

Different Rendering

From "browser" to "user agent"

Touchtone

Sound Only

Mobile

Phone

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Phone -

Applications

Different Style Sheets

Low bandwidth

machine with

low resolution

**Re-branded** 

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Web Site

Marked up

document

describing

content only

187

- or in other attributes (e.g. bgcolor)

The *style* attribute contains everything that determines what an element looks like when rendered and where it is placed

188

- It has a number of properties to do this
  - · e.g. font-size and background-color

style gets its property values from:

- specific settings specified for this element
- settings for its tag type, class or id
- settings for its containing object
- default settings

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## **Cascading Style Sheets**

What Can You Set?

- http://www.w3.org/TR/1998/REC-CSS2-19980512/propidx.html

color

font-size

margin

padding table-layout

volume

background-image

text-decoration (e.g overline)

The full list of style properties you can set is at:

- available from the web site

Some examples:

height

size

width

background-color

border-width

font-family

max-height

text-align

text-indent

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and lots more



- they specify stylistic aspects of a particular element or all the elements of a particular type or class
- A style sheet is a group of formatting specifications of the form: selector { property: value; property: value; .... }
- The **selector** determines which element types are affected and each property, value pair assign a value to a property.

#### Examples:

h1, h2, h3 { color: red }	// all h1, 2 and 3 headings are in red	
<pre>p { font-size: 12pt; font-face:</pre>	{ font-size: 12pt; font-face: Verdana }	
	// all paragraphs are in 12pt Verdana	
<pre>* {text-align: left}</pre>	// everything is left aligned	

180

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## **Old HTML and XHTML Style Examples**

#### Old

- A paragraph with some <font face="arial" color="red"> red text</font> in the middle

#### XHTML

- A paragraph with some <span style="font-family:arial; color: red"> red text</span> in the middle

191

#### Old

– <body bgcolor="blue">

#### XHTML

- <body style ="background-color:blue">

#### Where Style is Specified

190

They can be used in three ways, of increasing maintainability:

- In-line. The stylistic information is added to one particular element using the *style* attribute, but with the style sheet syntax:
   <h3 style = "color : yellow; font-size : 18pt" >
- 2. **Embedded**. In a style sheet embedded in the header section of the document the styles will apply to all of the document:

```
<head>
<style type ="text/css">
<!--
h5 { color: blue; text-align: center }
-->
</style>
</head>
```

3. External. In a separate document which can be shared by several pages. The style sheet rules are held in a separate file with the extension .css. Every page in a site can then link to the same style sheet:
 <head>

192

link rel="stylesheet" href="myStyleSheet.css" type="text/css" > </head>

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# ID, Class and Style

A style sheet can set the style for:

a particular element by referring to the id attribute

 On the page: <a href="https://withub.com">https://withub.com">https://withub.com</a>
 In the stylesheet: #heading">.....</hl>

 a class of elements
 by referring to the class attribute
 On the page <a href="https://withub.com">https://withub.com</a>

 a class of elements by referring to the class attribute
 On the page <a href="https://withub.com">https://withub.com</a>
 a class of elements
 by referring to the class attribute
 On the page <a href="https://withub.com">https://withub.com</a>

 elements of a particular type by referring to the tag name
 In the stylesheet: td { padding: 20px, 20px, 0px, 0px }

 elements of a particular class of a particular type by referring to both the tag name and the class
 On the page <<li>class="tocitem">https://withub.com">https://withub.com</a>

li class="addresslist">... 
In the stylesheet: li.tocitem { color: red }
li.addresslist { color: yellow }

193

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## Style and <div> and <span>

These two element types are specifically for enforcing an abstract structure which can be used to guide style

The ISD09 web site contains, among other lines:

<h1 id="mainheading">Information Management- October 10 <span class="upper">th</span></h1>

<div id="leftColumn">

<div class="section">

Lectures

#### In the ISD09 style sheet are lines like:

#mainheading { text-align: center; font-size: 32pt; background: #A0A0A0; }
#leftColumn {float: left; width: 45%; } <!- force this to the left of the page
.upper { position: relative; top: -0.5em } <!- effectively a superscript
.subheading { text-align: left; font-size: 18pt; background: #A0A0A0; margintop: 1em; }
.section { padding: 0em; margin: 0em; }</pre>

195

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#### **Example: Classes in Style Sheets**

Using embedded or external style sheets seems to imply (e.g.) that all paragraphs must look the same which is too limited

To allow different styles for paragraphs (just like Word) HTML elements have an attribute called *class* which identifies a style in the style sheet



## Positioning and the Box Model

Each element expects to be placed to the right or below the last element with a little gap (the padding) between them

