

Design for All Project Team

Executive Summary Report

**Final Report
15.05.00**

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1. Introduction

This report has been developed in response to Commission Mandate 273, "Design for All and Assistive Technology" which requests the European Standards bodies to identify standards needed to make the Information Society accessible to everyone, including elderly people and people with special needs.

This report, and an accompanying background /state of the art report, have been developed by an independent project team (see clause 5 for list of project participants), under the auspices of the ICT Standards Board. It should be noted that the ICTSB does not necessarily endorse or approve of all or any of the recommendations in this report. The ICTSB has set up its own group to carry out an independent evaluation of the recommendations in this report and will provide its response by early summer 2000.

This report should be seen in the context of Mr. Prodis new vision for Europe, eEurope. A key strand in this vision for Europe is "eParticipation" which is concerned with making eEurope accessible to all people. At the recent EU Ministerial Summit in Lisbon, 10/11 April, the workshop entitled "Citizens with Special Needs", established as part of eParticipation, made a key conclusion:

Access for all citizens in eEurope will only happen if there is Legislation and standards to support that legislation.

Further:

The workshop specifically references this report as a first step to identifying the legislation and standards needed to make eEurope accessible to all people.

The reader should bear in mind that both the technology and political situation are not static, and that some existing recommendations may become out of date, and new and as yet unidentified recommendations, could become more important than those currently prioritised.

1.1. Goal

The main **goal** of this report is to identify the future standardisation needs for ICT in order to create a society that is accessible to all citizens.

The main **result** of the report is a proposed work programme for the European Standards bodies that lists work items to be standardised (see section 4 and Annexes) to achieve the above goal.

The work programme details work items proposed for standardisation, identifies which standardisation bodies should be responsible for carrying out the proposed work items, when (timeframe) and prioritises the work items.

1.2. Background for the project

The use of ICT (Information and Communication Technology) is rapidly becoming an essential part of the economic, educational and social life of the European citizen. This heightened reliance on ICT to convey/distribute content and services has raised concern as to whether these new services are fully accessible for all people, especially to elderly people and people with disabilities.

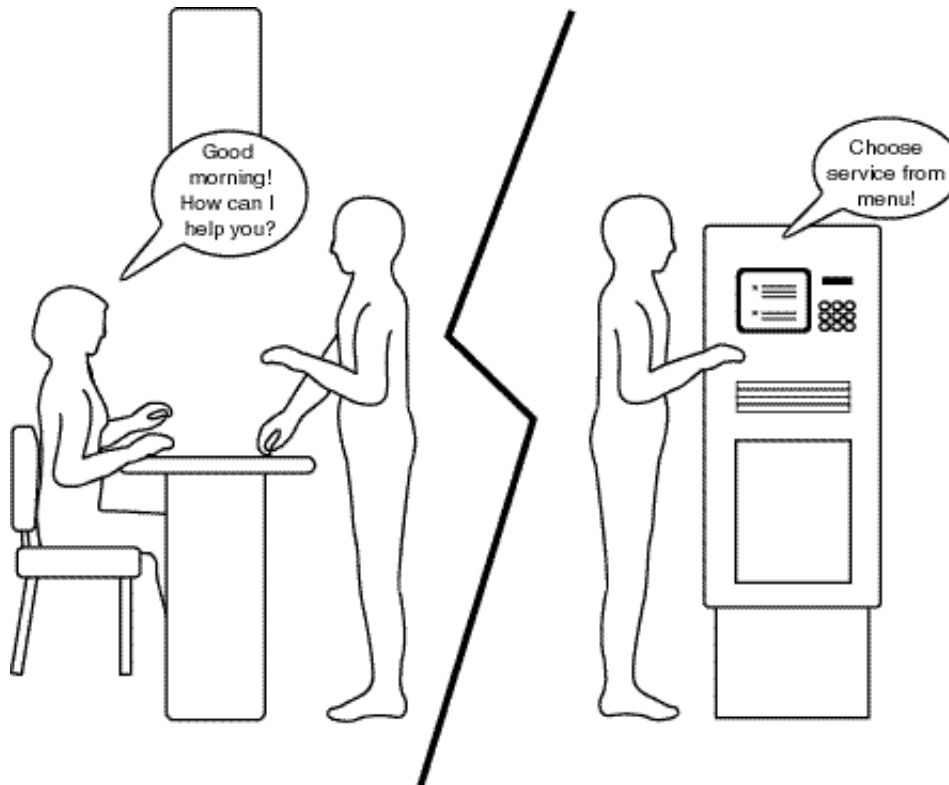


Figure One: We are going from a service society to a self service society. This puts considerable emphasis on the user interface of ICT products, services and systems.

Access by elderly people and people with disabilities to mainstream technology and technology-based services is a major issue in enabling and facilitating their integration in society. The growing proportion of elderly people and people with disabilities in the European population signifies that the urgency of this issue will not decrease in the years to come.

However, as Table One below shows, user interfaces are getting more complex due to increased functionality. This in turns puts even great emphasis on the design of user interfaces of ICT.

Today's user Interface	Tomorrows user interface
Monochrome	Unlimited number of colours
Limited numerical keying	Unlimited alphanumeric input
One channel of input	Several channels of input
Limited use of sound	Voice recognition/ synthetic speech
Limited responsibility with loss of card	Unlimited liability
Constant service offered	Different services – different times
One simple task to complete	Several different part tasks to complete complex prime task
Mainly bank related	All societal functions
Voluntary use	Enforced use
Requires use of 1 card	Two or more cards
1 card – 1 PIN to remember	Many cards, many codes to remember

Table One: Key differences between today's and tomorrow's user interfaces

Note: When designing user interfaces, we must look at the whole, not just individual parts. If we are missing a part, the whole system/ product might not function. The implication is that we need standards that cover all the parts to the same level, if anything is missing the system/ product might not work.

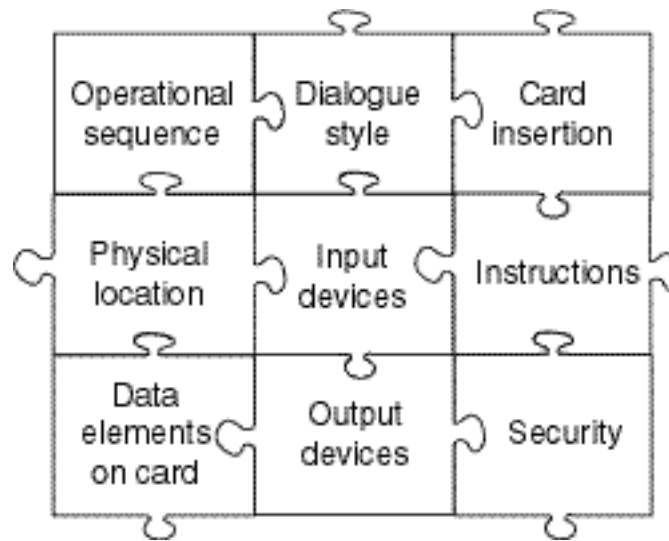


Figure Two: The user interface is like a jigsaw puzzle: it can only function if all the pieces have been identified, actually exist and fit together.

Figure two shows how many different issues interact in a user interface. Standards must cover (relate to) all parts to ensure a functional product.

