



Consumer Requirements in Standardisation relating to the Information Society

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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).

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'.⁵⁴

The opportunities offered by the Information Society considerably affect the lives of all consumers⁵⁵. 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 across borders 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

⁵⁴ See Annex 2.

⁵⁵ *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.*

publicly available. In general, transparency and the low degree of consensus give reason for 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 (see Annex 1) to have access to products and services. Discrimination exists if elderly people and people with disabilities cannot use many of today's mainstream consumer products and services. CEN/CENELEC Guide 6⁵⁶ providing guidelines for standard-makers on how to address the needs of elderly and disabled people is a tool to assist

⁵⁶ 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.

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 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 interface⁵⁷ 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.

⁵⁷ For example EN 29241-10 - Dialogue principles and ISO/CD 13407 – 2: Human centred design processes for interactive systems.

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

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:

- 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;
- Usability;

- 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

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) or by transmissions (e.g. radio or infra-red).

In the past years, national governments and other parties involved in the drawing up of legislation in the different European countries embarked on formulating frameworks for the use and propagation of modern information- and communication techniques (see: German 'Information- and Communications Services Act' of August 1997).

These frameworks deal largely with interoperability and key consumer areas, such as data protection (privacy), security of data exchange, consumer rights in tele-shopping, distance learning or teleworking, intellectual property rights, as well as common European regulations for broadcast services. In addition to these initiatives, EU Directives for the harmonisation of national regulations in this area are under consideration or preparation at Community level.

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. For example, a consumer should not be forced to buy different TV sets or set-top units to access different services/ broadcasts. Standard 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 (Trust Centres and approved bodies) 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);
- Standards should not force consumers to buy the same product for different purposes/systems;
- Where different system standards and non-compatible functionality exists for TV reception and video processing, multi-standard or multi-functionality TV sets and VCRs 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:

- Children and electronic games
- Digital broadcasting and reception
- Electronic commerce
- Information access terminals
- Internet
- Learning technologies
- Road and public transport informatics
- 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 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.

5.2 DIGITAL BROADCASTING AND RECEPTION

Digital broadcasting is the broadcast of digital audio, programmes digital video programmes 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 State-controlled organisations. 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 inter-link 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.

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. government-controlled 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.

Recommendations for standardisation

▪ 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 VCR 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.

▪ **Hardware considerations (television)**

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;
- 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.

- **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.

5.2.1 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).

5.2.2 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.

5.3 ELECTRONIC COMMERCE

This means ordering and paying for commodities by means of mass-market ICT products and services such as TV, screen phone, PC and Internet. Electronic commerce can take place from the home or office, in public places, and on the move. Market forces for the introduction of electronic trade and purchasing systems are very strong, and a number of incompatible payment systems on the Internet have already emerged. 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 physically and psychologically. They should also be available via technologies other than the PC, e.g. through TVs, screen phones and mobile phones.

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*
- *Inter-working between 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*

Electronic commerce is an area, which is still in its infancy⁵⁸. Little material exists upon which to systematically base consumer requirements in electronic commerce. 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, 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. Trustmark schemes wishing to participate in the e-confidence initiative must comply with a set of requirements (BEUC/X/179/2000).

Parallel to the **e-confidence initiative of the European Commission**, CEN embarked on a CEN/ISSS Workshop on e-Trust. Unfortunately, ANEC has to express its strong concerns regarding the results and the Draft Agreement as submitted in late 2002. The set of regulatory and self-regulatory requirements as elaborated by the CEN/ISSS Workshop on e-Trust ignores basic legal requirements of European legislation as far as consumers are concerned. Hence, ANEC is not in the position to endorse the document as it is and calls upon CEN/ISSS to redraft the document taking into account the ANEC comments, which are based on the joint e-confidence project of UNICE-BEUC, in order to address consumers' needs.

Recommendations for standardisation

- **Ease of use** is an acknowledged problem for consumers. Field studies in Norway of existing self-service systems and of the Internet show that while consumers may want to use a service, the design of the user interface does not always allow for them to do so;
- **Consistent user interfaces** are a precondition for use of the system by all citizens. 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);

⁵⁸ Global standardisation efforts began in 1997 with the ISO/IEC JTC 1 - Business Team on Electronic Commerce, ISO TC 68: Banking, securities and other financial services and CEN/TC 224: Machine-readable cards. CEN/ISSS launched a Workshop on Electronic Commerce in 1998.

