



# Standards for Business

## ETSI White Paper No. 2 Young Children and ICT – current issues in the provision of ICT technologies and services for young children

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## **About the author**

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Anne Clarke is one of Europe's leading experts on the impact of ICT on young children. For the past 4 years, she has been leading ETSI's programme of work in the Human Factors Technical Committee defining the issues in this important area, and developing guidelines for the industry. As a result of this work, young children are now seen as a key sector of the European Information Society. Other standards organisations are now also adopting this approach.

Following a bachelor's degree in ergonomics, and post graduate research for a number of public utilities, Ms Clarke joined the research staff of the Human Factors Department of Loughborough University. As a researcher and project manager with HUSAT, the Human Factors Institute, she led a number of international human factors research programmes, funded by the European Commission. She was Chairman of the IS&N group of projects working on advanced communications projects, and for the related series of international IS&N conferences. She also participated in several projects looking at the longer term future of technology development. She is also a member of the Permanent Steering Committee for the Human Factors in Telecommunications (HFT) series of biennial research conferences.

She now acts as an independent consultant to the telecommunications sector on human factors issues. Her work with ETSI, supported by Telefonica, has led to a number of publications and conference presentations on the impact of ICT on very young children.

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# **Young Children and ICT – current issues in the provision of ICT technologies and services for young children**

**March 2006**

This White Paper highlights some of the current concerns about the use of Information and Communication Technologies (ICT) by young children, particularly those under the age of 12 years. It describes several initiatives (including work being done by ETSI) which aim to better understand and address those concerns.

The White Paper is based on an article written by the author for the Human Factors in Telecommunications conference in March 2006.

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## FOREWORD

The work of the ETSI Human Factors Technical Committee covers many important areas of ICT product and service design and deployment. These include the development of user profiles, the design of novel multimodal interfaces, and the preparation of important guidelines for the industry about the interaction between people and ICT. Human Factors have become an essential facet of ETSI's standardisation work.

For the past 4 years, Anne Clarke has been leading ETSI activities in relation to the impact of ICT on young children. This area of the European Information Society has often been neglected, and undeservedly so. Our children are the future of the new global knowledge economy, in which Europe is a leading participant. Today's young children are tomorrow's knowledge workers and entrepreneurs. It is therefore essential that they are able to fully experience the power of modern ICT during their formative years.

This paper summarises the current issues in this vital area. It outlines the work which ETSI's Human Factors Technical Committee has already supported, and proposes new areas in urgent need of investigation and research. Anne and her teams of co-workers have produced outstanding results, which have been widely accepted, and incorporated into current practice.

As Chairman of ETSI's Human Factors committee I am delighted to support ETSI's work to improve safeguards for young child users of ICT products and services.

*Stephen Furner, BT plc*  
*Chairman ETSI Technical Committee HF*

# **Young Children and ICT – current issues in the provision of ICT technologies and services for young children**

Children are now a substantial segment of the market for Information and Communications Technologies (ICT) products and services in Europe. It is estimated that this market will be worth over €30B in a few years. Informal evidence suggests that the most popular Christmas present this year for children as young as 6 years of age was a mobile phone. In schools throughout the European Union (EU), children under 12 years of age are using the Web every day [Livingstone (2005)] [1].

All stakeholders in this area recognise the particular vulnerabilities of young children who are still developing physically, socially, and emotionally. Speaking at a meeting in Luxembourg in June 2005, Information Society Commissioner Reding called on stakeholders, and particularly on the supply side, to make special provision for young children in their activities<sup>1</sup>. For four years, The European Telecommunications Standards Institute (ETSI) has been leading research and consensus establishment in the area of ICT products and services for young children under 12 [Clarke et al (2006)] [2]: much of this work has been carried out with funding from the European Commission and the European Free Trade Association (EFTA).

The objective of this paper is to review issues in the market for ICT products and services for children, particularly those under 12 years of age. Although much has been successfully completed, there are still major concerns for the safety and security of young children who are using ICT products and services.

## **1. The risks to young children from the use of ICT**

It is self evidently true that young children today face risks. These risks include everything from the difficulties of crossing the road to the malign intent of some adults in our society. The scale of the risk is sometimes exaggerated, especially by tabloid newspapers more intent on volume sales than the accuracy of information. Some of the risk is more in the perception of adults than research statistics would support. For example, the number of children who go missing each year, or who fall prey to malevolent adults, is a very tiny proportion of the total child population. Nevertheless, we must accept that there are risks.