In the Member States of the European Union, the number of people who are elderly or disabled is estimated at between 60 and 80 million. There is a large overlap between these two groups since disability is strongly related to age, with 70% of people with disabilities being aged 60 or over. By the year 2020 it is estimated that 25% of the population will be aged over 60, and the largest increase is expected in the oldest age groups (75+) where disability is most prevalent. This rise in the elderly population signifies that in the near future the European Governments must create a large number of assistance services or they must ensure that the elderly are capable of living independently over a longer time period. This would imply that transport facilities, shops, public buildings and services, consumer goods, accommodations, communications etc. should be adapted to encompass these “new” user groups.

It is a major challenge for the European Union to maintain and improve the quality of life, integration and independence of these citizens, including providing technology based solutions aimed at integrating them and helping them to lead full and independent lives. Today, the European Union strives towards this goal through concerted efforts in different areas, e.g. the eEurope Initiative, development of new legislation, support to technological research and development, and the development of new standards. Central for all these efforts is a focus on users requirements and design for all (e.g. eParticipation for the Disabled).

This report focuses on the European Unions efforts to develop new ICT standards in order to provide European citizens with accessible ICT products and services. The market for accessible ICT products is growing, although European industry, in contrast to some American market players, has not yet seen the market opportunities that are offered through “design for all” solutions. In this respect, standards can play a significant role providing guidance and offering a clear framework for developers who wish to make their products and services accessible for all. Standards also offer the opportunity to show conformance to regulatory requirements (e.g. ADA).

The main goal of this report is to identify the future standardisation needs for ICT in order to create a society that is accessible to all citizens.

1.3. Constraints

1.3.1. Rationale for subdivision of ICT

The domain of ICT-technology is very large, and growing. Development of new technology and convergence between already established technologies, both within and outside the ICT-domain, provides for fuzzy borders between technological domains. As a consequence it is very difficult to differentiate between ICT-domains.

Within ICT-domains, convergence among different technologies also makes it difficult to identify independent sub-domains. There is today substantial overlap between sub-domains that previously were considered as distinct, e.g. telecommunications and personal computers.

This project has chosen to adopt the classification used in ANEC’s Consumer Requirement document (ANEC IT98-007). Slight modifications were made in order to adapt the different categories (sub-domains) with regard to the competence of the project group.

The categories chosen are listed below:

- Communication Devices
- Digital Broadcasting
- Wayfinding
- Internet and Electronic Commerce
- Personal Information Appliances
- Personal Computers
- Public Access Terminals
- Services – Voice
- Smart Cards
- Smart Housing

2. Design for All and Assistive Technology

The frame of reference for this project is built upon two complementary approaches: “Design for All” and “Assistive Technology”.

2.1. Design for All

Design for All is the intervention on environments, products and services with the aim that everybody, included the future generations, independently of the age, sex, capacities or cultural baggage can enjoy participating in the building of our society.

It is a simple idea: **make products and services usable by everybody**. It serves two purposes at the same time: meeting the needs of consumers who have difficulty using some products, and meeting the needs of companies who want to expand their potential market.

2.2. Assistive Technology

For the purpose of this report, the definition of “technical aid” in the international standard ISO 9999:1998 will be used:

“Any product, instrument, equipment or technical system used by a disabled person, especially produced or generally available, preventing, compensating, relieving or neutralizing the impairment, disability or handicap”

2.3. Combining Design for All AND Assistive Technology

Ideally all products and services should be accessible to 100% of the population (Design for All), but today this is not a realistic goal, both due to the large variation in user characteristics, inadequate understanding of the complexity in user characteristics, situational demands, available technology, etc. A complementary approach is therefore needed to address those cases where it is not practical, possible or cost-effective to meet all requirements. In these cases, an Assistive Technology approach focuses on the development of special interfaces and devices that can bridge the gap between demands from the products/- environment and the users abilities (see figure three below).

Examples of Assistive Technology include the size of text on a screen (increasing the size for those that have vision problems could be annoying for the rest of the population) or the volume of a headphone. In these two cases, glasses will correct the problem for those who have vision deficiencies and a hearing aid will improve the inability to hear sounds at an ordinary volume and frequency.

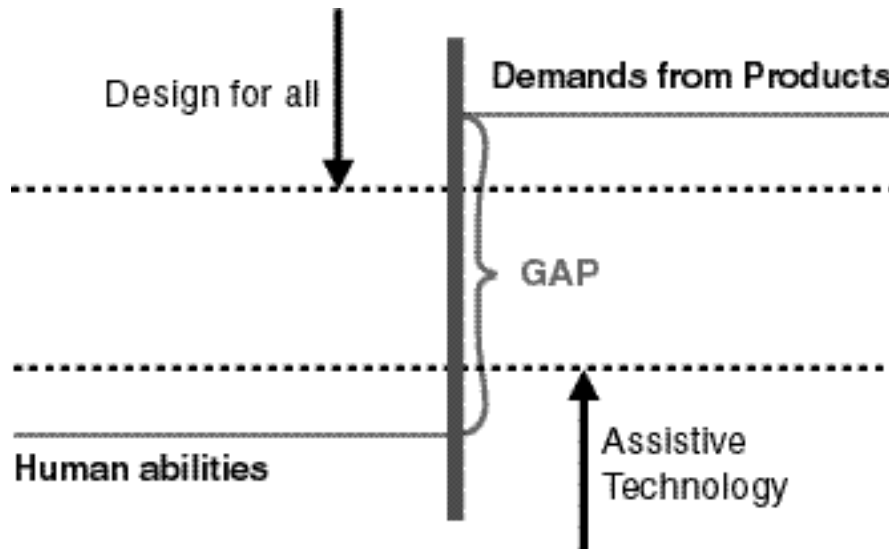


Figure Three: Society has three ways to reduce the gap: The Design for All approach or The Assistive Technology approach or a combined approach.

3. Choosing the “right approach”

3.1. Issues to consider

When writing the proposed standardisation workplan (chapter 4 and the Annexes) a number of issues were carefully considered when attempting to choose the “right” approach.

These issues include, (but are not limited to):

1. the importance of design for all and yet lack of formal standards in this area (need for high impact)
2. design for all is a public interest issue, not necessarily just commercial
3. the speed at which ICT is developing (need for quick solutions)
4. convergence amongst technologies (need to work across traditional boundaries)
5. the need to avoid prescriptive solutions that prevent creativity
6. involvement by all stakeholders, especially from the users and representatives
7. the need for transparent and democratic processes
8. the need for pragmatic solutions.

3.2. Approaches to consider

When compiling the proposed workplan we have compared the above issues in relation to the major characteristics of different approaches, as shown in table two below.

Approaches	Advantage	Disadvantage
Legislation	High impact	Long time
Public Procurement	High impact	Technology lock in, presuppose standards exist
Formal standard (EN)	High impact may be related to legislation	Long time – 5 + yrs
CWA- (CEN only)	Full consensus of all interested parties, rapid procedures similar to consortia. Quicker than standards, democratic, transparent	No formal national status. New – not everyone knows what they are. Dissemination.
Ess, TSs (ETSI and CENELEC)	Full consensus of all interested parties, rapid procedures similar to consortia. Quicker than standards, democratic, transparent	No formal national status. New – not everyone knows what they are. Dissemination
Guidelines	Practical and pragmatic	Not binding
Code of Practice		Not binding
Industry agreement	Will be used	Excludes other stakeholders – consumers.
Research	Strong on user requirements	Dissemination, patents, from theory to practice

Note: The characteristics of the different approaches are not complete – the table merely gives an indication of some of the major characteristics.

