

WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JANUARY 2009.

Draft BS 8878:2009

Web accessibility – Building accessible experiences for disabled people – Code of practice

Contents

Foreword	3
0	Introduction 5
1	Scope 6
2	Normative references 7
3	Terms, definitions and abbreviations 7
4	General principles 7
5	The impact of the choice of web technologies and web content authoring tools on disabled people's experience of web content 8
6	Web accessibility guidelines 10
7	Defining and implementing an accessibility policy for a business or organization 11
8	Involving disabled people in the planning, development and testing of a business' or organization's website 13

Annexes

Annex A (normative)	Normative references 19
Annex B (normative)	Terms, definitions and abbreviations 20
Annex C (informative)	Business case 24
Annex D (informative)	Allocation of responsibilities 25
Annex E (informative)	DDA and the law 27
Annex F (informative)	How disabled people experience web content 31
Annex G (informative)	Contracting web design and auditing services 38
Annex H (informative)	Example policy statements 40
Annex I (informative)	Suggested user profiles 43
Annex J (informative)	Measuring user success 37

Bibliography	44
--------------	----

List of figures

Figure 1 – Decision process for technologies and web content authoring tool selection	10
---	----

List of tables

Table 1 – Examples of accessible, usable and enjoyable user experiences	6
---	---

Summary of pages

This document comprises a front cover, an inside front cover, pages i to xx, pages 1 to xx, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on **XX Month 200X**. It was prepared by Technical Committee IST/45, Web accessibility. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

This British Standard is based on PAS 78:2006, which will be withdrawn.

Information about this document

The content of PAS 78:2006 has been fully revised and updated to reflect current good practice in the building and maintenance of accessible web content.

NOTES FOR DPC

(1) This draft was released for public comment on 1 December 2008, at which time the Web Accessibility Initiative (WAI) Web Content Accessibility Guidelines 2.0 (WCAG 2.0) is a “candidate recommendation”. It is not possible to include reference to guidelines that have not reached full “recommendation” stage. It is predicted that WCAG 2.0 will become a “recommendation” during the DPC (draft for public comment) period. This being the case, this draft will be amended prior to final publication to include references to WCAG 2.0 where appropriate.

(2) Attention is drawn to the fact that BS 0-2 (A standard for standards – Part 2: Structure and drafting – Requirements and guidance) requires spelling to be taken from The Shorter Oxford English Dictionary. Particular attention is drawn to the fact that words such as organization and optimize use the “z” spelling.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller type, and does not constitute a normative element.

The word “should” is used to express recommendations of this standard. The word “may” is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the Clause. The word “can” is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

NOTE Annex A contains a list of documents referenced normatively; Annex B contains a list of terms and definitions.

WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JANUARY 2009.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

0 Introduction

0.1 General

The Disability Discrimination Act 1995 (DDA) [1] has placed a legal duty on UK businesses and organizations to ensure that disabled people do not experience unreasonable difficulty in accessing and using web content. However, the legal imperative should not be the sole driver for a business or organization to take steps to make its web content more accessible to and usable by disabled people.

- The Family Resources Survey [2] found that there are almost 10 million disabled people in the UK with a combined spending power in the region of 80 billion pounds per annum. Furthermore there are millions of other individuals that are affected by sensory, physical and/or cognitive impairments, including those resulting from the ageing process.
- Research undertaken by the Disability Rights Commission (DRC) “The Web: Access and inclusion for disabled people” [3] confirmed that people without disabilities are also able to use web content that is optimized for accessibility more effectively and more successfully.
- Content developed upholding World Wide Web Consortium (W3C) guidelines and specifications can be more easily transferred to other media, such as interactive TV, mobile phones and handheld computers.
- Accessible content, for example where a text equivalent is provided for graphical elements, is highly visible to search engines, often leading to improved findability and improved search engine optimization of web content.
- Accessible web content is becoming increasingly important in the workplace. There is a legal responsibility under the DDA to allow disabled people equal access in employment. Equal access to web content, applications, hardware and software through which access is afforded is becoming crucial.

Ensuring accessibility can also generate good publicity for a business or organization, particularly those that have a duty to produce a public statement of corporate social responsibility or evidence they have complied to the legal requirement to demonstrate their “public sector duty” to disabled people (as applies to central government departments and local councils).

0.2 Understanding accessible experiences

The goal of any web project should be to create web experiences that are accessible, usable and enjoyable for everyone.

NOTE 1 See Annex C for information on the business case for making web content accessible.

NOTE 2 Further business benefits achieved by making web content accessible are given at <http://www.w3.org/WAI/bcase/benefits.html>.

Table 1 gives examples of accessible, usable and enjoyable user experiences.

Table 1 – Examples of accessible, usable and enjoyable user experiences

Access	Use	Enjoy
The user can access all the information and functionality that they need to meet their goals	The user can use the information and functionality to meet their goals efficiently and effectively	The user has an enjoyable experience, e.g. may spend longer on the site than necessary because they are enjoying the interaction
Examples		
The web content can be read by a screenreader	The user can find the product they are looking for quickly and easily	The user found what they were looking for and enjoyed reading about the different products available
A deaf person is able to read the subtitles on a video	The subtitles contain all the pertinent information the deaf person requires	A deaf person had access to real-time captioning and could enjoy watching the video whilst understanding what was being said
A blind person is able to access an audio description of a video	The audio description contained all of the information to enable the blind person to understand the action of the video	The audio description was written in a style fitting to the genre of the video so it is both enjoyable and informative
A person with multiple sclerosis can read a novel online	The user is able to adjust their browser settings to a colour combination that they can read	They're able to enjoy the novel online

1 Scope

This British Standard gives recommendations for building and maintaining web experiences that are accessible to, usable by and enjoyable for disabled people.

It gives recommendations for:

- the management of the process of, and guidance on, upholding existing accessibility guidelines and specifications;
- the involvement of disabled people in the development process and using automated tools to assist with accessibility testing.

BS 8878 is applicable to all public and private organizations. The audience for this document includes:

- business owners;
- marketing managers;
- public relations officers;
- web managers;
- HR managers;
- heads of IT;

or whomever is ultimately responsible for web content policy within an organization that wishes to offer accessible, usable and enjoyable web experiences to their users, observing good practice under the existing voluntary guidelines and the relevant legislation.

NOTE The Disability Discrimination Act 1995 (DDA) uses the term “service provider”, however in BS 8878 the term “business or organization” is used to include private companies, non-profit organizations, government departments, local councils, public sector organizations and academic institutions, all of whom owe a legal duty to disabled people as set out in the DDA.

2 Normative references

The documents listed in Annex A are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3 Terms, definitions and abbreviations

The terms, definitions and abbreviations used in this British Standard are given in Annex B.

4 General principles

4.1 BS 8878: Claims of conformance

Organizations wishing to claim conformance with BS 8878 should do so in hard copy, electronic media or any other medium.

In making such a claim, a business or organization should address all of the provisions of BS 8878.

NOTE As a code of practice, this British Standard takes the form of guidance and recommendations. It is not to be quoted as if it were a specification and particular care is to be taken to ensure that claims of conformance are not misleading. Any user claiming conformance to this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

The claim should identify the type of conformity assessment undertaken as one of:

- a) certification;
- b) other party assessment; or
- c) self-assessment.

4.2 Ownership

The Managing Director or Chief Executive Officer of a business or organization should ensure that a department or specified role is responsible for the organization’s compliance with BS 8878.

NOTE 1 See Annex D for information on the allocation of responsibilities.

This department or role should prepare a business case for accessibility using the AbilityNet business case (see Annex C) and the information on the Disability Discrimination Act (see Annex E) for guidance.

NOTE 2 This member of staff might be, for example, the Chief Technology Officer, Human Resources Director, Public Relations Director, Communications Director or Marketing Director depending on the size and structure of the business or organization.

4.3 Understanding how disabled people access and use web content

The department or role identified in 4.2 should appreciate the different methods by which disabled people access and use web content (see Annex F).

NOTE Further information is available from My Web, My Way (<http://www.bbc.co.uk/accessibility/>), AbilityNet (<http://www.abilitynet.org.uk/>) and the W3C guidance on “How people with disabilities use the web” ([http://www.w3.org/WAI/EO/drafts/PWD Use Web/](http://www.w3.org/WAI/EO/drafts/PWD%20Use%20Web/)).

4.4 Understanding accessible experiences

The department or role identified in 4.2 should understand the organization’s duties under the DDA. In the absence of county court case law it is not yet possible to make recommendations that guarantee compliance with the DDA, however, the named member of staff identified in 4.2 should understand the spirit of the DDA (see Annex E) and the steps that can be taken to create an experience for disabled people that is equal to the standard enjoyed by all users.

4.5 Understanding the impact of the choice of technologies and authoring tools

The department or role identified in 4.2 should develop an understanding of the impact of the choice of technologies and authoring tools on disabled people’s access and use of web content (see Annex F).

The business or organization’s procurement policy should include requirements that any web authoring tool supports production of accessible content (see 5.2). The authoring tool itself should also be accessible to disabled web content developers.

NOTE 1 See Annex C for further information on contracting web design and auditing services.

5 The impact of the choice of web technologies and web content authoring tools on disabled people’s experience of web content

5.1 Web technologies

A crucial decision within the web development process is what technology (e.g. Flash, JavaScript, ActiveX, etc.) to use to create web content or user interface functionality.

