EDeAN
European Design for All
e-Accessibility Network

White Paper:
Promoting Design for All and e-Accessibility in Europe

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Abstract: This White Paper results from the collaboration of Design for All and e-Accessibility expert bodies representing the European Union member states (ref: the coordination centres of the national European Design for All e-Accessibility networks in 23 European Union Member States, in this document referred to as NCCs).

The objectives of this White Paper are three fold: (i) to present the current state of affairs of the European Design for All e-Accessibility Network (EDeAN), active since 2002 as part of the European Commission's action line supporting the development of the European Information Society; (ii) to outline a roadmap for future initiatives, actively reflecting views of the EDeAN network in specific domains related to Design for All, e-Accessibility and e-Inclusion; and (iii) to bring forward a set of suggestions and recommendations regarding the activities of the network, aiming to support the creation of a fully inclusive European Information Society.

The paper is organised as follows. The first section provides a short introduction to Design for All and Accessibility in Information Society (IS) and Information Society Technology (IST) developments in Europe. Section 2 provides an overview of policy as well as Research & Development activities related to Design for All and accessibility in IST in Europe. Section 3 briefly describes the role of the European Design for All e-Accessibility Network (EDeAN) and the new challenges that emerge as a result of the changing European policy environment. Section 4 presents current challenges that emerge in five domains directly related to Design for All and accessibility, namely Policy and Legislation, Industry, Monitoring and Evaluation - Benchmarking, Standardisation, research and Development, and Education and Training. Finally, section 5 puts forward a number of recommendations with regard to future activities for EDeAN.

The contents of this paper reflect results from the open discussion forums supported in the EDeAN website (ref: EDeAN Special Interest Groups, SIGs). The draft paper was written by the EDeAN Secretariat for 2005, FORTH-ICS (Greece), and completed with the support of all NCCs. Support was also provided by the European Commission DG Information Society and Media and by the D4ALLnet project (ref: an EC funded project with the code IST-2001-38833).

1. Introduction: Design for All and Accessibility in the Information Society

The emergence of the Information Society and the Information Society Technologies (IST), i.e., the new technologies that drive it, signify the transition towards a new form of society based on the production and exchange of information and, in effect, of knowledge. The consequent changes affect not only the interaction in computer-mediated human activities, but also individual human behavior, collective consciousness, and the economic and social environment. As a result of IST developments (e.g., proliferation of diverse interaction platforms, such as wireless computing, wearable equipment, kiosks), the range of the population which may gradually be confronted with accessibility problems extends beyond the population of disabled and elderly users to include all people. Moreover, the social and cultural infrastructure which enables a positive social and economic environment and community-based activities may not support the new requirements of the emerging `knowledge society' [11]. Hence, instead of being empowered by IST, disadvantaged or excluded groups, including the unskilled, disabled, and the elderly, face the danger of further marginalisation.

In that respect, the notion of sustainable development, that is meeting the needs of the present without compromising the ability of future generations to meet their own needs, is central and encompasses issues of enormous importance to citizens, whether it be maintaining and increasing long-term prosperity, or working towards a safe, healthy and socially inclusive society. Thus, today, the socially inclusive and universally accessible Information Society is a critical quality target and a global requirement that entails coping with diversity in: (i) the characteristics of the target user population (including people with disabilities); (ii) the scope and nature of tasks; and (iii) the different contexts of use and the effects of their proliferation into business and social endeavours.

Access to information is a basic right and the increasing amount of publicly available information is even more important for people with disabilities and other groups at risk of exclusion. However, a number of obstacles are yet to overcome in order for disadvantaged groups to be able to fully benefit from it. Many may seem skeptical about new technology, as it could eventually lead to new forms of discrimination, if part of the population is not able to access it [10]. Traditionally, problems of accessibility to computer-based applications and

services were addressed by adapting products designed for the 'average' user with Assistive Technology products. With the development of the Information Society, this approach has shown, in the context of more than a decade of research efforts, several limitations, due to a number of reasons:

- The technology under development is so complex and varied that it is not completely clear how the Information Society will actually develop in the future, what technology will be actually deployed and how users will have to interact with the emerging intelligent environment;
- The services and applications that will, in fact, constitute the part of the Information Society visible to the users, are not yet defined in details (the meaning of services and applications in this context is broader than the present definition in information technology and telecommunications: for example, an intelligent kitchen or a smart house include interactive technologies that support various user tasks);
- Accessibility to the foreseen information environment will be so crucial for the population at large that it is imperative to preclude IST emergence in a form that is not accessible by design to large portions of the population;
- The changing nature of the information society means that the issue is not just of information provision to the user but of information utilisation by the user, enabling them to carry out tasks as varied as cooking a meal, booking a holiday or applying for a parking permit.

Therefore, it is necessary to develop and adopt more generic and systematic approaches to the issue of accessibility, which are identified under the term "Design for All" (DfA). Conceptually, the DfA approach is a well-defined body of knowledge, which has brought about very important results in architecture, industrial design and new media design. In the Information Society, the adoption and practice of DfA, although advocated by many actors in the field, still presents significant challenges, due to the inherent characteristics of the sector, and in particular the established industry practice of designing mainstream products targeted to the so called 'typical' user. In the context of this paper, DfA has a broad and multidisciplinary connotation, abstracting over different perspectives [2], such as:

- Design of interactive products, services and applications, which are suitable for most of the potential users without any modifications.

- Design of products, which have standardized interfaces, capable of being accessed by specialised user interaction devices.
- Design of products which are easily adaptable to different users (e.g., by incorporating adaptable or customisable user interfaces).

From the above, it follows that DfA either subsumes, or is a synonym of, terms such as accessible design, inclusive design, barrier-free design, universal design, etc., each highlighting different aspects of the concept.

Design for All in IST entails an inherently multidisciplinary effort and a structured research community able to integrate all necessary expertise [21]. The main objective of this paper is the proposal of a set of activities that favour the integration of the entire range of competencies necessary in a cooperative group. To achieve the above objective, the field is required to engage in a coordinated effort to exemplify the relevance of DfA to various IST sectors, and subsequently to integrate the different perspectives through which DfA is conceived and practiced across different disciplines. To this end, this paper aims to assess the current state of affairs regarding Design for All and eAccessibility in Europe, three years after the establishment of EDeAN, the European Design for All eAccessibility Network, and make concrete proposals and recommendations as to how to proceed in the medium to long terms.

2. Background

2.1 European Policy on DfA and Accessibility

Disability has traditionally been a barrier for millions of people who are not able to benefit from the recent advances in IST technologies. If one takes into account that the overall number of people with disabilities is increasing and it is currently estimated at 7% to 10% of the population worldwide [24], not to mention the ageing population, it can be concluded that millions of people are excluded from basic constitutional rights, as well as goods and services. These numbers underline the growing demand expressed nowadays for online services and tools that are universally accessible and usable, so that the entire population can benefit and be(come) active. This attitude towards the development of accessible and usable goods is an ethical and political necessity [14].

