

Preface

Overview and Motivation

The Web has rapidly become more and more pervasive in almost everybody's lives. There are many daily activities that can be performed much more comfortably online. There are also daily activities that cannot be performed without using the Web. Much of the power of the Web comes from the fact that it presents information in a variety of formats and, therefore, is theoretically accessible by users using a variety of technologies, devices, and computer applications. The Web also becomes a medium to disseminate information in more places and times, and to more people of varying characteristics than any other media can ever achieve.

To create resources that can be used by the widest spectrum of potential visitors rather than an idealized "average," there is a need to consider universality of Web delivery. As director of the W3C, Tim Berners-Lee, puts it: "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."

This requires consideration of the needs and requirements of individuals with disabilities, older persons and children, people for whom English is a second language, people whose cultures and backgrounds are dissimilar to those of Web developers, and those using outdated hardware and software. This list is not an exhaustive list, and this book only scratches the surface of the need to think about nontraditional Web users in the Web design process.

For that reason, the key objective of this book is to look at the topic of universal Web design and evaluation in a new direction by focusing on the user aspect of universal Web design and interaction, and to present the wide range of advanced technology that can help disadvantaged users get access to Web information. The book discusses the basis of a broad framework for the development and evaluation of Web sites for people with various special needs, enriched with contributions from domains as diverse as education, information systems, library and information studies, computer science, business, clinical health, and many others.

The book puts the emphasis on the users, and proposes methodologies, strategies, and approaches for designing and evaluating interfaces that facilitate effective interaction of users with special needs.

The book's objective is to provide information on the state-of-the-arts research in the area of universal Web design to university educators and educators in general; university administrators; researchers; librarians; accessibility and usability consultants; Web-based system managers, designers, technicians, and evaluators.

Description of Chapters

Universal Web design is an approach to the design of Web-based systems, services, and environments to be as usable as possible by as many people as possible regardless of age, ability, background, or situation. For that reason, our book is structured in five broad sections. Section I introduces the general topic of Web accessibility and the current situation with Web accessibility adoption in the society. Section II talks about issues faced by users at the two extremes of life, older persons and children, when interacting with the Web, and how design can alleviate these issues. These two user groups are traditionally underrepresented in the Web design community and, therefore, this book aims to raise awareness of the importance of considering these groups. Section III considers gender-related differences in Web interaction, and how design can appeal to a certain gender. Gender-related differences are very much recognized and highlighted in other areas, such as marketing. Research in this topic, however, is still rare and patchy. This section provides some guidelines and findings of the process of designing for a specific gender group. In Section IV, we include chapters that discuss cross-cultural and multilingual aspects of Web interaction. As Tim Berners-Lee stated, the power of the Web is in its universality, yet the majority of Web sites are aimed at people from Western cultures who speak English. This section presents the work in introducing a multilingual aspect in Web design and work in understanding the effect of cultures in Web interaction. Finally, in Section V, the chapters include studies that aim at facilitating equal Web access for people with specific disabilities. Again, as Tim Berners-Lee stated, the Web should provide access by everyone regardless of disability, and yet low conformance to Web accessibility guidelines was reported worldwide, some arguably are caused by the lack of awareness of the issues faced by Web users with disabilities. This section highlights the state-of-the-art studies on this issue.

The book includes 12 chapters from prominent international authors. The international character of the book is evident from the fact that it includes chapters from authors from Canada, Italy, Republic of Ireland, United Kingdom, and the U.S., encompassing charity organizations, higher education institutions, and medical centers, to name a few.

The following sections present an overview of each chapter.

Section I: Introduction and General Issues

Chapter I, *Web Accessibility and the Needs of Users with Disabilities* is written by Aspasia Dellaporta. It discusses Web accessibility, and focuses on the challenge of meeting the needs of a diverse audience with different types of disabilities, as well as outlining best practices. It reveals that Web accessibility problems do not only affect blind people, but other users with disabilities as well.