When selecting a technology, web content developers should consider:

- whether the chosen technology has the attributes necessary to create accessible content; and
- whether the technology exposes content, structure and functionality to assistive technologies used by disabled people.

5.2 Web content authoring tools

In the choice and procurement of tools businesses and organizations should require suppliers to list any deviations from ATAG (see 6.2).

NOTE At the time of publication, no single authoring tool that supports all ATAG Priority 1 checkpoints is known.

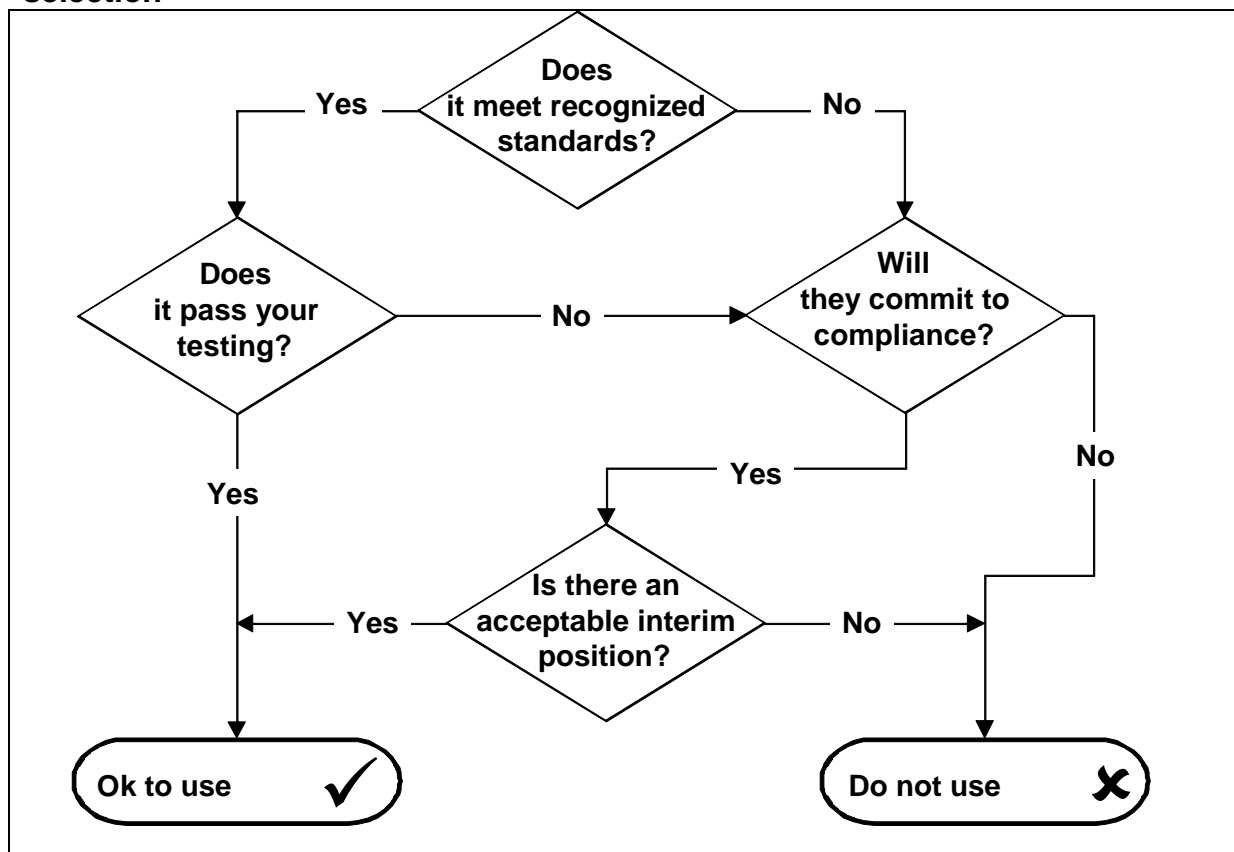
5.3 The technology selection process

A process for making decisions on which technology to use should include the following:

- Ensuring your audience will be able to do the following with your web content:
 - find it;
 - use it;
 - understand it;
 - (where relevant) be entertained by it;
 - (where relevant) learn from it;
 - (where relevant) share it;
 - (where relevant) reuse as part of something bigger.
- Consider using a combination of technologies to achieve your goals.
- If a technology meets some but not all of your criteria, consider providing an alternative solution, which provides disabled people with access to the same content, updated at the same time as the original content.
- If a technology meets none or only a few of your criteria, and an alternative, accessible method of providing that content is not reasonable or possible, ensure you let your disabled users know why this is the case.

NOTE Figure 1 gives the decision process for technology selection.

Figure 1 – Decision process for technologies and web content authoring tool selection



6 Web accessibility guidelines

NOTE The World Wide Web Consortium (W3C) Web Accessibility Initiative (WAI) publishes three sets of guidelines which, when harmonized, increase the likelihood that web content will be accessible to and usable by disabled people.

- Web Content Accessibility Guidelines (WCAG): [<http://www.w3.org/TR/WCAG>]
- Authoring Tool Accessibility Guidelines (ATAG): [<http://www.w3.org/TR/ATAG>]
- User Agent Accessibility Guidelines (UAAG): [<http://www.w3.org/TR/UAAG>]

6.1 Web Content Accessibility Guidelines (WCAG)

NOTE WCAG are important accessibility guidelines for businesses and organizations and web content developers and project managers to be familiar with, as they are considered to be the de facto standard for accessible web design world wide.

NOTE FOR DPC

This draft was released for public comment on 1 December 2008, at which time the Web Accessibility Initiative (WAI) Web Content Accessibility Guidelines 2.0 (WCAG 2.0) is a “candidate recommendation”. It is not possible to include reference to guidelines that have not reached full “recommendation” stage. It is predicted that WCAG 2.0 will become a “recommendation” during the DPC (draft for public comment) period. This being the case, this draft will be amended prior to final publication to include references to WCAG 2.0 where appropriate.

6.2 Authoring Tool Accessibility Guidelines (ATAG)

NOTE ATAG are the guidelines for authoring tool developers.

6.2.1 Web content developers using an authoring tool or content management system (CMS) to develop their web content should strive to use one that upholds ATAG.

6.2.2 Businesses and organizations should ensure that any web content authoring tool or CMS they procure upholds ATAG, so that the content it creates is accessible to disabled people.

6.2.3 Businesses and organizations should ensure that any web content authoring tool or CMS they procure upholds ATAG so that the tool is usable by disabled web content developers.

NOTE 1 W3C WAI has published a set of companion techniques to help software developers implement ATAG in their products: [<http://www.w3.org/TR/ATAG10-TECHS/>].

NOTE 2 W3C WAI has published a document to assist web content developers in procuring authoring tools that uphold ATAG: "Selecting and using authoring tools for web accessibility" [<http://www.w3.org/WAI/impl/software.html>].

NOTE 3 W3C WAI has published "Authoring Tool Accessibility Guidelines Overview" [<http://www.w3.org/WAI/intro/atag.php>].

6.3 User Agent Accessibility Guidelines (UAAG)

6.3.1 Web content developers should aim to develop web content that is usable and accessible on a reasonable range of web browsers and operating systems. For examples of current browsers see [http://www.bbc.co.uk/guidelines/newmedia/technical/browser_support.shtml].

6.3.2 Businesses and organizations should ensure that web content developers are aware of UAAG. Web content developers can promote the adoption of UAAG by software developers by designing web content that upholds WCAG

NOTE 1 User-agent (or functionality) detection scripts and work-arounds will usually be necessary so that a similar experience of the web content is provided for users of popular browsers that do not uphold W3C guidelines and specifications.

NOTE 2 It is not the responsibility of the business or organization to ensure that the browser used by the disabled person upholds UAAG.

NOTE 3 It is the responsibility of user agent developers to comply with UAAG.

NOTE 4 Browsers that do not uphold W3C guidelines and specifications might not interpret standards-compliant mark-up correctly.

NOTE 5 W3C WAI has published "User Agent Accessibility Guidelines Overview" [<http://www.w3.org/WAI/intro/uaag.php>].

7 Defining and implementing an accessibility policy for a business or organization

NOTE Example policy statements can be found in Annex F.

7.1 General

7.1.1 The business or organization should ensure that an accessibility policy is in place for its web site.

NOTE An accessibility statement (which is a summary of the accessibility policy) should be prominently displayed on the web site for the attention and benefit of disabled people (see **7.1.3**).

7.1.2 The accessibility policy should outline the accessibility targets that will be set and any measures that will be taken to broaden access to content that is not presently accessible to or usable by disabled people (see **7.2**).

7.1.3 The accessibility policy should be referenced in invitations to tender and contract documents and should contain requirements for contractors (i.e. web development agencies) undertaking the development and maintenance of the web content.

7.1.3.1 Such contractors (i.e. web development agencies) should be asked specifically to commit to helping the business or organization meet its accessibility policy and this should be reflected in all contracts.

