

Standardisation Of Assistive Devices And Design For All Solutions

Prof. Jan J. Engelen
Kath. Univ. Leuven (Belgium) and MC COST219ter
Kasteelpark Arenberg 10, B-3001 Leuven (Belgium)
tel. +32 16 32 11 23 - fax +32 16 23 74 31
jan.engelen@esat.kuleuven.be

Abstract

Developments of assistive devices have been going on for a long time, an evolution driven by the availability of low cost hard- and software. Despite this, these *ad hoc* developments will never gain a large market share. This led many years ago to the concepts of Design for All or Universal design: mainstream products built so that they are usable for persons with impairments too, and this without adaptations. Because design for ALL understandably is hard to achieve, some prefer calling it Design for the most.

One of the major roadblocks to DfA concepts is the fact that the commercial impact of designing for all is not well understood within industry which created a lot of “wait and see” reactions.

More and more legislative actions are put in place requiring public bodies and companies to make sure that their products and services are accessible and usable not only by “standard” users but also by others such as elderly persons or people with a functional impairment.

For their technical part, these legislative texts do have to refer to international standards. We sketch briefly the formal, the *ad hoc*, the company driven and the informal activities in the standardisation field.

1 Standardisation: general overview

In very general terms, producing a “standard” (*fr*: norme, standard; *de*: Norme; *es*: norma) is a voluntary action set up, almost uniquely, by commercial partners who believe that the standardisation will permit easier exchanges of products and goods. This implied very often that acceptance of the standards is also voluntary and triggered by expected commercial benefits.

On the other hand, laws in many countries are referring more and more to the required acceptance of several standards (e.g. on safety or on ecological aspects). The net result of this need for standards is that nowadays many standardisation initiatives are stimulated (= subsidised) by public bodies or, in Europe, directly and indirectly by the European Commission. Also many guidelines have been created by stakeholder groups.

1.1 Formal standards

Probably the best known examples of standards are the ISO standards (ISO = International Organization for Standardization). These are very formal documents created by an accepted international body after consultation with many national standardisation organisations and a rigorously established voting procedure. The immediate consequence is that producing these standards (and even updating them) takes a very long time.

In Europe, standardisation work has been delegated since many years to the official standardisation groups (CEN, CENELEC and ETSI). Each of them has its own domain to cater for. Their international counterparts are respectively ISO, IEC and ITU-T.

Fig. 1: The ESOs, the European Standardisation Organisations

European Committee for Standardisation



European Committee for Electrotechnical Standardisation



European Telecommunication Standards Institute



A few of these have agreements with ISO and ITU-T (International Telecommunication Union- Telecommunication Standardization Sector) so that some of their work can be shared and so that some standards are just taken over from each other.

More national and international standardization bodies are mentioned in sections 2.2 and 2.3.

1.2 Standardisation related work (“informal standardisation work”)

Over the last years several of these standardisation bodies have set up standardisation-related initiatives that are easier to manage and can produce outcomes much faster. They all have special designations so that they cannot be confused with the “real” standards. E.g. ISO has developed a new range of “deliverables”, or different categories of specifications, allowing publication at an intermediate stage of development before full consensus.

Some of these standardisation related activities are given in the following table:

Name	Website	Names of related activities
ISO	http://www.iso.ch/	<ul style="list-style-type: none"> • Publicly Available Specification (PAS) • Technical Specification (TS) • Technical Report (TR) • International Workshop Agreement (IWA).
ITU-T	http://www.itu.int/ITU-T/	<ul style="list-style-type: none"> • Recommendations
CEN	http://www.cenorm.org/	<ul style="list-style-type: none"> • CEN Workshop Agreement (CWA)
ETSI	http://www.etsi.org/	<ul style="list-style-type: none"> • Specialist Task Forces (STF)
CENELEC	http://www.cenelec.org/	<ul style="list-style-type: none"> • CENELEC Workshop Agreement (CWA) • CENELEC Guides
CEN/CENELEC		<ul style="list-style-type: none"> • CEN/CENELEC Guides

Examples of this type of activities in relation to DfA and eAccessibility are given below.

