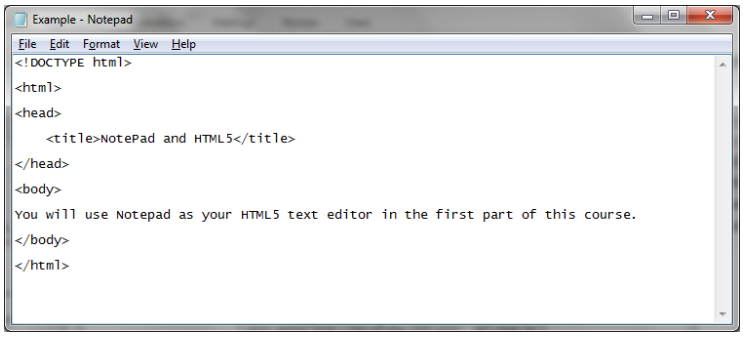

Figure 1-1: HTML code in text editor

NOTE:
The code shown in Figure 1-1 is HTML5. The documents in this course are all written to HTML5, which is the latest version.

Many text editors exist, all with more capability than Microsoft Notepad. Open-source examples you may want to use include:

- Notepad++ (http://*notepad-plus.sourceforge.net*).
- jEdit (*www.jedit.org*).
- Vim (*www.vim.org*).
- Cream (http://*cream.sourceforge.net*).
- Emacs (*www.gnu.org/software/emacs*).

Most of these products have versions that will run on multiple operating systems.

Graphical User Interface (GUI) Editors

graphical user interface (GUI)
A program that provides visual navigation with menus and screen icons, and performs automated functions when users click command buttons.

Graphical user interface (GUI) markup editor applications place markup instructions into files for you; you do not need to know HTML to use GUI editors. Many GUI HTML editors still do not produce valid HTML. Nevertheless, such editors provide a graphical user interface that makes it easy for you to create HTML pages without writing any code manually. You simply point and click with your mouse, and the code is generated by the program. Commands are displayed on the graphical user interface as they will appear in a browser, thus the programs are often called WYSIWYG (What You See Is What You Get) editors. Some developers feel that using a GUI editor application saves time. Others feel that GUI editors create confused HTML code and do not provide true flexibility.

Popular GUI HTML editors include Adobe Dreamweaver, Microsoft Expression Web, Mozilla SeaMonkey and Adobe GoLive. The KompoZer GUI editor is shown as an example in Figure 1-2. In this course, you will use the Bluefish GUI editor.

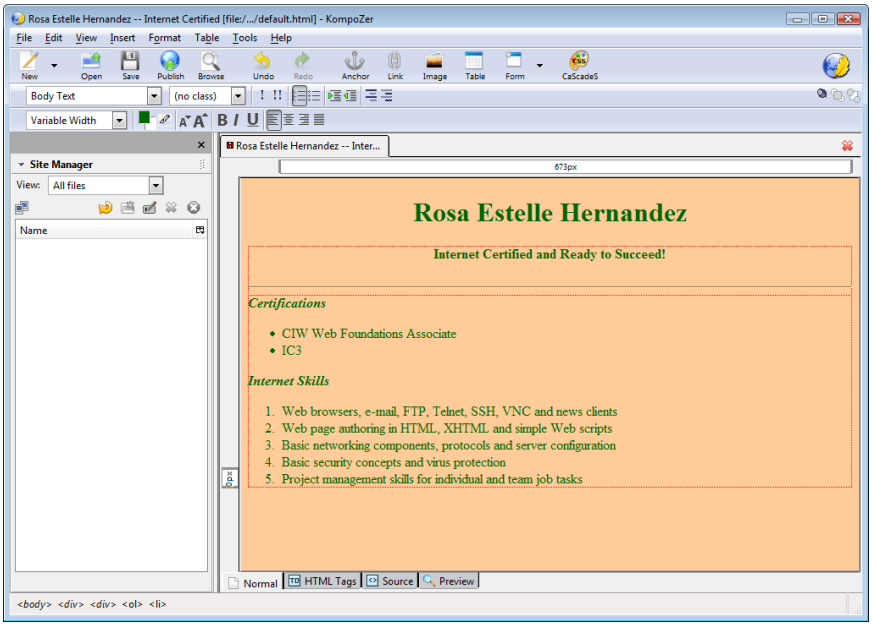

Figure 1-2: KompoZer GUI markup editor

Why learn markup languages?

As already mentioned, most GUI HTML editor applications have not kept pace with the evolution of HTML, and do not provide options for more recent markup standards. However, many of these GUI programs allow you to modify your HTML code manually from the GUI. If you know HTML, you can maximize the benefit of these programs by manually adding code that the GUI editor does not. Further, if you are considering learning any scripting or programming languages, such as JavaScript, you *must* learn how to write code manually.

Learning to write your own markup code in a text editor will enable you to create highly attractive, functional HTML documents, regardless of any other available software. Another reason to use a text editor is so you can learn the fundamentals of markup languages, then update a page to the latest standard or recommendation. You will learn about markup language standards later in this course.

History of Markup Languages

OBJECTIVE
2.1.1: History of markup languages

In this section, you will learn about the types of markup languages available to you for creating online documents.

Standard Generalized Markup Language (SGML)

Standard Generalized Markup Language (SGML)
A metalanguage used to create other languages, including HTML and XHTML.

metalanguage
A language used for defining other languages.

Standard Generalized Markup Language (SGML) is a **metalanguage**, which means that it is used to create other languages, including HTML and XHTML. SGML was originally created by IBM and was standardized in 1986 by the International Organization for Standardization (ISO). SGML is a powerful markup language that describes documents by organizing concepts separately from their visual presentation. However, it is also very complex and difficult to learn.

SGML's purpose was to describe only the information within a document, not the formatting of it. With SGML, you can describe how data elements in the document relate to each other. SGML was not designed to format the data's appearance on the page.

Document Type Definition (DTD)
A set of rules contained in a simple text file that defines the structure, syntax and vocabulary as it relates to tags and attributes for a corresponding document.

SGML essentially requires that you create, or define, your own document language rules. This set of language rules is called the **Document Type Definition (DTD)**. The DTD is generally specified in a separate file, which you reference, or declare, at the beginning of each document that you want to conform to the rules. Once the DTD is established, then all elements in the document must conform to it. You will learn more about DTDs and how to declare them later.

Hypertext Markup Language (HTML)

Tim Berners-Lee of MIT invented Hypertext Markup Language (HTML) with colleagues from CERN (the European Particle Physics Laboratory) as a means of distributing non-linear text, called hypertext, to multiple points across the Internet. Berners-Lee felt that SGML and other languages were needlessly complex and did not suit the need for a cross-platform language that helped format documents.

hyperlinks
Embedded instructions within a text file that link it to another point in the file or to a separate file.

In HTML, one document links to another via pointers called **hyperlinks**. Hyperlinks are embedded instructions within a text file that call another location in the file or a separate file when the link is accessed, usually by a click of a mouse. The global set of linked documents across the existing Internet framework grew into the World Wide Web.

HTML vs. SGML

Like SGML, HTML facilitates data exchange through a common document format across different types of computer systems and networks on the Web. However, HTML does not allow you to define a DTD and has fewer language elements than SGML. As a result, HTML is easier to use and has become the standard method of encoding information for Web documents.

The latest version of HTML, called HTML5, is not based on SGML. This departure has allowed the simplification of HTML structure. For example, the DTD is no longer required.

HTML 3.2 and HTML 4.01 recommendations

OBJECTIVE
2.1.2: HTML and XHTML

HTML 3.2 is an older but functional HTML standard. Some Web pages and HTML editors still use the 3.2 and 4.01 standards.

The HTML 4.01 Recommendation (released in 1999) contained many improvements from HTML 3.2, most notably Cascading Style Sheets (CSS). You can access this standard at *www.w3.org/TR/html4/*. The 4.01 specification included minor modifications to the 4.0 specification.

HTML 4.01 supported multiple spoken languages. For example, HTML 4.01 allowed you to create Web pages that read languages such as Hebrew from right to left. HTML 4.01 also allowed you to create ambitious tables and forms, as well as incorporate scripting languages. You will learn more about scripting solutions, such as JavaScript, later in the course.

The W3C regulates the development of CSS standards.

HTML 4.01 flavors

NOTE:
You can review terms and languages in **Activity 1-1: Defining Web page authoring terms**.

As Web pages were developed in HTML 4.01, they had three distinct variants, or "flavors." The HTML 4.01 flavors ensured that you could use the specification and still remain backward-compatible with older Web browsers. Following is a short description of each flavor.

- **HTML 4.01 Transitional —** allowed developers to insert formatting using either CSS or traditional layout instructions (e.g., HTML font, color and phrase elements). This version rendered in browsers that did not support HTML 4.01 features such as CSS. This version also allowed tags that the W3C considered to be less useful, known as "deprecated tags."
- **HTML 4.01 Strict —** required the exclusive use of CSS when defining layout instructions. Deprecated tags were not allowed and generated errors.
- **HTML 4.01 Frameset —** required for pages that used HTML frames, which placed Web pages inside each other to create separate panes in the browser window. Some felt that frames provided additional functionality or enhanced a site's look and feel.

You specify the flavor of HTML by using a document type (<!DOCTYPE>) declaration. You will learn more about the <!DOCTYPE> in this and later lessons.

Many Web pages were written to versions of HTML 4.01. In this course, however, you will create pages using HTML5, which will be discussed shortly. To understand HTML5, you must first be familiar with XML and XHTML.

Extensible Markup Language (XML)

Extensible Markup Language (XML) A markup language that describes document content instead of adding structure or formatting to document content. A simplified version of SGML.

Extensible Markup Language (XML) is a language used to describe data elements on a Web page. XML enhances the structure and navigation of data. It is not used to format the page's appearance. Businesses use XML because it allows data to be interchanged with all types of applications.

XML is often used with intranets and extranets because these systems tend to focus mostly on sophisticated personal and business transactions. These types of transactions require the elements that XML offers.

OBJECTIVE 2.6.1: XML functionality

XML documents can be formatted into print documents, Web documents, PDF documents, comma-separated values (CSV), Braille, text-to-speech and many other formats. This versatility allows XML to easily format content from a textbook, for example, which can be published to the Web in an e-learning course. Because the documents are well-formed and define only the content, changes can occur on the fly (i.e., dynamically or without interruption), without administrators or programmers manually reformatting the content before transmission.

NOTE: Make sure you understand the differences between HTML and XML.

XML is often misunderstood. Many people think XML is just another set of markup used to format Web pages. This assumption is incorrect. In fact, XML is not used to format Web pages, but to describe the data from which Web pages are created. The W3C governs the development of XML.

Extensible Hypertext Markup Language (XHTML)

Because the requirements for XML and HTML are dramatically different, the developers of HTML decided to create a medium that would merge the two into a markup language called Extensible Hypertext Markup Language (XHTML).

client
An individual computer connected to a network. Also, a system or application (such as a Web browser or user agent) that requests a service from another computer (the server) and is used to access files or documents.

The idea was to make the transition from HTML to XML without making all existing HTML documents unusable in XML **clients**. These requirements meant that XHTML could not completely depart from HTML, nor could it be patterned completely after XML. XHTML documents are not required to render correctly in standard clients, but will have little if any difficulty. For a more detailed discussion about compatibility issues, visit the W3C site at the following URI:

www.w3.org/TR/2002/REC-xhtml1-20020801/#guidelines

When you use XML, the term Uniform Resource Identifier (URI) is preferred over the standard HTML term Uniform Resource Locator (URL).

