Accessibility: it's not just about visual impairment

When we think about accessibility within technology, the term "accessible" is often assumed to mean forms of assistive tools and techniques for users who are visually impaired, or more specifically, blind.

Whilst blind and partially-sighted users do make up the largest proportion of computer users with a disability, other types of impairment are frequently overlooked when considering accessible design, e.g. deafness, language and cognitive impairment, mobility impairments, as well as other forms of visual impairment such as colour blindness.

The Disability Discrimination Act of 1995 makes it unlawful for service providers to treat users less favourably because of a disability. It's also unlawful to refuse to make reasonable adjustments to a service that will maximise accessibility for all users; companies can be sued under the DDA for failing to comply with accessibility guidelines.

Some important facts to remember when considering accessibility of your service or website:

- There are approximately 8.6 million disabled people in the UK covered by the Disability Discrimination Act (around 15% of the population)
- By 2010, 40% of the UK's population will be over 45 - the age at which the incidence of disability begins to increase significantly
- Users with disabilities have an estimated annual purchasing power of around £40-£50 billion

Deafness and hearing impairment
As the internet evolves, bandwidth increases and websites become more media-rich, many sites are increasing their video and audio content. In particular, news websites, social networking sites such as Youtube, Myspace and many others have become much more reliant on video content.

Unfortunately, despite the tools being readily available, the majority of video content on the web is not captioned. The important points to remember when trying to ensure your content caters for audiences with degrees of hearing loss are:

- Ensure that important content is not conveyed purely through audio
- Provide transcripts for all audio content
- Consider providing captioning for video clips

Motor skills
Motor skills and mobility impairments include everything from rheumatism to tendonitis, tennis elbow to cerebral palsy. Approximately 3.8 million people in the UK have some form of arm or hand problem which causes restricted or impaired computer use.

Mobility-impaired users have a range of technologies available to help improve accessibility:

Mouth sticks/head wands
The simplest assistive devices for mobility-impaired users. Simply a stick either held in the user's mouth or strapped to the head that can be used to make physical contact with the keyboard or trackball. Inexpensive and readily available but can be tiring to use for long periods.

Single-switch access
For users with extremely limited mobility, these switches have a simple on/off state that's used in conjunction with custom software to interpret the user's clicks enabling them to navigate programs, websites, type documents via predictive text features etc. They can also be connected to Environmental Control Units which can allow the user to turn lights on/off, access a telephone etc.

Sip and puff switch
Similar in principle to single-switches, a flexible mouth-piece attaches to a headset which fits over the ears and doesn't require a power source to use. These switches then convert the user's breath input into an on/off signal which again can be set to control programs, browsers, word processors, Environmental Control Units etc.

Trackball mouse
Trackballs can be used in conjunction with a mouth stick or head wand as they are easier to operate in this manner than a standard mouse. Users who have limited hand control can also learn to use them with their feet.

Voice recognition software
Many mobility-impaired users adopt the use of voice recognition software, such as Dragon NaturallySpeaking which can be used for a wide range of tasks from internet use to word processing. Initial calibration used to be a lengthy process but this has now been much improved.

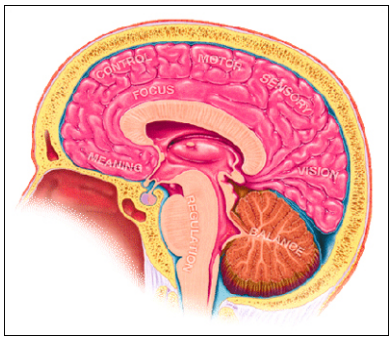
Eye tracking
Another device suitable for users with severely limited or no hand control. By following eye movement and blinking, the device can allow the user to navigate programs and websites, word process and even play games. They are the more expensive of mobility-impaired tools but prices are dropping and currently start at around several thousand pounds.