1.3 Ad hoc and industry standards, conflicting standardisation procedures

Quite often some companies are able to put forward one of their developments as a standard to which others have to adhere in order to build, e.g., third party products. Well known are the technical specifications of Microsoft products and a few others.

Equally often industry groupings are working out guidelines or recommendations for standardisation of matters important to their community. Widely known examples are Open E-book, IETF, Daisy, ECMA, WAP, Bluetooth etc. Strictly spoken also the IEEE standards (e.g. on WiFi) fall in this category.

Sometimes groups interested in standardisation address formal standardisation bodies, sometimes they prefer passing through industry related bodies.

2 New developments in DfA related standardisation (formal standards)

As DfA standardisation was explicitly mentioned in the eEurope2002 plan, several new actions were established over the last years in the European context (Engelen, 2003). In my opinion four major recent changes can be distinguished: the set up of coordinating working groups and organisations; the democratisation of the standardisation processes themselves; the increasing impact of non-formal standardisation bodies and the establishment of standardisation related discussion fora open for non-specialists. Each of those aspects will be briefly explained in the remainder of this contribution.

2.1 European initiatives

2.1.1 Initial steps

In the middle of the nineties when ICT systems started booming, ETSI, one of the three European standardisation organisations organised, in collaboration with the Danish Centre for Technical Aids and the European Commission the 1996 "European Policy Workshop ICT Standardization and Disability in Europe". The three major outcomes (Brandt, 1996) retain their importance, even nowadays, although the third one (legislation) has since been taken on board in several EU countries:

- Industry is not sufficiently aware of the market potential for accessible products
- Standardisation processes should take into account the requirements of people with disabilities and these users should be more involved in standardisation work
- Need for legislation

2.1.2 Coordination initiatives

2.1.2.1 ICTSB

The ICT Standards Board (ICTSB)¹ is an initiative from the three recognised European standards organisations with the participation of specification providers as partners to co-ordinate standardisation activities in the field of Information and Communications Technologies (ICT).

The ICTSB listens to requirements for standards and specifications that are based on concrete market needs and expressed by any competent source. The Board then considers what standards or specifications need to be created, and how the task will be carried out (and by whom).

¹ Link: <http://www.ictsb.org/> and <http://www.ict.etsi.org/>

2.1.2.2 DATSCG

The "Design for All and Assistive Technology Standardisation Co-ordination group²" was created within ICTSB as a direct response to the eEurope2002 plan.

It has the following objectives:

- To ensure co-ordination of the ICT related standardisation work in the DfA and AT fields;
- To act as an overall focal point on design-for-all and assistive technology standardisation;
- To assist in organising promotional activities on design for all and assistive technologies standardisation requirements in ICT;
- To promote the knowledge and awareness of existing guidelines and tools by the market-players.

Although membership is on invitation, DATSCG tries to involve as many organisations as possible in their activities, including organisations of, or for, persons with a disability. Especially the contribution of the European Disability Forum (EDF)³, as representative of the final users is very important. Another important player is ANEC representing the standardisation needs of all customers and users. Also the Association for the Advancement of Assistive Technology in Europe (AAATE)⁴ has an observer status to the DATSCG.

DATSCG has proven to be an important channel for information exchange on standardisation issues as it groups the main players in this field.

2.1.2.3 eAccessibility expert group

Mainly as a consequence of the eEurope actions for the promotion of ICT use in Europe, the European Commission created several working groups to keep an eye on the actions promised by the different EU countries and by the Commission itself.

With respect to standardisation the ESDIS-eAccessibility group produced an overview document⁵ by the end of 2002 (Engelen, 2003b).

2.1.2.4 COPRAS

COPRAS (Cooperation Platform for Research and Standards)⁶ was a support action project in the EU's 6th Framework Programme, aiming to improve the interfacing, cooperation and exchange between IST (Information Society Technologies) research projects and ICT standardization. It was initiated by several European standards organisations in cooperation with the ICTSB, the coordinating forum for ICT standardization in Europe.