To these risks, which arise generally in society, we must add the additional risks to which young children are exposed through the use of modern ICT products and services. Here too, we must distinguish actual risk from the perception of risk. It is clear from extensive research that there are some risks: these additional risks mainly arise from two sources. The first is physical safety concerns about the actual equipment. Repetitive Strain Injury (RSI) caused by very young hands using a keypad designed for adult hands, known colloquially as 'sms thumb', is an example. These risks are due largely to poor physical design, which is addressed in detail in a new set of design guidelines for ICT products targeted at young children, published as ETSI Guide EG 202 423 [3].

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<sup>1</sup> Safer Internet Event on Child Safety and Mobile Phones in Luxembourg, 14 June 2005.

The other major category of additional risks for young children arises from the main characteristic of modern ICT. Mobile phones, email, and the Internet are communications products and services. The risks to young children arise because of the ability of the product or service to enable the child to communicate. While communication with family and close friends is considered essential for the child's social development, what is less desirable, and very troubling for parents, is the thought of the child communicating with unknown or undesirable contacts through text messaging, email, chat rooms or other forms of electronically mediated interaction. Also included in this category is the case of young children who gain access to harmful content (as a form of communication). At the extreme end of the spectrum of these concerns is the thought that such interactions might be taking place unsupervised, and lead eventually to 'grooming', and to the most disastrous consequences of a child being harmed.

There is a third category of risk, which arises from the misuse and abuse by the children themselves, as discussed in the next section.

The incidence of actual harmful consequences to young children due solely to their use of ICT is, thankfully, tiny. However the concerns remain. As the market for services to young children grows, these concerns are unlikely to decline, without appropriate actions by the industry in concerted action with parent groups. The primary responsibility for the protection of children must lie with their parents/guardians. However it must be recognised that this ideal might not be realised in each and every case, despite earnest effort by all concerned. Even in the ideal case, there remain actions which service providers can take to reduce even the smallest risk.

## **2. Social consequences of large scale deployment of ICT**

The use of new technology in ways never originally envisaged has consequences for society. For example, the misuse of the mobile technology by the children themselves has given rise to a subculture of ICT abuse among the young, and also among some older children. Examples include bullying by means of text messages, bluejacking<sup>2</sup>, and 'happy slapping', a form of common assault, the motive for which includes the ability to make a recording of the assault on camera phones. Another example is the proliferation of the 'Am I hot or not?' rating type web pages, where young people are being encouraged to make cruel, and even offensive comments about each other, or about their teachers, parents etc.

These social consequences arise through providing young children with new communications facilities without having a clear understanding of the child's needs for communication or their ability to deal with new communications channels. There is also the failure to encourage positive usage and to discourage, or prevent, usage leading to negative social consequences.

Much of the work on these types of behaviour requires a deep understanding of child development and behavioural psychology, and of the feedback between new

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<sup>2</sup> Sending anonymous text messages or images to other phone users via Bluetooth® short-range radio.

communications capabilities mediated through technologies and antisocial behaviour among young children. Given that we, as adults, struggle to cope with the demands of today's 24/7, broadband communications world, then we cannot expect our children to fare better. The questions parents and child experts are asking are firstly how to deal with such emergent behavioral trends, and secondly what assistance can they expect from the technologists, and others, who work for the ICT product and service providers? Surely we do not advocate a strategy where the industry deploys, and the rest of society must deal with the consequences, however uncomfortable and worrying these consequences may be for our children?

### **3. Why young children are a 'protected market'**

Due to the supervisory and oversight functions and obligations of parents, the children's market has features which are unique. In effect, without the approval of parents, it is very difficult for suppliers of any product or service targeted at young children to succeed.

The market also relies to an extraordinary extent on "pester power". The customer, in this case a young child, is insufficiently aware of the features of the product or service, because they are too young. Thus marketing and advertising relies on the child's perception of need, and on the child pressing the parent hard to buy the product or service. There has been much discussion of this particular feature of the market for other, i.e. non-ICT products, including possible action by various regulatory authorities to curtail the actions of suppliers [Which? (Jan 2006)] [4]. The question of the use of pester power remains an issue for ICT service providers.