Two versions of XHTML were created by the W3C: XHTML version 1.0 and XHTML version 1.1. Version 1.0 became a W3C recommendation in 2000. Version 1.1 earned its original recommendation in 2001. A third version, XHTML 2.0, was abandoned by the W3C in 2009 in favor of a new XHTML5 version, which is still under development. It is important that you are familiar with XHTML because you will encounter Web pages designed using it. Table 1-1 shows the various XHTML specifications.

Table 1-1: W3C XHTML specifications

XHTML Version	W3C Status	Notes
XHTML 1.0	Recommended in 2000	Still used in some production environments
XHTML 1.1	Recommended in 2001	Still used in some production environments; provided "modularization"
XHTML 2.0	Abandoned in 2009; it did not provide backward compatibility	The W3C decided to pursue an XHTML version based on HTML5 instead
XHTML5	Working draft	Under development as part of the HTML5 specification

NOTE:
Be sure you understand the relationships among HTML, XML and XHTML.

As you have learned, HTML describes only a document's visual layout, and XML allows you to describe the function and context of the information contained in a document. XHTML allows HTML to become XML-compliant. Thus XHTML extends HTML by allowing the convergence of HTML documents with XML structure, creating forward-compatibility for documents. For more information about how XHTML, XML and HTML work together, visit *www.w3.org/MarkUp*. You can read the W3C's XHTML 1.0 specification at *www.w3.org/TR/xhtml1*.

HTML5

NOTE:
Take time to research HTML5-compatible browsers.

HTML5 is the latest version of HTML under development by the W3C. This course will focus on this specification. At the time of this writing, HTML5 was a W3C working draft. The W3C has created an HTML5 logo to market the technology, shown in Figure 1-3.

Figure 1-3: HTML5 logo

HTML5 provides modern requirements for the Internet with fewer plug-ins, such as the ability to standardize how video and audio are presented on a Web page. To that end, HTML5:

- Introduces the <video> element, which is designed to eliminate the need to install third-party plug-ins (such as those for Adobe Flash or Microsoft Silverlight).
- Adds the <audio> element, which allows pages to seamlessly add audio files for events such as podcasts.
- Establishes ways to enable drag-and-drop capability for Web pages without using third-party add-ons.
- Gives developers more native tools such as download progress indicators, image captioning options and form validation tools to use on a page.
- Provides developers with a native option for **offline storage**, and enables applications to run as expected even without network connectivity.
- Allows developers to retrieve the geographical location information for a client-side device, called **geolocation**. Examples include using the Global Positioning System (GPS) of a mobile device to determine the device's location, which allows Web services to be provided based on the client's location.

offline storage
The ability for Web browsers and online services to download and access content and services without being connected to the Internet.

geolocation
An HTML5 Application Programming Interface that allows developers to retrieve the geographical location information for a client-side device.

You will learn more about HTML5 throughout this course. To view the HTML5 specifications, go to: *http://dev.w3.org/html5/spec/Overview.html*

NOTE:
It is extremely important to apply a standard consistently throughout your pages. It is more important to be consistent than it is to use the most recent HTML standard. Remember this motto: "Pick it and stick to it."

Choosing and applying a language standard consistently

Whether you develop your own Web pages using HTML5, HTML 4.01, XHTML 1.1 Transitional, or any other flavor of these markup languages, it is important that you adopt a single W3C standard and apply it consistently throughout your document, Web pages or site. Otherwise, your pages may have difficulty rendering properly in user agents. This best practice also applies when you are using other types of languages in your online documents and sites, including CSS, scripting languages such as JavaScript, programming languages, and so forth.

Markup code validation

It is possible to validate all markup code automatically. Many validators exist, but the most authoritative is the W3C Markup Validation Service (*http://validator.w3.org*).

Using this service, you can upload local HTML files for validation, or provide the URL of a Web page to validate it. In this course, you will use the W3C validation service to validate your HTML5 code. However, it is important to note that this validator reads the <!DOCTYPE> declaration on an HTML page and validates according to the specified DTD. So, if your document references an older HTML 4.01 Strict DTD, then the validator will validate code according to the HTML 4.01 Strict specifications.

To reiterate, make sure you adopt a single W3C standard and apply it consistently so that when you validate your markup code, the code and your specified DTD will match, and the results of the validation process will be legitimate.

Validating your markup code is worthwhile because validated code is most likely to be interpreted accurately by the majority of user agents. As a result, your pages will render as you expect and will be available to a larger audience.

Following are some tips to consider when validating your markup code:

- Do not be discouraged when you see multiple problems reported for a page. Sometimes one small flaw can cause the remaining code on the page to fail validation, even if the remaining code is actually valid.
- When errors are reported, search through the code carefully to find the true problem. Sometimes when a validation program finds a problem, it does not report the correct cause or it may not report the cause clearly.
- Make sure that you are validating the correct file.

CIW Online Resources – Online Exercise

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to complete an interactive exercise that will reinforce what you have learned about this topic.

Exercise 1-1: Comparing markup languages

Universal markup creation

Good Web page coding generally involves ensuring that the content is rendered appropriately regardless of the browser used to render it. To ensure this type of consistent, or universal, rendering, Web page developers can apply certain practices to their coding that result in universal markup:

OBJECTIVE
2.1.8: Using a single W3C standard

- Follow W3C standards carefully.
- Choose one standard version of any given language you use, and apply that standard consistently throughout your document, pages or site.

Creating universal markup code is important for several reasons:

- Your pages will be ensured to render in future versions of most browsers.
- Your pages will be more scalable. This means that as you add more sophisticated content, make pages searchable or use the content in ways you have not yet imagined, you can still use markup you created without having to revise the code extensively.

- Your pages will be more accessible to disabled users. You will be able to more easily make your pages compliant so that your site is available to the widest possible audience and does not present a liability to your organization.

In some situations you may find that universal markup seems unnecessary. For example, if you are writing markup code for a page for your company's intranet, and all employees use the same browser, you can feel comfortable using proprietary language extensions and technology. In this case, you can be relatively sure that your HTML5 code will render consistently in that browser every time. But suppose the company's browser choice changes. Most situations call for pages that can be viewed in a variety of browsers, so creating universal markup is always good coding practice.

Consistent use of an HTML standard — such as HTML5, for example — can improve your page's ability to rank higher in a search engine results page.

In the following lab, you will visit the W3C Web site to learn more about commonly used markup languages. Suppose your project manager has asked you to research current Web standards. She has heard that HTML 4.01 is common but that newer standards exist, and she wants to know the best sources for this type of information. What Web pages would you research or recommend to explain Web standards?

Lab 1-1: Reviewing W3C standards

OBJECTIVE
2.1.2: HTML and XHTML

In this lab, you will visit the W3C Web site to learn more about commonly used markup languages.

1. First, you will learn more about the HTML5 specification. Open a browser and visit ***www.w3.org/TR/html5/***. Scroll through the specification to learn more about HTML's relationship to SGML, as well as HTML elements.
2. Next, learn more about XML by visiting ***www.w3.org/XML***.
3. Visit ***www.w3.org/TR/xhtml1/*** to learn more about XHTML 1.0 and ***www.w3.org/TR/xhtml11/*** to learn about XHTML 1.1.
4. Now, visit the W3C home page at ***www.w3.org***. Review the mission of the W3C, then browse through the site.
5. Visit the W3C Markup Validation Service at ***http://validator.w3.org*** and learn more about this service.
6. Further familiarize yourself with HTML, XML and XHTML by accessing Google, Bing or another search engine, and entering search strings such as the following: "**HTML versus XHTML**"
7. Consider the sources presented in your search results. Link to some that look reliable, and read the various explanations that you find to better understand the differences between HTML and XHTML.

In this lab, you visited the W3C Web site and other sites to learn more about HTML, XML and XHTML.

The HTML Web Development Trifecta: HTML5, CSS and JavaScript

The future of Web design lies within three technologies: HTML5, Cascading Style Sheets (CSS) and JavaScript. These technologies used together provide Web pages that easily adapt to smartphones, tablets, gaming devices and smart TVs, as well as to traditional PCs.

Apple co-founder Steve Jobs provided a great argument for using these technologies in his famous "Thoughts on Flash" blog. (Adobe Flash is a browser plug-in that provides multimedia such as video, animation, interactive games and audio.)

> *"…we strongly believe that all standards pertaining to the web should be open. Rather than use Flash, Apple has adopted HTML5, CSS and JavaScript — all open standards. Apple's mobile devices all ship with high performance, low power implementations of these open standards. HTML5, the new web standard that has been adopted by Apple, Google and many others, lets web developers create advanced graphics, typography, animations and transitions without relying on third party browser plug-ins (like Flash). HTML5 is completely open and controlled by a standards committee, of which Apple is a member."*

NOTE: Review sites that use HTML5, CSS and JavaScript. Two examples are: *http://sophiehardach.com* and *www.20thingsilearned.com/en-US/home*

HTML5, CSS and JavaScript are sometimes called the "HTML5 family. " Table 1-2 explains the functions of each technology.

Table 1-2: HTML5 family

Technology	Description
HTML5	Markup language used for structuring and presenting Web page content
Cascading Style Sheets (CSS)	Style sheet language that provides the formatting and "look" of a Web page or document written in a markup language
JavaScript	Scripting language that provides dynamic, interactive capabilities to Web pages

This course teaches the basics of HTML5 and CSS. Several JavaScript examples will be included to show interactive HTML5 elements, but JavaScript is fairly complex and is covered in a separate CIW course.

CIW Online Resources – Online Exercise

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to complete an interactive exercise that will reinforce what you have learned about this topic.

Exercise 1-2: The HTML Web Development Trifecta

CIW Online Resources – Course Mastery

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to take the Course Mastery review of this lesson or lesson segment.

SDA Lesson 1 - Part A

Web Site Development Principles

You need more than knowledge of markup languages and talent for design to contribute to a successful Web development team. You also need to understand the business concerns and issues associated with Web development, from copyright issues to site development planning. The following sections discuss many responsibilities of a Web project manager. You may have a different role on a Web development team, but understanding project management makes you a stronger and more valuable team member.

OBJECTIVE
2.14.2: Web project management fundamentals

Project management and the Web development project cycle

NOTE:
Make sure that you understand the steps of the Web development project cycle listed on this page.

Creating a Web site requires you to work closely with individuals and teams of individuals. To work smoothly with other teams, you must carefully outline and communicate the project's steps. While you may not manage the project, at the very least you will be part of it. So you must understand the typical Web development project cycle. Consider the following steps:

- Create and document an initial Web site plan.
- Obtain relevant input from stakeholders.
- Communicate the Web site plan.
- Consider technical and non-technical concerns.
- Develop the site.
- Publish the site.
- Manage the site.

NOTE:
You can learn more in-depth details about project / program management in the CIW *Internet Business Associate* course.

Each step is discussed in the following sections.

Part of the management cycle is optimizing pages so that they rank highly in search engine results pages.

