

Introduction

This is the second issue of NRHM in 2004, the first volume to appear with two issues. The main theme for the issue is Accessible Hypermedia and Multimedia (Guest Editors, Simon Harper, Yeliz Yesilada and Carole Goble). We would like to thank all the authors who submitted papers and the reviewers who contributed substantially both to the selection and via feedback to the final presentation of papers. Scholarly Hypermedia will be the theme for the first issue of 2005 (Guest Editor Simon Buckingham Shum).

This second volume of NRHM published by Taylor & Francis continues the publication in both print and digital format begun last year. The online NRHM can be found via the journal's website at www.tandf.co.uk/journals/titles/13614568.asp. Online versions of NRHM provide CrossRef citation linking based on Digital Object Identifiers (DOI) and a search capability. For early information on the contents of NRHM issues, readers can make use of SARA (Scholarly Articles Research Alerting, see www.tandf.co.uk/sara). We are interested in exploring the possibilities of the digital medium in future issues, for example digital video clips illustrating environments, data or interfaces discussed in the paper. Authors are encouraged to contact the Editor regarding other proposals for digital material. For more information and current calls for papers, see the NRHM website.

Introduction to Accessible Hypermedia and Multimedia

Layout and structure are key to good visual design. They are the conduit for both the content and the graphics. Being able to easily and quickly interact with the layout and structure is crucial for reading and understanding the content. This is particularly important for disabled people (e.g. visually impaired) as the layout and structure usually hinder them accessing the content rather than helping them to interact easily with it.

Conventional journals on accessibility tend to be single disciplinary in nature. However, we are concerned that a single disciplinary approach prevents the cross-pollination of ideas, needs and technologies from other related but separate fields. This special issue is therefore decidedly cross-disciplinary in nature. It brings together a range of articles from the perspectives of users, accessibility experts, graphic designers, and technologists from academia and industry to inform how accessibility can be supported. To strengthen the cross-disciplinary nature of this special issue, we have also solicited the views and thoughts of nine world-renowned researchers all from related but different fields that mainly do not focus

on the accessibility domain. We asked for their views on how accessibility affects them or (will) should affect them. Throughout the remainder of this introduction we relate their thoughts and concerns to material selected for this special issue.

Accessibility means many things to many people; some designers see accessibility as a hindrance to their design goal, others see it as a challenge, and still others see it as necessity. For example, Eric Meyer thinks that “Accessibility is the soul of the Web” (p. 9), whereas Bob Regan considers that “Web accessibility and Web design are two disciplines with a common theory and divergent practices” (p. 11). However, despite these different explanations and approaches, we all agree with Ted Nelson when he suggests that “Accessibility isn’t just a code-word for the challenged, it’s what everybody needs” (p. 9).

Many accessibility researchers believe that designers do not think about accessibility in the same terms as users and practitioners. Most designers usually focus on the creative process and perceive that accessibility will constrain their design and creativity. They tend to believe that accessible and creative designs are mutually exclusive. As Bob Regan says: “despite the theory that links Web accessibility and Web design, they do not share a set of common practices” (p. 9). However, designers create art and the accessibility community should not make the mistake of trying to constrain this creativity. In fact, accessibility practitioners need to understand and accept that rich media like Flash, scripting languages like Javascript, rollover buttons, complex images and animations are not going away, and neither should they. As David Lowe suggests, “Accessibility is not something that is achieved simply by using specific technologies, nor is it something which can be ‘tacked on’ to a completed application. Rather, accessibility needs to be woven deeply into the design of the application, and as such true accessibility requires effective designs and hence design processes” (p. 8). This also highlights the fact that designers play a crucial role in generating accessible pages. The accessibility community needs to demonstrate that accessible design is good design and accessible pages do not need to be bland and dull. Although there are already a number of good examples of both accessible and visually appealing websites such as Oxfam (www.oxfam.org) and eBay (www.ebay.co.uk) [1], we still need to provide a good set of examples. As Bob Regan says, “designers do not emulate designs because they are accessible, they emulate sites that they admire or that inspire them”, so it is important to have accessible pages that can inspire designers.

Many Web designers move from print media to Web design and this pre-gained experience in creating static designed artefacts forces them to see design as fixed and immovable once created. A designer creates and controls the development of what is in effect a piece of art and therefore, once created, should not be changed or violated. It can be difficult to convey the idea that users often require Web pages to adapt to their needs, and the fact that this sometimes goes beyond art. User experience must also be taken into account because in some cases the design is accessible but the user is still not having a good interaction experience.

