Through other's eyes

Independent testing specialist Tim Edmonds closes our issue on user interface testing with his take on the very first thing designers and testers should consider: accessibility

My sixteen years of testing experience have been mainly at the integration, system and user acceptance levels, with the emphasis firmly on functional testing. Indeed it is significant that on many projects on which I have worked the source documents on which testing was based were called 'Functional Specifications'. On some projects I tested non-functional attributes such as performance and security, but when working with mainframe and PC based applications any usability issues were generally confined to matters such as ensuring consistency in the user interface, and the availability of appropriate help text and error messages.

Testing web-based systems changed all that, with known target user environments being replaced by an open environment. One consequence of this was a need to test how accessible the functionality was under different configurations of operating systems and browsers. Another was the lack of a standard for the user interface. As I began to test the functionality of web applications I soon became painfully aware of some usability issues; these included inconsistent methods for carrying out similar tasks, over-lengthy navigation paths, unnecessarily complex screens for carrying out apparently simple tasks, and needless validations. For e-commerce applications the implications were serious.

I began to discuss these problems with developers, to build usability into my test plans, and to report usability issues as software faults. This was still very limited in scope and did not include any formal consideration of broader accessibility issues, such as the aspects of website use that have most impact on those with physical impairments.

The realities of accessibility

My awareness of web accessibility was brought into focus following an incident last October which put my left leg in a thigh-length plaster for several months. During that time I was confined to a world that consisted of three downstairs rooms at home, although the internet meant that I could still communicate with the outside world via email and the web. However, space was limited by a make-shift arrangement of furniture that was necessary, and my PC had to be positioned such that its TFT screen was a metre away and slightly above eye level. Even after I had adjusted the brightness setting to its maximum, the quality of the display from this viewpoint was significantly reduced compared to normal desktop use. Effectively I was accessing the internet as someone with visual impairment and so I had to make adjustments in the way that I configured and used the PC.

With a lengthy spell off work in prospect I wanted to fill my time usefully, and an opportunity soon arose when a locally-based charity asked for volunteers. My offer of help was accepted, and I was asked to do a job which involved making telephone calls to various other charities, not-for-profit organisations and related commercial companies. First I needed to research these organisations to find out what they did and to obtain a telephone number and contact name – a task ideally suited to the web.

It was this work that quickly brought home to me some realities of website accessibility, and I began to look at the pages that I visited wearing a usability testing hat. The same applied to my regular internet usage – some of my favourite sites were less easy to use in my changed circumstances. What follows are observations on some of my web accessibility experiences during my incapacity. From them I suggest some resources to use in addressing these issues when testing web applications.

Size matters

One of the first things that I did to address my problem of distance from the PC display was to set the view text size to 'Larger' in my browser (Internet Explorer 6). Immediately I was struck by the different responses of websites to this change, so to magnify the effect further I then set the size to 'Largest'. A few sites coped well, with all or most of the significant text being enlarged and more readable, as I expected. However, on several sites the increase in the size of text had an adverse effect on the rest of the page, typically causing text to overlap graphics, text boxes, borders or other text, with consequent difficulties in reading. On a few sites the text size did not change at all and so small text remained too small to read.

That was only the beginning. Further investigation of my browser's accessibility capabilities revealed that it could be configured to ignore the font sizes and styles specified on web pages. This solved some problems but often revealed additional inconsistencies and errors, thereby opening up a further range of testing possibilities. The lesson for me as a tester was clear – the use of different text sizes was an accessibility issue which previously I had not considered specifically in my website testing, but which I would certainly include now.

The colour is magic

My view of the screen meant that my ability to distinguish between colours was reduced and, as I soon discovered, on many websites the colour combinations used could result in text magically disappearing into the background. For example, a visit to a local authority site revealed a combination of a dark green background with dark text colours which made navigation a nightmare, regardless of the size of the text. Here and on several other sites the colour choice seemed to be influenced by adherence to a 'corporate' colour scheme that was probably designed for purposes other than web pages. Testers should be prepared to point out this kind of conflict – those responsible for company design criteria may not be aware of implications like this and should welcome feedback.

I found that the easiest pages to read were those with black text on a white background – straightforward and effective – but any dark colour on a light background was also fine. Light text on a dark background was usually readable, but the choice of font then became significant – thin spidery typefaces tend not to work well in these circumstances. Some people with visual impairment find white-on-black the most readable and one charity site offered this as an alternative to its standard black-on-white.

My investigations of the browser's accessibility options revealed a configuration option to ignore the colours specified on web pages. However, as I found with text size, this was sometimes only a partial solution that served inadvertently as a 'test technique' to highlight other issues.

A picture is worth a few words

Another potential block to my view of website contents was the use of graphics and video clips. Of course both can be effective

media on websites, but they can also intrude and become counterproductive when used as self-indulgent embellishments. For example, several of the sites that I visited used an image as a tiled background such that text positioned over it was very difficult to read, particularly when text and image colours were similar.

Animated graphics can also cause difficulties. Sometimes they merely distract, but in two cases there were hyperlinks behind animated graphic controls, making it a challenge to read the text on them that described their function. One site included this 'feature' on most of their pages so that navigation was rather like playing an arcade game of 'hit the hyperlink'. Admittedly this was a youth charity, whose typical users would be more visually and digitally adept than me, but they made it as difficult as possible for me to find out how to contact them.

