



# **Consumer Requirements in Standardisation relating to the Information Society**

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**European Association for the Co-ordination of Consumer Representation in Standardisation, AISBL**  
Av. de Tervueren 32, box 27 – B-1040 Brussels, Belgium - phone +32-2-743 24 70 - fax +32-2-706 54 30  
e-mail: [anec@anec.org](mailto:anec@anec.org) - internet: [www.anec.org](http://www.anec.org)

## Table of Contents

<b>1.</b>	<b>ANEC in Brief .....</b>	<b>1</b>
<b>2.</b>	<b>Introduction .....</b>	<b>2</b>
<b>3.</b>	<b>Generic Consumer Requirements in ICT Standardisation .....</b>	<b>4</b>
<b>4.</b>	<b>Horizontal Aspects of Information and Communication Technologies and Consumer Recommendations for Standardisation.....</b>	<b>9</b>
4.1	Man-machine interfaces .....	9
4.2	Inter-linking technology (Interoperability) .....	10
4.3	Power Consumption of ICT .....	11
4.4	Evaluation of ICT .....	13
4.5	Information on ICT .....	14
<b>5.</b>	<b>Key Areas of the Information Society and Consumer Requirements for Standardisation .....</b>	<b>16</b>
5.1	Biometrics.....	16
5.2	Children and electronic games.....	18
5.3	Digital broadcasting and (interactive) reception .....	19
5.3.1	<i>Digital TV broadcasting (DTV).....</i>	<i>20</i>
5.3.2	<i>Digital Audio Broadcasting (DAB) .....</i>	<i>25</i>
5.3.3	<i>Personal video Recorders .....</i>	<i>25</i>
5.4	Electronic Commerce .....	25
5.5	Information Access Terminals.....	30
5.5.1	<i>Personal Digital Assistants (PDA).....</i>	<i>30</i>
5.5.2	<i>Public Access Terminals .....</i>	<i>31</i>
5.6	Internet .....	33
5.6.1	<i>Internet Access and Quality of Service.....</i>	<i>34</i>
5.6.2	<i>Communications .....</i>	<i>37</i>
5.6.3	<i>Internet broadcasting (streaming) .....</i>	<i>38</i>
5.6.4	<i>Privacy.....</i>	<i>38</i>
5.7	Learning Technologies .....	40
5.8	INTELLIGENT TRANSPORT SYSTEMS .....	41
5.9	Smart Cards .....	45
5.10	Smart Houses .....	48
5.11	Telecommunications.....	52
<b>6.</b>	<b>CONCLUSION.....</b>	<b>55</b>
<b>ANNEX 1 .....</b>	<b>56</b>	
<b>ANNEX 2 .....</b>	<b>58</b>	
<b>ANNEX 3 .....</b>	<b>59</b>	

## 1. ANEC IN BRIEF

ANEC stands for 'European Association for the Co-ordination of Consumer Representation in Standardisation', in short the *European consumer voice in standardisation*. ANEC was established in 1995 as an international non-profit association under Belgian law to defend consumer interests in European standardisation and to counterbalance industry while aiming at a high level of protection. ANEC is funded by the European Commission and EFTA, and its Secretariat is based in Brussels. Our areas of priority are: Child Safety, Design for All, Domestic Appliances, the Environment, the Information Society, Services and Traffic Safety.

### ***Strive for safety, quality and Design for All***

ANEC provides technical expertise based on a network of more than 200 consumer representatives across Europe. Our experts participate directly in the work of more than 60 Technical Committees and New Deliverables of the European Standards Bodies. We are a full member of ETSI, an associate member of CEN and an observer to CENELEC.

ANEC has the responsibility to represent a wide range of consumers in standardisation, including the young and the elderly, and those with disabilities. The challenge of today is to integrate the concept of Design for All into the standardisation process. Modern standards have to ensure safe access to products and services for all consumers irrespective of age and abilities even though there will always be consumers with a combination of severe physical, sensory and cognitive impairments who will not be able to use a product or a service.

### ***Why is consumer representation in standardisation important?***

Standardisation is not only about product safety, it also addresses new areas such as the environment, services and e-commerce. Besides, in the context of the European Union (EU), the regulatory role of standardisation under the New Approach to Technical Harmonisation makes it even more important to participate in the process. Proper consumer participation at all levels is vital to ensure that the public interest is taken into account.

Unfortunately, consumer involvement in national standardisation is far from being satisfactory. It is developed to any appreciable extent in only eight of the 15 EU and three EFTA countries. This is the result of an ANEC study on the national arrangements for consumer representation in standardisation published in 2001 (ANEC2001/GA/014).

### ***Revision of the European standardisation system***

Against this background, ANEC has been calling for a revision of the European standardisation system (ANEC2001/GA/007). For instance, consumers ask for measures to protect stakeholders representing the public interest. These measures should include improved quality control and the establishment of a mechanism for conflict resolution within the standards bodies ([www.anec.org](http://www.anec.org)).

## 2. INTRODUCTION

To become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion - such is the ambitious goal that EU leaders set themselves at the Lisbon summit in March 2000 to be reached in 10 years. As part of the strategy, the European Commission launched the e-Europe 2002 initiative, recently succeeded by the e-Europe 2005 initiative. The objective of the e-Europe 2005 Action Plan is on the one hand to stimulate services, applications and content covering both online public services and e-business, and on the other hand to enable widespread broadband access and a secure information infrastructure. e-Europe 2005 also claims to put the user at the centre and to ensure the inclusion of all citizens.

These objectives are endorsed by a number of political statements such as the Council Resolution on *e-Inclusion* calling on the Member States and the European Commission to support actions for 'tackling technical barriers for people with different disabilities in terms of Information and Communication Technologies (ICT) equipment and web-content and the Council Resolution on "eAccessibility: improving the access of people with disabilities to the knowledge based society" of 6 February 2003.<sup>54</sup>

The opportunities offered by the Information Society considerably affect the lives of all consumers<sup>55</sup>. Due to the enormous impact of the Information Society on the consumer, it is vital that standards elaborated for Information Society products and services should take into account the views of the consumer. No wonder that ANEC, the European consumer voice in standardisation, pays particular importance to ICT and the Information Society. The ANEC ICT Working Group focuses on the following areas: E-commerce - Internet - Smart cards - Smart houses - Digital broadcasting and reception - Public access terminals - Road transport telematics - Telecommunications. One of our main objectives is to obtain standards that ensure adequate levels of safety, security of information and interoperability as well as design for all and accessibility.

Technologies and processes, in particular in the ICT sector, emerge at a rapid pace. Product and technology life cycles have never been shorter. In many cases, the formal standard-making process is too slow to produce the standards required by the market quickly enough. Hence, there has been a mushrooming of several hundred informal standards consortia producing their own technical specifications. In contrast to the formal standards bodies, informal standardising bodies may establish a closed group, often for commercial benefit. The output may not be publicly available. In general, transparency and the low degree of consensus give reason for

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<sup>54</sup> See Annex 2.

<sup>55</sup> *The consumer is a natural person or group of persons using products and/or systems for purposes, which are outside his or her trade, business or profession. The consumer is the end user of the products/ systems and is usually the one paying for them. Consumers are not homogeneous and have a wide variety of needs and abilities. Consumers have different qualifications, abilities and requirements in using systems or products. Education, gender, cultural and ethnic background can influence their way of handling or operating products and systems. Industry has then to take these different characteristics into account for the design of products/systems and particularly when designing user manuals, which should not be restricted to purely technical information.*

concern. Therefore, ANEC called upon the European Commission not to use non-formal standards including New Deliverables of the European standards bodies to complement European legislation.

To be able to influence standardisation in the fast-moving high-technology ICT sector, ANEC has elaborated this report on ***Consumer Requirements in Standardisation relating to the Information Society***. The document does not address legal issues, but provides a number of generic consumer requirements and priorities for standardisation activities in relation to the Information Society in general and to Information and Communication Technologies (ICT) in particular to be taken into account when producing ICT standards.

Hence, this report is meant as a **guidance document addressed to standards-makers**, consumer representatives on Technical Committees and political decision-makers, in particular the European Commission. It will be subject to continuous updating.

The report is deliberately repetitive thus allowing the reader to consult the different chapters individually and independently from each other. Whilst Chapter 3 identifies generic requirements in ICT standardisation and recommends certain areas for standardisation to match these requirements, Chapter 4 looks at five horizontal features of ICT and provides for each of them an analysis in terms of relevance to consumers and, consumer priorities and recommendations for standardisation. On the basis of the generic consumer requirements in ICT standardisation, Chapter 5 elaborates on the consumer priorities in ten key areas of the Information Society and gives recommendations for standardisation from a consumer point of view.

### 3. GENERIC CONSUMER REQUIREMENTS IN ICT STANDARDISATION

ANEC calls upon the standard-makers to take the following generic consumer requirements into account when designing, selecting, commissioning, modifying and standardising ICT systems. It is proposed that these recommendations be promoted as a joint CEN/CENELEC/ETSI memorandum to guarantee their application across all the standardisation work in the ICT sector. This would contribute to the production of a coherent and consistent catalogue of standards even when consumer representatives are not directly involved in the technical work.

- Accessibility/Design for All
- Adaptability
- Child safety issues
- Comprehensible standards
- Consistent user interface
- Cost transparency
- Easily adaptable access and content control
- Ease of use
- Environmental issues
- Error tolerance and system stability
- Explorability
- Functionality of solution
- Health and safety issues
- Information supply for first-time user set-up procedure
- Interoperability and compatibility
- Multi-cultural and multi-lingual aspects
- Provision of system status information
- Privacy and security of information
- Quality of service, system reliability and durability
- Rating and grading systems
- Reliability of information
- Terminology

#### **Accessibility/Design for All**

It is a basic consumer right to have access to products and services (see Annex 1). Discrimination exists if elderly people and people with disabilities cannot use many of today's mainstream consumer products and services<sup>56</sup>. CEN/CENELEC Guide 6<sup>57</sup> providing guidelines for standard-makers on how to address the needs of elderly and disabled people is a tool to assist standard-makers to rectify this discrimination. Standards, in particular in relation to ICT and the Information Society, should build upon the concept of 'Design for all'. Design for All does not

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<sup>56</sup> ANEC Policy Statement on Design for All (June 2003, ANEC2003/DFA/027)

<sup>57</sup> ISO/IEC Guide 71: 2001 provides guidelines for standard-makers on how to address the needs of older persons and persons with disabilities. ANEC considerably contributed to the drafting of this document, which the European standards bodies adopted as CEN/CENELEC Guide 6: 2002. It is important to note that the two documents are identical.

mean designing for everyone, but designing for as many people as possible while acknowledging that there is a minority of disabled people with severe impairments who need adaptations or specialist products. Hence, ANEC calls upon the European standards bodies to implement CEN/CENELEC Guide 6 in a systematic manner.

### **Adaptability**

The system should be adaptable to meet a user's specific requirements and abilities. For example, it should be able to provide output in a format and at a pace that meets the individual's needs. This is a way of achieving consistency for the user. This principle could also be applied to prevent unintended users gaining access to a system and in the case of custom upgrading of systems.

### **Child safety issues**

Children (12 years and younger) are becoming an increasingly significant consumer group for advanced computing and communications services. In some cases children as young as two or three years old are using ICT equipment. Therefore there is a need to monitor ICT products and issues, which do not primarily fall within the area of child safety, but which do pose a threat to child safety.

### **Comprehensible standards**

Standards must be unambiguous and easy to understand, i.e. written in plain language so that non-technical people can comprehend them and contribute to the standardisation process.

### **Consistent user interface**

The systems must have a consistent user interface. It is especially important that the method of processing, storing and accessing the systems is consistent for the user. A consistent user interface can be achieved by different means e.g. all components of the user interface are uniform, or the user interface adapts to the user so that the user always meets a personalised uniform interface. This principle was the subject of a European research project, in which the feasibility of using a smart card to trigger a personalised user interface was evaluated and promoted for standardisation.

### **Cost transparency**

The system must be transparent regarding all costs involved. Cost information should be presented in a standardised way. This includes both the initial costs involved for the user and the secondary costs in terms of subscribing to and operating the system, especially when inter-working on networks, or when using on-line help or other fundamental services (e.g. directory enquiries or short message service on a mobile phone). Disconnecting from a service must be free of charge or the charge must be stated in a standardised way at point of purchase.

### **Easily adaptable access and content control**

Parents, being responsible for their children, should have technical devices at their disposal to control access and the content of electronic media.

### **Ease of use**

ICT must be easy to use for all intended user groups stated in the scope of the standard. Following ergonomic software principles for user interface<sup>58</sup> design should help achieve ease of use. ICT standards should address ergonomic aspects of ICT hardware, software, services and support. Existing standards should be applied.

Systems should also display dialogue elements to the consumer and allow them to choose from items generated by the system or to edit them. Menus are a typical technology to achieve this goal.

Ease of use can be measured in terms of performance (e.g. the time taken by users to complete a predetermined task, and/or the number of errors, and/or satisfaction with a service: see EN 29241 -11 Guidance of usability). Goals for ease of use - known as usability statements - should be developed.

### **Environmental issues**

ICT standards should indicate that environmental issues, such as power consumption, have been addressed. A clean life cycle from manufacturing to disposal should be the goal of all ICT systems/products. Possible environmental risks that may arise in the product/system life cycle should be identified and indicated to the consumer.

A standardised way of assessing and indicating environmentally friendly ICT products, services and systems should be developed.

### **Error tolerance and system stability**

The system should anticipate errors of operation and be forgiving. Informative error messages should lead the consumer forwards. The system should be robust and should remain stable if consumers try services, which cannot be delivered or make choices that are redundant.

### **Explorability**

The system should encourage the consumer to discover its functions without involving additional costs.

### **Functionality of solution**

With regard to functionality of solution, one has to ensure that the standard addresses the problems actually faced by consumers and provides help to solve these problems. There should be advice on which user groups and tasks the system should be used for, and in which operating environments. This advice should be in the scope of the standard. The advice should be open to review.

### **Health and safety issues**

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<sup>58</sup> For example EN 29241-10 - Dialogue principles and ISO/CD 13407 – 2: Human centred design processes for interactive systems.

When developing ICT standards any health and safety issues should be assessed. Existing standards should be applied.

### **Information supply for first-time user set-up procedure**

The user set-up procedure should provide sufficient set-up instructions. Any automatic set-up system should have manual override.

### **Interoperability and compatibility**

Different services must be interoperable so that, in practice, any service can be accessed on any appropriate network on any relevant device, thus avoiding the acquisition of access to several different networks and terminals for similar services (i.e. portability is achieved). Compatibility within a system should be ensured, for example new versions of systems should be compatible with previous versions of the same system and components for systems originating from different manufacturers should also be compatible. Different systems should be compatible so as to allow their joint operation.

### **Multicultural and multi-lingual aspects**

Multicultural and multi-lingual aspects need to be considered when developing global ICT standards.

### **Provision of system status information**

The status of the system (e.g. waiting for input, checking, fetching, etc.) should be constantly available to the consumer. Different mechanisms should be employed to give complete feedback to the consumer, e.g. audio/visual for error messages data input required. All messages should be positive and not place blame on the consumer.

### **Privacy and security of information**

The system should ensure the privacy of the individual. It should not be possible for unauthorised people to follow a user's activities on an electronic network. Electronic footprints are to be avoided. Standards should help provide methods for checking this, especially in open and decentralised networks (Internet). Inevitable footprint data must be deleted after an appropriate time. The system should not allow disclosure of information about the consumer to unauthorised people and should indicate clearly to whom information is given.

Security of information - sent, stored, received or deleted - must be ensured. The level of security should be clearly stated to the consumer.

### **Quality of service, system reliability and durability**

There should be a standardised way to determine and present quality of service, system reliability and durability. This should include the development of standardised performance indicators. This information should be displayed at the point of sale. Batteries are an example of products in respect of which consumers need such information at point of sale (durability and reliability).

### **Rating and grading systems**

ICT standards should allow the application of rating and grading systems, which would provide information on quality to assist the consumer's decision.

### **Reliability of information**

The system should indicate the reliability of information (possibly by quoting sources) provided on the system (e.g. in the event of system failure, a message should be given to explain, for instance, that the bank clearing system has been out of action).

### **Terminology**

As part of a consumer-centred design, the terminology used in user interfaces, (this includes brochures, user instructions and information presented by the system) should meet the basic generic consumer requirements or ISO Guide 37: 1995 – Instructions of use of products of consumer interest.

## 4. HORIZONTAL ASPECTS OF INFORMATION AND COMMUNICATION TECHNOLOGIES AND CONSUMER RECOMMENDATIONS FOR STANDARDISATION

This chapter looks at five horizontal, partly technical features of Information and Communication Technologies:

- Man-machine interfaces
- Inter-linking technologies
- Power consumption
- Information on ICT
- Evaluation of ICT

For each of them, an analysis is provided so as to identify the relevance to consumers and the consumer priorities. On the basis of the analysis, recommendations are made for standardisation.

### 4.1 MAN-MACHINE INTERFACES

The man-machine interface is the contact point with the system. A poorly designed and non-standardised interface can adversely affect how the consumer is able to perform his task, increase the possibility of error and adversely affect the consumer's satisfaction and perception of both the service and the system as a whole. A good interface can have the opposite effect. The design of user-friendly information includes, in particular, aspects of how the different technologies are set up and what specific area is being dealt with because a software solution cannot be more user or consumer friendly than the applications it is supporting. This applies to both consumer and professional applications.

In the case of 'unconscious proximity detection' systems - the 'blue-tooth' radio frequency protocol being one such example - significant benefits can be obtained for the consumer in automating processes, but the consumer needs to have ultimate control of the system and access to the information it has utilised.

#### **Recommendations for standardisation**

To facilitate a minimum level of man-machine interaction, there is a need for standardisation work in the following areas, which are closely interrelated:

- Usability, ease to use and Design for All principles
- Awareness of wireless solutions: Standards need to be developed to ensure that consumers are aware of wireless links and what data is transferred;
- Adaptable user interfaces through the encoding of user requirements;
- User interface elements;
- Standards should develop better presentation of products and services to the user. This should include the use of interactive touch screen technology, multilingual audio and video and 3-D presentations of objects;

- Speech interface protocols need to be developed and standardised. This will facilitate the operation of man-machine interfaces without the need for physical contact and also simplify the operation of complex machines (e.g. ATMs, ticket machines and retail machines).

