Meeting the On-line Needs of Disabled Tourists: an Assessment of UK-based Hotel Websites

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ABSTRACT

The easy exchange of rich information between often geographically dispersed parties is an important precursor of successful tourism transactions. Internet-based technologies, in particular the World Wide Web, offer possibilities to both buyers and sellers to exchange information without the constraints of geography and time diminishing its richness. The disabled, representing a significant part of any marketplace, may, however, have difficulties accessing the content of the Web and therefore sharing the benefits of rich information exchange. This is the principal concern of 'Web content accessibility'. Focusing on the tourism sector, in particular UK-based hotels, this paper examines the accessibility of their websites. However, recognising that it is not just access to information that is important for the disabled, but also the quality of that information, the paper also examines the extent to which the information contained on websites serves their particular needs. Utilising the accessibility testing software 'Bobby', disappointingly low levels of Web content accessibility were found amongst the sample of websites. Against a framework of information needs developed from criteria provided by disability organisations, the sample also revealed disappointingly low levels of specific (relevant) information for the disabled. Copyright © 2006 John Wiley & Sons, Ltd.

INTRODUCTION

In a recent survey to ascertain how Scotland meets the needs of disabled tourists the disability charity Capability Scotland (2002) tasked disabled 'mystery shoppers' to:

(1) visit an attraction and use all its facilities;
(2) visit local tourist information office and travel agents, requesting information about accessible accommodation and restaurants in a short break destination in Scotland.

Respondents were then tasked with assessing each of these in terms of: (i) The accessibility of the premises; (ii) the quality of the service; and (iii) the quality of the information they received. The survey generated mixed results. Managers and operators of visitor attractions appeared to meet the needs of the disabled reasonably well. For example, 80% answered that the attractions were 'Accessible to you'

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and 60% reported a suitable counter. Of the information facilities surveyed the results were also favourable. For example, 60% of the respondents reported adequate parking at Tourist Information Offices, and 60% reported accessible display stands at travel agencies. Importantly, 80% of tourist offices and 60% of the travel agents had appropriately trained staff. However, the survey also highlighted some notable concerns. For example, only half the travel agents could offer some information in alternative formats (e.g. audio or Braille equivalents for text). Of more concern was service provision. When asking about suitable accommodation and places to eat, i.e. questions about accessibility, the results were mixed. Only half the facilities visited could provide this information. As the report concludes, this is problematic because; 'There is no point in information facilities being accessible to disabled people, if the information provided by them cannot meet their needs as tourists' (Capability Scotland, 2002, p. 4).

The Capability Scotland (2002) results cannot easily be ignored by organisations wherever they are in the tourist value chain. Firstly, there are legal requirements under the UK's Disability Discrimination Act for organisations to make reasonable public accommodation for those with disabilities. Of course, similar public accommodation requirement exists elsewhere (e.g. the Americans with Disabilities Act). Beyond any legal mandate for accessibility, there is an equally compelling second reason — a marketing mandate — for addressing issues of access. Simply stated, depending on the definition being used, between 5 and 20% of the population are estimated to be disabled (UNESCAP, cited in Yau *et al.*, 2004). In the context of the UK, this translates into an estimated 11 million individuals over the age of 16 covered by disability legislation (Grewal *et al.*, 2002). Importantly, this group, together with their family and friends, can create a potentially significant, but often ignored, market (Yau *et al.*, 2004). Remembering that tourists to the UK are likely to come from outside as well as from within the UK, it is also worth noting at least one other figure for the disabled; the estimated 54 million USA individuals with some level of disability (Lach, 1999). Giving further impetus to this group is the fact that the population is ageing and that 'no consumer group is more susceptible to disabilities than the elderly' (Burnett and Bender-Baker, 2001, p. 7). The disabled will therefore become an even more significant group in society not only in terms of their sheer numeric size, but also in terms of their tourism pounds, dollars, euros. . . . The potential spending power of the UK disabled population, already estimated to be £20 billion (Capability Scotland, 2002), therefore can only increase.

Legal and marketing mandates are not just the domain of the physical environment though. Internet-based technologies, in particular the World Wide Web, have come to play an important role in the tourism industry. Indeed, the technologies appear ideally suited to the industry. On both the demand and the supply side, the web facilitates information exchange in what is often a dispersed and fragmented marketplace, breaking the constraints of time and place and diminishing the significance of the three long held constraints of information distribution, 'location, location, location' (Wynne *et al.*, 2001). Crucial in this exchange is the feature (and benefit) that information in this arena can be rich (i.e. timely-current, customised, interactive and vivid) irrespective of distance. Information intermediaries and service providers are no longer constrained by a richness-reach trade-off (Evans and Wurster, 2000). Thus, in contrast to a brochure mailed out (achieving low richness and medium/high reach), a Website provides possibilities for both high reach and high richness. In short, the Web and Internet-based technologies solve navigational problems of search and supply without the constraint of physical location. They can, therefore, cause the 'Death of Distance', the 'Homogeneity of Time', and the 'Irrelevance of Location' (Pitt *et al.*, 1999). In turn, Internet-based technologies offer organisations the potential for more effective distribution, be it via co-operation with other groups (e.g. affiliate programs), and/or the rearrangement of distribution channel partners (e.g. potential disintermediation), and/or customer relationship management. Indeed, the ability of organisations and destinations to use integrated information and computer technology will determine future competitiveness (Buhalis, 2003).