- **Metaphors and supporting icons** should be standardised to help facilitate ease of use;
- **On-line help:** Standards defining minimum levels (performance and content) and user interface presentation need to be developed. On-line help should be evaluated for ease of use;
- **Interworking** between standards is a precondition for electronic commerce. Interworking is required between different application domains and, different technologies, and between the different standards bodies, both formal and informal;
- **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;
- **Addressing consumer issues in all phases and all areas of electronic commerce standardisation.** As noted above, electronic commerce is in its infancy. The framework needs to be established that will allow consumer issues to be addressed throughout the whole standardisation process. This includes the scheduling of standardisation work, the setting of priorities and participating in the technical work. 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 the consumer. Permitting an unknown organisation (abroad) to access your bank account is a very unfamiliar concept to most users/consumers today, and places emphasis on security arrangements. (Trust in the network is required or Trusted Third Parties - TTP). Indeed banks, card issuers and software organisations advise against this.
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;
- The process of **delivering access codes** to the user/consumer in a way that is secure should be standardised;
- To reduce the security risk from the delivery process, the consumer should be able to **change access codes** immediately upon their receipt. Standards should facilitate this;
- Clear, concise **information** must be provided to the consumer about security risks;
- **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. captured by service providers. Electronic footprints should be avoided. The consumer should be advised of any information retained by service providers, network operators or

other actors. Note: There is ongoing legal work on privacy in several European countries. Privacy may therefore be regulated by law;

- **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. To this end, ANEC calls upon the European standards bodies to implement CEN/CENELEC Guide 6, which provides guidelines for standard-makers on how to meet the needs of elderly and disabled people;
- **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. All messages should be phrased in positive manner in order to avoid placing blame on the consumer. 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'). This is an approach that helps building trust in the system;
- **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. This information should also include the expected completion time;
- **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;
- **Rating and grading systems:** Electronic commerce standards should allow the application of rating and grading systems. Standards for calculating and presenting ICT systems in terms of ease of use, cost, durability, system reliability and information reliability (source and content) need to be developed;

- **Order confirmation:** Purchasers of goods and services should get a quick, personal response (via e-mail) from the merchant. This 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 ensuring mobility:** It should be possible for the consumer to carry out electronic commerce from any location (home, office, public environment, on the move) on any type of terminal (smart phone, TV, PC, mobile phone) once authentication has been achieved. Standards for authentication across locations and terminal types are therefore needed;
- **Standardise procedures for right of redress:** Different service providers have very different procedures for addressing disputes. These vary considerably between countries, applications and service providers. To improve consumer confidence in how disputes are resolved, a common procedure for dispute settlement between consumers and service providers needs to be established.

5.4 INFORMATION ACCESS TERMINALS

5.4.1 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 needs standardised information on the lifespan of the battery, i.e. the life expectancy of the device itself.

5.4.2 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 users, 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 users*
- *Systems which provide cash payment should accept a wide range of valid coins and notes*
- *User selected output (audio or visual)*
- *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 user must be able to easily understand which services are provided by the system*
- *The system must inform the user 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 user profiles are given on cards*
- *The user should be enabled to resume an interrupted session*
- *The user 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 user 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 user*
- *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.*

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;
- Users 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**, preferably 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;
- ISO 9241-14 (menus) should be reviewed and adapted so that it relates to self-service systems, including those with audio output. As a second step, this set of rules should be evaluation in a field trial and a revised set of rules be supplied to CEN TC224 WG6;
- 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. The icon and symbol set should be drawn according to ISO 3461 and developed according to ISO 9186;
- A test method for **evaluating security at the man-machine interface** with respect to observation of the PIN code as it is being entered needs to be developed;
- **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.

5.5 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. 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.

5.5.1 INTERNET ACCESS AND QUALITY OF SERVICE

5.5.1.1 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. In a study carried out by a CEN/ISSS Working Group on Quality of Internet Service it is recommended that a standardised method of measurement and rating system should be applied to ISPs so that users/consumers could select an ISP that would meet their needs. This rating system was judged preferable to a single pass/fail quality standard because of the variety of different user requirements and the differing cost and performance structures that ISPs were able to offer.

Recommendations for standardisation

- **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. Standards on this issue are deemed necessary because of conflicts or potential conflicts between international laws;
- **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.