It is recognised that there may be existing standards in place or ongoing that may appear to cover some of the above elements. However, many of these existing standards were developed for the office environment, for trained office workers, and for the PC. These standards may not be relevant for the (untrained) consumer, in a home environment, using delivery mechanisms other than the PC (e.g. smart phone, WEB TV, mobile phone, etc). Existing standards may not inter-work.

## **4.2 INTER-LINKING TECHNOLOGY (INTEROPERABILITY)**

This refers to the inter-linking of telephones, satellite-, video- and audio components, set-top units and Personal Computers in respect of common hardware and software as well as service parameters. Inter-linking may be physical (by wire or connectors) or wireless (by radio transmissions or infra-red).

It is vital for the consumer that the various systems of Information and Communications Technologies that have been established and will further evolve work together. Technical components and systems must not only be interconnectable, but need also to be interoperable to provide services at acceptable prices. This is of particular importance in order to prevent the establishment of monopolies by guaranteeing a common technical and administrative platform for free and easy access to public services so that all consumers can benefit from the Information Society. In addition, comparable high-level requirements regarding quality, performance and safety of products and services will only be achievable by interoperable and inter-changeable system parameters. Standards can be an important tool in this area. According to the concept of the 'New Approach to Technical harmonisation', European harmonised ICT standards could underpin the emerging legal frameworks with concrete requirements.

The consumer must be able to access services by the use (in principle) of component parts from any manufacturer. Basic services should be available without the need for upgrading or changing existing systems. It should be possible, for example, to listen to stereo broadcasting with a simple mono radio with no loss of information.

### **Recommendations for standardisation**

- Open standards for wide range interoperability between IT-, consumer electronic and telecommunications equipment and systems;
- Common technical requirements for quality, performance and technical safety of ICT-, telecommunications and entertainment electronic equipment;
- Common standard solutions for free access of both service providers and clients (users) to new networks or services such as on-line services or digital broadcasting. This means standardised interfaces and encryption systems;
- Compatible standard formats for new data storage media and equipment (e.g. DVD) irrespective of their purpose or area of operation;

- Standardised interfaces and BUSES for easy linking ICT equipment, entertainment electronic components and household appliances to telecommunications- or power supply networks for data exchange, telephony or remote control of technical processes at home;
- Standardised cables and connectors marked with common and easily understandable symbols. Symbols must have been tested out with end users (consumers). Symbol names should be explained in the user manual or similar non-technical documentation;
- Clear definitions of man-machine interfaces for the use of public and private services via ticketing and vending machines and public information terminals; including aspects such as accessibility, performance, and user information in respect of use by disabled persons;
- User-friendly hardware and software: Components, systems and devices (including software), which allow or facilitate inter-linking, must be user-friendly without requiring technical knowledge. User-friendliness includes any user instructions or manuals or online help;
- New and revolutionary products, systems and services in the field of Information and Communication Technologies (e.g. Internet Telephony) shall be interoperable with existing solutions;
- Access to illegal and indecent content: Standardised hardware and software 'features' have to be developed to prevent children and younger people gaining access to pornographic, violent or racist materials transmitted in any way;
- Privacy and security: Common design and administration of technical components and services especially as part of open networks. Components and services must work together in such a way that a minimum of personal data, if any, is registered, processed and used by the specific service (the principle of 'data avoidance');
- Security infrastructure: Harmonised technical and organisational requirements for all elements of the security infrastructure for digital signatures to guarantee a high level of security, compatibility and interoperability within the system;
- Digital signatures: Strong requirements for the security and privacy of hard- and software components used for the purpose of digital signatures within Trust Centres and on the user's/consumer's side;
- Encryption standards: Strong encryption standard codes for secure use of electronic commerce and other uses (e.g. medical prescriptions);
- Where different system standards and non-compatible functionality exists for TV reception and video processing, multi-standard or multi-functionality TV sets and recording devices should be available on the market.

### **4.3 POWER CONSUMPTION OF ICT**

Due to increasing environmental problems, limited fuel resources and the continuously growing global market of Information and Communications Technologies, the need to decrease energy consumption has become more important day by day and has been acknowledged by politicians (Kyoto Agreement).

In order to achieve this goal, the specific energy consumption per machine/device must decrease faster than the growth in the number of machines and electrical devices.

## Recommendations for standardisation

- **Standardised definitions:** Definitions for power consumption should be standardised. All definitions must be reasonable, easy to apply and easy to understand. Different ICT services and devices, however, have to be treated in different ways. There must be clear definitions of different operating modes for all systems for the following modes:
  - In use/ operation (e.g. fulfilling task);
  - Waiting (e.g. for an input, action starts immediately after request);
  - Sleeping (e.g. can be activated by an input signal after a certain period);
  - Stand-by (e.g. can be activated by control signal);
  - Off (switched off);
  - Clear definitions of the following time-based performances: Average time of operation per year/ Standard use time cycle/ Start-up-time, recovery-time.

- **Standard method for testing power consumption**

Based on the definition of measuring conditions (e.g. voltages, temperature, input and output signals, load), a benchmark can be standardised which aims for reproducible, comparable values describing the behaviour of the device under test in an accurate and reasonable way.

- **Standardised information to the consumer**

Based on the definitions given above, there should be a standardised way to inform the buyer about the power consumption of a product (e.g. a standardised label). In addition, advice has to be given to the consumer on how to reduce or minimise power consumption (e.g. switching off over-night).

- **Standards for energy saving systems**

Due to the tendency of ICT equipment to become integrated into systems or networks the aim of saving energy can be achieved by improving network performance. This would normally require minimal additional hardware, if any. This process should be enforced actively by:

- Standards for more energy-efficient systems (e.g. fax machine switched on by telephone system if an incoming call is detected);
- Definition of connections and timing (e.g. minimal waiting times) for master devices (e.g. telephone systems, computers) and slave devices (e.g. fax machines, printers);
- Standard performance goals should be defined for specific pieces of apparatus or systems defining maximum permitted or recommended power consumption in stand-by or idle mode;
- Standards for defining intelligent energy management systems (e.g. auto power reduction or shut-off if a device has been idle for a specific time). Such systems are application- or device specific, and standards should define the appropriate energy management objectives.

#### **4.4 EVALUATION OF ICT**

From the consumer's point of view, specifications for the design of software are necessary in order to compare and evaluate products. Both the great diversity of similar products (e.g. software) and the great number of types of application software make it very difficult for the consumer to find the most suitable programme. In addition, commercially available products have a confusing number of functions requiring a detailed study of the technical specifications and user manuals and often detailed training courses. Hence, consumer priorities are a benchmark standard for testing, suitable tools for life-cycle analysis and tools for user requirement generation.

### Recommendations for standardisation

- Test methods should be standardised to provide data to consumers for easy comparison before purchase, e.g. energy consumption, cost in standard mode, necessary equipment/knowledge, restrictions, safety, instructions;
- Suitable tools for life-cycle analyses, which integrate the different quality characteristics: ISO 9126 defines different quality sub-characteristics, which are important in assessing the quality of a product. These characteristics are:
  - Functionality (suitability, accuracy, interoperability, compliance, security)
  - Reliability (maturity, fault tolerance, recoverability)
  - Usability (comprehensibility, learnability, operability)
  - Efficiency (time behaviour, resource behaviour)
  - Maintainability (analysability, changeability, stability, testability) and
  - Portability (adaptability, installability, conformity, replaceability);
- These technical functions should be complemented with 'human factor functions', which describe the different qualifications, ages and cultural background of the users/consumers. ICT should either support the different user/consumer categories, or should describe which qualification (ability) is needed to use a product;
- To this end, it would be useful to test the usability of products with different types of users/consumers during the design stage of a system and upon its completion;
- Results from research and development (R&D) projects should be considered and integrated in all new drafts in the area of ICT standardisation;
- Standards for eliciting consumer requirements and integrating them into the systems design process should be developed.

### 4.5 INFORMATION ON ICT

This topic covers the provision of relevant information to the consumer about all types of ICT products, services and systems before the sale (e.g. contracts), at the point of sale (costs) and whilst using products, systems and services (user support).

A prerequisite for consumers to make appropriate decisions regarding the purchase and use of ICT products, systems and services is that they have the right information at the right time and in the right place. For instance, at point of sale the consumer needs to compare different alternatives and fully understand the implications of purchasing 'packages' (e.g. free modem with two years Internet subscription - the price of which may alter by the time the technology is out of date. Upgrading costs a lot of money, as does release from the agreement). The consumer also needs to understand and analyse his/her needs in relation to technological solutions. Purchasing inappropriate ICT solutions may have considerable consequences in both the long and short terms.

**Recommendations for standardisation**

- Standardisation of what information should be given (at what time, type of information, means of information), one standard product profile;
- Standardisation of information presentation before sale, at point of sale and whilst using ICT. All types of information presentations must be easy to comprehend and relevant to the user's/consumer's tasks.

## 5. KEY AREAS OF THE INFORMATION SOCIETY AND CONSUMER REQUIREMENTS FOR STANDARDISATION

ANEC has identified ten interacting key areas of the Information Society as being of particular importance to the consumer:

Biometrics

Children and electronic games

Digital broadcasting and reception

Electronic commerce

Information access terminals

Internet

Learning technologies

Intelligent transport systems

Smart cards

Smart houses

Telecommunications

Taking into account the generic consumer requirements in ICT standardisation as described in Chapter 3, this chapter describes the consumer relevance and priorities in the ten key areas identified, on the basis of which recommendations are made for standardisation.

As stated in the introduction, this report is deliberately repetitive in order to allow the reader to consult this chapter independently from the previous chapters as well as the individual subsections.

### 5.1 BIOMETRICS

Biometrics is the automated recognition of individuals based on their behavioural and biological characteristics. Biometric technologies vary from fingerprint and face recognition to signature dynamics or voice patterns; other methods exist which are also quite mature, such as hand skeletal or vascular technologies.

Biometric technologies are being (or will be in the near future) integrated in governmental documents including travel documents, electronic ID-cards or electronic driving licences. They are also used for business applications such as access control to enterprises. The application range is very wide and new application areas (e.g. in the banking area) will follow suit, in the future. They can be used for access to domestic buildings and have other potential in the home.

### **Why is it important for consumers**

Though biometrics is not widespread in applications today, its importance is increasing. Governments feel that the use of biometrics can increase national security. Consumers are then forced to use biometric technologies; there is no choice offered (e.g. when travelling to US you will be obliged to give your fingerprint).

If consumers are given the choice, acceptance is an issue. Consumer acceptance is decreased by factors such as: lack of security, health, accessibility, and societal aspects, as well as linkage to previously anonymous data, etc.

### **Consumer Priorities**

- easy to use for end users with respect to their specific needs and societal backgrounds
- accessibility
- low cost for use
- privacy
- security
- data protection
- no misuse of derived data (e.g. on health)
- health and safety
- guaranteed fallback systems
- limited false acceptance (non-acceptance) rates
- physical system environment and man-machine-interface
- information on/transparency of biometric data
- duties and responsibilities of the stakeholders
- impact of aggregation of data from disparate databases
- covert surveillance
- redress in the event of false acceptance or rejection

**Key aspects for standardisation**

- SC37 WG6 Cross-jurisdictional and societal issues

**5.2 CHILDREN AND ELECTRONIC GAMES**

Not all electronic media offer adequate information for children all the time. The number of channels (digital TV, internet, electronic games) is increasing rapidly. Parents are responsible for their children's physical, intellectual and social development. Many parents want to protect their children from uncontrolled or unwanted or unlimited access to electronic media, which are broadcasting trivia, sex, crime or commercials. Parents need to have the means to monitor, filter or limit their children's use of electronic media (Internet, TV, electronic games).

At the moment, most devices can only be turned on and off. If a child of 6 turns on a device, that device should only present media that is appropriate to this young user. Standards can help parents to choose the right media with the right content at the right time. Appropriate standards can help parents supervise the unwanted influence of electronic material on their children.

## Recommendations for standardisation

- Access control must be reliable and easy to handle (hardware-key /smart card);
- Access control must be adaptable to the parents' and the children's needs:
  - access only to qualified and rated TV-channels, websites or games;
  - access only to qualified and rated content (suited to children older than a certain age);
  - access only until a predefined time;
  - access only for a predefined period (time–budget, no more than 10 h per week)
  - monitor the programmes watched or websites visited;
- Broadcast material will include an access control-system to charge for content. There should also be access control enabling the supervision of minors by their parents;
- Video/audio data that contains information in a standardised form appropriate to the viewer can help to limit unsuitable use by minors;
- A complete system should include software or videos containing the information in a standardised way indicating whom it is suited to;
- A rating system and rating scales corresponding to the children's needs as well;
- Hardware that filters out unwanted information.

## 5.3 DIGITAL BROADCASTING AND (INTERACTIVE) RECEPTION

Digital broadcasting is the broadcast of digital audio, video and data signals. These may be transmitted either terrestrially, via satellite or cable, from a single source to multiple receivers.

Digital broadcasting has changed the way consumers receive their programmes and what programmes they are being offered. In particular, the number of individual channels available to the individual consumer has increased by a factor of ten or more. Broadcasting systems and the supply of programmes are no longer in the hands of a few public broadcasters. Instead, broadcasting is, in whole or in part, under the control of commercial interests.

Without the necessary standardisation and/or legislation it is possible that broadcasters' commercial interests could result in consumers either being excluded from some services or suffering the inconvenience and cost penalties associated with a multiplicity of receiving equipment components.

Consumer, however, must be able to receive and access services to which they are entitled by using component parts (receivers) from a choice of manufacturers. For example, a consumer should not be forced to buy different component parts, such as a TV monitor, to access different TV services or broadcasts. Consumers should be able to connect the receiving components with other associated products (e.g. digital video recorders, cameras, data recorders, printers) in such a way that the programme or data and any control signals can be utilised without the need for special interface devices. Priority should be given for such interconnections to be in the digital domain. The systems should also optionally be able to interface with any additional services supplied by the service providers to augment their broadcasts (e.g. Teletext systems, programme start and stop signals, Electronic Programme Guides, automatic timer recording systems, programme identification systems). A single inter-link system should be standardised across all

component manufacturers. Only open and interoperable platforms and standards can enhance consumers' freedom of choice<sup>59</sup>.

It is important for consumers to be able to freely access, at all times, all key national or international broadcasts that they are entitled to by virtue of being a citizen or licence payer (e.g. public broadcasters and other national networks). These should be maintained with no extra cost or technical barrier to reception, i.e. 'free to air'.

It is important that consumers are able to ensure their privacy, and this should extend to the use of data from any automatic listener/viewer ratings monitoring or interactive TV/radio systems which utilise a two-way link (either by cable, phone line or satellite). Consumers should be able to access and control any information that has been sent from their receiver to the broadcaster. This would typically be taken care of in regulation on data protection and privacy.

In addition, all receiving equipments should allow Assistive Technology to be connected in order to ensure the disabled people access to the Information Society services provided by digital broadcasting.

### 5.3.1 DIGITAL TV BROADCASTING (DTV)

#### Recommendations for standardisation

##### ▪ Hardware considerations

Digital TV is delivered to the home via different platforms: satellite (DSTV), cable (DCTV), terrestrially (DTTV) and possibly in the future via the Internet. It is important that standards concerning the receiving hardware allow a user to be able to access any platform available locally without problems, and that they are able to change platform at any time without having to replace significant parts of their hardware.

- Where more than one digital TV broadcasting system exists in a particular country or territory the necessary receiving circuitry (tuner) should be able to be retro-fitted to existing vision and sound equipment. This can either be by an external box or by a plug-in external circuit. Standards need to be in place to ensure that these connections (tuner circuit to video/audio processing) allow for all types of TV and audio equipment and all types of electronic interfaces (e.g. component video, composite video and UHF);
- Where more than one digital TV conditional access key or encryption system exists from a given transmission platform then the systems should co-exist in one single receiver;
- Interconnections between any set-top unit and the receiving and/or viewing equipment should be via standardised connections and signals;
- Interoperability: set-top units (decoders) should work with all standardised receiving and viewing equipment and should not be brand specific;

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<sup>59</sup> European Commission Communication on Barriers to widespread access to new services and applications of the information society through open platforms in digital television and third generation mobile communication, COM (2003) 410 final.

- Upgradeability: Where access or decoding upgrades may be required (e.g. to improve performance or protect from piracy) the set-top unit should be either upgradeable (in software or hardware) or the upgrade should be 'backwards compatible';
- The design of television receivers should be such that upgrading or expanding should be easy to do and at reasonable cost. To this end a standard 'bus' and 'backbone' architecture similar to that used by desktop computers should be used;
- On any receiving, recording, viewing or other associated hardware a standard plug and socket arrangement should be used;
- Connection possibilities should be logical, with a minimum of variations;
- Controls and connections should be clearly labelled either using recognised terminology in the language of the country in which the equipment is being sold or by use of a standard set of symbols;
- Instruction manuals should be provided only in languages applicable in the countries in which the equipment is being sold. On-screen menus should be available for all appropriate European languages;
- Point of sale information. The principal functions and features of equipment should be clearly displayed at the point of sale so that fair comparisons between brands can be made.
- A standard remote control should be adopted utilising a standard infrared modulation system and protocol that enables a single control to operate all associated equipment and allows unique identification of the devices. The remote control layout and labelling should be standardised.

#### ▪ **Electronic Programme Guides (EPGs) and navigators**

Because of the large number of channels and associated services available on digital television, it has become necessary to provide programme guides in electronic form. These guides are likely to be provided by the broadcasters themselves, so standards need to be in place to ensure they are not compromised or biased because of this. The content in the EPG for a network should be based on voluntary co-operation between all the programme providers and edited by one body.

Set-top box manufacturers today already offer built-in navigators to help consumer's access the television content. These navigators should be equally unbiased.

- The guides should be easy to use (compliant with the 'General Consumer Principles for Standardisation relating to the Information Society'). In particular, any index should be easy to use and any programme classification system should be easy to understand and unambiguous;
- The guides should not be biased towards or in any way favour particular broadcasters or their associates;
- If these guides provide additional services (e.g. automatic recording programming), then a standardised interconnection and data protocol should be used between all the component parts that use these services;
- If these guides provide additional information, this should be in a standard meta-tag form that is compatible between Electronic Programme Guides and other programme indexing, recording or logging systems;
- Vague or misleading terminology when describing programme formats, such as 'ambient sound', 'surround sound', 'super-wide', 'panoramic' should be avoided when referring to standard broadcast formats, as long as this terminology is not a matter of accepted technological definitions by standardisation bodies.

