



**ANEC - European Association for the Co-ordination
of Consumer Representation in Standardisation**

Consumer Requirements in relation to ICT Standardisation

Part II
Consumer Priorities in
Information and Communications Technology

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**ANEC
EUROPEAN ASSOCIATION FOR THE CO-ORDINATION OF
CONSUMER REPRESENTATION IN STANDARDISATION**

36 AVENUE DE TERVUEREN, BOX 4 - B-1040 BRUSSELS
PH. +32 2 743 2470 - FAX +32 2 736 9552 - E-MAIL: ICT@ANEC.ORG

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2. Introduction

The vast opportunities offered by the information society will change the lives of nearly all consumers. Technologies and services increasingly become available regardless of national and even continental borders. This urgently requires international and regional solutions to ensure interoperability of products and efficient consumer protection across borders.

Standards which ensure adequate levels of safety, security of information, interoperability and most importantly, accessibility to all consumers are required. It is vital that any standards developed for information society products and services are developed taking into account the views of the consumer.

ANEC, the European Association for the Co-ordination of Consumer Representation in Standardisation has therefore identified main consumer concerns in key areas of the information society which need to be tackled. This document represents part two of a policy statement on "consumer requirements in relation to ICT standardisation" which was submitted to the European ICT Standards Board, a body co-ordinating the information society work of the three European standards bodies as well as of various industry fora.

The first part of the document, elaborating on generic consumer requirements applicable to the entire information society standardisation (ANEC98/ICT/06), such as ease of use, interoperability, adaptability and design for all, has been adopted by the European ICT Standards Board as part of its own policy.

Whilst both documents can be seen separately, ANEC highly recommends that both documents should be considered to obtain a full understanding.

2.1 Definitions

For the purposes of this document, the following definitions shall apply:

Consumer: 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.

Dialogue: Interaction between a consumer and a system to achieve a particular goal.

System: A configuration of hardware and software which is designed to perform tasks in a particular environment. The system typically interacts with consumers via some form of dialogue.

Interoperability: The ability of equipment from different manufacturers (or different systems) to communicate together on the same infrastructure (same system).

3. Consumer requirements

3.1 Generic consumer requirements

The following generic consumer requirements as elaborated in ANEC98/ICT/06 should be considered in all ICT standardisation:

- Ease of use
- Design for all
- Functionality of solution
- Multi-cultural and multi-linguistic aspects
- Terminology
- Comprehensible standards
- Interoperability and compatibility
- Consistent user interface
- Adaptability
- Provision of system status information
- Error tolerance and system stability
- Ease the consumer's need to remember system operation
- Explorability
- Privacy and security of information
- Cost transparency
- Quality of service, system reliability and durability
- Reliability of information
- Health and safety issues
- Environmental issues
- Rating and grading systems

3.2 Horizontal consumer requirements in ICT

In addition to these generic consumer requirements there are a number of consumer needs which have to be taken into account when standardising products and services for the information society. These include most importantly an enhanced opportunity for consumers to participate in the development of standards. A direct involvement of consumer experts where appropriate in current work at all levels and during all work stages must be possible. Consumers need to be consulted in all work items concerning them.

The standardisation process should also respect rules of ethicality, i.e. scientific and objective methods should help to assess ethical sound products (e.g. no child labour, no support of ideologies based on discrimination or violence). This information should then be indicated in a standardised way.

The following more technical issues need particular attention:

3.2.1 Man-machine interfaces

The man-machine interface is the point where the human interacts with the system. Information may be given visually (typically display screen) and or auditorially (telephone menu). The human responds via an input device (telephone keys, joystick, keyboard, etc). The interaction is steered by a dialogue

Why it is important for consumers

The man-machine interface is the contact point with the system. A poorly designed and non-standardised interface can adversely affect if the consumer can perform his task; increase the possibility of error and adversely affect the consumers satisfaction and perception of both service and whole system. 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 can not be more user or consumer friendly than the applications it is supposed to support (this applies to both consumer and professional applications).

Key aspects for standardisation

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

- a) user interface elements,
- b) usability
- c) adaptable user interfaces through encoding of user requirements

It should be noted that the above areas are closely interrelated and should interwork.

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 (smartphone, WEB TV, mobile phone, etc). Existing standards may not interwork.

Work item Review of existing and ongoing standards, formal and de facto, to establish the status of work in this area and there interworking. Establish their relevance from a consumer/user interface perspective in a home environment, using delivery mechanisms other than a PC.

Pending the results of 1, new work items may be needed in respect to the categories above.

3.2.2 Inter-linking technology

The inter-linking of telephones, satellite-, video- and audio components, Set Top units and Personal Computers in respect of common hard- and software as well as service parameters.

Why it is important for consumers

Governments and other parties involved in the drawing up of legislation in the different European countries begin to formulate frameworks for the use and propagation of modern information- and communication techniques (see: German "Information- and Communications Services Act" from 1st August 1997).

These frameworks largely deal with interoperability and key consumer areas, such as data protection (privacy), security of data exchange, consumer rights in teleshopping, telelearning 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 Commissions level.

