

Making websites and eBooks accessible


Introduction

This document is about making websites and eBooks—and more specifically their content, accessible to people with disabilities or impairments, including those who may engage with the website's or eBook's content using the help of assistive technology, for example a screen-reader.

Making an accessible website or eBook does not mean making a different type of publication. It just means being systematically correct in how it is put together. So, it is about best practice.

Websites and eBooks use similar technologies. Both are created with variants of HTML and CSS (Hypertext Mark-up Language and Cascading Style Sheets). So making either of them accessible has a lot in common. One way of thinking of an eBook is as a specific type of stand-alone website. That may be an oversimplification, although it is not entirely untrue.

Here is a sample showing part of a webpage:



Magus Digital's web site © 2011

The Magus Digital website substantially achieves AAA compliance with the WCAG 2.0 (Web Content Accessibility Guidelines) when checked with automated assessment tools. That does not necessarily mean that it is fully accessible to all disabled users though. It means that there are no known or likely problems that might obstruct access. A further manual assessment of possible problems that automatic checking cannot evaluate suggests that there are few of any significance. So, it is reasonable to assume that for most of its audience there will not be accessibility issues.

The accessibility of the website will be periodically reviewed to maintain or improve on this position.

This has been arrived at by applying best practice to the design and build process, with good usability in mind and adaptability to different circumstances anticipated at the outset. The objectives were to target an inclusive audience and to maximise cross-platform and device independent compatibility without compromising quality or design. Relatively minor revisions and extensions of the outcome of this were all that was required to achieve the high level of accessibility.

Arguably this has not been too difficult to deliver because the Magus Digital website is a straightforward collection of information. It is not an eCommerce site and does not involve interactivity or media enhancements, which it has no current need for. However, it is never-the-less a valid demonstration of what may be done when best practice is applied and that designing for accessibility does not mean designing for a lowest common denominator, or dull production values.

The Magus Digital website uses valid HTML5 and CSS3. The supplementary documents that the website contains may not all be as accessible as they could be. That position will

There is no need to compromise quality or design—simply apply best practice in the creation process then fine tune to maximise the accessibility of the outcome.

Click on an item for more information or to download resources. Or navigate sections and pages from this menu:

Publishing: 1 | 2 | 3 | Marketing: 1 | 2 | Digital Intelligence: 1 | 2

[Tweet](#)
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[Share](#)

Accessibility
 Privacy and Cookies

This is how the content on the right of the page appears in its mark-up:

```
<h2 id="policy" class="type">Magus Digital's web site</h2>
<aside>
<div class="type2">There is no need to compromise quality or design&#8212;simply apply best
practice in the creation process then fine tune to maximise the accessibility of the outcome.</div>
</aside>
<p>The Magus Digital website substantially achieves AAA compliance with the WCAG 2.0 (Web
Content Accessibility Guidelines) when checked with automated assessment tools. That does not
necessarily mean that it is fully accessible to all disabled users though. It means that there are no
known or likely problems that might obstruct access. A further manual assessment of possible
problems that automatic checking cannot evaluate suggests that there are few of any significance.
So, it is reasonable to assume that for most of its audience there will not be accessibility issues.</p>
```

<p>The accessibility of the website will be periodically reviewed to maintain or improve on this position.</p>