#### ▪ **Satellite dishes/ receiving antennae**

In any one territory or country reception of all satellite broadcasts intended for that territory need to be available utilising one fixed dish. This should be of max. 60 cm diameter for the central footprint and max. 80 cm diameter for outer areas.

Where DTTV is provided using UHF bands IV and V. This should be receivable using a single receiving aerial that is compatible with existing analogue broadcasts.

#### ▪ **Technical performance and compatibility**

Received picture and sound quality should meet prescribed technical standards. The consumer should be made aware of the level of quality being transmitted (e.g. data rate of MPEG2 signal) so that they can compare the quality of different suppliers or platforms. A standardised method of presenting this information will be needed.

In any one territory or country reception service areas and signal levels should meet prescribed technical standards. All digital receivers should incorporate a signal level and quality meter so that the consumer can check their signal.

All new technical improvements and developments should be 'backwards compatible' to at least 7 years of earlier models.

#### ▪ **Conditional access key or encryption systems**

Where encryption systems are used, they should not result in a reduction of picture or sound quality.

There should be no commercial conflict of interest between broadcasters and suppliers of conditional access technology, encryption systems or interactive (two-way) TV systems that results in consumers having reduced choice or excessive extra costs.

Broadcasters supplying key national or local programmes that a consumer is entitled to by virtue of being a citizen or license payer (e.g. BBC, BRT, RTE) should be 'free to air' and not use conditional access encryption systems unless it can be demonstrated that there are no hidden extra costs to consumers (e.g. use of a system such as Videocrypt-'level 0' which does not require a subscription card, still requires the consumer to pay the built-in decoder costs).

#### ▪ **Access control**

A standardised access control system should be employed to control access to programmes the consumer is entitled to (e.g. pay TV). European wide standard smart card access would be a typical example.

A programme rating (PTY) code system should be standardised so that consumers can choose to bar or search for particular types of programme. This would be independent of conditional access rights.

Access and payment control should be achieved using a European-wide standard system e.g. smart cards. The consumer should have the choice of using their personal multi-function card or a dedicated one supplied by the programme provider. A choice of pre-payment or 'pay per view' should be available via the card system.

The rating code system should categorise content such as sex, violence or language. Controls should protect against use by unintended users such as children with controls encompassing time of day, themes, advertising or religion.

The rating code system should be flexible enough to be adjusted for the differing requirements or tolerances of different member states.

#### ▪ **Transparency of costs**

The business model for supplying broadcast television in Europe is moving towards an integrated package business model. This is the so-called vertically integrated model. Under such a system, the costs to the consumer can become hidden or confused. For example, certain services or equipment may appear to be given 'for free' but are in fact being subsidised by subscription and other charges.

Free to air entitlement: At the point of sale, the following should be made clear to the consumer:

- Non-subscription entitlement;
- Subscription costs and obligations (minimum length of contract) and additional ongoing costs (e.g. phone calls for software updates);
- Any additional installation costs and system maintenance costs;
- Costs of 'pay per view'

Phone calls and other service costs relating to interactive services should be clear and complete whenever the service is being used.

Provision of key programmes: Certain designated key programmes or events, such as major sporting or political events, should always be made available to all owners of receiving equipment without additional costs.

Standard on screen symbols should be employed to denote when a phone call is being made.

- **Phasing out of analogue/ deterioration of analogue**

The phasing out of the analogue services should not cause consumers to be in a position whereby they are unable to receive established services, nor should there be an undue financial burden on consumers to upgrade.

During the period of simulcasting digital and analogue TV, the technical and programming standards on the analogue services should not be compromised (e.g. reduction of transmitter power, significant increase in letterbox format pictures or connecting the analogue transmitters with inferior DTTV feed).

Free to air only options for receiving state or other publicly funded broadcasts should be made available to all consumers before analogue switch-off.

Equivalent digital reception should be made accessible to all areas of a country or region before the analogue service is switched off.

- **Power consumption**

Some 'conditional access' systems require the digital television to be kept in an active stand-by mode to facilitate updating access and programming software.

Stand-by-power consumption of receiving systems and PVRs should be kept to a minimum and below a prescribed standard level.

A permanent stand-by condition should not be used. If regular contact with the broadcaster is required for data updates, this should be done using timed access periods, not by permanently powering the receiver/LNB sections.

- **Access for all**

All digital TV platforms should support expansion modules that offer access to consumers with special needs (e.g. currently in the UK a spare PCMCIA slot is incorporated in digital receiving equipment and it is expected that audio description or signing modules will be developed using these).

Audio description services should be available on all primary broadcasts. The audio description signal should have the capability to be independently controlled (e.g. volume) from the main audio channel and it should be possible to record these signals on a domestic digital VCR or PVR.

Subtitling services should be available on all primary broadcasts and it should be possible to record these signals on a domestic digital VCR or PVR. Where applicable, colour-coded subtitles should be used to identify different speakers.

- **Other services**

Digital television and radio services can be accompanied by additional interactive services such as Active Teletext, Internet access via TV and dedicated interactive shopping and information services. The **performance of these services** should also meet quality standards.

It should also be clear to consumers when they are moving from a service where the broadcaster (or other regulatory body) is responsible to an area such as Internet access where the broadcaster or other regulatory body has no jurisdiction.

### 5.3.2 DIGITAL AUDIO BROADCASTING (DAB)

Radio broadcasting is a more mobile medium than television and this mobility needs to be catered for.

#### Recommendations for standardisation

- DAB receivers should be compatible with all DAB regions in Europe;
- Set-top DAB receivers should meet hi-fi quality standards;
- Car or portable DAB receivers should meet certain technical quality standards, particularly in terms of power consumption and radio frequency sensitivity;
- The quality of broadcasts should meet minimum quality standards or a quality rating - based on broadcast data rate and number of channels - should be indicated to consumers so that they can make comparative judgments regarding the quality of different broadcasters;
- Additional text-based information accompanying DAB broadcasts should be accurate and meet quality standards (traffic announcements, radio text news, programme information text).

### 5.3.3 PERSONAL VIDEO RECORDERS

These are devices that record digital video signals onto a hard disc. These offer temporary storage of programmes. This can be used for time-shift recording or for 'delayed' viewing of a live programme. PVRs utilise an EPG to facilitate user programming. Some PVRs have intelligent software agents built in. This allows the PVR to 'learn' a user's programme preferences and predictively select programmes to record.

#### Recommendations for standardisation

- **Technical quality:** The PVR should offer one quality level that records the digital signal without significant quality loss;
- The PVR should record all subtitles;
- **Privacy:** Information gathered or calculated by the PVR regarding a users programme preferences should not be passed on to the service provider or third party without the consent of the user. The user should also be able to access such information;
- PVR and EPG combinations should provide certain **key features:** ability to record all programmes in a series, ability to adjust recording times to allow for re-scheduling or over-runs, ability to 'pause' live TV, ability to record the whole digital stream including surround sound encoding and programme synopsis;
- **Transparency of costs:** Any additional costs involved in using a PVR, such as additional subscriptions or telephone calls made by the PVR, should be made clear to the consumer.

## 5.4 ELECTRONIC COMMERCE

It means buying products and services by electronic means such as TV, mobile phone and PC. Electronic commerce can take place from the home or office, in public places, and on the move. Electronic commerce will have social, legal, ethical and technical implications for the consumer.

On the other hand consumers can derive advantages from using electronic commerce, provided that the systems are easy and consistent to use and accessible.

Today, personal computers are the most widespread means of accessing Information Society services, e-commerce in particular. Digital TV receivers with set top boxes and mobile phones are currently running a distant second place to PCs, while devices spanning several categories are emerging. In future, once a multi-platform environment is the norm, consumers are expected to want to access the same digital services and content in a variety of situations and locations, using different devices and network connections.

It has become evident though that the consumer's confidence in the opportunities offered by electronic commerce is crucial for its success - a confidence, however, which is still lacking in the European market and in particular across borders. Marks and labels are means of creating consumer confidence. Hence, new regulatory and self-regulatory requirements or the revision of the existing ones are currently being elaborated at the European level in order to enhance consumer confidence in e-commerce<sup>60</sup>. Consumers are in particular very much concerned by security of payment systems and the protection of their personal data.

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<sup>60</sup> In 2001 the European Commission launched its "e-confidence initiative" in collaboration with consumers and industry seeking to promote a high level of consumer protection and to encourage the sale of goods and services on the Internet. Trust mark schemes wishing to participate in the e-confidence initiative must comply with a set of requirements (BEUC/X/179/2000).

Electronic purchasing is important to consumers for several reasons:

- It may be the only way in which certain products or services will be offered for sale in the future. Not being 'conversant' with electronic commerce will reduce an individual's choice while choice being a fundamental consumer right;
- It can, through potentially lower costs, provide better offers (e.g. home delivery, wider choice, lower prices) than traditional city-centre stores. Again, those conversant with electronic commerce should be able to enjoy lower prices, while those who are not will pay higher prices (discrimination). It has to be noted though that prices for some goods are actually higher via electronic commerce than from traditional stores, yet consumers are willing to pay for the convenience of being able to shop when it suits them;
- It may be the most suitable way to shop for people living in remote areas, single parent families, working people or disabled consumers, provided there are accessible website pages. Consumers who are not able to use the electronic commerce systems or do not trust them will be discriminated against (i.e. disadvantaged) when this becomes a normal means of purchase;
- Electronic commerce currently presupposes that the consumer has access to a computer and a modem. The initial costs associated with this (equipment, software, installation, training costs) will be a barrier to many, as may the running costs. The use of other delivery techniques where the consumer has already invested in equipment (e.g. TV sets) needs to be considered on an equal footing.

### **Consumer priorities**

- *Ease of use*
- *open and interoperable applications and standards*
- *Cost transparency*
- *Privacy*
- *Standards for all information delivery technologies*
- *Design for All (accessible websites)*
- *Research into consumer aspects of e-commerce*
- *Order confirmation*
- *Error tolerance*
- *Security of transactions (including financial aspects)*
- *System status information*

### **Recommendations for standardisation**

- **Ease of use** is an acknowledged problem for consumers. Design for All principles and accessibility guidelines should be applied to all commercial web-sites;
- **Consistent user interfaces** are a precondition for use of the system by all consumers. It is especially important that the method of processing, storing, navigating and accessing the system is consistent for the user. This can be achieved by user interfaces being adaptable to

the individual, for example by coding on cards, or by user interfaces being consistent across several systems;

- **Standard tools/ measurement techniques** for measuring ease of use of electronic commerce are needed. These could be based on tools used for measuring ease of use in office systems (ISO 9241-11). Ease of use can be measured in terms of performance (e.g. the time taken by users to complete a predetermined task, and/or the number of errors, and/or the satisfaction with a service (EN 29241 -11 Guidance of usability). Goals for ease of use - known as usability statements - should be developed;
- Electronic commerce standards should address **ergonomic aspects of hardware, software, services and support**. Existing standards should be applied (e.g. ISO 9241);
- **On-line help:** Standards defining minimum levels (performance, content and Quality of Service) and user interface presentation need to be developed. On-line help should be evaluated for ease of use;
- **Interoperability** between **different application** standards is a precondition for electronic commerce. Interoperability is required between different application domains and, different technologies;
- **Standards for all information delivery technologies:** It should be noted that the thrust of current standardisation work is directed only towards delivery of electronic commerce via the PC. Other delivery technologies, e.g. TV, telephone or mobile phone are not being systematically considered in ongoing standardisation work. Given that throughout Europe the penetration of telephones and television sets is considerably higher than that of PCs it is important with regard to costs, for both the consumer and service providers, that these existing delivery mechanisms are utilised. Standards are needed to support this;
- **Involving consumers in all phases and all areas of electronic commerce standardisation.** As noted above, electronic commerce is in its infancy. In order to take consumers' need properly into account, the involvement of consumers in the standardisation process should be enhanced. CEN EN 614: 'Ergonomics design principles - Part One: Terminology and general principles' is an example of a standard specifying end user involvement in the design process. It stipulates when consumers should be involved and, what types of analysis work should be done with them, and describes user testing. This concept could be applied to electronic commerce standards;
- **Security of transactions** is one of the most important aspects for consumers in order to enhance their trust. Password and user name are not sufficient, so, new ways of encryption and digital signatures need to be refined and standardised. An effective digital signature requires a public key algorithm, a secure hash algorithm, and a system of key management. Interoperability requires agreement on standards for these items, plus agreement on the security procedures of a Trusted Third Party or certification authority. Information to the consumer about **levels of security**, and on whether security has been breached, should be based on standards.

Moreover, the process of **delivering access codes** to the user/consumer in a way that is secure should be standardised and clear, concise **information** must be provided to the consumer about security risks. Web retailers should operate a '**customer account**' system whereby if a consumer returns for a subsequent purchase then his credit card details are held on a (optional) secure file in such a way that they do not have to be sent over the Internet a second time;

- **Encryption:** Various sophisticated encryption systems have been proposed, for instance RSA/SET two-key system, Trusted Third Party (TTP) or digital signatures. These are likely to become de-facto standards. Official standards bodies need to adopt these systems so that

consumers feel confident about them. In order to be adopted, the systems need to be demonstrably secure;

- **Privacy**, i.e. confidentiality of personal information, such as the configuration of user interface requirements and the choice of service applications, as well as personal data, children data in particular, should not be disclosed to third parties, e.g. captured by service providers. Electronic footprints should be avoided. The consumer should be informed before of any information retained by service providers, network operators or other actors according to the relevant legal provisions.

**Privacy enhancing technologies** should be easy to use, cost-effective and based on open and interoperable standards.

- **Design for All:** Electronic commerce standards should build upon the concept of 'Design for All' aiming at designing products, systems and services for as many people as possible while acknowledging that there is a minority of disabled people with severe impairments who need adaptations or specialist products. CEN/CENELEC Guide 6, which provides guidelines for standard-makers on how to meet the needs of elderly and disabled people should be applied systematically;
- **Error tolerance** and an easy and obvious recovery procedure when an error occurs should be standard for electronic commerce. Lack of this causes the consumer to feel insecure and inadequate. If there is high error tolerance and a standard 'way out', it will help the consumer feel more confident and at ease;
- **Provision of system status information:** The status of the system (e.g. waiting for input, checking, fetching) should always be indicated to the consumer. Different mechanisms should be employed to give clear feedback to the consumer, for instance audio/visual for error messages data input required. Equally, mechanisms advising on the consequences of actions should be available (e.g. 'if you start downloading the file you have selected it will take 76 minutes. Press 'cancel download' or 'Download'').
- **Presentation of information about goods/services:** There is a need for a standardised product data sheet informing consumers about the goods and services they are intending to buy. This would facilitate comparison between products and also inform consumers of any special conditions applying (e.g. an APEX plane ticket is non-refundable and cannot be changed or 'perhaps the electrical appliance you are looking at will not run on the mains electricity supply in your country');
- **Cost transparency:** The system must be transparent regarding all costs involved. Cost information should be presented in a standardised way. This includes both the initial costs involved for the user and the secondary costs in terms of subscribing to and operating the system, especially when inter-working on networks, or when using on-line help or other fundamental services (e.g. directory enquiries or short message service on a mobile phone). Disconnecting from a service must be free of charge or the charge must be stated in a standardised way at the point of purchase. It is important that consumers at all times know the financial consequences of their purchase and different ways of having the purchase sent (by courier, by air, or by surface mail) and the costs of returning goods.
- **Quality of service and system reliability:** There should be a standardised way to determine and present quality of service and system reliability. This should include the development of standardised performance indicators. This information should be displayed at the point of sale;
- **Order confirmation:** Purchasers of goods and services should get a quick, personal response (via e-mail) from the merchant. This standardised response should confirm expected delivery time, provide an order number, confirm what is being purchased, provide a point of contact if goods and services are not delivered on time, advise on redress if goods or

services are not satisfactory or are damaged in transit, and advise on mechanisms for the return of faulty goods;

- **Authentication and identification:** consumers' personal data should always be protected. However, it should be possible for the consumer to buy on-line from any location (home, office, public environment, on the move) on any type of device (TV, PC, mobile phone). Standards for authentication systems that are interoperable and compatible with mainstream devices are therefore needed.

## 5.5 INFORMATION ACCESS TERMINALS

### 5.5.1 PERSONAL DIGITAL ASSISTANTS (PDA)

A Personal Digital Assistant (PDA) is a hand-held device for simple personal administrative tasks such as calendar, telephone directory, to-do list, reading e-mails. A PDA is often used as a kind of appendix to a PC where simple administrative tasks are transferred from the PC to the PDA. This involves a function for the synchronisation of data between the two computers. This can be achieved by an IR port, serial connection or a docking station. External ports can also be used for connection to the Internet via a mobile telephone. Some have a built-in modem for connection to the Internet. As regards functions and capacity, the PDA could be placed in the middle of a continuum of mobile devices ranging from standard laptop PCs (high-end) to basic mobile telephones (low-end). Currently two types of PDA exist on the market: keyboard-based PDAs ('clamshells') and stylus-and-pad based PDAs ('tablets'). According to market analysts by 2005 about 40 percent of the population will have access to the Internet by TV or mobile telephone. Many people will have a choice of PC, TV or phone as an access method, and will use different devices at different times or for different tasks. Enhanced phones will dominate mobile terminal by GPRS, JAVA, WAP, LBS, SMS, MMS.

These predictions imply that the PDA will become a significant consumer product during the next few years, although it will not at all reach the same penetration level as the mobile telephone. It could be expected that communication features will increasingly be integrated into the PDA.

As regards consumer needs for standardisation of PDAs, it has to be noted that the market for mobile devices is currently evolving rapidly and will continue to evolve during the next few years. This means that the window of opportunity for standardisation will not be wide open during this period. The PDA of today is a less standardised device than the PC. More than five operating systems exist on the market.