Accessibility is not only utilitarian it is also about comfort, 'feel' and enjoyment. Many users may wish to adapt the page to their own requirements and therefore tools and designs that support this 'adaption' will become of increasing importance. As Helen Ashman indicates, "personalization and adaptation are the tools that will make it possible to provide an apparently simple yet powerful tailoring of data and services to individual users and to small groups with special interests and needs" (p. 5).

Designers need to become aware that their design may be changed and adapted by the user and so they should start to design with this challenge in mind. While guidelines work hard to address users' needs, Web adaptation technology must also be used to control page look and feel. Adaptation and flexibility are the focus of our first paper "Taking control of the Web browser" by Vicki L. Hanson (IBM Research). Vicki proposes that the needs of many individuals fall outside the guidelines for accessible content that most Web authors take into consideration. She proposes that many users, for example, wish that they could simply 'enlarge' what is on a Web page and express the wish that pages would be 'less confusing'. To meet these needs, Vicki proposes an adaptive and flexible Web browser, along with various software applications to provide for a variety of ways in which page presentations can be altered.

Designers have been forced into using workarounds (like image spacers) because the accessibility technology did not provide them with a technological solution. As Eric Meyer highlights, "the lack of accessibility in many sites is a reflection of the twisted design techniques that were developed (not out of spite, of course, but because there wasn't any other choice in the early days)". Therefore, we believe it is the responsibility of the accessibility community to support designers by providing solutions, technical demonstrators and dialogue. The article entitled "Automated interpretation and accessible presentation of technical diagrams for blind people" by Mirko Hortsman *et al.* goes some way towards this goal by proposing a system for the interpretation and accessible presentation of technical diagrams for visually impaired users. As Dave Shea stresses, "graphic design is about visual perception", so it is important to provide techniques such that people who cannot use their vision can also access the information encoded in the graphics. While the article is not directly relevant to the Web, it does elucidate exciting ideas with regard to diagram description and interaction that may become useful for describing all kinds of diagrams and graphics, especially Web-based Scalable Vector Graphics.

Although most hypermedia and multimedia systems rely heavily on (as yet inaccessible) graphics, they nevertheless can provide an important platform for e-learning and online teaching. These systems can be very important with regard to students with disabilities who otherwise may not have access to high-quality institutions and the learning resources they offer. Helen Ashman provides a good example to support this: "many students in European universities are unable to make direct use of online teaching materials due to disability, or find online notes

challenging and slow to use” (p. 5). Therefore, the challenge here is to present the educational material in an accessible and easy-to-use form for all students.

Acknowledging the importance of education we have included both a full article and a technical note on this topic. Mirabella *et al.* describe in their paper “Accessible e-learning material: a no-frills avenue for didactical experts” the problem of supporting technical guidelines while ignoring those required by didactical experts and suggest that this may negatively impact learning effectiveness. In particular, their work proposes tapping into the experience of didactical experts by providing them with an avenue through which they can appropriately contribute to the development and deployment of accessible e-learning material. Next, Karampiperis and Sampson present their findings in the technical note “Supporting accessible hypermedia in Web-based learning systems”. They propose that there is a need for an architectural definition of a Web-based learning system that satisfies the design steps and requirements identified following the current state-of-the-art accessibility approaches and techniques. They go on to postulate the need to define an accessibility application profile for enabling the formalization of learning object accessibility properties in order to match learning content with learner accessibility preferences. These two articles propose a number of guidelines to support accessibility and e-learning. However, although conforming to guidelines is necessary, it is not sufficient to provide accessibility. As Wendy Hall indicates: “the website could pass all the accessibility guidelines and standards but still be impossible for users to navigate or find the sort of information they need” (p. 6). Previously guidelines were feared and not particularly testable but movement is now being made towards standards harmonization between guidelines sets (WCAG, 508, DDA, etc.) and making those sets testable in a more rigorous way. Guidelines need to be quickly adaptable to new technologies and best practice, and it is important to have the ability to quickly include guidelines for different activities such as search engine results navigation and the semantic delivery of information. Peterson and Panovic hint at this in their article “Accessing Egypt: making myths and producing websites in cyber-Cairo”. They discuss how the ethnographer’s task is the specification of key actors, institutions and discourses active in the making and remaking of accessibility in a given context. In their article, they examine how Egyptian Web producers at the turn of millennium (1999–2001) sought to design Web portals that would allow the ‘typical’ Egyptian to easily access the World Wide Web. They go on to describe the pitfalls that occur because the preconceived ideas of the Web producers were out of touch with Egyptian social realities. Indeed it seems that these Web producers should have more fully researched their user base, as indicated by Jef Raskin, and designed “the technology to meet the needs of the human” (p. 10).