5.5.1.2 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 where a simple, logical approach is used. Any particular topic or programme can be accessed directly using the form 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).

5.5.1.3 (Parental) controls and censorship

In a consumer trial in the 90s amongst 60 UK families, there was a high incidence of inadvertently receiving undesirable, obscene material, and children were tempted by 'chat lines' and newsgroups with unsuitable content.

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.

5.5.1.4 Advertising

Many Internet sites carry advertising. This is an area in need of both standardisation and legislation.

Recommendations for standardisation

- It should become evident to consumers what is an advertisement and what is not;
- **Accountability:** Traditional legislation and voluntary codes of practice should be enforced equally for Internet advertising;

- As a consequence of the **Design for All** concept, special attention should be paid to the needs of those who lack computer literacy skills;
- 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))
- 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.

5.5.2 COMMUNICATIONS

5.5.2.1 E-mail

Many consumers use electronic mail as an alternative to traditional methods of personal communication.

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. (For example: A recent e-mail 'crash' of several hours in America caused a world-wide loss of e-mail. News reports suggest that this occurred because the e-mail codes are handled by one organisation only);
- **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.

5.5.2.2 Internet 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.

5.5.3 (ELECTRONIC) COMMERCE

5.5.3.1 Security of Financial Transactions (via the Internet)

Financial transactions (home shopping and banking) on the Internet are expected to increase, yet there exists a public perception that such transactions are insecure (see also Section 5.1, Electronic Commerce).

Recommendations for standardisation

- **Liability:** Under all these systems consumers need to know the extent of the card issuer's liability for Internet transactions. (In the UK, there is consumer legal protection⁵⁹ when using credit cards, but its applicability to Internet and international transactions is unclear);
- **Costs:** Transaction costs (credit card charges) should be clear to the user and should not restrict small-cost purchases. There should be no cost penalties using the payment methods for transactions via the Internet compared with purchases by other communications systems;

⁵⁹ Consumer Credit Act 1974, (Section 75): Protection against breaches of contract

- **Ease of use:** The use of cards or e-cash transactions over the Internet should be easy and it should be evident to the consumer what is going on. A standardised sequence and terminology should be employed;
- **Contracts:** The contract between the consumer and the retailer should have similar scope to other mail order transactions. This is a legislative issue rather than a standards issue⁶⁰. However, on any Internet retailer web site the contract should be available in a standardised format (e.g. standard indicators or positions or links) and be accessible, easily understood, easily readable (e.g. standard font size) and available in an appropriate number of international languages;
- **Security:** Transactions on the Internet, using cards, should be no less secure than other card transactions. However, digital technology is capable of providing better security and this should be utilised. There is a perception by many consumers that the system is not financially secure, so it would make sense to address this issue;
- **Trust Marks:** Marks and labels are means of creating consumer confidence. A number of initiatives have been introduced in order to identify 'trusted' web retailers. A typical example being Which Web Trader, which is used in several European countries (www.which.net/webtrader). In the UK, this system has proved to be very popular with both consumers and retailers. However, if a trust mark system is to be used universally then standards need to be adopted for the trust mark systems themselves.
Unfortunately, ANEC has to express its strong concerns regarding the results of the CEN/ISSS Workshop on e-Trust and the draft agreement as submitted in late 2002. The set of regulatory and self-regulatory requirements as elaborated by the Workshop ignores basic legal requirements of European legislation as far as consumers are concerned. Hence, ANEC is not in the position to endorse the document as it is and calls upon CEN/ISSS to redraft the document taking into account the ANEC comments, which are based on the joint e-confidence project of BEUC and UNICE in order to address consumers' needs. This project was launched by the European Commission seeking to promote a high level of consumer protection and to encourage the sale of goods and services on the Internet. Trustmark schemes wishing to participate in the e-confidence initiative must comply with a set of requirements (BEUC/X/179/2000).
- Web retailers should operate a '**customer account**' system whereby if a consumer returns for a subsequent purchase then their 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;
- If an insecure transmission link is being used, appropriate warnings should be displayed;
- **Liability:** Consumers should not be liable for losses resulting from fraud.

⁶⁰ EU Directive on Distance Selling (97/7/EEC)

5.5.4 INTERNET BROADCASTING

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.