In order to address such necessity, the European Commission has undertaken a number of initiatives to promote the idea of an information society accessible to all [1]. The eEurope 2002

and eEurope 2005 action plans[1] recognise the need for "an Information Society for all", and point out four lines of action, namely policy measures, dissemination of good practices, benchmarking indicators to monitor progress, and overall coordination activities, as primary means to achieve the designated targets [16]. On 25 September 2001, the Commission adopted the Communication 'eEurope 2002: Accessibility of Public Web Sites and their Content' on improving the accessibility of public Web sites and their content. This action was to be executed by the European Institutions and the (then) 15 European Union Member States through the *Adoption of the Web Accessibility Initiative (WAI)*[2] *Guidelines for public Web sites by the end of 2001.* Moreover, there have been declarations and resolutions by the Ministers' Council, and the action plan of October 2003 by the European Commission following up on the European Year for People with Disability[3] which lists, among four activity sectors, access to technologies and their use. As a result of these actions as well as similar initiatives in a number of countries, Web accessibility is nowadays required by law (e.g., in Italy and Germany) and policies (e.g., European Parliament, 2002), while in the USA, websites are additionally required to comply with the provisions of Section 508[4] of the US Rehabilitation Act. At the same time, a number of standards, guidelines, checklists and techniques for Web accessibility and Design for All have been proposed worldwide. However, results of recent surveys show a very low conformance to these guidelines, and the majority of Web-based communication and information tools remain inaccessible to a large number of people. For example, a survey on websites from Ireland, United Kingdom, France and Germany regarding their conformance to WCAG 1.0 and HTML standards indicated an average of 40% Priority 1 diagnostic violations [18].

2.2 Research and Development

Over the past 15 years, accessibility has featured as a prominent technical target in a variety of RTD projects in Europe. Several collaborative projects have been carried out under TIDE, the Telematics Applications Programme and the Information Society Programme, as well as other Programmes of the European Commission. These efforts have pursued an evolutionary path, initially adopting reactive, and subsequently advocating proactive strategies to accessibility.

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[1] eEurope 2005: http://europa.eu.int/information_society/eeurope/2002/action_plan/index_en.htm

[2] Web Accessibility Initiative (WAI): http://www.w3.org/WAI/

[3] http://www.eypd2003.org/eypd/eypd/index.html

[4] Section 508: http://www.section508.gov/

The first approach aims to build technical systems for various categories of people with disabilities, mainly by adapting commercially available solutions and offering assistive technology add-ons. The qualification of this approach as reactive results precisely from the a posteriori adaptations that are delivered. The second and more recent approach focuses on proactively taking into account the requirements of diverse user groups, including people with disabilities, throughout the development lifecycle of interactive systems, from early design phases to evaluation, implementation and deployment, thus building systems which are inherently accessible. It is this second approach that has introduced the concept of Design for All in the context of interactive applications and services. An important aspect to notice in relation to these projects is the progressive shift towards more generic solutions to accessibility. In fact, with the exception of early exploratory studies, all subsequent projects embodied both a reactive RTD component as well as a focus on proactive strategies and methods. The latter were initially oriented towards the formulation of principles, while later on emphasis was placed on the demonstration of technical feasibility. Thus, early development efforts (e.g., the GUIB project[5]) aimed to provide tools for the adaptation of graphical user interfaces to alternative modalities, such as speech, sound and tactility. The acquired experience and the recognition of the shortcomings related to reactive approaches in a radically evolving technological environment led to the investigation and application of proactive approaches. The GUIB-II project[6] was the first such practical demonstration, and elaborated the concept of dual interaction, (i.e., user interfaces concurrently accessible by both sighted and blind users), as well as an implementation platform for dual interaction.

Following this development, the approach was subsequently further generalised to cater for the needs and requirements of all potential target user groups. This was the focus and content of the ACCESS project[7], which delivered a user interface development methodology, as well as several tools and prototypes, to substantiate the viability of the Design for All perspective into Human Computer Interaction. The proposed approach is based on the intelligent self-adaptation of user interfaces for addressing the requirements for customisation, accessibility and usability. The methodology and tools developed by ACCESS were applied and extensively tested in the context of the AVANTI project, which developed a web browser capable of intelligent self-adaptation

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[5] TIDE 103 - GUIB (Textual and Graphical User Interfaces for Blind People, 1/12/1991 - 31/5/1993).

[6] TIDE 215 - GUIB-II (Textual and Graphical User Interfaces for Blind People, 1/7/1993 - 31/12/1994).

[7] TIDE TP1001 - ACCESS (Development platform for unified ACCESS to enabling environments, 1/1/1994 - 31/12/1996).

and inherently accessible by sighted, non-sighted, speech-motor and language-cognitive impaired users. More recently, the PALIO project[8] extended the proactive approach by considering various forms of user interface and content adaptation, including adaptation based on the geographical location of the user.

In addition to the above, other European initiatives have also contributed to raise awareness on accessibility issues and create an environment in favor of Design for All. The COST actions 219[9], 219bis and 219ter seek to promote research in the field of telecommunications and teleinformatics with the aim of proposing solutions to the problems related to the needs of disabled and elderly people in providing access to new telecommunication and teleinformatic services. The main objective is to increase the availability of telecommunication services and equipment so that they are also accessible to elderly people and people with disabilities.

Other projects, such as the INCLUDE project, aimed to provide the necessary support in all relevant sectors and at all stages of the Telematics Programme to ensure that new developments deriving from the programme are accessible to disabled and elderly people by applying Design for All principles. The DASDA project targeted and supported industry and Information Society professionals to increase awareness and incorporate Design for All methods. The educational material is available on line. Moreover, the WAIDA project focused on the application of Design for All concepts and methods to improve accessibility to the Web in Europe. The project approach was to support and accompany the technical and guidelines development work ofW3C/WAI with educational and tools-related activities that are specific to the European context[10].

In recent years there have been efforts toward the establishment of a multidisciplinary community of people combining expertise in accessibility and in telecommunication services and applications, and towards creating synergies between relevant expertise, such as the IS4ALL thematic network[11], that aimed to establish a wide, interdisciplinary and closely collaborating "network of experts" (Working Group) to provide the European Health Telematics industry with a comprehensive information package detailing how to appropriate the benefits of Universal

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[8] IST-1999-20656 - PALIO (Personalised Access to Local Information and Services for Tourists, 1/11/2000 - 30/4/2003).

[9] COST219: Accessibility for All to services and terminals for next generation mobile networks. See: http://www.tiresias.org/cost219ter/ for more information.

[10] WAI-DA (IST 13470): http://www.w3.org/WAI/WAIDA/

[11] IS4ALL: IST Thematic Network "Information Society for All" (IST-1999-14101). For more information see: http://is4all.ics.forth.gr/ .

Design. These efforts need to be continued and further enhanced in order to consolidate knowledge and facilitate the wider adoption of DfA practices.

3. The European Design for All e-Accessibility Network

The European Design for All e-Accessibility Network (EDeAN)[12] was established by the European Commission and the High Level Group for the Employment and Social Dimension of the Information Society (ESDIS) in July 2002. The network aims to raise the profile of Design for All (DfA) and emphasize its importance in achieving greater accessibility to the Information Society for as many people as possible (eAccessibility), as one of the specific goals of the eEurope 2002 Action Plan. The European Council held in Lisbon on 23/24 March 2000, set the ambitious objective for Europe to become the most competitive and dynamic economy in the world. It recognised an urgent need for Europe to quickly exploit the opportunities of the new economy and in particular the Internet.

