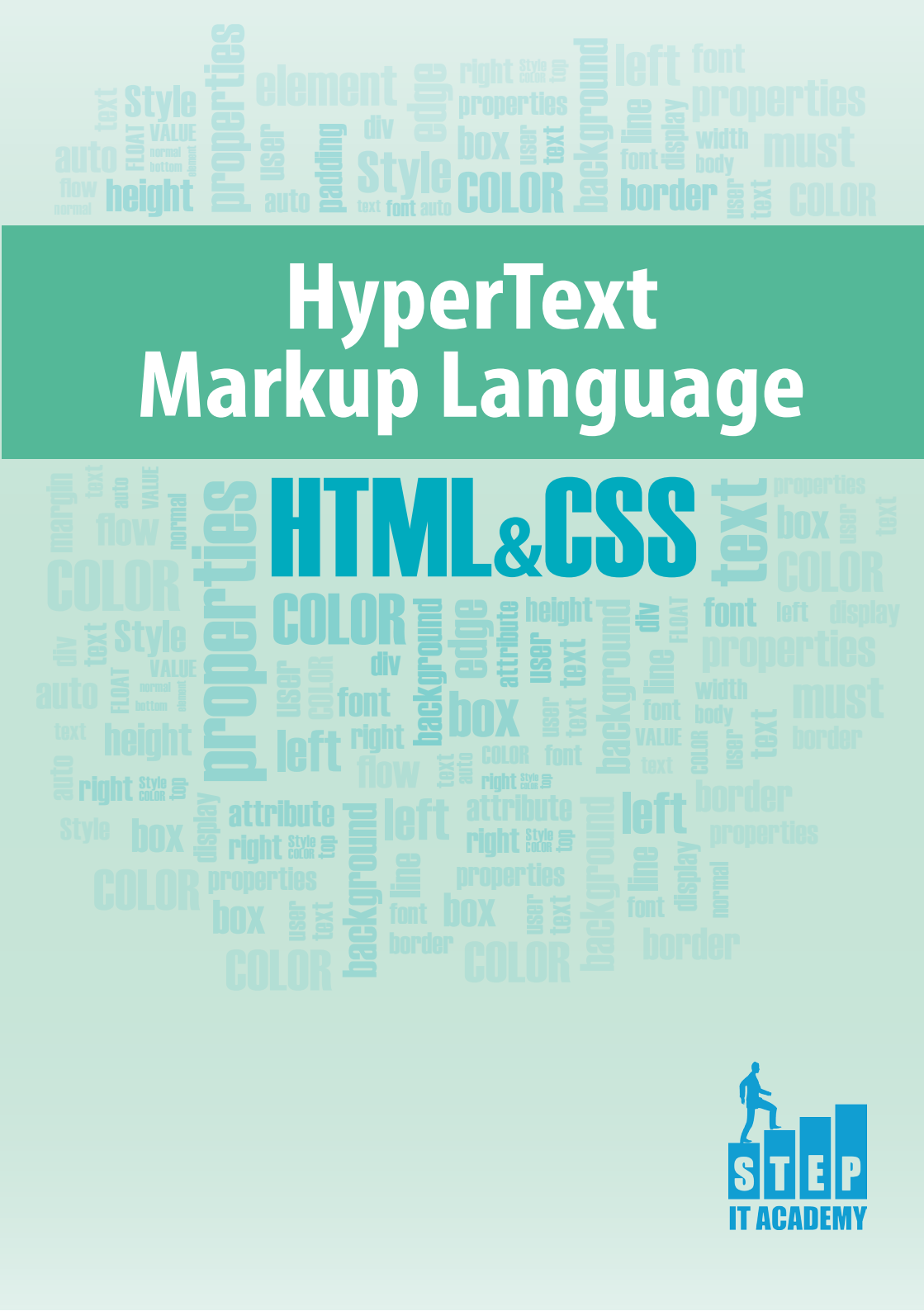
HyperText Markup Language



STEP IT ACADEMY

Unit 5

Graphics in Web design

Contents

Graphics in web design

Nowadays the importance of graphic information on web-pages is difficult to overestimate. As they say, "A picture is worth ...". Graphic elements make pages more visual and attractive. However, before we start adding images to our pages, consider the graphic formats supported by modern browsers, as well as the methods for obtaining and optimizing them using Adobe® Photoshop CS.