From the designer’s perspective education and outreach are important factors for the incorporation of guidelines. The challenge has moved on from the creation and publication of guidelines to making designers aware of guidelines

and facilitating their use by a dialogue with design practitioners, not accessibility experts. As Julie Howell says: “it is clear that until budding Web developers receive appropriate training the gap between good intentions and good practice will remain” (p. 7). Dave Shea, as a designer, also supports this by saying that “it’s really not difficult to do the job, it’s just a matter of knowing how” (p. 9).

Together the articles in this special issue present a picture of the current state of the art of research in accessible hypermedia and multimedia. We hope that this issue will be of use to researchers who are interested in investigating accessibility and accessible technologies as well as to practitioners who want to build practical accessible systems. This issue aims to address layout, structure and presentation from the viewpoint of accessible hypermedia, multimedia and good visual design. It is mainly inspired by the most recent workshop (www.w4a.info) on Web accessibility that was held at the World Wide Web Conference (New York, USA, May 2004) [1]. To follow up, this special issue attempts to focus on a number of critical issues that formed the focus of the workshop. To reflect the cross-disciplinary approach of both the workshop and this special issue, we conclude with the views of experts from different but related fields. We believe they can inspire designers, researchers, and accessibility experts from academia and industry in their effort to support accessibility.

Helen Ashman (ACM Special Interest Group on Hypertext, Hypermedia and the Web (SIGWEB))

Helen Ashman is a lecturer and hypermedia practitioner at the University of Nottingham. She is the Information Director of the ACM Special Interest Group on Hypertext, Hypermedia and the Web (SIGWEB).

In everyday life in Europe, people are encountering increasing amounts of information, data and options. There is more choice in almost every aspect of daily life than ever before, and more opportunities than previous generations could have dreamed of. Option and opportunity are eminently desirable ideals, providing people with a sense of control in their lives that can easily be lacking in the highly structured society in a densely populated Europe. Human nature requires an element of self-determination in order to achieve a fulfilled and worthwhile life, and to maintain a sense of identity in an increasingly anonymous environment.

Personalization and adaptation are the tools that will make it possible to provide an apparently simple yet powerful tailoring of data and services to individual users and to small groups with special interests and needs. Option is enabled by the adaptation and personalization forming content and its presentation according to the user’s own requirements, while opportunity is enhanced by the adaptation and personalization giving access to data and services that may not otherwise have been available to certain users and groups. For example, many students in European universities are unable to make direct

use of online teaching materials due to disability, or find online notes challenging and slow to use.

The potential for adaptive hypermedia and personalization technologies to enhance the opportunities of disabled people and, indeed, all people, is great. Adaptation and personalization can present the same materials to different people in different ways, tailored according to their needs and abilities.

Wendy Hall (The British Computer Society (BCS))

Wendy Hall is Professor of Computer Science at the University of Southampton. She was the founding Head of the Intelligence, Agents, Multimedia (IAM) Research Group in the University's School of Electronics and Computer Science and is currently the Head of School. Wendy was awarded a CBE in the Queen's Birthday Honours list in June 2000, and became a Fellow of the Royal Academy of Engineering (FREng) in the same year and now sits on the RAE Council. She is a Fellow of the IEE (FIEE) and chairs the Education Sub-committee of the IEE Qualifications Board. Wendy was appointed to the Prime Minister's Council for Science and Technology in March 2004 and is currently President of the British Computer Society.

To be absolutely honest I don't know much about accessibility. I recognize it as a very important issue but I have never been involved with any accessibility projects either from a research perspective or a user community perspective. I have been involved with organizations that have produced very inaccessible websites that suffered as a consequence. They suffered because they were attacked by the people who care about such things, and because they made it so difficult for people to access the information in the website. What seemed always to be very apparent was that if the site was inaccessible for people with particular disabilities, then it was generally inaccessible by people without disabilities. I'm not sure if this is always the case, but I have always found that if we take care to make sure that a site meets the accessibility guidelines/standards, then it helps everyone. So although this is not a world I have ever been closely related to, I very much appreciate the efforts of the individuals and teams who have been responsible for developing accessibility guidelines and standards.