As one of its deliverables, COPRAS has developed a set of Generic Guidelines facilitating interfacing between research projects and ICT standards organisations⁷. Its ultimate goal was to bring IST research and standardisation closer together and to provide research projects as well as other stakeholders in government, industry, and society with a platform facilitating exchange between research and standardisation, and furthering Europe's leading position in ICT development.

² Link: http://www.ictsb.org/DATSCG_home.htm and http://www.ict.etsi.org/DATSCG_home.htm

³ Link: <http://www.edf-feph.org/en/welcome.htm>

⁴ Link: <http://www.aaate.net> or <http://139.91.151.134/>

⁵ Available at:

http://europa.eu.int/information_society/policy/accessibility/dfa/standards/a_documents/eaccess2002_dfa_st_review_report.html

⁶ Link: <http://www.w3.org/2004/copras/>

⁷ Link: <http://www.w3.org/2004/copras/docu/faq/Overview.html>

2.1.3 Standardisation efforts through workshops and other collaborative schemes

As stated before (in 1.2) a democratisation process is taking place in the standardisation arena. Besides formally established committees for creating the “real” standards, all standardising bodies now have working groups and task forces where all interested people are welcome, minimally as observers but often as contributors too.

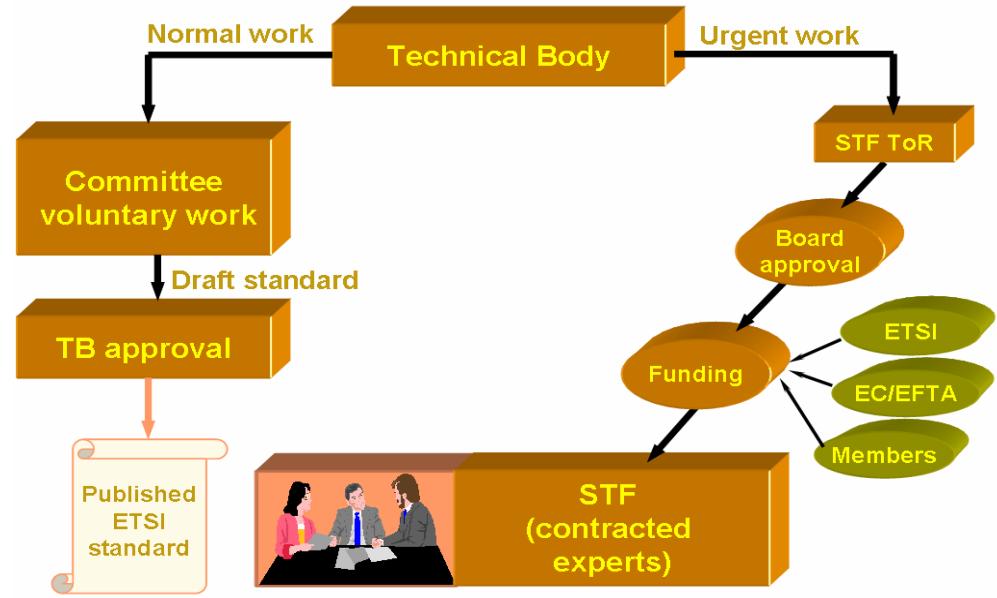
2.1.3.1 CEN Workshop agreements in the DfA field

Examples are the establishment of a CEN Workshop on “Design for all in ICT”, CWA14661 “Guidelines to Standardisers of ICT products and services in the CEN ICT domain⁸” and, more recently, the creation of the CEN Workshops on website certification, in full “Specifications for a complete European certification scheme concerning the delivery of a Quality Mark for Web Content Accessibility - WS/WAC⁹” and the Workshop on "Document Processing for Accessibility" (CWA-DPA).

2.1.3.2 ETSI STF's

Specialist task forces are a typical working method for ETSI. An STF is a team of highly-skilled experts working together over a pre-defined period to draft an ETSI standard under the technical guidance of an ETSI Technical Body and with the support of the ETSI Secretariat¹⁰.