Formats of Graphics Files

JPEG Format (Joint Photographic Experts Group)

This format for the first time realized a new principle of image compression with loss of information — JPEG. It is based on the removal of information that is still not perceived (or poorly perceived) by the human eye from the image. Deprived of redundant information, the image takes much less space than the original image. The degree of compression, and consequently, the amount of information being deleted is smoothly regulated. Low compression ratios give better image quality, while high ones can significantly worsen it.

The JPEG is most widely used to create images on the Internet. Compactness of JPEG files makes this format indispensable in cases where the size of files is critical, for example, when they are transmitted over communication channels. JPEG supports grayscale and full-color images in RGB and CMYK models. Transparency is not supported.

Use JPEG format for photographic images only. In the drawings with clear boundaries and large filling areas, compression defects are strongly manifested. Especially typical is the appearance of "dirt" around dark lines on a light background and visible square areas.

GIF (Graphics Interchange Format)

The format was created by the largest online service CompuServe (now a part of AOL, America Online) specifically for the transmission of raster images in global networks. It is aimed at compactness and uses the LZW compression algorithm, which does not lead to loss of quality. It is used only for its original purpose — on the Internet, because it only supports indexed images.

The GIF format allows you to save several indexed images in one file (almost like layers in Photoshop). Browsers are able to demonstrate all these images in turn, resulting in a simple animation. In the animation file, not only frames of animation are stored, but also the parameters of its demonstration. GIF-animation due to its simplicity is the most common on the Internet.

In addition, one of the colors in the palette of the indexed image can be declared transparent. In the browser, areas of this color will be transparent, the background of the page will be visible through them. This transparency, however, has a distinctly visible pixelation on the curvilinear border of transparency (due to the fact that only two degrees of transparency are supported — transparent and opaque):

An indexed color model does not allow saving more than 256 colors in a table. Therefore, the GIF format is used to

represent small-color graphic elements of web pages (buttons, frames, banners, markers, background patterns, etc.)

PNG Format (Portable Network Graphics)

As the name implies, the PNG format is intended for transferring images over the network. This is a fairly young format for Web graphics, competing with GIF. All the latest versions of browsers support it without special plug-ins. The format supports halftone and full-color RGB images with a single alpha channel, as well as indexed and monochrome images without alpha channels. The alpha channel serves as a transparency mask. Thus, the PNG format is the only common format that allows you to receive full-color images with a transparent background. It is worth noting that PNG images with a full 8-Mbit alpha channel are not supported by Microsoft® Internet Explorer, whereas Opera and Firefox correctly display them (there is reason to think...):

The PNG format uses a powerful lossless compression algorithm based on popular LZW compression.

BMP Format (BitMap)

The bitmap format created by Microsoft® is designed for use in the Windows operating system. It is used to represent bitmap images in program resources. Only images in the RGB model with a color depth of up to 24 bits are supported. In principle, the format assumes the use of the simplest compression algorithm — RLE (Run Length Encoding), without loss of information, but this option is rarely used because of potential incompatibility problems.

This format is rarely used on web pages in our time. We consider it in our course only as a tribute to history.

Adding Images to a Web Page

The <img /> tag and its attributes

You can insert an image on a web page using the <img /> element. This element must contain the src attribute, which specifies the address of the image file.

Below is an example of inserting an image located at C:\images\image1.jpg :

```
<img src="file:///c:/image/image1.jpg" />
```

This element has one obligatory src attribute and a number of optional (below are listed the main ones)

Attribute	Description
src = url	Graphics file address
alt = text	Alternative text; pops up when hovering over an image; it is output in a blank frame in the browser mode of no graphics load
border = value	Thickness of border in pixels; 0 means no border. By default, border=0 if the image is not a hyperlink, and otherwise border=2
height = value	Image height in pixels (custom by default) or as a percentage of the browser window height
width = value	Image width in pixels (custom by default) or as a percentage of the browser window width
align = value	Aligning image horizontally or vertically. The texttop, abscenter, center, bottom, absbottom values provide various options of vertical alignment relative to a text row; when applying these values, the input image breaks the text thread. If the left or right values are set, the image will be correspondingly aligned horizontally; setting these values provides text wrap

Attribute	Description
hspace = value	Free space to the left and right from the image in pixels
vspace = value	Free space on top and from below of the image in pixels
usemap = #name	The map name is specified (see the map element) that sets areas sensitive to mouse click in this picture
id, style, class, title, onClick, onDblClick, onKeyDown, onKeyPress, onKeyUp, onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, dir, lang	Optional attributes, they are described in the section HTML 4+ Concepts.