7.2 Content of the accessibility policy

The accessibility policy should include:

- a) A description of the disabled user profiles to be consulted during the development of the web content (see Annex J for suggested user profiles).
- b) An explanation of the core tasks users should be able to achieve on the site (e.g. buy a book) and the criteria for determining success (see Annex G).
- c) A description of the process to be used for developing and maintaining content to meet the needs of these users, including:
 - 1) identifying user needs;
 - 2) developing the web content to meet those needs;
 - 3) measuring the performance of the web content in meeting those needs.
- d) Details of the accessibility level to be upheld.
- e) If an area or element of the web content is unlikely to be accessible to people with particular impairments, justification should be provided for:
 - 1) any repairs to be made to improve accessibility, along with a reasonable estimate of when the repairs will be made;
 - 2) how disabled people can access this content or functionality via alternative means.
- f) If neither e)1) nor e)2) are possible, an explanation of why it is considered reasonable for the area to remain inaccessible should be provided.

NOTE Attention is drawn to the Commission for Equality and Human Rights' (CEHR) "Code of Practice – Rights of Access: services to the public, public authority functions, private clubs and premises".

7.3 The accessibility statement

7.3.1 Businesses and organizations should publish an accessibility statement on their web site, ensuring that the accessibility statement itself is fully accessible to and usable by disabled people, even when other content on the site is not. An accessibility statement is a summary of the business or organization's accessibility policy.

7.3.2 The accessibility statement should include information on how disabled people can optimize the web content to suit their individual needs, e.g. how to change the screen colours and text sizes followed by an outline of the information covered in **7.2**.

NOTE Details of how to optimize the user experience of web content can be found at <http://www.bbc.co.uk/accessibility>. Organizations may consider linking to this site.

7.3.3 The accessibility statement may reference the W3C guidelines and specifications that the web content upholds. However, businesses and organizations should avoid the inclusion of technical terms and jargon in the accessibility statement, which should communicate using clear language directly to disabled people so that they understand its implications.

NOTE Where self-awarded logos are used, these are only to be displayed when the web content conforms to the standards indicated and conformance should be checked and maintained on a regular basis.

7.3.4 The accessibility statement should provide contact details (e.g. email, postal, telephone, textphone and Typetalk) for the benefit of disabled people who wish to request further information about the business or organization's more detailed accessibility policy and provision for disabled people to lodge suggestions, comments and complaints with the business or organization.

NOTE Advice on the provision of textphone facilities is provided by RNID (Royal National Institute for deaf People).

8 Involving disabled people in the planning, development and testing of a business' or organization's website

8.1 Gathering requirements from disabled users of a business' or organization's website

8.1.1 General

Businesses and organizations (or the web development agency contracted to undertake the work) should ensure that requirements are gathered from disabled people at the earliest stage and that the methods chosen accurately capture disabled users' particular requirements. Expertise should be sought to help to facilitate this.

NOTE The best method for gathering these requirements will depend on a number of factors, including how easy it is to recruit and elicit useful data from people with different disability profiles (see Annex J).

8.1.2 Disabled user recruitment

Businesses and organizations may contract a specialist recruitment agency to recruit users who exactly match the required criteria. This ensures the right user profiles are met while the randomness of the selection process provides added confidence in the results; however this service can be expensive and time consuming and will need to be repeated for each round of testing.

Businesses and organizations may convene a panel of users to work with on a regular basis. This is less expensive and quicker to set up. However, these users will eventually develop expertise in using web content in general, and how the web content to be tested works, making them less likely to experience the same usability problems as novice users.

8.2 Usability testing with disabled people

8.2.1 General

Businesses and organizations should test for accessibility to and usability by disabled people throughout the design lifecycle. The earlier accessibility problems are found, the easier and cheaper they are to fix. The key stages for testing are:

- **Requirements:** Learn what elements work and identify areas for improvement by running accessibility validations, disabled user evaluations or expert reviews of your existing site or competitor sites.
- **Design:** Evaluate early designs with disabled users using accessible prototypes; expert reviews of early designs can be conducted to identify potential problems.

NOTE Evaluating webpage templates before building the site is a much more effective way of ensuring that WCAG is being upheld.

- **Build:** Identify usability issues with disabled user tests; predict usability and accessibility problems with expert reviews; validate code against W3C guidelines and specifications and check using assistive technologies.
- **Maintenance:** New pages and changes to existing pages should be tested for usability by and accessibility to disabled people. Small changes, such as adding a new graphic, writing a new paragraph or changing a form should, as a minimum, be tested for conformance to WCAG. Large changes that affect important tasks within the interface, i.e. how a user logs onto a site or buys a product, should undergo disabled user testing.

8.2.2 Creating a test plan

8.2.2.1 Businesses and organizations should develop a test plan that will enable the accessibility targets to be achieved and their performance measured. For example, The test plan might state that to achieve the accessibility success criteria, early user evaluations may be needed to identify any design issues.

8.2.2.2 The accessibility test plan should clearly state:

- which accessibility testing methods will be used;
- how the method supports the accessibility targets;
- when during the project lifecycle the tests will take place;
- how the test results will be documented;
- how the test results should be interpreted.

8.2.3 Determining accessibility

8.2.3.1 General

Approaches for determining accessibility include:

- Automated testing to determine whether the web content upholds WCAG (see **8.3.3.2**).
- Validation testing of code to determine whether it upholds WCAG; tools include validators for HTML and style sheets (see **8.3.3.3**).
- Conformance inspection to manually review each webpage and determine whether it upholds WCAG (see **8.3.3.4**).

WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JANUARY 2009.

- Assistive technology tool testing to determine whether the web content can be accessed using the tools commonly used by disabled users (see **8.3.3.5**).
- Expert review on early designs and/or finished code to identify quality and consistency issues not typically identified during user testing (see **8.3.3.6**).
- User testing with a set of representative users attempting to achieve a set of representative tasks (see **8.3.3.7**).

8.2.3.2 Automated testing

Businesses and organizations and their web content developers should be aware of the capabilities and limitations of commercially available automated testing tools.

NOTE Although these tools check against a relatively small proportion of the WCAG guidelines, they can be useful for analysing a whole site and conducting periodic audits.

8.2.3.3 Validation

Businesses and organizations and their web content developers should ensure that they begin the evaluation and repair process by validating their mark-up against WCAG.

W3C's Mark-up Validation Service should be used [<http://validator.w3.org/>].

W3C CSS Validation Service should be used to evaluate the validity of any CSS [<http://jigsaw.w3.org/css-validator/>].

8.2.3.4 Conformance inspection

Conformance inspection is a systematic manual review of each webpage against WCAG which typically follows a validation test and involves reviewing each piece of content and control.

Conformance inspections provide a single method for determining whether web content upholds WCAG. However, they are time consuming and require an expert in accessibility, usability and web content code to perform the inspection to an acceptable standard.

Due to the amount of effort that is required to inspect a page, web content developers should consider an approach that involves inspecting a sample number of pages on the site. This sample should include pages with high usage or involve critical interactions such as form filling.

8.2.3.5 Testing with assistive technology

8.2.3.5.1 Testing with assistive technology checks whether assistive technologies can read and interact with web content and whether they can activate user interface controls.

If web content conforms to WCAG, assistive technologies that conform to UAAG should work with the site. Although it is not the responsibility of the web content developer to change their code to make an assistive technology work correctly they may wish to provide work-arounds if they exist.

8.2.3.5.2 Assistive technology tool tests can provide a relatively quick way for a tester with specialist knowledge of the tools to assess the web content's accessibility. However, these tests do not assess the usability of the interface; if an accessibility problem is found, it may not be obvious where the problem lies. In this case, a conformance inspection is the only way of testing compliance (see **8.3.3.4**).

NOTE There are assistive technology resources available for all budgets from free software available on the web through to professional consultants.

8.2.3.6 Expert review

8.2.3.6.1 Reviews can be conducted on early designs and finished code and can be relatively quick and inexpensive. They are useful for identifying quality and consistency issues not typically identified during user testing. However, they do not find the same type or number of problems as user testing; they can identify problems that real users would not experience; and the quality of the findings is directly related to the skill and experience of the experts.

There are a number of different types of structured review processes, including heuristic evaluation, where an interface is inspected against a set of heuristics or guidelines, and a cognitive walk-through, where evaluators step through a series of actions with a goal of completing a typical user task. Experts can use assistive technology in their evaluation.

NOTE Specialist training is required in the use of assistive technologies to make sure they are using the technologies in the appropriate way as a disabled person would.

8.2.3.7 User testing with disabled people

NOTE See Annex J for information on measuring success.

8.2.3.7.1 Why is user testing with disabled people necessary?

User testing with disabled people involves recruiting a set of representative users and asking them to attempt to use the web content to achieve a set of representative tasks. It provides the best evidence of the web content's accessibility as:

- people are unpredictable: how users interact with a web content is often different from the assumptions of web content developers; user testing often uncovers unexpected requirements;
- people are adaptable: designs that appear problematic may be usable in reality;
- web content developers become familiar with the features of their design solutions and frequently fail to notice problems that disabled users might experience;
- web content developers have different and sometimes conflicting goals to users; often user testing evidence is needed to qualify the relative merit of different design approaches;
- web content developers have computing skills, but may have limited knowledge of alternative computing environments; user testing provides real and often new insight into how different types of users access the web;
- business objectives can sometimes conflict with the accessibility of the web content e.g. third party delivered content such as advertising.

8.2.3.7.2 User testing methods

User testing should include users from a range of disabilities and preferences, including a mix of beginners and experienced web users using a range of assistive technologies or other strategies to access web content.