It is vital for the consumer that the various systems of information and communications technology that have been established and will further evolve under these frameworks work together. Technical components and systems must not only be interconnectable but shall also be interoperable to provide services at acceptable prices. This is particularly necessary 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 will benefit from the information society. In addition comparable high level requirements specifically for 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. Like the principle of the "New approach for technical harmonisation and standardisation" of 1985 European harmonised ICT standards could fill these legal frameworks with concrete requirements.

Consumer Priorities

The consumer must be able to access services by use (in principle) of component parts from any manufacturer. For example, a consumer should not have 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.

Key aspects 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 like 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 telecom- 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 to 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, public information terminals a.s.o. including aspects like accessibility, performance, user information in respect of the use by disabled persons also.
- **USER-FRIENDLY HARD- AND SOFTWARE.** Components, systems and devices (including software) which allow or facilitate interlinking must be user-friendly. They must be easily usable by consumers and not require technical knowledge. User-friendliness includes any user instructions or manuals or online help.
- **NEW AND REVOLUTIONARY TECHNOLOGY:** New and revolutionary products, systems and services in the field of information and communication technology (e.g. Internet Telephony) shall be interoperable with existing solutions.

- **ACCESS TO ILLEGAL AND INDECENT CONTENT:** Standardised hard- 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 none or as little as possible personal data is registered, processed and used by the specific service (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 Signature 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 Signature within Trust Centres and on the users side.
 - **Encryption standards.** Strong encryption standard codes for a secure use of electronic commerce and other uses (e.g. medical prescriptions.) **etc**

- **COMPATIBILITY OF DVD PRODUCTS:**
 - Where there is no single multi-media terminal for private use available, non-compatible system standards for digital audio and video processing appliances for home use (DVD) shall be harmonised at least for similar purposes in the field either of exclusive computer applications or electronic entertainment.

 - Where different system standards and non-compatible functionality exists for TV-reception and Video processing multi-standard or multi-functionality TV sets and VCR´s should be available on the market.

3.2.3 Power Consumption of ICT

Due to increasing environmental problems (global warming, CO2 emissions), limited fuel resources and continuously growing global market of information and communications technology (with an estimated growth rate of 20% per year) the need to decrease energy consumption has become more important day by day. Representatives of the European Community agreed to stabilise the CO2-emissions at 1990 levels by the year 2000.

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.

Key aspects 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 do 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 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 reached by improving network performance. This would normally not require any or only minimal additional hardware. In very many cases no or a minimum of additional hardware is needed. 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 apparatus or systems defining maximum permitted or recommended power consumption in and standby or idle mode.

3.2.4 Evaluation of ICT

Why it is important for consumers

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 application software make it very difficult for the consumer to find the most suitable program. In addition, commercially available products have a confusing number of functions requiring detailed studying of the technical specifications and user manuals and often detailed training courses.

Consumer Priorities

- A benchmark standard for testing
- Suitable tools for life-cycle analysis
- Tools for user requirement generation

Key aspects 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 analysis, which integrate the different quality characteristics:

ISO 9126 defines different quality sub-characteristics, which are important to assess the quality of a product. These characteristics are

- Functionality (suitability, accuracy, interoperability, compliance, security)
- Reliability (maturity, fault tolerance, recoverability)
- Usability (understandability, learnability, operability)
- Efficiency (time behaviour, resource behaviour)
- Maintainability (analysability, changeability, stability, testability) and
- Portability (adaptability, installability, conformance, replaceability)

These technical functions should be complemented with "human factor functions" which describe the different qualification, age and cultural background of the users. Information and communication technologies should support the different user categories, or should describe which qualification (ability) is needed to use a product.

For these reasons it would be useful to test the usability of products with different types of users 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.

3.2.5 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).

Why it is important for consumers

A prerequisite for consumers to make appropriate decisions regarding the purchase and use of ICT products, systems and services is having the right information at the right time and right place.

For example, at point of sale the consumer needs to compare and contrast different alternatives and fully understand the implications of purchasing "packages" (e.g. free modem with 2 years Internet subscription - the price of which can be altered by which 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 both long and short term.

Consumer Priorities

Standard on what information should be given (at what time, type of information, means of information), one standard product profile

Key aspects for standardisation

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 users tasks.

4. Consumer priorities and requirements in key areas of ICT

In addition to the general consumer requirements and priorities as identified above, ANEC considers the following areas of information and communications technology as of particular importance to the consumer.

Given the rapid growth of information and communications technology this document will be updated and reviewed regularly.

4.1 ELECTRONIC COMMERCE

Ordering and payment of commodities by means of mass market ICT products and services (such as by TV, screenphone, PC and WWW). Electronic Commerce can take place from the home, office, in public places and by people on the move.

Why it is important for consumers

Electronic purchasing is important to consumers for several reasons.

- It may be the only way certain products or services will be offered for sale in the future. Not being “conversant” with electronic commerce will reduce an individual’s choice (choice being a fundamental consumer right).
- It can, through potentially lower costs, provide better (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, those not will pay higher prices (discrimination). NB. Prices for some goods are actually higher via Electronic Commerce than from traditional stores, yet consumers are willing to pay for 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, people at work or for disabled consumers. 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 can the running costs. The use of other delivery techniques where the consumer already has invested in equipment (e.g. TV sets) needs to be considered on an equal footing.

