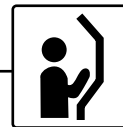


Chapter 11

Public Access Terminals





Contents

Introduction	11-2
Standards	11-3
Output from Projects	11-5
User Requirements	11-7
Conclusions	11-17

Introduction

What are Public Access terminals?

We could define a Public Access Terminal (PAT) as an interactive system based on a computer acting as a sale or information point of products and services. The system is designed to be used without the need of personal assistance and it is placed in public areas, indoors or outdoors.

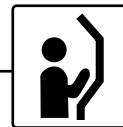
Currently, people are used to see Public Access Terminals in the environment. Autobanks, automatic ticket selling machines in transport or shows are products already implemented and used by a variety of people.

At the same time, we must keep in mind that its introduction will not end with these products. In the future, key societal services, such as getting hold of information and buying any kind of products and services will be available on Public Access Terminals.

The main reasons for the current and future penetration of PAT's in our society is the low maintenance cost, no need for personal assistance and the ease of registering of information on the actions carried out at the terminals.

The rapid and wide ranging introduction of these products in key societal functions, will require that people will have to interact with them in the near future in order to enjoy participating in the building of society.

For this reason, we must design future Public Access Terminals bearing in mind human diversity and different capabilities. Only by acting in this way, we will be able to ensure that everybody, independently of age, sex, capacities or cultural baggage could make use of them.



Standards

The main standards related to Public Access Terminals of different standardisation bodies are detailed. Most of them are not only related with the PAT domain but also with other domains (for example smart cards, communication devices, etc).

But it is important to have them described at this point because it is impossible to think of a PAT without interaction with the other ICT domains, as a separated telecommunication device.

The list consists of different existing standards (number and title) grouped by the standardisation body responsible for them.

Relevant ISO Standards.

ISO 7000 (1989)	Graphical symbols for use on equipment.
ISO 7001 (1991)	Public information symbols.
ISO 7239 (1990)	Development of principles for application of public information symbols.
ISO 9186	Procedures for the development and testing of public information symbols.
ISO 9241	Ergonomic requirements for office work with visual display terminals.
ISO/IEC 9995	Information technology: keyboard layout for text and office systems.
ISO 7816	Identification cards – Integrated circuit cards with contacts.
ISO/IEC 10536	Identification cards – contactless integrated circuit cards.

Relevant IEC Standards.

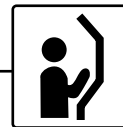
IEC 73	Colour of pushbuttons and their meanings.
IEC 118-4	Hearing aids: magnetic field strength in audio frequency induction loops or hearing aid purposes.

Relevant ITU Standards.

ITU-T E.134	Human factors aspects of public terminals – general operating procedures.
ITU-T E.135	Human factors aspects of public telecommunications terminals for people with disabilities.
ITU-T E.118	Automatic international telephone credit cards.
ITU-T E.133	Operating procedures for telephone credit cards.
ITU-T E.161	Arrangement of figures, letters and symbols on telephones.
ITU-T P.370	Magnetic field strength around the earcap of telephone handsets which provide for coupling to hearing aids.

Relevant CEN Standards.

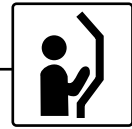
EN 1332	Machine readable cards, related device interfaces and operations.
Part 1	Design principles and symbols for the use interface;
Part 2	Dimension and location of tactile identifier for ID1 cards;
Part 3	Keypads;



Part 4	Coding of user requirements for people with special needs.	ETR 160	Human factors aspects of multimedia telecommunications.
EN 29241	Part 4 Keyboard requirements; Part 11 Usability statement.	ETR 167	User instruction for public telecommunications services: Design guidelines.
EN 726	Requirements for IC cards and terminals for telecommunications use.	ETR 136	Tactile marker on prepaid telephone cards.

Relevant ETSI Standards.

ETR 029	Access to telecommunications for people with special needs: Recommendations for improving and adapting telecommunication terminals and services for people with impairments.	ETS 300 381	Telephony for hearing impaired people; Inductive coupling of telephones earphones to hearing aids.
ETR 039	Human factors standards for telecommunications applications.	ETS 300 488	Telephony for hearing impaired people; Characteristics of telephone sets that provide additional receiving amplification for the benefit of hearing impaired.
ETR 068	European standardisation situation of telecommunication facilities for people with special needs.	ETS 300 679	Telephony for hearing impaired people; Electrical coupling of telephone sets to hearing aids.
		ETR 165	Recommendations for a tactile identifier on machine readable cards for telecommunication terminals.



Output from projects

ISO-COPOLCO

Standards are written by experts from those industries producing a product or service, who use the standards process as a platform to form a common opinion, a standard. It is therefore important, in this process, to involve all those who will be affected by the standard. This includes in particular the private user or consumer. Within ISO the Consumer Policy Committee (COPOLCO), is the group that takes into account the needs of all consumers related with standardisation.