Web content developers should include user testing in any procurement and tender documentation and ensure that all user testing conforms to BS EN ISO 13407.

The expense of conducting user testing can mean that budgetary considerations only allow a very small sample; this can provide erroneous results which should be treated with due caution.

A number of ethical and practical issues should be taken into account before embarking on user testing with disabled people.

NOTE Both the Usability Professionals Association (UPA) (see <http://www.upassoc.org/>) and Market Research Society (see <http://www.mrs.org.uk/standards/guidelines.htm>) have Codes of Conduct covering how consultants and researchers should conduct themselves.

8.2.3.7.3 Budgetary considerations

8.2.3.7.3.1 Sample sizes

If more than one user experiences the same problem during testing, this provides stronger evidence that the problem will affect a significant number of users. Consideration should be given to the expense of larger sample sizes versus confidence in the results.

8.2.3.7.3.2 Using specialized evaluators

There are many specialized usability groups with trained evaluators who can run user tests following this rigorous method. This ensures confidence that the recommendations have been based on data derived from a proven method and trained observers can not only identify usability problems, but explain why users are having difficulties. However, such evaluations can be expensive and take time to set up.

A less expensive alternative is for an internal evaluator, who has not been involved in the design or development of the web content, to sit beside selected users as they attempt to use it. The evaluator should not simply show a web content to users and ask them what they think of it. They should ask users to perform given tasks to complete. They should observe whether they have any difficulties such as navigational issues, use of site search or system ambiguity.

NOTE 1 Although using an internal evaluator will be less expensive, the results may be less reliable because an untrained evaluator might not realize the underlying user problems, might attach more significance to a problem than there really is or allow personal opinions to get mixed into the results. It is also difficult to ensure that users feel at ease and confident to talk about the problems they are having with the interface. An untrained evaluator may inadvertently prevent the users from communicating problems they are experiencing.

NOTE 2 Although focus groups can be used effectively to gather requirements, they are inappropriate to use to identify usability errors. Usability tests require that representative users actually use an interface as they attempt to complete critical tasks. It is their success or failure to complete tasks which is the most important measure, rather than their subjective assessment of a design.

8.3 Review and maintenance

8.3.1 Businesses and organizations should ensure a regular programme of accessibility testing after the web content launch to maintain the desired level of accessibility, which should include the following.

- Benchmarking the site against the accessibility policy by running user evaluation or conformance inspections to identify accessibility problems.
- Running tests using access technology with new tools or new versions of tools.
- Testing the accessibility of new and changed pages.

WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JANUARY 2009.

- Enabling feedback to be provided by all users.

8.3.2 Businesses and organizations should ensure awareness of any new specifications, devices, technologies, user behaviour and expectations that would change accessibility requirements.

Annex A (normative)

Normative references

The following referenced documents are indispensable for the application of this document (for dated references, only the edition cited applies).

BS EN ISO 13407, Human-centred design processes for interactive systems

W3C guidelines and specifications available at <http://www.w3.org>, especially:

- WAI-WCAG;
- WAI-ARIA.

Annex B (normative)

Terms, definitions and abbreviations

For the purposes of this British Standard, the following terms and definitions apply.

B.1 access technology

hardware or software used to adapt or make computer systems and services accessible to a disabled person

NOTE 1 Examples include the provision of screenreaders and text-to-speech systems; screen-magnification software; tactile braille display, trackballs, touch pads/screens, etc.; alternatives to standard computer mice, keyboards, switches and speech recognition software.

NOTE 2 Also referred to as assistive technology, adaptive technology.

B.2 accessibility

ability of people with disabilities to perceive, understand, navigate, and interact with web content

B.3 Authoring Tool Accessibility Guidelines (ATAG)

Authoring Tool Accessibility Guidelines published by the W3C WAI

B.4 authoring tool

software that generates web content

B.5 automated conformance testing tools

software tools used, without direct human intervention, to assess whether authoring of a web content upholds guidelines and specifications

B.6 Cascading Style Sheets (CSS)

languages designed to specify what document elements look like, e.g. colours, borders, spacing, font style

NOTE 1 Also referred to as style sheets.

NOTE 2 Typically used to define what pages look like e.g. colours, borders, spacing, font style. Aural CSS enable web authors to define how their pages are read aloud by screenreaders that support them.

NOTE 3 Also referred to as content production system (CPS).

B.7 cognitive impairment

decline in mental functioning, ranging from mild impairment, such as lack of concentration, to extreme impairment including increased problems with distraction, exhaustion by tasks that require mental energy, or problems with handling complex information

NOTE In more extreme impairment, people may have difficulties with the sleep/wake cycle, changes in mood, or disorganized thinking and speech.

B.8 content management system (CMS)

software that is used to create, modify, delete and archive content

NOTE Typically a CMS is also used as a way of publishing content to a web content.

B.9 disability

<DDA> physical or mental impairment which has a substantial and long-term adverse effect on [a person's] ability to carry out normal day-to-day activities

NOTE The above definition is that included in the 1995 DDA and is the one that would be considered by a County or Sheriff's Court judge when ruling on a case of potential disability discrimination. See also impairment (B.12).

B.10 Flash

rich media programming format that allows web developers to add animation, multimedia and interactive applications to web content

NOTE 1 Flash™ content (.swf files) is viewed through a user agent plug-in called the Flash Player™.

NOTE 2 Flash™ file formats and authoring tools are proprietary.

B.11 heuristics

guidelines or rules that are used to guide the process of evaluation

B.12 impairment

physical, sensory or mental or cognitive impairment

NOTE 1 Physical impairments include motor impairments; sensory impairments affect the senses, such as sight and hearing; cognitive and mental impairments include learning disabilities and mental health problems.

NOTE 2 Physical, sensory or mental or cognitive impairments may be linked with a reduction in functionality or strength such as loss of vision.

NOTE 2 Some people might have a number of impairments.

NOTE 3 Impairments can differ in degree.

B.13 interoperability

the ability of software and hardware on different machines from different vendors to share data

B.14 learning disabilities

cognitive impairment affecting the way someone learns, communicates or does some everyday activities

NOTE A learning disability affects someone's intellectual and social development all their life.

B.15 mark-up

code used to structure, identify and format content on web content, e.g. HTML

B.16 organization

the DDA uses the term "service provider", however in BS 8878 the term "organization" is used to include the company, non-profit organization, government department, local council, public sector organization or academic institution.

B.17 plug-in

additional piece of software users need to download to enable them to view non-HTML content (such as PDF files, Flash or Java) in their browser

B.18 Portable Document Format (PDF)

file format for the distribution of content that retains the formatting and layout it was given at its creation and can be viewed on different computers and platforms via a specialized reader or via a browser plug-in (see **B.17**)

NOTE 1 A useful feature of PDF files is that they look exactly the same for all senders and receivers of document regardless of hardware or software used.

NOTE 2 PDF files are viewed through a plug-in.

NOTE 3 PDF is a proprietary but published specification. Documentation about PDF and accessibility can be found at <http://access.adobe.com>.

B.19 usability

extent to which a [web content] can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

[adapted from ISO 9241-11:1988, definition **3.2**]

B.20 user agent

software (including web browsers and plug-ins) that retrieves and renders internet content or services, including text, graphics, sounds, video

NOTE 1 Examples include media players (including Adobe Flash Player for Flash content) and other software that renders web content (including Adobe Acrobat Reader for PDF content).

NOTE 2 Access technology might sometimes be considered a user agent.

B.21 User Agent Accessibility Guidelines (UAAG)

User Agent Accessibility Guidelines published by the W3C WAI

NOTE The version of UAAG in use at the time of publication is 1.0.

B.22 W3C

see also World Wide Web Consortium (**B.29**)

B.23 W3C/WAI guidelines

accessibility guidelines (ATAG, WCAG and UAAG) published by the W3C WAI

B.24 W3C specifications

documents published by the W3C that define and describe all aspects of how to code different types of web mark-up

B.25 Web Accessibility Initiative (W3C WAI)

body of the W3C that, in coordination with organizations around the world, pursues accessibility of the web through five primary areas of work:

- technology
- guidelines
- tools
- education and outreach
- research and development.

B.26 Web Content Accessibility Guidelines (WCAG)

Web Content Accessibility Guidelines published by the W3C WAI

NOTE The version of WCAG in use at the time of publication is 1.0. See also 6.1.

B.27 webpage template

pre-defined generic page format that is used to create web pages

B.28 web content developer

individual or organization responsible for designing and building a web content or web content

B.29 World Wide Web Consortium (W3C)

international consortium of organizations that develops interoperable technologies (specifications, guidelines, software and tools) to lead the web to its full potential

Annex C (informative)

Business case

NOTE FOR DPC:

AbilityNet is currently preparing a business case for accessibility. It is anticipated that this will be completed during December. When the business case is available, a summary will be included in this annex along with a link to the full version on the AbilityNet web content.

Annex D (informative)

Allocation of responsibilities

The following is a checklist of activities (posed as questions) that might be applicable in larger organizations to support the development of an accessibility policy. These activities might relate to internal organizational processes including training and development programmes and staff awareness programmes.