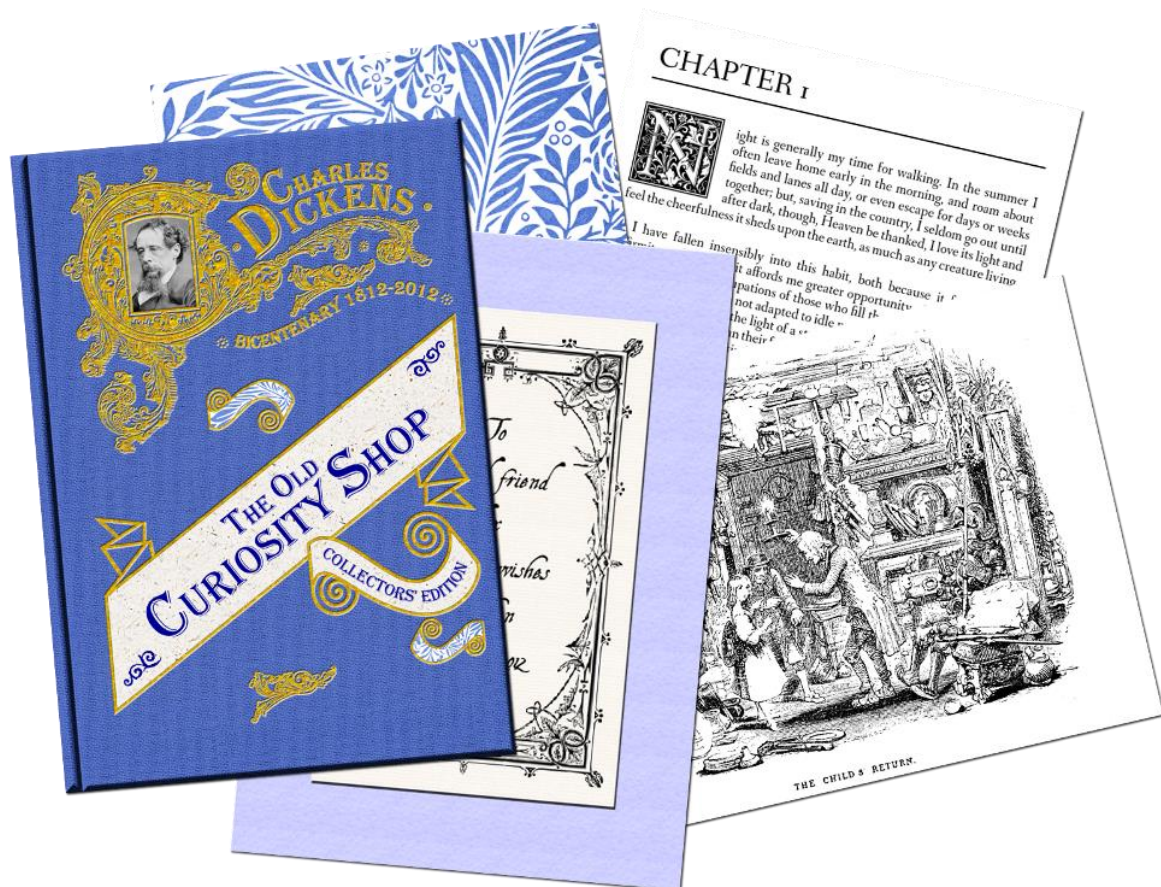
And here is a sample from an eBook's mark-up:

<h1 class="chapterHead" id="heading_id_1">CHAPTER 1</h1>

<p class="noIndent">Night is generally my time for walking. In the summer I often leave home early in the morning, and roam about fields and lanes all day, or even escape for days or weeks together; but, saving in the country, I seldom go out until after dark, though, Heaven be thanked, I love its light and feel the cheerfulness it sheds upon the earth, as much as any creature living.</p>

<p class="noIndent">I have fallen insensibly into this habit, both because it favours my infirmity and because it affords me greater opportunity of speculating on the characters and occupations of those who fill the streets. The glare and hurry of broad noon are not adapted to idle pursuits like mine; a glimpse of passing faces caught by the light of a street-lamp or a shop window is often better for my purpose than their full revelation in the daylight; and, if I must add the truth, night is kinder in this respect than day, which too often destroys an air-built castle at the moment of its completion, without the least ceremony or remorse.</p>

And this is what it looks like. The mark-up above begins Chapter 1:



The scope of this document

- This document summarises some general approaches and details a few instances of best practice that will result in more accessible outcomes.
- It is only intended as an introductory overview.
- In respect of webpages it primarily considers how to make relatively straightforward static webpages accessible; however, the same techniques often apply to the content and templates of other types of webpages—dynamic or interactive for example; so represents best practice generally.
- With regard to eBooks it primarily focuses on the ePUB specification, which is an open standard. The use of ePUB3 is assumed, which specifically supports accessibility. Again though some of what is said here represents best practice generally and would apply to other formats also.
- The use of HTML5, or XHTML5 and CSS3 are assumed in the examples given, as these are the current technologies. Other versions of these languages will sometimes be in use.
- XML and JavaScript also occur in both webpages and eBooks, though are beyond the scope of this introductory document.
- This document references more comprehensive resources and guidelines in a ‘Further resources’ section at the end. These should be consulted for further explanation and detail.