It is plainly apparent that there is no-one “right” approach that will cover all the issues.

3.2.1. Type of user interface standards

When choosing standardisation approaches in relation to user interface design, the project team also took into account that user interface standards can take any one of the following forms: each of them has its advantages and disadvantages.

Design process standard

E.g. ISO 13407 Human Centered Design processes for interactive systems. This describes what activities should be done in the systems design process to ensure that the final system is user friendly.

An advantage is that it is flexible/adaptable. A disadvantage is the need for expertise to carry this out, adapt to specific situations.

Performance measures / Quality Assurance

E.g. EN 29242-11 Usability. This type of standard specifies outcomes in relation to user groups (e.g. “99% of first time users should be able to enter a system, perform a task, then leave the system without making a mistake”). Performance measures can include (but are not limited to): ability to complete stated tasks, error tolerance, time permitted to complete tasks. Subjective measures of satisfaction can also be recorded.

The advantages with this are that designers have complete freedom to design solutions. Only outcomes are tested. The problems include setting realistic criteria and levels of acceptance.

Design and test methodology

This type of standard specifies a design and test methodology (e.g. ISO 9186 Procedures for the development and testing of public information symbols) for user interface elements. An advantage with this is that it specifies a series of specified test methods (comparison testing, confusion testing, comprehension testing). Disadvantages include agreement on and specification of test methods and limits, number of subjects needed for testing, etc.

Principles for User Interface Design

This type of standard (e.g. EN 29242-11, EN 1332-1) states high level principles to follow. The advantages include that it can be universally applied. The disadvantage includes interpreting and operationalising high level requirements.

Detailed specifications

Detailed specifications (e.g. EN 1332-2 tactile identifier on machine readable cards) provide detailed specifications – e.g. the radius of a notch on a machine readable card. Another example is EN 1332-1 that includes detailed recommendations on the operational sequence of entering and exiting smart card systems.

An advantage is that the requirement can easily be controlled. A disadvantage is that it may hinder development.

NB. A CWA could include any combinations of the above.

3.3. Developing the standardisation workplan

According to the scope of work for this project, a workplan defining work items, lead responsibility, timeframe and prioritisation should be developed. This is shown in Chapter 4 and in the Annexes.

However, it should be emphasised that the workplan is the independent project teams proposal: - it will be up to the Technical Committees that are identified to agree on the proposed work items, develop a timeframe and give it prioritisation in relation to other ongoing work items within the TC's responsibility.

In some cases, we have suggested several TCs/ WGs under "lead responsibility". This is because these different TCs should be jointly involved in the work, and they should determine who will have "lead responsibility".

The results of the project teams deliberations are to be found in the next chapter and in the Annexes for each of the different ICT domains.

Footnote:

1. ETSI TC HF has sent a communication to the ICTSB, HF 22-041, confirming that it has reviewed the High Level Recommendations (Chapter 4), Annex A – Communication Devices and Annex I – Services, and lists the Work Items that ETSI TC HF identifies as being needed, and which fall under the mandate of ETSI TC HF. It is also noted that ETSI TC HF does not have the resources to complete all the work items.

2. CEN TC 224 has reviewed the High Level Recommendations and Annex G – Smart Cards at its 33rd Plenary Meeting held in Oslo, in April. With regard to Annex G, it confirms that that Work Items, 5 and 10 are ongoing in WG 6, and Work Item 15 is ongoing in the CEN ISSS WS E-SIGN. It has instructed WG 6 to fulfil Work Item 1, developing a Business Plan of the other proposed work items soonest, taking account of existing resources. TC 224 noted that CEN TC 224 WG 6 does not currently have the resources to carry out all the work items identified in Annex G.

4. High level recommendations

4.1. Generic issues across domains

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	GENERAL				
GEN 1.	Improve co-operation between research programmes, standardisation bodies and businesses.	R&D Support Strategy	EU – Info Soc.	High	Q 2/2000
GEN 2.	Evaluate alternative strategies to persuade business to adopt the “design for all” philosophy.	Research Strategy for dissemination	EU – Info. Soc., Enterprise & Consumer	High	Q2/2000
GEN 3.	Review existing “Design for All” Guidelines in different ICT domains and develop generic set of ICT Guidelines	Research Guidelines Follow up team	EU Research Programme	High	Q3/2000
GEN 4.	Review and adapt different types of human factors /ergonomics standards (e.g. design process related standards, such as ISO 13407; usability standards – ISO 9241 and standards based on design principles EN 1332-1), so that they are applicable to public / consumer use of ICT in a design for all framework.	Revised Standards	ISO TC 159, CEN TC 122, ETSI TC HF CEN TC 224 WG 6	Medium	Q4/2000
GEN 5.	Develop Codes of Practice for ethical procedures to be followed when developing, designing and implementing ICT-technology.	Codes of Practice	New CWA	Medium	Q3/2000
GEN 6.	Develop legislation and standards to ensure cost transparency, including cost comparison, for ICT products, services, systems and related usage costs.	Legislation Standard	EU – Consumer Affairs. CEN	High	Q2/2000
GEN 7.	Develop a Follow Up plan for this work (as for ISO TC 68 / CEN TC 224), taking into account new initiatives (e.g. eEurope) and new technological and other developments.	Business plan	EU - ICTSB	High	June 2000..
GEN 8.	The pre-eminence of world-wide standards is recognised. However, where the development of world-wide standards cannot take place in a timely manner, European standards should initially be produced, which could later contribute to world-wide standards	Standards	ICTSB	Medium	Q3/2001

	LOCATION/ACCESS				
GEN 9.	Determine general principles for information presentation for the identification and localisation of mobile ICT devices (e.g. PIA's, PDA's,). Information to be presented in visual, audtive or tactile modes.	Technical report	ETSI SMG	Medium	Q3/ 2000
GEN 10.	Determine general principles for information presentation (visual, audible and tactile) for the identification and localisation of ICT service points.	ENV	CEN TC 224 WG 6 ETSI TC HF	High	ONGOIN G
GEN 11.	Review, adapt and develop standards and/or guidelines for procurement and installation of ICT service points (e.g. ATMS) to ensure accessibility to the service point and at the service point.	ENV	CEN TC 224 WG 6 ETSI TC HF	High	ONGOIN G
	HARDWARE				
GEN 12.	Develop standard and guidelines for layout and identification of functional areas at public access terminals.	Guidelines	New CW Info. Kiosks	Medium	Q3/2000
GEN 13.	Review and develop standard for colour coding of ICT products, systems and service, taking into account cultural differences and users diversities.	Legislation Product Safety Standard	EU – Consumer. CEN	High	Q2/2000
	INTEROPERABILITY				
GEN 14.	Review and apply standards for communication protocols between technologies covered in this report and assistive technologies.	Industry Agreement (CWA ?)	Industry	High	Q2/2000
GEN 15.	Review, adapt and/or develop a range of standardised hardware interfaces (physical, IR, wireless) between technologies covered in this report and assistive technologies.	Industry Agreement (CWA ?)	Industry	High	Q2/2000
GEN 16.	Evaluate alternative approaches to the organisation of dynamically reconfigurable networks and establish an open standard.	Industry Agreement (CWA ?)	Industry	High	Q2/2000
GEN 17.	Develop standards for coding of data to be communicated between devices and assistive technology. Cooperate with work on user profiling.	Research Industry Agreement (CWA)	Research Industry	High	Q2/2000
	ICONS, SYMBOLS & PICTOGRAMS				
GEN 18.	Develop a common set of icons, symbols and pictograms to be applied across all ICT domains. This set to be able to be presented in all modes – visual, auditative, tactually.	Research Standards	EU – IST Research ISO/IEC SC 35	Medium	ONGOIN G in different sectors