It is important to note here that I think there are two aspects to accessibility. One is the design issues that affect the ability for people with disabilities to access information, and the other is the design issues that affect the ability for users in general to find their way around the information made available at particular websites. A website could pass all the accessibility guidelines and standards but still be impossible for users to navigate or find the sort of information they need.

Do I think the Web is a hindrance to accessibility? The answer has to be, in the overall scheme of things, no. The Web has been a major breakthrough in technology that has enabled anyone with an Internet connection to access information from any Web server assuming they have the necessary access rights.

The more interesting question relates to current Web browsers – are they a hindrance to accessibility? – as they mediate the interaction between users and the information available via the Web. My answer to this question is almost certainly yes. The early designs of the Mosaic Web browser were very pragmatic. Mosaic made access to the Web very easy at a time when most people were using complicated command-line driven protocols to access files on the Internet. It enabled the Web to reach people in a way that might not have been possible if such a functionally simple interface had not been designed. But the design of Mosaic has influenced the design of Web browsers ever since, and there is little chance of this changing. We are stuck in the Web browser paradigm as surely as we are stuck in the QWERTY keyboard paradigm, and this is a disadvantage to everyone as we move into the world of pervasive computing. We need to think outside the Web browser to make any major breakthroughs in user interface design. If we do this with accessibility issues in mind we will all be winners.

Julie Howell (Royal National Institute of the Blind (RNIB))

Julie Howell is a Digital Policy Development Manager at the Royal National Institute of the Blind (RNIB) in the UK. She established the RNIB's Campaign for Good Web Design, a national initiative to raise awareness of the benefits of making websites accessible to disabled people.

Assuming that few would argue against the right of disabled people to use the Web, and assuming that even fewer would argue against the need for Web design to be 'good design', the greatest challenge to good accessible design must be the transformation of good intentions into best practice. In April 2004, the Disability Rights Commission (DRC) published the results of extensive research into the accessibility of websites in the UK. The report's main findings made grim reading: 81% of the sites surveyed failed to meet even the most basic criteria for accessibility as set out by the World Wide Web Consortium (W3C). In addition to studying websites, the researchers also interviewed website commissioners and developers in an effort to gauge their awareness of accessibility. Ninety-seven per cent of website commissioners interviewed claimed to be aware of accessibility as an important issue, while 76% stated that they have policies on accessibility. If we believe this is true, then why is there a huge gap between policy and practice? Eighty per cent of Web development agencies interviewed for the research said they attempted to develop accessible sites at least some of the time. But where is the evidence? In fact, only 9% of Web developers claimed any sort of expertise in Web accessibility. So perhaps we should not be so surprised that the Web is still largely inaccessible. It would appear that accessible Web design is beginning to be regarded as a 'dark art'. This should not be the case. The W3C Web content accessibility guidelines have been developed on the premise of openness ('open standards'). When it comes to the guidelines, surely the message is the medium: guidelines that are easy to understand, easy to implement. Somehow, somewhere,

something is going wrong. In its recommendations the DRC suggests that “organisations which provide and oversee education and training for developers . . . should promote an understanding that good development practice entails attending, and responding, to the needs of disabled people”. It is also suggested that modules on disability awareness and accessibility be offered as part of the basic training in website development. Further to this, such modules should form an integral part of any continuing professional development. It is unclear how the DRC will promote the teaching of Web accessibility techniques within universities. But it is clear that until budding Web developers receive appropriate training, the gap between good intentions and good practice will remain.

David Lowe on *Hypermedia, Multimedia and Accessibility*

David Lowe is a Professor in the Faculty of Engineering at the University of Technology, Sydney. He has active research interests in the areas of Web development and technologies, hypermedia and software engineering. He has published widely in the area, including several books: Hypermedia and the Web: An Engineering Approach (Wiley, 1999) and XPath, XLink, XPointer, and XML: A Practical Guide to Web Hyperlinking and Transclusion (Addison-Wesley, 2002)

While various technologies undoubtedly have an impact on our ability to create accessible applications, or to support access to other applications, the real key is not in the technologies themselves but rather in how we approach the development of applications. Accessibility is not something that is achieved simply by using specific technologies, nor is it something that can be ‘tacked on’ to a completed application. Rather, accessibility needs to be woven deeply into the design of the application and, as such, true accessibility requires effective designs and hence design processes. Unfortunately, current hypermedia (and Web) design methods and models typically do little to address accessibility as a specific design criteria or give designers clear guidance in this area. The result is a disjoint between design methods and accessibility design. For example, while there is considerable expertise and research on what defines accessible systems (and hence implementations), we have not fed this into understanding how it might be reflected in designs created using current methods or represented using current models. While I don’t have good answers to how this might be addressed, I can at least provide some key questions that we need to consider. Is accessibility something that should be embedded into the data model? Or the hypertext model? Or the presentation model? Or is it something that arises out of the interaction between all of these? How are accessibility requirements best modelled? Is accessibility something that is really determined purely at the user interface level or is it fundamentally designed at the information architecture level? Or do we need to even go further back to the workflows and business processes and information sources themselves? We won’t be able to consistently create accessible applications until we are able to answer these questions.

