

## **User requirements; Guidelines on the consideration of user requirements when managing the standardization process**

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## Foreword

This ETSI Guide (EG) has been produced by ETSI Special Committee User Group.

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## Introduction

A good standard should guarantee a full inter-working between different products or services conforming to that standard. In addition it should be simple to implement, user friendly without conflicting options, ensuring as far as possible an upward compatibility with the products conforming to former standards matching the PTOs network specifications world-wide.

In this perspective, standard validation and equipment certification are important, from a users' point of view, to guarantee a real inter-working.

In fact, the requirements pertain not only to the process of a standard but more generally to the whole content of a standardization project, e.g. to the environment of the provision of a service or product.

To reach this result, the following three main issues have to be considered:

- How TC experts ask users about their requirements.
- How users formulate their inputs in an appropriate way to be properly taken into account by the standard makers.
- How to monitor the standardization progress from a users' point of view.

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# 1 Scope

The present document gives guidance on how user requirements have to be taken into account during the standardization process.

The present document is applicable to the planning of any standardization project but especially of those which are identified as having a direct impact on the satisfaction of the requirements listed in clause 6.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] EN 29241-10: "Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs); Dialogue principles".
- [2] EN 29241-11: "Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs); Guidance of usability".
- [3] ISO/CD 13407: "Human centred design processes for interactive systems".
- [4] ISO 9241: "Ergonomic requirements for office work with visual display terminals (VDTs)".
- [5] ISO Guide 37 (1995): "Instructions for use of products of consumer interest".
- [6] UN Standard Rules on the Equalization of Opportunities for Persons with Disabilities.
- [7] ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".
- [8] ITU-T Recommendation I.510: "Definitions and general principles for ISDN interworking".

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# 3 Definitions and abbreviations

## 3.1 Definitions

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

**Business user:** User using telecommunication product/services while performing his business tasks which have nothing to do with telecommunication business.

**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.

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

**End-user:** Consumer or business user without any technical knowledge of telecommunication technology using telecommunication terminals.

**Interconnection:** The physical and logical linking of telecommunication networks allowing users of one organization to communicate with users of another organization or to access services provided by another organization.

**Interface:** The common boundary between two associated systems. [ITU-T Recommendation I.112, definition 408].

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

**Interworking:** Interactions between networks, between end systems, or between parts thereof, with the aim of providing a functional entity capable of supporting an end-to-end communication. [ITU-T Recommendation I.510].

**IT&T manager:** Person responsible in a company for telecommunication and information technology activities.

**Service, telecommunication service:** That which is offered by an Administration or ROA to its customers in order to satisfy a specific telecommunication requirement. [ITU-T Recommendation I.112, definition 201].

NOTE: bearer service and teleservice are types of telecommunication service. Other types of telecommunication service may be identified in the future.

**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.

**User:** Without any specific addition this word is used in the following clauses, to identify the telecommunication user community in general, e.g. end-users and IT&T managers. This means user of product or services possibly conforming to standards.

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

COST219	E.U. Co-Operation project of Scientific and Technical research n°219
EP	ETSI Project
EPP	ETSI Partnership Project
EU	European Union
HF	Human Factors
ICT	Information and Communications Technologies
IT&T	Information Technology and Telecommunication
OCG	Operational Co-ordination Group
PRD	Project Requirements Definition
R&D	Research and Development
TB	ETSI Technical Body e.g. TC, WG, EP or EPP, etc.
TC	Technical Committee
TIDE	E.U. Technology Initiative for Disabled and Elderly people
TO	Technical Officer
WG	Working Group

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## 4 Different Types of Users

"User" is a word very often used in the standardization area but with various possible meanings: it can be understood as "user of standard" or "user of product/service possibly conforming to one or several standards". The present document is focused on the last category of users, even if some of the actions described in clause 7 may be useful for other categories.

Nevertheless, "users of product/service" themselves may have different concerns depending whether they are:

- consumers;
- business users taking into account that they can be in their office or outside their office including their own household;
- IT&T managers, e.g. those who are responsible for IT&T services in a company;

- manager of companies using ICT as a means to gain competitive advantages.