OBJECTIVE
2.7.3: Accessibility standards and compliance

Developing accessible Web pages

You must design your Web pages with accessibility in mind so that your pages are available to all visitors of your site. For example, consider that the baby-boomer generation (anyone born between 1946 and roughly 1964) commands an enormous amount of income. As this generation ages, its members will develop sight, hearing and cognitive challenges. Ignoring these common disabilities in your design means that you will exclude this group of individuals. As a result, you will not have as popular or as lucrative a site as you may like.

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) was enacted in 1990 to protect the civil rights of disabled people. This law has many sections, and includes mandates for equal employment opportunities and public accommodations for disabled people. It also includes mandates that electronic information be accessible to disabled people. Significant compliance failures are subject to financial penalties.

According to the U.S. Justice Department, the ADA also applies to cyberspace communications. In an opinion letter dated September 9, 1996 (*www.usdoj.gov/crt/foia/cltr204.txt*), the U.S. Department of Justice stated the following:

> *"Covered entities under the ADA are required to provide effective communication, regardless of whether they generally communicate through print media, audio media, or computerized media such as the Internet. Covered entities that use the Internet for communications regarding their programs, goods or services must be prepared to offer those communications through accessible means as well."*

Because it is an active law, the ADA is relevant to anyone designing pages in the United States, and anyone creating sites that will be visited by users who live in the United States. The standards are officially known as the U.S. Department of Justice ADA Standards for Accessible Design. Any penalties are the result of prosecution brought by the U.S. Justice Department; lawsuits from individuals and class action suits are not possible. The Justice Department tries to determine good-faith efforts before bringing lawsuits, and generally punishes only violators who exhibit long-term, wanton disregard for the standards. To learn facts and myths about ADA, visit *www.usdoj.gov/crt/ada/pubs/mythfct.txt*.

As a Web designer, your job is to create what the Department of Justice calls "reasonable accommodation" in your Web sites for people with various disabilities. You must make reasonable accommodations if you are a covered entity, which according to ADA is any "private employers, state and local governments, employment agencies and labor unions". Critical ADA compliance factors to consider when creating reasonable accommodations in your Web sites include:

- Ensuring that all images have text-based descriptions so that sight-impaired visitors can access sites through screen-reader technology.
- Providing text-based alternatives to all non-text content (e.g., Java applets).
- Providing forms that are easily read by screen-reading technology.

NOTE: Visit the official ADA site at *www.ada.gov*.

Video is not ADA-compliant because sight-impaired visitors cannot see it. Video with audio but no alternative text support is a problem because hearing-impaired visitors cannot hear it.

For more information about ADA, visit the following sites:

- The ADA Home Page (*www.ada.gov*)
- A paper that summarizes ADA from a legal perspective, "Applying the ADA to the Internet: A Web Accessibility Standard" by Cynthia D. Waddell, J.D. (*http://people.rit.edu/easi/law/weblaw1.htm*)
- Usability.gov, which is a U.S. Department of Health and Human Services site (*www.usability.gov*)
- An accessibility article on the All Things Web site (*www.pantos.org/atw/35588.html*)
- Current Web design articles in About.com's Web Design/HTML section (*http://webdesign.about.com/od/accessibilityvalidators/a/use_acces_valid.htm*)

Additional disabilities acts and initiatives

Following is a partial list of disabilities acts and initiatives for various nations:

- Canada's Common Look and Feel Standards for the Internet page (*www.tbs-sct.gc.ca/clf-nsi/index_e.asp*)
- The Australian Government's Guide to Adopting the W3C Web Content Accessibility Guidelines (WCAG)(*www.finance.gov.au/publications/wcag-2-implementation/docs/wcag-transition-strategy.pdf*

- India's Maharashtra Right to Information Act (*http://righttoinformation.gov.in/*)
- The e-Japan Priority Policy Program (*www.kantei.go.jp/foreign/it/network/priority-all/index.html*)

Additional information about various national laws and standards is available on the W3C at *www.w3.org/WAI/Policy*.

Web Content Accessibility Guidelines (WCAG)

NOTE: Consider the challenges inherent in making Web pages accessible to people with visual disabilities. The WAI offers many good solutions of which every Web developer should be aware.

Web pages should be accessible to all people, including those with disabilities. To assist in this mission, the W3C has created the Web Accessibility Initiative (WAI). The WAI has developed the Web Content Accessibility Guidelines (WCAG) to provide a universal set of standards promoting accessibility. According to the WAI, the Web's full potential can only be realized by "promoting a high degree of usability for people with disabilities." The WAI works with worldwide organizations in five main areas: technology, guidelines, tools, education and outreach, and research and development.

The European Union and Australia have mostly adopted the WCAG standards.

WAI aims to ensure that core technologies used on the Web, such as HTML, Cascading Style Sheets (CSS), Extensible Markup Language (XML) and the Document Object Model (DOM), are equally accessible to all users, including those with physical, visual, hearing and cognitive disabilities. (You will learn more about these technologies later in the course.) For example, a person with a visual disability may be unable to view a multimedia presentation on the Web. One way to solve this problem is to include text equivalents of the presentation in the code. The multimedia player, such as Apple QuickTime or Microsoft Windows Media Player, could then access the text equivalent and present it to the user in Braille or as speech.

The WAI works with numerous W3C Working Groups to ensure that the standards for various W3C technologies include accessibility options. For example, the HTML standard supports improved navigation, extended descriptions of complex graphics, and multimedia captions. It also supports device-independent user interface descriptions that allow users to interact with Web pages using mouse, keyboard or voice input.

You can visit the following Web sites to learn more about Web page accessibility for disabled people:

- Web Accessibility Initiative (WAI) (*www.w3.org/WAI*)
- Web Content Accessibility Guidelines (WCAG) Recommendation (*www.w3.org/TR/WCAG20*)
- The WAI Policies page (*www.w3.org/WAI/Policy*)
- The WAI Evaluation page (*www.w3.org/WAI/eval*)
- Curriculum for Web Content Accessibility Guidelines 1.0 (*www.w3.org/WAI/wcag-curric*)

Following are additional WAI concerns and standards:

user agent
Any application, such as a Web browser, mobile phone, smartphone or help engine, that renders HTML for display to users.

- **User agent accessibility** — A **user agent** is any device used to view a Web page. The most common user agent is a Web browser. Additional user agents include mobile device applications, such as smartphones and tablets. The W3C User Agent Accessibility Guidelines document is available at *www.w3.org/TR/UAAG20*.
- **WCAG checklist** — A checklist for the accessibility guidelines detailed in the WCAG is available at *www.w3.org/TR/WAI-WEBCONTENT/full-checklist.html*.

NOTE:
Read through the Accessibility Guidelines checklist (*www.w3.org/TR/WAI-WEBCONTENT/full-checklist.html*). This checklist allows developers to prioritize the many accessibility elements to ensure that development time is spent wisely.

- **Accessibility for developers** — The W3C also addresses ways to ensure that development tools can be used by disabled people. For more information, read the W3C Authoring Tool Accessibility Guidelines at *www.w3.org/TR/WAI-AUTOOLS*.

Accessibility extensions include the following:

- Adobe Dreamweaver includes alternative text for all images and multimedia elements. Screen readers read aloud this alternative text for disabled users. Learn more at *www.adobe.com/accessibility/products/dreamweaver/overview.html*.
- Adobe Flash Professional includes extensions that have captioning and video accessibility features at *www.adobe.com/accessibility/products/flash/*.
- Microsoft provides extensive information about accessibility features for all of its operating systems and products at *www.microsoft.com/enable/training/default.aspx*.

NOTE:
The conformance material is provided for informational purposes only. It is not required knowledge for the CIW Web Foundations Associate exam. However, it is recommended for creating Web pages that anyone can access.

Although different situations should be considered when designing Web documents, each accessible design choice generally benefits several disability groups, and the Web community as a whole. For more detailed information, you can read the WAI specification at *www.w3.org/TR/WAI-WEBCONTENT/*.

Section 508 of the Rehabilitation Act

On June 21, 2001, the U.S. government implemented Section 508 of the Rehabilitation Act: Electronic and Information Technology Accessibility Standards. Section 508 requires that all electronic and information technology developed, procured, maintained or used by federal agencies be comparably accessible to users with disabilities. Section 508 is based on the Priority 1 and 2 checkpoints of the W3C's WAI Web Content Accessibility Guidelines 1.0. You can learn more about Section 508 by visiting the following URLs:

- Federal Information Technology Accessibility Initiative, Section 508 home page (*www.section508.gov*)
- U.S. Access Board, Section 508 of the Rehabilitation Act (*www.access-board.gov/508.htm*)

The chief purpose of Section 508 is to ensure that disabled individuals have a comparable level of access to information. Each standard aims to ensure that Web page design and other computer-based elements do not limit access to information by disabled users. Section 508 includes the following standards for Web sites:

- All non-text elements must have a text-based equivalent.
- If using multimedia, all equivalent information must be properly synchronized with the multimedia so that disabled persons are not at a disadvantage.
- Information must be equally available in color and without color.
- Documents must be made available without requiring an associated style sheet.
- Text descriptions must be made available for all image maps.

- Client-side image maps should not be used because they cannot be properly presented to visually impaired users.
- If using tables for data, you must identify all row and column headers.
- If a table has two or more rows or columns, you must use row and column headers.
- Sites that use frames must have titles that easily enable alternative browsers to navigate through each frame.
- If necessary, a separate text-only site should be made available to ensure access.
- When scripting technology is used to enable a site feature (e.g., a form), a plaintext alternative must be available that allows an assistant application to read the feature.

You can visit *www.section508.gov/index.cfm?fuseAction=stds* to read the Section 508 standards.

CIW Online Resources – Online Exercise

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to complete an interactive exercise that will reinforce what you have learned about this topic.

Exercise 1-3: Web accessibility measures

In the following lab, you will visit sites that post accessibility standards. Suppose you belong to a Web development team. Your project manager approaches you and asks about common Web accessibility standards. She has a half-hour available for you to show her some resources on the Web. What sites would you visit?

Lab 1-2: Viewing accessibility standards sites

OBJECTIVE
2.7.3: Accessibility standards and compliance

In this lab, you will view sites devoted to Web accessibility standards.

1. Open a Web browser.
2. Visit the following sites:
   - The W3C Web Content Accessibility Guidelines (WCAG) site at ***www.w3.org/TR/WCAG20***
   - The Section 508 site at ***www.section508.gov***
   - The Treasury Board of Canada Secretariat's Web Accessibility site at ***http://www.tbs-sct.gc.ca/ws-nw/wa-aw/index-eng.asp***
3. Read some information at each site you visit. How does each site define accessibility? How are the standards similar and different among sites? Can you see the ways in which accessibility standards are applied to these sites?
4. Conduct searches on the Internet for additional accessibility standards relevant to your particular situation. What other standards can you find?

In this lab, you viewed sites devoted to Web accessibility standards.

OBJECTIVE
2.12.1: Validating Web documents

NOTE:
See **Optional Lab 1-2: Using site accessibility evaluation software**.

Verifying Web page accessibility

You can manually verify Web page accessibility, but it is much quicker to use automated accessibility validators. Table 1-3 describes some of the most common tools.

