

# Medical Informatics Europe '97

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# INCLUDE them All

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## 1. Designing for all

The most important lesson learned from the first phase of the EU Telematics Applications Programme was that all projects must ensure that their resulting equipment and systems are applicable for use by as many people as possible.

Early projects has shown that although their solutions where ideal for the narrow group of people for whom they had been specifically designed, they were unusable by many others, and especially by people with disabilities. This was not because any intention to exclude people from using the system, but purely because nobody thought about it!

Few people working in the designing and manufacturing area have realised just how many facets are there to ensure that their research results and development would be applicable to everybody, old as well as young, disabled as well as fit people.

The aim of the INCLUDE project is to improve accessibility to new projects and independent developers by making certain they truly understand that their results take full account of the needs of the disabled and elderly people

In this work we present the concept of «Designing for all» why it is important to manufacturers and how it can be adopted by developers focusing on Telematics and Telecommunication equipment.

## 2. Why should you care?

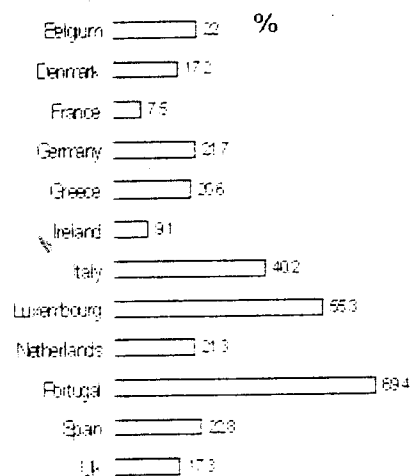
In geographic Europe alone, where the overall population is around 800 Million, there are currently about 100 million elderly people and 50 million people with a disability (this figure includes disabled people who are also elderly). The figures for the European Union are currently about 77 million elderly people and 43 million people with a disability. These are large numbers indeed and the trends show that they will become larger (figure 1). With the emergence of the single market and disappearance of the fragmented national markets, there is a unique opportunity to design products at an affordable price for a part of the market that was previously difficult to reach.

**THE OVER-80 POPULATION AS A PERCENT OF THOSE 60 AND OLDER**

	PROJECTED			
	1980	1990	2000	2020
	%	%	%	%
Belgium	10.5	14.1	15.9	18.4
Denmark	10.4	14.6	20.2	16.1
France	11.8	17.5	16.9	19.2
Germany	9.0	14.0	14.6	18.7
Greece	11.0	13.3	15.5	21.1
Ireland	12.2	12.5	17.1	13.6
Italy	9.7	12.7	15.3	20.7
Luxembourg	9.9	11.0	15.4	16.9
Netherlands	10.4	14.4	17.7	15.6
Portugal	10.3	9.5	15.8	18.6
Spain	9.4	11.3	16.5	19.3
UK	11.2	13.5	19.5	17.7
<b>Total</b>	<b>10.3</b>	<b>13.9</b>	<b>16.4</b>	<b>18.9</b>

SOURCE: EUROSTAT 1996

**PERCENT INCREASE IN OLD-AGE BENEFITS PER PERSON, 1983-1992**



1985 PRICES  
SOURCE: EUROSTAT 1996

Figure 1 Statistics on the aging of population in Europe

There is a growing movement in the EU to improve the rights of disabled people. More and more companies are becoming willing to support these moves - both as an employer and service provider. Disabled organizations have been keen to point out specialist products and services that are of key importance to disabled people. Plans made in America for complying with the Americans With Disabilities Act have shown that additional costs need not be overly high. Disability groups there who have been consulted by businesses realize the financial implications they face and are prepared to take a more pragmatic approach in making their demands.

**3. What should you know?**

*3.1. Available Technology*

**3.1.1. Speech Technology**

Recent developments in speech technology have led to significant improvements in quality and accuracy and a reduction in prices. This is important for people with disabilities since speech technology can be used for interpersonal communication, access to information and control of the environment.

**3.1.2. Smart Cards**

Self-service terminals are being used by the general public for an increasing range of applications. Bank cash dispensers and ticket selling machines for public transport now offer a bewildering number of choices to the user. To handle this increased number of choices, the terminal often incorporates a sophisticated interface which can cause problems for users who are elderly or have a disability. To help these users it may be possible to modify the terminal interface to meet the user's needs (e.g. large characters on the screen).

### 3.1.3. Relay Services

The text telephone enables customers who cannot use the phone in the normal way, because of deafness or a speech impairment, to talk to each other using a keyboard and display unit. This enables them to talk to other users of text telephones. A relay service is a real-time system which translates in both directions between text and voice and voice to text.

### 3.1.4. Smart Houses

A home which can include the technology to allow for devices and systems to be controlled automatically, may be termed a smart house. The degree to which this control is exercised is determined by cost, the user's wishes and the type of building. A smart house can be used to help people with physical, mental or sensory disabilities to live independently.

### 3.1.5. Alarm Systems

In everyday life, people need to be alerted to signals that give a warning or indication of action to be taken; a typical example is domestic smoke detectors which are now inexpensive and widely used. However people with disabilities may not be able to use existing equipment or services, and special systems are often prohibitively expensive.