- This is called normal flow

There are several ways you can change this:

- You can position an element relative to its container by setting the position property to be "relative"
- You can position an element to be fixed on the page by setting the position property to be "absolutely"
- You can position an element to be on the leftmost part of the page by setting the float property to be "left"

Each element is placed in a box like this

- and you can change margin, border and padding in a style sheet



#### Lengths, Widths and Heights

Lengths can be specified in several different ways:

- as pixels e.g. 36px
- as ems (the font height) e.g. 1.2em
- as exs (the height of the 'x' character) e.g. 1ex
- in physical units e.g.1cm, 1.2in don't use these unless you are targeting a specific device
- as a **percentage** of the containing object, e.g.
  - line-height: 120%; percentage of the line height
  - width:50% percentage of the containing block level object

Margins, padding, line-heights, widths and heights can all be set using one or other of these

- They also have the setting **auto** which is usually the default and which will calculate the size of the object automatically

197

- Borders also have a style, colour and width

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## **Style and Programming**

<ul> <li>Jsing scripts in the web page you can change the style of elements as the user performs some action</li> <li>making them move or look different</li> <li>e.g. highlighting an element the user has selected</li> </ul>					
Nasty example:					
<ul> <li>this makes an image disappear when you roll the mouse over it and re- appear when the mouse moves off the image:</li> </ul>					
<img <br="" alt="Colour&lt;br&gt;Wheel" class="imageClass" id="wheel" src="colorwheel.gif"/> onMouseOver= "this.style.visibility='hidden';" onMouseOut=" this.style.visibility='visible';">					
But this only works because we have a coherent structure for style					
<ul> <li>The program has available a hierarchical data structure holding the elements and attributes (the DOM)</li> </ul>					
- Each element has a style attribute which can be changed					
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# The Cascading Aspect

Now we have a conflict between stylistic settings since there are so many places where these could be.

- The conflict is resolved by assigning formatting using the following precedence (dominant settings first):
  - 1. Attributes, such as *bgcolor*, in HTML tags are the first used although deprecated in XHTML

199

- 2. Inline style settings using the style attribute
- 3. Embedded style sheets
- 4. Imported style sheets (not dealt with here)
- 5. Linked style sheets
- 6. User settings in the browser
- 7. **Default browser** settings

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## **Problems in Web Site Design**

The creation of a web site needs careful design

- The goal is to convey information in such a way that it can most easily be found and understood
- In doing so, there are a number of problems to overcome:
  - **Effectiveness** does the web site convey the image you want and does it focus the reader on the most important material?
  - Legality will the web site break laws (in other countries)?
  - Offensiveness even if legal, will people be turned off by your presentation?
  - **Browser capability** can the browser manage new techniques? you should put alternatives if not

200

Search engine capability - have you provided appropriate keywords?

Navigability - does the user get lost?

**Speed** - do the pages download quickly enough?

Keeping up-to-date – make the content easy to maintain

## **Conditions of Use Applicable to Student Web Pages**

Students are encouraged to establish web pages using resources provided by the department. However, it is important to realise that pages are published via JANET (the Joint Academic Network) and it is your responsibility to ensure that you adhere to the Janet Acceptable Use Policy

#### http://www.gla.ac.uk/services/computing/regulations/web/acceptable.shtml

Under no circumstances may you use your web pages:

- to publish or link to illegal, pornographic, indecent, defamatory or insulting material for commercial purposes or to advertise goods or services
- to facilitate access to copyrighted material of any sort
- to host information or software which might compromise security or directly or indirectly cause harm to other systems or users within the Department or elsewhere

Standard departmental Conditions of Use do, of course, also apply. Please remember that publishing material is legally different from holding such material privately and that you are ultimately personally responsible should any party take action over any damage or offence caused by your pages

201

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#### **Guidelines for Web Site Design**

Use an effective **metaphor** - so the reader can use real world intuitions Maintain page clarity - use clear text and effective diagrams Make the web site consistent - each similar page should have the same layout Maintain user orientation - provide effective indications which let the user know where, in the context of the whole site, the current page is - e.g.:

- a sidebar frame with a table of contents
- a home button on every page
- forward and back buttons
- top of page buttons (for long pages)

Avoid unnecessary download time - animations, images and sounds take time

- do you really need them - if so provide different versions for different connection speeds (56K and broadband)?