USER INTERFACE					
GEN 19.	Review existing standards and guidelines for input and output devices (for office use by professionals). Adapt to include non-professional users in a non-office setting.	Research Revised Standards Guidelines	EU – IST Research Programme	Medium	Q3/2000
GEN 20.	Develop standards for comprehension of user interfaces using information from several modalities.	Standards	ISO TC 159 CEN TC 122 ETSI TC HF ITU	Medium	Q4/2000
GEN 21.	Develop a set of metaphors relevant for different ICT domains in a public setting. Existing (office) metaphors (PC) are probably not relevant for a home setting using other technology.	Research Recommendations	EU – IST Research Programme ISO TC 159 CEN TC 122 ETSI TC HF ITU, CEN TC 224 WG 6	High	Q3/2000
GEN 22.	Develop guidelines for the structure, form and presentation of verbal messages.	Technical Report / Guidelines	ETSI TC HF ITU	Medium	Q3/2000
GEN 23.	Review standards and guidelines for user interface navigation in office environment and adapt to public/ home / mobile environment.	Revised standards	ISO TC 159 CEN TC 122 ETSI TC HF ITU, CEN TC 224 WG 6	Medium	Q4/2000
GEN 24.	Develop Code of Practice for minimum help facilities to be provided in relation to use of ICT services/products	Code of Practice – CWA	CWA - ANEC + Industry	Medium	Q4/2000
GEN 25.	Develop standard for multimodal interaction design, including minimum “time outs”.	Standard	ISO TC 159 CEN TC 122 ETSI TC HF	Medium	Q4/2000
GEN 26.	Provide a recommendation regarding prompting in potentially critical/ damaging dialogues.	Recommendation	ISO TC 159 CEN TC 122 ETSI TC HF	Medium	Q4/2000
GEN 27.	Develop standards for operational sequences in relation to frequently used public terminals.	Standard	CEN TC 224 WG 6 ETSI TC HF	Medium	Q4/2000
USER PROFILING					
GEN 28.	Revise 1332-4 to include coding for service interfaces, different application domains, different environments.	Revised standard	CEN TC 224 WG 6	High	ONGOING
GEN 29.	Establish mechanism to allow cardholders to customise which services are to be put on card, and what limits are to be set for different services.	CWA	New CWA / – DISTINCT	High	Q2/2000
SAFETY AND SECURITY					
GEN 30.	Review and develop legislation and standards for giving and receiving emergency information (e.g. emergency calls). To be accessible for all users and all modalities.	Legislation Standards	EU - Consumer	High	Q3/2000
GEN 31.	Review and develop legislation	Legislation	EU	High	Q3/2000

	and standards for emergency procedures. To be accessible for all users / all modalities	Standards	Consumer		
GEN 32.	Develop standards and guidelines for privacy and security of information. To be accessible for all users / modalities	Legislation Standard	EU Consumer	High	Q3/2000
GEN 33.	Develop interoperability standards that allow users to securely identify themselves using chosen and approved security modules (biometric, PIN, etc).	CWA	CEN ISSS WS E-Sign	High	ONGOIN G
GEN 34.	Develop standards for presentation of alarms and alarm hierarchy both in the home (different modalities) and at alarm centres.	Standard	CENELEC TC 79 / CEN TC 122	High	Q3/2000

5. References/Contact information

The Center for Universal Design at North Carolina State University:	http://www.design.ncsu.edu/cud
Trace Research and Development Center:	http://www.trace.wisc.edu
INCLUDE project:	http://www.stakes.fi/include
COST 219:	http://www.stakes.fi/cost219
NORDICT project:	http://www.centil.dk/cgi-bin/gentest.pl
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Annex A: Recommendations for Communication devices

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	REQUIRED STANDARDS ON INTERFACES FOR ADAPTATION EQUIPMENT:		CEN / ISO		
A 1.	Develop recommendations on adaptability of phone user interfaces to people with different needs.	Technical Report	ETSI SMG 9 / ITU-T	High	Q4/2001
A 2.	Standardise interface (corded and cordless) to external input devices (e.g. larger keyboard).	Standard	ETSI AT / STQ	High	Q4/2001
A 3.	Standardise interface (corded and cordless) to external display systems (e.g. TV, large display).	Standard	ETSI AT / STQ	High	Q4/2001
A 4.	Develop standards for the wireless connection of audio to hearing aids (e.g. ANSI C63.19).	Standard	ISO/IEC	High	Q4/2001
	REQUIRED RECOMMENDATIONS FOR MULTI-MODAL USER INTERFACES:				
A 5.	Develop recommendations for multi-modal dialogue prompting; multi-modal presentation of information (e.g. on cost structure and billing), multi-modal help.	Technical report	ETSI TC HF	High	Q4/2001
A 6.	Develop recommendations on "blind" activation and navigation.	Technical report	ETSI TC HF	High	Q4/2000
A 7.	Review user interface recommendations attending to typefaces, legibility, sizes, colours and graphical representations on products designed for all.	Technical report	ISO.ETSI TC HF to provide input	Medium	Q4/2001
A 8.	Develop recommendations for converting display information into voice output.	Technical report	ISO	Medium	Q4/2001
A 9.	Develop recommendations for additional auditory signals (tones) in dialogues building on ETR 101041	Technical report	ETSI TC HF/ ITU-T	High	Q4/2000
A 10	Develop recommendations on feedback typology: how to activate the different outputs (speech, visual...), message typologies, tactile feedback.	Technical report	ETSI TC HF/ ITU-T	High	Q4/2000
A 11	Develop recommendations on how to make equipment usable for left or right-handed and single-handed users.	Technical report	ISO	Medium	Q4/2001
A 12	Develop recommendations on the implementation of shift or function keys (in terms of offering alternatives for the one-handed user).	Technical report	ETSI TC HF/ ITU-T	Medium	Q4/2001

	REQUIRED RECOMMENDATIONS ON LOWERING COGNITIVE DEMANDS:				
A 13	Standardise minimum timeout in dialogue input prompts.	Standard	ETSI TC HF	High	Q2/2001
A 14	Develop recommendations on characteristics of novice and expert menus and help systems.	Technical report	ISO	Medium	Q2/2001
A 15	Review previous standards (ETR 116) and develop standards for interaction elements (shape, colours, feedback, and dimensions...) for physical and screen controls and indications.	Technical report	ETSI TC HF.	Low	Q2/2001
	SAFETY AND SECURITY:				
A 16	Standardise accessibility of emergency calls (as in GSM).	Standard	ETSI / ITU-T	High	ONGOING
A 17	Develop recommendations for prompting in potentially damaging dialogues.	Recommendation	ITU-T	High	Q2/2001
A 18	Standardise the interface for biometric identification.	Standard	CEN ISSS WS E-SIGN, ETSI SEC, CEN TC 224 WG 6	Medium	ONGOING
A 19	Develop technical (non-human factors) standard on security aspects of Design for All products.	Standard	CEN TC 224 WG 6, CEN ISSS WS E-SIGN	High	Q4/2001
	STANDARDS FOR TEXT TELEPHONY:				
A 20	Complete standard for National text-telephone relay services.	Standard	ETSI / ITU-T, National standardisation bodies	High	ONGOING
	STANDARDISED SYMBOLS:				
A 21	Standardise symbols for different kinds of telecommunications terminals and services; symbols for user interface elements; symbols for on-off, mains, receiver, etc.	Standard	ISO/IEC 35 ITU-T. ETSI TC HF to provide input	High	ONGOING
	OTHER RECOMMENDATIONS:				
A 22	Review recommendations for specialist directory enquiries and service help facilities for people with special needs.	Recommendations	ETSI / ITU-T	Medium	Q4/2001
A 23	Develop standards for camera characteristics in public videophones.	Standard	ETSI TC HF / ITU-T	Medium	Q4/2001
A 24	Develop a standard for range of viewing angles	Standard	ETSI TC HF / ITU-T	Medium	Q4/2001