Internal communications

- Board and Executive Workshops – have you informed the board of the issues to enable them to make a judgment on the Organizational Policy statements?
- Management Programme – Have you initiated a programme of events/information to inform your organization's managers of the implications of the Disability Discrimination Act (DDA) ?
- Staff Programme – have you initiated a programme of events/information to inform each individual in your organization of the personal implications for them of the law in relation to disabilities and/or difficulties like dyslexia, e.g. their right to a reasonable adjustment to their working practices, or the provision of auxiliary aids or services?

External marketing and communication

- Marketing and Communications – have you integrated accessibility into market segmentation and marketing communications development processes?
- Customer Needs – have you assessed the size, scope, nature, perceptions and needs of the different segments of the audience, including disabled users and the elderly?
- Customers/Community/Shareholders Awareness – do your stakeholders know where and how to access your marketing and communication in a way that meets their needs?
- Communication – do you provide alternative accessible communication e.g. electronic alternatives to paper based communication such as leaflets, guides and other small print documents?
- Web Communication Feedback – do you test your existing communication with panels?

Training

- On-going training –Do you have on-going training for all of your specialists and managers/supervisors so they are aware of legal developments, and the new tools and techniques available to support disabled and elderly people?

Procurement

- Procurement – have you integrated accessibility requirements into your procurement processes so that deliverables from your suppliers will be accessible?

HR

- Disability Equality Scheme – if you are a public body, have you taken steps to publish a Disability Equality Scheme and Action Plan by December 2006?

WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JANUARY 2009.

- HR recruitment and retention practices – do you have established practices that individuals are made aware of throughout their employment for declaring disabilities or difficulties in communication and use of the web?
- Individual support – do individuals have access to support e.g. coaching/hardware/software/quiet area to work?
- Employee Needs – do you include specific questions in your employee attitude surveys and hold panels to get feedback?

Annex E (informative)

DDA and the law

E.1 BS 8878: The Disability Discrimination Act 1995

The Disability Discrimination Act (DDA) makes the fair treatment of disabled people a legal requirement. If an organization's web content has poor accessibility or poor usability, that organization could be in breach of the DDA. That exposes the organization to a risk of being sued for unlawful discrimination.

E.2 The legislation

The DDA states: "It is unlawful for a provider of services to discriminate against a disabled person [...] in refusing to provide, or deliberately not providing, to the disabled person any service which he provides, or is prepared to provide, to members of the public".

It also makes clear that it is unlawful to discriminate in the standard of service provided to a disabled person or in the manner of its provision.

The DDA also states: "Where a provider of services has a practice, policy or procedure which makes it impossible or unreasonably difficult for disabled persons to make use of a service which he provides, or is prepared to provide, to other members of the public, it is his duty to take such steps as it is reasonable, in all the circumstances of the case, for him to have to take in order to change that practice, policy or procedure so that it no longer has that effect."

E.3 The DDA's application to web contents

The DDA includes "access to and use of information services" among a list of examples of services to which it applies. Information services will include web contents. Consequently, web contents must be accessible and usable to comply with the DDA.

E.4 The DDA's application to intranets

Other provisions of the DDA exist to protect disabled employees, as opposed to members of the public. If an organization has an intranet that provides information to help staff perform their normal duties, such as contact details or office forms and manuals, that intranet ought to be accessible to any disabled member of staff.

If the intranet is not accessible to a disabled member of staff and the information is not provided to that person in another format that is accessible, that person could argue before an employment tribunal that he or she has been discriminated against.

E.5 The DDA's application to software

The DDA is likely to cover some types of software and not others. It is likely to cover software provided as a download for installation and running on a user's computer; and it is likely to cover software that is hosted remotely and provided to users across the internet (an approach sometimes known as 'Software as a Service' or 'Cloud Computing'). When software is sold only on a tangible storage device, such as a CD, it is less likely that the DDA will apply.

The distinction may seem illogical but it derives from a small body of case law that has classed packaged software as 'goods' and bespoke software as a 'service'. Only a court can decide whether the DDA will apply in particular circumstances. There has

been no ruling on this point and in the absence of any other guidance, developers of software are safer to assume that the DDA does apply to software delivered digitally than to assume that it does not.

E.6 Who owes the duty

The DDA applies to a party concerned with the provision, in the UK, of services to the public or to a section of the public. That is likely to include the operator of a web content that targets a UK audience, though it is possible that more than one party will share responsibility. For example, if a travel firm uses a third party's booking engine on its web content and that booking engine is not accessible to disabled users then either or both parties could be challenged under the DDA.

A web developer may also carry responsibility, though it is a less likely target than its client. In theory, the Disability Discrimination Act could be used against a web developer if the developer "knowingly aids" its client to produce a site that is not accessible, perhaps by following client instructions to build a site in a way that is not accessible to disabled users.

The DDA states: "A person who knowingly aids another person to do an act made unlawful by this Act is to be treated for the purposes of this Act as himself doing the same kind of unlawful act."

E.7 To whom the duty is owed

The duty in the DDA that affects web contents is a duty owed to disabled people at large. It is unlikely that a court will weigh up the duty in relation to each individual disabled person who wants access to a web content. In contrast, the duty in the DDA that affects intranets is a duty owed to the individual disabled people with whom an employer has dealings. So an employer is required to consider the particular needs of any disabled member of staff.

E.8 Claims of compliance with the DDA

There is a misconception that conforming to a particular Level of WCAG will make a web content "DDA compliant". The DDA makes no reference to WCAG or any other web guidelines. Only a court can decide whether a particular web content complies with the DDA or not.

The key question for a court is likely to be whether disabled users can access and use the web content without unreasonable difficulty. Time, inconvenience and effort will be relevant factors in gauging whether there is unreasonable difficulty.

The best evidence of a compliant web content is likely to be evidence of successful user testing that involved disabled participants. Frequent testing and the involvement of participants with different disability profiles will strengthen that evidence.

Evidence that a web content conforms to WCAG Level A or higher will be useful but it is likely to be less influential before a court or tribunal than evidence of successful user testing.

Courts are unlikely to expect every organization to put every web content they control through regular testing by a range of participants. A court is likely to expect an investment in testing that is in proportion to the overall investment in a particular web content.

When a small business commissions a web content, a court may be satisfied by evidence of successful testing by one blind user. Research commissioned by the Disability Rights Commission (2004) suggests that blind users tend to experience more difficulties in using web contents than other impairment groups. A court is likely to expect more extensive testing by a large organization.

Organizations and developers ought to be pragmatic about testing. For example, if an organization or a developer is launching a site that copies the design of an existing site, it might not be necessary to test the new site to the same extent as the original.

E.9 When to make adjustments to web content

The DDA refers to the need for service providers to take "reasonable steps" to remove existing barriers to access. This duty came into force on 1 October 1999. If a web content was difficult to access or use at that date, changes were required. However, web contents launched after 1 October 1999 ought to have been accessible and usable when launched.

Accordingly, web content operators ought to not wait until a complaint is received before making a site accessible. A Code of Practice published in 2006 by the Disability Rights Commission states: "Service providers should not wait until a disabled person wants to use a service that they provide before they give consideration to their duty to make reasonable adjustments."

The Disability Rights Commission no longer exists but its work has been continued by the Equality and Human Rights Commission and the Code of Practice is still in force. If any provision of the Code appears to a tribunal or court to be relevant to any question arising in the proceedings, the DDA provides that the Code has to be taken into account.

The Code also states: "Failure to anticipate the need for an adjustment may render it too late to comply with the duty to make the adjustment."

It could be difficult to justify a delay in failing to make an existing web content accessible given that the relevant DDA provisions have been in force since 1999.

The duty to make reasonable adjustments is not one that ought to be considered once and then forgotten. The duty to make reasonable adjustments is a continuing one and what was originally a reasonable step might no longer be sufficient. Factors that will be relevant in determining whether adjustments are reasonable include the cost of adjustments to be made, the cost of any adjustments already made and the financial resources of the organization.

E.10 Providing access technologies on web content

The DDA says that a service provider must take reasonable steps to provide auxiliary aids or services if this would enable (or make it easier for) disabled people to make use of its services.

The most common approach to web accessibility to date has been to make a web content compatible with a user's preferred access technologies. However, web contents can also offer access technologies for all visitors. For example, a button on the web content might launch an audio player that converts that site's text into speech.

It is unlikely that there is currently a legal duty on web content operators to provide such technologies. The Disability Rights Commission's Code of Practice of 2006 gives examples of auxiliary aids that it may be appropriate to provide for people with a vision impairment. The examples include "accessible web contents" – which suggests a focus on making the site accessible with a user's access technology.

However, an organization ought to anticipate the needs of disabled people, and these can change as technology and best practices evolve. If there is demand for these technologies from disabled users generally or from a significant class of disabled users (such as children), the provision of access technologies could be a reasonable step under the DDA. At present there is no evidence of a general need for such technologies. It follows that web contents are unlikely to be breaching the DDA in failing to provide them.

E.11 Responsibility for user-generated content

It will generally be unrealistic to hold the operator of a web content liable for the accessibility of user-generated content.

For sites that deal with high volumes of user-generated content, it will be impossible to ensure the accessibility of each item of content without excessive cost or a fundamental change to the nature of the service. The DDA's duty to take reasonable steps does not require steps that would fundamentally alter the nature of the service or that would cause the operator to incur excessive expenditure. What constitutes "excessive" will depend on the size and resources of the organization concerned.

The DDA also allows less favourable treatment of disabled persons where such treatment is necessary because the provider of services would otherwise be unable to provide the service to other members of the public.