Avoid distractions - an animated logo may catch the attention and draw it away from the information

Ensure your site is generally displayable and accessible, e.g.

provide alternatives to images and (?) colour and advanced features 202

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### Jakob Nilsson's Original Top Ten Mistakes

- 1. Frames can't be e-mailed and can cause clumsy interaction
- 2. Bleeding Edge Technology use of techniques not generally available make the site inconsistent across browsers
- 3. Scrolling text and looping animations these distract the visitor
- 4. Complex URLs a long URL will be hard to remember
- 5. Orphan pages you should always be able to get back to the home pages
- 6. Scrolling navigation pages content pages can scroll, but on pages that direct you about the site, all the links should be visible at once
- 7. Lack of navigation support use a consistent navigation technique

203

- 8. Non-standard link colours
- 9. Outdated information
- 10. Slow download times

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Some Web Sites

http://usability.gov/guidelines/ - evidence based guidelines

http://www.useit.com/alertbox/ - articles by Jakob Nielsen

http://www.usableweb.com/ - many guidelines

- http://www.w3.org/TR/WAI-WEBCONTENT/ guidelines for accessibility – see next slide
- http://www.webpagesthatsuck.com/ looking at bad design can be as informative as looking at good design

#### http://www.budugly.com/ - ditto - AND REMEMBER IF IT'S NOT BUD UGLLY, THEN YOU PROBLY PAID TO MUCH

These ones are on the web site etc., etc. -

Book – Web Design in a Nutshell, 2ed – Jennifer Niederst, O'Reilly, ISBN 0-596-00196-7

204

### The Wide Variety of Users and Contexts

Users may be operating in contexts very different from your own:

- They may not be able to see, hear, move, or may not be able to process some types of information easily or at all
- They may have difficulty reading or comprehending text
- They may not have or be able to use a keyboard or mouse
- They may have a text-only screen, a small screen, or a slow Internet connection
- They may not speak or understand fluently the language in which the document is written
- They may be in a situation where their eyes, ears, or hands are busy or interfered with (e.g., driving to work, working in a loud environment, etc.)
- They may have an early version of a browser, a different browser entirely, a voice browser, or a different operating system

205



207

## How People with Disabilities Use the Web

W3C Working Draft at http://www.w3.org/WAI/EO/Drafts/PWD-Use-Web/

This is a set of scenarios including:

- Online shopper with color blindness (user control of style sheets)
- Reporter with repetitive stress injury (keyboard equivalents for mouse-driven commands; access-key)
- Online student who is deaf (captioned audio portions of multimedia files)
- Accountant with blindness (appropriate markup of tables, alternative text, abbreviations, and acronyms; synchronization of visual, speech, and braille display)
- Classroom student with dyslexia (use of supplemental graphics; freezing animated graphics; multiple search options)
- Retiree with aging-related conditions, managing personal finances (magnification; stopping scrolling text; avoiding pop-up windows)
- Supermarket assistant with cognitive disability (clear and simple language; consistent design; consistent navigation options; multiple search options)

206

 Teenager with deaf-blindness, seeking entertainment (user control of style sheets; accessible multimedia; device-independent access; labelled frames; appropriate table markup)

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## **Browser Safe Colours**

Recall that the RGB system permits 256 values for each of red, green and blue

- but many devices can only manage 256 colours

Browsers typically support only 216 "**browser safe**" colours made from six possibilities each of red, green and blue:

- hex 00, 33, 66, 99, CC, FF
- decimal 0, 51, 102, 153, 204, 255
- see http://www.w3.org/MarkUp/Guide/Style for these

#### Browsers also understand a set of **named colours:**

black = "#000000"	green = "#008000"	silver = "#C0C0C0"
lime = "#00FF00"	gray = "#808080"	olive = "#808000"
white = "#FFFFFF"	yellow = "#FFFF00"	maroon = "#800000"
navy = "#000080"	red = "#FF0000"	blue = "#0000FF"
purple = "#800080"	teal = "#008080"	fuchsia = "#FF00FF"
aqua = "#00FFFF"	orange = "#FFA500"????	

208

20/10/2009

20/10/2009

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#### **Standards Overview**

The use of XML promotes a sustainable sharing of data structures for web content – e.g. XHTML

Web Content Accessibility Guidelines produced by W3C

- version 1 (5-May-1999) is a Recommendation
  - http://www.w3.org/TR/WCAG10/
- version 2 (30 June 2005) is a Working Draft
  - http://www.w3.org/TR/2005/WD-WCAG20-20050630/

Best design practice is also being standardised

- US Dept of Health & Human Sciences
  - http://usability.gov/guidelines/
- Jakob Nielsen's *useit* web site
- http://www.useit.com/

- Usable Web

- http://usableweb.org/

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# Some Examples

Provide text alternatives for non-text information

- e.g. in displayed text, Braille or synthesised speech
- put in redundant text links for image maps
- provide an auditory track with a visual track
- provide synchronised text with a time varying multimedia object

