

ETSI's standardisation work on guidelines for young children's use of ICT products and services

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Abstract

ETSI (The European Telecommunications Standards Institute) has a major programme of work, going back 4 years, which targets the accessibility and security of ICT products and services for young children under the age of 12 years. Young children are very important in the eSociety; they are the future of the current European Information Society. The 'design for all' and universal design approaches have emphasised the requirements of older people and those with specific needs. However, the needs of young children have often been neglected. This work by ETSI was the first standards work in this area, and it is widely recognised by child agencies, the industry in general, and the EU. Global standards organisations are following this lead to expand their scope to include the needs of young children.

This paper reports on the work that ETSI has conducted to date.

Key words: Young children, Standardisation, Design for All

1. Background

ETSI (The European Telecommunications Standards Institute) has a major programme of work, going back 4 years, which targets the accessibility and security of ICT products and services for young children under the age of 12 years.

The first project, STF201, defined the needs of young children for ICTs and defined the need for new guidelines for the design and deployment of ICTs, which target young children as users [ETSI (2003)]. This was followed by STF266, which has just produced new design guidelines [ETSI (2005)]. This will be followed by a new project STF QC, which will provide guidelines for service providers.

2. STF201 – Requirements capture

This project, the first to deal with children under 12 years of age, began in January 2002. Its objective was to review the human interaction issues for access to ICT (Information and Communications Technology) by children and provide guidance on how these should be dealt with by ETSI..

The work followed the usual schema for ETSI STFs, i.e. research, drafting the new Technical Report, and consultation with stakeholders.

The final output of the Technical Report ETSI TR 102 133 [ETSI (2003)] provides an overview of children and their ICT requirements at various developmental stages, going on to propose a framework for the systematic investigation of children's use of ICT. This framework addresses child development in terms of social, cognitive and physical maturation, and illustrates how a composite of these three dimensions may be used to uncover central issues related to the child's use of ICT products and services. Issues related to the physical operation of ICT, the requirements of dialogues for children's use, and such factors as legal and ethical concerns are also addressed. The report concludes that "Children, as ICT users, are in most respects differently able than their adult counterparts. Only if their abilities, needs and requirements are studied, understood and differentiated, can working, understandable and accessible ICT solutions be offered."

The conclusions in the report were based on reviews of relevant literature, surveys of media coverage of issues, organised stakeholder consultations and informal consultations with representatives from industry and academia. The report further recommended that the conceptual and procedural framework that resulted from this initiative should be used for the development of distinct sets of guidelines for (a) product designers, (b) service providers and (c) standardisation organisations.

The main issues raised in the report are highlighted below:

2.1 Design issues

Children, as ICT users, have different abilities than their adult counterparts. Only if their abilities, needs and requirements are studied, understood and differentiated, can working, understandable and accessible ICT solutions be offered.

It is recommended that:

- The analytical approach described in clause 5 of the TR is recommended as a conceptual and procedural framework for the development of ICT products and services.
- Representative descriptive studies of ICT use among children should be encouraged and promoted.
- Gender and cultural differences (including language) are not thoroughly understood as they relate to product and service design for children.
- Guidelines for product evaluation for children need to be tailored specifically to children.
- Children instinctively share their experiences. A better understanding of this process is needed in order to design better products and services.

2.2 Market issues

A better understanding of the market for ICT products for children and its characteristics is urgently needed. The market's transient nature makes it difficult to market relatively high-priced products to children and their parents.

It is recommended that:

- Studies of the market for ICT products for children need to be undertaken.
- Technology that grows with the child is needed. Developers as well as parents are unwilling to invest in expensive techno-toys and ICT devices that are discarded after a short period.

2.3 Health and safety concerns

There is still a great deal of confusion and misinformation about the health and safety concerns from some ICTs.