The main policy recommendations of this group are:

a) Promotion of Design for All.

Standard bodies should:

Promote standardisation work to ensure that products, services and environments are available, accessible, usable and safe for all consumers, including the elderly and people with disabilities, and adapt the general concepts of Design for All when developing and revising standards.

- Raise awareness and provide information for standards developers on the issue of accessible design.

- Co-ordinate between the standards committees dealing with mainstream products and those with responsibility for technical aids and accessibility standards for elderly and people with disabilities.

- Promote the standardisation of specific features or adaptations, where they exist, to make products/services more accessible and usable.

b) Consumer representation of the elderly and people with disabilities in standardisation work.

- It is important for standards bodies:

To ensure the direct participation of the elderly and people with disabilities, as consumers, in the standardisation process.

c) Links between research programmes and standardisation.

Standard bodies should promote:

- Co-operation and information exchange with research programmes on accessibility issues.

- The use in standards work of the result of existing research in technical research programmes in ergonomics and related to product/service accessibility.

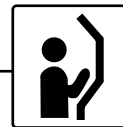
CEN

Within CEN there are three technical committees that currently are working in standardisation related to Public Access Terminals.

- CEN TC 122: Ergonomics. A TC that tackles general requirements, not only related with Public Access Terminals, but can be of great importance.

- CEN TC 293: Technical aids for disabled persons. Is another TC that takes care of general issues but can define some aspects directly related with Public Access Terminals and its interaction with the user.

- CEN TC 224: Identification card system. Centred on smart cards but also relevant for Public Access Terminals. WG 6 is working with the Man- Machine Interface, which is producing the EN 1332 series. This includes subject areas such as keypads, tactile marking on cards, dialogue design principles, icons, symbols and pictograms, coding of user profiles on smart cards, and physical access to card operating devices (including self service terminals).



COST 219

Currently the project is known as COST 219bis as a continuation of the old COST 219 that finished in 1996. The project is not working directly on Public Access Terminals, but in relation to telecommunication services.

The aims and objectives of the study group related to standardisation are to:

Study the telecom-legislation/liberalisation issues.

Study how to pursue the uptake of the COST 219 report. The report had as urgent needs to develop standardisation on: inductive coupling of hearing aids to telephones, interference caused by TDMA to hearing aids, text telephony and videotelephony (all these issues are relevant to a PAT).

NORDICT

The conclusions of this Nordic project is that, at the current time, no standardisation body has addressed the Public Access Terminal as such in general sense. But, as has been explained, standardisation work is in progress for many possible components of the PAT, such as smart cards, keyboards, video systems and sound output.

INCLUDE

Within INCLUDE project, we can find two projects that are mainly related to Public Access Terminals and Design for All:

INFOPOLIS. Guidelines and recommendations on design of future user-oriented information systems (on-street terminals).

ATTACH. Style guide for the implementation of public self-service kiosk according to best ergonomic practices.

Nordic Council:

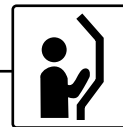
Consumer requirements for Self Service Systems

A project commissioned by the Nordic Council in 1993-1995 has detailed a series of consumer requirements for card based self service systems. Another report details a strategy for getting consumer requirements into the standardisation process. Whilst the reports are somewhat dated, the principles may still be relevant.

Norwegian project:

Self Service for All?

This publicly funded project, currently only available in Norwegian, provides "Design for ALL" guidelines to those purchasing and installing self service systems and advice on adapting user interfaces.



User Requirements

Locating and Physical Access



Public

- The Public Access terminal must be placed in an area that everybody can reach. We must have in mind that to interact with a Public Access Terminal the user can need additional space (for a companion, for valuables and possessions).
- The Public Access Terminal (PAT) has to be easily recognised and located by everybody.

Requirements

Standardisation



Physical

- The surroundings of the PAT should be on level, without steps and with a maximum slope of 6%. Just in front of the PAT there should be a clear area to allow wheelchair users to manoeuvre.
- It is covered by the European Concept of Accessibility and the architectural laws of each European member.
- NB. Ongoing standardisation work in CEN TC 224 WG 6 on an ENV for Physical Accessibility to Card Operating Devices should cover many of the issues related to accessibility.



Auditory

- Ease detection of the PAT without the need of acoustic signals.
- Develop guidelines on the locating signs of PATs.



Visual

- Street furniture or other objects should not obstruct the surroundings of the PAT.
- Ease detection of the PAT.
- Same as physical.
- Need of standardisation of a system of detection for blind people (usable in traffic lights, PAT detection, orientation...)



Cognitive

- All the signs to locate PATs should have a consistent and easy-detectable look.
- Same as auditory.