Overview

It is always easier to make an accessible website or eBook by intending to do that from the beginning, than it is to retro-fix something that has been badly made. So include accessibility in the context of good usability and adaptability to different circumstances that should be anticipated at the outset of a project, because these benefit everyone in the audience, or target market.

There is no need to compromise quality or design—simply apply best practice in the creation process then fine tune to maximise the accessibility of the outcome.

Fluid, also called ‘adaptive’, or ‘responsive’, design is often appropriate where the objectives are to target an inclusive audience and to maximise cross-platform and device independent compatibility without compromising quality or production values. Relatively minor revisions and extensions of the result of developing this way are usually all that is required to achieve a high level of accessibility.

Fluid design is quite easy to use with flowing content (see below).

Documents are most accessible if they are correctly structured and have their presentational values separated from what they are actually about. Web technologies do this best because they semantically describe the document structure (say what the component parts of it are) and allow for complete separation of content and design (when made properly).

When content is separate from design it becomes much easier to present it in different ways.

A significant issue is the use of WYSIWYG software (What You See Is What You Get) by limited skillsets to create websites and content, or inappropriate skillsets and the wrong software to make eBooks. This means the practitioners are not always conversant with what they need to do and there may be limitations to what their tools can deliver automatically. There is nothing inherently wrong with WYSIWYG software if it also allows direct access to the mark-up (the HTML and CSS) and outputs a standards compliant result. However, to be perfectly honest anyone using it, or any type

of authoring or editing tool, that cannot understand mark-up, or work directly in it when necessary, should not be producing either websites or eBooks.

Accessibility depends on good use of mark-up.

A mistake that is often made is assuming that eBooks are somehow a derivative of print books and that they involve a print production workflow. As they are created with web technologies they are best authored with tools that are intended for that purpose and that work directly with XHTML5 and CSS3. Unfortunately at present a lot of eBooks begin as output from graphic design software that was originally directed at print solutions, so structure and presentation get jumbled up in varying degrees, sometimes quite badly. The ideal is in fact to adopt a Digital-first workflow to deliver digital product and to output print editions directly from eBooks as Digital2Print conversions. This means an accessible version of the work exists before a print edition does. This the opposite of what most of the established publishing sector is doing, which explains why the potential for accessibility offered by eBooks is not always met.

Accessibility has been a feature of web development for over a decade, so print production needs to learn from it and not attempt to lead in this.

The essential principles

The principles of making a website or eBook accessible are relatively straightforward:

1. Use mark-up correctly. Use valid HTML5 and CSS3. Structure the content well, so that its organisation reflects what it is about:
 - a. This means the hierarchical use of headings
 - b. The proper use of paragraphs
 - c. The correct use of different types of list
 - d. Nesting these together in a way that relates items of connected content
 - e. All of this could be described as making sure the document has a logical flow
 - i. Here is an example showing a level 2 heading, followed by a paragraph, a list and another paragraph. The HTML tags say what they contain, <p> for paragraph for example:

```
<h2 id="resources" class="type">Digital Accessibility resources</h2>
```

```
<p>To encourage and support an inclusive approach to accessibility Magus Digital has provided the following introductory guides to Digital Accessibility that assess what that means and that contain insights into making content accessible in well-designed webpages, as well as ePUB3 eBooks and Word and PDF documents: </p>
```

```
<ul>
```

```
<li><a href="docs/Digital_Accessibility_v1.1.pdf">Digital Accessibility</a></li>
```

```
<li><a href="docs/Making_Documents_Accessible_v1.1.pdf">Making Documents  
Accessible</a></li>
```

```
<li>Making Accessible Websites and eBooks.</li>
```

```
</ul>
```

<p>These reflect the knowledge and expertise of Magus Digital and sample techniques used on this website. They are, however, simply an overview and are not intended as definitive documents. These resources are made available in accessible PDF format.</p>

- ii. There should only ever be one level 1 heading in a coherent document. So, only one to begin a webpage, or eBook chapter.