The aim of the eEurope 2002 Action Plan was to ensure that the targets set by the Lisbon European Council were reached by defining the necessary measures. eEurope initially identified certain areas where action at European level would add value [15]. As a result, the actions were clustered around three main objectives:

a) A cheaper, faster, secure Internet (Cheaper and faster Internet access, faster Internet for researchers and students, secure networks and smart cards)
b) Investing in people and skills (European youth into the digital age, working in the knowledge-based economy, participation for all in the knowledge-based economy)
c) Stimulate the use of the Internet (Accelerating e-commerce, government online: electronic access to public services, health online, European digital content for global networks, intelligent transport systems)

In the context of eEurope, the eAccessibility resolution focuses on promoting the access opportunities that innovative technologies can offer to citizens in the Information Society, and especially to members of social groups at risk of exclusion, and in particular people with disabilities and elderly people [17].

EDeAN was initially created with the goal to promote awareness and application of the DfA and Universal Access principles and provide:

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[12] EDeAN: http://www.edean.org

- A forum for Design for All issues.
- Input for European Curricula in Design for All.
- Idea sharing through joint activities such as conferences, symposia and exchanges of students and scholars.

EDeAN is also charged with fostering awareness and promoting changes of culture in the public and private sectors. It also aims to establish links with appropriate education channels to embed Design for All best practices in new curricula. Through a series of common activities and proposals, the Network has now become a cohesive group that can effectively work toward the advancement and excellence of Design for All. The Network also collaborates and liaises with various relevant national, regional, European and international networks, organisations and projects, such as AAATE (the Association for the Advancement of Assistive Technologies in Europe), ICCHP (International Conference on Computers Helping People with Special Needs), W3C (the World Wide Web Consortium), COST219ter (European Co-operation in the field of Scientific and Technical Research, Action 219ter), DATSCG (Design-for-all and Assistive Technology Standardisation Co-ordination Group), IST-2001-38833-D4ALLnet (Design for All Network of Excellence), IST-2001-38786-IDCnet (Inclusive Design Curriculum Network), etc. EDeAN is responsible for reporting through the e-Accessibility Expert Group to the EC and the eEurope responsible group that best reflects member states positions and priorities within the areas of e-Accessibility, Design for All and e-Inclusion. The EC, via the Directorate General for the Information Society and Media (DG INFSO & Media), participates as an active observer in the Network and supports facilitation of the work, where possible. In particular, the DG INFSO plays an active part in the Network, in accordance with eEurope Action Plans.

According to its Charter[13], EDeAN is a non-profit, self financing network, coordinated by the Secretariat that rotates yearly. Initially, the Secretariat was managed by the Danish Centre (2002 - 2003) and iRv (The Netherlands) followed in 2004. For 2005, the EDeAN Secretariat was managed by FORTH-ICS (Greece). The Secretariat Management for 2006 has moved to STAKES (Finland), to be followed from CNR (Italy) in 2007. National Contact Centres (NCCs) have been appointed in 22 European countries[14]. They are organisations active in the domains of Design for All, e-Accessibility and Assistive Technology, and act as contact points of the

[13] The EDeAN Charter is available at: http://www.edean.org/about.asp?selectedcategory=5

[14] For a full list of the EDeAN NCCs see: http://www.edean.org/about.asp

EDeAN network. NCCs are responsible for liaising with the EDeAN secretariat and provide support and actively promote Design for All in their countries. The NCCs contribute to and share EDeAN information. There are already more than 150 European, academic and research, rehabilitation, user as well as industrial organizations represented in EDeAN, the majority consisting of academic institutions and rehabilitation centres. The network has been supported by two EC funded projects (thematic networks), IDCnet (Inclusive Design Curriculum network) and D4ALLnet (Design for All network).

The IDCnet project[15] has significantly contributed towards the development of curriculum recommendations for DfA in European universities in the area of ICT. IDCnet was originally established as a support to the eEurope Action Plan, which stated the need to create a European curriculum for designers and engineers in Design for All, and subsequently evolved into an initial support to the activities of EDeAN related to curriculum. IDCnet produced recommendations for an optimal graduate profile for DfA, a taxonomy for core knowledge and skill sets for model curricula, and a set of recommendations on DfA-related higher education and research policies and strategies. Furthermore, IDCnet successfully implemented a number of pilot courses, from which many are taught on a continuous basis. This extraordinary effort served to validate the taxonomy and recommendations. The EDeAN Special Interest Group on Curriculum has taken over the IDCnet project, and is currently further developing these results.

The D4ALLnet project[16] has developed and deployed an infrastructure for virtual networking between EDeAN members. HERMES, the EDeAN web portal, currently supports all virtual networking activities of EDeAN, through the provision of accessible facilities to enable the operation of the EDeAN Special Interest Groups (SIGs), and hosts the ARIADNE resource centre infrastructure and content. HERMES and ARIADNE have been fully operational since July 2004 and are available at the url address http://www.edean.org. The EDeAN virtual networking infrastructure has already significantly contributed towards creating a DfA community in Europe sharing common interests, working under similar objectives and expanding the principles of DfA to a wider audience in Europe. Figure 1 illustrates the EDeAN model of cooperation and the synergies described above.

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[15] IST-2001-38786 - Inclusive Design Curriculum Network (http://www.idcnet.info)

[16] IST-2001-38833 – Design for All Network of Excellence (http://www.d4allnet.gr)

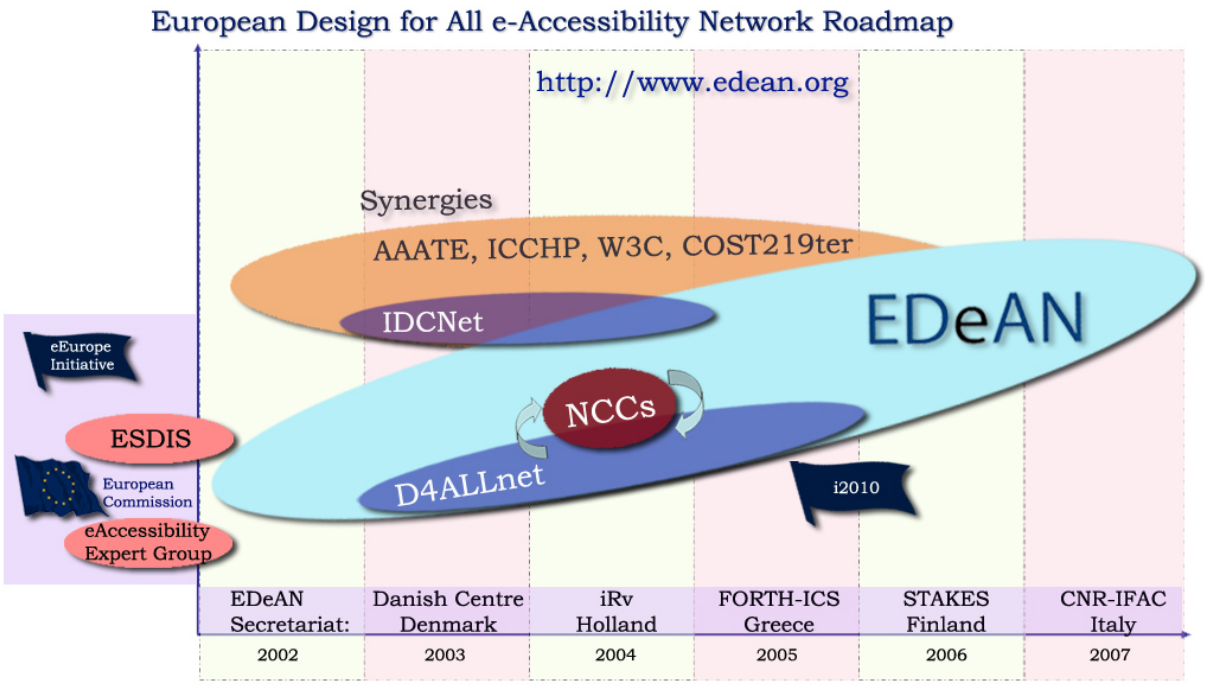

Figure 1: EDeAN Roadmap

It has been recognised that EDeAN so far contributed to:

- Favouring networking between organisations on issues related to DfA and establishing the infrastructure to continue networking activities in the long term.
- Promoting and disseminating the ideas and principles of DfA to a number of European and International Conferences and events as well as to the wider community.
- Collecting a common pool of information with a significant amount of resources related to DfA.
- Preparing educational material for the introduction of DfA to the Curricula of European Universities.