Requirements

Standardisation



Dexterity

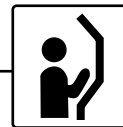
- The user has to be able to approach to the PAT from any flank.

- Same as physical.



Combination

- None identified.



Physical Handling



Public

- Everybody must reach all the interaction buttons, slots, and operation points and obtain all the feedback from the PAT.
- The PAT must allow a correct approach of everybody to it from any flank.

Requirements

Standardisation



Physical

- To situate all the operation points accessible for a wheelchair user.
- The screen must be readable by a wheelchair user or a tall pedestrian user.
- Create standards on accessibility to PATs (compilation of existing recommendations).



Auditory

- To duplicate all the acoustic detection output with visual outputs.
- Create standards on detection and recognition of a PAT.



Visual

- Easy detection and recognition of all the operating points of the PAT.
- Logical distribution of the operation points attending to the interaction process.
- Create standards for the different operation points (tactile recognition).
- Create guidelines on distribution of the different operation points.



Cognitive

- People must recognise easily what type of machine it is and what it will do.
- All the interaction points (slots, buttons, screen buttons) must be easily detected and recognised.
- Different PATs with the same function must be similar.
- Create standards on PAT recognising (labels, legibility).
- Create standards for the different operation points (card or coin slots, printer output) in detection and communication with other devices or PATs.



Requirements

Standardisation



Dexterity

- To allow the interaction with the different operation points.

- Same as physical.
- Create standards for the different operation points (mainly with anti-slide properties of materials).



Combination

- The operation points must have feedback (acoustic, tactile and visible).

- Create standards on operation points (shape, colours, feedback, dimensions) either if they are physical buttons, buttons in a tactile screen.



User Interface (UI)



Public

- Common functions, either within different PATs or within different services in the same PAT, must have the same user interface.
- The user interface must have a consistent graphical representation.

Requirements

Standardisation



Physical

- Tall pedestrian users and short wheelchair users can have parallax problems in the display-side button system and precision problems in the tactile screen system.
- Create standards on the user interface with regard to typefaces, legibility, sizes, colours and graphical representations.
- (NB EN 1332-1, Annex A, to be developed, will provide graphic representations).



Auditory

- All the acoustic feedback must be visual at the same time.
- Possibility to adjust the acoustic signal feedback and volume.
- Create standards on feedback typology: how to activate the different outputs (speech, visual...), message typologies, tactile feedback...
- Create standards on hearing aid users (inductive loops, possibility to plug in hearing aids).



Visual

- The entire user interface must be "readable" by a visual impaired person.
- Utilisation of standard layouts for keypads.
- Create standards on "blind" navigation and its activation.
- Use the standardised keypad layout (EN 1332-3) on Public Access Terminals.



Requirements

Standardisation



Cognitive

- Reproduce graphical representations of common functions.
 - Ensure that the same functions are made under the same user interface.
 - Have a continuous feedback from the PAT while it is processing the information.
- Create standardisation on consistent graphical representations. (NB EN 1332-1, Annex A, to be developed, will provide graphic representations).
 - Create standardisation on feedback typology (as auditory).



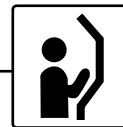
Dexterity

- For manual dexterity the dimensions of the operation buttons are priority.
- Same as physical.



Combination

- The location of the different buttons in the screens must be repetitive and logical. Feedback requirements: simple expressions and short sentences.
- Create guidelines on standard layouts for tactile screens.
 - Create standards on "language" feedback (both acoustic and visual).



Operation



Public

- Currently, young people used to work with computers are the main users of the Public Access Terminals. In order to avoid training with the different PATs it is necessary to develop standards on the operating sequence.
- Different PATs with different functions must have a similar logical operation.

Requirements

Standardisation



Physical



Auditory



Visual

- None identified.



Cognitive

- The location of the different operation points in the PAT must coincide with the logical sequence of operation and the utilisation of each operation point.
- Many elderly or cognitive impaired people need more time to read and understand the different screens of the PAT.
- Create standardisation on the sequence of interaction with a PAT and the feedback to the user (detection of the active operation point).
- Create guidelines on the location of the different buttons and operation points in the PAT.
- Specify minimum times for time outs.



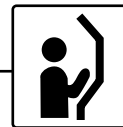
Dexterity

- In those operations requiring money transaction the operation process must be secure against making mistakes with the operation buttons.
- Create standards on the sequence of interaction with a PAT (same as cognitive).



Combination

- The user should know what the PAT is asking him (if it is waiting a card, coins, an answer to a question).
- Create standards on the sequence of interaction with a PAT (same as cognitive).



Adaptation to User Profile



Public

- Although we are trying to design Public Access Terminals accessible to everybody, some characteristics of the user interface and the operation process can be tailored to special needs of the user.
- Some of these characteristics can be: language, size of the messages and labels, time between different displays, speaker volume, operation typology. Many of these are specified in EN 1332-4, although not widely implemented on PATS.