A picture may be worth a thousand words, but sometimes you need a few words as well as, or instead of, pictures. Images on web pages can (and should) have some 'alternative text' associated with them, to be displayed if the image is not present for any reason. I configured my browser to disable graphics. This showed where no alternative text had been provided and, where the image was also a link, it meant that there was no indication of where the link went. Many visually impaired users access the web using text-to-speech browsers, which will render alternative text audibly, so lack of text effectively hides the message in the image, whether or not it has a hyperlink associated with it. An extreme example was a site that on entry provided a page consisting only of graphical images with no alternative text, so with graphics disabled in the browser there was no text at all displayed on the page! So here is another testing suggestion – try running some web test scripts with the browser graphics disabled. Similarly, if a website makes extensive use of video then try running some tests with video disabled.

Some guidelines and resources

What I have described above are a few examples of real web accessibility issues that can be used to feed into formal or informal usability testing. This is, of course, a selection based on personal experience with impaired vision and merely represents the tip of the iceberg. For example, what about colour blindness, sensitivity to flashing screens, and deafness? Fortunately there are many resources available that can be used to plan and focus the test effort:

The World Wide Web Consortium (W3C) under its Web Accessibility Initiative (WAI) provides a set of Web Content Accessibility Guidelines which can be used as input to web page design and testing. The current draft of this document is available at *www.w3.org/wai*. There is a wealth of other useful material here, including information about evaluating websites for accessibility and alternative browsers for special needs.

There are various statutory regulations that have a bearing on accessibility. For example, in the UK the 1995 Disability Discrimination Act, Part III – Access to Goods and Services, makes it unlawful for service providers to discriminate against disabled people in certain circumstances. For more information see *www.disability.gov.uk/dda/#part3*.

In the USA Section 508 requires that Federal agencies' electronic and information technology is accessible to people with disabilities. There is a great deal of information available at *http://www.section508.gov*.

Jakob Nielsen's Alertbox columns, published on his website at *www.useit.com/alertbox*, are a rich source of information about usability issues in general and include several covering accessibility topics.

Tools and automation

Using different browser configurations for text, colour and graphics is effectively adding additional test environments. So, in the same way that you might test technological accessibility under different versions of operating systems or browsers, you can run tests under alternative browser settings. Fortunately testing conformance to guidelines or regulations is a task well suited to automation, and there are resources available through the internet to help with this. For example, the WAI website has a section with links to many different measurement tools, and the Section 508 website contains links to tools and resources for implementing conformance.

Whether or not you have a mandatory compliance requirement to measure and improve accessibility, the Bobby website at *http://bobby.watchfire.com* is a good starting point. This measures against either the WAI Web Content Accessibility Guidelines or Section 508, and awards a 'Bobby approved' icon for websites that prove a given level of conformance. If you are not sure about how accessible your website is, then Bobby offers a free service that provides accessibility feedback on a given URL (single page only) and this is well worth trying.

Tools like Bobby are particularly suited to situations such as that where a 'corporate style' transferred to the web page gives accessibility problems. In these cases a report from a tool based on a recognised standard or set of guidelines offers an objective way to inform and convince management that it is worth taking a different approach to the website.

Feedback and a word of caution

The work that prompted this article was concerned mainly with charity sites and 'caring' organisations. Whereas I would just abandon my use of a poorly accessible commercial website, in these cases I took the trouble to give some feedback. So, where there was an easily reproducible error or usability problem (and if I could locate the contact details) I sent an email 'incident report' describing it. On revisiting some of these sites when writing this article I was pleased to see that several of them have made changes and I can 'close' the incident reports! They include the local authority site with the indistinguishable text and background colours, which now displays a very readable dark green text on a light yellow background. Alas, the site that opens with the text-free page when graphics are disabled remains unchanged and just as unusable.

At the other end of the spectrum, there were some sites that stood out because they were clear and easy to use, so I took the time to tell them so. For an example of what can be done to make a website clear and accessible, take a look at the Bobby-approved site *www.sense.org.uk*.

However, a word of caution is necessary here. A website that displays a *Bobby approved* logo shows that it meets a certain level of conformity to a set of guidelines, as reported by a tool analysis of the underlying HTML. However, it does not mean that there are no accessibility problems. For example, on another approved site I found the Bobby logo and the accessibility features were on the home page, but instead of being positioned at the top left of the page they were at the bottom right hand corner, reached only by scrolling and easy to miss. One of the features offered was a 'text only' option. Selecting it initiated a conversion utility to render the page and this took several minutes to complete – a process that was repeated for each link selected. Furthermore, the resultant pages were the utility's literal interpretation of the original HTML, including any duplicate links and unnecessary information.

So, by all means use conformance tools as part of testing – they have a valuable role to play – but develop some additional accessibility tests of your own. Users need testers on their side and improving accessibility for users with special needs will, after all, improve usability for everyone.

Author's note: I am grateful to all the developers and test practitioners who have taken the time to discuss usability and accessibility issues with me, and particularly to Isabel Evans who, amongst other things, introduced me to Bobby. PT