Now in more detail. The img element can have the following special attributes:

- *src* is the absolute or relative address of the image file (Mandatory!);
- *alt* — alternate text (Mandatory!);
- *width* — image width;
- *height* — image height;
- *align* — image alignment (Canceled!);
- *hspace* — horizontal indents from the borders of the image (Canceled!);
- *vspace* — vertical indents from the image borders (Canceled!).

Only two of them are required: src and alt.

Adding an image

The src attribute must contain the address of the picture file. The address, or path, can be specified in two different forms: absolutely and relatively.

Absolute path indication is used in cases where it is necessary to address a resource located on another website, another computer on the network or another logical disk (if it is a local file addressing within a single machine). For example — the page is located on the website "http://www.somehost.com/index.html", the image "image.jpg" is located in the Images folder on the website "http://www.otherhost.com". Then the code for connecting this image will look like:

```
<img src="http://www.otherhost.com/Images/image.jpg" />
```

Relative addressing is used to specify the resource address within the same website, the logical disk. The following notation is used:

- "/" indicates the root directory of the website or disk
- "./" indicates the current directory
- "../" indicates the parent directory
- "name /" means the directory that is a child of the current.

Thus, if you want to specify the path to the image "image.jpg" located in the "Images" directory, the child relative to the current one, use the following address:

```
<img src="Images/image.jpg" />
```

Alternative text

The alt attribute is used for the textual description of the image. If the visitor's browser does not support images, or they are currently disabled, then instead of images, the user sees the following on the page:

Alternate text can give the user at least some information about this image. This is doubly important in cases where the image is also a link. If the alternative text is absent, the result will be completely deplorable.

In the case where the image was displayed successfully, the alternative text acts as a tooltip that occurs when the mouse cursor is over the image:

The following is a complex example showing the addition of an image to a page and the use of the alt attribute.

Aligning the image

To align images relative to page boundaries, you can use the float style property. This property can take the following values:

- "left" — the image is placed on the left, the text wraps it on the right
- "right" — the image is placed on the right, the text wraps it on the left

That is, the align attribute is used not only to align the image, but also to control its wrapping with a text. Example:

```
<h2>
    finalFlares v1.0
</h2>
<img src="sample_img_3.3.1.jpg" style="float: left;" ... />
```

```
<p style="text-align: justify;">
    <i>Light Diffusion</i>, <i>glow</i> and <i>outline
    glow</i> are the main
    effects created by <b>finalFlares</b> from <b>cebas
    Computer GmbH</b>. Unlike the built-in 3ds max
    equivalent, finalFlares creates much more natural-
    looking effects with powerful and flexible controls.
    In addition to faster rendering and better control
    over effects, finalFlares also provides full support
    of <i>Particle Flow</i> and
    <i>ThinkingParticles </i>.
</p>
<p style="text-align: justify;">
    finalFlares is available for 3ds max 6 and 7
    at the price of <b style="color: red;">245$</b>
    until April 30, 2005. After April 30, the price
    will be <b style="color: red;">299$</b>.
    Unfortunately, there is no information about
    the availability of the demo version
    of the product.
</p>
```

In some cases, image wrapping needs to be stopped. For example, you need to start a new section immediately below the image. In this case, immediately after the element, after which the wrapping should be stopped, insert the element <br style="clear: both;" />. For example:

```
...
<img src="someimage.jpg" alt="Some image"
     style="float: left;" />

<p> The text of the paragraph that wraps around
    the image ...
</p>
```

```
<br style="clear: both;" />
<p>
    This paragraph is already under the image,
    not wrapping around it.
</p>
```

To center the image, insert the img element into a div or p element centered:

```
<div style="text-align: center;">
    <img src="sample_img_3.3.1.jpg" alt="Centered!" />
</div>
```

Image Dimensions

In addition to other attributes, it is recommended that you also set the image dimensions using the width and height attributes. In this case, you should specify the actual image dimensions in pixels. This is necessary for the browser to allocate the space for the element immediately before the download of the image from the server and not to violate the structure of the page in the future.