Table 1-3: Accessibility validators

Validator Tool	Description	Web-Based or Stand-Alone Tool?	URL
W3C Page Validator	Powerful HTML and XHTML validator	Web-based and Firefox add-on	*http://validator.w3.org* *https://addons.mozilla.org/en-US/firefox/addon/page-validator/*
Total Validator	Powerful HTML and XHTML validator	Firefox add-on	*https://addons.mozilla.org/en-US/firefox/addon/total-validator/*
Cynthia Says	A free site devoted to the W3C Web Content Accessibility Guidelines (WCAG)	Web-based	*www.cynthiasays.com*
Vischeck	A free service that simulates how a site will appear to color-blind users	Web-based	*www.vischeck.com/vischeck*
MAGpie	A free application that validates Web sites, and creates audio captions and multimedia descriptions	Stand-alone	*http://ncam.wgbh.org/invent_build/web_multimedia/tools-guidelines/magpie*

Partial color blindness is much more widespread than commonly realized. If your target audience is the entire world, read about color blindness to determine which color combinations are most easily read by the largest number of people. For information, color deficiency simulations and links to color-blindness tests, visit www.visibone.com/colorblind.

Additional Web page accessibility validation tools are available at *www.w3.org/WAI/ER/tools/*. It is important to understand that these automatic validators may not find issues related to the latest accessibility standards. Manual validation is generally the most thorough approach.

General Web page accessibility considerations

You have now learned about many accessibility standards, guidelines and validation tools. The following sections discuss common Web page challenges and resolutions.

Addressing visual challenges

Following are some common challenges and solutions for accommodating Web users with vision impairment:

- **Text readability** — Make sure that fonts used are the correct size.
- **Text support for images** — All images must be described in text using special HTML code.
- **Screen-reader support** — Ensure that all pages and page elements can be rendered by audio screen readers.

Addressing audio challenges

Following are some common challenges and solutions for accommodating Web users with hearing impairment:

- **Alternative audio support** — If you include audio content on a page, make sure that a text-based equivalent is readily available for hearing-impaired users.
- **Alternative speech input** — If your site includes the ability for speech input, make sure that an equivalent keyboard entry mechanism is available.
- **Text support for audio elements** — Make sure that any audio elements are clearly marked with alternative text so that readers can obtain the information.

Addressing cognitive and technical challenges

Following are some common challenges and solutions for accommodating Web users with cognitive impairment or equipment limitations:

- **Page content that flashes, flickers or strobes** — Such content may cause problems for those with neurological disorders.
- **Alternative navigation** — Navigation aids should be provided to help those with lower cognitive skills.
- **Audio support** — Audio transcriptions of text-based content may help users with reading disabilities such as dyslexia.
- **Low-resolution alternatives** — Design Web pages so that they do not require large, expensive screen resolutions, or provide low-resolution alternatives.

In the following lab, you will use a Web page accessibility-testing strategy. Suppose your Web development team has created a site following the WCAG standards. You are assigned to validate the site. One step you would perform in this validation process is ensuring that the site can be easily browsed by a text-based editor.

Lab 1-3: Using a text-only browser to evaluate accessibility

NOTE:
You can review disabilities acts that are more relevant to your particular region and country. Compare various acts for strengths and weaknesses.

In this lab, you will conduct a partial validation test to determine the accessibility of a site for users employing voice-recognition software. Sight-impaired Web users often use voice-recognition software to augment or replace their limited ability to view a Web page. Voice-recognition software is capable of reading text, but not images, on a Web page. You can use a text-based browser to determine how well a site uses text to describe its images.

1. Verify that you have created the **C:\CIW\Site_Dev\Lab Files** directory on your computer, and that the **Lab Files** folder contains subfolders and student files for all lessons in this course. If this directory does not exist, log on to CIW Online now, and extract the files for the **Site Development Associate** course.

   Note: Instructions for using the CIW Web Foundations supplemental files are provided in the front matter section of this book.

2. Open **Windows Explorer** and navigate to the directory **C:\CIW\Site_Dev\Lab Files\Lesson01\Lab_1-3**. Copy the **Lynx** directory to your Desktop.

*Note: If you cannot obtain the Lynx\ directory, use a Web browser to access a Win32 version of Lynx from **www.fdisk.com/doslynx/lynxport.htm**, then follow the remaining steps in this lab.*

3. Once you have copied the Lynx application to your Desktop, open a command prompt and change to the Desktop\Lynx\ directory using the following command:

   cd desktop\lynx

4. Launch the Lynx text-only browser by entering the following command in the command prompt:

   lynx http://www.ada.gov/

5. You will see the ADA Home Page appear in the Lynx browser, similar to Figure 1-4.

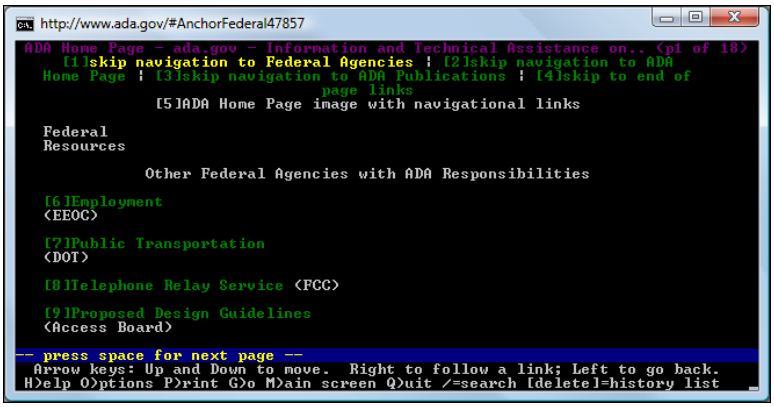

Figure 1-4: Official ADA home page in Lynx Web browser

6. You cannot use your mouse to navigate through Lynx. Following are common Lynx commands you can use to navigate:

   - **G** — allows you to specify a URL (precede all URLs with *http://* or *https://*)
   - **H** — summons the Help page, if present
   - **UP ARROW key** — moves to the top of the page
   - **DOWN ARROW key** — moves to the bottom of the page, by link
   - **RIGHT ARROW key** — moves to the next page
   - **LEFT ARROW key** — moves to the previous page
   - **Q** — quits Lynx (by first pressing Q, then pressing Y)

7. Review the ADA guidelines discussed previously in this lesson.

8. Navigate through the official ADA home page. How well are the images described when viewing this page in a text-only format? Does this page follow its own guidelines?

9. Visit the following page, and consider how this page follows ADA guidelines:

   http://people.rit.edu

10. Visit additional sites, including the following:

- Amazon.com (***www.amazon.com***)
- CNN (***www.cnn.com***)
- BBC (***www.bbc.co.uk***)

11. How well are images described when viewing these pages in text-only format? Do these pages follow other accessibility guidelines?

12. When you are finished viewing these sites, press **Q** then press **Y** to quit Lynx, then type ***Exit*** and press **ENTER** to close the command prompt.

13. As a class, discuss how these sites follow or do not follow ADA guidelines.

In this lab, you considered user disabilities in regard to Web page creation.

In the preceding lab, you used Lynx to test Web-accessibility standards. Lynx is a free, open-source, text-only browser. Lynx supports the HTTP, HTTPS, FTP and NNTP protocols. Users with disabilities, especially visually impaired people, often use text-based browsers to view the Web. In some cases, users may elect to disable graphics to view Web pages more quickly than if the graphics were visible. You can use Lynx to view your Web page to see how understandable your Web page is when the graphics are eliminated.

Many spider programs view your Web page the same way Lynx does. By using Lynx to test your Web pages for accessibility, you may be able to make appropriate changes to allow your site to score higher in Web search engine search results, thereby increasing your exposure.

Creating and documenting an initial Web site plan

OBJECTIVE
2.7.2: Web site diagram

Before you can create any HTML code, you must first create a plan for the site. This plan has several names, including:

- Site diagram.
- Storyboard.

OBJECTIVE
2.13.4: Web site plan documentation

Regardless of the name you use, this plan must include the following:

- A statement discussing the purpose and intended audience for the site. This statement may evolve over time, but it is important to begin with this statement to remind everyone involved why the site is being developed and to steer all efforts in the proper direction.
- A rough outline of the pages needed, including:
  - The default page (e.g., index.html), also called the home page.
  - Sections of the site (e.g., products, sales, international, contacts).
  - An estimate of the technologies required (e.g., databases, CGI, search capability, indexes).

Your Web team cannot create this plan in isolation. You must obtain input from stakeholders.

Wireframing

wireframing
The process of developing an outline for a Web presence.

Wireframing is another helpful tool for Web site planning. Wireframing is the process of developing an outline for a Web presence. Steps in the wireframing process usually include:

- Determining the purpose and objective of the Web site. Is this an e-commerce Web site? An informational Web site? A company intranet?
- Identifying all stakeholders for the site.
- Outlining the basic steps of the development process.
- Identifying steps for managing the project.
- Outlining site navigation.
- Identifying the technologies that are invoked with each user request.

As you can see from this list of tasks, quite a bit of work occurs before pages are created. Sometimes, software can help you with wireframing and project management.

Wireframing software can include:

- Microsoft Sketchflow (*www.microsoft.com/expression/products/sketchflow_overview.aspx*)
- Gliffy (*www.gliffy.com*)
- Web Site Wireframe Tool (*http://wireframe.talltree.us/default.asp*)
- HotGloo (*www.hotgloo.com*)

Additional tools are profiled at Speckyboy Design Magazine (*http://speckyboy.com/2010/01/11/10-completely-free-wireframe-and-mockup-applications*).

Determining the audience and message

OBJECTIVE
2.13.3: Stakeholder and audience requirements

Successful Web sites have a strong, central theme aimed at a distinct audience. They have the ability to support this theme by providing clear explanations and related services. You must start with a strong message, then consider how this message will be presented. Even the best looking Web page or site will fail in its purpose if it does not have a clear message.

As you determine your audience, consider eliciting input from various parties, including:

- **Customer representatives** — Organizations often have important customers attend meetings and provide input. Customer representatives can teach you about the various types of messages that appeal most to potential customers. For example, some may want to focus on the value of a particular product, regardless of cost. In other instances, customers may help you focus on a message that shows your products to be inexpensive. Once you have surveyed customers to determine what the market wants, you can begin to craft Web pages that clearly convey your company's message to its intended customers.
- **Suppliers** — If you are planning for large sales as a result of your Web effort, make sure that your product suppliers are ready for this. Otherwise, you could damage the company's reputation by making promises that cannot be kept. Even though a Web authoring team works mostly on creating markup pages, your Web site's ability to communicate with the public means that such business concerns are essential for the overall success of the project.

- **Shareholders** — If your organization is publicly owned, you may need to obtain input from shareholders about the look and feel of the site.

OBJECTIVE
2.7.4: Technical and audience standards

Validating design issues

The design elements with which you display information on your site can be just as important as the information itself. As previously discussed, the front end you present to users may determine whether users remain at and return to your site. Consider the following design concepts:

- **Message** — Deliver a coherent message for each page. Information that is not relevant or otherwise distracts readers from a well-conceived central idea should be placed on another page or eliminated.
- **Fonts** — If specifying fonts, make sure that you use common ones so that browsers do not have difficulty rendering them. Use proper sizes; small fonts are difficult to read.
- **Images** — Make sure that all images used on a page contribute to either the page's navigability or its message.
- **Color** — Take time to consider color combinations so that your pages are as attractive and readable as possible.

Validation should occur on a regular basis as the site is being developed. Although a final validation is necessary, the final validation should not be the only one. As you validate design issues, consider the following:

OBJECTIVE
2.15.6: Diversity and corporate culture

- **Organizational design standards** — You have already learned about the importance of branding standards. As you help develop Web pages, make sure that you are following developed rules and advice from your department and others. Such standards help support decisions concerning your organization's branding and marketing standards.