Content and design

2. Separate content from design, so that meaning is not reliant on presentation:
 - a. This is interconnected with item 1 above. Structuring the content identifies the role of each element in the document and its relationship to what comes before or after it. This is independent of what it looks like, so makes sense regardless of how the document is accessed.
 - b. Present the document using styling. This means applying a consistent style to each item in the document hierarchy telling it what to look like. Note that the examples of mark-up shown in this document only describe the content, although sometimes carry an 'id' or 'class' attribute as well. Everything about what they look like, their size, or where they are positioned is in an external CSS style-sheet linked to the page like this:

```
<!-- The content and design of this page are substantially separated. What it looks like is governed by this external style-sheet, so the content of the page simply follows a logical document structure. -->
<link href="styles/stylesheet.css" rel="stylesheet" type="text/css" />
```

A comment has been added to explain its purpose in this instance. Several comments have been added to the Home Page of the Magus Digital website as an aid to understanding accessibility. Most are shown in this document. They are also visible if the webpage is right clicked and 'View Source' is selected.

Alternative routes, flow and context

3. Provide alternative routes to the information:
 - a. Alternative descriptions are important where content is potentially inaccessible to some users, or their devices. The most obvious example is an image, which if it conveys important information also needs that to be explained in other ways:
 - i. An image should be described in case a user cannot see it. This is done with the 'alt' attribute of an image tag (meaning alternative description), which should be quite short and with a long description link where more detail is necessary. This is available to assistive technology though otherwise hidden. Captioning images with explanatory text is also useful and works for everybody. When SVG is used (Scalable Vector Graphics) a description tag may be incorporated instead.
 - a. In this example the image shows the logo of WritersReadersDirect, which uses the letters 'Wrd', as briefly described in the tag's 'alt'

attribute. It wouldn't make much sense to just say 'Wrd' or 'logo', so a short and meaningful explanation is used:

```

```

- b. In this next example from an eBook the picture has the following description embedded in the mark-up of the chapter. This only reveals itself to assistive technology:



THE CHILD'S RETURN.

THE CHILD'S RETURN: The narrator is shown returning the child to the old man inside The Old Curiosity Shop. The old man holds up a candle in a candle-holder above head height to light the scene. They are surrounded by a clutter of suits of armour, ornate objects, bottles and jars, pistols, daggers and swords, as well as heavy old fashioned furniture. There are drapes behind these on the left and there are some objects hanging from the ceiling. The old man is gaunt; his clothes are crumpled and perhaps a little old fashioned. His hair is white and long. He is wearing slippers. The girl is small and dainty and looks younger in this illustration than in others. The narrator, Master Humphrey in fact, is a late middle aged man in the simple attire of a prosperous tradesman. His clothes are also perhaps a little old fashioned for the times. Nell has a hand on his arm and is indicating towards him with the other, which implies she is explaining the events leading up to her return. A suit of armour on the right is sat in a chair, whilst one on the left has the visor open showing it is empty and it has no legs. They have an almost comic character in this illustration.

- c. It generally makes sense to add a caption to an image in a webpage, or eBook, as well as giving it an alternative description, since that will also be informative for all users about what the purpose of the image is; and it may be that what it is illustrating, rather than exactly what it looks like, is the more important factor to explain.
- b. Information in tables may be difficult to interpret if the table cannot be seen, or is large and complex. So, only use tables where they are necessary to display tabular data and always make sure that there is a 'Header Row' enabled, as that defines the columns in a more accessible way to a user that cannot see them.
 - c. Different disabilities and impairments have different obstacles to overcome and it is difficult to predict all scenarios, or what assistive software any given user may have. A way of dealing with this is to offer alternative routes and to use

parallel content in different forms, for example text and images that convey essentially the same information. Although one version makes the other redundant the end-user has a choice and it is simply seen as a design feature.