The above, which constitute the initial goals of the network since its establishment in 2002, illustrate the necessity of continuing the work of EDeAN, not only in fulfilling the original objectives, but also in setting new targets and facing the new challenges that arise. It is therefore essential that these efforts are sustained and enhanced, also taking into account the priorities of eInclusion and the i2010 – European Information Society 2010 strategic framework, laying out broad policy orientations that emphasise ICT as a driver of active inclusion in society and quality of life. Moreover, it is necessary to propose a strategy towards the implementation of a plan to mainstream accessibility to ICT products and services and promote eInclusion.

3.1 EDeAN and i2010

The successive e-Europe action plans (2002 and 2005) included a number of specific measures related to eInclusion. In e-Europe 2002, the action line "Participation of all in the knowledge economy" assigned targeted objectives in the areas of "design for all" and "public Internet access points". In e-Europe 2005, eInclusion underlies the priority given to modernisation of on-line public services (e-government, e-health and e-learning). The i2010 action plan[17] positions eInclusion as one of the three key policy priorities, with specific activities recommended: policy guidance on e-accessibility and coverage of broadband (2005), a European Initiative on eInclusion (2008), adoption of and action plan on e-Government (2006), launch of demonstrator projects to test technological, legal and organisational solutions to bringing public services online (2007) and setting up three quality of life ICT flagship initiatives (2007) [8]. In this context, eInclusion follows a twofold approach:

- Preventing digital exclusion, i.e., to prevent disadvantaged people and groups from being left behind in the development of the information society. Digital exclusion may result from a lack of digital literacy, from economic, geographical or technical barriers, or from a lack of capabilities to use efficiently the new services and facilities linked to information and communication technologies. Literacy, access and use are three key words in policies preventing e-exclusion.
- Exploiting new digital opportunities for increased inclusion of socially disadvantaged people or groups, or less-favoured areas. Digital opportunities refer to the distribution and circulation of knowledge resources, the potential of new information and communication services, new job opportunities and better access to employment, and, more traditionally as regards to ICT, overcoming barriers of distance or mobility.

In order for Design for All to materialise in the context of IST, a sound interdisciplinary theoretical frame of reference and a set of proven engineering and design practices are required. Both are necessary to establish a solid code of practice to influence new product development. Integrated and coordinated activities of a range of organizations across various disciplines, including Human Factors, Usability engineering, Human-Computer Interaction, Telecommunications and Software Engineering, industrial and media design and Assistive Technology, need to be carried out, in an effort to exemplify the relevance of DfA to various IST

[17] http://europa.eu.int/information_society/eeurope/i2010/communication/index_en.htm

sectors [22]. The growth in the use of ICT has a profound impact on society, thus increasing the necessity for better and more accessible ICT products and services for all citizens. In i2010, strong emphasis is given to full participation and to providing people with basic digital competence. Objective 3 of i2010 clearly states that: "An Information Society that is inclusive provides high quality public services and promotes quality of life". As digital convergence brings new challenges for eInclusion, eAccessibility needs to be addressed through a mix of research and stimulation measures to make ICT systems easier to use for a wider range of people. The challenges lying ahead are wider and not addressed by IST alone. It is therefore crucial that they are addressed also in a social sciences context.

Moreover, the Information Society and the consequent changes it brings to the socio-economic environment should also be considered in the context of a knowledge society, as knowledge through information becomes the key resource. Provision of opportunities for everyone to learn and to develop their skills and abilities while supporting also wider social objectives of inclusion and equality must be ensured. The emergence of the knowledge society entails an ever-increasing demand for well-educated and skilled citizens. As access to information becomes easier and less expensive, it becomes crucial that the skills and competencies relating to the selection and use of that information are considered. Tacit knowledge in the form of the skills needed to handle codified knowledge is crucial. It becomes more important than ever that access to the knowledge society is ensured for all citizens, including the disabled and elderly and that the potential to increase opportunities for independent living, and provide greater autonomy and improved social integration is fully exploited.

As market competition intensifies, the design codes anticipated to prevail are those capable of accommodating not only diversity in users' abilities, skills, requirements and preferences, but also the changing nature of human activities, in the variety of contexts of use, the increasing availability and diversification of information and knowledge sources and services, and the proliferation of technological platforms. Recent R&D work funded by the European Commission has demonstrated the technical feasibility of Design for All, particularly in the field of Human Computer Interaction [20]. In that respect, it is vital that EDeAN continues its efforts towards increasing awareness about Design for All, as well as promoting the diffusion and adoption of Design for All approaches and practices.

This can be achieved through the articulated structure of the EDeAN network's activities, which seek to establish consensus through networking, to develop a resource base and benchmarking

instruments for the European IS community, to facilitate education and training in all issues related to Design for All at a European level, to stipulate policy recommendations on pre-standardisation, legislation and public procurement, and to raise awareness and disseminate relevant knowledge through targeted and concentrated outreach activities.
Design for All has the potential to remove barriers created by technology and faced by disadvantaged groups and individuals, thus contributing to enabling independent living, socio-economic integration and quality of life. Moreover, in an increasingly information-based society, access to information is likely to determine the extent to which individuals or groups are able to engage and participate in basic societal activities. Design for All seems to offer an attractive framework, explicitly addressing access to information and services at all relevant levels (e.g., infrastructure, hardware and software). In pursuing the above, a core networking objective is to support existing partnerships and create new ones between academic, research, user, and industrial communities to promote DfA practices:

- Further increasing cooperation and collaboration at national and international levels to share knowledge and experiences on DfA through participation in common case studies and dissemination activities.
- Continuing the work of the web-based EDeAN thematic interest groups (called Special Interest Groups, SIGs) and enhancing also their off-line activities.
- Bridging perspectives and conceptions on DfA and stimulating industrial interest throughout the enlarged European Union.
- Articulating a demand for DfA products and services, by making end users active network participants through the SIGs and National Contact Centres of EDeAN. NCCs can play a vital role in promoting the EDeAN SIGs, inviting and enrolling new members from the Member States. The SIG members can then act as the driving force for the demand of DfA products and services in their countries and will have the opportunity to do so both directly through the SIGs and indirectly through the NCCs.

The year 2005 represents a landmark with respect to eAccessibility policy in Europe. This is illustrated by the publication of the EC Communication on eAccessibility, as well as the launching of the i2010 initiative. Also, the two EC – funded projects that were originally designated as support projects for EDeAN have come to a completion in 2005. IDCnet was successfully completed in February 2005 and D4ALLnet is to be completed by January 2006.