Annex B: Recommendations for Digital Broadcasting

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
B 1.	The DVB MHP operating systems should be standardised.	Industry Agreement	DVB project	High	Q3/2000
B 2.	The AUDETEL standard for audio description in DVB should be an European wide standard.	Standard	DVB projects	High	Q3/2000
B 3.	There should be a standard for picture-in-picture signing in DVB.	Standard	DVB project	High	Q4/2000
B 4.	All the services offered on both the DAB and DVB terminal should be available electronically at a standard external connection point - facilitate the use of special assistive devices (e.g., voice synthesisers, braille printers). The information should be available in an industry standard format. (e.g. XHTML)	Industry Agreement/ Standard	DVB project / CEN TC 293	Medium	Q4/2000
B 5.	The DVB and the DAB terminal should have a standard interface for keyboard and mouse.	Industry Agreement	DVB project DAB Forum	Medium	Q4/2000
B 6.	It should be possible to store different profiles if some of the family members have different needs.	Standard	CEN TC 224 WG 6	Medium	Q3/2000
B 7.	It should be possible for the user to bring with him the profile to use on other DAB and DVB terminals.	Standard	DVB project/ DAB Forum/ CEN TC 224 WG 6	Medium	Q4/2000
B 8.	There should be a structure for the on-screen menu for both DAB and DVB terminals which make them logical and easy to use.	Industry Agreement	DVB project DAB Forum	Medium	Q4/2000
B 9.	The numerical keypad should have the same layout as a telephone.	Industry Agreement/ Standard	ETSI TC HF/ DVB project DAB Forum	Medium	Q1/2001
B 10	Standardise following user interface elements: shape/ colour/ icon/ label for same function or action.	Standard	ISO SC 35/ DVB project DAB Forum	Medium	Q1/2001

Annex C: Recommendations for Way finding

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
C 1.	Develop a standard terminal independent format for accessing multimodal navigational information.	Standard	W3C	High	Q3/2000
C 2.	Develop standard symbols for marking wayfinding technology present.	Standard	ISO SC 35	Medium	Q1/2001
C 3.	Develop standards for maps allowing accessibility to different technologies and to different user requirements.	Standard	CEN/TC 293 Ad-hoc Group on Communication Aids	Medium	Q4/2000
C 4.	Develop a standard set of commands for navigation tasks.	Standard	None identified	Medium	Q4/2000
C 5.	Develop a standardised way of storing and using user profiles with navigational tasks.	Standard	CEN TC 224 WG 6/ CEN ISSS WS DISTINCT	Medium	Q4/2000
C 6.	These should be standardised location technology with high enough resolution in horizontal and vertical space for indoor and outdoor use.	Standard	ISO/TC 204	Medium	Q4/2000

Annex D: Recommendations for Personal Information Appliances

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
D 1.	Standardise external connector and protocol for external audio amplifier.	Choose Standard	ISO, CEN	Medium	Q4/2000
D 2.	Standardise interface for external display system (TV-Monitor, larger display).	Choose Standard	ISO, CEN	Medium	Q4/2000
D 3.	Standardise symbols for main operations (e.g. Power on/off).	Code of Practice/ Standard	ISO SC 35, ETSI	Medium	Q4/2000
D 4.	Standardise interface (protocols) for external input systems (e.g. keyboard).	Standard	ISO, CEN	Medium	Q4/2000
D 5.	Develop recommendations on the required adjustability of the display angles on non-mobile devices.	Code of Practice	ISO, CEN	Medium	Q4/2000
D 6.	Create standards on support for hearing impaired: possibility to plug in earphones or hearing aids.	Standard	CEN	High	Q2/2000
D 7.	Create standardisation on “blind” navigation and its activation.	Code of Practice	ETSI, Industry fora	Medium	Q4/2000
D 8.	Create recommendations on the user interface with regard to typefaces, legibility, sizes, colours and graphical representations.	Technical report	ETSI HF, ISO	Medium	Q4/2000
D 9.	Use the standardised telephone layout on the PIAs, require QWERTY layout for PIAs	Code of Practice	CEN	Medium	Q4/2000
D 10	Require external connection to separate keyboard (via IRDA, cable, Bluetooth, etc.)	Code of Practice	ETSI, CEN	High	Q2/2000
D 11	Create standards on UI symbols.	Technical report	ISO SC 35, CEN	High	Q4/2000
D 12	Create standards on feedback typology (auditory, tactile, visual).	Code of Practice	ETSI HF, CEN, ISO	Medium	Q4/2000
D 13	Standardise assistive technology interface.	Code of Practice	CEN TC 293, ISO	High	Q3/2000
D 14	Standardise the requirement for sequencing chord input as on a Macintosh and/or PC.	Code of Practice	CEN, Industry fora	Medium	Q4/2000
D 15	Standardise technology interfaces and protocols: Infrared, Bluetooth etc.	Technical Standard	Industry fora	High	Q2/2000
D 16	Standardise protocol for information exchange between peripherals and PIA. (same as for PC?).	Standard	CEN	High	Q4/2000
D 17	Standardise earphone connector.	Select Standard	CEN ETSI	High	Q2/2000
D 18	Standardise interface for identification modules.	Standard	CEN ISSS WS E-Sign	Low	Q4/2000

Annex E: Recommendations for Personal Computers

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
E 1.	Create a world wide recognised standard for hardware accessibility.	Technical Report	ISO TC159 or CEN TC 122	Medium	Q3/2000
E 2.	There is a need for open and modular solutions, which ensure that systems for identification and authentication of users can be introduced or replaced without interfering with the use of assistive devices. The security system and the assistive device or software should be transparent to each other and to the host computer.	Technical Report stating high level principles	CEN/ISSS Workshop on Electronic Signatures and/or ETSI SECurity TC	High	Q2/2000
E 3.	A standard on acceptable levels and measurement methods is required for ensuring that the electromagnetic characteristics of the hardware does not interfere with a hearing aid where the induction pick-up coil is activated.	Standard (Detailed specification)	IEC and/or CENELEC	Low	Q3/2000
E 4.	Noise emitted from a computer can be more annoying for a hearing impaired person than for other users. A global standard on acceptable levels and measurement methods taking account of the needs of hearing impaired people would substantially facilitate purchaser and consumer choices.	Research + Standard (Detailed specification)	IEC and/or CENELEC	Medium	Q3/2000
E 5.	The use of assistive devices in a multi-platform environment is a complex issue. An open, vendor-independent API would be a possible solution. One suggestion would be that CEN/ISSS, as a first step, arranges a one-day workshop or a round table where leading mainstream ICT manufacturers and manufacturers of assistive devices are invited to exchange views, identify problems and explore possible solutions.	Workshop Round table conference	CEN/ISSS	High	Q3/2000