Fig. 2: How STF's relate to ETSI's "normal standardisation" work



Some of the AT and DfA-related STF's have been focussing¹¹ on:

- Requirements of Assistive Technology Devices in ICT (STF 181)
- Study on the multimodality of icons, symbols and pictograms (STF 183)

⁸ Link: <http://www.tiresias.org/guidelines/cenisss/>

⁹ Links: <http://www.cenorm.be/cenorm/businessdomains/businessdomains/isss/activity/ws-wac.asp> and <http://www.support-eam.org>

¹⁰ Link: <http://portal.etsi.org/stfs/process/home.asp>

¹¹ More info about these STF's can be found by using following link:

http://portal.etsi.org/stfs/STF_HomePages/STFxxx/STFxxx.asp after replacement of "xxx" by the appropriate number

- Design for All: Guidelines for ICT Products and Services (STF 184)
- Duplex Universal Speech and Text (DUST) communication [e-Inclusion] (STF 267)
- Human related technical guidelines for real-time person-to-person communication services (STF 284)
- Access symbols for use with video content and ICT devices (STF 286)
- User-oriented handling of multicultural issues in broadband and narrowband multimedia telecommunications (STF 287)
- Display of public transportation information for disabled people (planned)

2.1.3.3 COST219ter

The main objective of this collaborative European Action (but with members from the US, Australia and Japan) is to increase the accessibility of next generation telecommunication network services and equipments to elderly people and people with disabilities by design or, alternatively, by adaptation when required¹². Several major actions towards standardisation have been undertaken over the past years.

COST219ter members have been collaborating with the ITU-T work on "Total Conversation; Increased usability of conversational services in mobile and fixed networks" (convener: Gunnar Hellstrom, cf. 2.3.2)¹³.

On March 8, 2005, COST 219ter organised in Florence a specialised workshop on "eAccessibility Legislation and Policy: The role of standardisation". Specialists of W3C, ISO, ETSI, ITU-T, the D4ALL.net project, EDeAN and TEDICORE (Australia) have presented the ongoing work within their organisations or countries¹⁴.

Within the COST219ter action a special working group was set up to harmonise testing for accessibility. Especially the usability and accessibility of mobile telephones was worked out thoroughly, was tested internationally and is available as a toolset (Chandler, 2007). In 2007 COST219ter and the European Disability Forum are planning to file this work to ETSI in order to make it a formal standard.

2.1.4 *Public discussions*

One of the unique and recent developments in the standardisation field, especially in relation to design for all, is the potentially large involvement of specialists, users and user representatives in the discussions.

2.1.4.1 EDeAN Standardisation SIG

The European Design for All Network (EDeAN) was established in 2002 as a response to the European eEurope programme for stimulation of IST use. One of the action lines was the "creation of a network of major expert centres in Design for All". Another was the "Publication of Design for All standards for accessibility of information technology products, in particular to improve the employability and social inclusion of people with special needs" (already mentioned in 2.1.2.3. Although initial discussions on the latter topic also took place in the eAccessibility working group a more open approach was established through the creation of a public discussion forum.

¹² Link: <http://www.cost219.org>

¹³ Link: <http://www.tiresias.org/cost219ter/florence/hellstrom.htm>

¹⁴ Link: <http://www.tiresias.org/cost219ter/florence/index.htm>

Members of the EDeAN network are exchanging information within so-called Special Interest groups. One of the discussion lines (to date there are 5 topic based ones and one for management use) is on ***Standardisation***.

The SIG Standardisation group has slightly over 100 members. Most of them come from Europe (but new EU member states are underrepresented), a few from the USA, Australia and Hong Kong. Also several observers of the European Commission are taking part in the discussions.

The Hermes platform has been shown to be a unique means of bringing information on ongoing standardisation activities directly to persons, interested by this subject but not member of formally established standardisation task forces or working groups.