Eric Meyer on CSS and Accessibility

Eric Meyer is the principal consultant for Complex Spiral Consulting (www.complexspiral.com). He is regarded by many as one of the most experienced and innovative CSS masters. He is also the author of Cascading Style Sheets: The Definitive Guide (O'Reilly & Associates), CSS2.0 Programmer's Reference (Osborne/McGraw-Hill) and Eric Meyer on CSS (New Riders).

Accessibility is in many ways the soul of the Web, and it was designed from the beginning to be accessible. The lack of accessibility in many sites is a reflection of the twisted design techniques that were developed (not out of spite, of course, but because there wasn't any other choice in the early days). In recent years, the combination of lightweight, structural markup and CSS has brought us back to the Web's accessible roots. The real barrier at this point is the sheer inertia of legacy sites, which are sometimes reluctant to update their markup. Over time, this will be less and less of a problem.

From my perspective, there are two problems with Web accessibility right now: the problems inherent in image-replacement techniques, and the brokenness of screen readers. Those are actually two sides of the same problem. In image-replacement techniques, the visual goal is to suppress the display of text content and replace it with an image (or Flash) that is more attractive to the eye. The idea is that the text is still in the document for accessibility purposes, but the visual presentation is more sophisticated than plain text will allow.

The problem is that screen readers are by and large audio renderings of the visual presentation, minus any image-replacement text, instead of being audio browsers. If screen readers would ignore screen-medium CSS and just render the content, there would be no problem. Instead, they try to force the screen and aural media together, and the results are terrible. Unfortunately, until these programs fix their flaws, there will be some tension between design and accessibility. That's a real shame, because for the first time in a long time, it seemed possible to have the two work side by side, just as they were always supposed to do.

Theodor (Ted) Holm Nelson on Hypertext and Accessibility

Ted Nelson is the visionary who is credited with coining the term Hypertext. He is also the founder and pursuer of the Xanadu project (www.xanadu.com). He is currently a Fellow of the Oxford Internet Institute and Visiting Fellow of Wadham College, University of Oxford, UK.

'Accessibility' isn't just a code-word for the challenged, it's what everybody needs. Today's computer documents have gone from bad to worse – simulating paper rather than allowing deep interconnection, annotation and re-use. The approach I hope to take in our DeepLit project will be to deconstruct and cache today's convoluted text formats into three levels: strands of pure characters; connections

of re-used content ('transclusions' – for quoted material); and overlays of links, decoration and new structure. This should allow people to create new views, read-aloud systems, and interactions for every purpose and need. We need to loosen things up a lot.

Jef Raskin on *Human Computer Interaction and Accessibility*

*Jef Raskin is the author of *The Humane Interface* (Addison-Wesley 2000), creator of Apple's Macintosh, the Canon Cat, click-and-drag selection and other inventions. He coined the term and the concept of 'information appliances'. Jef is an interface and systems designer, a writer and a consultant, concentrating primarily on making computers more usable and their interfaces efficient as well as pleasant.*

Humans are variously skilled and part of assuring the accessibility of technology consists of seeing that an individual's skills match up well with the requirements for operating the technology. There are two components to this; training the human to accommodate the needs of the technology and designing the technology to meet the needs of the human. The better we do the latter, the less we need of the former. One of the non-trivial tasks given to a designer of human-machine interfaces is to minimize the need for training. Because computer-based technology is relatively new, we have concentrated primarily on the learnability aspects of interface design, but efficiency of use once learning has occurred and automaticity achieved has not received its due attention. In addition, we have focused largely on the ergonomic problems of users, sometimes not asking if the software is causing cognitive problems. In the area of accessibility, efficiency and cognitive can be of primary concern. For example, users who must operate a keyboard with a pointer held in their mouths benefit from specially designed keyboards and well-shaped pointers. However well-made the pointer, however refined the keyboard layout, and however comfortable the physical environment we have made for this user, if the software requires more keystrokes than absolutely necessary, we are not delivering an optimal interface for that user.