#### Consumer priorities

- *Easy detection/recognition of interaction elements (e.g. power on/off, connection ports)*
- *Consistent user interface within and between applications on the same device*
- *Individualisation of the user interface and operating process, in particular adaptation to the specific physical, visual, auditory, dexterity and cognitive requirements of the user*
- *Good lighting, indoors as well as outdoors*
- *High battery capacity*
- *Freedom of choice between, easy connection and easy set-up of third-party peripherals and application software*

- *Security features to prevent unauthorised use*

### **Recommendations for standardisation**

- Usability criteria for design of generic interaction elements (e.g. power switch, stylus);
- Technology interface and protocol for plug-in and set-up of third party peripherals;
- Downloading and installation of third party application software;
- Since batteries in many PDAs are built-in and not exchangeable, consumers need standardised information on the lifespan of the battery, i.e. the life expectancy of the device itself.

## **5.5.2 PUBLIC ACCESS TERMINALS**

Public access terminals are usually to be found in a public environment. They provide access to a public or private service where the consumer operates an ICT-based device, which gives information or delivers a product or service without the involvement of service staff. Public access terminals can be free or operated by means of coins, notes, tokens or cards.

Key services, such as telecommunications, transport, public administration, banks and post offices often use information kiosks and other kinds of public access terminals as service channels in parallel to other channels such as home PCs, mobile terminals and personal service. Public information, which can be of considerable importance, (e.g. information about voting, taxes or legislation) must be available to all members of the public on equal terms. There must be no barriers neither in technical nor economic terms that prevent the public gaining access to such information. Otherwise a two-tier society will be created.

Consumers are expected to operate the terminal without the assistance of another person. Failure to operate the system correctly can result in the wrong information, service or product being delivered or even none at all. This could have considerable consequences. It is therefore vital that public access terminals can be operated by everyone in all environments.

### **Consumer priorities**

- *Public access terminals must be easy to use for the widest possible range of consumers, including disabled and elderly people*
- *Adequate physical access*
- *Design must be ergonomic*
- *The terminals must be robust and resistant to vandalism*
- *Standard for uniform design of system, making the generic features of the user interface consistent within and between systems and applications. This is particularly important for visually, intellectually and cognitively impaired consumers*
- *Systems, which provide cash payment, should accept a wide range of valid coins and notes*
- *Compliance with existing standards on symbols*
- *Categorised list of information must be provided*
- *The information provided needs to be reliable*
- *Clear difference between advertisements and information. Preferably no commercial advertising*

- *The consumer must be able to easily understand which services are provided by the system*
- *The system must inform the consumer if there are services normally provided which are not available*
- *Clear instructions*
- *Choice of languages, including any necessary character sets*
- *Privacy should be ensured if consumer profiles are given on cards*
- *The consumer should be enabled to resume an interrupted session*
- *The consumer must be allowed to cancel the transaction at any time*
- *The system must provide information on what to do when a mistake is made*
- *The consumer must have the right to redress and be provided with information on how to obtain redress*
- *The system should not emit or be sensitive to electromagnetic fields or radio signals such as to interfere with the operation of electronic appliances, for example pacemakers and hearing aids*
- *For card-based information kiosks, see Section 4.2 Smart cards*
- *In the event of a security failure, e.g. credit check, the card should still be returned. A comment should be added electronically. The system should display this information to the consumer*
  - *The conditions under which the terminal retains the card must be clear to the consumer, in order to prevent unauthorised use. This is of special importance for multi-function cards, where more than a certain number of mistakes by the owner will result in the loss of the card for all other functions as well.*
  - *Security: test method for evaluating security at the man-machine interface with respect to observation of the PIN code as it is being entered.*

### Recommendations for standardisation

- Services provided by publicly available information kiosks, may also be provided on other delivery channels, e.g. home computers, digital TV. To ensure maximal consistency between different delivery channels, **generic features in terms of the interaction**: menu system, dialogue, payment system should be standardised. Where the user interface is based on the Internet, appropriate standards for web services should be applied;
- For all consumers, in particular visually, intellectually and cognitively disabled users of public terminals, the most important aspect is the consistency of the user interface. **Style guides** should be developed for frequent applications;
- Users may only use public terminals occasionally and have probably been provided with little training for doing so. Hence, public terminals must be accessible without training. What is 'logical' to the consumer may be different from what is 'logical' to the designer. Consequently, it is essential that user interfaces, whether standardised or not, are tested with a cross-section of potential users including disabled and elderly people. This can be achieved by applying a **process standard for involvement of end-users**, e.g. ISO 13407;
- Consumers should be able to choose their preferred language when interacting with the terminal. This means that the terminal should be able to display the national characters of that language. The terminal should therefore satisfy a **suitable standard for character sets**, (e.g. ISO 10646);
- There is a need to standardise **card insertion** into the card-reading device so that users, having correctly oriented their cards, can quickly identify the card insertion slot and insert the card correctly. Ideally, the card-reader should be capable of reading the card, regardless of how it is inserted. The ideal positioning of card readers seen from the consumer's standpoint should be determined and the results integrated into standards;
- A **common set of functions** needs to be identified that should be graphically represented by icons, symbols and pictograms while a functional description is agreed for each function (e.g. ISO 3461 and ISO 9186);
- **Practical guidelines** for developing screen layouts for public terminals for electronic commerce need to be developed and tested;
- Standardised **receipt layouts** are to be developed and evaluated;
- **Coding of user profiles** on cards should be developed.

## 5.6 INTERNET

This chapter focuses on the consumer interface with the Internet. This includes access to and use of World Wide Web (WWW), Usenet Newsgroups, File Transfer Protocol (FTP), Internet Chat (IRC/ICQ) and E-mail while taking into account access to the Internet by any means, be it personal or be it public and fixed or be it portable.

A significant feature of the Internet, from a standards point of view, is that it is largely undefined, unregulated and only loosely controlled (e.g. Internet Society specifications). ANEC recognises that this feature is a major factor in the success of the Internet, particularly as an entertainment medium. It is therefore important to preserve these aspects in general. However, some legal controls and/or standards must be put in place if the Internet is to be used in areas such as public information or electronic commerce.

In fact, the telecommunications infrastructure that supports the Internet is significantly standardised. It is the Internet applications and services that are in need of standardisation if consumers are to trust and to make use of the Internet for communication, electronic commerce and information.

**Communication:** For the consumer, e-mail is one of the most popular features of the Internet, (according to surveys of Consumers' Association in the UK). It is important because it offers an easy-to-use, fast and low cost instrument for communication. It is essential that content confidentiality, security and privacy are guaranteed in this area.

**Electronic Commerce:** Mail order and other financial transactions are available via the Internet and this method of commerce may well increase and could eventually become the norm in some retail or banking areas. This raises important legal issues such as warranty/guarantee, redress and financial security.

**Information:** The Internet has the potential to become one of the main media for home and public information purposes. It is essential that all consumers have the ability to have easy and affordable access to the Internet and to the information required. Much of the Internet consists of what can be described as 'useful' information, which can be treated in a similar fashion to a reference library. This type of information and its retrieval may not be in need of standardisation. However, an increasing amount of information on the Internet is what is typically classified as 'primary information'. This includes local and national government information and other material to which consumers are entitled such as health, state broadcasting and other such public information.

## **5.6.1 INTERNET ACCESS AND QUALITY OF SERVICE**

### **5.6.1.1 Access to the Internet**

For consumers, access to the Internet is typically organised via some form of Internet Service Provider (ISP). It is important to ensure that these organisations work to a standardised code of practice. It is recommended that a standardised method of measurement and rating system should be applied to ISPs so that consumers could select an ISP that would meet their needs. This rating system is judged preferable to a single pass/fail quality standard because of the variety of different consumer requirements and the differing cost and performance structures that ISPs are able to offer.

### Consumer priorities

- *Transparency of costs, lengths of contract and contract termination penalties, which need to be made clear at the point of sale;*
- *The ISP's legal obligations to the subscriber: These must be transparent (e.g. what is their liability regarding content) and obligations should be made clear to the consumer. Consumers need to be able to tell where the ISP's liability ends and where the web information provider or trader begins.*
- *Ease of use and accessibility (e.g.: WAI guidelines)*

### Recommendations for standardisation

- **Technical performance criteria:** There should be a standard rating system to quantify the ISP's technical performance in terms of their local connection and their Internet peering arrangements. This should rate average data speeds, latency, packet loss, contention ratio. The standard should also include an assessment or rating for the ISP's availability and reliability of connection. This rating system should encompass different methods of connection: broadband, dial-up and mobile, in such a way that different ratings criteria could be applied for these different modes of access;
- **Quality of service to the user/consumer:** The quality of the overall service offered by the ISP should be also rated according to a standard. This would include the quality of the welcome pack, help line and other customer support, staff training and clarity of information regarding performance specifications and services provided.

#### 5.6.1.2 Information retrieval

The means of locating and retrieving information can be very confusing. 'Search engines' are useful for general research and 'surfing' but are too 'hit and miss' for the retrieval of primary information. A standardised format for making available and presenting primary information needs to be implemented.

### Recommendations for standardisation

- **Locating:** The means of identifying and locating primary information should be standardised to ensure all consumers can access it;
- **Formatting:** The URL structure of an Internet website containing primary information should follow a standardised pattern so that consumers can quickly and intuitively find the information they want without the need for stepping through a blind menu structure. (A useful example of this practice is the British Broadcasting Corporation's website – [www.bbc.co.uk](http://www.bbc.co.uk) where a simple, logical approach is used. Any particular topic or programme can be accessed directly using the form [www.bbc.co.uk/name](http://www.bbc.co.uk/name), where 'name' can be any programme name or topic;
- **Retrieval:** Methods of retrieving primary information need to be standardised into the fewest possible formats. For example, these could be based on existing file formats such as ASCII text, bitmap files or Adobe Acrobat files. Means of decoding these formats would therefore form part of the minimum requirements for a retrieval interface system (e.g. computer browser).

### 5.6.1.3 (Parental) controls and filtering methods

One of the main consumer concerns is the access by children to undesirable, obscene material and the different means of controlling and avoiding it.

#### Recommendations for standardisation

- **ISP's responsibility:** As a minimum requirement, Internet Service Providers should ensure that they do not carry any content that is notified to them by the competent authorities as being illegal (i.e. obscene, libellous, sacrilegious, dangerous) in the countries in which they provide their service. Internet Service Providers and authorities should pool information regarding such sites or newsgroups. This, however, would be a legal requirement, not a standards issue;
- **Rating systems:** Systems exist whereby web publishers can voluntarily categorise their pages or site, thus allowing web browsers to selectively filter such sites. These systems are based on industry standards. RSACI and Safesurf are well known examples. While these systems may work at a technical level, they are far from being universally adopted and are unlikely ever to achieve this. However, the system can still be a useful tool to assist filtering and should be formally standardised;
- **Filtering or blocking software:** Current third-party 'filtering' software (e.g. Cybersitter, CyberPatrol, Netnanny) could alternatively or additionally form a basis for controlling Internet content. However, in their present form these products do not perform adequately. Standardisation with respect to performance ratings could significantly improve these tools. In particular, they should be able to be tailored to specific needs and to regional or national requirements. Such filtering tools should be able to control content from all appropriate Internet applications, not just the World Wide Web. Typically, the control of filtering software will lie with the consumer but if third-party control is applicable then the user should be made aware that a filter is in use.

### 5.6.1.4 Advertising

Many Internet sites contain advertising. It should become evident to consumers what is an advertisement and what is not. This is an area in need of both standardisation and legislation. Traditional legislation and voluntary codes of practice should be applied equally to Internet advertising. Consumers are particularly annoyed by the enormous amount of unsolicited commercial e-mail, otherwise known as 'spam' they receive each day in their e-mail boxes (see also section below).

#### Recommendations for standardisation

- Special attention should be paid to **visually disabled users**. The modern Graphical User Interfaces (GUI) such as Windows and the use of advanced images on the Web (e.g. Java) cause problems for users of audio readout systems. Web pages should be accessible to all consumers, and text-only alternatives should be available (see, for instance, the WAI-Guidelines (Web Accessibility Initiatives) of World Wide Web Consortium ([www.w3.org/WAI](http://www.w3.org/WAI)))
- The 'error tolerance and system stability' should specifically address the protection of the system and consumer from so-called **computer viruses**. Anti-virus software should be standardised.
- "Spam" filters should allow consumers to control the content of their mail box. Standards for Quality of service criteria and evaluating tools are needed.

## 5.6.2 COMMUNICATIONS

### 5.6.2.1 E-mail

Many consumers use electronic mail as an alternative to traditional methods of personal communication. However, the proliferation of unsolicited commercial e-mail, or 'spam', has reached a point where it creates a major problem for the development of e-commerce and the Information Society. Consumers spend an increasing amount of time and money simply to clean up e-mail boxes. Experience in the field of e-communications already provided enough evidence that "spamming" works to the detriment of consumers due to many reasons. One of the reasons is the cost consumers face in relation to data storage and transmission and loss of time, the possible displacement of mails. Another reason is loss of confidence due to the typical content of unsolicited e-mails (pornography, pyramid and get-rich-quick games, miracle products etc).

In the European Union, e-mail marketing is only allowed with consumers' prior consent, with a limited exception covering existing customer relationships (Article 13 of Directive 2002/58/EC of 12 July 2002 on Privacy and Electronic Communications). This so-called 'soft opt-in' regime equally covers SMS messages and other electronic messages received on any mobile or fixed terminal.

#### Recommendations for standardisation

- **Personal security and privacy:** Consumers should expect at least the same level of security and privacy that they rely on when using the telephone or postal communications. However, with electronic mail there lies the possibility of better and improved levels of security and privacy than with traditional methods. Standards need to be in place to define the technical methodology and e-mail operator's code of practice;
- **Guaranteed delivery:** The e-mail system should be reliable enough to guarantee near 100% delivery. If due to technical or human operator problems, mail cannot be delivered then a standard method of 'returned mail' warning should be provided. There are particular legal issues if legal or contractual information is being sent via e-mail, and the methods of confirming receipt should be in place and standardised. If the mail does not get through there needs to be a maximum time limit for the returned mail message and the precise time of receipt or return needs to be recorded accurately;
- **System Security:** The e-mail infrastructure should be robust enough to withstand technical breakdown without loss or undue delay of mail. This implies that e-mail should not be the responsibility of one monopoly organisation.
- **Common interface:** e-mails browsers should store, display and thread messages in a standardised format and use a common terminology. Any proprietary enhancements to e-mail used for mail between users on the same network or service provider should be transparent to recipients outside the system.
- **Spam filters:** "Spam" filters, such as softwares or the filtering service provided by the ISP, should allow consumers to control the content of their mail box. Standards for Quality of service criteria and evaluating tools are needed.

### 5.6.2.2 IP telephones

Two main systems exist: computer to computer, where both or several parties need to be logged on to the Internet, and computer to conventional phone where only the caller is logged on to the Internet. Currently the limited performance and inconvenience of these systems mean that their use is restricted to 'enthusiasts', so standardisation may not be appropriate in the short or medium term.

#### Recommendations for standardisation

- **Security;**
- **Privacy:** Confidentiality of personal information, such as the coding of user interface requirements and the choice of service applications should not be disclosed to third parties, e.g. captured by service providers. Electronic footprints should be avoided. Consumers should be advised of any information retained by service providers, network operators or other actors. There is ongoing legal work on privacy in several European countries. Privacy may therefore be regulated by law;
- Transparency of cost;
- Controls on reception of unsolicited calls;
- No measurable global slowing down of the Internet should be caused;
- Quality of service and system reliability: Technical quality standards and facilities should be the same as for conventional phone systems. There should be a standardised way to determine and present quality of service and system reliability. This should include the development of standardised performance indicators.

### 5.6.3 INTERNET BROADCASTING (STREAMING)

Where public access broadcasting services are being offered over the Internet they should employ standardised audio and video coding systems. The necessary decoding software should be provided automatically if not already installed on the consumer's terminal. The broadcaster should make clear the required specification which the consumer's terminal equipment should meet and make clear any additional subscription costs which the consumer might incur.

Streaming media technology enables the real time or on demand distribution of audio, video and multimedia on the Internet. Streaming media is the simultaneous transfer of digital media (video, voice and data) so that it is received as a continuous real-time stream.

### 5.6.4 PRIVACY

The protection of privacy and personal data is a consumer fundamental right that should not be threatened by the ongoing technological development in electronic communications.

Privacy and security of information will be largely a legislative issue (EU Directive on protection of personal data 95/46/EC and EU Directive on processing of personal data and the protection of privacy in electronic communications). However, as detailed in Article 17 of the EU 95/46

Directive, there is a suggestion that a 'state of the art' protection system would be appropriate. If this is the case, such a system would presumably be appropriate for standardisation.<sup>61</sup>

As widely acknowledged, lack of privacy and the inability to control data, sensitive data in particular, is one of the main reasons that prevents consumers from full involvement in e-commerce transactions. The right of privacy, for example the right to be let alone and to freely browse the Internet without fear of surveillance, and the need to have information well protected in this publicly accessible network, have risen major consumer concerns.

Consumers are in fact concerned about the common practice of unfair data collection and profiling in e-commerce. The technology that is installed by default while surfing or buying on the net seems to be aimed at identifying consumers in connection with their behaviours. In addition, consumers are not sufficiently aware of the risks they are exposed to regarding the new technological means.

Therefore, peculiar attention should be paid to the Privacy Enhancing Technologies for consumers, which actually improve privacy options by, for instance, providing anonymity through strong encryption and secure authentication. Standardisation of such technologies should be a mean to make PETs easy to use, accessible by all consumers and cost-effective. The reference to PETs by Article 17 of Directive 95/46/E requires data controllers to implement 'appropriate technical and organisational measures' to protect personal data, especially in network transmissions.

Moreover, European Standardisation Organisations are one of the few places where consumers can contribute to the standardisation work, compared to the informal industry dominated consortia.

Consumers face the difficulty of recognising which technologies are genuinely "privacy enhancing". The idea of a certification scheme based on an independent verification of PETs has been put forward. Standards could play an important role in this context. As a consequence, standards could be used to improve consumers' access to and choice of goods and services. Standards could for example facilitate the development of common approaches across jurisdictions where divergent national laws exist between countries<sup>62</sup>.

There is an evident overlap between security and privacy issues. Firewalls and detection systems are needed in order to protect the consumer's personal information as well.

**Consumer priorities:**

- *Security of data transmission*
- *Ease of use and accessibility (Design for All)*
- *Cost-effectiveness*

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<sup>61</sup> British Standard BS7799 of 1995 would be an example of such a standard.