4. Content should flow. The content of a document should follow a logical sequence from beginning to middle to end in a linear fashion. This is sometimes referred to as content being linearized, simply meaning that each item of content follows another in an ordered sequence. Content constructed like this behaves like a liquid and ‘flows’ into whatever it is put into, taking on its shape, just like water in a glass. So, the end-user’s screen size, or the capabilities of their device, or the media channel they are using and many other obstacles to access become irrelevant.
 - a. Changing the font size, or the background colour, or the text being read out by a screen reader, should make no difference to flowing content.
 - b. Well-made digital product may have flowing content underneath, which has been presented visually as though it is not, by means of a linked style-sheet. This means the same content presents itself to different users, or under different conditions, in different ways. That makes it inherently accessible to the disabled and impaired.
 - i. As an illustration of this point, try reducing the size of the browser window when looking at the Magus Digital website. As it gets smaller the background image of the logo will fade to limit conflict with the text and it will drop out completely at the smaller screen sizes encountered on some devices. In theory when the Magus Digital website meets a screen reader it will linearize completely and reveal the hidden navigation—although that may depend on how clever the screen reader is of course. The website’s content is essentially linearized, flowing content controlled with CSS. Nothing is what, or where, it appears to be.
5. Where the format permits be aware of context and semantics:
 - a. Context: This may mean several things:
 - i. One way of thinking of context is as a reference to what a thing does rather than what it looks like. So, for example the most useful alternative description of the logo on a website is typically going to be ‘return to home page’, not a description of the image.
 - ii. Italic and bold describe what certain items of text are presented like in print and are simply descriptions of the font style. Web technologies allow for tags meaning ‘emphasise’ and ‘strong’ in their place, which have contextual meaning focusing on their significance when a document is being interpreted with the help of assistive technology. Use `` and ``.
 - iii. Perhaps the most obvious consideration is this: When a hyperlink to other content is included in any kind of document it is important to title or describe it contextually, so that the end-user understands what it points at. A web address is often long and not particularly meaningful to the human reader (neither is ‘click here’). The links to ‘Further Resources’ at the end of this document are used to provide examples of how this should be done.

- b. Semantics: This particularly applies to HTML5 and the closely related technology used in eBooks XHTML5 where it is possible to do. It also applies to specific areas of ePUB3 such as EDUPUB. These offer the possibility of semantic mark-up describing the purpose of parts of, or collections of content. As examples:
- i. HTML5 includes elements of mark-up that identify the purpose of content within a document. These are not visible to the end-user when the content is presented to them; however, significantly extend the structural organisation that is possible. This means elements of content may indicate their role and relevance in relation to the document as a whole to assistive technology (and therefore the user) in far greater detail.
 - a. In this example the tags 'main' and 'aside' are identifying the purpose of what they contain:

```
<!-- Note also the use of HTML5 semantic mark-up to indicate the purpose of elements
within the page. -->

<main title="We make beautiful eBooks:">

<h2 class="type">Setting new standards and defining the future of publishing </h2>

<aside>

<div class="type2">With the introduction of ePUB 3 it becomes clear that an eBook is not a
poor relation of a printed work, nor is its conversion from a print parent a sustainable model
for the future. There are many additional advantages to developing the eBook format
directly, which go beyond what a traditional book can do.</div>

</aside>

<p>Magus Digital draws on a background and extensive experience that covers a
combination of creative and technical disciplines. These include web development, art,
design and marketing; writing and journalism; and the direction of publication production
teams delivering for both screen and print outcomes.</p>
```

- ii. The eBook specifications for ePUB3 (which is for interactive and media enhanced eBooks) and for EDUPUB (which is a version of ePUB3 specifically for eTextbooks) have quite extensive possibilities for semantic mark-up. This has the potential to be game-changing for accessibility.

A few more rules to observe

- Give each page a title.
- Always let users know where they are and how they get to somewhere else.
- Always make it clear what is happening, particularly in interactive or transactional systems, or what the content is about.
- Create alternative routes to suit different requirements. This works for everybody not just disabled users (see also 3.c above).