The two projects provided support for the operation of the network, in terms of content creation (IDCnet), but also in the context of creating and maintaining the technical infrastructure for the operation of EDeAN and the organisation of the EDeAN SIGs (D4ALLnet).
In this evolving context, it becomes necessary to re-visit the policy environment and re-define the Network's goals accordingly, to maintain, continue and enhance EDeAN's role in the European policy making environment. Moreover, it becomes increasingly important that existing collaborations are enhanced and new joint activities are sought with other initiatives and projects active in the field, such as the eInclusion@EU project[18] and the ongoing activity of the RSA Inclusive Design Resource project[19] as well as a number of standardisation and benchmarking initiatives, including the CEN-ISSS workshop[20] and the WAB cluster[21].

4. Current challenges

The recent Commission Communication on eAccessibility identifies a core of practical challenges, as well as market, legal and policy issues towards improving eAccessibility and eInclusion in Europe, and elaborates a three-fold approach based on

- accessibility requirements in public procurement
- accessibility certification and
- better use of existing legislation [9].

In that respect, (i) the introduction of specific legislative measures to complement and enhance existing legislation, (ii) addressing and motivating the industry, (iii) effective benchmarking, (iv) providing harmonised standardisation, (v) the creation of a European curriculum for DfA and, finally, addressing future research activities and revisiting the operation of EDeAN by proposing concrete new activities that could be undertaken at the European level, are of particular importance. Moreover, it becomes necessary to further increase activities towards promoting awareness, dissemination and mainstreaming of DfA, aiming at a shift towards a more strategic approach in public and private organisations, and particularly addressing the industry in a

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[18] eInclusion@EU: http://www.einclusion-eu.org/

[19] The Inclusive Design Resource developed by the RSA. See: http://www.inclusivedesign.org.uk/ for details.

[20] CEN-ISSS: European Committee for Standardisation - Information Society Standardization System. See: http://www.cenorm.be for details.

[21] The EU Web Accessibility Benchmarking Cluster is a cluster of European projects to develop a harmonized European methodology for evaluation and benchmarking of websites. See: http://www.wabcluster.org/ for details.

systematic way. In such a context, this White Paper aims to identify specific challenges and propose future activities in five domains directly related to accessibility and Design for All, namely Policy and Legislation, Industry, Monitoring and evaluation - Benchmarking, Standardisation, and Education and Training.

4.1 Policy and legislation

With regards to Policy and Legislation activities to support eAccessibility and Design for All, it is important to stress the need for concrete measures that will not aim at imposing but rather will provide semi-voluntary incentives for the industry to engage in DfA practices and promote the development and use of DfA products and accessible ICT services for all. Legislation in this area can become outdated due to rapid technological development. Therefore, a combination of general legislation, specific legislation, "soft law" and reference to the relevant standards seem to offer the best possibilities to ensure eAccessibility.

Equality and non-discrimination are considered core principles for all eAccessibility legislation, including the areas of telecommunications services and public procurement. Two recent reports have attempted to map the eAccessibility policy domain from an EU perspective to provide a starting point for the analysis. These are the Commission Staff Working Paper on "Delivering eAccessibility" and the eEurope eAccessibility Expert Group's report "A Review of Legislation Relevant to Accessibility in Europe". In addition, the COST 219 and COST 219bis projects have produced various reports of relevance, the most recent and perhaps most comprehensive being “Bridging the Gap: Access to telecommunications for all people."

Since the publication of these reports, a number of significant developments have taken place in Europe, including the recent accessibility legislation that was enacted in Germany, Austria, Italy and the coming legislation in Ireland. However, there is still a lot to be done, and many EU member states have not yet started to discuss legislative developments in that respect. Although there has been progress at the level of policies and legislation in relation to addressing the needs of disabled users since the beginning of telecommunications liberalisation in Europe, that progress has been frustratingly slow and it is still only "halfway" legislation [3], [19]. A user perspective has thus been brought into telecommunications legislation and users with special needs have been recognised at certain points. What is needed now is that the Commission and Member States use the powers given in the Directives (on Terminal Equipment and on Universal

Service and Users' Rights) in order to achieve a more accessible society. At the same time, policies need to be strengthened so that more actions can be specified towards this goal. eAccessibility is not solely a question of accessible web sites, even if this is a central issue for the policy agenda [6]. It also includes, for instance, basic telephony services as well as mobile telephony and work in this area is far from complete. Apart from issues such as the basic accessibility of handsets, there is also the growing use of mobile devices to access eServices. This introduces an entire new set of accessibility challenges. Linked to this is the question of the scope of policy instruments in the telecommunications field, such as Universal Service Obligations, and whether these should be extended to cover mobile services, the internet and broadband access [5]. Another area that needs attention is smart homes. The increasing addition of intelligence and networking of devices in the home, as well as the accessing of eServices in various ways from the home, raises new accessibility issues and challenges. Other developments in the security area, such as biometrics, also need to be considered, as these can also raise new accessibility issues.

Overall, it can be concluded that there is little consistency across Europe and no harmonisation of strategy or implementation of Universal Access. Therefore, it becomes increasingly important that existing measures in telecommunications to improve accessibility are also implemented by Member States and the Commission. In addition, these would have to be extended to cover ICT services such as mobile telephony. It therefore becomes necessary to bring forward a common European legislation on eAccessibility based on the recent experiences from Austria, Germany, Italy as well as the US, and ensure the harmonisation of legislative measures across EU member states. Moreover, the work currently carried out by European initiatives such as the eInclusion@EU project which has been set up to support Information Society policy-making in the European Union could be further deployed, and cooperation with EDeAN in the context of information dissemination and results promotion further encouraged.

4.2 Industry

There seem to be quite a large number of reasons why providers are reluctant to introduce accessibility and DfA into their development process. Most of them claim that creating accessible services requires, among others, a considerable initial investment for equipment and recruitment of a proper team (e.g., training, technical assistance, purchase of authoring software and assistive technologies). There is also a growing need to improve networking between

stakeholders in order to achieve progress in the implementation of Universal Access principles into the design of IST applications and services. It is important not only to conduct research on design principles and to develop guidelines and recommendations, but also to closely co-operate with the mainstream ICT industry so that the principles are accepted and applied to technologies. Moreover, a growing need emerges to stimulate market attention to technologies that can support independent living for ageing and disabled persons, for example intelligent systems in the home and ambient environment. This could be facilitated, e.g., through support for technology transfer between the mainstream and assistive technology industries, as well as through more general support for the emergence of a dynamic assistive technology industry in Europe.

Often, ageing people have to buy products that are not accessible for them. Without a demand for accessibility is difficult to encourage the market. Therefore, market encouragement should actively address disabled and ageing people and their user organisations, and raise awareness of the need to demand accessible products. Moreover, Industry awareness of DfA in IST-related areas needs to be further increased and the development of DfA products and services intensified, by:

- Co-operating with standardisation bodies and other initiatives to promote eInclusion.
- Helping academia and research organisations to identify the mid- to long-term needs of the ICT industries with regards to eAccessibility.
- Creating awareness of the resources, ongoing research and educational activities at universities among industries.
- Speeding up the dissemination process of research results into new products, manufacturing processes and improved working conditions.
- Providing accessible telecommunications terminals within the universal service framework.
- Promoting availability and affordability of accessible terminal equipment as an obligation for designated universal service providers. There could be four elements to this approach - obligation for designated service providers, mechanism for recovery of net costs from a universal service fund, management systems guided by an advisory group to determine and review what terminals to include, and a regulatory and monitoring function to ensure effective working of the scheme.
- Focus on measures to encourage private enterprise to make their ICT based products and services accessible, including requiring accessible products and services for ICT public

procurement contracts to be accessible. In this case, European public procurement legislation should include specific references to accessibility criteria of relevant goods and services.