It is therefore recommended that:

- Radiation from mobile terminals and its effect on children needs to be addressed and monitored by independent bodies. In addition to traditional laboratory studies, effects on physical development need to be monitored specifically.
- Little is known about the social, physical and cognitive impacts of ICT use on child development.
- Descriptive studies grounded in theoretical models as well as research focusing on specific benefits and vulnerabilities must be encouraged.
- Children's susceptibility to repetitive strain injuries (RSI) is poorly understood.
- Research on RSI in relation to specific user interfaces and services is needed, e.g. the use of SMS on mobile terminals.
- The impacts of prolonged use of visual displays on the development of vision is poorly understood. Survey data gathered in 2000 indicate that children between 2 and 17 with access to computers, video games and television spend about 5 hours a day in front of some form of visual display (screen). Research on the impact of prolonged use of various types of visual displays on the development of vision must be encouraged.
- Typically, the child's ICT workplace is not tailored to match the physical dimensions and ergonomic requirements of children.
- Proper workplace design in schools, libraries and homes needs to be addressed as a preventative measure as well as to secure access for all. Guidelines that can be applied by non-professionals should be produced.
- Poorly designed and outdated ICT products are more likely to find their way into the hands of children.
- Schools should be provided with guidelines that can be applied to the evaluation of new as well as second-hand equipment that is donated to them by companies and government agencies.

2.4 Security and privacy concerns

- Age verification mechanisms independent of identity are needed.
- European standardisation bodies and activities investigating and/or proposing identity verification schemes should be made aware of the need for reliable age verification mechanisms that do not compromise the on-line anonymity of children.
- Parents, libraries and schools are requesting improved content control mechanisms. Such mechanisms should not filter out useful content.
- Online marketing targeting children and increasing use of personal profiles is expected to increase and must be controlled. Regulatory measures are needed, and need to be effectively enforced.
- There needs to be a critical focus on and monitoring of ICT products, applications and technologies that can be used for the purposes of (1) eliciting personal information in order to compile individual profiles on children, (2) tracking children's online activities, (3) designing personalised advertising aimed at individual children (microtargeting), (4) luring children with branded environments and (5) seamlessly integrating advertising and content.
- Mechanisms for parental consent in connection with sales transactions initiated by are needed.

- ETSI task forces and activities working in the area of online commerce need to take onboard issues related to sales transactions carried out by children with reference to the security and consent issues outlined above.

2.5 User interface design issues

- Help facilities, guidelines, manuals and documentation for children need to be better understood and produced.
- The specific benefits for children of common interactive elements in mobile user interfaces should be investigated and explored empirically.
- The availability of common, basic interactive elements increases the transfer of learning between devices and services and improves the overall usability of the entire interactive mobile environment. Such a transfer becomes even more important in a world of ubiquitous devices and services. Simplifying the learning procedure for end-users will allow for reuse of basic knowledge between different terminal devices and services and lead to a faster and easier adoption of new technologies, fully benefiting the end user without restricting the manufacturer's wish to use user interfaces based on a corporate look-and-feel and the overall user experience as a competitive edge.

2.6 General accessibility issues

- Any "Design for all"-approach must include the youngest users, if and where they are part of the targeted user group, differentiating abilities and requirements.
- Accessibility requirements cannot always be satisfied for all users. Therefore, it is important to support assistive devices in order to be able to display larger font sizes or provide higher volumes of speech output to those who require it. Similar user requirements are to be found when accessing devices and services with multimodal user interface capabilities that need to be adapted to the user's needs, e.g. a blind person retrieving a written short message or a non-literate child wanting to call their parents by speaking their name instead of entering the digits of their telephone numbers.
- Guidelines for connection of various assistive devices to mobile terminals need to be developed.
- When acquiring new hardware and software, schools should consider options that incorporate Design for All features to facilitate access to computers for all students, including those with special needs.
- Efforts by libraries and other community and public access centres to include components within their technology programs focused specifically on children should be encouraged.

2.7 Proactive issues

- The implications of anticipated future products and services need to be understood. Examples of such systems are communicating, networked, smart toys, image sharing (MMS and Internet), mobile edutainment and awareness systems.
- Technology and service development activities need to be monitored in order to try to anticipate and evaluate their impact on children.
- Specifically, implications of 3G (multimedia mobile terminals) need to be explored from the perspective of usability, content control and marketing.
- Speech interfaces are very appropriate for pre-literate children and children who lack the strength and co-ordination skills needed to use other types of input devices, but these are not designed for young children. Research on speech interfaces that take into account the vocal qualities of children needs to be undertaken.