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 achieve advantages using electronic commerce, provided that the systems are easy and consistent to use and accessible physically and psychologically. They should be available also via technologies other than the PC, e.g. through TVs, screenphones and mobile-phones.

Consumer Priorities

- Ease of use
- Interworking between standards
- Standards for all delivery technologies
- Research into consumer aspects of Electronic Commerce
- Privacy
- Design for all
- Error tolerance
- System status information
- Cost transparency
- Order Confirmation
- Security of financial transactions

Key aspects for standardisation

Electronic commerce is a technology still in its infancy, and there therefore exists little material upon which to systematically base consumer requirements. Global standardisation efforts began in 1997 with the ISO IEC JTC 1 Business Team on Electronic Commerce and the ISO TC 68/CEN TC 224 Project team on Electronic Commerce. CEN ISSS launched a Workshop on Electronic Commerce in 1998.

A research project (pilot - pre standardisation project) is therefore needed to systematically identify and attempt to resolve **consumer** issues in relation to electronic commerce. This should be ongoing and look at issues as and when they are identified either in the standardisation committees or from experience when using electronic commerce.

Despite the lack of practical experience with electronic commerce, it is possible to identify some areas for standardisation based on existing experience.

These areas are presented below.

- **Ease of use** is an acknowledged problem for consumers. Field studies in Norway of existing self service systems and of 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, navigation 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). Note: Ease of use can be measured in terms of performance (e.g. the time taken by users to complete a predetermined task, and/or 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.

- Electronic Commerce standards should address **ergonomic aspects of hardware, software, services and support**. Existing standards should be applied¹.
- **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, different technologies and between the different standards bodies, both formal and informal.
- **Standards for all 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, 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, both for 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, and consumer issues have not yet been fully identified. The correct framework needs to be established that will allow for consumer issues to be addressed throughout the whole standardisation process. This includes the programming of standardisation work, priority setting and participating in the technical work.

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 electronic commerce standards.

- **Security of transactions** is one of the most important aspects for the consumer. Providing an unknown organisation (abroad) with access to your bank account is a very unfamiliar concept to most users today, and places emphasis on security arrangements. (You need to trust the network or Trusted Third parties TTP). Indeed banks, card issuers and software organisations advise against this.

Password and user name are not enough, so new ways of encryption and digital signatures need to be refined and standardised. An effective digital signature

¹ e.g. IS 9241

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 if security has been breached should be based on standards.
- The process of **delivering access codes** to the user in a way that is secure should be standardised.
- To reduce the security risk from the delivery process, the consumer should be able to immediately **change access codes** upon their receipt. Standards should facilitate this.
- Clear, concise **information** shall be provided to the consumer about security risks.
- **Privacy**, i.e. confidentiality of personal information, such as coding of user interface requirements, 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 support the principle of "Design for all"². This is a process of creating products, systems, services which are accessible and usable by people within the widest possible range of abilities operating within the widest possible range of situations. This should also allow for different cultures.

This could be facilitated by standards on the interchange of different input/output devices needed to match individual requirements (e.g. blind person wants voice output). Equally, individual requirements could be encoded in a standardised way so that the user interface of the system is adapted to individual requirements (language preference, input mode preference, currency, etc.).

- **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, etc.) should always be indicated to the consumer (i.e. feedback). Different mechanisms should be employed to give clear 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.

² in line for example with *UN Standard Rules on the Equalization of Opportunities for Persons with Disabilities*

Equally, mechanisms advising on consequences of actions should be available (if you start downloading the file you have selected it will take 76 minutes Press «cancel download» or «Download»). This is an attribute that helps build trust in the system.

- **Presentation of information about goods/services**

There is a need for a standardised product data sheet informing you about the goods and services you are intending to buy. This would both facilitate comparison between products and also inform consumers of any special conditions applying (eg APEX plane ticket is non-refundable and cannot be changed; - the electrical appliance you are looking at will not run on the mains 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 initial costs involved for the user and costs in terms of subscribing to and operating the system, especially when interworking on networks, or when using on-line help or other fundamental services (e.g. directory enquiries, 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.

It is important that the 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 expected expedition 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) will need to be developed.

- **Order confirmation**

Purchasers of goods and services should get a quick, personal (via e-mail) response from the merchant. This response should confirm expected delivery time, provide an order number, confirm what is purchased, provide a point of contact if goods and services not delivered on time, advise on redress if goods or services are not satisfactory or damaged in transit, advise on mechanisms for return of faulty goods.

- **Authentication ensuring mobility**

It should be possible for the consumer to be able to carry out electronic commerce from any location (home, office, public environment, on the move) on any type of terminal (smartphone, 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. This varies considerably between countries, applications and service providers. To improve consumer confidence in how disputes are resolved a common procedure for resolving disputes/ errors between consumers and service providers needs therefore to be established.

4.2 Smart Cards

Smart cards are the result of three different technologies (integrated circuits, plastic material, printing) merging. 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

Colloquially known as prepaid cards or stored value cards. They do not have a built in micro processor, 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

The only «smart» card with a microprocessor. These cards both store data and perform operations on stored data. Examples are GSM and banking cards.