The important thing to keep in mind for mobility-impaired users is that most assistive technology in this area either works through the keyboard or emulates the keyboard, so simple keyboard shortcuts are most effective.

Generally, if a website or software performs well for visually-impaired users, it's more likely to work well for mobility-impaired users as the two groups share a common need for quick and simple navigation. Some things to keep in mind when designing for mobility-impaired users:

- Keep the number of page elements down to a minimum
- Links should be easy to find
- A clearly laid out sitemap is essential
- Give the user the ability to skip less important content and long lists
- Allowing the user to resize a page can make clickable areas bigger, useful for pointing devices which are less accurate

Cognitive impairment



Cognitive impairments cover a wide range of clinical and functional disabilities including Down's Syndrome, autism, dementia, aphasia, attention deficit disorder, language impairment, dyslexia etc. The problems faced by users with these impairments are not always as cut and dried as those faced by, for example, deaf users who cannot hear the audio content; the impairment is not necessarily obvious.

For example, dyslexia can broadly be defined as a problem with literacy skills (i.e. reading, writing and spelling) although it's now widely accepted that dyslexia can also affect other skills, such as concentration, organisation, sequencing, orientation, short-term memory etc.

10% of people have some measurable degree of dyslexia. In the US, researchers estimate dyslexia occurs in around 5-9% of school-aged children, though some have put the figure as high as 17%.

Things to keep in mind for users with cognitive and language impairments:

- Keep text short and simple where possible
- Don’t present too much information on one page
- Avoid dense blocks of text; use more white space on pages
- Numbered lists are preferable to bulleted lists as they offer more of a sense of defined structure
- When using graphics, make them relevant to the context and as clearly iconic as possible
- Avoid sarcasm, satire, parody, metaphors etc.
- Avoid jargon; use clear and simple writing
- Use summaries and conclusions
- Use bold to highlight important content, rather than italics or underlining
- Use sans serif fonts such as Arial, Verdana or Helvetica, with a minimum font size of 12pt, or better still, use style sheets to let the user set their own choice of font/colours
- Provide a glossary if necessary

Other forms of visual impairment
Visual impairment encompasses various forms of blindness and vision loss, such as colour blindness and simply weak sight. If you're over fifty, you may already have experienced websites with a font size that's too small to read comfortably.

Colour blindness is the inability to distinguish between certain colours, most commonly red and green. In the UK, around 8% of men and 2% of women are colour blind. Some tips to consider when designing for colour blind users:

- Avoid using colour alone to signify important information
- The easiest text to read is in strong black fonts on white backgrounds
- Red or dark green backgrounds degrade readability, regardless of font colour
- Coloured letters work best when in bold fonts with high-contrast backgrounds
- Use of red text (in particular in web-forms) to indicate invalid information can be easily missed by colour-blind users
- Again, the use of style sheets allows the user to select a font/colour combination suitable for their level of impairment

Of course, many of the tips in this article could be considered good design practice in general but it’s surprising how many sites are still badly conceived and put together with clumsy layout or lack of clear structure.

Due to the range and often conflicting requirements of different impairments, it’s not always possible to plan for every combination of accessibility needs. But by using basic accessibility guidelines (see the links below) and the willingness to listen and adapt to your audience’s needs, you can improve your product and be confident that you’re reaching the widest audience possible.

Useful links:

Disability Discrimination Act
http://www.opsi.gov.uk/acts/acts2005/ukpga_20050013_en_1

Web Accessibility Initiative (WAI)
http://www.w3.org/WAI/

WebAIM – Web accessibility infromation
http://www.webaim.org/

Abilitynet – national accessibility charity
http://www.abilitynet.org.uk

Connect – Communication disability network
http://www.ukconnect.org/

Youtube clips on accessibility:

BBC Click accessibility article
http://youtube.com/watch?v=U2VVxrWun6A

Assistive technology presentation: demonstrating a range of assistive technologies
http://youtube.com/watch?v=LDM64ScqGQk