In addition, using the width and height attributes, you can scale the image to your liking. For example, if you want to enlarge the 160×120 image by 2 times, then just specify one of the dimensions (height or width), increasing it by 2 times. The second size will be adjusted automatically so as to preserve the aspect ratio of the image:

```
<img src="sample_img_3.3.1.jpg" alt="Original image" />
<img src="sample_img_3.3.1.jpg" alt="Enlarged image"
     width="320" />
```

Be careful! If you change both the width and height attributes for an image, there is a risk of distortion. Therefore, calculate the new height and width of the image in such a way that you do not change the aspect ratio. Example:

```
<img src="sample_img_3.3.1.jpg" alt="Distorted image"
     width="520" height="120"/>
```

In any case, I recommend changing the sizes of images that you use on your pages using specialized software, for example — Photoshop. Do not scale images using HTML. Specialized programs have much more advanced and efficient algorithms for image interpolation and, consequently, the undesirable pixelation effect when scaling decreases.

Controlling the background of an element

You can use the color or image as the background of the element. Therefore, it is in this lesson that we discuss the issues of managing the background of the page and its elements.

So, you can assign a background color or a picture to any element of the page. This task is solved by adding the CSS style to the desired element. The question arises: how can I assign a background color or a picture to the entire page? Correctly — use the style for the body element.

The following is a list of CSS styles for managing the background:

- *background-color:* color; — background color of the element;
- *background-image:* url(address); — background image of the element;

- *background-attachment:* fixed | scroll; — fixing the background image;
- *background-repeat:* repeat | repeat-x | | repeat-y | no-repeat; — method of repeating the background image;
- *background-position:* x y; — positioning of the background image.

Let us turn to examples

Example 1: Using the page's background image

The following example demonstrates the use of the background image and the color of the page:

```
<body style="background-image: url(bg_01.gif);
      background-color: #ffffff; font-style: italic;
      font-size: 14pt;">

<h1 style="text-align: center;">
    Page background image
</h1>

<p>
    So, you can assign a background color or picture
    to any element of the page. This task is solved by
    adding the CSS style to the desired element.
    The question arises: how can I assign a background
    color or picture for the <b>whole</b> page?
    Correctly — use the style for the <b>body</ b>
    element.
</p>
```

The background image is a 25×25 pixel image. The browser automatically repeats the image, filling the whole space of the element (page) with it.

Example 2: control of repetition and position

By default, the browser automatically repeats the image, filling the entire space of the element with it. This process can be controlled using the background-repeat style property:

You can stop repeating the background image, for example, by assigning a background-repeat: no-repeat style for the element:

```
<body style="background-repeat: no-repeat;
      background-image: url(bg_02.jpg);
      background-color: #ffffff;
      font-style: italic;
      font-size: 14pt;">
```

Example 3: positioning the background image

If, after canceling the repetition of the background image, you want to place it on the center of the page, then use the background-position style property:

```
<body style="background-position: 50% 0%;
      background-repeat: no-repeat;
      background-image: url(bg_02-1.jpg);
      background-color: #ffffff;
      font-style: italic;
      font-size: 14pt;">
```

You can specify the position of the background image by specifying its coordinates horizontally and vertically, separating them by a space. You can use percent. So, the 0% 0% coordinates means placing the image in the upper left corner, 50% 50% — in the center of the page, etc.

Example 4: Fixing a background image

If in the body of a document equipped with a background image, you place a so large fragment of text that a scroll bar appears, then the text of the page will be scrolled along with the image. Scrolling the background image can be canceled if you set the style rule background-attachment: fixed. Example:

```
<body style="background-attachment: fixed;
      background-position: 20 20;
      background-repeat: no-repeat;
      background-image: url(bg_02-1.jpg);
      background-color: #ffffff;
      font-style: italic; font-size: 14pt;">
```

I hope these simple examples fully demonstrate the background management capabilities offered by CSS.

Unit 5.
Graphics in Web design