Why it is important for consumers

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), are 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, social security cards, etc. They are regarded as the «key» to Electronic Commerce.

Given that smart cards are the key to the information society, and given that there is a desire to avoid a two tier information society (those that are members of the information society and those that are not) it is essential that no barriers to use (economic or technical) of smart card systems exist.

Consumer Priorities

- Direct consumer involvement in smart card standardisation
- Interworking between standards
- Customisable smart cards
- Security of confidential information (medical records, banking details, etc.)
- 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
- Informational retrieval, identification

Key aspects for standardisation

Note 1: Similar considerations for public access systems also apply here.

Note 2: There are so many different uses related to smart cards, depending upon the applications (transport, medical) that is almost impossible to have an overview and from that draw out all generic issues.

Generic Aspects for smart card standardisation

- **Addressing consumer issues in all phases and all areas of smart card standardisation.**

The correct framework needs to be established that will allow for consumer issues to be addressed throughout the whole standardisation process. This includes the programming of standardisation work, priority setting and participating in the technical work.³

- **Interworking** between standards (both between ETSI and CEN and within CEN) is a fundamental requirement, especially in the area of Intersector Electronic Purses, that would permit the consumer to carry fewer smart cards and greatly improve the convenience of carrying cards when travelling between areas where there currently are specific card schemes.
- **Customisable cards** should allow the consumer to choose the applications 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.

³ 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.

- **Access to information stored on the card.** The card holder only should have access to all information on the card, i.e. there should be data transparency. The card holder should be able to see what information is on the card, how long it has been there, if it has been modified and by whom, who information has been transferred to. The card holder should decide who has access to information on the card. Service providers should only have access to their own domain.
- **Privacy**, i.e. confidentiality of personal information, such as coding of user interface requirements, choice of service applications should not be disclosed to third parties, e.g. by capture on terminals, or by servers. The service providers that are chosen by the consumer to be included on the card, should only have access to their own application. Electronic footprints, should be avoided. Note: There is ongoing legal work on privacy 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 that ensure higher levels of security than PIN Codes (e.g. via biometrics, encryption) are needed.
- **Information** to the consumer about levels of security, and if security has been breached could be based on standards.
- **Secure delivery of PIN's:** 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 immediately change the codes 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 a supermarket checkout that several instances /cashier, customers in checkout queue, 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 card holders. This varies considerably between countries, applications and service providers. To improve consumer confidence in how disputes are resolved a common procedure for resolving disputes/ errors between card holders and service providers needs therefore to be established (e.g. card holder alleges that a ticket was not issued from a ticket machine, although he has been debited for it. As another example, the cardholder alleges that a phantom withdrawal has occurred).
- The **legal responsibilities** (service provider/ intermediary/ consumer) must be clarified.
- **Cost transparency** - The system must be transparent regarding all costs involved. Cost information should be presented in a standardised way. This includes both initial costs involved for the user and costs in terms of subscribing to and operating the system, especially when interworking on networks, or when

using on-line help or other fundamental services (e.g. directory enquiries, 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**

Listed below are standardisation areas that would together help improve the user interface and thereby improve ease of use.

- **Consistency** at the user interface (either through standardised user interfaces or via adaptable user interfaces that adapt through 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 individuals requirements (e.g. language, output medium required, etc.).
- Develop a **standardised set of metaphors** (e.g. windows, desk top) that can be used in everyday life.
- Develop a **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 ensure **avoidance of card capture** (especially multi-application or identification cards) in the card reading device are required. A consumer concern is that their card is 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, etc.) should be always available for the consumer (i.e. feedback). Different mechanisms should be employed to give complete feedback to the consumer e.g. audio/visual. All messages should be positive and not place blame on the consumer.
- Equally **mechanisms for 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 consequences of actions are needed.
- 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** (height of terminal and card reading devices, reach requirements, etc.), **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.)

Specific aspects for standardisation

Informational 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. These include:

- **Access and modification rights** to the information stored on the card (legal issue) and tools to facilitate this (standards issue).
- **Data transparency** for card holders (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 card holder should be able to access information on the card using a **preferred mode of input and/or output** (visual, audio, Braille).

4.3 Internet

This chapter concerns itself solely with the consumer interface with the Internet. This includes access to and use of World Wide Web (WWW), Usenet Newsgroups, file transfer (FTP). Internet relay chat (IRC) and E-mail.

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, commerce, etc.

Why it is important for consumers

Information: The Internet has the potential to become one of the main media for home and public information purposes. It is important (essential) that all consumers have the ability to have easy and affordable access to the Internet and to the information required.

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

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 for in some retail or banking areas. This raises important legal issues such as warranty, redress and financial security.

Consumer Priorities

4.3.1 Information and Access.

Access to the Internet

For consumers, access to the Internet is via some form of Internet Service Provider (ISP). There may be a case for ensuring that these organisations work to a standardised code of practice.