In addition, the business needs may be very different with respect to the size of the company and to the sector where the business is performed. Even if a direct involvement of these types of users in the technical work is desirable, experience has shown that this is not likely to occur and the following guidelines have been written to find means to take their requirements into account in order to get better standards and hence better products and bigger markets.

Manufacturers or service/network providers who used standards to get cheaper design and implementation of products or services are expected to take directly part in the technical standardization work to sustain their requirements.

## 4.1 User representation in ETSI standardization process

These multiple aspects of the users highlight that somebody supposed to speak on behalf of users should carefully investigate and get the point of view of the various categories of interested users. To do such a review of the user requirements, it is absolutely necessary to understand the technical issues and translate them into a language that users can understand in order for them to see what is at stake and which are the advantages and drawbacks of the different possible solutions. Only when such a debate happens, then the picture of the user requirements in a given area can be drawn. This is one of the reasons why a consultation of the ETSI members in the user category is not enough and that it has to be extended to as much users and users' associations as possible.

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## 5 Different types of standards

The standardization process has to deal with a wide range of standards related to telecommunications. Users are only interested in those standards which are related to a limited number of issues, e.g. terminals, some specific interfaces and services.

### 5.1 Terminals

Users expect to get the widest possible set of services with a single terminal. In addition the terminals and the different devices needed to get the services should be fully interoperable and interchangeable with backward compatibility provided.

### 5.2 Interfaces

In the current telecommunication networks, various types of interfaces are needed for interconnection and interoperability purposes. Users are not interested in all these interfaces but only in those where their systems can be connected, e.g. mainly, man-machine interfaces, user to user interfaces and private network to public network interfaces.

The man-machine interface plays a key role in accessing a product or system. It is therefore of the utmost importance that basic consumer and user requirements are considered when designing and standardizing man-machine interfaces. In the standardization of man-machine interfaces the generic consumer requirements given in clause 6, should be applied. Particular attention needs to be given to aspects such as ease of use, functionality of solution, consistent user interface and adaptability. The man-machine interface should be ergonomically designed and it should allow access by all consumers with or without special requirements.

In this area the users' interest is related to these interfaces between the pieces of equipment or service provision they are used to buy, in order to enable competition between different providers or to be able to easily exchange devices/providers.

### 5.3 Services

The standardization of services is an issue for long discussions. Nevertheless, if users agree that not everything should be standardized in this area, they are asking for consistency between the different services and service providers. Therefore, interoperability as well as common rules for accessing and processing the services are, from a user point of view, issues for standardization.



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## 6 Project requirements definition

According to the ETSI Technical Working Procedures, the first step, when establishing a new ETSI Project or ETSI Partnership Project, is to provide a Project Requirements Definition (PRD) for the GA approval. The PRD and, more generally the definition of the scope of a standard, is a key step for users to give their requirements.

Before drafting a PRD or the scope of a standard related to an issue identified in clause 5, structured human factor methods should be used to analyse the user requirements (e.g. task analysis, task decomposition, scenarios, simulation, prototyping, questionnaires and discussion groups, etc.). In addition to the following generic requirements, the information got that way with appropriate validation can help to draft a suitable PRD or scope.

NOTE: TC HF has a specific role to play in finding the technical specifications to meet the user requirements in this area.

### 6.1 Ease of use

ICT should be easy to use for all intended user groups stated in the scope of the standard. Following ergonomics software principles for user interface design e.g. [1] and [3] should help to achieve ease of use.

ICT standards should address ergonomic aspects of ICT hardware, software, services and support. Existing standards should be applied [4].

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 [2]). Goals for ease of use (known as usability statements) should be developed.

### 6.2 Design for all

ICT standards should support the principle of "Design for all" in line for example with *UN Standard Rules on the Equalization of Opportunities for Persons with Disabilities* [6]. This is a process of creating products, systems, services which are accessible and usable by people with the widest possible range of abilities operating within the widest possible range of situations. This does not mean that every product should be designed for people with special needs but that the standard allows the development of products designed for people with special needs.

There may however be occasions where a system is not intended for all users. In these instances, the standard should state which users and tasks the system is not designed for and why these groups' requirements are not taken into account.