OBJECTIVE
2.19.4: Ethnic and cultural issues

- **Ethnic diversity** — You may be asked to tailor messages to particular cultures and ethnicities. Project management will ensure that such needs are considered and recommended during planning meetings. It is your responsibility as a designer to create pages that implement all recommendations.

Your development team will also want to consider demographic and cultural issues, including:

- **Language choice** — Some organizations will need to use only one language for their sites, such as English. Others may need to create multiple sites in various languages to accommodate an international audience. Still others may offer an immediate choice of one or two languages because the government of the country in which they reside demands such accommodations, for example.
- **Common color schemes** — Preferences for color combinations differ from one culture to the next. Remain sensitive to and informed about such preferences.
- **Messages that appeal to customers** — You may need to alter your message about a particular product or activity if you present it to another culture. Consider the expectations and preferences of specific cultures so that your message is as clear and appealing as possible.

OBJECTIVE
2.19.3: Corporate culture

In the following lab, you will review Web sites from major manufacturers to learn how they address different cultures. Suppose your project manager has asked you to research sites that address cultural diversity, including sites that target populations using different languages. Consider the types and sources of examples that you could provide.

Lab 1-4: Researching ways that Web sites address cultural diversity

In this lab, you will review Web sites from major manufacturers to learn how they address different cultures.

1. Open your Web browser. Visit and compare the following sites:

www.toyota.com

www.toyota.ca

NOTE:
In this lab, answers will vary. Consider how companies around the world address ethnicity and culture.

2. After you have reviewed these sites, answer the following questions:

- What language choices were offered at the *www.toyota.com* site? Why?

  _____

  _____

- What language choices were offered at the *www.toyota.ca* site? Why?

  _____

  _____

- What differences in color schemes exist? Why?

  _____

3. Compare the following Web sites from Ford Motor Company:

www.ford.com

www.ford.ru

4. After you have reviewed these sites, discuss the following questions as a class:

- What differences exist in the color schemes, if any? Why?
- Review the images and technologies used. Which site uses more active content?
- Does one site offer more car models than the other?
- What audience does the *www.ford.com* site seem to consider the most?

5. Visit additional sites and compare color schemes, languages and message approaches. Use a search engine to help you find examples of multicultural international approaches. What types of businesses tend to be most accommodating?

In this lab, you reviewed Web sites of major manufacturers to see how they tailor their company messages to various cultures.

OBJECTIVE
2.7.1: Stakeholder input

Obtaining relevant input from stakeholders

When creating a Web site, stakeholders are relevant organization employees or contributors who can provide or help determine the following information:

- The purpose of the Web site.
- The site's look and feel.
- The services that the audience requires from the site.
- Funds available to develop the site.
- Development timelines. Although your team will largely determine how long it will take to create the site, your team will also have to coordinate with other departments in the organization. For example, the sales and marketing teams are likely to have important input about when the site is published, as well as its look and feel.

OBJECTIVE
2.13.2: Company site requirements and collaboration

As you work with your stakeholders, remember the following:

- People who will approve your project often have no technical expertise in your field. Nevertheless, remember that they are essential to the success of your project.
- Be prepared to explain non-technical needs to a technical audience. In other words, make sure that you can present business concerns to IT professionals in ways that will help ensure that your needs are met.

OBJECTIVE
2.13.1: Site development teamwork

Your site development team can consist of diverse professionals whose focuses and concerns will differ. However, each will have valuable contributions, and you must be able to communicate effectively with all of them. Following are some examples of team members who might collaborate with you on a Web development project:

- A representative from marketing to help guide branding issues
- An IT worker responsible for configuring servers and network access
- A representative from sales who can provide additional information about specific customer needs
- Members of the Web development team who will use Web technology to create the best site for the organization's needs

Once you have obtained all essential input, you can create your initial storyboard. Figure 1-5 shows a sample storyboard for a relatively simple site.

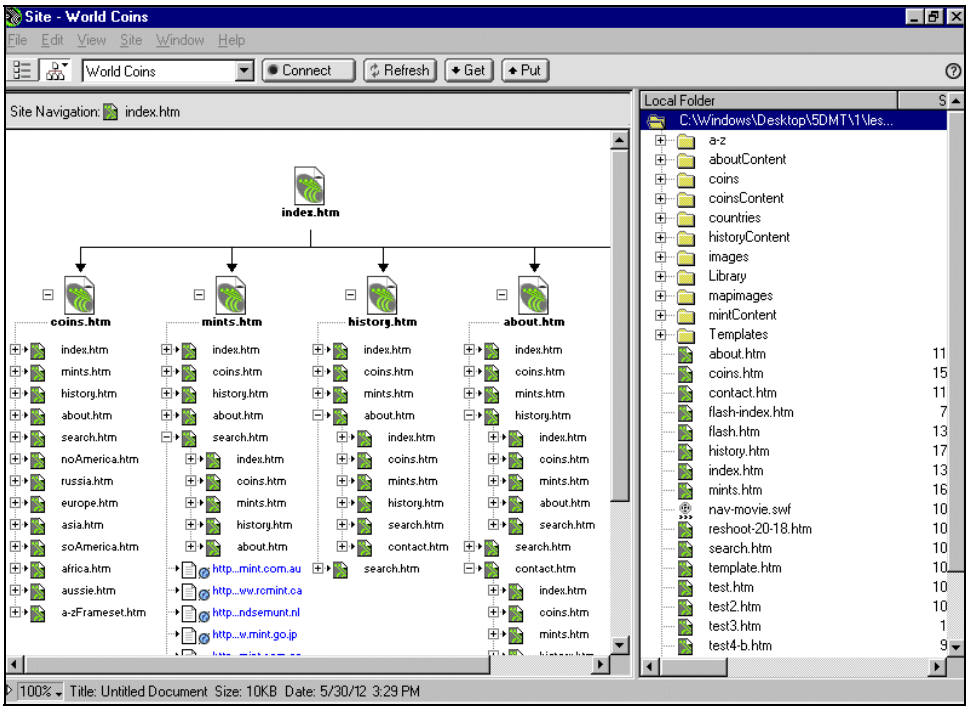

Figure 1-5: Sample storyboard

site map
A brief, hierarchical representation of a Web site that enables visitors to quickly identify areas of the site and navigate to them.

You and your team will develop this initial storyboard into a completed Web site. The storyboard also provides a **site map** to help visitors quickly find resources on your site.

OBJECTIVE
2.13.4: Web site plan documentation

Documenting and communicating the plan

In addition to creating a site storyboard, you must also document decisions made in all meetings. All plans must be distributed and approved. Any decisions involving changes in dates and allocations of funds may require further approval from the organization.

As the plan moves toward finalization, you must communicate it effectively using at least some of the following strategies:

- Calling relevant parties to ensure that everyone is satisfied
- Sending e-mail messages
- Sending postal ("snail mail") messages if necessary
- Sending fax messages

A telephone call is appropriate at times, but because phone calls are not usually recorded, they cannot be readily recalled and referenced. E-mail and paper-based transmissions can be stored for later retrieval, and used for reference and accountability.

Communicating the Web site plan

As you communicate the Web site plan, you will make oral and written presentations. Following are some typical strategies to consider.

OBJECTIVE
2.13.5: Web site plan communication

Oral presentations and presentation aids

As you give oral presentations about your Web site plan, use presentation aids and tools to help illustrate your plan:

OBJECTIVE
2.15.3: Presentation software

- **Presentation software** — Slide-based software, such as Microsoft PowerPoint and Google's Presentations application within Google Docs, is common and user-friendly. Presentation software creates a sense of professionalism.
- **Overhead projection** — You may need to create transparencies of statistics and marketing ideas. Be prepared to bring an overhead projector.

OBJECTIVE
2.15.2: Presentation aids

- **Whiteboards** — You can bring your own whiteboard or use one that is already in the presentation room. A whiteboard helps you to present your ideas as well as write ideas gathered from your audience. You should always take your own set of notes during a team presentation, but you can also use a whiteboard or poster paper to record open discussions (often called brainstorming). Such discussions are very helpful because they show that you are listening to ideas.
- **Easel and poster paper** — If a whiteboard is not available, bring an easel and poster paper so you can take notes for everyone to see. Because an easel and poster paper are portable, you can keep this record of audience feedback.

NOTE:
There are many different uses for pie charts and bar charts.

- **Charts** — Pie charts graphically present information about a topic, showing the relative percentages of all constituent elements. For example, a pie chart can help you show the size of a particular market niche you are targeting. Bar charts are helpful for showing trends or a particular project's progress.
- **Published handouts** — Your audience can use handouts as notes from the meeting. If you want to emphasize a particular portion of a presentation, back it up with a handout.

Presentation tools help you convey information, and also prove that you have properly prepared for a meeting and are not wasting your audience's time.

OBJECTIVE
2.15.7: Meeting leadership

Leading discussions

Project managers generally lead and moderate meetings related to a Web development project. Consider the following strategies that you can use to effectively take the lead during a meeting:

- **Make introductions** — As you introduce people, explain their roles on the team.
- **Recall past business** — Make sure that each team builds on past decisions and considers past discussions in a meaningful way. At all times, try to make any repeated discussions culminate in a decision that allows the group to show progress on the project.
- **Create a list of action items, including timelines** — A list will help you communicate your team's progress.
- **Monitor time** — Even if important information is imparted in your meetings, if they are too long then important participants may not want to attend again.
- **Ensure proper discussion focus** — Provide an agenda of meeting topics so participants come prepared and expecting to discuss only relevant issues. Consider announcing a time limit for a particular discussion if you fear that it may continue too long.
- **Handle heated discussions** — Changing focus may be especially important if a discussion becomes too heated or if animosity develops among participants.
- **Distribute minutes** — Meeting notes, or minutes, help all parties see progress result from meetings. Minutes also help everyone identify unfinished business, as well as determine any particular topics that were omitted.

OBJECTIVE
2.15.4: Technical concept clarification

Considering technical and non-technical concerns

In your meetings, you are likely to find that although everyone may share the same goal, they may not be able to communicate specific needs to each other. A common problem is that some team members do not have much technical knowledge, but nevertheless have ideas that are essential for the success of the site. Often, the non-technical employees in your meetings can ensure funding for your project.

It is the project leader's responsibility to ensure that input and requests from team members with little or no technical knowledge are heard and seriously considered. Similarly, you must ensure that project members with technical experience clearly convey their capabilities, limits and needs to non-technical team members. Otherwise, team members will constantly speak past each other, and confusion will result. Confusion can increase especially if project members work remotely. Ways to ensure clarity both in meetings and in communication include:

- **Regularly asking if anyone has questions** — This strategy helps some team members speak up. However, less outgoing individuals who have questions may still hold back.
- **Asking team members to summarize their understanding of decisions** — Although this strategy puts some people on the spot, this is preferable to having team members remain confused about the project's direction.
- **Asking a third party to deliver a summary of progress** — This third party can attend your meeting and ask questions of team members. By listening to responses, you can gauge overall team participation and understanding.
- **Writing regular updates about the project** — Make sure that in your updates you translate technical requirements into non-technical language, and vice versa.