<sup>62</sup> The consumer policy committee of ISO, COPOLCO, has passed several unanimous recommendations to the ISO Council that they develop an international management standard for the protection of privacy. In May 2001, COPOLCO issued a recommendation that the Council address the need for work on an international standard for consumer protection in electronic commerce, which would include requirements for the protection of personal data. Despite this support, previous efforts in ISO itself to address this issue have met with opposition from the industry side.

- *PETs interoperability with other applications, software or hardware*
- *Clear information on privacy rights and on use of PETs*

### **Recommendations for standardisation**

- Security of performance<sup>63</sup>;
- Encryption (electronic signatures based on public key or symmetric key cryptography)
- Control and transparency of monitoring tools used by service and information providers (e.g. cookies);
- Anonymous and pseudonymous browsing and email systems
- Standards for the evaluation/comparison of the different existing PETs.

## **5.7 LEARNING TECHNOLOGIES**

The term 'Learning Technologies' refers to the application of Information and Communication Technologies in learning. The technologies can be applied as tools for learner interaction in the context of content delivery so as to improve and enhance the learning process or make it more available. Delivery is assumed to be predominantly on-line or via a network, but not exclusively so.

Learning technologies can be integrated into education and training systems for many purposes, including administration of the system or management of the process/learning content or curriculum development and production/delivery and distribution of learning/user support and interaction/assessment and examinations.

It is important to consumers that the use of learning technologies, especially Internet learning, increases with the use of modern Communication and Information Technologies. The domain of training, in particular, addresses all consumer groups, but also the principle of life-long learning demonstrates that learning is no longer restricted to schools or higher education.

Bad learning experiences can influence the life of consumers decisively. This is why the quality of the learning system gains much more importance to the user than the economic risk. The quality of the learning system as the key interest of consumers can apply to the development process of the learning system, to the learning material included, and to the related services of the learning system provider. The quality of the learning system can be demonstrated by information and documentation so that the consumer is able to choose a learning system according to his specific needs or by ensuring minimum requirements on the different processes in the life cycle of a learning system.

Apart from the specific interest of consumers regarding the quality of the learning system, the general problems inherent in ICT such as accessibility, data protection, Design for All.

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<sup>63</sup> For example the International security standards: ISO/IEC 17799: 2000

### Consumer priorities

- *Transparency of the product (the learning system including learning technologies) and related services*
- *Easy to use for end users with respect to their specific needs and learning contexts*
- *Adequacy to the users learning needs*
- *Accessibility*
- *Choice of languages (multilingualism)*
- *Adequacy to the end user's cultural background*
- *Convenient design*
- *Presentation of learning content suitable to heterogeneous learner groups (adults/children)*
- *Qualification of all personnel participating in the development process*
- *Inclusion of all relevant parties in the development process: educational software experts, scientists with knowledge of the learning content, software engineers*
- *Information on the learning system, related services and the contract (e.g. preconditions for usage, learning objectives, teaching methods, time needed, duration of learning process, costs, knowledge and skill taught)*
- *Information on possible examinations, certificates*
- *Documentation on learning progress, learning outcome*
- *Authenticity and quality of learning material (sources have to be documented)*
- *Adaptability and topicality of learning material*
- *Possibility of replacement and renewal of learning material to learner situation*
- *Data security, protection of data privacy (data on learner)*

### Recommendations for standardisation

- **Quality Assurance:** This may be a standard similar to ISO 900X, but taking into account the specifics of learning technologies;
- Usability and suitability of applications for **collaborative learning**. Collaborative technologies are the interface between learner and system provider and therefore have to comply with all requirements regarding man-machine interfaces;
- **Learner information:** A standard should specify the syntax and semantics of a 'Learner Model', which characterises a learner (student or knowledge worker) and his or her knowledge/abilities. This standard has to include elements for recording knowledge acquisition, skills, abilities, learning styles, records, and personal information. The aspects of data protection have to be incorporated.

## 5.8 INTELLIGENT TRANSPORT SYSTEMS

For consumers, Intelligent Transport Systems mean increased **transport safety**, more accessible/easy to use transportation systems (and thereby reduced costs for special transportation solutions for disabled people), improved quality of service, security (tracking of stolen vehicles) and reduced vehicle pollution.

With regard to increased safety, for example, it should be noted that the cost of transport accidents is estimated at around at 2% of the Gross Domestic Product of the European Union. Road accidents are the largest single cause of death for EU citizens under 45 years.

Preventing death and disabling injuries entails a transport system that is better adapted to the needs, errors and physical vulnerabilities of its users rather than one that expects users to cope with increasingly demanding technologies.

Electronic toll systems for example should be interoperable in order to allow consumers to travel across Europe without having to change their on board equipment/ type of service agreements. Moreover, interoperable technologies will allow value-added services and safety systems to be developed for consumers (ex: automatically generated emergency calls in the event of accidents). However, manual toll systems should be maintained in order not to exclude consumers whose vehicles do not possess the necessary equipment.

The coupling of ICT in road transport is already helping to make travel easier, more comfortable, more efficient and safer. This wide area includes real-time traffic and public traveller information, in-vehicle guidance systems, traffic/public transit/parking, information collection and distribution, traffic management systems and co-ordination, human interfaces and ergonomics, and vehicle/highway automation. This area has overlaps with other consumer priorities relating to 'electronic commerce', 'public access terminals' and 'smart cards'. These areas should be consulted for further information.

### **Consumer priorities**

- *Safety (ex: automatic emergency call)*
- *Access to information*
- *Reduced pollution and environment-friendly technologies*
- *Security (ex: post-theft tracking systems for recovery of stolen vehicles)*
- *Accessibility/Design for All: DfA does not mean designing for everyone, but designing for as many people as possible while acknowledging that there is a minority of disabled people with severe impairments who need adaptations or specialist products.*
- *Fees payment: electronic and non-electronic toll systems:*
  - o *Interoperability and compatibility of systems*
  - o *Protection of privacy in the event of electronic tagging of people and vehicles*

### **Recommendations for standardisation**

- **Types of standard needed:**

There are several different strategies for developing standards; for example: quality assurance standards, standards that describe activities to be carried out in the systems development

process, standards that describe testing and standards for ease of use (usability standards). When initiating standardisation activities from the areas for standardisation (see below) consideration as to which type of standard is most beneficial should be given. In the Intelligent Transport domain, usability standards may well be appropriate in many cases. ITS must be easy to use for all intended user groups stated in the scope of the standard. Following ergonomic software principles (EN 29241, parts 10-19) for user interface design should for example help achieve ease of use.

#### **Areas to be considered:**

- **Safety**

- Standards for the functional safety and reliability of complex transportation systems.
- Standards for RTT to monitor driver performance (drowsiness);
- Standards to facilitate electronic 'car trains' – maintain safe distances;
- Incident Management: Specifications for command and control systems to ensure interoperability of all types of input, access to all relevant data, compilation and assessment of data, and output channels and logging;
- Standards for command, control centers command and control systems for the emergency services so that cross-agency/boundary incident logs can be transferred intact without having to retype in details the whole incident;
- Standard for central to roadside communications, in respect of their communication systems to ensure interoperability with the roadside systems; the standard must be able to handle input/output in several languages, over several media and in different modes (visual, auditory, tactile/ Braille);
- Standard for location referencing;
- Standards for assessing risk / emergency preparedness for passengers, including children and elderly people. (e.g.: How do you assess emergency preparedness in a train tunnel with regard to elderly people/ children?);
- Transponder systems for child restraints: all transponder-equipped child restraints should be interoperable with all systems, independently on the car manufactures. Consumer information and labelling should be clearly understandable.

- **Accessibility**

- Standards for accessibility of children and disabled persons of all stages in public transport system;
- Standards for ease of use and accessibility of Intelligent Transport Systems technologies.

- **Consumer interface**

- Standardised signs, symbols, icons, pictograms for public and in-vehicle transport according to Design for All principles;

- Standards for accessibility of information in different languages and in different output modes adapted to individual requirements;
  - Standards for usability and risk assessment when driving and using ICT simultaneously;
  - Design of speech interfaces;
  - Interfaces and interoperability with assistive technologies for input/output of information;
  - Transparent cost information;
  - Design process related standards (e.g. similar to EN 614, ISO EN 13407) building on European Statement of Principle on HMI for In-Vehicle Communication Based Services.
- **Infrastructure/intermodality**
    - Standardised transmission method for receiving traffic information via radio/other devices (information about traffic jams, accidents);
    - Standards to facilitate electronic 'car trains' – maintain safe distances;
    - Standards for interoperability between hand-held devices and RTT systems (e.g. blue-tooth light crossing)
    - Standards for 'Continuous Vehicle Communication Based Services to provide ITS Services' to facilitate interoperability and compatibility of RTTT services (across applications and between countries) to achieve standardisation of information exchange and communication protocols;
    - Standardisation of information exchange: location referencing, including in urban areas, and its convertibility by means of a clear structure/architecture;
    - Interoperability of databases (e.g. ticketing, timetables);
    - Conventions for design of timetables/ tickets;
    - Standards to support ticketing, purchasing, values/tokens/ money across traditional sectors;
    - Door-to-door travel information and ticket services: connection between databases of different carriers and payment of services delivered by different systems.
- **Environmental issues**
    - Standards should indicate that environmental issues, such as power consumption, have been addressed. A clean life cycle from manufacturing to disposal should be the goal of all ICT systems/products, ITS devices included. Possible environmental risks that may arise in the product/system life cycle should be identified and indicated to the consumer.
- **Quality**
    - Quality of service and system reliability. There should be a standardised way to measure and present quality of service and system reliability. This should include the development of standardised performance indicators.

## 5.9 SMART CARDS

Smart cards are the result of the merging of different technologies (integrated circuits, plastic material, optical memory storage functions and printing). The term 'smart card' is used to describe any card with an integrated circuit embedded. There are three types of smart cards:

1. Small capacity memory-only chip cards known as prepaid cards or stored value cards. They do not have a built-in microprocessor and cannot therefore perform operations. They only store data.
2. Wired logic chip cards: These cards can both store data and perform operations on the stored data. They do not actually possess a microprocessor.
3. Microprocessor cards: These cards both store data and perform operations on stored data. Examples are GSM and banking cards.

In addition, a new combination of the above, e.g. chip and high storage optical memory cards, known as "Combi-cards" may soon be on the consumer market.

Card-based systems have started to permeate key facets of the Information Society. They are the key to bank services (at Automatic Teller Machines - ATMs - or via telephone), and the key to communications (phone cards, GSM), transport (tickets, toll booths) and identity cards (electronic passports/machine readable visas), health (patient cards/ health care professional cards) TV encryption cards, electronic purses, access control for buildings and social security cards. They are also considered as the 'key' to electronic commerce.

Given that smart cards are crucial to the Information Society, and given that there is a political will to avoid a two-tier Information Society, it is essential that no barriers both in economic and technical terms exist to the use of smart card systems.

### Consumer priorities

- *Design for All and ease of use*
- *Direct consumer involvement in smart card standardisation*
- *Interoperability between standards/applications and avoidance of duplication of standards*
- *Customisable smart cards*
- *Security of confidential information (medical records, banking details)*
- *Consumer access to information stored on the card, terminal or database and modification of information by consumers*
- *Increased Privacy*
- *Security*
- *Standard procedures for redress*
- *Cost transparency*
- *Information retrieval, identification*
- *Electronic signatures*

## Recommendations for standardisation

There are so many different uses related to smart cards, depending upon the applications (for instance transport or medical) that is almost impossible to provide a complete overview on generic issues.

- **Involving consumers in all phases and all areas of electronic commerce standardisation.** As noted above, electronic commerce is in its infancy. In order to take consumers' need properly into account, the involvement of consumers in the standardisation process should be enhanced. CEN EN 614: 'Ergonomics design principles - Part One: Terminology and general principles' is an example of a standard specifying end user involvement in the design process. It stipulates when consumers should be involved and, what types of analysis work should be done with them, and describes user testing. This concept could be applied to electronic commerce standards;
- **Interoperability** between standards or applications is a fundamental requirement, especially in the area of Intersector Electronic Purses, which would permit the consumer to carry fewer smart cards and greatly improve the convenience of carrying cards when travelling between areas where there are currently specific card schemes;
- **Customisable cards** should allow the consumer to choose which applications are required (transport, telecommunications, credit or debit card), and from which service provider (transport company x, bank b, telephone company c). The consumer would therefore 'own' his/her card, not a service provider. The consumer should be able to choose the number of cards to be carried;
- **Access to information stored on the card:** Only the cardholder should have access to all information on the card, i.e. there should be data transparency. The cardholder should be able to see what information is stored on the card, how long it has been there, whether it has been modified and by whom, and to whom information has been transferred. The cardholder should decide who has access to information on the card. Service providers should have access only to their own domain. Back up of smart card data should be provided;
- **Privacy**, i.e. confidentiality of personal information, such as the coding of user interface requirements and the choice of service applications, should not be disclosed to third parties, e.g. by capture on terminals or by servers. The service providers chosen by the consumer to be included on the card should have access only to their own application. Electronic footprints should be avoided;
- **Security** is a fundamental requirement needed to ensure consumer trust in a smart card system, especially where transactions are involved. Standards which ensure higher levels of security than PIN codes (e.g. via biometrics, encryption) are needed; Information to the consumer about levels of security and whether security has been breached could be based on standards;
- **Secure delivery of PIN codes:** The process of delivering access codes in a way that is secure should be standardised according to the consequences of abuse. To reduce the security risk from the delivery process, the consumer should be able to change the codes immediately upon their receipt. Standards should facilitate this;
- **Standardise procedures for right of redress:** Currently different service providers have very different procedures for addressing disputes with cardholders. These vary considerably between countries, applications and service providers. To improve consumer confidence in how disputes are resolved, a common procedure for disputes settlement between card holders and service providers needs to be established (e.g. a cardholder alleges that a ticket was not issued from a ticket machine, although he has been debited for it. As another example, a cardholder alleges that a phantom withdrawal has occurred);

- **Cost transparency:** The system must be transparent regarding all costs involved. Cost information should be presented in a standardised way. This includes both the initial costs involved for the user and the secondary costs in terms of subscribing to and operating the system, especially when inter-working on networks, or when using on-line help or other fundamental services (e.g. directory enquiries or short message service on a mobile phone). Disconnecting from a service must be free of charge or the charge must be stated in a standardised way at point of purchase;
- **User interface standards:** The user interface and thus the ease of use could be improved by:
  - Consistency at the user interface (either through standardised user interfaces or via adaptable user interfaces that adapt for example by coding on cards);
  - Customisable user interfaces through coding of requirements on the smart card so that the system and service are tailored to the individual's requirements (e.g. language, output medium required);
  - Standardised set of icons/formats (e.g. windows, desk-top) that can be used in everyday life;
  - Standardised set of symbols for the user interface;
  - Card insertion into card-reading device to be standardised (ideally any way, or even better contactless cards);
  - Standards (software and/or hardware) to avoid card capture (especially multi-application or identification cards) in the card-reading device are required. One consumer concern is ensuring that cards are not captured when travelling abroad;
  - Access for **consumers with special needs** can be attempted in several ways - by ensuring **physical access** (e.g. height of terminal and card-reading devices, reach requirements), by **adapting the user interface** through coding of user requirements on cards (see above) and by **providing plug compatibility** for different input - output devices. These complementary methods would all benefit from standards. Access can also be facilitated by use of contactless cards (reduces problems for those with dexterity and or fine manipulation impairments, or people of small stature, including children).
  - Standardised receipts (content and layout);
- **Provision of status information:** The status of the system (e.g. waiting for input, checking) should be constantly available to the consumer (i.e. feedback). Different mechanisms should be employed to give complete feedback to the consumer e.g. audio/visual;
- The cardholder should be able to access information on the card using a preferred mode of input and/or output (visual, audio, Braille).

## 5.10 SMART HOUSES

A Smart House is a dwelling that incorporates a communications network that connects the key electrical appliances and services and allows them to be remotely controlled or accessed. Electrical appliances and services would include items such as environmental controls (heating and lighting), security devices (alarms, motion detectors), home entertainment, cooking appliances, cleaning appliances, and communication systems.

The Smart House can be considered as the combination of three elements: home automation, a communications network and intelligent control. The communications network can be based on a physical cable (copper or optical fibre) or a wireless network or a combination of both. The intelligent control can be based on a centralised computer or it can be based on distributed intelligence consisting of several local and remote computing devices. Remote access and control of the system may be available through a 'gateway'. This could be used by the homeowner and/or by service providers.

Developments in home electronics indicate that all houses in the future could be Smart Houses. Provided that consumer aspects are properly addressed, this can mean increased comfort, convenience, security and energy savings for most groups of consumers. Different groups of consumers may achieve different benefits (e.g. physically disabled people can use remote control to operate all devices in the home, as opposed to having to move to individual devices round the home to control them).

There is a trend towards the consumer being increasingly interested in secure and safe houses, especially in the most rapidly growing consumer group, the elderly. Most elderly people prefer to live in their own home as long as possible (as opposed to being placed in care). Security, safety and comfort are important issues for independent living by elderly people.

Smart Houses can help address these issues, and thereby contribute to individual consumer satisfaction. In addition to this individual aspect, society at large can benefit through the increased independence and satisfaction of the elderly. Soon one European in four will be over 50 years of age, but the number of *older* elderly is growing more rapidly than the group of *younger* elderly. Care services are experiencing increased pressure to deliver care to the dependent elderly. Smart Houses can decrease the pressure on the care services, provided that Smart House systems are flexible, standardised and easy to use.

Smart Houses represent an entirely new way of using the electrical installations and appliances in a house, which the consumers are unaccustomed to *and* unfamiliar with. If the technology is difficult for consumers to operate and maintain, some consumers will be disadvantaged, i.e. will not be able to enjoy the potential benefits (energy savings, integrated alarms) offered by the system. Ironically the groups (elderly) who might gain the most benefit from such systems might be the very ones who cannot operate them. If Smart House technology is going to be beneficial to the consumer, standards must ensure ease of installation and operation.