2.1.4.2 USEM project

This is an EU framework 6 Specific Support Action set up to empower users from disability related organisations so that they can take part in standardisation work. Especially in DfA standardisation, the presence and involvement of users is very much welcomed but almost non-existent. Despite the fact that often special funding is made available for participation, users used to feel uncomfortable in this type of work. This is what USEM (started in the beginning of 2007) will try to change. The USEM project is coordinated by the Dutch iRv-organisation¹⁵.

2.2 Some national initiatives

2.2.1 USA

In the USA, due to its large concentration of huge software enterprises, several official and de facto organisations are active. In a recent contribution¹⁶, Gregg Vanderheiden, director of the Trace R&D Center at the University of Wisconsin-Madison, enumerated over 40 of these standardisation groups. Also the number of guidelines is rapidly growing (cf. below).



RERC work on Access Guidelines

- Guidelines for Consumer Products (1992)
- IBM Accessibility Guidelines (1993)
- Software Accessibility Guidelines for ITF (1994)
- First Web Guidelines (HTML) (1995)
- Microsoft Accessibility Guidelines (1999)
- TAAC work
 - complied over 1000 guidelines for TAAC Committee
 - On-Line Design Tool - 255
 - EITAAC work – and support
 - Universal Design Principles
 - Accessibility Essentials – Design tool 2
 - User Requirements
 - WCAG (W3C Web Content Accessibility Guidelines)

In the US several legislative actions have been undertaken, and as could be expected, they often do not refer to official formal standards (as there are still very few) but to guidelines made to specify the details of the laws.

Two of them are very famous

- American with Disabilities Act (ADA)

¹⁵ Link: <http://www.irv.nl>

¹⁶ Gregg Vanderheiden, “New, More Robust Models for Access to Mainstream Technologies”, presented at COST219ter conference “Extending Horizons: Accessibility to Next Generation Networks Conference”, London, BT Centre, January 2007

- Federal Rehabilitation Act (Section 508)

Although the laws themselves fall outside of the scope of this contribution, especially Section 508 work is highly important for standardisation¹⁷.

Outside observers (e.g. from the European Union) were welcomed to participate in the 2007 revision of the 508 Guidelines.

2.2.2 UK

In 1995 the Disability Discrimination Act (DDA) was passed to introduce new measures aimed at ending the discrimination which many disabled people face. It protects disabled people in the areas of:

- employment
- access to goods, facilities and services
- the management, buying or renting of land or property
- education

The Act is based on the principle that disabled people should not be discriminated against by service providers or those involved in the disposal or management of premises.

Although the use of standards is stressed no specific guidelines are given¹⁸.

2.2.3 Italy

In Italy the law imposing accessibility measures to ICT systems was accepted in 2004 under the name "Stanca act" (after its main promoter, the minister of for Innovation and Technologies). It refers extensively to ISO standardisation work. The Law aims at drawing up set of rules governing the criteria and requirements for guaranteeing accessibility. The guidelines intend to regulate both the operational and the organisational issues related to accessibility, as well as introducing the Usability Principle, defined in a similar way as ISO 9126-1 and ISO 9241-11 rules.

2.2.4 Japan

Article 13-2 of the Industrial Standardisation Law of Japan states that relevant ministers must enact any drafts proposed by JISC (Japanese Industrial Standards Committee) as industrial standards.

ICT accessibility is being promoted through the Accessible Design Forum. This forum ensures that committee members are aware of ageing and disability issues, that users themselves are represented (and trained if necessary). Their activities are heavily based on ISO/IEC Guide 71 (JIS Z8071).

The development of the actual accessibility standards is done through a hierarchical approach (cf. picture). JISX8341-1 contains the overall framework and the common guidelines.

Standards JISX8341-2 and higher then specify the accessibility requirements for the different application domains.