3. STF266 – Design guidelines

Following the success of STF 201, STF 266 has been working on producing Human Factors Guidelines for the design and deployment of ICT products and services used by children. This ETSI Guide, EG 202 423 [ETSI (2005)], was published in October 2005. The guide provides input to the design processes of ICT product and service providers, and for Design for All processes, where the main target user is young children.

The guidelines include specific guidelines in the following areas:

3.1 Physical Interaction with ICT

General guidelines

Physical characteristics of devices

Input devices

- Keyboards and buttons

- Pointing and selection devices

- Other input devices

Output devices

Child ergonomics

Health and Safety issues

Consumer regulation and public procurement issues

3.2 Operational issues of terminals and services

Comprehending instructions

- Style and format of language

- Jargon

- Labels and abbreviations

- Symbols and icons

- Notification of status

Configuration and set-up

- Control of outgoing calls

- Control of incoming calls

- Identification as legitimate user

Operation

- Turning on a device

- Initiating a communication

- Receiving a communication

- Ending a communication

Navigation

- Metaphors

- Menus

- Speech recognition interfaces

- Help facilities

- Error handling

Handling of information

3.3 Services

- Generic guidelines for services
 - General
 - Service availability and access
- Voice call services
- Messaging services
 - Text and data messaging
 - Voicemail (voice messaging)
 - Instant messaging
- On-line gaming
- Transactional services
- Emergency call services
- Passive location and positioning services
- Internet access, browsing and applications

3.4 Content

- Appropriateness of Content
 - Comprehensibility to children
 - Harmful content
 - Interpersonal Communication
 - Moral, ethical and cultural diversity
 - Ability to exchange information within an acceptable use policy
 - Misleading and misunderstanding by children
 - Subliminal persuasion within content
 - Enabling purchases without adult consent
 - Boundaries to data-mining customers behaviour
 - Social Interaction
- Practical Safeguards

ETSI efforts in this area have not gone unnoticed. Great efforts have been made to disseminate the work at conferences and workshops, including; the Mobile Service Strategies to the Youth Market in Barcelona (October 2004); the User Profile workshop organised by ETSI STF 265 (October 2004); the Human Factors and the Digital Home Workshop in Sophia Antipolis (October 2004); the Social Aspects of Communications Technologies Workshop in Newcastle (November 2004); and the Future Generation Conference in Sophia Antipolis (December 2004).

The culmination of the work was a stakeholder workshop held in Brussels (April 2005) at which there were participants from a full range of stakeholders including representatives from mobile operators, telecoms services providers, government bodies, standards makers, child interest groups (including disabled children's groups), representatives from the Safer Internet Programme, from the European Commission and academia.

4. Results and conclusions

The key results from the ETSI work to date are as follows:

4.1 Children under 12 are not just a sector of the normal market for ICT products and services:-

- they don't have the intellectual maturity to be full players in the market;
- the use of modern ICTs, such as the Internet and 3G phones, increases the risks to a child's social development, and to their security.

4.2 Children (under 12) are, in effect, a 'protected market':-

- parents, child agencies, and regulators act as protectors of young children, and effectively as 'gatekeepers' to this market;
- young children should not be treated as 'small adults', and products and services need to be designed specially for young children;
- young children cannot legally engage in transactions.

4.3. Technology solutions aimed at increasing security are weak regulators:-

- filters and blocking agents depend on operational intervention (set up, monitoring, etc);
- all such solutions can be defrauded, either by the children themselves, their peers, or, more worryingly for parents, by those seeking to prey on a child's vulnerabilities.

4.4 There is an urgent need for a voluntary code of practice (Guidelines), which will moderate suppliers activities in the market for products and services for young children:-

- this is current EU policy, as outlined recently by Commissioner Reding in a speech in Luxembourg¹;
- the new Guidelines must deal with future products and services, as well as current ones (e.g. Location Based Services on a child's phone);
- to make technology solutions effective, service providers may need to ensure that they are formally aware that a particular handset/terminal is being used by a child under 12.

To make any new guidelines work, there must be a wide consensus in the industry, and child agencies (representing young children) must also approve. This is the next phase of the ETSI work. A failure of this process could lead into an uncoordinated and ad hoc, over regulation by public administrations, at enormous cost.

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5. References

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¹ Safer Internet Conference on Child Safety and mobile phones. Luxembourg 14 June 05