5.5.5 PRIVACY

It is likely that national laws will continue to apply to Internet activities. It is important that consumers are aware of such matters as Copyright Law and other legal liabilities when using the Internet. The Internet itself is only loosely regulated by the Internet Society (subsections include the Internet Architecture Board and Internet Engineering Task Force). It may be that consumers would regard standardisation of the Internet itself as being inappropriate or undesirable. However, where products or services are made available via the Internet, the regulation of those products and services may be appropriate. In other terms, the interface needs to be standardised but not the Internet itself.

In the UK, for example, various organisations such as the Advertising Standards Authority (ASA), the Office of Telecommunications (Ofcom), the Office of Fair Trading (OFT), the Direct Marketing Association exist to cover such activities. However, to quote from a recent Consumers' Association Report "While there is no need for a new body of law for the Internet, there is a need to ensure an adequate institutional framework for ensuring consumer protection. The very nature of the Internet creates challenges that the existing regime is unable to cope with. Trying to squeeze new technologies into the existing regime will only lead to inadequate regulation and it is time for a more radical review of the regulation of the communications industry"⁶¹.

Privacy and security of information will be largely a legislative issue (EU Directive on protection of personal data, 95/46/EC). However, as detailed in Article 17 of the EU 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.⁶²

Recommendations for standardisation

- Security of performance;
- Accountability or monitoring of the system;
- Liability;

⁶¹ A review of security methods relating to consumers and their legal rights has been published by Consumers' Association; Which? Magazine; March 2001.

⁶² British Standard BS7799 of 1995 would be an example of such a standard.

- Control and transparency of monitoring tools used by service and information providers (e.g. cookies);
- Costs

5.6 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.

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. Within the CEN/ISSS Workshop Learning Technologies a project team has been set up to clarify the possibilities for the establishment of such standards;
- 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. Within the CEN/ISSS Workshop Learning Technologies the need for standards in this domain is being examined. In ISO/IEC JTC1 SC36 a working group on Collaborative Learning will presumably be set up. For the time being, this WG deals with the work items 'collaborative workplaces' and 'learner to learner interaction scheme';
- **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.

5.7 ROAD AND PUBLIC TRANSPORT INFORMATICS

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.

Road Transportation Telematics (RTT) standards should facilitate the provision of services for all travellers, including people with special needs and children, regardless of whether they are drivers, pedestrians or users of public transport). ICT should be used in order to maximise usability, efficiency, safety, and the quality of service provided. RTT standards should also enhance the safety of non-traffic users (pedestrians) and help conserve the environment.

Furthermore, standardised traffic information systems could allow the consumer to travel anywhere in Europe and receive transmissions containing information on congestion and incidents. Traffic accidents are a significant cause of deaths and injuries to consumers across Europe. RTT/ICT may help indirectly to reduce this.

Consumer priorities

- *Safety of those using transport systems/ others (pedestrians) not using them*
- *Access to information*
- *Billing/ ticketing*
- *Transparency of costs*
- *Post-theft tracking systems for recovery of stolen vehicles*
- *Automatic tolling - implications for the private motorist of charging for use of motorways and/or access to certain areas*
- *Reduced access to city centres and popular tourist areas*
- *Implementation of environmental policies*
- *Protection of privacy in the event of electronic tagging of people and vehicles*

Recommendations for standardisation

▪ User interface

- Standardised user interfaces of road navigation systems (menus, terminology, navigation techniques, audio messages);
- Standardised signs fixed and static, symbols, icons, pictograms for public and in-vehicle transport;
- Safety standards applicable to the presentation (e.g. display) of received information;
- Standards for accessibility of information in different languages and in different output modes adapted to an individuals' requirements;
- Standards for usability/ risk assessment when driving and using ICT simultaneously;
- Design of speech interfaces;
- Vehicles to have interfaces to assistive technologies for input/ output of information;
- Transparent cost and cost information.