¹⁷ Link: <http://www.section508.gov/>

¹⁸ Link: <http://www.tiresias.org/reports/dda.htm>

Fig. 3: Structure of Japanese Accessibility Standards



2.3 International initiatives

2.3.1 ISO



ISO (International Organization for Standardization) is the world's largest developer of standards. Although ISO's principal activity is the development of technical standards, ISO standards also have important economic and social repercussions. ISO standards make a positive difference, not just to engineers and manufacturers for whom they solve basic problems in production and distribution, but to society as a whole. ISO has been very active, amidst a huge range of other topics, in computer usability and accessibility.

A few examples of their recent standardisation work related to e-accessibility are:

- ISO DIS 9241-20 "Ergonomics of human-system interaction - Part 20; Accessibility guidelines for information/communication technology (ICT) equipment and services"
- ISO TS 16071 "Ergonomics of human-system interaction -- Guidance on accessibility for human-computer interfaces"

Other important ISO standardisation work is referenced in the documents of JTC1-SWGA (cf. below)

Establishment of a Special Working Group on Accessibility.

One of the major ISO initiatives in this field is the creation (2004) of a Special Working Group (SWG) on Accessibility within the existing Joint Technical Committee 1.

- JTC 1 believes that the work in the area of information communication and technology standardization for accessibility is a major undertaking, encompassing many international, regional and local interests.

In order to reach these goals the JTC1-SWGA membership is kept very much open to all individuals and organisations involved in related activities. Also ALL documents are made public on the SWG's website¹⁹.

¹⁹ Link: <http://www.jtc1access.org/>

2.3.2 ITU

ITU, headquartered in Geneva, Switzerland is an international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services. Telecom Standardisation falls under subgroup ITU-T. Within ITU-T,



Study Group 16 (ITU-T-SG16) is responsible for studies relating to multimedia service capabilities, and application capabilities (including those supported for Next Generation Networks).

Study Group 16 has established a subgroup on "Accessibility and Standardisation"²⁰.

This group has published an ACCESSIBILITY CHECKLIST²¹ for the makers of standards to ensure that they are taking into account the needs of those to whom accessibility to ICTs are restricted, the deaf or hard-of-hearing for example. Such a list ensures that accessibility needs are taken into account at an early stage, rather than having to retrofit existing standards.

Another important issue for SG 16 is Total Conversation. Total Conversation is an ITU Service description found in ITU T Rec. F.703 and covers videophony with real-time text. A Total Conversation Service is an audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more locations. The concept is aimed at providing rich media real-time conversation for all people and for varying situations. This includes, but is not limited to, people that are disabled in some way, e.g. the deaf or hard-of-hearing, blind, etc., but also people who find themselves in a situation where the complementing media – video and real-time text – together with voice fulfil the conversation needs much better than only voice.

2.4 Guidelines, task force reports, working groups (informal or de facto standards)

2.4.1 W3C Guidelines

In relation to Design for All or Universal Design, there is one very well known example: the World Wide Web consortium and especially the **Web Access Initiative**²² that produced several guidelines on web accessibility.

Although almost universally accepted as the primary reference point for web accessibility matters, many countries establishing legislative actions for imposing web accessibility, were not able to refer to the WAI guidelines as the W3C cannot be considered a standardisation body in the proper sense of the word. Unfortunately, this has already led to several national variants of web accessibility guidelines.

2.4.2 ICF: International Classification of Functioning, Disability and Health

As a new member of WHO Family of International Classifications, ICF²³ describes how people live with their health condition. ICF is a classification of health and health related domains that describe body functions and structures, activities and participation. The domains are classified from body, individual and societal perspectives. Since an individual's functioning and disability occurs in a context, ICF also includes a list of environmental factors.

ICF is useful to understand and measure health outcomes. Strictly spoken ICF is not a standard but it is frequently used by funding organisations to quantify problems caused by impairments.

²⁰ Link: <http://www.itu.int/ITU-T/studygroups/com16/accessibility/>

²¹ Link: <http://www.itu.int/ITU-T/studygroups/com16/accessibility/docs/tacl.pdf>

²² Link: <http://www.w3.org/WAI/>

²³ Link: <http://www.who.int/classifications/icf/en/>

3 Activities bypassing formal standardisation

It has been mentioned several times that legislative processes in most countries have a strict need for referral to formal national or international standards. Especially in the domain of e-accessibility these standards tend to be non-formal such as workshop agreements, technical specifications, guidelines instead of formal standards etc.