- Add hidden navigation and explanations to help users of assistive technology—‘jump to content’ links for example.
 - There are different opinions on how best to do this with CSS, so that it is not seen, though is available to assistive technology—and doesn’t get misinterpreted by search engines. Here is some sample mark-up from the Magus Digital website that does this:

```
<!-- This navigation menu is for the benefit of assistive technology and to help its users
bypass parts of the page that they don't need, whilst going straight to those they do. The
menu is hidden by the style-sheet, so other users don't see it. -->
```

```
<nav>
```

```
<ul id="Access" class="hidden">
```

```
<!-- This menu also uses accesskeys to make essential navigation accessible -->
```

```
<li><a href="#rightCont" accesskey="1">Skip to content</a></li>
```

```
<li><a href="#Section" accesskey="2">Navigate by main section topic</a></li>
```

```
<li><a href="#altNav" accesskey="3">Navigate by page or content subject</a></li>
```

```
<li><a href="#Docs" accesskey="4">Go to supplementary documents</a></li>
```

```
<li><a href="contact.html" accesskey="5">Contact Magus Digital</a></li>
```

```
<li><a href="index.html" accesskey="6">Return to Home Page</a></li>
```

```
<li><a href="access.html" accesskey="7">Accessibility</a></li>
```

```
</ul>
```

```
</nav>
```

- Make sure that ‘drop down menus’ are accessible and usable via a keyboard as well as a mouse if you use them.
- Periodically review the accessibility of a website, or eBook, to maintain or improve on what has been done. Standards evolve and technology changes quite rapidly in the digital environment and something that wasn’t supported previously may be now.
- Say what something does when that is important, not what it is, or looks like.
 - Again some sample mark-up from the Magus Digital website showing this follows. On most pages a selection of images on the left of the webpage creates an alternative way of moving around the site or going to other related content. The images used do illustrate what they point at; however, this is in reality just an alternative navigation route, meaning what the images look like isn’t particularly relevant to a user that cannot see them. What matters is what the links attached to them do (see 5.a.i also):

```

<nav>

<!-- These images have links attached to them and what these point at is more important
than what they look like, so their alt attributes describe that. -->

<ul class="flowing">

<li><a href="publishing3.html"></a></li>

<li><a href="publishing.html"></a></li>

<li><a href="publishing2.html"></a></li>

<li><a href="marketing.html"></a></li>

<li><a href="marketing2.html"></a></li>

<li><a href="intelligence.html"></a></li>

<li><a href="intelligence2.html"></a></li>

</ul>

</nav>

```

- Also, consider the accessibility of documents or other supplementary content that may be attached to a website, or embedded in an eBook.

Further resources

Detailed standards and guidance for accessibility are already in place and include these:

- [Web Accessibility Initiative](#)
- [WCAG 2.0](#) (ISO 40500)
- [WAI-ARIA 1.0](#)
- [WCAG2ICT](#)
- [UAAG2](#)
- [BS 8878](#)

Most of the Web is made with these mark-up languages: HTML, XML, XHTML, [HTML5](#), XHTML5, [CSS2 and CSS3](#).

There are detailed specifications for eBooks and eTextbooks ([ePUB3](#) and [EDUPUB](#))—and for comics or graphic novels; and there are the [EPUB Accessibility Guidelines](#) covering accessibility. And the [EPUBTest Testsuite](#) includes test files for assessing the accessibility of eReading software, as one of the measures of its compliance with and implementation of the ePUB3 specification.

Test with an automated system as a basic evaluation of how well the use of clean mark-up and best practice development processes have worked as means of delivering digital accessibility. There are several, of which [AChecker](#) is one. It has customisable options that allow different types of checking to be done.

Test with a screen reader

The NVDA (Non Visual Desktop Access) screen reader is free. Although other proprietary screen readers are in common use—and there may be differences in how documents are handled by each of them, installing this one gives content creators, website owners and designers and developers of digital resources, the opportunity to test their output for accessibility with assistive technology.

This is a valuable exercise both as a means of flushing out potential problems and from the perspective of understanding the challenges for some end-users in the audience.

[Download the NVDA screen reader](#) here. A small donation is suggested, though is not obligatory.

Disclaimer

This document on Making Websites and eBooks Accessible is for general information and guidance purposes only and is intended simply as an introduction to and overview of the subject area—and of surrounding and interrelated influences.

Its commentary represents well-reasoned professional opinion based on the author's knowledge expertise and an informed interpretation of the available resources at the time of writing, some of which may be derived from third-party content from trusted sources that has not been independently verified.

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