### 6.3 Functionality of solution

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

### 6.4 Multicultural and multilingual aspects

Multicultural and multilingual aspects should be considered when developing global ICT standards.

### 6.5 Terminology

As part of a consumer centred design, the terminology used in user interfaces, (this includes brochures, user instructions and information presented by the system) should meet the basic generic consumer requirements or meet ISO Guide 37 [5].

## 6.6 Comprehensible standards

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

This requirement is probably one of the most difficult to fulfil and this is why other means are necessary to reach the users' need to understand standards via for example presentations described in clause 8.

## 6.7 Inter-operability and compatibility

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

## 6.8 Consistent user interface

The systems should have a consistent user interface. It is especially important that the method of processing, storing and accessing the systems is consistent for the user.

NOTE: A consistent user interface can be achieved by different means e.g.:

all components of the user interface are uniform;

the user interface adapts to the user, so that the user always meets a personalized uniform interface. This principle is the subject of the TIDE project 1040 "SATURN", where the feasibility of using a smart card to trigger a personalized user interface is being evaluated and promoted for standardization.

## 6.9 Adaptability

The system should be adaptable to meet user specific requirements and abilities. For example, provide output in a format and at a pace that meets the individuals' needs.

NOTE 1: This is a way of achieving consistency for the user: see above.

NOTE 2: This principle could be applied to prevent unintended users gaining access to a system.

NOTE 3: This principle could be applied in the case of custom upgrading of systems.

## 6.10 Provision of system status information

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

## 6.11 Error tolerance and system stability

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

## 6.12 Minimize the consumer's need to remember system operation

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

## 6.13 Explorability

The system should allow users to discover its functions.

## 6.14 Privacy and security of information

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

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

## 6.15 Cost transparency

The system should be transparent regarding all costs involved. Cost information should be presented in a standardized 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 should be free of charge or the charge should be stated in a standardized way at point of purchase.

## 6.16 Quality of service, system reliability and durability

There should be a standardized way to determine and present quality of service, system reliability and durability. This should include the development of standardized performance indicators. This information should be displayed at the point of sale. Battery is an example of products where consumers need such information at point of sale (durability and reliability).

## 6.17 Reliability of information

The system should indicate reliability of information (possibly by quoting sources) provided on the system. For example: balance of account is xxx ECU at 10:00 on ddmmyy. (Note: bank-clearing system has been out of action last two days).

## 6.18 Health and safety issues

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

## 6.19 Environmental issues

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

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

## 6.20 Rating and grading systems

ICT standards should allow the application of rating and grading systems.

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# 7 Implementing co-operation between standard makers and users

While aiming to implement co-operation between standard makers and users, it is useful to remember that for the users, standards are:

- a way to get low cost products/services;
- a means for long-life product/service provision preserving users' investments;
- a tool ensuring interoperability and compatibility to enable competition between suppliers;
- a means to ensure that the specific requirements of the user/consumer are properly addressed in the design of product and services.

As far as possible, all these aspects have to be taken into account to achieve a good co-operation between standard makers and users in a win-win perspective.

The User Group is the ETSI committee in charge of consolidating the functional user requirements and of developing co-operation between the users and TBs. To achieve that it strives to attract representatives of users and user organizations at the national level in the European countries and at European or international level as well. Each of these representatives ensures an efficient bi-directional communication between the User Group and the European users, particularly the user organizations. It is not meant that TBs should not have direct contacts with users but that they should take care that users have in general, many different characteristics.

## 7.1 TC experts asking users about their requirements

The purpose is that standard makers, instead of taking a decision among themselves, ask users on their point of view each time when starting a new project or during the standardization process, they have to define user requirements and there is a doubt about what the users want.

While doing that, technical experts should remember that users don't have a detailed knowledge of technical issues and therefore, when asking questions to the users, they should not just ask "what do you want" but should give enough background on the advantages of the different possible solutions to a technical debate and rise the issue at the functional level.

### 7.1.1 Direct participation of users in the technical work

When this direct participation is achieved, it should be remembered that users have multiple characteristics and therefore a single point of view cannot represent all the user requirements. Hence any user representative in a Technical Body should endeavour to get all users' point of view via liaison with the User Group.