Recognising the potential advantages of the technology in the exchange of information, the number of individuals on-line has grown dramatically. Indeed, it is now estimated that it will exceed 1 billion by mid 2005 (Press Release, Computer Industry Almanac, cited on clickz.com, 2005). Significantly, between 10 and 20% of those on-line are reported to be individuals with disabilities (iCan.com, in Salamone, 2002). To receive the benefits of Internet-based technologies, this 10–20% of users must, however, be able to access the content it provides. Consider, for example, how some disabled individuals may not be able to see, hear, move or process some types of information. For example, 1.1 million UK citizens are eligible to be registered blind (Oppenheim and Selby, 1999). Others may have difficulty reading or comprehending text. For example, The British Dyslexia Association (BDA, 2004) reports 4% of the population as severely dyslexic, with a further 6% having mild to moderate problems (bda-dyslexia. org.uk). Additionally, some with motor impairments — perhaps cerebral palsy — may have difficulty manoeuvring a mouse.

If the web is to be used effectively as a source of information about tourism, and organisations want to maximise their reach in the market, there is a clear competitive imperative for ensuring access for all, both on-line as well as off-line, at the tourist office, travel agent, or at the destination itself. However, there is more than just a competitive imperative for on-line accessibility. As the Internet and Web become increasingly important in our daily lives, access to information, as well as the opportunity it provides, involves the civil rights of people with or without disabilities (Yu, 2002). The legal mandate for accessibility, already covering physical spaces, will therefore be increasingly applied to cyber spaces. Testimony to this can already be seen with the UK's Disability Discrimination Act and the on-line examples of services that appear in the recent 'Code of Practice: Rights of Access, Goods, Facilities, Services and Premises 2002'.

Acknowledging the significance of Internet-based technologies in tourism consumption, as well as the size of a disabled tourist market segment with particular needs and capabilities, this research investigates Web content

accessibility. However, taking note of the Capability Scotland (2002) conclusion that there is no point in information facilities being accessible to disabled people if the information they contain cannot meet their needs as tourists, the research also assesses whether the content accessed meets their needs.

The literature review section begins by outlining the problems faced by disabled Internet users and the likely minimum requirements of accessibility. Attention is then given to the little Internet accessibility research published thus far, establishing some benchmarks against which any subsequent results, including those established here, may be compared. The methodology section outlines the research processes adopted and discusses key issues surrounding the research process. The findings derived from both quantitative and qualitative approaches are reported, together with a discussion of their implications and limitations. Finally, the paper ends with some concluding remarks.

LITERATURE REVIEW: ONLINE ACCESSIBILITY FOR DISABLED AND CHALLENGED INDIVIDUALS

Accessible Web pages accommodate the differing capabilities, needs and situational considerations of Web users. Consider, for example, how some individuals face issues such that they may (World Wide Web Consortium, 2002):

(1) not be able to see, hear, move or process some types of information;
(2) have difficulty reading or comprehending text;
(3) not be able to use a keyboard or mouse;
(4) not be able to speak or understand fluently the language in which the document is written;
(5) have a text-only screen, a small screen, or a slow Internet connection;
(6) be in a situation where their eyes or hands are busy;
(7) have an early version of a browser, a different browser, a voice browser or a different operating system;

Specifically, accommodating the needs and capabilities of the disabled means that Web pages must be designed to allow the effective

Table 1. Examples of assistive technologies[a]. (Sources: Adapted from World Wide Web Consortium and ferl.becta.org.uk)

Technologies	Function
Braille	Creates patterns of raised dots that can be read using the fingertips
Screen readers	Creates synthesised speech telling the user about all aspects of the page and all navigational links
Text to speech	Softwares creating synthesised speech to read what is on the screen (having been copied to a separate program in some cases). Programs also provide text highlighting and colour contrasts
Screen magnifiers	Enlarges text and graphics
Alternative keyboards (keyguards, on-screen keyboards, single function devices)	Provides alternative ways of creating keystrokes for people with physical impairments, including dexterity problems
Speech to text	Used to operate computer via spoken commands
Text browsers	Used with screen readers for people who are blind
	Used by many people who have low bandwidth connection and do not want to wait for images to download
Internet browser accessibility features	Examples include enlarging or changing text, font and colour of web pages
Microsoft assistive technologies	Examples include Narrator, Magnifier and On-screen Keyboard

[a] Assistive technology defined as: 'Equipment and software used to maintain or improve the functional capabilities of a person'.

use of assistive technologies. In spite of the Web's relative recency, a variety of assistive technologies now exists to improve the functional capability of a person (Table 1). Functional capability, ensuring access, will only be improved, however, if website design acknowledges the way the technology works and is operated by its user. For example, screen readers present the user with pages in a linear fashion directing it either to speech synthesis or audio output, or to refreshable Braille. The user navigates with the tab key, moving from link to link and moving down with arrow keys. Items not available through keyboard strokes or through well-defined links will therefore be missed.