In addition to all this, it has been shown that young children need products specially designed to take account of the fact that their physical faculties are not yet fully developed. Hands, fingers and eyes do not have the same characteristics as those of adults. Because of these particular characteristics, it is better for suppliers in general to consider young children as a 'protected market'. It is clear that young children do have needs. Specifically, they have needs, commensurate with the stage of their development they have reached, for ICT products and services. However, acquisition of such products and services has to rely on the purchasing power of parents. Furthermore, since young children cannot legally enter into contracts, they have to rely on the parent in this respect as well.

All of this means that suppliers of ICT products and services for young children have to behave differently than they would if the market was made up of adults. Hence the use of the term protected market.

### **4. New technologies likely to increase the risks for young children**

Today's ICT are about to be replaced and superseded by a new range of communications products and services. The next generation of ICT products and services will extend the power, reach, and universality of interworking and internetworking products. Pervasive, ubiquitous and ambient computing products, embedded and wearable communicating devices, and *ad hoc* networking

technologies will bring a paradigm shift greater than that precipitated by the telephone, the internet and the mobile phone taken together.

The scope and scale of the communications pathways in today's information society defines the fundamental characteristics of the modern world. Email, chat rooms, the mobile phone, web blogging and the ubiquitous power of the press, and of radio and TV broadcasting services, drive the current information age. Instant and worldwide information dissemination is the norm. News of earthquakes and the destructive power of hurricanes arrives in real time. Nobody with a mobile phone is out of reach of friends and family. If we now propose to change fundamentally the way the next generation of communications technologies enables interpersonal communication, then we have to be aware that there will be new social consequences.

This is especially the case for young children. The main concern will be that the risks of harmful contacts, outside of direct parental supervision will increase. As an example of an emerging technology, consider Location Based Services (LBS). Today, the accuracy of the location is limited to the size of the mobile cell in which the mobile phone is operating. The question parents are asking is "If I can establish the location of my child with this technology, can anyone else do this?". Even with safeguards in place, the activities of hackers and the perverted actions of those who prey on young children could make a child less safe because of this technology. Law enforcement authorities in a number of countries are becoming increasingly concerned about this technology.

Next generation LBS will put satellite positioning technology into mobile phones. This will improve the accuracy of location to about 3m. Will this make a child more or less safe? If *ad hoc* networking capability is then added, where the child's mobile can form communications sub-networks with anyone else on a street who has a mobile phone, will this make the child more or less safe?

LBS is just an example. Other examples include on-line gambling (the natural extension of on-line gaming), access to video streaming of harmful content at broadband speeds on mobile technology, and the extensive use of automatic subscription services, seen today in the ring tones phenomenon, but easily extensible to much more costly services in the future. All of these technology trends present new challenges for young children, and for their parents, who are struggling to cope with the downside of today's technology. What will parents need to say to their children a few years from now about safe use of communications technologies? How much do we expect parents to know in depth about modern ICT and how they operate?

## **5. Best practice ICT education for young children**

It might be considered that all of this argues for strict education of young children in the features, good and bad, of communications products and services. Clearly, education has a major role to play. Best practice examples, including safe texting and searching guides, and guidelines for better chat room practice will help.

At a more fundamental level, there is a list of important questions about young children and ICT which need to be addressed. This list would include questions such as:

- At what age should a young child -
  - own a mobile phone?
  - have their own domain name?
  - create and maintain their own web page?
  - start blogging, or MSN type messaging, or using chat rooms?
  - be allowed to use chat rooms unsupervised?
- Do parents have a right to look at a child's text messages, emails, or blogs? Until what age?

There is a clear need to develop a set of age related digital competencies for young children, analogous to similar age related literacy or numeracy skills competence. Young children today are growing up in an Information Society, and will, as adults, work predominantly in the knowledge economy. This implies that in a real sense the future of the European knowledge society is today's 4 to 12 year olds. They learn and play with ICT in the same way as previous generations used pencil and paper, slide rules, and printed dictionaries. A range of achievable, age-related digital competence goals needs to be established, in order to help teachers and parents ensure that young children are not just familiar with mobile phones and internet terminals. Young children must also be educated about the risks, real and perceived, and be shown best practice examples of ICT use commensurate with their social development. This will be one of the issues to be researched in the new ETSI project on guidelines for service providers, which is to start soon<sup>3</sup>.