Sometimes it will be appropriate for an organization to make user-generated content accessible. For example, an organization might exercise editorial judgement to select and promote the 10 best user-generated videos from a collection of 10,000. Captioning 10,000 videos is likely to be prohibitively expensive; but it is likely to be reasonable to expect the organization to caption 10 videos.

Web content operators ought to encourage users to follow good accessibility practices when submitting content. For example, a photograph or video-sharing web content could offer the tools to add captions (not just tags) to content.

Where an organization uploads content to a third party web content to make that content publicly available, that organization could be held responsible for making its contribution accessible. Individuals do not share this responsibility when they upload content.

Annex F (informative)

How disabled people experience web content

F.1 General

F.1.1 Introduction

Some disabled people are able to enjoy the full web experience despite their impairments without any additional assistance or accommodation. Other disabled people need to change some of the settings of their operating system or browser in order to access and use web content, read the screen, others can only read access and use the web content with the aid of access technology.

Other people rely more heavily on the ability to alter font sizes and colours to suit their individual needs.

F.1.2 Web developers

Web developers should familiarize themselves with the different access technologies and strategies that disabled people might use to access and use content and should develop an understanding of the diverse access needs of people with different, complex and combined impairments.

NOTE Further information is available from My Web, My Way (<http://www.bbc.co.uk/accessibility/>), AbilityNet (<http://www.abilitynet.org.uk/>) and the W3C guidance on “How people with disabilities use the web” ([http://www.w3.org/WAI/EO/drafts/PWD Use Web/](http://www.w3.org/WAI/EO/drafts/PWD%20Use%20Web/)).

F.1.3 Web project managers

Web project managers should ensure that accessibility is integrated into the project lifecycle. They should be aware that disabled people have a broad range of user profiles (see Annex H for guidance on user profiles).

NOTE 1 It is the responsibility of the disabled user or their purchasing agent (e.g. their employer) to ensure that any assistive technologies or techniques they choose to use uphold W3C User Agent Accessibility Guidelines (UAAG) guidelines and specifications.

NOTE 2 W3C WAI has published a list of alternative browsing methods. The document is called “Alternative web browsing” [<http://www.w3.org/WAI/References/Browsing/>].

NOTE 3 Attention is drawn to the W3C draft document “How People with Disabilities Use the Web” found at <http://www.w3.org/WAI/EO/Drafts/PWD-Use-Web>.

F.1.4 Changing operating system and browser settings

Some of the disabled people who experience mild to moderate impairments do not use assistive technologies to access web content. Instead they can benefit from accessibility features within the operating system they are using, e.g. they might alter screen colours and text sizes, control the size of the mouse pointer or control the flash rate of the cursor by making use of accessibility features within their operating system or browser.

For many disabled people, the ability to choose screen colours and font sizes by changing their browser settings is crucial. Most browsers allow the user to change how web content appears in this way.

The BBC and disability and technology charity AbilityNet, have produced a website to inform disabled people of changes they can make to their operating system to optimize accessibility: [<http://www.bbc.co.uk/accessibility/>].

NOTE 1 Microsoft™ publishes detailed information on changes that can be made to the Windows™ operating system: [<http://www.microsoft.com/enable/>].

NOTE 2 Apple™ publishes detailed information on changes that can be made to the Mac OS™: [<http://www.apple.com/accessibility/>].

NOTE 3 Detailed information on changes that can be made to Linux™ can be found at: [<http://lars.atrc.utoronto.ca/>] [<http://accessibility.kde.org/>] [<http://developer.gnome.org/projects/gap/>].

F.2 Disabled people: needs and technologies

NOTE The following subclauses contain examples of the needs and technologies used by disabled people.

F.2.1 Disabled people can have more than one condition and more than one impairment

It is important to understand that many disabled people have more than one impairment.

For example, these scenarios could all relate to one person.

- a) “I have severe dyslexia. I need text read out to me, especially when I am filling in forms online so I can check that the information I have put in is correct.”
- b) “I have visual stress and have difficulty reading web pages as they can look to me like ‘rivers of text’. Good contrast between background and foreground colours improves the legibility of text by 50% for me.”
- c) “I have ADHD (Attention Deficit Hyperactivity Disorder). I am easily distracted by pictures, moving images and diagrams. Clear, uncluttered pages of information help me to concentrate.”
- d) “My eyesight is deteriorating. I need to wear my reading glasses and to have bigger text size to comfortably see the content on the screen. My co-ordination is not what it used to be and the mouse can sometimes be awkward to use.”

F.2.2 Blind and partially sighted people

F.2.2.1 Needs

The needs of blind and partially sighted people differ according to the level and nature of their visual impairment.

- Colour blindness. Many colour blind people cannot read certain colour combinations that provide low levels of contrast. For this reason, colour should never be used as the sole means of conveying information.
- Mild partial sight or no visual impairment. Everyone benefits when information displayed with good colour contrast, and using resizable fonts.
- Moderate partial sight. Many partially sighted people benefit when information is organized logically and without too much moving content.
- Severe partial sight. Many people with severe partial sight access web content with the aid of assistive software know as ‘screenreaders’ that voice the content of the screen out loud. Such software is dependent on WCAG-conformant code to be perceived correctly.

Non-textual information that is represented in non verbal ways, such as actions on a video, should be made accessible through audio description, which describes non-

verbal actions in the video or on the screen, the perception of which is crucial to understanding the content.

F.2.2.2 Technology

Blind and partially sighted people might use any of a number of different techniques to help them access and use web content.

- Customizing browser or operating system settings to increase the size of the text and/or increase the contrast of colours.
- Screen magnification software to magnify the view of the whole web page.
- Screenreader software to read the web content aloud through computer speakers or a headset, or into dynamic braille output.

F.2.2.3 Scenario

Calum, despite limited vision, uses a computer very effectively, relying on speech output (via a screenreader) to access and use the full range of applications including email and the web. He finds technology increasingly powerful in terms of accessing information and services. He often wants to access multimedia online but finds the lack of audio description frustrating as he can tell that he is not able to access all of the content on the screen.

F.2.3 Deaf and hard of hearing people

F.2.3.1 Needs

There are many causes of hearing loss and deaf and hard of hearing people have many different user profiles.

- The most prominent cause of hearing loss is age. The ageing process can cause other impairments including sight loss and decreased dexterity; it can also affect cognitive abilities.
- Hearing loss can also be a result of over-exposure to loud noise, or may be caused by head injuries, genetic defects and other medical conditions.

Most people with hearing loss use written English and often also spoken English to read and communicate. A smaller group of deaf people, often including those who have been profoundly deaf since birth, use sign language to communicate. The most commonly used sign language in the UK is British Sign Language (BSL). As BSL has a different syntax and grammar to English, BSL users can find information in written English hard to understand.

F.2.3.2 Technology

A number of different technologies can be used to enable deaf and hard of hearing people to access web content.

- Many deaf and hard of hearing people use technologies such as email, instant messaging and real-time text to communicate over the Internet.
- Most people with hearing loss benefit from captions or subtitles for audio-visual content but they should be easy to read with good contrast.
- Many people with hearing loss continue to use audio in whole or in part and thus benefit from good aural contrast between foreground and background sound.

- Textphone numbers do not follow the same convention as telephone numbers. Web developers should bear this in mind when creating form fields for telephone contact information.
- Subtitles or captions are preferable to transcripts, as transcripts (which usually only contain the words spoken in an audio file or sound transmission) cannot always provide the full richness of content such as a radio broadcast.
- Sign language users benefit from information in sign language which could be provided alongside spoken or written content in the form of video clips of sign language presenters/interpreters, or via avatars (animated characters which sign).

F.2.3.3 Scenario

Clare, who is deaf, says that the web has opened up another way for her to communicate. She can book holidays online, talk to friends via chat rooms and access a wealth of information she had not been able to access before. But she finds it very frustrating when there are no subtitles on video clips or when she cannot leave her textphone number as a contact detail.

F.2.4 People with learning disabilities

F.2.4.1 Needs

People with learning disabilities have differing needs according to the level or type of their learning disability, their personal preferences for how they like to access information or depending on any other disabilities they might have.

- Many of people with learning disabilities, particularly those with complex needs, use web content with support from other people. However, many people with learning disabilities use web content alone and benefit from information being presented in specific ways.
- Many people with learning disabilities benefit from clear and easy language.
- Clutter or too many options on a page can render the content inaccessible to many people with learning disabilities.
- Video and audio content can be easier for many people with learning disabilities to understand if it is displayed in accessible ways.

F.2.4.2 Technology

A number of different assistive technologies and strategies can be used to enable people with learning disabilities to access web content.

- People with more complex learning disabilities, for example people with an additional physical disability, may use assistive technology to access and use web content. Examples of assistive technologies include switches, head wands or mouth sticks, larger keyboards and mouse alternatives such as joysticks.
- Some people with learning disabilities benefit from having information displayed in more manageable pieces, with consistent navigation, the ability to control colour and text size, images in place of text and a combination of mutually-supporting images and text.
- People with learning disabilities may find video and audio easier to access and use when keyboard access, symbols, captions or transcription are additionally available.

- Many people with learning disabilities have a secondary impairment and choose to use technology specific to that need rather than technology specific to their learning disability.
- Text-to-speech software, which reads web content aloud, and symbolizing software, which converts text into a simple pictogram language, can help people with learning disabilities to access and use web content.
- Some people with learning difficulties benefit from information displayed using signs indicated by a presenter or interpreter.