Annex F: Recommendations for Public Access Terminals

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	GENERAL				
F 1.	Raise awareness on this ICT domain to be treated as a whole, not as a different assembly of components of other ICT services, as smart cards, PC devices , etc.	Strategy	EU CEN ETSI ISO	High	Q2/2000
	LOCATION/ACCESS				
F 2.	Elaborate standards on the detection, location and recognition of telecommunication devices and Public Access Terminals.	Standards Legislation	CEN ETSI ISO	High	Ongoing
F 3.	Elaborate guidelines on accessing the Public Access Terminals operation points.	Guidelines	CEN ISO	High	Ongoing
F 4.	Elaborate standards on detection, location and recognition of the different operation points of the Public Access Terminal.	Guidelines Standards	CEN ISO	Medium	Q1/2001
	USER INTERFACE				
F 5.	Elaborate guidelines on the sequence of interaction with a Public Access Terminal and the feedback to the user (detection of the active operation point).	Guidelines	CEN ETSI ISO	Low	Q1/2002
F 6.	Elaborate standards on speech recognition.	Technical report Standard	CEN ETSI ISO	Medium	Q1/2001
F 7.	Elaborate standards on synthetic speech.	Technical report Standard	CEN ETSI ISO	Medium	Q1/2001
F 8.	Elaborate standards/guidelines on consistency of user interface (to ensure similar interaction in common services).	Standards Guidelines	CEN ISO	Low	Q1/2002
F 9.	Create standards for “blind” navigation and its activation.	Guidelines Standards	CEN ETSI ISO	High	Ongoing
	INTEROPERABILITY				
F 10	Elaborate standards on the interaction between the Public Access Terminal and different user assistive technology devices.	Standards Guidelines	CEN ETSI ISO	High	Ongoing and continuous
F 11	Elaborate standards on the interaction between the Public Access Terminal and different system assistive technology devices.	Standards	CEN ETSI ISO	High	Ongoing
F 12	Elaborate standards on interaction between Public Access Terminals and hearing aid users (inductive loops, possibility to plug in hearing aids, connector and protocol for external audio amplifier...).	Standard	ETSI	High	Ongoing

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	HARDWARE				
F 13	Revise standards on the use of communication devices (telephone layout, keyboards...)	Standard	CEN ISO	High	Ongoing
	USER PROFILING				
F 14	Elaborate standards to adapt the Public Access Terminal to the user needs (interaction with smart cards, infrared controls...).	Standards Guidelines	CEN TC 224 WG 6, ETSI, ISO	Medium	Q1/2001
F 15	Elaborate standards on feedback to the consumer, with regard to output (auditory, tactile, visual), message typologies, feedback sequence.	Standards	CEN ETSI ISO	Medium	Q3/2000
F 16	Adapt existing standards and guidelines for tests of usability to include Public Access Terminals.	Revise standards/ guidelines	CEN ISO	High	Q2/2000
	ICON SYMBOLS & PICTOGRAMS				
F 17	Revise standards on the user interface with regard to typefaces, legibility, sizes, colours and consistent graphical representations.	Standards	CEN ISO	High	Ongoing
F 18	Revise standards on user interface symbols and pictograms.	Standards	CEN ISO	High	Ongoing
	SAFETY AND SECURITY				
F 19	Elaborate standards on secure design of the Public Access Terminals and its location site.	Legislation Standards	CEN ISO	Medium	Q3/2001
F 20	Elaborate standards on secure feedback for the user ("large" acoustic and visual feedback).	Standards	CEN ISO	Medium	Q1/2001
F 21	Elaborate standards on the improvement of safety operation of the Public Access Terminal and error protection.	Standards	CEN ISO	Medium	Q1/2001
F 22	Elaborate standards on secure transaction using telecommunications (SSL...)	Standards	ETSI	Medium	Q1/2001
	OTHER RECOMMENDATION				
F 23	Elaborate standards to provide the same service on many terminal types.	Guidelines Standards	CEN ISO	Low	Q1/2002
F 24	Elaborate guidelines on each public access service (tourist information, note and coin operating machine, self-vending machines...) to unify their behaviour.	Guidelines	CEN ISO	Low	Q1/2002

Annex G: Recommendations for Smart cards

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	FRAMEWORK				
G 1.	Develop a framework of all user interface related smart card issues that should be standardised.	Business Plan	CEN TC 224 & WG 6	High	Q2/ 2000
G 2.	Revise the EN-1332 series to take on board domains other than financial services and telecommunications, and environments other than public space, and more recent technologies.	Revised standard 1332 series.	CEN TC 224 WG 6,	High	Q3/ 2000
G 3.	Adapt usability standards (ISO 9241-11) to smart card systems and the design for all philosophy.	Standard	CEN TC 122 / TC 224 WG 6	Medium	Q3/ 2000
G 4.	Adapt design process related standards (ISO 13407, EN 614) to smart card systems and design for all.	Standard	CEN TC 122/ TC 224 WG 6	Medium	Q3/ 2000
	ACCESS				
G 5.	Revise CEN TC 224 WG 6's Scope of Work on the ENV Physical access to terminals, to include visual and cognitive accessibility.	ENV	CEN TC 224 WG 6	High	ONGOING
	AUDITORY				
G 6.	Revise standards for testing the intelligibility of speech/ voice output from systems in various environments, including public spaces.	Revised standard	ETSI TC HF	Medium	Q3/2000
G 7.	Develop standards for the structure, form and presentation of verbal messages for use in public environment .	Standard	ETSI TC HF CEN TC 224 WG 6	Medium	Q3/2000
	CARD DESIGN				
G 8.	Revise 1332-2 to provide one tactile identifier that meets its Scope of Work and that is in line with other existing standards (ETSI).	Revised standard	CEN TC 224 WG 6 ETSI TC HF	Low	Q3/2000
	USER INTERFACE				
G 9.	Key elements of visually presented user interfaces should be standardised. This standardisation should not compromise competition.	Standard	CEN TC 224 WG 6 ETSI TC HF CEN TC 122	High	Q3/2000
G 10	Complete NWI, EN 1332-1 Annex A, development of Icons, symbols and pictograms.	Standard	CEN TC 224 WG 6 ISO SC 35	High	ONGOING
	CODING OF USER PREFERENCES				
G 11	Revise 1332-4 to include coding for service interfaces, different application domains, different environments.	Revised Standard	CEN TC 224 WG 6	High	Q2/2000