### 7.1.2 Liaison Experts attending the key TBs to understand the experts' concerns on user requirements

When a direct participation of the users in the TB is not possible, then they could be represented in the key TCs/WGs/EP/EPP by appointed representatives having the appropriate skills to understand the technical issues and to sustain the user requirements in front of the technical experts.

### 7.1.3 Liaison statements

Whether or not there are user representatives in a TB, a means to achieve an efficient communication between the User Group and the experts is to exchange Liaison Statements giving the appropriate functional background to any technical issue.

## 7.2 Users formulating their inputs in an appropriate way to be properly taken into account by the standard makers

Once more, since users have multiple characteristics, the User Group should consult all the interested parties about the technical issues raised by the technical experts. Such a consultation needs time even if the TB expects a quick answer.

According to the type of issue to deal with, the result can be a simple liaison statement, a more elaborated paper or even an ETSI deliverable. In the first case, the User Group commits itself to answer the question within three months with its best endeavours to get the point of view of all the user organizations outside ETSI. In another case, a nine month period should be given to get the answer.

### 7.2.1 Managing the User Group Work Programme

Every year in its Autumn meeting, the User Group Team will meet with TO representatives to update its Work Programme containing all the work items identified as the main concerns from the users, and to decide which ones to tackle during the next year. The User Group Team will entrust a Topic Group with the task to handle each work item. Topic Group convenors and rapporteurs will be appointed accordingly. A Topic Group will have from 10 to 20 European users (who do not need to be ETSI members).

The User Group will then ask the appropriate TBs (TC/EP/EPP) about the work they currently are doing related to the identified topics and about the issues where users' inputs are relevant. If needed, a meeting between representatives from the User Group and relevant TCs will be organized.

### 7.2.2 Using sources outside ETSI

Any work undertaken to identify the users' needs relating to work undertaken in ETSI, including those of elderly and disabled ones, whether it comes from the EU or from any user or consumer associations or another source, should be taken for consideration by the User Group with any relevant TB and, if appropriate, adopted as ETSI deliverables. This includes EU supported projects, such as TIDE, COST219 and others.

### 7.2.3 Handling the deliverables

Each Topic Group should come to a draft for approval within 6 months. This final draft will be approved by the Topic Group then by the User Group and, if appropriate by the User Community.

After approval of a deliverable, a meeting with all the interested parties in ETSI will be organized to decide how to fulfil the user requirements (for example in the framework of the OCG).

### 7.2.4 Addressing the user requirements

As far as possible, the deliverable or liaison statement, when available, will be presented to the interested TBs by a User Group representative. When liaison experts are appointed to attend the TB meetings, they will present these user requirements and discuss about the best means to fulfil them.

After a decision is taken regarding these user requirements, the TB should send back an answer to the User Group on how they have been taken into account.

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## 8 Monitoring the standardization process from a user point of view

Users can hardly understand the functional purposes of the standards. Therefore the users interest in standardization should be attracted by an explanation of these functional purposes. When taking part in the ETSI process, the users are expecting to notice that their contributions have been properly taken into account. In addition, they would like to get some useful information for their current business.

To meet these multiple goals, once a year, a presentation of the standardization progress in ETSI will be given to the users with appropriate review of their requirements. Key people from the TB should participate in this presentation. If round tables are organized in conjunction with such a presentation, then useful inputs from the participants can also be foreseen.

In the same spirit and since suppliers indicate several times that, due to the time pressure, they have to manage the design of new product/services in parallel with the standardization process, then, when an ETSI Project is mature enough, pilot experiences should be launched with users' participation to get their early comments. This should contribute both to improve the suitability of the standards and, on the other hand, to the promotion of new technologies and hence to the development of the market.

It could also be useful to have Universities and adequate R&D organizations taking part in these pilot experiences.

The possibility to develop the "Incubator" concept in this context should also be studied.

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## History

<b>Document history</b>		
V1.2.1	June 1998	Membership Approval Procedure      MV 9835:      1998-06-30 to 1998-08-28
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