Focusing on an international R&D agenda for Universal Accessibility: Reflections from the 2nd ISF workshop

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Abstract

This position paper reviews and provides a consolidated account of the results of the second workshop of the International Scientific Forum "Towards an Information Society for All" that took place in Heraklion, Crete, Greece on June 15-16, 1998. Specifically, it examines the developed recommendations for further R&D work, in the light of recent developments and initiatives related to universal access to today's and tomorrow's applications and services.

1. Background to universal accessibility

Universal accessibility in the Information Society signifies the right of all citizens to obtain equitable access to, and maintain effective interaction with, a community-wide pool of information resources and artefacts. Universal accessibility implies more than direct access or access through add-on (assistive) technologies [3], since it emphasises the principle that accessibility should be a design concern, as opposed to an afterthought. In other words, it is claimed that universal accessibility entails the development of systems which can be used effectively, efficiently and enjoyably by all users. To this end, it is important that the needs of the broadest possible end-user population are taken into account in the early design phases of new products and services.

Recent advances towards universal accessibility have provided a design wisdom in the form of design principles and guidelines [4], platform specific accessibility guidelines, e.g. for Graphical User Interfaces (GUIs), or the WWW [5], or domain-specific guidelines, e.g. for text editing, or graphic manipulation [6]. The systematic collection, consolidation and interpretation of these guidelines is currently pursued in the context of international collaborative initiatives, such as the Web Accessibility Initiative - WAI of the World Wide Web Consortium [7] and the ISO TC159/SC4/WG5 [8].

In addition to the above, in recent years, several technical research and development projects have provided insights towards new user interface development frameworks and architectures that account (explicitly, or implicitly) for several issues related to accessibility. Examples include the EC funded projects TIDE-ACCESS TP1001 [9] and ACTS-AVANTI AC042 [10], as well as the Japanese FRIEND21 initiative [11].

Moreover, efforts towards universal accessibility in the fields of IT&T have met wide appreciation by an increasing proportion of the research community, including research consortia in the context of various Programmes of the European Commission; industry, such as Microsoft Active Accessibility and Java Accessibility; scientific and technical committees, such as the Association for Computing Machinery (ACM's) USACM public policy committee; legislative acts, such as the Americans with Disabilities Act, 1993, USA Telecommunications Act 1996 - sec.255; and the United Nations General Assembly Standard Rules [12].

Although there are significant efforts in developing guidelines and recommendations for universally accessible systems, the areas covered today are limited considering the scope and rapid developments of IT&T technologies. On the other hand, technical research and development projects and recent efforts of the mainstream industry to provide insights towards new development methodologies and tools that account for accessibility, are inadequate to support the new collaboration- and communication intensive human activities that will be supported in the envisioned Information Society.

2. The 2nd ISF Workshop

2.1 The International Scientific Forum on "Towards an Information Society for All"

The International Scientific Forum on "Towards an Information Society for *All*" is an international network for collaboration, discussion and exchange of experience and practice on the broad range of issues related to the accessibility, usability and ultimately acceptability of the emerging Information Society. The objective of the International Scientific Forum (ISF) is to promote the establishment of a favourable environment for the creation of an Information Society acceptable to all citizens.

The term *Information Society*, although difficult to define accurately, is frequently used to refer to the new status quo and the new socio-economic and technological paradigm likely to occur, as a result of an all-embracing process of change that is currently taking place; it is expected to affect the interaction in computer mediated human activities[1], individual human behaviour, as well as collective consciousness, and to have major economic and social impact.

In this context, the ISF aims to promote universal design in Information Society technologies, emphasising *accessibility* and *high quality of interaction* by the broadest possible end-user population, including disabled and elderly people. Accessibility, in this context, concerns the right of all citizens to obtain and maintain access to a society-wide pool of resources and information artefacts, while, on the other hand, high quality of interaction, implies quality in the use of information artefacts by humans in the various problem-solving, or information seeking activities.

2.1 Themes of the 2nd ISF Workshop

The second meeting of the ISF took place at Heraklion, Crete, Greece, 15-16 June, 1998, and was sponsored by the European Commission and ICS-FORTH. The focus of this meeting was the treatment of "accessibility" in the Information Society technologies, aiming to elaborate, review and consolidate the outcome of the first ISF meeting, as reported in [1], in the context of four thematic topics, namely:

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[1] The term refers to the broad range of new virtualities facilitated by the fusion of computer networking, consumer electronics and multimedia, and which are likely to determine all kinds of collaboration- and communication-intensive human activities in business, residential or social communities.