When we study interface design, we usually think in terms of accommodating higher mental activities, the human capabilities of conscious thought and ratiocination. Working with these areas of thought bring us to questions of culture and learning, and the problems of localizing and customizing interface designs. These efforts are essential, but it is almost paradoxical that most interface designs fail to first assure that the interfaces are compatible with the universal traits of the human nervous system – in particular those traits that are sub-cortical and that we share with other animals. These characteristics are independent of culture and learning, and often are unaffected by disabilities. Most interfaces, whether designed to accommodate accessibility issues or not, fail to satisfy the more general and lower-level needs of the human nervous system. In the future, designers should make sure that an interface satisfies the universal

properties of the human brain as a first step to assuring usability at cognitive levels.

Bob Regan on *Macromedia and Accessibility*

Bob Regan is the senior product manager for education and government at Macromedia. He looks at features, techniques and issues that affect designers, developers, and government and education end users that include accessibility. He is also a contributing author to several books including Constructing Accessible Web Sites, The Flash Usability Guide, Dynamic Dreamweaver MX, and The Webmasters Handbook.

Web accessibility and Web design are two disciplines with a common theory and divergent practices. Both endeavours rely on a standard set of techniques to ensure a consistent experience of data and content across a diverse set of end users. Both rely on creative individuals to build and deliver great sites and great experiences that have an impact on the user. Both seek to extend the reach of the end user and link individuals together to form a stronger collective whole. However, despite the common theory that links them, Web accessibility and Web design do not share a common set of practices. Sites hailed for their accessibility are rarely noted for their design. Sites hailed for their design are rarely noteworthy as models of accessibility. Few sites are ever held up as models of both great accessibility and great design.

Designers do not emulate designs because they are accessible, they emulate sites that they admire or that inspire them. It is only by reaching the hearts and minds of the very designers who create websites that accessibility will truly become mainstream in its practice. Designers need to bring their considerable creative powers to bear on the specific challenges of accessibility. The accessibility community needs to value that power of design and to cultivate a culture of innovation and creativity in accessible design. To date, the absence of a connection between designers and accessibility represents the greatest failure of accessibility and its greatest challenge moving forward.

Dave Shea on *CSS Zen Garden and Accessibility*

Dave Shea is one of the top designers in the Web industry. He is also the creator and cultivator of the highly influential CSS Zen Garden (www.csszengarden.com), which demonstrates the design power behind Cascading Style Sheets.

The furthest thing from my mind when I'm in Photoshop is how accessible my imagery should be. Graphic design is about visual perception. In a setting where visuals are absolutely everything, there's no point in being concerned about those who can't view them. But that's not to say I never do. When building my design work into a final product, all of a sudden it becomes incredibly important for me to start thinking about who's going to need to access my work. I build websites

for the sake of communicating information; if a user cannot access that information, then I have failed my job for that particular user. So how can two disciplines be reconciled with seemingly contradictory goals? Fortunately I don't have to think about it, as those far more knowledgeable than I have done the thinking for me. The W3C's Web Content Accessibility Guidelines (WCAG) are a listing of methods for ensuring that the content I produce is available to the widest range of users possible.

Adding ALT text to my image tags is simple for me – but it makes an incredible impact on the experience of a blind user accessing my work with a screen reader. Formatting my document structure with proper HTML markup like header elements requires no more education than a few minutes to figure out which element does what job; but the ability for a user to skip between linear elements in a non-linear fashion is a huge boost to the usefulness of a site. When it comes down to it, building a properly accessible site is no more work than knowing the proper way of coding HTML, because it was designed to be accessible. Layout tools like CSS mean I don't have to compromise my design ideas to achieve this. It's really not difficult to do the job well, it's just a matter of knowing how.

Acknowledgements

Many people contributed to the success of this special issue. We would like to thank the programme committee for their exceptional work and dedication in the review process; our sponsors SigAccess, IBM Research, Macromedia and Adobe for their support; the general editors Doug and Daniel; and finally, the authors for their excellent work and participation.

Reference

S. Harper, Y. Yesilada and C. Goble, Eds, *Proceedings of the International Cross-disciplinary Workshop on Web Accessibility, W4A*, New York City, USA: ACM Press, May 2004. ISBN 1-58113-903-9. www.doi.acm.org/10.1145/990657.

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