- Ensure that there is a large enough European space (harmonisation) to persuade commercial goods and service providers to offer more accessible goods and services. For example, provide VAT exemptions on specific goods and services to encourage the provision of more accessible solutions.

4.3 Monitoring and evaluation - Benchmarking

As demonstrated by examples both from Europe and the USA [12], the public sector as a major purchaser of ICT equipment and services can exert significant influence on industry through IST purchasing power and policy. Hence, the possibilities to introduce eAccessibility requirements in public procurement, especially for ICT equipment and services, should be actively used [7]. A useful model for this is the section 508 of the US Rehabilitation Act. Testing, benchmarking and labelling of the eAccessibility of products and services [23] become increasingly important if eAccessibility in Europe is to be addressed in a substantial manner.

The W3C with the WAI guidelines have set the standard criteria for the evaluation of the accessibility for web sites. The resulting framework is widely accepted and the number of conforming sites is slowly increasing [25]. Still a lot remains to be done to convince responsible persons of the importance for their company to offer accessible web sites to their customers. In that respect, National Authorities could show good example by implementing the guidelines on the public web sites.

A key to success would be to have the conformity to the guidelines checked through an easy and inexpensive evaluation process. This requires a commonly agreed conformity assessment method, and wide availability of the relevant tools. This could be addressed in a number of ways:

- Awareness of the W3C-WAI guidelines should be further developed and all European countries should adopt them for the public web sites to show good example.
- EDeAN NCCs should coordinate national actions, such as providing seminars and courses and make the guidelines accessible in the national language.
- Tools need to be developed to run a harmonized evaluation process and be made available at low or no-cost.

- Many Member States have begun initiatives to increase the adoption of W3C-WAI guidelines. However, a common monitoring mechanism is still to be put in place in order to obtain comparable data across Member States. Awareness of the WAI guidelines should be further pursued and all European countries should adopt them for the public web sites to show good example.
- It is also important that a regular common method based monitoring process is in place for all public web sites.
- Following the Australian experience, a Disability Advisory Body comprising representatives from disability organisations and collaborating with the European Disability Forum, to monitor the impact on people with disabilities of all proposed telecommunications codes and standards could be established. Also, a wider approach including ageing persons, cultural minorities and other disadvantaged groups should be encouraged.

4.4 Standardisation

Another important point to be made with respect to improving accessibility of IST concerns technical standards. These are important if accessible IST-based services are to become widely available. The on-line services industry and IST manufacturers should be encouraged to develop and accept such standards. One crucial area is, for example, the application of the emerging standards for accessible document structures for people with visual or other print-related impairments. Of particular importance in this respect are the Web Accessibility Initiative (WAI) guidelines for public sector web sites. By taking a leading role in the application of these guidelines, the public sector can stimulate the private firms to follow this path. Efforts to be made in order to achieve full accessibility of current and future IST-based environments should of course not be confined to the Internet in its current form. Rather, a wide range of IST systems and services (for instance, information kiosks and other public terminals, various kinds of mobile devices) have to be considered, too.

A number of standardisation activities are carried out at the European Level and in the United States, and a number of standards have been created and are also in use nationally. It is very important to foster harmonisation of standardisation activities across Europe to render standardisation actions more efficient than at present. From the point of view of promoting social participation of the elderly and people with disabilities, it is desirable that these issues are also

taken into consideration in different regions [13]. However, if the established standard differs from region to region, it will not only confuse users but also erect barriers to international trade. In the future, it is necessary to promote international activities in this field and to coordinate the standards of various regions through those activities. The following is a set of actions that could be considered with regards to Standardisation activities:

- Promote the production of harmonised standards.
- Ensure regular monitoring and update of standards for web accessibility in order to keep pace with the rapid development.
- Ensure that the necessary standardisation activities are identified and carried out, focusing on the need for standards connected with the directives of the European Commission (harmonised standards). This may require complementary mandates from the Commission to the European standardisation organisations (CEN, CENELEC and ETSI).
- Create and adopt an "eAccessibility mark" for goods and services which comply with relevant standards for eAccessibility.
- Include the principle of "mainstreaming accessibility" in other areas of standardisation activities through the development of Design for All guidelines to be used by the European standardisation organisations.
- Ensure that consumer interest is represented in standardisation activities by developing a mechanism that would permit formal consultation with official representatives of users from disadvantaged groups, e.g., for users with disabilities, the European Disability Forum.
- Promote co-ordination among the work carried out by the European standardisation organisations in the field, and in particular continue the collaboration with DATSCG (Design-for-all and Assistive Technology Standardisation Co-ordination Group).

4.5 Education and training

Work on the creation of a European curriculum for DfA education has progressed in the last three years, also as a result of the work of IDCnet project, mainly in the context of setting the requirements for a European Curriculum on DfA, as well as helping define the ideal profile of the DfA practitioner – graduate student. Moreover, some University courses on Web accessibility or DfA are now being taught in some universities (e.g, University of Linz, University of Crete). It is absolutely necessary that this work continues under the auspices of

EDeAN, and particularly that the successful examples of DfA courses that have been carried out in some universities across Europe are further developed. Moreover, a number of pilot on-line training courses that have been developed in the past (e.g., IS4ALL) provide a very good ground for the deployment of training courses, targeted to students and professionals alike. To that effect, it is important that the experiences and know-how developed are further enhanced and disseminated so as to:

- Ensure that proposed Design for All curricula are developed and adopted by the relevant educational authorities in all Member States.
- Improve the employability of people with disabilities through appropriate vocational programmes targeted towards IST jobs as well as training in IST oriented skills within other vocational programmes.
- Apply the principles of DfA in new and existing facilities for lifelong learning to upgrade the skills of people with disabilities, ageing persons and cultural minorities.
- Ensure that multimedia materials and the use of ICT in education do not create new barriers for the integration of disabled students or students from other disadvantaged groups, by fostering the creation of accessible educational content (i.e., accessible textbooks and multimedia material).
- Ensure that eAccessibility becomes a regular part of all education programmes of vocational schools of any level, e.g., Web masters, multimedia authors and software developers.

4.6 Research activities

Apart from the five domains addressed above, it becomes increasingly important that EDeAN also addresses current challenges that emerge in the context of DfA research activity. Although the purpose of EDeAN so far has not concentrated on research, the number and the quality of research institutions represented in the network, constitute a critical mass that could foster research on DfA, in terms of monitoring technological developments, explore the state of the art in DfA both in terms of theoretical and engineering grounds, and evaluate and assess research results.

Monitoring technological developments and projecting their implications on human activities, would in effect have to address representative future scenarios of Ambient Intelligence (AmI)

Environments (e.g., the ISTAG scenarios)[22] and investigate how different technological trends shape these environments as well as the implications on potential users, including people with disabilities and elderly people [4].

Exploring the state of the art in DfA, both in terms of theoretical and engineering grounds, becomes essential in order to deliver a collection of DfA methods and tools for addressing specific challenges relevant to Design for All and its applications to solve real problems of users. This process could involve pooling together existing methods developed and used by EDeAN members (e.g., assessment protocols and manuals, requirements engineering protocols, usability instruments, software libraries for building accessible components, software tools for integrating and adapting systems and interfaces to access information and communicate, design criteria, principles and guidelines), as well as the development of new ones through research projects addressing prominent gaps. In summary, the main aim of this activity would be to pool the resources necessary to plan, set up, and test pilot examples of Design for All based accessible environments.