Key Issues for standardisation:

- Transparency of costs, lengths of contract and contract termination penalties. These need to be made clear at the point of sale.
- The ISP's legal obligations to the subscriber. These need to be clarified (e.g. what is their liability regarding content) and these obligations should be made clear to consumers. The Consumer needs to be able to tell where the ISP's liability ends and where the web information provider or trader begins. There needs to be standardisation in the industry on this issue because of conflicts or potential conflicts between international laws.
- Performance criteria. There should be a standard rating system to quantify the ISP's technical performance. This should rate average data speeds and system busy (line engaged) frequency on say a monthly basis. Furthermore there is also be a case for a standard rating system to quantify the performance of the telecommunications infrastructure that makes up the Internet itself.

Information Retrieval

The means of locating and retrieving important or other primary information can be very confusing. 'Search engines' are useful for general research and 'surfing' but are too 'hit and miss' for everyday information retrieval.

Key Issues for standardisation

- **Locating:** The means of identifying and locating primary information should be standardised to ensure all consumers can access it .
- **Retrieving:** Methods of retrieving primary information needs to be standardised into as few as 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)

(Parental) Controls and Censorship

In a recent Internet trial⁴ using 60 families there was a high incidence of inadvertently receiving undesirable, obscene, material and children were tempted by 'chat lines' and newsgroups with unsuitable content.

Key Issues for standardisation

- 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 etc.) in the country(ies) that they provide their service. Internet Service providers and authorities should pool information regarding such sites or newsgroups.
- There needs to be a standardised way of ensuring that users do not receive text, pictorial and other multimedia presentations that they may consider unwelcome for whatever reason, this includes unsolicited e-mail. It is recognised that any categorising of information may have to be carried out on a self regulating basis, however a standard method of categorising would aid this process. Such categorisation will need to be able to be 'tuned' by the user, to meet their varying or differing needs taking account of local conditions and individual user requirements. (e.g. what is deemed acceptable in one country will be unacceptable in another yet the information will carry the same category). Current third party 'filtering' software (e.g. Cybersitter, CyberPatrol, Netnanny, etc.) could alternatively or additionally form a basis for this but at present they do not meet the above requirements and are neither standard nor mandatory.

Ideally the control of the filtering software will be with the consumer but if third party control is applicable then the user should be made aware that a filter is in use.

⁴ Which? magazine July 1997

Advertising:

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

Key consumer issues for standardisation:

- It should be clear 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.

Generic Requirements:

The Generic Consumer requirements (Section 3.1) should apply with the following highlighted as key issues for standardisation.

- As a consequence of the Design for All approach, 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 (Java, etc.) cause problems for users of audio readout systems. Web pages should be accessible to all consumers, text-only alternatives should be available.⁵
- 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.

4.3.2 Communications

E-mail

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

Key Issues for standardisation:

- Personal Security and Privacy: Consumers should expect at least the same level of security and privacy that they get from telephone or postal communications. However with electronic mail the potential exists for this security and privacy to be better than 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 here if legal or contractual information is being sent via E-mail, 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.

⁵ See e.g. World-Wide Web Consortium "Web accessibility initiative" and design guidelines

- **System Security:** The E-mail infrastructure should be robust enough to withstand technical breakdown without loss or undue delay of mail, this will mean that E-mail should not be the responsibility of one monopoly organisation. (example: A recent E-mail 'crash' of several hours in America caused a world-wide E-mail loss. News reports suggest 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.

Internet Telephones:

Two main systems exist: Computer to computer where both or several parties need to be logged to the Internet; Computer to conventional phone where only the caller is logged to the Internet. Currently the limited performance and convenience of these systems means their use is restricted to 'enthusiasts' so standardisation may not be appropriate.

If they were to increase in use significantly, the key consumer issues would be:

- security;
- privacy. i.e. confidentiality of personal information, such as coding of user interface requirements, 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.

- 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.

4.3.3 Commerce

Security of Financial Transactions (via the Internet).

(See section 4.1, Electronic Commerce)

Financial transactions (home shopping and banking) on the Internet are expected to increase yet there exists a public perception that such transactions are insecure. A 1997 report⁶ by the Legal and the Policy departments at Consumers' Association UK covers the subject of Internet transactions in depth. The following section draws on this report.

Currently EFTPOS, Charge and Credit cards are the main methods but it is likely that one or more of the various 'e-cash' systems will also become commonplace.

Some main areas identified in the report and key issues for standardisation or legislation for each of are detailed below.

- **Liability:** Under all these systems the consumers' need to know the extent of the card issuer's liability for Internet transactions. (In the UK there is consumer legal protection⁷ when using credit cards but its application for 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.
- **Ease of use:** The use of card or e-cash transactions over the Internet should be easy and it should be clear 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 issue⁸.
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, is no less secure than other
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.

⁶ CONSUMER TRANSACTIONS ON THE INTERNET. CONSUMERS' ASSOCIATION 1997

⁷ CONSUMER CREDIT ACT 1974. (SECTION 75). PROTECTION AGAINST BREACHES OF CONTRACT, ETC.

⁸ EU DIRECTIVE ON DISTANCE SELLING. DIRECTIVE 97/7/EEC

Web retailers should operate a '**customer account**' system whereby if a consumer returns for subsequent purchase then their credit card details are on a (optional) secure file such that they do not have to be sent over the Internet a second time.

- Encryption: Various sophisticated encryption systems have been proposed. (RSA/SET two key system; Trusted third party (TTP); Digital signatures; etc.) These are likely to become de-facto standards. Official standards bodies need to adopt these systems so that Consumers' will feel confident about them. In order to be adopted the systems need to be demonstrate-ably 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.