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
G 12	In1332-4, implement function that allows the user to be able to customise which services the card can be used for and what limits are to be set for different services.	Standard	CEN TC 224 WG 6	High	Q2/2000
	SECURITY AT THE MMI				
G 13	Standards for specifying and measuring security at the man machine interface, should be developed.	Standard	CEN TC 224 & WG 6	High	Q3/2000
G 14	Develop standard for interoperability of security mechanisms, so that the different users can employ different techniques dependent upon their capabilities (e.g. voice recognition for visually impaired users).	Standard	CEN TC 224/ CEN ISSS WS E-SIGN	High	Q3/2000
	INTEROPERABILITY				
G 15	Complete ongoing CWA so that IC readers are interoperable with a variety of home ICT delivery mechanisms, all smart cards and assistive technology .	CWA	CEN ISSS WS FINREAD	High	ONGOING
G 16	Develop standard to facilitate interconnection between terminal and users personal user interfaces/ equipment. Both communication protocol and technological interface should be standardised.	Standard	CEN TC 293/ CEN TC 224	High	Q3/2000
	TERMINAL EQUIPMENT DESIGN				
G 17	Standardise orientation of card insertion slots.	Standard	CEN TC 224 WG 6. ETSI TC HF & TE	Medium	Q3/2000
G 18	The layout of functional areas on the terminal should be standardised.	Standard	CEN TC 224 WG 6, ETSI TC HF & TE	Medium	Q3/2000
G 19	Develop a standard for the location, design and dimensions of screen contrast and brightness controls.	Standard	CEN TC 122, TC 224 WG 6, ETSI TC HF & TE	Medium	Q3/2000
G 20	A standard for the connection of an inductive loop or headset to a card reading device should be developed.	Standard	CEN TC 224 WG 6, ETSI TC HF & TE	High	Q3/2000
G 21	Guidelines to ensure that the design of handheld terminals allows visually impaired people to use them should be developed.	Guidelines /ENV	ETSI TC HF, SMG, TE CEN TC 224 WG 6	High	Q3/2000
G 22	Design for All guidelines should be developed to assist the procurement and installation of smart card systems in public spaces	Guidelines / CWA	Public Authorities	High	Q3/2000

Annex H: Recommendations for Internet and Electronic Commerce

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
H 1.	Develop and implement a certification process for accessible software products.	Standard	ISO or/and CEN	High	Q3/2000 – Q3/2001
H 2.	Investigate alternative strategies to legislation in order to ensure accessible software products. (undo burden)	Strategy	CEN and legislation	High	Q3/2000 – Q3/2001 review every 4 years
H 3.	Standards for separating document content and structure from presentation should be developed. The separation of document structure from presentation in XHTML1.0, HTML4.01 and CSS2 might prove to be a promising start in the area of the Internet.	Standard R&D	W3C, CEN	High	Q3/2000 – Q4/2001
H 4.	Oblige all content providers in the Internet to make their sites accessible to all by the usage of the WAI guidelines. (undo burden)	Legislation, Standard	W3C	Very High	ASAP
H 5.	Make open standards for security, privacy, authentication and payment in the Internet for easy integration into non-mainstream Internet software for efficient support of assistive devices.	Legislation, Standards	Industry, W3C, CEN ISSS WS E-SIGN	High	Next 3 years
H 6.	Confirm acceptance of accessibility techniques such as MSAA and develop strategy to ensure usage.	Legislation, Strategy	Industry and regulators	High	Q3/2000 – Q3/2001 review every 2 years
H 7.	Develop technologies for presenting visual content (virtual reality, multimedia) via modalities other than visual.	R&D	R&D and Industry	Medium	Next 3 years

Annex I: Recommendations for Services

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
I 1.	Consumer organisations and organisations representing elderly people and people with disabilities should participate in standardisation work on the European level and be supported on the national level.	Conference followed by Technical Report	ANEC/ European Disability Forum	Medium	Q3/2001
I 2.	Contacts/interaction between organisations representing elderly and disabled people and standardisation bodies (technical experts) should be organised via reference groups in CEN, CENELEC and ETSI. The same applies to specification providers. These reference groups could also monitor progress.	Formal liaison procedures	CEN CENELEC & ETSI	Medium	Q3/2001
I 3.	A focal point/reference group on the national level managed by the national standardisation organisations is strongly recommended. At the same time research into the best ways of involving users in the process should continue.	Formal liaison procedures	National standards bodies	Low	Q3/2001
I 4.	Implement existing design guidelines. Operators of services should be made more aware of the requirements of elderly and disabled users. They should be encouraged to develop and present business plans in the area of special services for elderly and disabled users. They should also develop and present business plans to give elderly and disabled users access to other services.	Implement Design guidelines	EU	High	Q3/2001
I 5.	Provide a minimum number of public text telephones in selected sites	Legislation	EU	Medium	Q3/2001
I 6.	Network facilities to provide text information in parallel with (or in place of) voice information	Technical report	ETSI	Medium	Q3/2001
I 7.	Implement standards on notched cards for all payphones and tactile identifiers on other pay cards	Legislation	EU	High	Q3/2001
I 8.	Develop Specialist directory enquiry and service help facilities	Guideline	ETSI TC HF	Low	Q3/2001
I 9.	Develop standardised layout of alphanumeric characters on keypads	Standard	ETSI TC HF	Low	Q3/2001
I 10.	Prohibit disconnection of telephones for emergency calls	Legislation	EU	Low	Q3/2001
I 11.	Bills to be made available in alternative formats, e.g. large text, audio, Braille.	Legislation	EU	Low	Q3/2001
I 12.	Implement use of Access to directory enquiries for text telephone users	Legislation	EU	Medium	Q3/2001
I 13.	Implement text relay services for deaf, hard of hearing and speech impaired people throughout the European Union	Legislation	EU	Medium	Ongoing

	Work Items	Deliverable (action required)	Lead respons- ibility	Priority	Proposed timetable
I 14.	Develop alternatives to PINs for user identity verification	Standards	CEN ISSS WS E-Sign, ETSI SEC	High	ONGOIN G
I 15.	Make standards more easily accessible as ETSI has done	Decision	CEN & CENELEC	Medium	Q3/2000

Annex J: Recommendations for Smart houses

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	STANDARDS WORK /GUIDELINES				
J 1.	Standardise interface between assistive technologies (e.g. IR environmental control systems), consumer and smart house systems through co-ordinated standards work.	Co-ordination of standards bodies	CENELEC TC 205, CEN TC 293	High	Q3/2000
J 2.	Standardise the links between smart house installations, alarm centres and system for ambulant care.	Co-ordination of standards	CENELEC TC 205, 215, CEN TC 79	High	Q3/2000
J 3.	Create consistent user interfaces for smart house systems	Standards/guidelines	CENELEC TC 205, CEN TC 122	High	Q3/2000
J 4.	Develop standard to ensure interoperability of smart house components	Standards	CENELEC TC 205, CEN TC 122	High	Q4/2000
J 5.	Develop standard to ensure flexibility and modularity of smart house systems	Standards/guidelines	CENELEC TC 205, 215	High	Q4/2000
J 6.	Develop standard to ensure compatibility of systems	Standards	CENELEC TC 205	Med	Q4/2000
J 7.	Standardise installation aspects	Standards/National guidelines	CENELEC TC 205, 215	Med	Q1/2001
J 8.	Develop standard to ensure centrally located and easily accessible technical centre in the building	Standards/National guidelines	CENELEC TC 205, 215	Med	Q1/2001
J 9.	Develop standard for accessibility of smart house components in relation to all physical varieties and mobility modes, as well as auditory, visual and cognitive needs.	Standards/guidelines	CENELEC TC 205, 215	High	Q1/2001
J 10.	Develop standards ensuring that sufficient room is available for extra components and extensions for electricity and ICT in the technical centre (related to smart houses).	Standards/guidelines	CENELEC TC 205, 215	Med	Q1/2001
J 11.	Standardise hidden conduits to windows and doors for electricity for control or alarms	Standards/guidelines	CENELEC TC 205, 215	Med	Q1/2001
J 12.	Develop a standardised adaptable user interface for control and input devices across smart house and information systems (e.g. internet, audio and video).	Co-operation between standards	CENELEC TC 122 TC 205 TC 206 TC 100 X ETSI/ IETF/ W3C	High	Q3/2000