## **6. The responsibilities of parents of young children using ICT**

Service providers, politicians and regulators are very quick to point out that parents are fundamentally responsible for a child's education, security and even behaviour (witness the ASBO (Anti Social Behaviour Orders) culture in the UK). For instance, Steve Ballmer, chief executive of Microsoft, said that parents had a duty to educate their children about how to stay safe online [5]. However, most parents today are not sufficiently aware of the features of today's ICT products and services. Of course some are quite advanced, knowledgeable users themselves, but this does not mean that even they necessarily understand the full implications of products and services in use by young children. In addition, there is a large percentage who freely admit that they cannot even operate the TV remote control, let alone surf the web or configure mobile phone features. Stephen Carrick-Davies of the UK based children's charity Childnet says "most parents have no idea of how file sharing works, or that many of their children are downloading files illegally" [6].

This means that awareness actions, such as INSAFE, have much work to do to inform parents about modern ICT. In particular, and as mentioned above, parents need help to understand the communications potential of modern ICT. Understanding this issue alone would provide a powerful impetus for parental supervision and

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<sup>3</sup> An ETSI Specialist Task Force on "Specification and guidelines for service providers on the provision of information services to children" is expected to start in April 2006, with funding from the European Commission and EFTA – for more information see <http://portal.etsi.org/stfs/Activestfs/activehome.asp>

monitoring of their children's communication practices. Of course, this is a social and psychological dilemma for parents. When to intervene, how to deal with 'suspect' activities, what to say to young children whose friends and peers appear to be allowed freedoms that are worrying, these, and many other challenges need to be met by today's parents. Indeed this is not a new challenge for parents, who have struggled with similar concerns for generations. What is new is the pervasiveness and portability of modern ICT, which result in increasing communications activities by young children away from adult supervision.

The ICT industry can do more to help here – more than exhorting parents to greater effort, or producing leaflets and booklets of guidance for parents [Vodafone (2005)] [7], helpful though they may be. The industry, taking its corporate social responsibility seriously, can curtail and restrict some aspects of ICT services for young children in order to remove the worry for parents at source.

## **7. Corporate social responsibility**

Our concern here is about what parents think about exposing their children fully to the market, and to the actions of service providers. Theoretical considerations about the nature and control of markets are beyond the scope of this paper. However, there are practical concerns, and direct actions, which service providers in the ICT sector could address, if there was general agreement to do so. The background to this is the legal framework within which all service providers operate, and in particular the data protection legislation [EC Directives (1995 & 2002)] [8] [9].

The main question here is whether service providers, acting together, should consider a voluntary restraint of normal practice, when the customer is a child under 12 years of age? A range of possible restrictions could be discussed. Some of these restraints might include a ban on automatic signup messages (for example for ring tones), and a restriction on direct financial transactions. The possibility of a ban on access to Location Based Services on children's phones should be top of the list.

More generally, this raises the question of whether or not service providers should be told that a particular product or service is in use by a young child. For example, if there was a requirement to make service providers aware that a mobile phone, or some web service, was being used by a young child, then it would make further actions by service providers in the interest of better child security easier. It could also be argued that this would protect service providers from possible legal action if it were proved that a child or indeed children generally had in some way suffered as a consequence of actions of the service provider.

The technical and administrative issues this raises may, initially at least, cause many service providers to reject this idea. Someone, the child's parents most likely, would have to inform the service provider that a particular product or service is in use by a young child. Parents would need reassurance that such a database of child users was totally secure, and that access to the data was only by authorised and trained staff. From the service providers' viewpoint, the extra costs of administering such a system might be substantial, but they would not be prohibitive.

However if we now look at the data protection considerations, it might be argued that a young child cannot be aware of the consequences of a purchase of an ICT product, or agreeing to an action which potentially allows their personal details to be used in the same manner as that of an adult. This in turn might argue that the service provider needs to be aware that a particular customer is a young child.

The general case about market forces, free trade, and the characteristics of today's economic framework is not under discussion here. What is needed is an open discussion of the costs, and benefits, of specific actions for both sides, parents and children as well as service providers, within the existing legal framework, including data protection.

What must be avoided, if at all possible, is over-regulation of the sector. If national administrations are moved to action by the concerns of parents and parent groups, then the industry as a whole will have to face the consequences. This will not necessarily make children any safer. However, the consequent costs, both financial and in terms of negative publicity, would be very large.