Requirements

Standardisation



Physical

- Adaptation of the user interface or operation process to specific physical requirements of the user.
- Implement EN1332-4 on different user devices.



Auditory

- Adaptation of the user interface or operation process to specific auditory requirements of the user.
- Same as physical.



Visual

- Adaptation of the user interface or operation process to specific visual requirements of the user.
- Same as physical.



Cognitive

- Adaptation of the user interface or operation process to specific cognitive requirements of the user.
- Same as physical.



Requirements

Standardisation



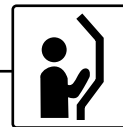
Dexterity

-
- Adaptation of the user interface or operation process to specific dexterity requirements of the user.
 - Same as physical.



Combination

-
- None identified.



Security of Operation



Home

- No need for special characteristics to assure the security of operation.



Public

- If we have in mind that Public Access Terminals allow people to carry out transactions related with their identity, the privacy of the operation must be assured.
- The PAT, the site where it is located and the communication with other devices must minimise the risk of interception of private information.
- At the same time, outdoors environments can be very corrosive. So, the PAT must be robust and resistant.

Requirements

Standardisation



Physical

- None identified.



Cognitive



Dexterity



Auditory

- Some hearing impaired people could need a higher volume of the acoustic feedback, which can be heard by people near the PAT.
- Create standardisation on how acoustic feedback can be secure for the user.



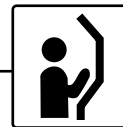
Visual

- Some visually impaired people may need larger type, which can be read by people near the PAT.
- Create guidelines on how to improve the safety of the terminal.



Combination

- The lack of security in the PAT is one of the main reasons for not using the terminals.
- The privacy of PIN codes, bank accounts and electronic cards codes must be assured.
- Same as visual.
- Improve secure transaction using telecommunications (SSL.).



Conclusions

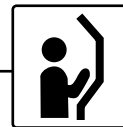
Firstly, this ICT domain needs to be treated as a whole, not just as an assembly of different components of other ICT services/products, such as smart cards, PC devices (screens, keyboards).

Secondly, the different standardisation bodies should take into account that, in the near future, the interaction with Public Access Terminals will

be very frequent. In order not to exclude people from the self service, we must ensure that the diversity of the population is taken into account in standardisation.

More detailed standardisation needs and suggestions on which standardisation body could carry out recommendations are shown in the following table.

STANDARD	CEN	CEN-ELEC	ETSI	ISO
Develop standards on the detection, location and recognition of telecommunication devices and Public Access Terminals in concrete. (ENV 1332)	X		X	X
Develop standards on accessing to the Public Access Terminals operation points. (ENV 1332)	X			X
Develops standards on detection, location and recognition of the different operation points of the Public Access Terminal. (ENV 1332)	X			X
Develop standards on the sequence of interaction with a Public Access Terminal and the feedback to the user (detection of the active operation point).	X		X	X
Develop standards on the interaction between the Public Access Terminal and different user assistive technology devices.	X		X	X
Develop standards on the interaction between the Public Access Terminal and different system assistive technology devices.	X		X	X
Develop standards on interaction between Public Access Terminals and hearing aid users (inductive loops, possibility to plug in hearing aids, connector and protocol for external audio amplifier).			X	
Develop standards on the use of communication devices (telephone layout, keyboards) (EN 1332-3)	X		X	X
Develop standards on speech recognition.	X		X	X
Develop standards on synthetic speech.	X		X	X
Develop standards to adapt the Public Access Terminal to the user needs (interaction with smart cards, infrared controls).(EN 1332-4)			X	X
Develop standards on consistency of user interface (to ensure similar interaction in common services). (EN 1332-1)	X			X
Develop standards to provide the same service on many terminal types.	X			X



STANDARD	CEN	CEN-ELEC	ETSI	ISO
Develop standards on each public access service (tourist information, note and coin operating machine, self-vending machines) to unify their behaviour.	X			X
Develop standards on the user interface with regard to typefaces, legibility, sizes, colours and consistent graphical representations.	X			X
Create standards on user interface symbols and pictograms. (EN 1332-1, Annex A)	X			X
Create standards on "blind" navigation and its activation.	X		X	X
Develop standards on feedback to the consumer, attending to the output (auditory, tactile, visual), message typologies, feedback sequence.	X		X	X
Adapt existing standards and guidelines for tests of usability to include Public Access Terminals.	X			X
Develop standards on secure design of the Public Access Terminals and its location site.	X			X
Develop standards on secure feedback for the user ("large" acoustic and visual feedback).	X			X
Develop standards on the improvement of safety operation of the Public Access Terminal and error protection.	X			X
Develop standards on secure transaction using telecommunications (SSL).			X	