Last but not least, evaluation and assessment of intermediate and final DfA results is a process that is still under-developed, as the field of Design for All is still lacking instruments to help designers measuring (in qualitative or quantitative terms) the degree to which a certain product, service or process meets Design for All criteria, as well as user needs and expectations. Consequently, it becomes important to eliminate this gap by qualifying and quantifying DfA engineering in terms of process benchmarks and product quality attributes, in an effort to develop the instruments needed to conduct evaluations and assessments of intermediate or final results. On the other hand, efforts need to be devoted to develop methods and techniques for evaluating the impact that Design for All products can have in terms of the resulting benefits for the potential users and their integration in the Information Society. In that respect, EDeAN could contribute to introducing new instruments into effect and obtain feedback on their performance as means for evaluating and assessing DfA qualities. The overall objective is to establish the means through which Design for All practitioners can reliably assess either process and/or obtain feedback on how they concur to create an accessible Information Society.

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[22] IST Advisory Group (2003). Ambient Intelligence: from vision to reality ftp://ftp.cordis.lu/pub/ist/docs/istag-ist2003_consolidated_report.pdf

4.7 Summary and recommendations

A number of challenges in five domains directly related to Design for All and Accessibility have been briefly presented. Current developments in Policy and legislation and Standardisation, the role of the Industry, education on DfA and Monitoring and evaluation – Benchmarking of accessibility, can be considered as a result of the current developments in the European IS environment. Hence, it becomes increasingly important that they are effectively addressed in order to improve eAccessibility and eInclusion in Europe. In that respect, it is important that a common European legislation on eAccessibility is sought, not in the context of imposing but rather motivating and providing incentives for the industry to engage in DfA practices and promote the development and use of DfA products and services. This, in turn, could contribute to the stimulation of market attention to such technologies and further increase the demand for DfA products and services. The monitoring and evaluation of conformity to accessibility standards and guidelines and the development of subsequent mechanisms to support it also becomes a necessity. In a similar way, the development of harmonised standards and consumer participation in standardisation activities should be encouraged, in the context of a wider collaborative environment of industrial, user, standardisation organisations and policy – legislative bodies. In that respect, ensuring that DfA and accessibility becomes a regular part of all educational programmes of vocational schools is essential, as is the development of a curriculum for DfA for European universities and Design Schools. Last but not least, the need for EDeAN to also address current challenges that emerge in the context of DfA research activity has been stressed. The above, in turn, make apparent the fact that EDeAN must re-position itself in the context of these developments and that the operation of the network is revisited to address the current as well as the future challenges laying ahead, towards the creation of a European Information Society for All.

5. Future plans for EDeAN

Over the past three years since its establishment, EDeAN has significantly contributed to raise awareness and bring forward major issues related to the adoption of DfA practices and accessibility requirements towards the creation of a European Information Society for All. At present, an efficient networking infrastructure has been set up, supporting the operation of the network at the European level. Moreover, one of the main objectives, that is to ensure the

participation and representation of all European member states in EDeAN, has nearly been accomplished. As of December 2005, 23 EU member states are represented in EDeAN.
It is now important to support and further enhance networking activities in a more structured way, to produce concrete results that can be more easily exploited by integrating different (virtual and real) networking mechanisms and by structuring the undertaken virtual activities. Moreover, EDeAN has to establish itself as the leading European institution in the area of Design for All and eAccessibility in the context of the Information Society. As such, EDeAN could create a European « Design for All and accessibility observatory » incorporating all or most related European initiatives to monitor the state of art of Design for All and e-Accessibility of IST in Europe and perform annual web accessibility surveys in all member states. Therefore, the NCCs have a crucial role to play in mobilising resources and organising these activities. Moreover, EDeAN should become the leading information and consultation source for policy makers, designers, standards developers, producers, consumers and all other concerned parties. A periodic evaluation of all standardisation activities with respect to Design for All and accessibility should be carried out by the NCCs and their impact on the real-life situation of disadvantaged groups, including ageing and disabled persons, evaluated regularly. To put it in a more concrete way, it is important that EDeAN enhances its current activities and further seeks to:

- Collaborate with other international initiatives / programmes / projects in the context of future (EDeAN) activities, towards the creation of material such as guidelines, recommendations, a “quality mark on web accessibility”, etc.
- Re-define the EDeAN Special Interest Groups (SIGs). So far the EDeAN SIGs have provided a basis for structured discussion in specific areas of interest in DfA. However, in certain cases, the topics addressed by the SIGs and the work model followed did not achieve the overall goals. Participation in discussions and real interest have been lower than anticipated. This problem may be tackled by re-defining the SIGs areas of interest, as well as the method of work. This will be a collective process that will have to involve the EDeAN NCCs and member organizations, as well as current SIG moderators and members.
- Continue and enhance data collection and filtering process for DfA-related resources, in order to maintain and enhance the data structure and organisation of the ARIADNE DfA Resource Centre as a European-wide resource base on DfA.

- Develop methods and techniques for evaluating the impact that Design for All products can have in terms of the resulting benefits for the potential users.
- Qualify and quantify DfA engineering in terms of process benchmarks and product quality attributes in an effort to support users and their integration in the Information Society.
- Operate as a European-wide environment for the testing and evaluation of DfA technical solutions.
- Extend the uptake of DfA within industry in Europe by creating a basis for cooperation between companies and the European DfA community via common fora. This could take a form of an "accessibility consultancy" service, that will aim at:
    - Helping the industry, academia and research organisations to identify the mid- to long-term needs of the DfA sector
    - Supporting the industry in developing DfA related strategies
    - Creating awareness of the existing resources, ongoing research and educational activities among universities and industries
    - Speeding up the dissemination process of research results into new products, manufacturing processes and improved working conditions
    - Acting as a forum for industry to implement results from various European projects in FP5-FP6, ensuring and adequate management of IPR issues
    - Extending and updating existing materials that address the commercial benefits of DfA and discuss them with industrial stakeholders
    - Organising interdisciplinary workshops and promoting joint research between the industry, academia and end user organisations
- Establish both on-line and off-line Design for All courses building upon previous work that has been carried out in the context of the IDCnet and IS4ALL projects, including the creation of guidelines to implement DfA courses for a wide range of stakeholders, e.g., designers, business executives, user groups, undergraduates (modules) and postgraduates (MSc degree level).
- Produce case studies to demonstrate how such materials are both useful and accessible.
- Make concrete recommendations for developing the curriculum, and for determining the areas where DfA should become part of the curriculum in European universities and design schools.

- Further enhance dissemination and outreach activities, including:
    - Organisation of information seminars and workshops
    - Establishment of a publication series of DfA cases that could be elaborated in a press format, presenting different perspectives and benefits as best practice examples
    - Establishing a regular publication of regular reports, presenting the results of surveys and regular reports that could be carried out by the EDeAN SIGs and the NCCs
    - Continue and improve the bi-monthly EDeAN newsletter
    - Establish an annual EDeAN publication, EDeAN Year Book, reporting on the state of art of DfA in Europe, with the contribution from the NCCs and other EDeAN member organisations.

Finally, it is the hope of everyone involved in the writing of this paper, that this effort will be continued on a regular basis and as stressed above, take the form of an annual EDeAN publication, reporting of the state of the art of Design for All and accessibility in Europe. With the input and contributions from all EDeAN NCCs and other active EDeAN member organisations, this attempt would not only be a state of the art report, but would also prove to be a good opportunity for a self-monitoring exercise of the work of the Network.