Consumers are major stakeholders in Smart Houses, and yet they are under-represented at the industrial and political levels (with a few exceptions). In the short and medium term, consumers will have to decide whether they want to embrace this technology or whether they will opt-out. It will not be a simple decision such as purchasing a new appliance. There is unlikely to be any

financial benefit to completely re-equipping and re-wiring their house to convert it to a Smart House. The fully functional Smart House will most likely be a newly built home. However, they could decide on a retrofit solution employing computer control and radio frequency networking.

Such Smart House solutions are likely to be made financially attractive by consortia of companies consisting of equipment, software and service providers who will bring Smart House technology into the home by subsidy and subscription. It is therefore important to establish technical standards so that these different systems offer the consumer interoperability, compatibility and simplicity.

From a consumer's point of view, solutions should not be proprietary, because companies 'owning' the infrastructure will dictate the preconditions. In reality, the cost and complexity of a Smart House system will inevitably result in a number of proprietary systems together with a degree of commercial vertical integration. Consumers may therefore find themselves financially or physically 'tied-in' to a system. It is important for operational and technical standards to exist to ensure that a consumer can change their system or service without major redesign and appliance replacement for their home.

A key consideration is the possibility of different Smart House systems, for the internal communications and infrastructure (e.g. HomeRF, European Installation Bus, Echelon, BATIBUS, CE-Bus) to be compatible. If one particular system achieves the de-facto standard, excluding the others, there is a strong possibility of problems for consumers who have chosen another system at an early stage. For consumers, it is therefore vital that the major Smart House internal communications systems should work towards standards that allow interoperability.

Smart Houses will also govern the way consumers and service providers communicate and interact with the outside world via the home 'gateway'. Again, they could find themselves locked into a particular system or service hierarchy, depending on who controls their particular gateway. Standards need to ensure that these systems are interoperable so that a consumer can change their service provider without loss of functionality or safety.

### **Consumer priorities**

- *Interoperability between communication systems (internal and external) and between individual components (appliances)*
- *Reliability and Quality of Service (QOS) standards for implementation and maintenance*
- *Cost benefit over a period of time that justify installation cost*
- *Safety of the Smart House system and appliances*
- *Security and privacy*
- *Comfort and convenience*
- *Standard, easy user interfaces for the main Smart House control systems*
- *Easy to understand and operate the complete system*

### **Recommendations for standardisation**

- **Standardised definitions of basic services:** It is easier for the consumer to choose the desired services and options according to the desired functionality and his/her own personal wishes if there is a standardised list of choices. This is particularly true because the concept of a Smart House is new;

- **Consistent user interface for different BUS systems:** This is necessary if consumers are to choose confidently between the different BUS systems;
- **Standardising the user interfaces of the Smart House systems:** Assuming that Smart House systems are compatible, the main consumer issue is ease of use. This can be achieved by standardising the user interfaces;
- **Interoperability between BUS systems:** Interoperability should be standard between components, appliances and systems. This should also include ordinary home electronics that could be BUS compatible. Otherwise the consumer must buy conversion devices or software that can sometimes cost as much as the product itself;
- **Flexibility and modularity:** The technology needs to be easily upgraded, modified and reprogrammed, (preferably by the user him/herself with average PC knowledge) as needs change through a life cycle. Modularity is one of the benefits of Smart Houses that provide flexibility. If the user cannot do it service contracts should be standard;
- **Standards for installation aspects of Smart Houses:** This will ease the decision processes in each project, and ensure the basic requirements for a consumer-friendly installation with a minimum of ugly components showing. This is particularly important when installing BUS systems with cables. A standard position for the conduits (either by the floor, by the ceiling or at a certain height on the wall) makes the cable accessible for future installations and servicing;
- **Standardised training for installers:** This should include understanding user aspects and co-operating with user representatives;
- **Control devices:** Consumers have different requirements regarding the control devices necessary to operate their Smart House. The variations can be in vision, dexterity, reaction time and ability to understand interfaces (cognition). The control devices are vital for the consumers' perception of function and ability to use Smart Houses, because they are what the user meets. Different suppliers deliver completely different switches and other control devices, and they have shown little interest in standardising them. There should be standard basic switches that are tested and easy to understand and use for different user groups (Design for All). Standardised (local language) text and or symbols to indicate functions on switches and on displays would assist. These should be compatible with other consumer electronic symbols;
- **Reliability:** Consumers are often (and quite rightly so) sceptical about new systems that they have not used before. The systems should be fail-safe to allow the consumers to rely on their systems and components. This is of importance to homes as well as for commercial buildings. In the event of a power failure, uninterrupted power supply (UPS) or some other backup system should be installed as a standard to secure heating, light and other vital functions. This is particularly important in hospitals, nursing homes and houses for elderly and disabled people. In addition **manual override** must be standard;
- **Safety:** One particular concern relates to how individual products will function when linked into a complex control system. At present, no one 'standard' form of communication or system control has been agreed upon, so although individual items may be safe in themselves, their safety systems may be compromised when they become connected to a particular control system. The risk that appliances and devices controlled by a Smart House may presently lie in the following areas:
  - Heat (burning and scalding)
  - Water control (flooding/scalding)
  - Gas control (explosion, asphyxiation)
  - Mechanical (unexpected operation or movement of appliances/devices)
  - Fire (alarm control)

- Physical access (door and window lock control);
- Safety systems concerning **unauthorised access** (e.g. hacking into a domestic gateway) needs to be standardised;
- **Interference:** The system as a whole, and its individual components, should not cause electrical interference and should be immune from electrical interference to a level that guarantees satisfactory and safe performance;
- **Performance standards:** Performance standards for signal transmission quality over cabling, hand-held remote controls, radio links need to be enforced so consumers can be confident that an installation will work as expected;
- **Standardised and compulsory quality assurance procedures before systems are set in operation** This includes standardised procedures for testing each function and component before the system is delivered to the consumer and for testing each component for compatibility with other manufacturers systems or components. The providers and installers of the systems should have an interest in and knowledge about the particular consumer's needs, and respect these throughout the planning and implementation process. These professions should require such knowledge as a standard part of certification requirements;
- **Consistent and user-friendly documentation and service procedures:** Information, documentation and training in user aspects and operation of the systems must be standard procedure on implementation and before operation. This is particularly important to the consumers because Smart House technology represents an entirely new way of using your electrical appliances;
- **Standardise the interface between remote receptors and environmental controls:** This can save expensive double installations in the homes of people who need IR environmental controls (e.g. physically handicapped), because the BUS installation can communicate with the IR sender;
- **Mechanical access:** With respect to external access, Smart Houses may incorporate a mechanical system to allow the delivery of goods without the occupants being present. For example, this could be a locked compartment accessible from the outside by the suppliers and accessible from the inside by the occupants. The system could be operated with a simple locking system or with some alternative interlocking mechanism that provides a secure system. A standardised system needs to be defined.  
With respect to internal access, internal door and window locks may be controlled automatically (e.g. bathroom door may automatically lock when a person is present). Such systems need to be standardised for fail-safe use and allow for emergency access;
- **Personalised controls:** Smart House systems and appliances may be personalised for individual occupants. Standardisation in the means of occupant identification, the configuration of the system and the security and privacy of the occupant's data will be required. Such systems should also be fail-safe, for example if an occupant loses their identity tag;
- **Standardise the control and metering of gas, water and electricity supply:** This can make it easier to save energy through using Smart House systems. If metering is done remotely, standards are a help;
- **Energy:** Standards or targets for total energy consumption need to be set for the Smart House system as a whole (not necessarily for individual components);
- **Transparency of costs and contracts:** A standardised form of presenting costs and services provided is necessary to allow consumers to compare systems in an easy to understand form.

## 5.11 TELECOMMUNICATIONS

Over the past decade tremendous changes have been experienced within the telecommunications sector due to liberalisation and privatisation processes coupled with technological innovation. As a result, telecommunications has now developed into an enabling technology. Telecommunications services provide the means for consumers to communicate with other parties (friends, relations, suppliers, employers) on a global basis by speech and e-mail, and also to access information and subscription services. Consumers now have access to services offered by a number of competing suppliers, not all of whom own their own infrastructure, and these are based on two different techniques, namely fixed line or mobile.

Fixed-line communications provide services using a Network Termination Unit (NTU) at a fixed location in a consumer's premises and permanently attached by wire and landline to a supplier network. Each NTU has a unique identifier (a number) and can be used by anyone with a terminal/telephone set with access to the NTU. Several terminals can usually be connected to an NTU, including cordless telephones, but only one can be used at one time unless private switching equipment is provided. (This is currently unusual practice for consumer applications but may become less so in the future). Fixed line communications can provide capability for a wide range of services of interest to consumers, from voice to video, depending on the type of landline and wire connection used. Convergence between telecommunications and broadcasting, with consumer reception of both audio and TV over a telecommunications landline, is already happening by cable TV companies. Access to Internet services and the WWW is also freely available at low speeds, but with the advent of broadband fixed line connections, much higher rates supporting a full range of graphics are now beginning to appear. Such broadband connections will support telephony, Internet and video services over affixed line connection.

Mobile communications provide services from a mobile handset/terminal at a location wherever the user happens to be (at home, in a car/train or in the street) connected to the supplier's network by radio. Each terminal has a unique identifier (number) and can be used by anyone with access to the terminal and knowledge of its PIN (Personal Identification Number), usually the owner or his/her close family. Mobile communications offer much greater flexibility and personal mobility to consumers but services are currently limited to voice and low-speed data/information retrieval. However, improvements in cellular radio technology (the third generation or 3G) will allow high-speed data rates to be used, allowing a full range of Internet-type services to be offered.

Fixed-line services are universally available throughout the world due to well-defined interconnection arrangements between suppliers. Mobile services are also available globally through roaming arrangements between service provider networks, but to a lesser extent due to major differences in the cellular technology used by different networks. It is usually possible for calls originating on a fixed line network to terminate on a mobile network and vice versa. Consumers need to be aware of the global coverage offered by mobile service providers.

Both fixed-line and mobile services can provide services at all times and for most users. However for those who do not pay connection fees or own a mobile terminal, connection is limited to fixed-line services using payphones provided by fixed-line service operators.

Whilst fixed line services are mostly reliable, mobile services can be markedly less so, being subject to poor reception depending on the location of the terminal. Mobile communications offer increased possibilities for emergency communications (the mobile phone could save your life). They also have distinct advantages in terms of both cost and technology in countries with difficult geographical topography (e.g. Norway and Italy), thus allowing for easier connection of people in otherwise remote regions. However, remote area coverage is not always available and information on coverage is often missing or difficult to understand.

Mobile communications are much cheaper to provide and maintain than fixed line connections, but such differences in costs are not passed on to consumers. Fixed-line supplier tariffs are cheaper than mobile operator tariffs, but as mobile operators increase market share and provide better levels of service and coverage, the difference is decreasing

Call charges between supplier networks can vary considerably. Fixed-line operators who do not own infrastructure but lease this from others often undercut their competitors owning infrastructure due to the lower overheads involved. Also, it is usually more expensive to call a mobile phone from a fixed line connection than to call another fixed line, and vice versa. Information on tariffs can be difficult to understand and most suppliers offer various packages based upon use with information presented in such a way as to make direct comparisons almost impossible.

There are no known health and safety aspects with fixed-line communications that have not been taken account of in standards but with mobile communications there are possible effects of electromagnetic fields emanating from handsets when held next to the brain and from local transmitting stations. To date there are no proven instances of a health hazard but some governments have taken a precautionary stance and much research work is being undertaken. There are also possible safety effects on technical equipment including hearing aids, medical equipment, pace makers, aircraft landing systems, in-car electronics including braking systems and train signalling equipment. Standards are, however, in course of preparation to protect all types of users.

Directory services are available for fixed-line connections but not for mobile connections.

As mobile handsets are usually reliant upon batteries for operation, call and usage times are limited by battery capacity. This disadvantage does not apply to fixed line terminals, which remain available for use whilst connected to the network. However, some NTUs and many items of customer terminals now depend upon a reliable mains electricity supply for continuous availability.

Consumer priorities **Next Generation Networks**: The next generation network is the result of the combination of public switched telephone network (PSTN) and public switched data network (PSDN), creating a single multiservice network (broadband). From a consumer point of view, this new infrastructure and architecture, based on open source software and standards, could mean better quality of service and lower prices. However, they permit user identification, authentication and localisation. Therefore, it is essential to address from the beginning the problems of consumers' privacy protection and the need of new regulatory framework to reflect the new technology as well as new standards, open and interoperable.

- *Universal service for all and European emergency call*
- *Minimum service level for a fixed price connection on fixed and/or mobile connection*
- *Transparency of tariffs to allow comparison*
- *Number portability (mobile and fix)*
- *Understandable information of geographical coverage available worldwide*
- *Ease of use (user interface design)*
- *Batteries and charging for mobile terminals*
- *Safety and health (information about health hazards)*
- *Harmonisation between all supplier networks, both fixed and mobile. (As reliability and coverage of mobile networks increase, consumers are expected to differentiate to a lesser extent and assume one network connection will provide both fixed and mobile facilities.)*
- *Security for terminals and protection of personal information during use of services. In particular, mobile services allow for user location and tracking possibilities, which in turn provide both advantages and disadvantages for consumer use*
- *Introduction user-friendly user identity schemes.*
- *Accessibility of devices, interoperability with assistive technologies*

#### **Recommendations for standardisation**

- **Standardise presentation of information about geographical coverage area:** Information should be presented in an unambiguous way to allow comparison and should be provided for both national and international coverage. Information should be based on geography and not on population. For mobile networks the information should cover roaming facilities;
- **Standardise presentation of information for minimum level of service:** Different providers offer different services, often with different names. To allow comparison of services there is a need to standardise terminology and functionality and to present a minimum level of service in a standardised format;
- **Ergonomic design of handsets, terminals and services:** Ergonomic design can facilitate ease of use, reduce errors in use and assist use by people with impairments. Standards employing 'Design for All' principles should help achieve this;
- **Develop standards for adaptable user interfaces:** Standards can be developed for coding on Smart Cards and terminals to allow the latter to be configured to individual preferences, functionality and to set up required services;
- **Standardise health warnings:** Standards should include requirements for any health warnings that may prove necessary e.g. use of hand-held mobile phones and effects on pacemakers and hearing aids;
- **Standardise compatibility of use of terminals on networks:** Standards should include information to ensure that consumers can clearly understand which terminals can be used for which services provided by the various different providers;
- **Standardise quality of service:** Standards are necessary to define parameters necessary to determine the quality of service offered and how these can be measured for comparison purposes. Typical parameters cover terminal performance, end-to-end speech quality and intelligibility, connection times, service provision time, fault reporting, billing and customer service response times;

- **Standardise access to emergency services:** Apart from standardisation of emergency numbers across Europe, standards should ensure that all terminals are available for emergency calls without use of a PIN and that a power reserve is available or a clear indication that the terminal is not in functional use;
- **Standardise interconnection arrangements:** Standards should support interconnection between supplier networks to allow end-to-end calls to be set up over different supplier networks without restriction;
- **Billing:** Costs should be transparent to consumers and presented in ways based upon standardised presentation of tariff information;
- Standards are required to assist the establishment and development of **directory services** so any fixed/mobile user can find the number of another user regardless of supplier or network used. This factor is becoming increasingly important as the number of suppliers increase;
- **Battery information:** For any terminal device using battery power for operation, a standardised method of indicating low-battery status is required. Data sheets should be clearly distinguished with individual calls clearly priced;
- **Connection plugs and sockets:** All future standards works should include information to encourage use of standard plugs and sockets on terminals to allow use across Europe with or without special adaptors;
- **CLI suppression:** All terminals fixed and mobile should allow suppression of CLI (Calling Line Identification) facility as a standard feature;
- **Common information fact sheet** should be available at the point of sale and include performance data such as typical usage time, recharge time, weight and lifetime with information presented in a non-technical language.

## 6. CONCLUSION

The ANEC report on *Consumer Requirements in Standardisation relating to the Information Society* has both a political and a practical dimension.

On the one hand, the ANEC report intends to contribute to the objectives of EU policies as reflected in the e-Europe 2005 initiative and the Consumer Policy Strategy 2002-2006 of the European Commission calling for the opportunity for consumer organisations to make an input into wider EU initiatives with a consumer dimension at all stages of the EU decision-making process.

On the other hand, the report offers guidance to standard-makers and consumer representatives in their standardisation work. It identifies and describes the following **generic consumer requirements** to be taken into account when producing ICT standards: Accessibility/Design for All, Adaptability, Child safety issues, Comprehensible standards, Consistent user interface, Cost transparency, Easily adaptable access and content control, Ease of use, Environmental issues, Error tolerance and system stability, Explorability, Functionality of solution, Health and safety issues, Information supply for first-time user set-up procedure, Interoperability and compatibility, Multi-cultural and multi-lingual aspects, Provision of system status information, Privacy and security of information, Quality of service, system reliability and durability, Rating and grading systems, Reliability of information and Terminology.

ANEC suggests endorsing these generic consumer requirements as a **joint CEN/CENELEC/ETSI memorandum** to ensure their application across all standardisation work in the ICT sector. This would contribute to the production of a coherent and consistent catalogue of standards even when consumer representatives are not directly participating in the technical work. In addition, the ANEC report elaborates on the consumer relevance and priorities in ten identified key areas of the Information Society, on the basis of which **numerous recommendations are made for standardisation**.

Given the extraordinary impact the Information Society and Information and Communication Technologies have on the life of all consumers, ANEC considers it crucial to ensure the interoperability of products and efficient consumer protection across borders. Standards, which are a useful means of establishing adequate levels of safety, security of information, interoperability and most importantly accessibility to all consumers, are required. It is equally vital that any standards elaborated for Information Society products and services take the consumer view into account.

Hence, ANEC calls upon standard-makers, consumer representatives (on standards committees) and political decision-makers to endorse this report and to use it in practical terms as a check list when elaborating standards relating to ICT and the Information Society.

**ANNEX 1****GENERAL CONSUMER PRINCIPLES**

The following 'Consumer Principles' elaborate on those fundamental consumer rights previously identified by the former US-President J.F. Kennedy, the United Nations and the European Commission and form an underlying guide for ANEC's activities to the benefit of consumer protection in standardisation.

**Access: Can people actually get the goods or services they need or want?**

In the majority of consumer work this is a function of consumers' ability to afford to buy the things they need or want and of their availability to all consumers regardless of location, social and economic considerations. For ANEC, this may lead to considerations of whether the use of national - rather than international or European - standards inhibits access to national markets throughout the EU.