Although the legal mandate for accessibility already applied to physical spaces will increasingly be applied to cyberspaces, the exact scope and requirement for those publishing online is not easily determined. First, the technologies, including the range of assistive technologies used by different individuals to meet their needs, are still being worked out. Second, little case law as yet exits. That said, some

guiding principles are to be found in the World Wide Web Consortium's (W3C), Web Accessibility Initiative (WAI) and the Web Content Accessibility Guidelines (WCAG) it has produced. As the nominal standards setting body for the Internet, the W3C (WAI) have developed an extensive set of design/programming principles that, if adopted, serve to improve the accessibility of websites. These design principles are stated at three levels depending on the degree of accessibility they ensure (Table 2).

As the Priority 1 design principles must be satisfied simply for some groups to be able to use web documents, this is the level websites have frequently been assessed against. That is, the websites are 'scored' as either passing or failing against the 16 design principles given at Priority 1 level (Table 3). A useful illustration of the benefits of following the Priority 1 guidelines can be seen in the work of Lilly and van Fleet (2000). For example, considering WCAG checkpoint 1.1 from Table 3: 'Provide a text equivalent for every non-text element . . .', the benefits are that 'The text in the "ALT"

Table 2. World Wide Web Consortium Priority 1, 2 and 3 accessibility levels. (Available at: http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505/full-checklist (accessed 4 October 2005))

Priority 1	16 design principles a Web content developer *must* satisfy. Otherwise, one or more groups will find it impossible to access information in the document. Satisfying the Priority 1 checkpoint is a basic requirement for some groups to be able to use Web documents
Priority 2	28 design principles a Web content developer *should* satisfy. Otherwise, one or more groups will find it difficult to access information in the document. Satisfying the Priority 2 checkpoint will remove significant barriers to accessing Web documents
Priority 3	19 design principles a Web content developer *may* address this checkpoint. Otherwise, one or more groups will find it somewhat difficult to access information in the document. Satisfying the Priority 3 checkpoint will improve access to Web documents.

Table 3. Priority 1 checkpoints for web content accessibility. (Source: World Wide Web Consortium, 2002)

		check point[a]
General	1.1	Provide a text equivalent for every non-text element (e.g. via 'alt', 'longdesc', or in element content). *This includes*: images, graphical representations of text (including symbols), image map regions, animations (e.g. animated GIFs), applets and programmatic objects, ASCII art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video
	2.1	Ensure that all information conveyed with colour is also available without colour, for example from context or markup
	4.1	Clearly identify changes in the natural language of a document's text and any text equivalents (e.g. captions)
	6.1	Organise documents so they may be read without style sheets. For example, when a HTML document is rendered without associated style sheets, it must still be possible to read the document
	6.2	Ensure that equivalents for dynamic content are updated when the dynamic content changes
	7.1	Until user agents allow users to control flickering, avoid causing the screen to flicker
	14.1	Use the clearest and simplest language appropriate for a site's content
Images and image maps	1.2	Provide redundant text links for each active region of a server-side image map
	9.1	Provide client-side image maps instead of server-side image maps except where the regions cannot be defined with an available geometric shape
Tables	5.1	For data tables, identify row and column headers
	5.2	For data tables that have two or more logical levels of row or column headers, use markup to associate data cells and header cells
Frames	12.1	Title each frame to facilitate frame identification and navigation
Applets and scripts	6.3	Ensure that pages are usable when scripts, applets, or other programmatic objects are turned off or not supported. If this is not possible, provide equivalent information on an alternative accessible page
Multimedia	1.3	Until user agents can automatically read aloud the text equivalent of a visual track, provide an auditory description of the important information of the visual track of a multimedia presentation
	1.4	For any time-based multimedia presentation (e.g. a movie or animation), synchronise equivalent alternatives (e.g. captions or auditory descriptions of the visual track) with the presentation
Fail safe	11.4	If, after best efforts, you cannot create an accessible page, provide a link to an alternative page that uses World Wide Web Consortium technologies, is accessible, has equivalent information (or functionality), and is updated as often as the inaccessible (original) page

[a] Checkpoints numbered (ordered) as per original.

attribute will display for visually impaired visitors using a voice output programme with a text based browser or for those users of a graphical browser who chose to load Web pages with the images turned off' (Lilly and van Fleet, 2000, p. 11). For checkpoint 12.1: 'title each frame to facilitate frame identification and navigation', the benefits are that: 'Visitors with visual impairments using screen readers and magnifiers will be better able to access your Web site. Most screen readers interpret information in tables from left to right rather than up and down. Magnifiers may render large tables unreadable' (Lilly and van Fleet, 2000, p. 11)

The W3C design principles provide a robust set of criteria to assess a website against. However, the most famous accessibility case already heard, McGuire versus Sydney Organising Committee for the Olympic Games (Case Law: *Maguire v Socog* H99/115 <http://www.hreoc.gov.au/disability_rights/decisions/comdec/2000/DD000120.htm> [accessed 25 November 2002]) suggests that organisations need to consider slightly more in the determination of a reasonable minimum level of accessibility. Here, in finding in favour of the plaintiff, the Commission took into account not only the W3C design principles, but also the benefits of access for the user and the costs to the organisation to provide access (Sloan, 2001). As these two factors are likely to vary from case to case, the ambiguity for organisations is over what is 'reasonable' minimum accommodation. Although the best position for any organisation would be to provide the maximum level of accessibility possible, a useful starting point would be to conform to the Priority 1 design principles. Indeed, in many cases satisfying these Priority 1 principles requires only modest manipulation of the website (Davis, 2002).