This has lead to several alternative approaches.

3.1 National laws with own guidelines

In January 2005 a very important European colloquium was held in Paris on "Policies and Legislations in favour of e-accessibility in Europe". Delegates from many countries have explained their national situation. The simple conclusion of the workshop is that almost no harmonisation seems to exist (yet). The details can be found in the colloquium's archives²⁴.

3.2 Procurement rules as an alternative to standardisation

As stated above the European Union faces a serious problem about supranational legislation: it is almost impossible to achieve in the accessibility domain.

On the other hand long term experience in the US shows that the buying power of governments and authorities can be used to impose accessibility requirements. The principle is quite simple: authorities add, in their calls for tender, special clauses on accessibility features that the products or services they want to buy, will have to meet. This forces manufacturers to pay attention to the accessibility of the equipment they develop and sell. As a consequence many, also in Europe, see procurement strategies as a way to improve the accessibility of goods and services too.

Mandate 376

The 2005 EC Communication on Accessibility²⁵ stressed again that Public Procurements in the ICT domain are an important lever for the deployment of eAccessibility as they have the potential to play a vital role in removing barriers to participation in the Information Society by disabled or older people.

By the end of 2005 a mandate (called Mandate 376) has been given by the European Commission to the European Standardisation Organisations (ESOs) to come up with a solution for common requirements and conformance assessment.

The mandate²⁶ requests both Inventory work (phase I) and real standardisation activities based on phase I conclusions (phase II). The start of this Mandate's work was plagued with several problems. As a consequence the work has not started (yet) in April 2007.

²⁴ Link: <http://www.braillenet.org/colloques/policies/program.html>

²⁵ In full: The Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee, and the Committee of Regions, regarding eAccessibility (adopted on 13 September 2005).

Link: http://europa.eu.int/information_society/policy/accessibility/policy/com-ea-2005/a_documents/cec_com_eacc_2005.html

²⁶ Link: http://europa.eu.int/information_society/policy/accessibility/deploy/pubproc/eso-m376/a_documents/m376%20en.pdf

4 Conclusions

In this contribution we have tried to avoid enumerating the many details on DfA and AT standardisation actions. We have focussed on the very important changes that take place in the standardisation field (e.g. the informal work, more open discussions) and especially on the impact of these changes for improving the situation in the field of Design for All and Assistive Technology.

References

- Brandt, A. ed. (1996). ICT Standardization and Disability in Europe, in Proceedings of the European Policy Workshop, Amsterdam (April 1996), ISBN 87-89407-59-8, ETSI Sophia Antipolis
- Bühler, C., & Stephanidis, C. (2004). European Co-operation Activities Promoting Design for All in Information Society Technologies. In Proceedings of the 9th International Conference on Computers Helping People with Special Needs (ICCHP 2004), Paris, France, 7-9 July (pp. 80-87). Berlin Heidelberg: Springer-Verlag
- Chandler, E, Dixon E & Tyler S. (2007). Mobile phone evaluation toolkit, p. 255 e.s. in "Towards an Inclusive Future, Impact and Wider Potential of Information and Communication Technologies", ed. by P. Roe for COST219ter, ISBN 92-898-0027 /EUR 22562, ESF-COST, Brussels
- Engelen, J. (2003). The next hot item for Assistive Technology and Design for All: standardisation. In "Assistive Technology - Shaping the Future", ed. by G. Craddock, L. McCormack et al., ISBN 1-58603-373-5 (pp. 34-42), IOS Press Amsterdam-Berlin
- Engelen, J. (2003). The work of the eAccessibility Expert Group, presented at the International Congress "Accessibility for All", org. by ETSI, CEN & CENELEC (Nice, 27-28 March 2003); published electronically at:
http://www.etsi.com/cce/proceedings/6_1.htm