	Work Items	Deliverable (action required)	Lead respons- ibility	Priority	Proposed timetable
J 13.	Adapt and develop existing technical standards to facilitate integration and compatibility of information systems (e.g. internet, audio and video systems) with smart house systems.	Co-operation of standards. Convergence	CENELEC TC 122 TC 205 TC 206 TC 100 X ETSI/ IETF/ W3C	High	Q3/2000
J 14.	Create standards on hearing aid coupling (inductive loops, possibility to plug in hearing aids).	Standard	ETSI TC HF	Med	Q1/2001
J 15.	Standardised interface to external display system (e.g. TV, large display).	Standards	CENELEC	Med	Q3/2000
J 16.	Create standards on interaction elements (shape, colours, feedback, dimensions) for physical and screen controls and status feedback.	Standards	CENELEC CEN 122 ISO	Med	Q3/2000
J 17.	Standardise and user test Smart House symbols and terminology.	Standards/ project	CENELEC Suppliers ISO/IEC JTC1 SC 35	High	Q3/2000
J 18.	Develop standard for failsafe features and manual override systems.	Standards	CENELEC 205 TR 12	High	Q3/2000
J 19.	Create standards on UI symbols for smart houses, like metaphors, icons, navigation.	Standards	CENELEC ISO 10646	Med	01/2001
J 20.	Create standards on feedback typology for all major user groups.	Standards	CENELEC TC 205	Low	Q3/2000
J 21.	Standardise requirements for which basic functions a house must have, and where they are placed in the building to provide flexibility.	Standards/ guidelines	CENELEC TC 205	High	Q3/2000
J 22.	Adapt standards for good lighting, (co-operate with CENELEC TC on lighting)	Standards	CENELEC	Med	Q2/2000
J 23.	For social alarm systems. Include Design for All issues into CEN TC 79 work. Standard adaptation to hearing aids.	Co-operation between standards	CEN TC 79 CENELEC standard prEN 50134 1-2, 1993E.	High	Q3/2000
J 24.	Coordinate CENELEC Mandate 273 with TC 79, because integrated alarms and transmission of these into other alarm systems is a main aspect in smart house technology for universal design. Assistive technology needs to be integrated into the requirements so disabled persons can send alarms.	Co-operation between standards	CENELEC Mandate 273 TC 79 ETSI	High	Q3/2000
J 25.	Revise standards on remote metering to take account of smart house and design for all issues.	Co-operation between standards	CENELEC TC13 IEC TC13 CEN TC 294	Med/ high	Q3/2000
J 26.	Revise standards for access to buildings to include smart house issues.	Co-operation between standards	ISO/IEC JTC1, subcommittee 31 CEN TC 225	Med	Q4/2000
J 27.	Revise technical standards related to	Co-operation	CEN TC 247	High	Q3/2000

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	energy saving to include design for all philosophy.	between standards	and EN 12098-1		
	CODES OF PRACTICE				
J 28.	Identify and manifest quality guidelines and courses for electrical suppliers and installers in order to incorporate procedures for securing user needs into their planning and installations.	Guidelines development Courses	Electrical contractors associations	Med	Q2/2000
J 29.	Develop service contracts with clear division of responsibilities.	Standard practice development	Electrical contractors associations	Med	Q2/2000
J 30.	Develop guidelines and procedures for ensuring legal issues, informed consent and protect against invasion of privacy in connection with cognitive dysfunction and surveillance.	Legislation Procedural guidelines	National responsibility	High	Q2/2000
J 31.	Develop procedures for standard and compulsory quality assurance and testing before being taken into use.	Procedural guidelines	Electrical contractors + experts Housing comp.	High	Q2/2000
J 32.	Develop standard procedures for testing systems after installation and before actual use. This applies to all elements and functions of the system, and the installer as well as the users must be present and go through the installation with "hands on" experience.	Procedural guidelines	Electrical contractors ass., installers + experts	High	Q2/2000
J 33.	Develop standard procedures for service and periodic maintenance, and clear lines of responsibility.	Procedural guidelines	Electrical contractors associations + experts	High	Q2/2000
	RESEARCH AND DEVELOPMENT				
J 34.	Identify and ensure universal user needs as well as individual user needs and requirements at each step in the process of planning and implementing smart house systems. Project must build on existing experience with implementations. Involvement of users is recommended.	A project to develop systematic guidelines for planners	ANEC Experts	High	Q3/2000
J 35.	Create standard visual and auditive displays for feedback of status and control messages and standardise trials methods with users representatives. These ideas for standard interfaces and pictograms must be accessible by all suppliers and systems.	Develop standard displays/ guidelines	ETSI, CEN CENELEC Human factors, design and HCI experts	Med	Q3/2000
J 36.	Evaluate how existing, simple light switches are designed to enable people who are unfamiliar with "smart" designs on switches can turn on the	Project for design development	Manufacturers Experts on	High	Q3/2000

	Work Items	Deliverable (action required)	Lead responsibility	Priority	Proposed timetable
	light manually in a smart house without learning entire new controls and smart fixtures. The results must be design recommendations for the manufacturers.		HCI design and human factors		
J 37.	In order to raise the safety, security and efficiency issue of using smart housing alarms to help look after people in care housing, sort and standardise the user aspects of the connections and interfaces between smart house systems and alarm services.	Project Workshop	To be seen in conjunction with standards work in CENELEC TC 79. CEN/ISSS	High	Q3/2000
J 38.	Ethical issues of surveillance must be discussed in a European workshop. European project, but needs to be adapted to the legislation issues in each country..	Workshop Project	CEN/ISSS Workshop + national activities	High	Q3/2000
J 39.	Make a list of standard basic installation of the most frequently used modes of controlling the smart house, with potential for individual adaptations.	Project	National organisations	Med	Q3/2000
J 40.	Recommend user tests of new user interfaces before putting them on the market. Human centered design of processes for interactive systems, in conjunction with ISO/DIS 13407.	Project	Manufacturers, researchers in 5 FWP IST Programme:	High	Q3/2000
	CONSUMER INFLUENCE				
J 41.	Recommend co-operation between consumer organisations and standards organisations.	Workshops, Regular meetings	Consumer reps, ANEC, standards organisations, CEN ISSS	Med	Q4/2000
J 42.	Require cost transparency upon planning and buying smart house systems.	Co-operation	Consumer organisation, ANEC, suppliers	Med	Q4/2000
	OVERALL CONCLUSIONS				
J 43.	Standards work to be integrated with the developments of codes of practice, recommended research projects and consumer involvement.	Cross section and organisation work, workshops	CEN, CENELEC ETSI ANEC	High	Q2/2000
J 44.	Ensure all user requirements and influence in the convergence developments within new, wireless smart house systems and in the communication systems between smart house systems and the rest of society.	Create a strategic plan Workshop	ANEC CEN/ISSS ICTSB ETSI	High	Q3/2000
J 45.	ICTSB has created a Group on standards for intelligent homes and buildings (GSIHB), reporting to the ICTSB, to ensure to ensure proper co-ordination of standards work done in	Emphasize importance of inter -standards bodies working group – recall	ICTSB & then CWA	High	Q2/2000

	Work Items	Deliverable (action required)	Lead respons- ibility	Priority	Proposed timetable
	the respective organisations and report back to ICTSB, but so far very little progress has been made. This is particularly important in this area, because smart house standardisation and developments are complex and the concerns of many organisations and many related technologies.	group and give clear mandate. Establish CWA.			