A REVIEW OF PREVIOUS ACCESSIBILITY SURVEYS

As yet, relatively few academic works report on Web content accessibility. What research there is has, moreover, tended to focus on the area of library access to information. Additionally, this research largely reports on USA university/college and library websites. For example, Lilly and van Fleet (1999) researching Yahoo's 100 'most wired' colleges found only 40 to be accessible. These findings are mirrored in Craven's (2000) study where only 37% of library Web pages were found to be accessible. More recently, Schmetzke (2001) found the average accessibility of USA campus library websites to be 59%, up from similar previous studies in 1999 and 2000 where Web page accessibility was found to be 31 and 40% respectively.

Library sites ought to report higher than average levels of accessibility given that information dissemination is their core activity, and that colleges and universities have worked hard to widen participation to groups previously underrepresented in education — including the disabled. Indeed, the higher than average reporting of accessibility of library websites is borne out in the few surveys reporting other areas. For example, Jackson-Sanborn *et al.* (2002) on making a broad assessment of sites across 'six genres' found an average 33.9% Priority 1 accessible. This figure is only as high as it is by virtue of the fact that government and college sites (two of the genres) are reported at 60% and 43% Priority 1 accessible. The other genres, clothing, international sites, job sites and overall most popular sites recorded only 40, 19, 29 and 15% Priority 1 accessible, respectively. Elsewhere, Murphy (2002) on evaluating 17 UK high street banks found almost all failing on accessibility because of poor coding and poor screen design. These results are mirrored in the work of Williams and Rattray (2003), where only 17% of UK-based accountancy firms passed at the Priority 1 level. Perhaps even more disappointingly, McCord *et al.* (2002) on testing the accessibility of Web-based health information resources using screen readers and an automated software checker found none completely accessible.

Given the competitive and legal imperatives for accessible travel/tourism Website content, the first aim of this study is to determine the level of accessibility currently provided by UK-based travel/tourism sites. However, the study goes further than merely checking the accessibility of websites against the *de facto* standards represented by the different design principles of the W3C. Although adherence to

these design principles provides an essential starting point in providing access to content, access to content is only truly meaningful if that content actually meets the needs of disabled individuals. For example, Yau *et al.* (2004) report respondents as frequently having to undertake detailed planning to minimise problems, including the need to identify information on accessibility to scenic spots, toilets, hotel accommodation, and transportation, as well as availability of assistance. Arguably then, there is little point in the information facility (the website) being accessible to disabled groups, if the information then provided does meet their needs as tourists. The logical second aim of this study is therefore to determine whether the websites' content actually meets the informational needs of disabled tourists.

In addressing these two aims this work marks the first stage of a two-phase investigation into the accessibility of tourism websites. Although adherence to both the W3C design principles and any stated information requirements technically maximises access to information facilities and the quality of information contained therein, the second (following) phase will address whether technical maximisation is in fact what different disabled groups need and want and, moreover, what attitudes are formed from experiencing different levels of accessibility. Saving the reporting of this second phase for another paper, the methodology used for the two stated aims of the first phase are as described below.

METHODOLOGY

Determining the current level of Website accessibility

Satisfying the W3C Priority 1 design principles (Table 3) is a basic requirement for some disabled groups to be able to use Web documents. As such it is arguably the minimum accessibility requirement of a website. Recognising this, the majority of prior research has assessed websites against the Priority 1 design principles. In doing so, it has also tended to use the automated Web accessibility software 'Bobby', developed by the Centre for Applied Special

Technology (CAST; http://www.cast.org/bobby). This software is able to scrutinise a website's programming against (some of) the W3C Priority 1, 2 and 3 design principles.

Although the Bobby software has at least one notable limitation in terms of its inability to assess and report website compliance against all of the design principles, requiring therefore some additional manual accessibility checks to be made for complete reporting, it does nevertheless offer researchers some significant compensatory benefits. First, the software reports its results in an easily readable format. Indeed, the results are collated by priority level so that sites can be deemed as passing/failing against the design principles at Priority 1, 2 and 3 levels. Second, the software identifies where manual user checks need to be performed. For example, with Priority 1 design principle 1.1 (Table 3), although the software is not able to check the quality/usefulness of any equivalent alternative text provided by a developer for a non-text element (e.g. a picture), it does identify where manual checks are required. It is also worth noting in the Bobby software's favour that although manual user checks are essential in ensuring comprehensive accessibility there is a trade-off for the researcher in terms of the additional time required to perform all the manual checks and the value of the additional information subsequently obtained from doing so. Indeed, arguably, the automatic checks on their own are likely to be a good indicator of a website's overall accessibility. Simply, websites that fail to comply with the design principles the Bobby software can scrutinise automatically are also likely to fail against the other, often more complex, errors the software cannot report on and require manual checks.