Many people with disabilities do not use assistive technologies. This may be because their disability is not severe enough to benefit from assistive technology support; it may be because they are not aware of the availability of assistive technologies that might help them access web content; or it may be that they choose not to use assistive technologies. It is therefore crucial that all web content and options for interaction are clear and easy to find and use.

NOTE 1 See also, Inclusive New Media Design:

<http://www.inclusivenewmedia.org/about-accessibility/good-id-accessible-design.xhtml>

F.2.4.3 Scenario

Jane has a learning disability, is deaf and is partially sighted. It is important that she can control how content appears on the screen so she can access the content she wants to. When options to change the way content is displayed are not made clear to her she often misses out on information. She relies on consistency of layout.

F.2.5 People with cognitive impairments

F.2.5.1 Needs

The needs of people with cognitive impairments are diverse and the ways in which people perceive web content can vary depending on the nature of their condition (people with conditions including multiple sclerosis, dyslexia, strokes and head injuries may all experience cognitive impairments such as difficulty concentrating, fatigue, confusion and short-term memory loss)

- Complex navigation, content with a higher than average reading age, complicated layout and movement can all cause accessibility and usability difficulties for people with cognitive impairments.
- People with cognitive impairments benefit from clear layout, images that support text and the option to change how the page is displayed, e.g. the ability to change the background colour or text size.

In any interaction that moves to user on from one screen to another (such as filling in an online form) it is important that a person with cognitive impairments can go back and forth between screens if necessary.

F.2.5.2 Technology

People with cognitive impairments might use a number of different technologies and techniques to help them to access and use web content.

- Many people with cognitive impairments use assistive software that reads the web content aloud to them and highlights the text as it is read.

- Some people with cognitive impairments will wish to change their browser settings or operating system settings to customize the appearance of web content.

F.2.5.3 Scenario

Margo has multiple sclerosis. On a particular day she might have difficulty concentrating. If web content is not displayed in a consistent and logical manner throughout the site, Margo might take longer to find the information she needs.

F.2.6 People with physical impairments

F.2.6.1 Needs

People with conditions such as repetitive strain injury (RSI), cerebral palsy or who are quadriplegic due to a condition or accident may use alternative ways to access and use web content. For many people, impairments caused by accidents and illnesses are only temporary.

- Web content should be usable by people who cannot operate a computer mouse or touch pad.
- Devices such as mobile phones can be inoperable by people who have difficulty using their fingers and hands.
- Some web features such as forms, drop down menus, navigation and multimedia can cause particular difficulties for people with physical impairments.

F.2.6.2 Technology

A number of technologies are available to assist people with physical impairments to access and use web content.

- Many people with physical impairments use devices and strategies such as keyboards-only access, alternatives to the standard computer mouse (such as head pointing devices and switches), speech recognition software or eye tracking software to access and use web content.
- People with physical impairments will often use a combination of devices and strategies (for example, someone with RSI might use a combination of technologies, such as keyboard but no mouse and speech recognition software).

F.2.6.3 Scenario

David is paralysed from the neck down and ventilated. He uses a headset and an on-screen keyboard to use his computer. The computer and the web are his primary communication tools which enable him to access news and sport information. He also uses the web to interact with his local community through message boards and email.

Annex G (informative)

Measuring user success

G.1 Key performance indicators

Tasks will depend on the aims of the web content, but examples might include:

- a) Find out how to contact the organization via email, phone or letter (for any site)
- b) Find out what services are available on the site (e.g. a sitemap, for any site)
- c) Find out a commonly searched-for bit of information (for information sites)
- d) Buy a product in a reasonable length of time (for an e-Commerce site)
- e) Successfully learn the thing you went to the site for (for learning/education sites).

G.2 Criteria for measuring success

Criteria for determining success include:

- a) Effectiveness:
 - How often can disabled users complete each task? (task completion rate)
 - How well can they complete each task? (degree of completion, error rates)
- b) Efficiency:
 - How much effort does it take to complete each task? (number of keystrokes/clicks, time taken, pauses)
- c) Satisfaction:
 - What is an appropriate experience? (different for education, banking, entertainment, buying products)
 - Does the experience fit with your brand values?
 - Perceived efficiency.
 - Perceived effectiveness.

Annex H (informative)

Contracting web design and auditing services

H.1 Choosing a web content developer

H.1.1 It is not possible to provide a definitive specification for a fully accessible web content which will satisfy the requirements of the DDA. Therefore organizations ought to be sceptical if contracting companies declare that they will create web content that are “DDA-compliant” or “compliant with the law”. Conversely, organizations cannot require a web designer to design a web content that is “DDA-compliant” or “compliant with the law”.

H.1.2 There is currently no nationally recognized system of accreditation for web content developers who claim to create accessible web content that uphold W3C guidelines and specifications. Web content commissioners can therefore perform their own reference checks until they are satisfied that the web content development contractor has competence and experience in developing accessible web contents that uphold W3C guidelines and specifications.

H.1.3 Checks might include:

- a review of previous work;
- references from previous clients;
- a practical knowledge of BS 8878;
- a practical knowledge of W3C guidelines and specifications;
- an appreciation of the implications of “The Disability Rights Commission Code of Practice: Rights of Access: services to the public, public authority functions, private clubs and premises” (see http://www.equalityhumanrights.com/Documents/Disability/Services/Access_code.pdf);
- familiarity with access technologies.

H.2 Agencies providing web accessibility consultancy

There is currently no accreditation board for web accessibility consultancy services in the UK and no harmony between web accessibility consultants.

Web content commissioners can refer to the guidance in **9.1** when commissioning accessibility consultants.

H.3 Contracting usability testing services

H.3.1 Questions for suppliers might include the following.

- Which usability testing techniques are appropriate for this project, e.g. interviews, surveys, focus groups, expert reviews and testing with real users?
- What standards are followed and what measurements will be taken?
- Can the supplier work to recognized ISO standards?
- What type of users will be included in supplier testing?
- Will helpful and accurate answers be generated?
- How usable will the deliverables be?

- Can the deliverables be tailored to meet needs?
- Do the deliverables contain analysis, illustrations, raw data, and recommendations?
- Are the deliverables easy to digest: are findings prioritized and grouped meaningfully?
- Can the supplier provide support in the understanding and uptake of findings?

H.3.2 Criteria for assessing responses might include the following.

- Can the supplier discuss the relative benefits of a range of methods?
- Can the supplier give examples of previous successes of different methods?
- Can the supplier distinguish between different types of real-user testing and advise accordingly?
- Does the supplier offer a range of expert review options?
- Can the supplier discuss the appropriateness of measurements and standards?
- Does the supplier use meaningful and actionable measurements?
- Can the supplier discuss the limitations of measurements in terms of statistical significance?
- Can the supplier provide screening documents for user recruitment, and justify their inclusions?
- Does the supplier understand the importance of sample size, in relation to needs?
- Does the supplier focus on demonstrated problems and not users' feelings?
- Does the supplier use closed questions or lead users?
- Does the supplier use meaningful scenarios to test the web content?
- Can the supplier work to technical and commercial constraints, where appropriate?
- Can the supplier suggest actionable solutions, not just state problems?

Annex I (informative)

Example policy statements

I.1 Example Organizational Web Accessibility Policy

“<Organization Name> is committed to ensuring that all company web contents, intranets and online applications are accessible to everyone. People access the web in many different ways and <Organization Name> supports inclusion for all, regardless of disability, capability or technology.

To support this policy, a suite of additional policies have been created. This policy framework aims to provide information most relevant to different areas of the organization. Policies within the framework include:

- <Insert Policy>;
- <Insert Policy>.

Policy Intention

The intention of this policy is to identify clear accessibility principles that all <Organization Name> web contents should follow. For the purpose of this policy, the term “web content” includes:

- All external web contents, including extranets;
- All internal web contents, including intranets;
- All online applications.

Policy Principles

The principles of this policy form a set of requirements that <Organization Name> will uphold. The principles should be fulfilled according to the policy timetable.

- To meet responsibilities under UK law, including the Disability Discrimination Act (1995/2005);
- To meet current industry guidelines for accessibility, such as the Web Content Accessibility Guidelines (WCAG) from the World Wide Web Consortium (W3C);
- To meet the needs of internal and external stakeholders, providing an inclusive online experience;
- To respond appropriately to feedback from internal and external stakeholders.

Policy Timetable

A clear timetable for meeting the principles of the policy has been defined. The timetable reflects the need for a multi-faceted approach.

- For all future web contents, created after <Insert Date>, the policy will be effective immediately;
- For all existing web contents, a programme of introduction will be put in place for the policy.”

I.2 Example Public Web Accessibility Statement

“<Organization Name> is committed to providing a web content that is accessible to the widest possible audience, regardless of disability, capability or technology.

We are actively working to increase the accessibility and usability of our web content and in doing so adhere to many of the available standards and guidelines.

Guidelines and Standards

This web content endeavours to conform to level Double-A of the World Wide Web Consortium (W3C) Web Content Accessibility Guidelines 1.0.

These guidelines explain how to make web content more accessible for people with disabilities. Conformance with these guidelines will help make the web more user friendly for all people.