Developing the site

Once you have obtained enough information and created a definitive plan, you can begin developing the site. As your team develops the site, you will be engaged in various activities, including:

- **Creating markup code** — You will develop pages that fulfill all design standards.
- **Testing functionality** — Make sure that the site performs well technically before it is published to the Web. This involves testing the site in multiple browsers, for example.
- **Approving the site** — All stakeholders will need to approve your team's work. Make sure that all parties have seen the site before publication, and make sure that you have documented this fact.
- **Publishing the site** — The site must be properly placed on a Web server. You may also participate in decisions such as whether you will configure your own Web server or use a Web server configured by another provider.

OBJECTIVE
2.14.3: Pre-launch functionality testing

2.12.3: Testing pages in browsers

Testing pages in multiple Web browsers

As you develop Web pages, make sure that you test your Web pages using multiple Web browsers. A different generation of the same browser may interpret HTML somewhat differently. For example, Internet Explorer 9 and higher uses an HTML-rendering engine that has been significantly revised from version 8. Similarly, current versions of Firefox have a significantly revised rendering engine. You should always consider how each vendor and each version implements HTML standards differently.

If you are preparing a site for public use, it is advisable to write your HTML code using the most widely supported standards.

The HTML code used in this course will function in all browsers. However, there will always be subtle differences from browser to browser.

OBJECTIVE
2.7.5: Usability and browser compatibility

In some situations, you may feel it is unnecessary to test your pages on a wide variety of browsers. For example, you may not need to perform as many tests for the company intranet if the company has standardized to one browser, such as Windows Internet Explorer. Nevertheless, it is always good practice to ensure that your code is compatible with all browsers so that your browser options are flexible.

NOTE:
See **Optional Lab 1-1: Comparing Web browsers**.

Browser types and versions

Table 1-4 discusses browsers to consider for your Web site testing process.

Table 1-4: Commonly used Web browsers

Browser	Description	Download Location
Windows Internet Explorer	A proprietary Microsoft browser installed by default on all Windows operating systems.	*www.microsoft.com*
Mozilla Firefox	An open-source browser. Firefox versions are available for various operating systems, from Windows to Linux.	*www.mozilla.org*
Google Chrome	An open-source browser from Google. Chrome has many new features, such as a clean interface, automatic crash recovery, multi-threading capability, improved sandboxing, isolated tabs and privacy mode.	*www.google.com/chrome*
Opera	An alternative Web browser with extended language support.	*www.opera.com*
Lynx	A command-line text-only Web browser. Often used by those with shell accounts and those who are visually impaired because it can be used with software that renders text into voice. A binary version is included with most versions of UNIX/Linux.	The source code is available at *http://lynx.isc.org*. A Windows binary is available at *www.fdisk.com/doslynx/lynxport.htm*

NOTE:
Each browser (including different versions of the same vendor's browser) can render HTML differently. This difference results from the use of proprietary code, and from each vendor's different implementation of the W3C standards.

Remember that Web browsers are not the only user agents that render HTML pages. Additional user agents include:

- Smartphones.
- Tablets.
- Gaming consoles.
- Other devices that read markup language.

When testing your Web pages for browser compatibility issues, check the following:

- **Rendering of tables** — If you use HTML tables to format content, some browsers may not render the information proportionally, which can distort the way information appears on the page. Some browsers also do not support table options.
- **Strictness levels** — Older browsers may not be able to render the newer versions of HTML or XHTML well.

- **Color support** — If you use background colors or colors within tables, your customers' browsers may not render them exactly as you have intended.
- **Images** — As you already know, some Web browsers do not support images at all. Some browsers do not render background images, whereas others do. Always provide alternative text descriptions for images, and use background images sparingly.
- **Scripting languages** — Make sure that any scripting language you use is supported by the majority of Web browsers.
- **HTML version** — Choose a version of HTML that you know most browsers will support. The HTML5 specification is a solid choice because it is backward-compatible and can render in most browsers.

As a general rule, the closer you adhere to W3C standards, the more consistently your Web pages will render in various browsers. Also, be conservative when using elaborate features that may not render well in certain browsers. Finally, as you develop your Web pages, use features that are supported by the most commonly used browsers.

OBJECTIVE
2.14.4: Existing site management

Managing the site

You are unlikely to develop and post a site that never needs modification. In fact, managing a site usually requires more time and work than initially developing it. As part of a team that manages a site, you must:

- **Create new content** — The perception that a site has failed to remain current can be damaging. Innovation and fresh content are both essential to managing a site that stays popular.
- **Update dead links** — For various reasons, links that once functioned may fail over time. A link can become invalid because a page's location was changed on the hard drive, or because the link pointed to an external Web site that no longer exists or has changed its structure. You can use automated applications to check your site for dead links. However, someone must still manually alter any invalid links to make them valid again.
- **Remove old sites** — Sometimes an entire site becomes invalid. It is your duty to remove such sites from the Internet.

OBJECTIVE
2.14.5: Content maintenance

- **Remove unused pages** — Pages on Web sites sometimes become stale, especially if they are tied to a marketing campaign. If they cannot be updated, they must be removed.
- **Ensure connectivity** — You or a member of the IT department may be assigned to ensure that the site is active and that enough bandwidth is available. You may have to upgrade or downgrade bandwidth, depending upon customer volume. You do not want customers to be frustrated by slow site access, but you also do not want to pay for unused bandwidth.

trouble ticket
A record of a problem related to a service provided by an ISP or cloud service provider. Used to record receipt of a complaint and track resolution of the problem.

- **Report access troubles** — Sometimes you need to contact your ISP and begin a **trouble ticket** to begin resolving a problem. It may also be your responsibility to follow up with problems to ensure they are properly resolved.
- **Process feedback from customers and stakeholders** — Your team will be asked to make changes to the site periodically. Some changes may be subtle; others may require considerable effort on your part to make the site fulfill its potential and truly benefit your organization.

OBJECTIVE
2.13.6: Site feedback and improvement

Obtaining feedback

Your Web team must process various types of feedback. Feedback can include:

- **Direct contact with customers** — People who frequent the site may contact you directly through feedback forms to inform you about desired changes.
- **Feedback from upper management** — Executive officers may request changes to the site in order to improve the company's image.
- **Feedback from sales and marketing** — Sales representatives often receive comments from their customers about desired changes. Addressing such reports of customer requests is essential to the site's success.

troll
A Web user who publishes negative comments or submits feedback simply to annoy or anger.

As you receive feedback, you must be able to distinguish between serious feedback and nuisance input. Some individuals scour Internet sites and pretend to provide serious feedback, when in fact they are just trying to cause problems. Such users are often called **trolls**. Trolls can employ various tactics, including sending annoying e-mail messages, submitting Web forms full of negative comments, or writing blogs or articles that disparage your site.

You and your team must also be aware that some people who are sincere about their feedback may have idiosyncratic perspectives. In any case, you should always work to obtain a consensus of opinion that includes reliable sources, then obtain appropriate stakeholder approval before making any changes.

OBJECTIVE
2.15.1: Management and customer feedback

Ways to obtain quality feedback

Your team can ensure that you obtain quality feedback by:

- **Providing Web forms on the site that ask for customer input** — Such forms should be available only to serious customers and/or members of the organization. For example, make the form available only to users who have paid for a service or provided verifiable identity. Otherwise, you increase your chances of receiving prank information from trolls.
- **Conducting surveys in person** — You or other team members can contact customers at the direction of your team leader. Such surveys should be directed to your top customers. Make sure that surveys are quick and to the point. You may also want to offer your customers a valuable product, service or discount in exchange for responding to the survey.
- **Conducting surveys via e-mail or text**— If you want to contact more people, an e-mail survey may be appropriate. However, be sure to send surveys only to established customers. Otherwise, your organization may receive a bad reputation as a "spammer."

OBJECTIVE
2.15.5: Feedback interpretation

As you process and interpret feedback, you should ask the following questions:

- Which suggestions should be taken seriously?
- Does this feedback apply directly to the Web site, or could this problem be solved by requesting that sales and/or marketing personnel work directly with complaining customers?
- What changes will please the majority of customers?
- How much will proposed changes cost? You must consider whether requested changes are economically feasible and worth the extra investment.
- How long will it take to make the proposed changes?

- Who must you contact in order to obtain approval and/or funding for the proposed changes?

OBJECTIVE
2.14.1: Web site legal issues

Intellectual property

Intellectual property is a unique product or idea created by an individual or organization, and that generally has commercial value. When creating a Web site, you must consider legal issues related to ideas, products and images that are widely available. You cannot "borrow" information from other Web sites. Table 1-5 describes common intellectual property issues and terminology.

Table 1-5: Intellectual property issues and terms

Intellectual Property Term	Description
Trade secret	Intellectual property that must remain private for a company to retain viability. Examples include proprietary code, business plans and sales contacts.
Copyright	The legal ownership of expression by an author. According to most developed countries, copyrighted intellectual property becomes the property of the author for a certain number of years. Copyright protection ensures that the person or group who owns the copyright has the right to publish or otherwise distribute material, and control how it is redistributed. In most countries, a copyright can be sold by its owner.
Trademark	A unique word, phrase or symbol that is claimed or officially registered by an organization with the government. Trademarks can include logos, phrases, company names and so forth. If a logo, word or phrase is trademarked, then only the organization that registered it can use it.
Licensing	The legally authorized use of another person's or entity's copyrighted intellectual property. The terms of the license are generally dictated by the copyright holder. Licenses require contracts and usually an exchange of money, services or both.
Infringement	Any violation of a copyright or trademark. Copyright and trademark infringement are punishable crimes.
Plagiarism	A specific instance of infringement in which an individual or entity claims to have created content (e.g., images, writing or other exact expressions) that was in fact created by other developers. Proven plagiarism can result in severe reprimands, loss of employment, corporate lawsuits and financial penalties.

Copyright scope, reach and time limits

NOTE:
Examples of trademarks include the Mercedes hood ornament, the Nike "swoosh" and McDonald's "I'm Lovin' It" tag line.

No copyright or trademark is permanent. Legal registrations must be renewed, so if you have trademarked or copyrighted a particular portion of your Web site, then you must manage this intellectual property. Research the laws for your own country to avoid surprises.

The legal issues described here apply to all phases of Web development. Do not ignore these concepts; doing so could lead to your dismissal and to legal action against your company. Precedent court rulings have held violators liable even when they claimed ignorance of the law.

You may be tempted to use other people's words and ideas when optimizing pages. Avoid that temptation. One way to create original yet relevant content is to work with another individual. Talk out your ideas. You will be surprised at how you can create an optimal page that is both original and relevant.

OBJECTIVE
2.20.4: Web site ethics

Ethical issues regarding copyright, trademark and plagiarism

Ethics is the study of making proper choices to ensure that other people's rights are not violated. Consider the following ethical points as you create markup code and design Web pages:

- You cannot copy a site's code or look without the owner's explicit permission. You can create entirely new code that provides a similar look and feel, but consider the perception you present if your site looks just like another.
- Borrowing a lot of code from a site infringes upon the author's copyright.
- The owner of a copyright may allow copyrighted material to be used by others. This permission may be exchanged by contract, for a fee or simply for proper attribution. Most major Web sites post their copyright and licensing contact information.
- All aspects of a Web site are copyrighted. Do not "borrow" images, text, logos, music, scripts, applications or code. Seek proper permission if you find an element on a site that you want to use.
- You cannot provide a link from your Web site to another site without permission because such a link generally implies that the two sites have a business relationship.
- You cannot copy or translate the content of another Web site without explicit permission.