4.3.4 Other areas of interest and concern

Privacy

The '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 appropriate for standardisation.⁹

In this case key consumer issues for standardisation could be:

- Performance. Is it demonstrate-ably secure.
- Accountability or monitoring of the system to ensure it is being applied.
- Liability.
- control and transparency of monitoring tools used by service and information providers (e.g. cookies)
- Cost

Legal

National laws will still apply to Internet activity. It is important that consumers are aware of such matters as Copyright Law and other Legal liabilities when using the Internet.

Regulation.

The Internet itself is only loosely regulated by The Internet Society (subsections include: Internet Architecture Board and Internet Engineering Task Force). It may be that consumers would regard 'standardisation' of the Internet itself inappropriate or undesirable. However, where products or services are made available via the Internet regulation of those products and services may be appropriate.

"The interface needs to be standardised but not the Internet itself"

⁹ British Standard BS7799:1995 would be an example of such a standard.

In the UK for example various organisations such as Advertising Standards Authority (ASA), Office of Telecommunications (Ofcom), Office of Fair Trading (OFT), Direct Marketing Association, etc. exist to cover such activities. However, to quote from the recent Consumers' Association Report² *“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”*.

4.4 Public Access Terminals

A public or private service where the consumer operates an ICT based device which provides information or delivers a product or service without involvement of other people. Public access terminals are usually to be found in a public environment. They can be free, coin, note, token or card operated.

See also Smart cards.

Why is it important for consumers

Key services, such as telecommunications, transport, public administration, banks, post offices are increasingly introducing information kiosks and other kinds of public access terminals. Public information (which can be of considerable importance - e.g. information about voting, taxes, legislation) must be available to all members of the public and on equal terms. There must be no barriers (technical or economic) that prevents members of the public gaining access to such information, otherwise a two tier society will be created.

The consumers are expected to operate the terminal without the assistance of another person. Failure to operate the system correctly can result in no or a wrong information, service or product being delivered. This could have considerable consequences. It is therefore vital that public access terminals can be operated by all persons 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.
- They must have ergonomic design.
- They 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. 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.
- Categorized 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 necessary character set.
- Privacy should be ensured if user profiles are given on cards.
- It should be possible 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.

Key aspects for Standardisation

- Services provided by publicly available information kiosks may also be provided on home computers. Consistency between public information kiosks and home computer platform should be ensured as regards the interaction: menu system, dialogue, payment system etc. If the user interface is based on the WWW, apply appropriate standards.
- For all consumers, in particular disabled and elderly users of public terminals, the most important aspect is consistency of the user interface; this is especially important for visually, intellectually and cognitively impaired users. One of the ISIS projects, EUKIOSK, has addressed the consistency issue by producing style guides for information kiosk applications to be used by, initially, five cities in Europe. A prime example of inconsistency is the lack of a single standard relating to the layout of numeric keypads. There are two common layouts: the telephone layout and the calculator layout. Reference 1¹⁰ identified 9 layouts on public terminals. prEn 1332-3 (Identification Card Systems: Man-Machine Interface: Keypads) Ref. 1 recommends that the telephone layout be used exclusively on public access terminals.
- With public terminals, the user may only use it occasionally and has probably been provided with minimal training in the use of the terminal. What is "logical" to the consumer may be different from what is "logical" to a designer. Consequently, it is essential that standards related to the user interface are tested with a cross-section of potential users (including disabled and elderly people). Public terminals must be accessible without training.
- 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.

¹⁰ Balfour, A, 1986 Ergonomical aspects of self service systems, Norwegian Research Council.

- 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.
- Review and adapt ISO 9241-14 (menus) so that it relates to self service systems, including those with audio output. Evaluate this set of rules in a field trial. Supply a revised set of rules to CEN TC224 WG6.
- Identify which common set of functions should be graphically represented by icons, symbols and pictograms. Agree a functional description 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.
- Develop and evaluate standardised receipt layouts.
- Coding of user profiles on cards should be developed.
- 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.
- It must be clear to the consumer under which conditions the terminal retains the card in order to prevent unauthorised use. This is of special importance for multi-function cards, where excess of a certain number of mistakes by the owner results in loss of the card also for all other functions.

4.5 Mobile Communications

Mobile communications provide access to telecommunications services at any terminal in different locations and whilst in motion. It also provides the capability of identifying and locating a particular terminal and or associated user.

Why it is important for consumers

Mobile communications offer personal mobility, defined as: "Being able to access telecommunication services at any terminal on the basis of a personal telecommunications identifier, and the capability of the network to provide those services according to the users service profile".

Mobile communications also allows communications in emergencies (could be lifesaving). Mobile systems have distinct advantages (costs and technical) in countries with difficult geographical topology (e.g. Norway, Italy) allowing the connection of people in otherwise remote regions. It should however be noted that

coverage in remote areas is not always provided. Information on coverage (or lack of it) is often missing or difficult to comprehend.

Mobile communications are much cheaper to maintain than the traditional land lines. These cost savings should be passed on to the consumer. In practice it is more expensive to call a mobile phone from a land line than to another phone connected to a landline. Information on such costs is seldom publicised.