### 3.1.6. Videotelephony

Transmitting pictures via the telephone network is not new, but very important for some groups of people with disabilities. Being able to communicate in sign language via the telecommunications network is a dream for many deaf people.

### 3.1.7. Virtual Reality

- Virtual reality (VR) technology is of inherent interest to people with disabilities

## 3.2. Standards

Standardization is a complex and costly process which has serious consequences for consumers if the needs are not fully appreciated and taken care of. The opportunities for people with disabilities to influence standards are currently limited and means must be found to overcome this problem.

Standards are complicated and come from a wide range of sources. Some of these are "official" bodies, some supplier groups, and some single suppliers. The EC has its own profiles called Euronormes (ENs) and a procurement handbook called Ephos, largely developed from the UK's Gosip and other work. It is confusing to discover that profiles can have several versions.

Closely associated with standards is benchmark testing of products, and suppliers who could be bluffing - they usually have a certificate that the product conforms. The question is, who issued the certificate, and is it an accredited laboratory or body? The next question is will the product work with your equipment, as there can be a range of options in the standards. Nevertheless, a test is a help, and interoperability testing may give us a better guide in future.

The message is loud and clear. We need benchmarks and standards across the board to ensure functionality and to meet user requirements. These not only have to be uniform but uniformly applied. Standards bodies will increasingly have to incorporate the design-for-all concept to ensure wider applicability and access. This in turn will have a positive knock on effect and result in enlarging markets world-wide.

### 3.3. Cost

Many people express the view that products and services for disabled people should be provided at low cost or, better still, free. While accepting that there is often a link between disability and financial means, application of such a policy could be interpreted as discrimination against other groups of customers. Indeed, many disabled people themselves argue against it, on the grounds that their aim is equality - in this instance, of access to the telecommunications network at a fair and affordable price. Another approach, is to compromise slightly on product design so that, while it retains the functionality required by disabled people, its design appeals to a wider audience. In this way, volume sales result in lower unit prices while recouping development and tooling costs. Additionally, the fact that they are then using a device or system marketed to the population as a whole can often enhance a disabled person's perception of being integrated into the community.

One message of the INCLUDE project is that if the needs of disabled and elderly people are considered at the early stages of any product or service development, then the inclusion of special features often results in minimal or no additional cost.

### 3.4. Marketing Approach

The approach to new product development is the classic one, whether responding to need pull or technology push. Qualitative research to test reaction to the concept is followed by quantitative research to scope market potential, prototype building and testing, alpha and beta trials, product or service build and subsequent marketing. This may sound simple, but it's not.

If the market is seen solely as a highly specialized minority market then no large company is going to invest in it. However, if the market is seen as one that is providing a range of products with facilities that enhance the use of the equipment for all users then significant market opportunities may become apparent. This market will not develop if the advantages being offered on the new equipment are not well developed. In general there is little active marketing of products with facilities appropriate to the needs of elderly and disabled people and consequently the market does not develop. The investment in the market must therefore have a significant amount set aside for promoting the products on a wide scale to the general public as well as the specialist market. Devices are very often purchased because of the insistence of a carer rather than the disabled people themselves.

### 3.5. A successful story

UK telephone service provider BT took the «Designing for all» approach when developing its Converse 300 telephone (figure 2). It compromised the design slightly, so that whilst retaining the key functionality required by many disabled people, its design appeals to a wider audience.

The telephone has many features to help people with impaired hearing, sight and dexterity, with an inductive coupler, a speech amplifier, an extra earpiece, a loudspeaker and large well-spaced and colour-contrasted buttons.

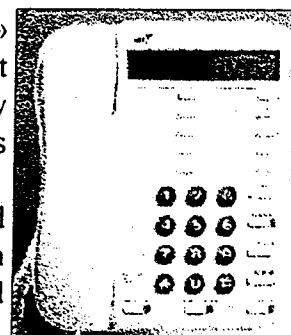


Figure 2 Converse 300

So attractive is the design to customers, not just people with disabilities, that it became one of BT's best sellers, demonstrating that carefully designed products can achieve high sales volumes and low unit costs whilst still including features that make independent living easier for many elderly and disabled people.

#### **4. Who can help you?**

The INCLUDE project, a EU support action, helps those needing information, advice or support on the needs of disabled and elderly people relating to technology projects.

INCLUDE really works and a good example comes from the EU SATURN project. Those who designed the original ATM cash dispensers gave little thought to how visually impaired people might use them. Only the 'pip' on the number 5 key gave any hint that blind people might sometimes need cash.

Thanks to the EU SATURN project, a new generation of terminals can automatically modify the display to suit the special needs of a range of disabled people.

As the user inserts a smart card the terminal can provide large characters, audio output, or a simplified menu, not only ensuring that a wide range of people with special needs, not just blind people, can be included in all the benefits that the new cash machines can bring, but also allowing everyone who uses the ATMs to benefit from these features, which are helpful not only to disabled and elderly people.

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