Given its widespread use in previous work, and in order to generate results that may be compared and contrasted with those in previous works, the Bobby software was utilised recording: (i) the number of websites passing the W3C design principles at Priority 1, 2 and 3 levels; (ii) the W3C Priority 1 'errors' identified on the websites.

As the Bobby software is unable to scrutinise websites for compliance against all the design principles, and a trade-off exists for researchers in undertaking all of the additional manual

user checks, only one manual user check was undertaken. Specifically, manual user checks were undertaken to assess the quality/usefulness of the equivalent alternative text for images (graphics), where indeed it was provided on websites. The importance of useful equivalent alternative texts for such non-text elements is easily highlighted. For example, if an image on a webpage has the equivalent alternative text 'picture' it will pass the Bobby assessment. But, if that image is important for the comprehension of the content of the page, or for navigation (e.g. an arrow pointing to some link), then the equivalent alternative text will need to be more than merely the word 'picture'. It will need to describe that the image directs attention to a link on the page. Alternatively, if the images are transparent graphics used for spacing the content of the webpage, the equivalent alternative text needs to indicate this with the appropriate (empty) alternative program attribute coding. This will indicate that the image is not necessary for understanding or navigating the page.

One hundred UK-based tourism websites were selected for evaluation; specifically UK-based hotels. To obtain a representative sample for the UK, city names were used as a part of a search string that also included the word 'hotel'. These were entered into the search engine 'Google'. The number of websites selected into the overall sample was calculated on the basis of the population of that city as a proportion of the total UK population.

In assessing the websites against the W3C Priority 1, 2 and 3 design principles only the homepage (entry page) of each of the UK-based hotel websites was assessed. The reason for this is that although a homepage may not be completely representative of the rest of the website it is nevertheless the page most individuals will access a website through. Accessibility issues here will either simply prevent further browsing through the website or signal to the individual the likelihood of further problems within the site, this in turn influencing their propensity to browse the site further. Of all pages, the homepage is likely therefore to have a critical importance. Additional support for the assessment of homepage accessibility only can be found in the results of Williams and Rattray (2003), where first and second logical links from homepages generated comparable error levels and error types.

Meeting the informational needs of disabled tourists

The Capability Scotland (2002) report concluded that there is no point in facilities being accessible to the disabled if the information then provided cannot meet their needs as disabled tourists. Likewise, there is no point websites being accessible to the disabled, conforming to the Priority 1, 2 and 3 design principles, if the information then contained on them does not actually meet their particular needs.

To assess if the information provided on tourist websites meets the needs of the disabled, i.e. being rich-relevant, a 'Framework of Information Requirements' needed to be developed. Drawing on criteria published by the Disability Rights Commission (drc-gb.org), The English Tourist Board (2004), DisabledGo (2004), Good Access Guide (2004), Access Able Travel (2004) and Tourism for All (2004), as well as further information contained in the Disability Discrimination Act (drc-gb.org/thelaw/index.asp), a detailed and comprehensive list of information requirements was constructed (Appendix A). The wide range of sources and criteria obtained from them ensured that the framework developed was comprehensive enough to cover the informational needs of most forms of disability.

Utilising the Framework of Information Requirements as a 'scorecard' to assess the richness-relevance of the information on a randomly selected subsample of 40 websites, two assessors independently: (i) reviewed the homepage; (ii) navigated to internal links clearly labelled as being specifically relevant to disabled tourists; (iii) navigated to internal links relating to hotel facilities or amentities; and (iv) ran a search through the site for the key words 'disability' and 'disabled' navigating to any relevant results. Discrepancies between the two assessors, in terms of their judgement about the relevance-richness of the information provided, were moderated by a third independent assessor.

As many of the randomly selected subsample contained agency booking websites, a further subsample of 40 sites was generated. To

develop this subsample, 10 booking agency websites were selected randomly. From each of these a quota sample was then drawn comprising two hotels with a three-star rating and two hotels with a four-star rating (the total sample therefore contained 20 three-star hotels and 20 four-star hotels). These ratings were selected in order to screen out hotels that might be considered exceptional in terms of service quality and price, and to provide a subsample of what might be considered 'mainstream' hotels. The websites of this further subsample were surveyed utilising the framework as above.

Acknowledging that catering for the informational needs of all tourists on the website itself might be considered an unreasonable requirement, access to rich-relevant information was further assessed with the sending of an email requesting specific information. The email contained a specific request for information relevant to a disabled individual (Appendix B) and was targeted at the original sample of 40 sites that provided an email address.

The assessments took place in December 2004.

DATA FINDINGS

Of the 100 UK-based hotel websites originally selected three sites were found to be duplicates. To avoid double counting these were removed from the final sample. Of the remaining 97 websites, 19 sites (20%) passed the Priority 1 level design principles the Bobby software could assess automatically, three sites (3%) passed the Priority 2 level principles, and only one site passed the Priority 3 level principles (Table 4).