Adverse aspects with mobile communications include the effects of the electromagnetic fields when held next to the brain, obtaining mobile phone numbers from different operators, safety effect on technical equipment including: hearing aids, medical equipment, aircraft landing systems, ABS brake systems and train signalling equipment.

Consumer Priorities

- Minimum service level for fixed price connect
- Transparency of cost and geographical coverage area
- Ease of use (user interface design)
- Batteries and charging
- Safety - banning use of hand held car phones.
- Health (information about health hazards)
- Harmonisation between different networks (fixed, mobile, cordless, public and private)
- Compatibility of different systems (GSM vs. successor, DECT 1800)

Key aspects for standardisation

Standardise presentation of information about the geographical coverage area.

Presentation of information has to be given in an unambiguous way. Coverage should be indicated geographically and not in relation to the population.

Standardise presentation of information for minimum level of service

Different operators have different minimum levels of service and may give their services different names. This makes it difficult to compare services. There is a need to standardise the terminology and functionality of different services, and to present minimum levels of service in a standardised format thus allowing the consumer to make an informed decision prior to purchase.

Ergonomic design of handsets and services.

Ergonomic design of handsets and services facilitate ease of use, reduce the possibility of error and can facilitate use by people with impairments. A key component of good ergonomic user interface design is consistency. Standards should help achieve this.

Develop standards for adaptable user interfaces via for example coding of user requirements on smart cards that in turn configure the handset to an individuals preferences and set up required services.

Standardise health warnings have to be provided, this includes in particular reference to pacemakers and hearing aids.

Standardise upwards-compatibility of GSM phones sold whilst successor (DCS) is on the market.

Standardise quality of service to allow comparison. This covers terminal performance, speech quality and load rate.

Standardise access to emergency services. Emergency numbers should be standardised across Europe. Emergency calls must be possible without a PIN code! A power reserve must always be available for emergency calls.

A **common infrastructure**, built on standards should be provided.

Costs should be transparent to the consumer and presented in a standardised way. This is especially the case for those ringing from land lines to mobile numbers. Individual calls should be individually priced. Prices on bills should be also given in currency (per call). The network operator should transmit on-line call costs.

Advice should be given to the consumer on getting **lowest overall costs** (sum of subscription type and calls). This could be based on the individual consumers billing information.

Standardise battery-low indicator

Standardise data plugs

All mobile telephones have to offer the **possibility to suppress call-line identification** (this should be a standard feature and not an additional option).

Standards to facilitate common directories/ directory services need to be established, so that any mobile user can find the number to another mobile user on a different network and or issued by a different service provide.

Standardise data performance sheets for batteries.

Data sheets to include performance criteria such as recharge time, run down time, weight, lifetime. Data sheets to be available at point of sale and presented in a non technical language.

4.6 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.

Definitions:

DAB - Digital Audio Broadcasting. (Radio)

Generally referring to a dedicated transmission chain for radio but could also cover radio broadcasts utilising subcarriers or multiplexes primarily carrying television transmissions.

DVB-C - Digital Video Broadcasting (television) distributed to consumers via a cable network

DVB-S - Digital Video Broadcasting (television) received directly from 'direct to home' (DTH) satellite transmissions.

DVB-T - Digital Video Broadcasting (television) received from terrestrial transmitters, typically using the same frequency bands and channels used by conventional analogue television.

EPG - Electronic Program Guide. Interactive programme listings and information transmitted with the program .

Why it is important for consumers

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

The consumer 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 have to buy different component parts, such as a TV monitor, to access different TV services or broadcasts.

The consumer should be able to inter-link the receiving components with other associated products (e.g. digital video recorders, cameras, data recorders, printers) such 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 license payer. (e.g. government controlled broadcasters and other national networks) and these should be maintained with no extra cost or technical barrier to reception. ie. '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). The consumer should be able to access and control any information that has been sent from their receiver to the broadcaster.

Consumer Priorities

Electronic Programme Guides (EPGs)

Because of the large number of digital channels available it will be 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.

Key aspects:

- The guides should be easy to use (compliant with the ICT “General Consumer Principles for Standardisation”). 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 this system should be standardised. 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 form that is compatible between electronic program guides.
- Vague or misleading terminology such as ‘ambient sound’, ‘surround sound’, Super-wide, Panoramic, should be avoided when referring to standard formats.

Set-top box receivers and built-in receivers (television reception)

Set-top boxes to upgrade existing televisions to digital television will contain the necessary radio frequency tuners, signal demodulators and de-cryption processes necessary to display the broadcast picture on a standard television (PAL, SECAM or NTSC as appropriate).

New receivers, demodulators and decoders should be built into the TV monitor.

Key aspects:

- where more than one digital TV broadcasting system exists in a particular country or territory (e.g. DVB-S and DVB -T) the necessary set top box should integrate all systems. If this involves a significant cost penalty for the consumer then it should be optional.