## **8. What has been done so far?**

Much good work is being undertaken at a European level with regard to young children's ICT use. For example the EU Safer Internet Programme<sup>4</sup> aims to raise awareness of the safer use of the Internet by children. There are a number of projects under this umbrella, such as INSAFE, SAFT, AWAREU. The European School Net exposes many of the issues in relation to ICT use by children.

For the past 4 years, ETSI has been investigating the standardisation issues in relation to ICT use by young children. In particular two reports have been produced: Technical Report TR 102 133 [10], published in 2003, focussing on the issues in relation to ICT being used by young children; and ETSI Guide EG 202 423 (2005) [3] which looks at design guidelines for ICT products and services to be used by children under 12.

The use of ICT by children is seen as a 'hot topic' within the industry. For example, a number of mobile operators within the UK have set a Code of Practice for new forms of content on mobile phones [O2 et al (2003)] [11]. As part of this a classification framework will be established to classify content as not being suitable for under 18's. This needs to be extended to differentiate content that is appropriate for children of different age groups. The UK Home Office has also worked on a code of practice for providers of location based services [12], and on the moderation of interactive services for children [13].

Access by young children to pornographic and other inappropriate content via the internet is of concern to many parents and guardians. Much effort, and some blind faith, has been invested in blocking software and content filters. However, there remain doubts about all filtering technologies. Firstly, they need maintenance and supervision by adults. Secondly, they have flaws which sometimes cause unintended blocking of allowed content. Young children like a challenge, and breaking the

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<sup>4</sup> EU Safer Internet Programme [http://europa.eu.int/information\\_society/activities/sip/index\\_en.htm](http://europa.eu.int/information_society/activities/sip/index_en.htm)

security of the filtering software has become a sort of 'underground' game for many young people at vulnerable stages in their development. The serious issue of supplier implementation and adherence to voluntary rating schemes is another difficulty. Finally, as revealed by Which? [Which? (Feb 2006)] [14] recently, there are security loopholes in all of these types of systems, which can be exploited relatively easily. One such loophole involved children who were getting access codes for pornographic material via mobile text messages.

## **9. Issues which need addressing**

This review shows that substantial progress has taken place in the area of young children and ICT. However, much still remains to be done. The most urgent need is to address the issues surrounding LBS. Codes of practice notwithstanding, there are emerging concerns on two levels. The first, as explored above, is about whether or not LBS makes young children more safe or less safe. The second issue is the growing concern that parents are being misled about what LBS is, and what it can do. In the UK, for example, as noted earlier, there is a voluntary Code of Practice for LBS suppliers [Working group of UK location service providers (2004)] [12]. There is some evidence that suppliers are not complying strictly with the terms of the Code.

Another major concern is about the rate of evolution of technologies, and of emerging products and services. It is difficult for parents, without considerable experience of ICT, to know where to draw the boundaries for their children's use of today's ICT. It is almost impossible for them to understand future products and services. Evaluation of the potential risks to young children of using new ICT products and services is a major research undertaking. This effort will take time, and therefore guidelines and other support for parents and young children necessarily lag behind large scale deployment.

We need to find a way to deal with this, preferable through the use of technology neutral guidelines – both for parents and young children, as well as for service providers. This would mean that parents could rely on the fact that suppliers will continue to follow the 'rules', even when next generation ICT are deployed.

Drawing up a set of rules about how service providers, and the industry in general, deals with customers who happen to be young children is another priority. The avoidance of over-regulation is not the only benefit to service providers from such an approach. On the positive side, self-regulation is seen by parents and child agencies, and the European Commission, as a more effective approach to the issues discussed in this paper.

It is time to consider the benefits for service providers of a 'ChildFriendly' scheme. This would take the form of a code of practice, drawn up by the industry, and by each service provider. The code would declare those aspects of the operations which the service provider had specifically organised to take into account the needs of its young child customers. It would include aspects such as special training for customer service staff, a particular concern and enhanced processes for the security of the child's personal data, and exceptional awareness of the particular needs of marketing activities targeting children, among others. The code would be freely available for scrutiny by parents and child agencies, and would be part of the 'safer product'

portfolio of the service provider. The marketing advantages of a 'ChildFriendly' type scheme will not be lost on the companies involved.

## 10. Conclusions

This paper has provided an overview of the major issues in the market for ICT products and services for young children, under 12 years of age. It is clear, that the scope, scale and wide range of issues impacting the lives of young children who are using ICT on a daily basis are important topics for further research. Parents and child agencies eagerly await the results of our work.

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