**Choice: Is there any? And can consumers affect the way goods or services are provided through their own decisions?**

Promoting consumer choice is fundamental to consumer policy. In standardisation, this principle is reflected in the request that a standard should not favour one particular manufacturer or supplier or be unnecessarily restrictive as to the design of the product or regarding materials used in a product's manufacture.

**Safety: Are the goods or services a danger to health or welfare?**

The safety of products used by consumers has always been the first priority of consumer representatives active in standardisation.

**Information: Is it available, and in the right way to help consumers make the best choices for themselves?**

The provision of adequate information, both to assist in consumer choice and to support the safe and effective use of the product or service, is a key consumer concern. Allied to this is a concern regarding the dangers of providing more information than consumers can readily absorb and, hence, reducing the impact of vital messages.

**Equity: Are some or all consumers subject to arbitrary or unfair discrimination?**

ANEC has adopted the specific aim of looking after the interests of various groups of consumers who are felt to be at particular risk.

**Redress: If something goes wrong, is there an effective system for putting it right?**

Ensuring that consumers can be confident in claims of compliance with standards is an important concern. This means that, in their Technical Committee work, consumer representatives should aim to ensure that tests are repeatable and reproducible. At a policy level it requires influence on systems for product certification and dispute settlement.

**Representation: If consumers cannot affect the supply of goods or services through their own decisions, are there ways for their views to be represented?**

By definition, individual consumers cannot materially influence the content of standards. ANEC and consumer representatives on national delegations are the main conduits for representing their interests and, whatever resource constraints there may be, must participate effectively in key areas of consumer concern.

## ANNEX 2

### **POLITICAL AND LEGAL FRAMEWORK REGARDING DISABLED PEOPLE IN THE INFORMATION SOCIETY**

The following documents set the political agenda regarding the interests of disabled people in the Information Society at European level:

- Commission Communication of 12 May 2000 'Towards a Barrier Free Europe for People with Disabilities', COM(2000) 284 final of 12.05.2000;
- The 'eEurope 2002 Action Plan' endorsed by the Feira European Council of 19 and 20 June 2000. The objective was to achieve participation for all in the knowledge-based economy. In particular, to promote better access to the knowledge based economy and society for disabled people by further action lines on:
  - Adoption of the Web Accessibility Initiative (WAI) guidelines for public websites;
  - Review of relevant legislation and standards to ensure conformity with accessibility principles;
  - Ensuring the establishment and networking of national centres of excellence in Design for All and creating recommendations for a European curriculum for designers and engineers;
  - Publication of Design for All-standards for accessibility of information technology products, in particular to improve the employability and social inclusion of people with special needs;
- Council Directive adopted on 27 November 2000, aiming at combating discrimination against disabled persons in the workplace (Council Directive 2000/78/EC of 27/11/2000);
- Council Resolution on 'e-Inclusion – exploiting the opportunities of the Information Society for social inclusion' (Council resolution 2001/C 292/02 published in the Official Journal of the European Communities of 18.10.2001 (C292) - calling on the Member States and the European Commission to endorse actions for: 'tackling technical barriers for people with different disabilities in terms of ICT equipment and web-content');
- Council Resolution on the 'Accessibility of public web sites and their content' of 20 March 2002, (Council Resolution 7087/02 of 20 March 2002).
- Council Resolution on "eAccessibility: improving the access of people with disabilities to the knowledge based society" of 6 February 2003 (Council Resolution 39/03 of 6 February 2003).

**ANNEX 3**
**LIST OF CONSUMERS RELEVANT STANDARDS in the ICT area**

NAME	TITLE	SCOPE
<b>Learning Technologies</b>		
<b>CEN</b>		
CWA 14590	Description of Language Capabilities	
CWA 14644	Quality Assurance Standards	
CWA 14926	Guidelines for the production of learner information standards and specifications	
CWA 14927	Recommendations on a Model for expressing learner competencies	
<b>ISO</b>		
ISO/IEC 19796	Quality Management, Assurance, and Metrics - Part 1 General Approach	
<b>E-Commerce</b>		
CWA 14842-1:2003	Electronic commerce - Shop presentation and transactions - Part 1: Regulatory and self-regulatory requirements	
CWA 14842-2:2003	Electronic commerce - Shop presentation and transactions - Part 2: Business process requirements	
CWA 14842-3:2003	Electronic commerce - Shop presentation and transactions - Part 3: ICT security requirements	

NAME	TITLE	SCOPE
<b>Cards (CEN TC 224, Smart Card Charter, eAut)</b>		
CR 13643:2000	Machine readable cards - Healthcare applications - Logical data structures and concepts for different card technologies for use by patients in health applications	
CR 13644:2000	Machine readable cards - Healthcare applications - Logical organisation of data on healthcare professional cards	
CR 13875:2000	Identification card systems - Intersector thin flexible cards - Security features	
CR 13909:2000	Identification card systems - Intersector thin flexible cards - Acceptance criteria	
CR 1750:1999	Identification card systems - Inter-sector messages between devices and hosts - Acceptor to acquirer messages	
EN 1038:1995	Identification card systems - Telecommunication applications - Integrated circuit(s) card payphone	
EN 1332-1:1999	Identification card systems - Man-machine interface - Part 1: Design principles for the user interface	
EN 1332-2:1998	Identification card systems - Man-machine interface - Part 2: Dimensions and location of a tactile identifier for ID-1 cards	
EN 1332-3:1999	Identification card systems - Man-machine interface - Part 3: Key pads	
EN 1332-4:1999	Identification card systems - Man-machine interface - Part 4: Coding of user requirements for people with special needs	

NAME	TITLE	SCOPE
EN 1362:1997	Identification card systems - Device interface characteristics - Classes of device interfaces	
EN 1375:2002	Identification card system - Intersector integrated circuit(s) card additional formats - ID-000 card size and physical characteristics	
EN 1387:1996	Machine readable cards - Health care applications - Cards: General characteristics	
EN 1546-1:1999	Identification card systems - Inter-sector electronic purse - Part 1: Definitions, concepts and structures	
EN 1546-2:1999	Identification card systems - Inter-sector electronic purse - Part 2: Security architecture	
EN 1546-3:1999	Identification card systems - Inter-sector electronic purse - Part 3: Data elements and interchanges	
EN 1546-4:1999	Identification card systems - Inter-sector electronic purse - Part 4: Data objects	
EN 1867:1997	Machine-readable cards - Health care applications - Numbering system and registration procedure for issuer identifiers	
EN 726-1:1994	Identification card systems - Telecommunications integrated circuit(s) cards and terminals - Part 1: Systems overview	
EN 726-2:1995	Identification card systems - Telecommunications integrated circuit(s) cards and terminals - Part 2: Security framework	

NAME	TITLE	SCOPE
EN 726-3:1994	Identification card systems - Telecommunications integrated circuit(s) cards and terminals - Part 3: Application independent card requirements	
EN 726-4:1994	Identification card systems - Telecommunications integrated circuit(s) cards and terminals - Part 4: Application independent card related terminal requirements	
EN 726-5:1999	Identification card systems - Telecommunications integrated circuit(s) cards and terminals - Part 5: Payment methods	
EN 726-6:1995	Identification card system - Telecommunications integrated circuit(s) cards and terminals - Part 6: Telecommunication features	
EN 726-7:1999	Identification card systems - Telecommunications integrated circuit(s) cards and terminals - Part 7: Security module	
EN 753-1:1997	Identification card systems - Intersector thin flexible cards - Part 1: General technical specifications	
EN 753-2:1997	Identification card systems - Intersector thin flexible cards - Part 2: Magnetic recording technique	
EN 753-3:1999	Identification card systems - Intersector thin flexible cards - Part 3: Test methods	
EN ISO/IEC 7810:1996	Identification cards - Physical characteristics (ISO/IEC 7810:1995)	

NAME	TITLE	SCOPE
ENV 1257-1:1994	Identification card systems - Rules for Personal Identification Number handling in intersector environments - Part 1: PIN presentation	
ENV 1257-2:1997	Identification card systems - Rules for Personal Identification Number handling in intersector environments - Part 2: PIN protection	
ENV 1257-3:1997	Identification card systems - Rules for Personal Identification Number handling in intersector environments - Part 3: PIN verification	
ENV 1284:1996	Identification card systems - Intersector rules for locking and unlocking of integrated circuit(s) cards	
ENV 14062-1:2001	Identification card systems - Surface transport applications - Electronic fee collection - Part 1: Physical characteristics, electronic signals and transmission protocols	
ENV 14062-2:2001	Identification card systems - Surface transport applications - Electronic fee collection - Part 2: Message requirements	
ENV 1545-1:1998	Identification card systems - Surface transport applications - Part 1: General data elements	
ENV 1545-2:1998	Identification card systems - Surface transport applications - Part 2: Transport payment related data elements	
ENV 1855:1996	Identification card systems - Intersector integrated circuit(s) card systems - Tolerance ranges for IC cards	

NAME	TITLE	SCOPE
prCEN/TS 1545-3	Identification card systems - Surface transport applications - Part 3: Tachograph related data elements	
prCEN/TS 1545-4	Identification card systems - Surface transport applications - Part 4: Driving licence related data elements	
prCEN/TS 1332-6	Identification card systems - Man-machine interface - Part 6: Provisions for physical accessibility, including wheelchair user access, to card reading devices	
prCEN/TS 14062-3	Identification card systems - Surface transport applications - Electronic fee collection - Part 3: Application and security aspects	
prCEN/TS 14062-4	Identification card systems - Surface transport applications - Electronic fee collection - Part 4: Test procedures	
prEN 1545-1 rev	Identification card systems surface transport applications - Part 1: Elementary data types, general codelists and general data elements	
prEN 1545-2 rev	Identification card systems surface transport applications - Part 2: Transport's and travel's payment related data elements and codelists	
prEN 1332-5	Identification card systems - Man machine interface - Part 5: Raised tactile symbols for differentiation of application on ID-1 cards	
EN 1332-1:1999/prA1	Identification card systems - Man-machine interface - Part 1: Design principles for the user interface - Symbols in the form of icons on screens and/or pictograms	

NAME	TITLE	SCOPE
WI00224182	Citizen European Card	
WI00224184	Identification card systems - Interoperable public transport application (IOPTA) - Part 1 :Definition of the interoperable public transport application	
WI00224185	Identification card systems - Interoperable public transport application (IOPTA) - Part 2 Requirements for a transport application on a contactless IC card	
<b>Ergonomics</b>		
CEN122/5	ERGONOMICS OF HUMAN COMPUTER INTERACTION	
<b>Information Security Management<sup>64</sup></b>		
<b>BSI</b>		
BS 15000-1:2002	IT service management. Specification for service management	
BS 15000-2:2003	IT service management. Code of practice for service management	
BIP 0005:2004	A Manager's guide to service management (formerly PD 0005:2003)	
PD 0015:2002	IT service management. Self-assessment workbook	
BS 7799-1:2000	Information technology. Code of practice for information security management	

<sup>64</sup> Information is a vital asset in any organization. The protection and security of this information is of prime importance to many aspects of an organization's business. It is important that an organization should not only implement a set of controls and procedures for information security but also manage and maintain them.

NAME	TITLE	SCOPE
BS 7799-2:2002	Information security management. Specification with guidance for use	
<b>Electronic communications</b>		
<b>IETF<sup>65</sup></b>		
ISOC/IETF RFC 3261 (2002) IETF RFC 2543 SIP	Session initiation Protocol	Session initiation Protocol – used to connect Voice over IP (Internet Protocol) phone calls.
IETF RFC 2793	RTP Payload for Text Conversation.	RTP Payload for T.140 text conversation. MIME Registered as "text/t140", used in H.323 and SIP
IETF draft RFC	Framework of requirements for real-time text conversation using SIP	
IETF RFC 3351	User requirements	Handles transcoding and other value added services invoked through SIP.
IETF RFC 2833	RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals	Encoding and transport of tones over IP
IETF RFC 2733	An RTP Payload Format for Generic Forward Error Correction	Error correction method

<sup>65</sup> Internet Engineering Task Force

NAME	TITLE	SCOPE
<b>ITU<sup>66</sup></b>		
ITU-T Study Group 16 v.150.1	Modem over IP	International Recommendation for transport of Modem over IP
ITU-T Study Group 16 V.VBS (in process)	Voice Band Data over IP	International standardization to develop a new Recommendation for Voice Band Data over IP. Useful for text telephony over enterprise networks.
ITU-T Study Group 16 V.ToIP (in process) QH-03001	Text Telephony over IP	International standardization to develop a new Recommendation for Text Telephony over IP.
ITU-T Rec. F.700	Framework Recommendation for multimedia services, Annex A.3.	Multimedia Framework
ITU-T Rec. F.703	Multimedia conversational services	Defines Text Telephony and Total Conversation services
ITU-T Recommendation H.224	A real time control protocol for simplex applications using the H.221 LSD/HSD/HLP channel.	Addition of client id=2 for T.140 text transport
ITU-T Rec. H.245	Control Protocol for Multimedia Communication	Multimedia Control protocol

<sup>66</sup> International Telecommunications Union

NAME	TITLE	SCOPE
ITU-T Recommendation H.248;	Gateway control protocol	Text conversation protocol for multimedia application. With amendment 1 (2000). Control of gateway between all forms of text conversation
ITU-T Rec.H.320	Narrow-band visual telephone systems and terminal equipment.	
ITU-T Rec. H.323 Annex G;(02/00)	Text Conversation and Text SET.	Defines T.140 text inclusion in H.323 IP Multimedia
ITU-T Rec.H.324	Terminal for low bit-rate multimedia communication	Addition of data channel for T.140 text
ITU-T Recommendation V.61	Analog simultaneous voice and data (permits Voice carry over with ASCII modems	
ITU-T Rec.T.134	Text Chat Application Entity	Application for text conversation in the T.120 data conferencing concept.
ITU-T Recommendation T.140	Protocol for multimedia application text conversation.	Text conversation protocol for multimedia application. With amendment 1 (2000).
ITU-T Rec.T.140 - Addendum	Marking of missing characters	Marking of missing characters

NAME	TITLE	SCOPE
ITU-T Recommendation V.18	Operational and Interworking Requirements for DCE:s Operating in the Text Telephone Mode	Includes automatic interworking with most legacy text telephones.
ITU-T Rec.V.250	Serial asynchronous automatic dialling and control	
ITU-T Recommendation V.8	Procedures for starting sessions of data transmission over the public switched telephone network	
ITU-T Recommendation V.8 bis	Procedures for the identification and selection of common modes of operation between Data Circuit-terminating Equipments (DCEs) and between Data Terminal Equipments (DTEs) over the public switched telephone network	Operational and interworking requirements for DCE:s operating in the text telephone mode.
ITU-T Rec.V.151 (under development)	Procedures for the end-to-end connection of analogue text telephones over an IP network	
ITU-T Rec.V.152 (under development)	Procedures for supporting Voice Band Data over IP networks	
H Series Supplement 1	Video Quality for sign language and lip reading	Quality characteristics of video transmission of importance for sign language and lip-reading use.
ITU Y.1541	Network performance objectives for IP-based services	

NAME	TITLE	SCOPE
<b>EIA<sup>67</sup></b>		
EIA/CES 608	Analog Television Closed Captioning (Line 21 Data Services)	
EIA 708 B	Advanced Television Closed Captioning	
<b>TIA &amp; T1 /ANSI<sup>68</sup></b>		
TR 30 TIA/EIA 825a	A Frequency Shift Keyed Modem for use on the Public Switched Telephone Network	The first standard for TTY signals, which permitted mainstream industry to design for compatibility with TTY as technologies moved to digital.
TR 30.1 TIA 1001 (in process)	Standards for text over IP (TIA 1001)	U.S. effort to develop standard methods for carrying Baudot over IP telephony networks, using voice band data and gateway approaches.
TIA- 504-A	Telecommunications-Telephone Terminal Equipment-Magnetic Field and Acoustic Gain Requirements for Headset Telephones Intended for Use by the Hard of Hearing	

<sup>67</sup> Electronic Industries Association

<sup>68</sup> American National Standards Institute

NAME	TITLE	SCOPE
ANSI/TIA-968-A	Telecommunications - Telephone Terminal Equipment - Technical Requirements for Connection of Terminal Equipment to the Telephone Network	
TR 45 TSB-121	2.5 mm Audio Interface For Mobile Wireless Handsets - Text Telephones (TTY)	Connector standard for wireless telephones and TTYs
C.63/ANSI ANSI C.63.19	American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids	Measurements of wireless telephone emissions and hearing aid immunity, with predicted performance based on measures. (Now in use in an FCC order)
T1.718-2001	PCS 1900 - Cellular Text Telephone Modem (CTM) Transmitter Bit Exact C-Code	
T1.719-2001	PCS 1900 - Cellular Text Telephone Modem (CTM) General Description	
TIA IS-127-2	Enhanced Variable Rate Codec, Speech Service Option 3 for Wideband Spread Spectrum Digital Systems - Addendum 2	
TIA IS-707-A-2	Data Services Options for Spread Spectrum Systems - Radio Link Protocol Type 3 - Addendum No. 2	
TIA IS-733-1	High Rate Speech Service Option 17 for Wideband Spread Spectrum Communications Systems	

NAME	TITLE	SCOPE
TIA IS-789A	Electrical Specification for the Portable Phone to Vehicle Interface	
TIA IS-823	TTY/TDD Extension to TIA/EIA 136-410 Enhanced Full Rate Speech Codec	
TIA -IS-840	Minimum Performance Standards for Text Telephone Signal Detector and Text Telephone Signal Regenerator	
TIA TSB-121	2.5 mm Audio Interface For Mobile Wireless Handsets - Text Telephones (TTY)	
TIA/EIA-688	DTE/DCE Interface For Digital Cellular Equipment	
T1 T1.209-2003	American National Standard for Operations Administration and Maintenance and Provisioning (OAM&) – Network Tones and Announcements	Provides and industry standard way for network routing messages to be conveyed in TTY in addition to voice.
<b>ETSI</b>		
ETSI dtr/hf 02015 version 1.5.2	Draft ETSI report on text telephony	
ETSI ETR 333	Text Telephony, User Requirements And Recommendations	Describes user needs for text conversation and guidelines for standardisation
ETSI TR 101 806	Guidelines for Telecommunication Relay Services for text and video	Guidelines for Telecommunication Relay Services for text and video
TD18	Human Factors (HF)	