Copyright and trademark laws are country-specific. The World Wide Web allows a person from one country to view information from all over the world. Suppose your employer asks you to research national and international copyright laws. What steps will you take?

OBJECTIVE
2.20.1: Content developer permissions

Avoiding copyright infringement, trademark infringement and plagiarism

Stealing the intellectual property of others is a serious matter. You must avoid even appearing as if you have stolen information. Ways to avoid problems include:

- **Reviewing all Web site content for originality** — This includes code, images and text. The review must be independent. In other words, choose someone who is not on your team but who will work diligently to highlight any potential infringement issues.
- **Conducting regular content reviews** — A single content review at the end of the project may not solve infringement problems. Regular reviews are likely to encourage development team members to change their practices so that you do not have a large problem to resolve near a deadline.
- **Obtaining express, written consent for any material you use** — Make sure that written consent is properly stored for later retrieval, and that developers do not take advantage of this consent. Even specific design concepts are copyrighted, so if you "borrow" someone else's unique expression for your own site, you may incur legal action. Of course, images and code are all protected by copyright.
- **Creating reasonable deadlines** — Busy developers often take shortcuts to meet deadlines. Work with your project manager to ensure that deadline pressure does not contribute to a team's tendency to copy content.

Plagiarism is never justified. When in doubt, simply consider another approach to expressing an idea. Never steal ideas or expressions of ideas from others and claim them as your own.

Avoiding copyright and trademark infringement is essential. So is avoiding plagiarism. Suppose your program manager asks you to find authoritative evidence of intellectual property laws. Where could you find this information?

Outsourcing

Increasingly, Web development work (including site design) is being outsourced to workers in remote locations. When outsourcing occurs, a local team of workers often remains to perform some tasks (sometimes permanently, sometimes only for a short time). This local team is usually charged with managing the project. The outsourced team will probably perform the Web page coding and other tasks that the local team cannot complete.

When working with remote teams and even other companies, you must consider the following:

- **Non-Disclosure Agreement (NDA)** — An NDA is a legally binding contract signed by both parties stating that they will not reveal any trade secrets or intellectual property owned by the other.
- **Legal consultation** — When signing NDAs and other documents is necessary, you should first retain legal counsel. Otherwise, you may make commitments that you cannot fulfill. Any contract breach can make your company liable for a lawsuit.

OBJECTIVE
2.20.2: Non-Disclosure Agreement (NDA)

Non-Disclosure Agreement (NDA)

An NDA protects the following intellectual property from unauthorized use by contractors, partners or others who are allowed access to it:

- Ideas and concepts
- Specific plans
- Code
- Written documents

Most NDAs specify penalties if stipulated violations occur. One problem with an NDA is that it takes time to agree about its content. If you involve several individuals on an NDA, then the timeline on a project might increase.

OBJECTIVE
2.20.3: Legal team consultation

Consulting with legal teams

You may have to consult with legal teams in the following situations:

- As you create NDAs
- If you decide to use a marketing campaign, trademark or copyrighted idea similar to another company's
- If you must investigate infringement by other companies against your intellectual property

In the following lab, you will investigate intellectual property concepts and laws. Suppose your project manager assigned you to work closely with a legal team. Before meeting with this team, you want to obtain some preliminary information about intellectual property concepts and laws. The sites you review in this lab provide this type of information.

Lab 1-5: Investigating intellectual property concepts and laws

In this lab, you will learn more about intellectual property concepts and laws.

1. One of the missions of the United Nations Educational, Scientific and Cultural Organization (UNESCO) is to ensure cooperation among nations regarding copyright laws. The UNESCO Universal Copyright Convention enables various countries to cooperate so that copyright is protected across the world. Open your browser, and visit the following site to learn more about the UNESCO Universal Copyright Convention:

   http://portal.unesco.org/en/ev.php-URL_ID=15241&URL_DO=DO_TOPIC&URL_SECTION=201.html

2. The Berne Convention is another international effort to protect copyright. Visit the following page of the World Intellectual Property Organization (WIPO) site to read more about it:

   www.wipo.int/treaties/en/ip/berne/trtdocs_wo001.html

3. Copyright law has many facets and differs among countries. Visit the following site to review copyright laws specific to the United States:

   www.copyright.gov/title17/

4. Visit the following site to learn more about general copyright issues:

   http://whatiscopyright.org

5. Using Google, Bing or another search engine, research the meaning of the word ***plagiarism***.

6. As a class, answer the following questions:

   - Which parties are responsible for protecting copyright?

     _____

   - What is plagiarism?

     _____

   - What can you do as a developer to ensure that you do not engage in activities such as copyright infringement and plagiarism?

     _____

     _____

     _____

     _____

In this lab, you investigated aspects of copyright and trademark law. You also researched the meaning of the word plagiarism.

CIW Online Resources – Online Exercise

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to complete an interactive exercise that will reinforce what you have learned about this topic.

Exercise 1-4: Reviewing Web site development principles

OBJECTIVE
2.18.1: In-house Web server costs

Hosting and Web Service Providers

When deciding how your Web site will be hosted on the Internet, you have several options. The first decision is whether your company will host the site in-house or use some form of service provider to do the hosting for you.

Table 1-6 compares benefits and drawbacks of configuring your own hosting solution and using other providers. You will learn more about Internet Service Providers (ISPs) and cloud service providers in the sections that follow.

Table 1-6: Configuring your own server vs. using service providers

Web Service Provision	Benefits	Drawbacks
Configuring your own hosting solution	-You have more control over your services. -You have more choices.	-You must purchase and house all necessary hardware and software. -Configuring your servers will take time and expertise. -You must manage your own server, including security services.
Using an Internet Service Provider (ISP)	-You do not need to purchase hardware or software. -The ISP will configure the server for you.	-You have fewer choices in the configuration. -An ISP provides only basic services (e.g., limited CGI and small databases). -You are dependent upon the ISP's management and security services.
Using a cloud service provider	-You do not need to purchase additional hardware or software. -A cloud service provider will do more than configure your server; it will also provide completed and finished services for your organization. -The cloud service provider will also create custom solutions.	-A cloud service provider often charges a flexible subscription fee that varies upon the resources used (e.g., software licenses and hardware). -As with an ISP, you are dependent upon the cloud service provider's management, security services and uptime reliability.

Web service providers

You do not have to buy, configure and maintain your own Web server to host your site. An Internet Service Provider (ISP) can provide preconfigured servers and as much bandwidth as you are willing to pay for. Quality ISPs generally understand the needs of their customers, and they probably already provide many of the scripts and tools you need.

A cloud service provider may be appropriate if your company requires more complete services than an ISP provides.

Co-location, dedicated hosting and virtual servers

OBJECTIVE
2.18.3: Hosting options

Table 1-7 summarizes the benefits and drawbacks of hosting solutions provided by service providers.

Table 1-7: Service provider hosting solutions — benefits and drawbacks

Hosting Solution	Description	Benefits	Drawbacks
Co-location	The service provider allocates space for your equipment. You provide the server hardware, and the provider supplies space and necessary bandwidth for your server.	-You have complete control over your equipment. -You do not have to share server resources with any other party. -You have a choice over both hardware and software configuration.	-This option is more costly. -If your equipment experiences problems (either hardware or software), your provider will give fee-based support because the hardware and software are yours. -You may need to fix any problems yourself. -You are responsible for your own security.
Dedicated hosting (or co-hosting)	The service provider gives you access to a dedicated server that it owns.	-You have less up-front cost. -Your site can be launched more quickly because most providers have preconfigured servers. -You do not need to purchase a server and associated software. -You do not need server configuration knowledge. -The service provider configures the system, then allows you to access the system and upload files.	-You are limited to the operating systems and services offered. -You must inquire about the level of customer support. Many providers do not provide extensive customer service, which may lead to long wait times in case of problems. -Some providers allow you total control over your dedicated host. In such cases, you (or a consultant) must secure your systems.
Virtual server	One Web server contains your site and several other sites.	-You have less up-front cost and faster deployment time. -The Web service is generally running already. You simply provide your thoroughly tested code.	-You rely upon the provider's server configuration. -You have no control over the server. You control only your Web files. -If the provider's security is lax, then your virtual server may be easily compromised. -You have less flexibility in Web server functions.

OBJECTIVE
2.18.2: Cloud service providers

Internet Service Provider (ISP) vs. Cloud Service Providers

Remember that an Internet Service Provider (ISP) provides bandwidth and possibly Web server space.

Software as a-Service (SaaS)
Software that is hosted centrally on the Internet and accessed by users with a Web browser.

A cloud service provider is prepared to provide more complete services, including:

- **Software as a Service (SaaS)**, such as e-mail, accounting, human resources management, customer-service relationship, Web hosting, and nearly any type of software.

- Backup services and nearly unlimited hard drive space on a pay-as-you go subscription.
- Advanced Web and database connectivity, including the creation of custom CGI applications.
- Enterprise resource planning (ERP), which is the ability to automate the planning and operations of your entire organization (e.g., hiring, termination, manufacturing, marketing).

OBJECTIVE
2.18.2: Cloud service providers

Costs of using a cloud service provider

Costs associated with a cloud service provider include:

- **Database connectivity** — Cost is based on the amount of database support you require.
- **Per-service costs** — Each additional service you use will increase costs.
- **Bandwidth** — In addition to increasing (or decreasing) bandwidth, you can also pay the cloud service provider to closely monitor bandwidth usage.
- **Customer support** — A cloud provider can provide customer service to your company, just like an ISP. Some providers also offer support to your customers, allowing you to avoid the hiring, training and maintenance costs of creating your own team.
- **Security** — Larger cloud service providers have their own security auditing teams.
- **Application development** — A cloud service provider will either have its own application development team or will have relationships with remote development teams that can create custom applications for you.

OBJECTIVE
2.18.2: Cloud service providers

Negotiating Web services and communicating needs

When working with an ISP or cloud service provider, be prepared to detail your needs. Clearly provide information such as:

- Potential amount of traffic.
- Hard drive space you will need.
- Database and CGI needs.
- Additional services (e.g., custom applications).

As you contact the ISP or cloud service provider sales representatives, obtain prices for each of the services you need. Then, negotiate your prices with service provider representatives by:

- **Indicating your present needs** — Discuss plans in which you pay full price now then negotiate lower prices later, or vice versa.
- **Asking to talk to the sales representative's manager** — The manager has the decision-making power to negotiate lower costs.
- **Asking your manager to discuss prices with the sales representative or with the representative's manager** — Escalating negotiations can enable exceptions and swifter decisions.

You may be able to negotiate lower costs based upon the nature of your organization. If your organization is not-for-profit or associated with education, for example, you may be able to obtain price discounts for services.

OBJECTIVE
2.18.5: Site information management

Information you need from your service provider

If you use an ISP or cloud service provider, you will need to obtain the following information from the provider:

- **Account information** — This includes user names and passwords of all accounts associated with your server. The service provider may issue you multiple user names. Write the information carefully and store it in a secure place (e.g., a locked safe).
- **IP addresses and DNS names of the server**.
- **Instructions about file and directory locations**.
- **The service provider's contact information** — Such information includes Help Desk support numbers (and possibly the names of dedicated help desk workers), e-mail and texting numbers.