6. Conclusions

This paper aimed to provide an overview of developments in five major domains related to Design for All and e-Accessibility in Europe, namely policy and legislation; the role of the industry; standardisation; monitoring and benchmarking and education and training. A number of currently emerging challenges have been identified, with the overall aim of further contributing to effectively address DfA, e-Inclusion and eAccessibility in the immediate future. An overview of policy as well as R&D activities over the past 15 years in Europe has also been presented and the role of EDeAN in the changing European policy environment revisited.

In this context, the importance of enhancing existing international cooperation activities and creating new ones in the areas of policy, benchmarking, and education and training in Design for All and eAccessibility has been stressed. Moreover, the need has been highlighted to further increase awareness, dissemination and mainstreaming of DfA and shift towards a more strategic approach in stimulating market attention and mobilising the industry by providing effective

motivation for the development of accessible IST products and services. Ensuring that DfA becomes a regular part of all educational programmes of vocational schools and European universities alike, encouraging the development of harmonised standards, increasing consumer participation in standardisation activities, promoting the creation of common e-Accessibility legislation in all EU member states, all play a crucial role in this respect.

Since its establishment in 2002, EDeAN has succeeded in becoming a European-wide forum for the discussion of DfA issues and in fostering awareness and mainstreaming DfA and eAccessibility. However, in the constantly evolving European environment, especially in the context of information and knowledge society and socially sustainable development, if EDeAN is to perform a constructive role in promoting and mainstreaming DfA and eAccessibility in Europe and in promoting changes of culture in the private and the public sectors, it is essential that its operation is revisited regularly and the future activities of the Network take into account and address all the challenges emerging now, as well as in the future.

Today, it seems clear that the foundations towards the creation of a more accessible information society in Europe have been laid. It is now necessary to go ahead in a coordinated manner to create a European market of accessible goods and services. The recent Communication of the Commission, and the stages of consultation which will precede it, will certainly constitute an important impulse for the European Union as well as for the members states to develop coordinated initiatives to guarantee accessibility, encouraging the industry in making their products and services more accessible, and offering users with disabilities an efficient instrument for advocacy in order not to be excluded from the advantages offered by the information society.

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References

[1] Bühler, C., & Placencia-Porrero, I. (2002): eAccessibility Expert Group Final report: eEurope – Participation for All Action line: Networking Centres of Excellence in Design-for-All and Developing an EU curriculum in Design-for All.

[2] 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.

[3] Bühler, C., Wallbruch R. (2005): E-Accessibility in Germany: Acts and Ordinances, Outcome of Benchmarking and Activities.

[4] Burzagli, L., Emiliani, P.L., Graziani, P., (2005): Ambient intelligence and disability: the technological perspective.

[5] COST 219 bis (2001): Bridging the Gap? Access to telecommunications for all people.

[6] COM (2001) 529 final, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: eEurope 2002: Accessibility of Public Web Sites and their Content. Brussels, 2001.

[7] COM (2002) 62 final, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: *e*Europe Benchmarking Report. Brussels, 2002.

[8] COM (2005) 229 final, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: i2010 – A European Information Society for growth and employment. Brussels, 2005.

[9] COM (2005) 425 final, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: eAccessibility. Brussels 2005.

[10] Council of Europe: Resolution 5165/03 e-Accessibility: improving the access of people with disabilities to the knowledge based society, OJ 14 January 2003.

[11] Council of Europe (2002): The Impact of New Technologies on the Quality of Life of People with Disabilities.

[12] Cullen, K., Milicevic, I,, Wynne, R. (2003): Benchmarking Social Inclusion in the Information Society in Europe and the US

[13] Engelen, J., & Emiliani, P.L. (2005): eAccessibility Legislation and Policy: the Role of Standardisation, in Proceedings of HCII2005 (Las Vegas). Retrieved January 15, 2006 from: http://www.esat.kuleuven.ac.be/pub/bscw.cgi/d19580/standardisation_JE_PLE_final.doc

[14] European Commission, Directorate-General for Employment, Industrial Relations and Social Affairs, Unit EMPL/E/4 (2001): Attitudes of Europeans to Disability: Eurobarometer 54.2.

[15] European Commission (2000): eEurope 2002: An Information Society for All Action Plan. Available: http://europa.eu.int/information_society/eeurope/2002/action_plan/pdf/actionplan_en.pdf

[16] European Commission (2002): eEurope 2005 Action Plan. Available: http://europa.eu.int/information_society/eeurope/2002/news_library/documents/eeurope2005/eeurope2005_en.pdf

[17] European Commission (2002): Delivering e-accessibility – Improving disabled people's access to the knowledge based society, SEC(2002)1039

[18] Marincu, C., McMullin, B. (2004): A Comparative Assessment of Web Accessibility and Technical Standards Conformance in Four EU States. First Monday. 9, number 7, July 2004. Retrieved November 5, 2005, from http://www.firstmonday.org/issues/issue9_7/marincu/.

[19] Scano, R. (2004): "Legge 04/2004 dalla teoria alla realtà", Edizioni IWA ITALY (ISBN: 88-7633-099-2).

[20] Stephanidis, C. (Ed.). (2001): User Interfaces for All - Concepts, Methods, and Tools. Mahwah, NJ: Lawrence Erlbaum Associates (ISBN 0-8058-2967-9, 760 pages)

[21] Stephanidis, C. (Ed.), Salvendy, G., Akoumianakis, D., Bevan, N., Brewer, J., Emiliani, P.L., Galetsas, A., Haataja, S., Iakovidis, I., Jacko, J., Jenkins, P., Karshmer, A., Korn, P., Marcus, A., Murphy, H., Stary, C., Vanderheiden, G., Weber, G., & Ziegler, J. (1998): Toward an Information Society for All: An International R&D Agenda. International Journal of Human-Computer Interaction, 10 (2), 107-134.

[22] Stephanidis, C., & Emiliani, P.L. (1999): Connecting to the Information Society: a European Perspective. Technology and Disability Journal, 10 (1), 21-44. [On-line]. Available: http://www.ics.forth.gr/hci/html/files/TDJ_paper.PDF

[23] U.S. Code (1998): The Rehabilitation Act Amendments (Section 508). Retrieved January 7, 2005, from http://www.access-board.gov/sec508/guide/act.htm

[24] World Health Organization (2003): Future Trends and Challenges in Rehabilitation. Retrieved December 13, 2004, from http://www.who.int/ncd/disability/trends.htm

[25] World Wide Web Consortium - Web Accessibility Initiative (W3C-WAI) (1999): Web Content Accessibility Guidelines 1.0. Retrieved January 31, 2005, from http://www.w3c.org/TR/WCAG10/

Figure legends

Figure 1: EDeAN Roadmap and synergies in the European IST Sector: The image demonstrates the establishment of EDeAN by the European Commission (EC) through the ESDIS and the e-Accessibility Expert Group in July 2002. It shows the collaboration of EDeAN with various relevant networks, organisations and projects (AAATE, ICCHP, W3C, COST219ter, etc), and its two EC funded support projects, namely IDCnet and D4ALLnet. Lastly, it displays the annual rotation of the EDeAN Secretariat (Danish Centre- 2003, iRv - 2004, FORTH-ICS – 2005, STAKES – 2006 and CNR-IFAC - 2007). HERMES, the EDeAN web portal, currently supports all virtual networking activities of EDeAN through the provision of accessible facilities and is available at: http://www.edean.org