This site has been built using code compliant with W3C standards for HTML, CSS and SVG. The site displays correctly in current browsers and using standards compliant code means any future browsers should also display it correctly.

This web content also uses Flash and Portable Document Format (PDF) to present information. In each case, every effort has been made to ensure people can access content easily. JavaScript is also used throughout the web content, but care has been taken to ensure that the site still functions completely for people without JavaScript enabled in their browser.

Exceptions

Whilst <Organization Name> strives to adhere to the accepted guidelines and standards for accessibility and usability, it is not always possible to do so in all areas of the web content. The following areas may be difficult for some people to use:

- <Insert Area 1>;
- <Insert Area 2>.

Contacting Us

We are continually seeking out solutions that will bring all areas of the site up to the same level of overall accessibility. In the meantime should you experience any difficulty in accessing this web content, please don't hesitate to <contact us>."

I.3 Example Accessibility Help Page

"<Organization Name> is committed to providing a web content that is accessible to the widest possible audience, regardless of disability, capability or technology. Our web content has been designed to be used with a screen reader, screen magnifier or other access technology.

The web content can be viewed on a range of different screen sizes and the size of text can be changed to suit different people. We have also included a search facility, sitemap and glossary, to help people find information more easily.

Changing Settings

Using your browser, you can change the size of text on this web content. You can also make other helpful changes in your browser, as well as within your computer generally. To find out what else you can do, visit My Web, My Way (<http://www.bbc.co.uk/accessibility/>).

Web content Tools

This web content also provides some additional tools to help you make the most of your time on the web content. A style switcher is available on every page. It allows

WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JANUARY 2009.

you to change the basic layout, colour contrast and text size of the web content, all in one go. It is also possible to listen to this web content being spoken aloud. We have enabled <Insert Technology Name>, so people can choose to listen rather than read information on the site.

Contacting Us

We are always looking for ways to help people get the most enjoyment out of this web content. If there is information you think should be included on this page, or if you are experiencing difficulties with the web content, please don't hesitate to contact us."

Annex J (informative)

Suggested user profiles

J.1 Vision impairment

Users with severe vision impairment, e.g. users of screen reader software.

Users with moderate vision impairment, e.g. users of magnification software.

Users with mild vision impairment, e.g. users who might enlarge text in the browser with high contrast and use Windows' colour preferences.

NOTE Because there are three main types of colour blindness it is unlikely that all problems would arise in user testing.

J.2 Mobility

Users with severe motor difficulties, e.g. users with Motor Neurone disease who might use switch access and an on-screen keyboard to interact with a computer.

Users with severe motor difficulties, e.g. users who are quadriplegic who might use speech recognition software.

Users with moderate motor difficulties or upper limb disorder, e.g. users who might only use a keyboard, a mouse being too difficult to use.

Users with mild motor difficulties, e.g. users who might use a mouse or equivalent access technology but who might have fine mouse control difficulties.

J.3 Cognitive and learning

Users with moderate dyslexia, e.g. users who might change site colours and text formatting, and who in many cases might supplement this with text to speech software for reading sections of text.

Users with mild to moderate learning or cognitive disabilities, e.g. users who might rely upon another person to assist them.

J.4 Deaf and hard of hearing

British Sign Language (BSL) users are especially relevant if there is multimedia content on the site or language issues.

Non-BSL deaf or hard of hearing users.

Bibliography

Standards publications

ISO 9241-11:1998 Ergonomic requirements for office work with visual display terminals (VDTs) – Part 11: Guidance on usability.

ISO 16071:2003 Guidance on accessibility for human-computer interfaces.

“Guidelines for standards developers to address the needs of older persons and persons with disabilities” – CEN/CENELEC Guide 6 – Edition 1 published January 2002.

Other publications

- [1] GREAT BRITAIN. The Disability Discrimination Act 1995. London: The Stationery Office.
- [2] Family Resources Survey 2003/04. London: Analytical Services Division, Department for Work and Pensions 2005.
- [3] Disability Rights Commission. The Web: access and inclusion for disabled people (2004). London: DRC ¹⁾.
- [4] CEHR. Code of Practice – Rights of Access: services to the public, public authority functions, private clubs and premises, The Stationery Office Bookshop.

Useful web contents

AbilityNet <http://www.abilitynet.org.uk/>

[http://www.adobe.com/Adobe Accessibility Resource Centre](http://www.adobe.com/Adobe%20Accessibility%20Resource%20Centre)

<http://www.adobe.com/accessibility/Becta> (British Educational Communications and Technology Agency) <http://www.becta.org.uk>

How people with disabilities use the web

<http://www.w3.org/WAI/EO/drafts/PWD-Use-Web/>

IBM Human Ability and Accessibility Center <http://www.ibm.com/able/>

Microsoft Accessibility [http://www.microsoft.com/ENABLE/Royal National Institute of the Blind \(RNIB\)](http://www.microsoft.com/ENABLE/Royal%20National%20Institute%20of%20the%20Blind) <http://www.rnib.org.uk/>

TechDis <http://www.techdis.ac.uk/index.php?p=9>

Usability Professionals Association (UPA) <http://www.ukupa.org.uk>

Useit.com <http://www.useit.com/>

W3C Web Accessibility Initiative (W3C WAI) <http://www.w3.org/wai/>

Web Standards Project (WaSP) <http://webstandards.org/>

World Wide Web Consortium (W3C) <http://www.w3.org/>

¹⁾ Available from CEHR (<http://www.equalityhumanrights.com>).

Further information

Am I making myself clear – Mencap's guide to accessible writing, 2002. London, UK, Mencap [http://www.mencap.org.uk/download/making_myself_clear.pdf].

Braun, K., Gadney, M., Haughey, M., Roselli, A., Synstelien, D., Walter, T., Wertheimer, D. (2002) Usability: the site speaks for itself. Birmingham, UK: Glasshaus.

British Bankers Association Accessible e-banking: making your online service accessible to all (2001). London, UK: BBA.

Gybels, Guido (2004) Deaf and Hard of hearing users and Web accessibility. London, UK, RNID [www.ictrnid.org.uk/docs/webacc.pdf].

Howell, J. (2000) Get the message online: making websites accessible to blind and partially sighted people. London, UK: RNIB.

Keates, S. and Clarkson, J. (2003) Countering design exclusion: an introduction to inclusive design. London, UK: Springer.

Keates, S., Clarkson, J., Langdon, P. and Robinson, P. (Eds) (2004) Designing a more inclusive world. London, UK: Springer.

Krug, S. (2000) Don't make me think! A common sense approach to web usability. Indianapolis, Indiana, USA: New Riders.

MCCAWS What Every Web Site Owner Should Know About Standards: A Web Standards Primer <http://www.maccaws.org/kit/primer/>.

Nielsen, J. and Tahir, M. (2001) Homepage usability: 50 websites deconstructed. Indianapolis, Indiana, USA: New Riders.

Nielsen, J. (2000) Designing web usability. Indianapolis, Indiana, USA: New Riders.

Paciello, M.G. (2000) Web accessibility for people with disabilities. Lawrence, Kansas, USA: CMP Books.

Pernice Coyne, K. and Nielsen, J. (2001) How to conduct usability evaluations for accessibility: methodology guidelines for testing websites and intranets with users who use assistive technology. Fremont, California, USA: Nielsen Norman Group.

Spool, J., Scanlon, T., Schroeder, W., Snyder, C. and DeAngelo, T. (1999) Web site usability: a developer's guide. San Francisco, California, USA: Morgan Kaufmann.

Web Accessibility: Web Standards and Regulatory Compliance (2006) by Jim Thatcher, Michael R. Burks, Christian Heilmann, Shawn Lawton Henry, Andrew Kirkpatrick, Patrick H. Lauke, Bruce Lawson, Bob Regan, Richard Rutter, Mark Urban, Cynthia D. Waddell, Birmingham, UK: friends of ED Velleman, E. and Snetselaar, H. (2000) Site seeing: the development of an accessible website or web-based multimedia product. Zeist, Netherlands: Bartimeus.

Zeldman, J. (2003) Designing with web standards. Indianapolis, Indiana, USA: New Riders.

Further sources of independent information and advice

Abilitynet: provides free information and advice, individual assessment of technology needs, the supply of access technology with free support, a programme of awareness education, and consultancy for employers on system and workstation adaptations. [<http://www.abilitynet.org.uk/>].

British Dyslexia Association: Aims to influence government and other institutions to promote a dyslexia friendly society. [<http://www.bda-dyslexia.org.uk/>].

Commission for Equality and Human Rights (CEHR): From 1 October 2007, the Equality and Human Rights Commission took over the role and functions of the Commission for Racial Equality (CRE), the Disability Rights Commission (DRC) and the Equal Opportunities Commission (EOC), with new responsibilities for sexual orientation, age, religion and belief, and human rights. . [<http://www.equalityhumanrights.com/>].

Mencap: The UK's leading learning disability charity. [<http://www.mencap.org.uk/>].

Royal National Institute of the Blind (RNIB): the UK's leading charity offering information, support and advice to over two million people with sight problems. [<http://www.rnib.org.uk/>].

Royal National Institute for Deaf People (RNID): the largest charity representing the nine million deaf and hard of hearing people in the UK. [<http://www.rnid.org.uk/>].

Scope: A disability organization in England and Wales whose focus is people with cerebral palsy. [<http://www.scope.org.uk/>].