NAME	TITLE	SCOPE
DTR 00018		
<b>3GPP</b>		
3GPP TS 22.101	Service principles	Brief description of mobile text conversation
3GPP TS 22.226	GTT Service Stage 1	GTT Specific service description
3GPP TS 23.226	GTT Architecture Stage 2	GTT Specific description of network architecture for text conversation and especially CTM text telephony
3GPP TS 26.226	CTM Modem, General description	Robust and error tolerant modem for text telephony specified for mobile networks
3GPP TS 26.110	Circuit Switched Multimedia Telephony (3G.324 )	Includes text conversation using T.140 in AL1 channel
3GPP TS 26.235	Packet Switched Conversational Multimedia (SIP)	Includes text conversation using T.140 in RTP as RFC 2793
<b>HFES – ANSI</b>		

NAME	TITLE	SCOPE
HFES 200.3:	Human Factors Engineering of Software User Interfaces	Software interface standard (Standard now includes 5 interface strategies developed by Trace)
HFES 200.5:	Human Factors Engineering of Software User Interfaces – Interactive Voice Response (IVR) and Telephony	A user interface standard for IVRs and voice mail.
<b>ICT Accessibility</b>		
<b>ISO<sup>69</sup></b>		
ISO/IEC GUIDE 71.2	Guidelines to address the needs of older persons and people with disabilities when developing standards	This Guide provides guidance to writers of relevant International Standards on how to take into account the needs of older persons and persons with disabilities.
ISO TC 159	Ergonomics	This is the ISO committee that encompasses all areas of ergonomic standards.
ISO TR 22411	Ergonomic data and ergonomic guidelines for the application of ISO/IEC Guide 71	This technical report will be a

<sup>69</sup> International Standards Organisation

NAME	TITLE	SCOPE
		compendium of accessibility related data
ISO 10075	Ergonomic principles related to mental work-load	This multi-part standard deals with environmental and situational impairments
ISO 20282	Ease of operation of everyday products	This multi-part standard includes a recognition of the needs of “ageing populations” with “deteriorating abilities”
ISO 9241	Ergonomics of Human System Interaction	This multi-part standard is a compendium of many ergonomic standards relating to computer systems
ISO TS 16071	Guidance for accessibility for human-computer interfaces	This was based on HFES/ANSI 200.2
ISO wd 9241-171	Guidance on accessibility	This IS will replace ISO TS 16071
ISO TS 16982	Ergonomics of human-system interaction – Usability methods supporting human centered	This technical specification provides

NAME	TITLE	SCOPE
		<p>guidance on methods for developing usable systems. It currently does not specifically recognize any accessibility related issues</p>
<p>ISO wd 9241-20</p>	<p>Accessibility guidelines for information communication equipment and services</p>	<p>This is a new initiative being led from Japan. Since it is intended to be above both hardware and software, a hardware specific part of ISO 9241 will be needed</p>
<p>ISO/IEC TR 19764</p>	<p>Guidelines, methodology, and reference criteria for cultural and linguistic adaptability in information technology products</p>	<p>This technical report deals with providing accessibility to people from non-English-speaking and potentially non-Western cultures</p>
<p>ISO/IEC TR 19765</p>	<p>Survey of icons and symbols that provide access to functions and facilities to improve the use of IT products by the elderly and disabled.</p>	<p>This proposed technical report will include a variety of</p>

NAME	TITLE	SCOPE
		accessibility icons that are currently being used without making recommendations on their usefulness.
ISO/IEC TR 19766	Design Requirements concerning icons and symbols in IT for elderly and disabled persons	There is not yet a draft of this accepted work item.
ISO/IEC 9127	Cover information for software packaging	Includes recommendations for accessibility information to be provided on the exterior of packaging.
ISO/IEC 18019	Software documentation guidelines	Includes guidelines for the accessibility of documentation.
<b>IEEE</b>		
IEEE P1583	Voting Machine Standard	Usability and Accessibility Standards for Voting Machines
IEEE P1621	Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments	Power Controls
<b>National Institute on Standards and Technology</b>		
<b>CBEFF</b>	Draft Common Biometric Exchange Framework Format	Biometric identification

NAME	TITLE	SCOPE
		standards (one of many)
<b>U.S. Election Assistance Commission (EAC)</b>		
<b>TGDC</b>	EAC Technical Guidelines Development Committee	Technical guidelines for voting systems, including accessibility (as mandated by Help America Vote Act)
<b>World Wide Web Consortium (W3C)</b>		
<b>WCAG</b>	Web Content Accessibility Guidelines working group.	Web Content Accessibility Guidelines + Accessibility techniques documents
<b>ATAG</b>	Accessibility Testing Access Guidelines	Authoring and testing guidelines
<b>UAAG</b>	User Agent Accessibility Guidelines	User-Agent Guidelines
<b>P&amp;F</b>	Protocols and Formats Working Group	Examining voice XML for implications in telecom (e.g., IVRs)
<b>XForms</b>	XForms	Web Forms / interface standards
<b>ANSI / INCITS/ International Committee for Information Technology Standards</b>		
ANSI/INCITS	Protocol to Facilitate Operation of	Universal Remote

NAME	TITLE	SCOPE
389	Information and Electronic Products through Remote and Alternative Interfaces and Intelligent Agents: Universal Remote Console	Console A standard for allowing alternate devices (including mainstream and assistive technologies) to be able to control mainstream telecommunication, information technology, audiovisual and home appliances.
ANSI/INCITS 390	User Interface Socket Description	XML based User Interface Socket Description
ANSI/INCITS 391	Presentation Templates	Presentation Templates to facilitate automated creation of user interfaces
ANSI/INCITS 392	Target Properties Sheet	Target Properties Sheets – to describe product resources for automated interface generation
ANSI/INCITS 393	Resource Description	Resource Description in target and on the Web
<b>Electromagnetic Fields</b>		
<b>CENELEC</b>		

NAME	TITLE	SCOPE
EN50383	<b>Basic standard</b> <sup>70</sup> for the calculation and measurement of electromagnetic field strength and SAR related to human exposure from radio base stations and fixed terminal stations for wireless telecommunication systems (110 MHz - 40 GHz)	Calculation and measurement
EN50384	<b>Product standard</b> <sup>71</sup> to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz) – <b>Occupational</b>	Demonstrate the compliance
EN50413	Basic standard on measurement and calculation procedures for human exposure to electric, magnetic and electromagnetic fields (0 Hz - 300 GHz)	Calculation and measurement
EN50366	Household and similar electrical appliances – Electromagnetic fields – <b>Methods for evaluation and measurement</b>	Calculation and measurement
EN50400	<b>Basic standard</b> for the calculation and measurement of electromagnetic fields related to human exposure from radio base stations and fixed terminal stations for	Calculation and measurement

<sup>70</sup> Basic Standard: a general document which describes the measurement methods and calculations necessary to assess the compliance with the legislation in force (method for measurement, Physic metric).

<sup>71</sup> Product standards: a document which describes the technical information required for the compliance assessment of a specific class of products. It refers to compliance with Recommendations of the EU Commission (limits, post processing of physical metrics).

NAME	TITLE	SCOPE
	wireless telecommunication systems (110 MHz - 40 GHz), when <b>put into service</b> <sup>72</sup>	
EN50401	<b>Product standard</b> to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to general public human exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz), when <b>put into service</b>	Demonstrate the compliance
<b>ITU</b>		
G.102 (11/88)	<b>Transmission performance</b>	Transmission performance objectives and Recommendations
G.102 (11/88)	<b>An architecture for end-to-end QoS control and signalling</b>	An architecture for end-to-end QoS control and signalling
<b>ETSI</b>		
ETSI EN 301 798	Anonymous call rejection (rejects service that incoming call without CLI)	<b>Standards for implementing</b>

<sup>72</sup> Put into service: Define measurement and calculation methodologies to be used by *service providers* in order to assess the compliance of the installation taking into account the environment and the presence of other possible EMF sources.

Put into Market: Define calculation and measurement methodologies to be used by the *device suppliers* to calculate compliance boundaries in a defined configuration with regards to the exposure limit. Moreover it define the necessary information to be produced by the device supplier in order to extrapolate the compliance boundaries in different configuration and with regards to different exposure limits.

NAME	TITLE	SCOPE
		<b>data-protection requirements</b>
ETSI EG 201 769-1	Quality of service parameter definitions and measurement methods	<b>Quality of services</b>
<b>Road Transport and Traffic Telematics (RTTF)</b>		
ENV/ISO 14904 : 1997	EFC <sup>73</sup> – Interface definition for clearing between operators review adopted on 2002-04-17	
EN ISO 14906 : 1998	EFC – Application interface definition for DSRC review adopted on 2004-03-29	
ISO NP 14907-1	EFC – Test procedures for user and fixed equipment – Part 1: Description of test procedures - Part 2: Application interface conf. tests  Specification (to be published soon)	
CEN ISO/TS 17573	EFC – System architecture for vehicle related transport services adopted on 2002-10-25	
CEN ISO/TS 17574	EFC- Security framework adopted on 2003-09-22	
EN 13149	PT <sup>74</sup> – Road vehicle scheduling and control systems,  Part 1: WORLDFIP definition and application rules for onboard data transmission,  Part 2 WORLDFIP cabling specifications,	

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<sup>73</sup>Electronic Fee Collection (EFC)

<sup>74</sup> Public Transport (PT)

NAME	TITLE	SCOPE
	<p>Part 3 : WORLDFIP message content</p> <p>prCEN TS 13149-3 is under TC commenting till 2004-09-29</p> <p>Part 4: CAN definition and application rules for onboard data transmission</p> <p>Part 5: CAN cabling specifications</p> <p>Parts 4 &amp; 5 were adopted on 2004-04-26</p> <p>Part 6: CAN message content</p> <p>Adopted on 2004-05-26</p>	
ENV 13998	PT – Non-interactive passenger information on ground	
ENV 12694	PT – Road vehicles – Dimensional requirements for variable electronic external signs	
ENV 12796	PT – Road vehicles – Validators	
ENV 13093	PT – Road vehicles – Drivers console mechanical interface requirements – Minimum display and keypad parameters	
ENV 13777:2000	DATEX specifications for data exchange between traffic and travel information centers	
ENV 12795	DSRS <sup>75</sup> Data link layer - Medium Access Logical Link Control	

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<sup>75</sup> Dedicated Short Range Communication (DSRC)

NAME	TITLE	SCOPE
EN 12834	DSRC Application layer	
EN 12253	Dedicated Short-Range Communication – Physical layer using microwave at 5.8 GHz	
EN 13372	Dedicated Short-Range Communication (DSRC) – DSRC profiles for RTTT applications	
CEN ISO/TS 17261	AVI/AEI <sup>76</sup> – Intermodal goods transport – Architecture and terminology adopted on 2004-08-27 by CEN. To be published soon	
CEN ISO/TS 17263	AVI/AEI – Intermodal goods transport – System parameters	
CEN ISO TS 17262	AVI/AEI – Intermodal goods transport – Numbering and data structures	
EN 12834	DSRC Application layer	
EN 12253	Dedicated Short-Range Communication – Physical layer using microwave at 5.8 GHz	
EN 13372	Dedicated Short-Range Communication (DSRC) – DSRC profiles for RTTT applications	

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<sup>76</sup> Automatic Vehicle Identification and Automatic Equipment Identification (AVI/A)



Product Type			Generic standards referred to.	Other documents	Equipment required.	Special room(s) required.	Comments
<b>1. SPECIFIED DOMESTIC APPLIANCES</b>							
Vacuum cleaners	Sound power (LWA) dB re 1pW	IEC60704-2-1	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
Forced draught convection heaters	Sound power (LWA) dB re 1pW	IEC60704-2-2	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
Dishwashers *	Sound power (LWA) dB re 1pW	IEC60704-2-3	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
Washing machines and	Sound power (LWA) dB re 1pW	IEC60704-2-4	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.



<b>spin extractors</b>	dB re 1pW		ISO 3744	86/594/EEC			Independent of measuring environment.
<b>Room heaters of the storage type</b>	Sound power (LWA) dB re 1pW	IEC60704-2-5	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
<b>Tumble dryers *</b>	Sound power (LWA) dB re 1pW	IEC60704-2-6	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
<b>Fans</b>	Sound power (LWA) dB re 1pW	IEC60704-2-7	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
<b>Electric shavers</b>	Sound power (LWA) dB re 1pW	IEC60704-2-8	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
<b>Electric hair care appliances</b>	Sound power (LWA) dB re 1pW	IEC60704-2-9	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.



							measuring environment.
<b>Ovens</b>	Sound power	IEC60704-2-10	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
<b>Electrically operated food preparation appliances</b>	Sound power	IEC60704-2-11	ISO 3743-1 ISO 3743-2 ISO 3744	EU Directive 86/594/EEC	Integrating-averaging sound level meter.	Reverberation, Hard walled, Anechoic or Semi Anechoic.	Can be replicated in other labs. Independent of measuring environment.
<b>Range hoods</b>	Sound power	IEC60704-2-13	ISO 3743-1 ISO 3743-2 ISO 3744 ISO 9614 -1 ISO 9614-2	EU Directive 86/594/EEC	Integrating-averaging sound level meter or Sound Intensity probe and software package.	Reverberation, Hard walled, Anechoic or Semi Anechoic. No special room (Intensity method)	Can be replicated in other labs. Independent of measuring environment. Intensity method is complex and time consuming and requires skill
<b>SPECIFIED APPLIANCES</b>							



cont.							
<b>General domestic appliances (white goods)</b>	<b>Sound power (LWA)</b>	IEC60704-1	ISO 3743-1	EU	Integrating-averaging	Reverberation, Hard walled, Anechoic,	Can be replicated in
			ISO 3743-2	Directive	sound level meter.	Semi Anechoic or outdoors	other labs.
	dB re 1pW		ISO 3744	86/594/EEC	Calibrated noise source (optional/recommended)		Independent of measuring environment.
<b>Computers and Office IT Equipment.</b>	Sound Power	ISO 7779	ISO 2741		Integrating-averaging	Reverberation, Hard walled, Anechoic	Can be replicated in
	Sound pressure level		ISO 3743		sound level meter.	or Semi Anechoic.	other labs.
	Spectrum analysis		ISO 3744		Calibrated noise source (optional/recommended)		Independent of measuring environment.
			ISO 9295	ISO 11203		)	
<b>General outdoor equipment</b>	Sound power (LWA)	ISO 3744		EU	Integrating-averaging	Large outdoor space with concrete surface	Can be replicated in other labs.
	dB re 1pW			Directive	sound level meter.		Independent of environment.
				2000/14/EC	Calibrated noise source (optional/recommended)		Configuring site takes time.
					)		May need to compensate for background noise, reflections, etc



<b>Lawnmowers</b>	Sound power (LWA) dB re 1pW	ISO 11094	EU Directive 2000/14/EC Integrating-averaging sound level meter. Calibrated noise source (optional/recommended)	Large outdoor space with grass or artificial grass surface	Can be replicated in other labs. Independent of environment. Configuring site takes time. May need to compensate for background noise, reflections, etc
<b>Hedge Trimmers</b>	Sound power (LWA) dB re 1pW	ISO 11094	EU Directive 2000/14/EC Integrating-averaging sound level meter. Calibrated noise source (optional/recommended)	Large outdoor space with artificial grass surface.	Can be replicated in other labs. Independent of environment. Configuring site takes time. May need to compensate for background noise, reflections, etc



UNSPECIFIED METHOD OF APPLIANCES MEASUREMENT					
<b>Sound Quality:</b> sones; acum; vacil; tu; asper UBA : au SPS: pu articulation index: %	None	ISO 532 (Loudness only)	Audio spectrum analysis software system with 'noise quality' or 'psycho- acoustic' analysis package.	?	Potentially 'quality' could be most relevant measurement. Unproven method for domestic appliances. May be difficult to replicate in other labs using different software.
			Integrating-averaging sound level meter.	Anechoic room or Room or enviroment needs to be specified.	Easy to do. Results will depend on environment and directivity of the sound field from the appliance.
	ISO 3741/42/45 ISO 3743-1 ISO 3743-2 ISO 3744 ISO 9614 -1		Integrating-averaging sound level meter.  Sound Intensity probe and software package. Calibrated noise source	Reverberation, Hard walled, Anechoic, Semi Anechoic or outdoors or Suitable but no special room required (Intensity method)	Can be replicated in other labs. Independent of measuring environment. Intensity method is



		ISO 9614-2		(optional/recommended )		complex and time consuming and requires skill
Hand held appliances (e.g. DIY Power Tools)	<b>Sound Pressure level at operators ear</b> (L <sub>pA</sub> or LA <sub>eq</sub> ). dB(A)		Health & Safety legislation	Integrating-averaging sound level meter or Noise dose meter.	Should be measured in the environment it is to be used in	Easy to do. Close measurements may be adequately independent of the environment.
	<b>Subjective assesment</b>	IEC 60268-13	ANOVA statistical analysis	Listening panel	Specified listening room	Time consuming and costly to achieve statistically significant results. Unproven for domestic appliance noise?
<b>Hi-Fi</b>						



<b>Loudspeakers</b>	Sound pressure level Frequency analysis dB / dB(A)	IEC 60268 -5	IEC 60268-1 IEC 60268-13	Sound level meter or audio analyser. Signal generator and power amplifier.	Anechoic Room. (or any large room if time delay spectrometry used).
<b>Headphones and Personal Stereos</b>	Sound pressure level Frequency analysis dB / dB(A)		IEC 60268-1 EN 50332-1 EN50332-2	Artificial Ear or Head and Torso simulator. Audio analyser.	no
<b>Microphones</b>	Sensitivity Frequency analysis dB / dB(A)	IEC 268-4	IEC 60268-1 IEC 60581 -5	Sound level meter / reference microphone. Controlled sound source	Anechoic room
<b>Toys</b>					
<b>Toys general</b>	Sound pressure level dB(A), dB(C) and dB(C)peak	En 071-1	IEC60318		ISO3746 Annex A (i.e. any normally furnished room >30cu m.)
<b>Toys with headphones</b>	dB(A)	En 071-1 (Parts of)	IEC60126	Artificial ear	no