Chapter II, *Failing the Disabled Community?: The Continuing Problem of Web Accessibility* is written by David Kreps and Alison Adam. It discusses the current situation with Web accessibility provision, ranging from the legal view to a more practical view. It provides the caveats of automatic accessibility evaluation.

Section II: The Two Extremes of Life

Chapter III, *Designing Children's Multimedia* is written by Bridget Patel. It summarises young children's perspectives about "'good" educational multimedia Web design. It uses a social-constructivist view of learning as the basis to perform user-centred Web design with young children. This chapter is complemented with a case study of using a child-centred participatory design approach with Year 2 children (6 and 7 year olds).

Chapter IV, *Bonded Design: A Methodology for Designing with Children* is written by Andrew Large, Valerie Nessel, Jamshid Beheshti, and Leanne Bowler. It presents a new methodology for designing information technologies called bonded design that is especially suited for design sessions where designers and children collaborate. The chapter is complemented with two case studies where designers work with elementary school students.

Chapter V, *Ageing and its Implications for Elderly Web Experience* is written by Syarifanor Hisham and Alistair D. N. Edwards. It discusses ageing related issues, and their implications for the Web experience of elderly users. The chapter includes a summary of the use of the Web among elderly users in Malaysia. The chapter concludes with some ideas concerning the cultural and demographic differences in determining new trends, directions, and opportunities in advanced Web design specifically for elderly users

Section III: Gender Issues

Chapter VI, *Gender Issues in HCI Design for Web Access* is written by Stefania Boiano, Ann Borda, Jonathan P. Bowen, Xristine Faulkner, Giuliano Gaia, and Sarah McDaid. It presents HCI models at different levels of abstraction, and how gender issues could impinge at each of these levels. The chapter contains some examples

from the commercial and cultural fields in the form of design case studies of home pages for Web sites that exhibit gender-related orientation.

Chapter VII, *Interpreting the Female User: How Web Designers Conceptualise Development of Commercial WWW Sites to Satisfy Specific Niche Markets* is written by Noemi Maria Sadowska. It argues that the prevalence and accessibility of WWW makes it a powerful vehicle of change both within design practice and in terms of gender structures more widely. It presents an example of gendered Web portal design that targets female users.

Section IV: Cultural Issues

Chapter VIII, *From Computer-Mediated Colonization to Culturally-Aware ICT Usage and Design* is written by Charles Ess. It uses Hofstede's and Hall's theories to explain communication failures caused by differences between the values and preferences embedded in CMC (computer-mediated communication) and those of a given cultural group. It provides examples of successful online cross-cultural communication via CMC.

Chapter IX, *A Case Study: Creating and Designing a Bilingual Resource Web Site for Somali Immigrants* is written by Sauman Chu, Mauricio Arango, and Charles Earl Love Yust. It addresses the design and procedural variables of creating a bilingual Web site information portal for an audience of culturally diverse immigrants. It describes the design process of a bilingual Web site for Somali immigrants in Minnesota.

Section V: Accommodating Disabilities

Chapter X, *Web Site Design for People with Dementia* is written by Nada Savitch and Panayiotis Zaphiris. It describes design considerations when building Web sites for people with dementia. It also illustrates appropriate methodologies for working with people with dementia.

Chapter XI, *Comparing Comprehension Speeds and Accuracy of Online Information in Students with and without Dyslexia* is written by Sri Kurniawan and Gerard V. Conroy. It describes describing problems people with dyslexia experience with reading online material and some technological aids available to help them. It presents a user study that found that students with dyslexia are not slower in reading than students without dyslexia when the articles are presented in a dyslexia-friendly colour scheme, although they still made more errors in comprehension.

Chapter XII, *Implementing Accessible Online Learning for Blind and Visually Impaired Students: A Pilot Study* is written by Hugh O'Neill, Inmaculada Arnedillo-Sánchez, and Brendan Tangney. It presents a framework for the design of acces-

sible online learning environments for blind and visually impaired students using a combined approach of WCAG and principles of universal design for learning. It is complemented with a case study of using objectivist instructional design theory to teach blind and visually impaired students how to write Web pages in HTML.