The Habitat for Humanity Web Site

Habitat for Humanity (also known simply as Habitat) is a not-for-profit, volunteer-driven organization that builds and sells homes for families across the world. The potential homeowner becomes a partner in building the home, and contributes to the actual building process as much as possible. This practice is called "sweat equity." Volunteers also help build the home. For years, Habitat has specialized in helping young people across the world contribute their time to help others obtain decent housing. The Habitat for Humanity site is shown in Figure 1-6.

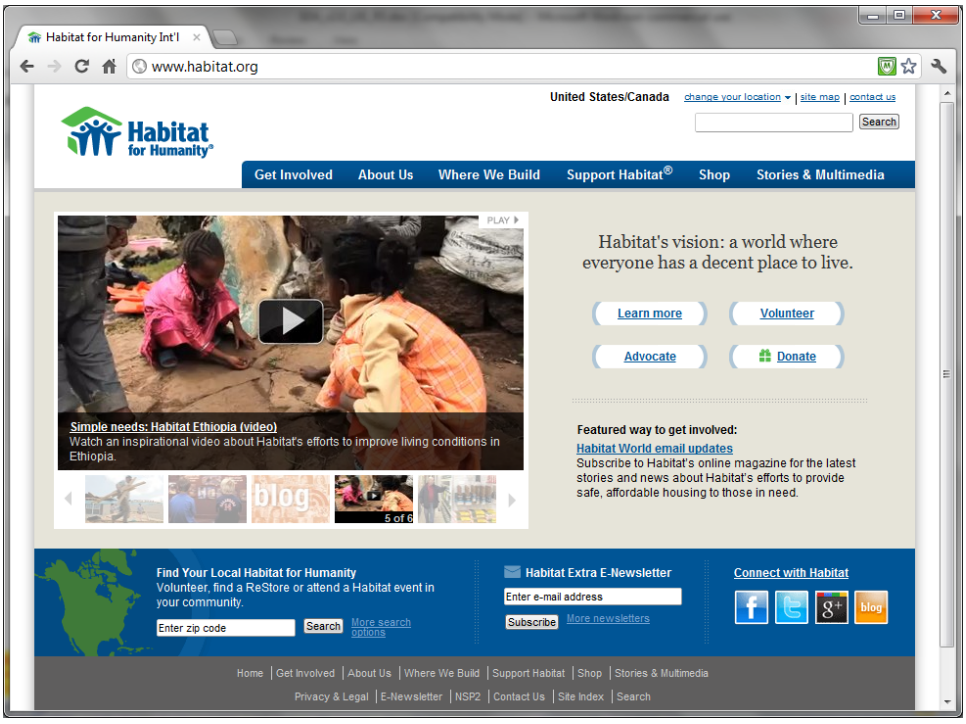

Figure 1-6: Habitat for Humanity site

Habitat for Humanity has built more than 150,000 homes across the world. Habitat also arranges no-interest mortgages and reasonable payment schedules for the homeowner, in cooperation with businesses and charitable organizations.

Habitat for Humanity has allowed CIW to use an earlier prototype version of its Web site as an example of a commercial-grade site. This permission is in no way an endorsement of CIW or Certification Partners. Habitat's permission to use portions of its site in labs teaching site development skills does not represent any sort of alliance or partnership. Students will build prototype pages using Habitat for Humanity content, which is owned and copyrighted by Habitat for Humanity. The prototype pages that students build do not necessarily represent, duplicate or simulate the current live Habitat for Humanity Web site, which can be visited at www.habitat.org.

NOTE:
The Habitat site is searchable, which means that a database, complete with CGI and SQL, is necessary.

Visit the current live version of the Habitat Web site at *www.habitat.org*. As you review the Habitat site, evaluate the site's ability to convey Habitat's message and achieve its goals. As you do so, consider the following questions:

- What strategies does the Habitat site adopt to obtain volunteers for building homes?
- What technologies (e.g., search engines, PDF documents) are used on this site to help achieve its goals?
- What front-end issues should be considered for this site?
- Review the site for offered features. What back-end technologies will be required to fulfill the offered features?

CIW Online Resources – Course Mastery

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to take the Course Mastery review of this lesson or lesson segment.

SDA Lesson 1 - Part B

Case Study

Plan It Out

Seamus was assigned to create a Web site plan for a charity organization. He must ensure that the site includes the following features:

- A message stating the purpose of the charity
- An online form that will receive personal information from potential volunteers and place it into a database

Seamus' first step was to discuss the plan with stakeholders. He did not have a stakeholder group, so he obtained representatives from the following departments:

- Marketing
- IT
- Web development

Eventually, all parties were able to agree on a site plan. After creating the site plan, Seamus' project manager asked him to help present this plan to upper management. Seamus decided to use the following:

- Web page examples provided via an overhead projector
- A handout listing the names of the stakeholders, as well as projected costs and timelines

Upper management was very pleased, although they did have a few specific feedback points that they asked Seamus to consider. The project was approved, and Seamus was able to work closely with the project manager to create the site.

* * *

As a class, consider this scenario and answer the following questions:

- What other features might benefit this site?
- What other stakeholders could have been consulted?
- What additional presentation aids could have helped Seamus make a positive impression?

Lesson Summary

Application project

The ability to write markup code manually is important because many GUI editors do not use the latest markup language standards and are not proficient at connecting to databases. HTML is still an evolving language, so you should be ready to modify existing code at any time.

To research the most current Web standards and recommendations, use your browser to access the W3C site (*www.w3.org*). Locate the following information:

- What is the most recent version of HTML?
- What new developments have occurred?
- What additional technologies does the W3C discuss in relation to HTML?
- What is the future of HTML in general? Why was XHTML deemed necessary?

When you are finished with your research, visit the Habitat for Humanity site (*www.habitat.org*). Then answer the following questions:

- What is the message of this site?
- What technical people would you need to help develop this site? For example, consider the site's search engine.
- What input from non-technical people was necessary to develop this site?

Skills review

In this lesson, you learned about the origins of HTML and the purpose for its creation. You learned that the W3C is the standards organization governing the evolution of HTML, XML and XHTML. You also learned that HTML editors may provide a simple interface to help you create HTML pages, but without the core knowledge to write HTML code manually, you are limited in your Web page development. After you learn how to write HTML code, the possibilities are limitless. Finally, you studied principles of Web site accessibility, planning, development, hosting and management.

Now that you have completed this lesson, you should be able to:

- ✓ 2.1.1: Relate the history of markup languages to current techniques and technologies, including Standard Generalized Markup Language (SGML), previous versions of Hypertext Markup Language (HTML).
- ✓ 2.1.2: Identify the format and various versions of HTML, including HTML 4.01, Extensible HTML (XHTML), HTML5.
- ✓ 2.1.8: Explain the importance of consistently developing to a single W3C standard (e.g., HTML5).
- ✓ 2.6.1: Describe the functionality of XML.
- ✓ 2.7.1: Obtain input from stakeholders about acceptable technologies and color combinations.

- ✓ 2.7.2: Create an initial Web site diagram (i.e., a story board or prototype), and translate it into a site map.
- ✓ 2.7.3: Verify compliance with government and industry accessibility standards, including W3C Web Accessibility Initiative (WAI), U.S. Government Section 508, Americans with Disabilities Act (ADA).
- ✓ 2.7.4: Validate Web page design according to technical and audience standards adopted by employers.
- ✓ 2.7.5: Verify Web site usability, viewability and browser compatibility.
- ✓ 2.12.1: Test and validate Web documents.
- ✓ 2.12.3: Test Web pages in multiple browsers.
- ✓ 2.13.1: Work as a team member to develop pages and sites.
- ✓ 2.13.2: Collaborate with technical (e.g., IT) and non-technical (e.g., marketing) members of the organization to ensure sites meet requirements.
- ✓ 2.13.3: Determine information and audience requirements for a site, including stakeholders such as customers, employees, shareholders, suppliers.
- ✓ 2.13.4: Document a Web site plan.
- ✓ 2.13.5: Communicate the Web site plan effectively, both orally and in writing.
- ✓ 2.13.6: Obtain and document feedback, then improve the site, including working closely with sales and marketing to evaluate site effectiveness.
- ✓ 2.14.1: Define legal issues related to a Web site, including trademarking, licensing, copyrighting, licensing copyrighted materials, scope of copyright, reach of copyright, copyrighting process, copyright infringement and consequences.
- ✓ 2.14.2: Identify fundamentals of project management, including major stages of a Web design/development project cycle.
- ✓ 2.14.3: Identify processes of pre-launch site/application functionality testing, including checking links, testing with various browsers, testing against corruption of your e-commerce site, load testing, access to the site, testing with various speed connections.
- ✓ 2.14.4: Manage existing sites (e.g., remove dead links and/or upgrade connectivity when necessary).
- ✓ 2.14.5: Remove old sites and pages.
- ✓ 2.15.1: Identify ways to elicit useful feedback from management and customers.
- ✓ 2.15.2: Use presentation aids and support material, including charts, tables, figures, written content, overhead projection.
- ✓ 2.15.3: Use presentation software (e.g., slide-based software).
- ✓ 2.15.4: Clarify technical concepts for a non-technical audience, and use strategies to retain listener interest.
- ✓ 2.15.5: Interpret verbal, non-verbal and written feedback.
- ✓ 2.15.6: Address diversity and corporate/organizational culture when communicating your message by customizing meeting and message delivery, and listening for responses.

- ✓ 2.15.7: Identify ways to lead meetings (e.g., make introductions, invite questions, set time frames, set action times, monitor time, ensure proper discussion focus, publish minutes).
- ✓ 2.18.1: Investigate costs associated with placing and developing your own server.
- ✓ 2.18.2: Identify costs associated with using a cloud service provider.
- ✓ 2.18.3: Distinguish among dedicated hosting, co-location and virtual servers.
- ✓ 2.18.4: Activate features provided by managed services (e.g., CGI, forms).
- ✓ 2.18.5: Manage information relevant to a site (e.g., account information, passwords, IP addresses).
- ✓ 2.19.3: Consider corporate/organizational culture when designing page layout.
- ✓ 2.19.4: Demonstrate sensitivity to ethnic and cultural issues in page layout and design.
- ✓ 2.20.1: Obtain proper permissions from developers when repurposing content (e.g., other developers' code, images, concepts).
- ✓ 2.20.2: Create and sign a Non-Disclosure Agreement (NDA) when necessary.
- ✓ 2.20.3: Identify situations in which it is necessary to consult with a legal team.
- ✓ 2.20.4: Identify ethical concerns when developing a Web site.

CIW Practice Exams

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to take the Practice Exams assessment covering the objectives in this lesson.

SDA Objective 2.01 Review	*SDA Objective 2.14 Review*
SDA Objective 2.06 Review	*SDA Objective 2.15 Review*
SDA Objective 2.07 Review	*SDA Objective 2.18 Review*
SDA Objective 2.12 Review	*SDA Objective 2.19 Review*
SDA Objective 2.13 Review	*SDA Objective 2.20 Review*

Note that some objectives may be only partially covered in this lesson.

Lesson 1 Review

1. List three operating systems and three browsers on which HTML will function.

2. What is the purpose of a tag in markup languages?

3. What W3C project promotes Web page access for disabled Web users?

4. Why is it important to relate technical concepts to non-technical people during planning meetings?

5. When working with a service provider to upload a Web site, what is some of the essential information you will need?