At Priority 1 level, the most frequently occurring checkpoint error was a failure to provide equivalent alternative text for all images. Indeed, 70% of the sites failing at Priority 1 did not provide alternative text for all images. At 10% the next most frequently occurring error recorded was a failure to provide alternative text for all image type buttons. This was followed by (Table 5): failure to give each frame a title (7%); failure to provide alternative text for all image map hotspots (7%); and failure to provide alternative text for all image hotspots (5%). Incidentally, 51 of the websites that failed against the Priority 1 level design principle checkpoints, failed to meet only one of the Priority 1 criteria. By far and away the most common single error (in line with the findings in Table 5) was a failure to provide equivalent alternative text for all images. Indeed, 92% of the single design principle error sites failed on this one principle.

Table 4. Assessment of UK-based hotel sites passing at Priority 1, 2 and 3 levels using the automated Web accessibility software 'Bobby' developed by the centre for Applied Special Technology.

Number passing the Priority 1 checkpoints	Number passing the Priority 2 checkpoints	Number passing the Priority 3 checkpoints
19 (20%)	3 (3%)	1 (1%)

Sample size = 97.

Table 5. Analysis of total a Priority 1 errors detected using the automated Web accessibility software 'Bobby' developed by the Centre for Applied Special Technology.

Priority 1 checkpoints	Number of UK-based hotel websites	Percentage of UK-based hotel websites
Failure to provide alternative text for all images	75	70
Failure to provide alternative text for all image type buttons	11	10
Failure to give a title for each frame	8	7
Failure to provide alternative text for all image hotspots	5	5
Failure to provide alternative text for all image map hotspots	8	7
Failure to ensure every frame references a HTML file	0	0

[a] As some sites have more than one Priority 1 error the total number of errors exceeds the total number of sites examined.

Although the Bobby software provides a good indication of the accessibility of websites, manual user checks are required to provide a more comprehensive assessment of a site's accessibility. In this regard the quality of the equivalent alternative text that was provided on a subsample of sites was also assessed.

Of the 19 sites that passed at Priority 1 level, two of the websites had no images or frames. Manual checks assessing the usefulness of the equivalent alternative text were therefore performed on the remaining 17 sites. Of these 17 websites only one site contained a useful equivalent alternative text description as well as an explanation of the image type. Eleven of the websites had equivalent alternative text that described the content of the image, but failed to indicate the type of image (e.g., map, diagram, photograph). Five of the websites technically had alternative text, but the content of the equivalent alternative text had no relevant information about the image.

Considering the number of images without equivalent alternative text, the importance of meeting this checkpoint becomes somewhat clearer. As Table 6 illustrates, many of the sites contain more than 10 images just on the pages sampled. If these images are indeed necessary for navigation of the site, or for processing information, individuals who cannot, or do not, 'see' the image will have significant difficulties in effectively using the site. Incidentally, the 71 websites without alternative text utilised a total of 2015 images on the pages sampled, an average of 28 each!

As to the richness or relevance of information on the 40 websites in the original subsample, only one contained specific, but limited, information that might be deemed as relevant/rich to disabled individuals (information about transport connections). Of the 40 in the additional sample (twenty 3-star and twenty 4-star hotels), five websites contained information deemed relevant/rich to disabled individuals (three of the 4-star and two of the 3-star hotels).

Following the 31 emails sent out requesting information (Appendix B), eight responses (26%) were received. The information received from these eight was of variable quality. For example, one was an autoresponse that promised further information would follow, which it did not. One reply indicated that a booking request had been made for a set of dates, without any dates having been given in the original email! Another reply indicated that most 4-star hotels will 'certainly have some adaptable rooms'. On a more positive note, two requested further information and two gave links to websites with further information.

DISCUSSION

Information is acknowledged to be the 'lifeblood' of tourism because without information the customer's motivation and ability to travel is severely limited (O'Connor and Frew, 2002, p. 34).

Although information is the 'lifeblood' for all consumers, two qualifications to this assertion are important when it comes to many disabled and challenged tourists. First, it is not just information that is important, but access to it. Second, for disabled and challenged individuals the richness and relevance of information is also important. The Capability Scotland (2002) survey of tourist providers located in the *physical environment* showed encouraging efforts in terms of access as well as quality of information. In contrast, the survey results for at least one key player in the online part of the tourist value chain, UK hotels, revealed less encouraging results.

With only 20% of the UK-based websites passing the minimum Priority 1 design principles, the findings are not just disappointing when contrasted against accessibility findings for the physical environment, they are also disappointing against other online accessibility

Table 6. Use of images on sites without alternative (equivalent) text.

Number of images without alternative text on the site	Number of sites
1–10	21
11–20	20
21–30	7
31–40	7
41–50	3
51+	13

survey results. For example, the Priority 1 pass rate of hotel websites is notably lower than those in the Jackson-Sanborn *et al.* (2002), Lilly and Van Fleet (1999) and Craven (2000) surveys. Moreover, even though the results here may be argued to be somewhat comparable with the findings of Murphy (2002) and Williams and Rattray (2003), these works were based on assessments undertaken at least a year earlier, indeed possibly even earlier given the time lag involved between the submission and publication of papers.