#### Use mark-up and style sheets

- MathML for formulae
- use formal grammars and validate documents
- stylesheets create a consistent interface and speed download
- use relative rather than absolute measures

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# WCAG 1.0 Accessibility Guidelines

2.09

- 1. Provide equivalent alternatives to auditory and visual content
- 2. Don't rely on colour alone
- 3. Use markup and style sheets and do so properly
- 4. Clarify natural language usage
- 5. Create tables that transform gracefully
- 6. Ensure that pages featuring new technologies transform gracefully
- 7. Ensure user control of time-sensitive content changes
- 8. Ensure direct accessibility of embedded user interfaces
- 9. Design for device-independence
- 10. Use interim solutions don't rely on browsers coping with new techniques

211

- 11. Use W3C technologies and guidelines
- 12. Provide context and orientation information
- 13. Provide clear navigation mechanisms
- 14. Ensure that documents are clear and simple

# WCAG 2.0 Structure

210

- WCAG 2.0 is organized around four design **principles** for Web accessibility:
  - Content must be **perceivable**
  - Interface elements in the content must be **operable**
  - Content and controls must be understandable
  - Content must be **robust** enough to work with current and future Web technologies
- Under each principle are **guidelines** that define how the principle applies in a specific area.
- Under each guideline are **success criteria**, definitions, benefits, and examples. Success criteria are testable statements to further define the guideline and to determine conformance.

212

# WCAG2.0 Guidelines

<ol> <li>1.1 Provide text alternatives for all non-text content.</li> <li>1.2 Provide synchronized alternatives for multimedia.</li> <li>1.3 Ensure that information, functionality, and structure can be separated from presentation.</li> <li>1.4 Make it easy to distinguish foreground information from background images or sounds.</li> <li>2.1 Make all functionality operable via a keyboard interface.</li> <li>2.2 Allow users to control time limits on their reading or interaction.</li> <li>2.3 Allow users to avoid content that could cause seizures due to photosensitivity.</li> <li>2.4 Provide mechanisms to help users find content, orient themselves within it, and navigate through it.</li> <li>2.5 Help users avoid mistakes and make it easy to correct them.</li> <li>3.1 Make text content readable and understandable.</li> <li>3.2 Make the placement and functionality of content predictable.</li> <li>4.1 Use technologies according to specification.</li> <li>4.2 Ensure that user interfaces are accessible or provide an accessible alternative(s)</li> </ol>		<ul> <li>The <i>title</i> attribute:</li> <li>The value of the title attribute pops up when you scroll over the element</li> <li>This can be used for explanations, translations, etc.</li> <li>The <i>alt</i> attribute is used for textual alternatives</li> <li>SMIL allows you to synchronise a variety of time-dependent media</li> <li>The <i>tabindex</i> attribute for form controls can be used to set the tabbing order of the form fields</li> <li>The <fieldset> tag can be used to box a set of form fields</fieldset></li> <li>The <noscript> tag should be used for alternatives to scripts</noscript></li> <li>Use "em" not "pt" for font sizes – they scale better</li> </ul>
VISC/Dip II – ISD L9 - Style & Design (185-216) 215 20/10/2009		MSc/Dip II – ISD L9 - Style & Design (185-216) 214 20/10/2009
	1	

The <abbr> and <acronym> tags permit the full form of a shortened version to be entered through the *title* attribute

The <lang> attribute can be made use of (e.g. in SMIL)

The automatic refreshing of a page is better done through getting the server to send the HTTP header 301 (moved permanently) or 302 (moved temporarily) than through a meta-tag

Validators exist for XML-based technologies such as XHTML, e.g.:

- XHTML is at http://validator.w3.org/
- CSS is at http://jigsaw.w3.org/css-validator/

In general, if its well formed, any tag or attribute can be used by a program to enforce guidelines

215

## Jakob Nielsen's Top Ten Web Design Mistakes of 2007

**Some Techniques** 

- 1. Bad Search overly literal
- 2. PDF Files for On-line Reading
  - for print and dissemination only
- 3. Not changing the colour of visited links
- 4. Text that's hard to scan
  - formatting for the screen is different from paper
- 5. Fixed font sizes that don't let the user resize
- 6. Page Titles With Low Search Engine Visibility
  - titles should describe what's on the page for search engines
- 7. Anything That Looks Like an Advertisement
  - will be ignored
- 8. Violating Design Conventions e.g. consistency
- 9. Opening New Browser Windows
  - taking over the client machine is hostile and disables the back button

216

10. Not Answering Users' Questions - e.g. not listing the price

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