⇨ *accessibility and HCI design*

⇨ *accessibility and usability*

⇨ *accessibility and user interface software technologies*

⇨ *accessibility and standardisation.*

For each of these topics, the goal of the workshop was to develop concrete recommendations which would result in influential interventions, anticipated to expand the current scope of R&D activities and support measures in the direction of universal access and high quality of interaction for all citizens in the emerging Information Society. The deliberate intention to address the above HCI-related topics is justified by the critical role of this technology in shaping the type, range and scope of computer-mediated human activities in the emerging Information Society.

3. Reflections from the meeting

During the meeting, accessibility was considered as a global requirement for access to information by individuals with different abilities, requirements and preferences, in a variety of contexts of use. Thus, the meaning of the term was intentionally broad to encompass accessibility challenges as posed by diversity in: (i) the target user population profile (including disabled and elderly people) and their individual and cultural differences; (ii) the scope and nature of tasks (especially as related to the shift from business tasks to communication and collaboration intensive computer mediated human activities); and (iii) the technological platforms and associated devices through which information is accessed.

In total, over 50 recommended research items were identified, during the four mini-workshops. Subsequent analysis of these items revealed interrelationships which gave rise to clusters of R&D targets to be met en route to an information society. Four main clusters were identified [2] (see Table 1). These recommendations cover cross-programme issues and present a comprehensive roadmap for international collaborative R&D.

From the recommendations compiled during the workshop, seven specific provisions (necessary steps) to advance the available results on universal accessibility, in relation to the Information Society technologies, can be formulated. These are as follows:

⇨ Ensure the development of environments of use that are accessible by anyone, at any time, anywhere, employing the concepts of universal design and universal accessibility in the next generation of software technologies.

⇨ Perform studies on how communities of users (with diverse and changing requirements) are formed, evolve and intra- / inter- operate.

⇨ Develop new methods that facilitate the design of suitable computer-mediated activities for the broadest end-user population in the context of communities of users.

⇨ Promote and facilitate the use of more developmental approaches to the study of computer-mediated human activities to include the broadest end-user population.

Table 1: Proposed R&D road-map

Promote the development of environments of use	Support communities of users	Extend user-centred design to support new virtualities	Establish suitable accompanying measures
Determine desirable properties of environments of use (e.g. augmented capabilities on user's demand, multimodality, cooperativity, intelligence, adaptation, etc)	Individual / collective intelligence and community knowledge management	Develop suitable foundations for design by applying, integrating and extending existing user-centred design methods to facilitate the design of new virtual spaces	Articulating demand for design for all
Novel architectures for interactive systems for managing collective experiences of users and non-users	Methodologies for collecting / analysing requirements and understanding virtual communities	Develop metrics for important quality attributes (e.g. usability, accessibility, adaptation, intelligence, etc.)	Supporting the industry
Architectures for multiple metaphor environments	Provide means to access community-wide information resources	Provide computation support for usability engineering (e.g. computer-supported usability platforms)	Awareness and knowledge dissemination
Multi-agent systems and components to support co-operation and collaboration	Develop models to support social interaction amongst members of on-line communities	Extend existing requirements engineering methods to facilitate the elicitation of requirements in novel contexts of use and different user groups.	Technology transfer
Support individualisation and user interface adaptation (e.g. adaptability and adaptivity) of environments of use		Promote user involvement and develop protocols for effective user participation in design activities	
		Investigate and provide design recommendations for alternative interaction modalities and combinations	

⇨ Enhance and extend the tight evaluation-feedback loop advocated by user-centred design to cater for inclusive design of universally accessible systems.

⇨ Promote and facilitate the adoption and diffusion of good practice in the area of universal accessibility and usability of new products and services.

⇨ Establish accompanying measures to articulate demand for universal design and universal accessibility, and support the industry in adopting novel methods and practices (e.g. Accessibility / Usability Certificate), raise awareness, promote knowledge dissemination and transfer technology in the form of know-how and know-why.

4. Conclusions

This position paper has presented a consolidated account of the results of the second meting and workshop of the International Scientific Forum "Towards an Information Society for All", and discusses the notion of universal accessibility in the context of the emerging Information Society. To this effect, it briefly reviews accessibility principles and guidelines and provides an account of recent advances in technologies that promote and support universal accessibility. Finally, the paper presents specific provisions for proactive and generic strategies towards designing for the broadest possible end-user population, including disabled and elderly people. These provisions articulate an R&D road map for embedding universal accessibility in the evolving mainstream Information Society technologies.

Acknowledgements

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