Analysing the W3C design principles the UK-based hotel sites most frequently failed to meet (Table 3) serves only to reinforce the suggestion that although accessibility mandates may be understood in the physical world they are, as yet, not widely understood in the virtual world. For example, the most frequently occurring error reported — a failure to provide equivalent alternative text for all images — can be remedied with little effort. Moreover, by addressing only this error the Priority 1 pass rate would increase considerably. Further evidence, if any were needed, is provided from the analysis of those websites that actually provided the alternative text and technically passed this Priority 1 design principle. On a manual assessment of the provision of the alternative text, only two out of the 17 websites had useful/appropriate alternative text. Most of them had therefore failed to consider the real needs of the individuals who might use this text. For example, its importance for individuals using screen readers.

If the results show a lack of awareness of the importance of accessibility issues for disabled and challenged users, they also show a lack of awareness in another significant direction. Although accessibility is important for disabled and challenged individuals, the needs and capabilities of this group are, indirectly, frequently the needs and capabilities of others attempting to access the important information component of websites. For example, those using text-based browsers, perhaps simply because of slow Internet connection, would also benefit from the provision of useful equivalent alternative text. Accessibility is about the accommodation of different needs, and although it is most obviously considered in terms of the needs and capabilities arising

from disability and the assistive technologies often used, it is more than that. It is ultimately about interoperability for all. Indeed, away from the disabled, as Louviers *et al.* (2003) notes, organisations will have to acknowledge that individuals increasingly have an e-Communications portfolio of Internet access devices, deploying different devices at different stages of the decision making process. However, just as it is offline in the physical environment, as illustrated with examples such as graded pavements (Corcoran and Corcoran, 2002), good accessible design is good for all (Vanderheiden, 2000).

The 'good design is good for all' maxim means that the benefits of accessible design for disabled and challenged individuals are also likely to be shared by many other individuals. Currently then, given the poor pass rates at Priority 1, 2 and 3 levels, it is not solely disabled and challenged individuals that face barriers to content, but also a plethora of other individuals who for one reason or another also have particular needs and capabilities. For organisations, this makes the competitive mandate — the business case — for accessibility much greater.

The manual assessment of sites against the requirement for equivalent alternative text revealed that some websites had alternative text for some but not all images. This result leads to a general conclusion about the assessment of accessibility. For Bobby and W3C approval, all images, all image hot-spots, etc., are required to have equivalent alternative text. In other words the accessibility judgment is made on an all-or-nothing basis. However, websites are likely to show degrees of accessibility rather than simply being recoded as accessible/not accessible. For example, if nine out of ten images have alternative text the user may be able to make some use of the website in spite of the alternative text being missing for one image. A more complex assessment should perhaps therefore look at an incidence of accessibility measure. The advantages of such a measure would of course, again, have to be traded off against the additional time and cost involved in its calculation.

Considering the richness of the information provided for disabled and challenged individuals, the research revealed the provision of any

dedicated information to be the exception rather than the rule. Indeed, with only five of 80 sites containing such information, this can be judged as far from comprehensive. The results are, moreover, less encouraging than those of the earlier Capability Scotland (2002) survey. The hotels in question may in fact cater for the particular needs of the disabled. Indeed, recent initiatives, such as the announcement in 2002 that all (UK) Tourist Boards are coordinating on a new National Accessible Scheme for accommodation providers, suggests that awareness, if not accommodation, should be increasing amongst providers. Fundamentally though, even if accommodation providers are following or have followed such initiatives, they will have a limited real impact if the relevant information for the disabled tourist is not communicated through all the mainstream mediums likely to be used in the information search stage of tourism consumption.

In defence of websites' lack of information provision, it might be possible to make the case that there is a limited amount of information a website can practically contain. Moreover, in the case of the survey here, as many of the websites were in fact agency sites rather than proprietary sites the pressure on space might be even greater for them. This case probably would be acceptable had the websites, proprietary or otherwise, provided the requisite information on request. However, the email request for information produced a very poor response; indeed, only a 26% response rate after two weeks — the quality of which was distinctly variable.

Further work with tourist providers may provide an explanation for the lack of relevant information on websites or responses to emails. However, as the results of a survey of offline travel agents by McKercher *et al.* (2003) reveal, it is likely that in spite of accessibility initiatives suppliers simply do not understand the specialist needs of tourists with disabilities. This lack of understanding may stem from the fact that it is hard to empathise without some similar experience. It might also stem from the simple fact that (i) detailed research on disabled travellers is still fairly limited (Shaw and Coles, 2004) and (ii) service providers in the tourist industry are given very little education and training concerning legislation, access provision and service related to people with disabilities (Duruwalla and Darcey, 2003).

Although the cause of the lack of information and unreturned emails is still the subject of some speculation, the outcome of these is much easier to determine. First, and most obviously, these websites are losing business. Moreover, those that are not responding, but can meet the needs of the disabled traveller, are also missing the opportunity to develop loyal customers. Indeed, studies show that the greater the sensitivity and empathy paid to the disabled, the greater the benefits returned in terms of acceptance, sales and loyalty (Quinn, 1995; Baker *et al.*, 2002).

