

Preface



The desire to make information technologies accessible to diverse user populations has given rise to the burgeoning fields of universal access and design. The goal of accessible design is to develop technologies that are usable by the broadest possible spectrum of users. Mandated in some cases by government regulations, systems and applications that are accessible have become both economic and societal priorities. While emphasis and attention to accessible design is on the increase, fully accessible information technology remains a goal, not a current state. This special issue of the *IBM Systems Journal* on accessibility presents one snapshot of work in these areas. The papers in this issue include theoretical explorations on the topic of accessibility along with practical solutions and recommendations about how to advance the state of the art.

In “Accessibility requirements for systems design to accommodate users with vision impairments,” Brunet et al. discuss requirements for a platform to be accessible to users with vision impairments, emphasizing the difficulties that arise when accessibility features are introduced late in the development cycle. Access requirements are considered from the perspective of the systems architect, the assistive technology developer, and the application developer. Hoffman et al. also address the topic of architecture and accessibility in “Designing software architectures to facilitate accessible Web applications,” focusing on complex Web applications in support of multiple user groups. Critically, these authors raise the notion of usability, a topic that is echoed in a number of other papers in this issue. Turunen et al., in “An architecture and applications for speech-based accessibility systems,” are also

concerned with architectures that support accessibility, although their focus is specifically on describing elements of an architecture that support natural speech interactions with computers.

As developers strive to make systems and applications accessible to diverse user groups, tools that facilitate this task have become indispensable. The paper “Evaluating accessibility by simulating the experiences of users with vision or motor impairments” by Mankoff et al. presents research that would allow developers to experience the difficulties that users with vision or motor impairments experience with an application. User-centered design is acknowledged as the goal; but what is to be done when a sufficiently large population with a particular disability cannot be engaged for testing and design? A simulation tool is described that allows developers to identify usability problems early in the design process. In “Managing usability for people with disabilities in a large Web presence” by King et al., two key problems are addressed: the immensity of the task of evaluating the accessibility of millions of Web pages and the challenge of ensuring superior usability improvements. This paper presents solutions for managing these issues in an efficient, enterprise-wide way, drawing on the authors’ experience in making the IBM Web site accessible. Englefield et al., in “A proposed architecture for integrating accessibility test tools,” acknowledge that existing test tools require extensive customization to enable the developer to construct the user interface, generate reports, and so forth. They propose a set of automatic tools for evaluating Web site accessibility, returning to the

recurrent themes of usability and consideration of diverse users in the early stages of design.

Acknowledging the unique needs of users with disabilities, several papers in this issue address individual learning styles and needs. Two papers in this issue introduce questions about future needs and issues of designing for older adults. Demographics worldwide are shifting, such that populations, specifically working populations, are becoming older. A number of age-related disabilities can impact ability to use technology. The paper by Milne et al., "Are guidelines enough? An introduction to designing Web sites accessible to older people," raises issues of designing for older adults in the context of Web usability. Hanson et al., in "Improving Web accessibility through an enhanced open-source browser," discuss enhancements to a Web browser that allow personalization of the browsing experience. The underlying premise of the work is that users with disabilities are unique individuals, and even pages designed for accessibility may not meet the specific needs of each user. In "Accessibility, transcription, and access everywhere," Bain et al. describe speech-captioning applications that can serve a number of user populations in both educational and business settings. They address the question of how to exploit currently available technologies in order to make captioning more affordable and therefore, more pervasive. This work elaborates on a pragmatic view, that creating solutions with imperfect technologies (mediated by human intervention) will ultimately result in improved service as well as improved technology. Emiliani and Stephanidis look to the future in "Universal access to ambient intelligence environments: Opportunities and challenges for people with disabilities." They explore issues of accessibility for older users and disabled users as technology becomes ubiquitous.

This special issue concludes with a number of short papers that address specific accessibility applications and assistive technologies. Levine and Schapert, in "A mouse adapter for people with hand tremor," describe an assistive technology that enables easier mouse usage for persons who have difficulties controlling a typical pointing device. The paper by Petrie et al., "Personalization, interaction, and navigation in rich multimedia documents for print-disabled users," presents an application designed for print-disabled users that provides a

number of alternative multimedia options for access to print material. Finally, Harper and Bechhofer, in "Semantic triage for increased Web accessibility," tackle the problem of Web browsing by users with visual impairments. The difficulty of scanning for information is considered, and the authors present their research approach to dealing with this problem.

We have endeavored in this special issue of the *IBM Systems Journal* to convey a sense of the breadth and depth of some of the critical work underway in accessibility research and development. A range of disabilities is reflected—low vision, no vision, motor disabilities, cognition, and deafness—and different methods for increasing inclusion are explored. The aging of populations worldwide has accelerated focus on accessibility needs because aging is so often correlated with decreased vision, hearing, motor, and cognitive abilities. Deeper exploration into accessible solutions is required to meet the needs of the nearly one billion people worldwide with some form of disability. There are open questions about what needs to be done to address full societal access and technological advances required in order to fulfill that objective. We hope that the papers in this *Journal* can serve to advance both the science and the implementation of more accessible environments.

The next issue of the *Journal* is devoted to service-oriented architecture.

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