▪ Accessibility

- Standards for accessibility of all stages in public transport system;

- Standards for accessibility with regard to maintenance (vehicles, systems, safety features/ systems). Accessibility with regard to all users, including children and disabled persons.
- **Methods/process related**
 - 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/architectural**
 - Standardised transmission method for receiving traffic information via radio (information about traffic jams, accidents);
 - Standards to facilitate electronic 'car trains' – maintain safe distances;
 - Standards to facilitate central control of vehicles (e.g. lorries, busses) on motorways;
 - Standards for interoperability between handheld 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 communications 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 for 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;
 - PT priority at cross-roads: standardisation of exchanges between traffic servers and vehicles.
- **Safety**
 - Standards for RTT to monitor driver performance (drowsiness);
 - Standards for the functional safety and reliability of complex systems.
- **Command and control/emergency centre**
 - 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;
 - 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 of whole incident;
 - CCR must be able to handle input/output in several languages, over several media and in different modes (visual, auditory, tactile/ Braille);
 - Standards for load classification and provision of information relating to such loads to the relevant traffic management systems;
 - Standard for central to roadside communications, in respect of their communication systems to ensure interoperability with the roadside systems;
 - Standard for location referencing;
 - Hardware/communication links between rollover/crash sensor devices on hazardous freight vehicles, which will automatically communicate with the fleet/goods management systems and

then inform the police/fire services on the possible nature of the spill incident to which they are going;

- In-vehicle 'black box' collision detection/notification systems (perhaps from airbag deployment data) - so that onwards communication with Emergency Services is consistent;
 - Standards for the correct ergonomic design of command and control systems in order to reduce human error and reduce operator stress. Design of integrated systems that are easy to use.
- **Other**
- Demand responsive systems and car-pooling: information, reservation, and payment;
 - 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.

5.8 SMART CARDS

Smart cards are the result of the merging of three different technologies (integrated circuits, plastic material and printing). The term 'smart card' is used to describe any plastic 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.

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

- *Direct consumer involvement in smart card standardisation*
- *Interworking between 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*
- *Privacy*
- *Security*
- *Standard procedures for redress*
- *Legal issues*
- *Cost transparency*
- *User interface standards*
- *Information retrieval, identification*

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.

- **Addressing consumer issues in all phases and all areas of smart card standardisation:** The correct framework needs to be established to allow consumer issues to be addressed throughout the whole standardisation process. This includes the programming of standardisation work, the setting of priorities and participating in the technical work,⁶³
- **Inter-working** between standards (both within CEN and between CEN and ETSI) 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;
- **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

⁶³ EN 614: 'Safety of machinery: Ergonomics design principles - Part One: Terminology and general principles' is an example of a standard specifying end user involvement in the design process. It specifies when end-users should be involved, what types of analysis work should be done with them and describes user testing. The concepts in this standard could be applied to smart card standards.

should be avoided. It has to be noted that there is legislation on privacy in preparation in several countries. Privacy may therefore be regulated by law;

- **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. A minimum amount of information should be provided to the consumer about security risks (e.g. do not write down PIN code/change your PIN code regularly/remember that at the supermarket checkout several people (cashier, other customers in the checkout queue) as well as the security cameras can see your PIN as it is being entered);
- **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 metaphors (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;
 - 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. All messages should use a positive wording in order to avoid placing blame on the consumer;
- Equally **mechanisms for the consequences of actions** should be available (e.g. if you pay this bill from your current account you will be overdrawn and incur excessive financial penalties). Standards to facilitate feedback and the consequences of actions are needed;
- There is a need to review and adapt ISO 9241-14 (menus) so that it relates to smart card systems;
- 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).

5.8.1 INFORMATION RETRIEVAL/ IDENTIFICATION

Whilst smart cards used for identification purposes obviously share many of the above standardisation needs (e.g. security and privacy), they have some sector specific requirements.

Recommendations for standardisation

- Access and modification rights to the information stored on the card (legal issue) and tools to facilitate this standards issue;
- Data transparency for cardholders requires underlying standard;
- The ability to check that the data stored on the card is correct and up to date. Data integrity also needs checking. All require underlying standard;
- Certification of professionals allowed to enter and modify data on a card is required;
- Procedures for changing data, right of redress if incorrect data is entered;
- Back up of smart card data;
- The cardholder should be able to access information on the card using a preferred mode of input and/or output (visual, audio, Braille).

5.9 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 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.

5.10 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 non face-to-face 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 topology (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

- *Minimum service level for a fixed price connection on fixed and/or mobile connection*
- *Transparency of tariffs to allow comparison*
- *Understandable information of geographical coverage available worldwide*
- *Ease of use (user interface design)*
- *Batteries and charging for mobile terminals*
- *Safety - banning use of mobile terminals when driving*
- *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.*

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 directory services** should be available at the point of sale and include performance data such as typical usage time, recharge time, weight, 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.

7. 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.

8. 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).