CONCLUSION

Information is 'the lifeblood' of tourism. The Web offers benefits to both buyers and sellers in the ready supply and exchange of this lifeblood, information. However, without careful consideration of the capabilities and needs of all consumers these benefits may not be available to all. In particular, they may not be available to the sizable group of individuals in the marketplace with a disability. Simply, disabled travellers frequently have particular needs and capabilities when it comes to accessing and processing the content of the Web. Most notably, many will be accessing and processing information using assistive technologies.

Although ensuring access to the content of the Web maximises reach for the organisation and has therefore a competitive imperative, there are at least two other reasons for organisations to consider accessibility issues. First, denying access to information involves denying access to opportunity and participation. As such, a legal imperative is emerging and developing to ensure that discrimination does not take place. Second, the needs of the disabled are frequently the needs of others in society. Indeed, the maxim here is that good (accessible) design is good for all.

When working to accommodate the different needs and capabilities of individuals in the marketplace, organisations can look to the W3C and its design principles. Indeed, attempting to meet just the minimum Priority

1 standard would in many cases require little additional modification to existing pages. However, ensuring access by following the technical guidelines laid out in the three priority levels is only the first step in meeting the needs of disabled and challenged tourists. Organisations need to ensure that individuals have access to relevant or rich information that actually serves their informational needs.

In terms of access to content and the quality or relevance of that content the clear majority of the UK-based hotel websites surveyed in this research failed to meet the needs of disabled tourists. The obvious consequence of this is the opportunity cost of lost business and, later down the line, the opportunity cost of not establishing and building relationships. Of course this is made worse if organisations have indeed worked to provide accessible facilities and service related to people with disabilities at the hotel.

APPENDIX A

1 Generic information for all disabled tourists
  1.1 Pre-arrival services
    Met at the train station/airport/bus station/etc.
    Transport to and from hotel to connections
    Taxi booking service
  1.2 On-arrival services
    Assistance with bags on arrival
    Escort to room
    Guided tour of facilities
    Emergency and evacuation procedures
  1.3 During your stay
    Disabled car parking
    Transport to and from local attractions
    Specialist equipment available in-house (e.g. emergency assistance buttons, medical equipment, etc.)
    Ground floor rooms available where required
    Accessible entertainment in-house (e.g. bars, dancing, dining, live shows, etc.)
    Accessible excursions/activities arranged or provided
  1.4 Specialist staff skills
    Medical
    Access and facilitation

    Undertaken disability equality training
    Resolving problems and disputes
2 Specific information for visually impaired tourists
  2.1 During your stay
    Guide dogs welcome
    Facilities for guide dogs
    Assistance with dining facilities where required (e.g. personal assistance with self-service dining, arrangements to serve at table, escort to chair, etc.)
    Table service available in bars and restaurants
    Specialist in-house entertainment (e.g. live music, audio shows)
  2.2 Information communicated in alternative formats
    Large print
    Braille
    Audio
    Décor (e.g. colour coding to help route finding, contrast door frames with surrounding walls, steps distinguishable through contrasting brightness, avoid all-white finishes in bathrooms, coloured towels, coloured stickers on glass doors)
    Coloured coded crockery, glassware, serving dishes, etc., in restaurants/bars
    Personal explanation (e.g. location of facilities and room layouts, controls for equipment, etc.)
  2.3 Appropriate signage
    Contrasting colours
    Clear print
    Non-reflective
    Well-lit
    Accessible height
3 Specific information tourists with mobility impairment
  3.1 During your stay
    Availability of all facilities (i.e. are all facilities available to wheelchair users?)
    Location of facilities (e.g. ground floor, close proximity, no obstacles, etc.)
    Access to facilities (e.g. space to manoeuvre wheel chair, ramps, low reception desk, all controls at accessible height, blocks available to alter height of beds, etc.)
    Assistance with dining facilities where required (e.g. personal assistance with self-service dining, escort to chair, etc.)

Table service available in bars and restaurants

Specialist equipment available in-house (e.g. swimming pool lift, wheel chair hire, etc.)

4 Specific information for guests with limited dexterity

  4.1 During your stay

    Provide specially adapted crockery and cutlery

    Large buttons on controls and telephones

5 Specific information for tourists with hearing difficulties

  5.1 During your stay

    Induction loops/visible loop symbol

    Text phones

    Visual telephone alerts

    Visual or vibrating emergency alarms

    Accessible entertainment (e.g. subtitles for films, signer for live shows)

  5.2 Information communicated in alternative formats

    Visual text and imagery

    Sign-language

    Subtitled videos

    Teletext and Ceefax TV

APPENDIX B

Copy of email sent to booking agencies in the original sample

Dear Sir/Madam,

I am writing on behalf of a friend of mine who is currently planning a trip to London at the end of October. My friend has a motor disability and is a wheelchair user, so he would like information on accessible hotels in central London. As you can appreciate, he is eager to choose a hotel which will cater for his needs so that he can get the most out of his visit.

I would be most grateful if you could provide me with as much information as you can regarding hotels in central London that cater for wheelchair users, and the specific facilities/services they offer.

Thank you in advance for your consideration of this request.

Regards
Bill Russell

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