- where more than one digital TV conditional access key or encryption system exists in a particular country or territory (e.g. satellite DTV and terrestrial DTTV) the necessary set top box should integrate all systems. If this involves a significant cost penalty for the consumer then it should be optional.
- 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 be 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'.
- All television manufacturers should make all new design models of TV monitors available with DTV electronics built in.
- 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 countries that the equipment is being sold. On screen menus should be available for all appropriate European languages.
- Point of sale information. Principle functions and features of equipment should be clearly displayed at the point of sale so fair comparisons between brands can be made.
- A standard remote control should be adopted utilising a standard infra-red 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

Key aspects:

- 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. 80cm diameter for outer areas.
- Where DVB-T 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

Key aspects:

- Received picture and sound quality should meet prescribed technical standards.
- In any one territory or country reception service areas and signal levels should meet prescribed technical standards.
- All new technical improvements and developments should be 'backwards compatible' to at least 7 years of earlier models.

Conditional Access key or Encryption systems.

Key aspects:

- 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 (2-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, etc.) 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).

Key aspects:

- 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, language. Controls should protect against use by unintended users such as children with controls encompassing time of day, themes, advertising, 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

Key aspects:

- The costs of subscriptions and 'pay per view' options and any modifications to these costs, should be transparent to the consumer.
- 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.

Phasing out of analogue/ deterioration of analogue.

Key aspects

- 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).

Power Consumption

Some 'conditional access' systems require the digital television (DTV) to be kept in an active standby mode to facilitate updating access and programming software

Key aspects:

- Standby power consumption should be kept to a minimum and below a prescribed standard level.
- A Permanent standby 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.

Support for People with Special Needs

Key aspects

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

4.7 Smart Houses

A Smart house is a house that has a network that connects to key electrical appliances and allows them to be controlled from one central source. Electrical appliances include, but are not limited to items such as heaters, lighting, movement detectors, cookers, alarms, TV, video, air conditioning. Control from the central source can be online control, programming for future events, or by setting parameters (turn off cooker if no movement detected in kitchen within 10 minutes). Smart houses allow for the interaction of those elements controlled (as demonstrated by previous example).

Why it is important for consumers

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 (eg physically disabled people can use infra red 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), and security, safety and comfort are important issues for independent living of elderly people.

Smart houses can help achieve 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 every fourth European will be over 50 years, but the group of 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.

But Smart Houses represent an entirely new way of using the electrical installations 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, etc.) offered by the system. Ironically the groups (elderly) that might gain the most benefit from such systems might be the very ones that cannot operate them.

If Smart House technology is going to be beneficial to the consumer, standards must ensure ease of installation and operation.

Solutions should not be proprietary. Companies "owning" the infrastructure will dictate the preconditions. Consumers are a major stakeholder in smart houses, and yet they are unrepresented (with a few exceptions). A key consideration is the possibility of different Smart House systems (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 the consumers it is therefore vital that the major Smart House systems should work towards standards that allow interoperability.

Consumer Priorities

- Interoperability between systems
- Standard, easy user interface for the main Smart House systems
- Reliable system, implementation and maintenance
- Cost benefit over a period of time that justify installation cost

Key aspects for standardisation

Standardised definitions of basic services

It is easier for the consumer to choose desired services and options according to desired functionality and personal wishes if there is a standardised list of services for choice. 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 systems.

Standardising the user interface of the Smart House systems.

Given that Smart House systems are compatible, the main consumer issue is ease of use. This can be achieved by standardising the user interface.

Interoperability between BUS systems

Interoperability should be standard between components and between systems. This should also include ordinary home electronics that could be BUS compatible. Otherwise the consumer must buy binary connections that 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 himself, 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 changes.

Standardised training for installers, including understanding user aspects and co-operating with user representatives.

Control devices

Consumers have different requirements regarding the control devices necessary to operate their homes. The variations can be in vision, manual strength, fine co-ordination, 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 (universal design or 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 to 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 case of a power failure, uninterrupted power supply (UPS) 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.

Acceptable price. If the installation is more expensive than a standard installation, the added cost should be saved through using the system over a specified period. This can be achieved through energy savings or reduced need for personal operations. Standard ease of maintenance is a cost reducing issue.

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. The providers and installers of the systems should have interest in and knowledge about the particular consumers user 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 entire new way of using your electrical installations.

Standardise the interface between remote receptors and environmental controls.

This can save expensive double installations in homes of people who need IR environmental controls (e.g. physically handicapped), because the BUS installation can communicate with the IR sender.

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.

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4.8 Road and public transport informatics¹¹

The coupling of information technology and communications in road transport, is already helping to make travel easier, more comfortable, more efficient and safer. This wide area includes real-time traffic and travel information, in-vehicle guidance systems, traffic/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 identified by ANEC in ANEC98/ICT/07. These are relating to “electronic commerce”, “public access terminals” and “smart cards”. The above-mentioned areas should be consulted for further information.

¹¹ See also sections on “Smart Cards”, “Self-service systems” and “Information to consumers”

Why it is important for consumers

Standardised traffic information systems could allow the consumer to travel anywhere in Europe and receive transmissions containing information on congestion and incidents.

Consumer Priorities

- 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 vehicles

Key aspects for standardisation

- Transparent cost and cost information
- Standardised road navigation systems
- Standardised transmission method for receiving traffic information via radio (information about traffic jams, etc.)
- Safety standards applicable to the presentation (e.g. display) of received information
- 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.