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ETSI Guide

**Human Factors;
Inclusive eServices for all: Optimizing the accessibility and
the use of upcoming user-interaction technologies**

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Human Factors (HF).

Introduction

Europe, as well as other economically developed areas, is facing a number of social and economic challenges including an ageing population and high expectations with regard to quality of life, in particular in healthcare, environmental and transportation concerns. These changes in society are also reflected in new requirements for products and services resulting from changing sensory, cognitive and physical abilities of their users.

Experience shows a predominant pattern of products and services being offered that do not take sufficiently into account the needs of people with mild or severe impairments. This tendency contributes to create gaps between people with disabilities and the average population regarding the usage of Information and Communication Technologies (ICT). Two reasons for this state of affairs can be identified. First, companies do not see a business case in offering barrier-free products. Secondly, product and eService developers are often unaware of the requirements of customers with impairments, neither are they familiar with appropriate design solutions that in many cases are not very demanding in terms of research and development (R&D) and production costs.

The motivation for the development of barrier-free services and technologies can be regarded as demand driven, i.e. users, organisations and policy makers express needs that they are not able to satisfy today with existing eService offerings and products. Adopting a Design for All approach should be perceived as an opportunity as it can frequently lead to innovative design solutions that bring benefits to all users, increasing the overall attractiveness of product offerings.

The present document addresses relevant user requirements by taking a long-term approach in ensuring that new ICT will consider the various needs of all users (including older users and those with disabilities) at the time when the technology is first deployed, not as an afterthought as has been the case for many significant previous technological developments.

Building a Design for All approach into the design process of devices and services will ensure that these products have the broadest possible range of application by users with different abilities and users in different contexts. Fully utilising the provisions in the present document will enable manufacturers and suppliers to demonstrate that they have understood and overcome potential accessibility barriers that would otherwise have been created by new interaction technologies that they are using. Adopting such a planned inclusive design approach can be utilised as a positive marketing message that can be given when introducing such products.

Furthermore, adopting the provisions given in the present document will also significantly reduce the risk that manufacturers and suppliers who employ future interaction technologies will introduce products that fail to meet the needs of all sectors of society. Such use of the provisions will thus help industry to avoid the twin penalties of:

- the damage to corporate image that results from the introduction of products that are seen to discriminate against and exclude sectors of society that command widespread public sympathy;

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- the very high costs of having to retrospectively and rapidly re-engineer products in order to ensure that they no longer exclude sectors of society that have already been alienated by previous versions of the product.

Adopting the provisions in the present document may reduce the likelihood that device manufactures and eService providers become the subject of regulation. By doing so, they will be well prepared to comply with any standards or regulation that may in the future be implemented to achieve an inclusive approach to private and public procurement.

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1   Scope

The present document provides guidance for the user interaction design of telecommunication devices and services that are likely to become available for large-scale rollout to consumers in the next five to ten years. In particular, the document identifies provisions that have to be made in order to ensure that forthcoming interaction technologies deployed in devices and services will be usable by all users including older people and/or people with disabilities.

The present document lists user interaction technologies likely to be employed in future devices and services in the form of a technology roadmap. For each identified technology, key characteristics specified include:

- user requirements impacted by the technology;

- benefits and accessibility barriers that will result from deployment;

- solutions related to accessibility barriers (both those benefiting disabled users only as well as those being useful for all users in different contexts).

Measures are identified that need to be addressed prior to the large-scale implementation of those technologies in order to ensure their usability by users with the widest range of characteristics.

Within the scope of the document are those interaction technologies that are likely to be used in information and communication products and services and are likely to achieve a mass-market breakthrough between 2010 and 2020.

Interaction technologies that are exclusively used in:

- stand-alone, off-line products and services;

- assistive devices;

- safety and security-related products and services;

are not within the scope of the present document, even though the guidelines may also apply to some of them.

General user interface design issues (e.g. cognitive workload) that affect the usability and accessibility of user interfaces for eServices are also outside of the scope of the present document.

The intended readers of the present document are the designers, manufacturers and suppliers of all ICT products and services that may use new user interaction technologies in their future offerings. Researchers benefit from the present document by integrating its findings into their research at a very early stage.

It is expected that the present document should be utilised in the earliest stages of the planning of a new product or eService to ensure that the measures proposed can be taken into account during all stages of the product design and implementation process. Such usage should ensure that the resulting product or eService is as barrier free in its design as possible.

2   References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI EG 202 116: "Human Factors (HF); Guidelines for ICT products and services; "Design for All"".

[i.2] ETSI TR 102 849: "Human Factors (HF); Inclusive eServices for all; Background analysis of future interaction technologies and supporting information".

[i.3] ISO TR 29138-1: "Information technology - Accessibility considerations for people with disabilities - Part 1: User needs summary".

[i.4] ISO 9241-920: "Ergonomics of human-system interaction - Part 920: Guidance on tactile and haptic interactions".

[i.5] The Center for Universal Design, NC State University.

NOTE: Available at http://www.design.ncsu.edu/cud/about_ud/udprinciplestext.htm.

[i.6] ISO 9241-20: "Ergonomics of human-system interaction. Accessibility guidelines for information/communication technology (ICT) equipment and services".

[i.7] ETSI EG 202 417: "Human Factors (HF); User education guidelines for mobile terminals and services".

[i.8] ETSI TR 102 068: "Human Factors (HF); Requirements for assistive technology devices in ICT".

[i.9] ETSI ES 202 076: "Human Factors (HF); User Interfaces; Generic spoken command vocabulary for ICT devices and services".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

augmented reality: augmented reality displays are those in which the image is of a primarily real environment, which is enhanced, or augmented, with computer-generated imagery

NOTE: More generally, augmented reality can be defined as any media that is specific to user's location or context, which is displayed in order to augment or enhance user's specific reality.

Design for All: design of products to be accessible and usable by all people, to the greatest extent possible, without the need for specialized adaptation

eService: See service.

eService cluster: collection of multiple (electronic) services aggregating into one (joint, often more abstract) eService

haptic: passive perception through the sense of touch