

Chapter 10

# Inclusive Design or Assistive Technology

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This chapter considers the future of assistive technology, particularly in view of the effects of the Universal Design paradigm on mainstream design practice, and the inclusion of more 'assistive techniques' within the design of mainstream products. These trends could be thought to put the markets for assistive technology at risk. In contrast, however, the trends that led to the Universal Design agenda could also provide increasing market share for the Assistive Technology industries. In order to benefit from these trends, however, there need to be major changes in the way sections of the industry performs.

Please note that in this chapter, a number of generalisations about the assistive technology industry are made, many of which are not true for the whole industry. The author is fully aware that his criticisms do not apply to many companies within the industry, but has done this in order to simplify his message. He hopes that the far-sighted companies in this field will excuse him and all will learn something from these perceptions.

## **The medical model of assistive technology**

Assistive and mainstream technology are usually considered as separate market segments, with assistive technology being primarily a subset of rehabilitation engineering. In other words, assistive technology is primarily associated with either short-term recuperation from injury or illness, or long-term functional support.

As is discussed in a later chapter by the same author, there was a move in the early 1990s to encourage mainstream designers to consider a wider user group for their products. This move was prompted by both legislation, such as the 1990 Americans with Disabilities Act (ADA, 1990) and the 1995 UK Disability Discrimination Act (DDA, 1995) and also a recognition of the demographic changes of the population becoming older.

The move to consider a wider range of users was articulated as a 'Universal Design' or 'Design for All' agenda. It was based on the assumption that mainstream designers could learn from the experiences of designers of Assistive Technology in responding to the particular design needs of disabled users, and thus be able to design products for all users, including disabled people. The principal motivation of the Universal Design agenda was to increase the range of people who could use mainstream products. The essential idea was that mainstream products should either directly cater for 'everyone', without the need for modification or adaptation, or that accessibility 'hooks' should be built into all mainstream products to support specialised access equipment.

A true 'Design for All' philosophy would imply that there was no need for assistive technology as mainstream products would cater for the needs and capabilities of all users. Even without this (impossible) dream, however, it seemed that the move towards inclusive mainstream products would leave assistive technology as an even more fringe activity than it had been in the past, and one with a very strong health/rehabilitation flavour. This essentially follows the medical model of disability where products are designed primarily to provide for the special needs of people with disabilities. This model implies the development of high cost specialised pieces of equipment for decreasing markets. The equipment would be marketed to health or social work services, and would be designed mainly for use within an institutionalised setting, such as a hospital or care home.

When following this medical model, designers of assistive technology tend to think of the people for whom they are designing not as 'users' or 'consumers', but as 'clients' or 'patients', and the true 'customer' as a government agency. The assistive technology industry has also

often considered its 'clients' to be economically poor and politically powerless, using equipment which is procured for them either by government agencies or charitable bodies. The clients are rarely seen as the customer, because, they neither paid for their equipment nor had a major say in the choice of the equipment purchased.

The medical model of assistive technology, however, is a backward looking model and continuing to follow it will lead to significant opportunities for the field of assistive technology being missed. Combined with the loss of market segments, as Universal Design produces more desirable and accessible products, this could lead to an industry in crisis.

## **A future outside the Medical Model**

However, this need not happen. There is an opposing, and more optimistic, view of assistive technology markets in the future. As has been indicated in other parts of this book, demography, the wealth and disposable incomes of older people, and legislation in the developed world, means that 'older and disabled people' are now seen to be an important growth market. The obvious conclusion from this is that mainstream equipment should be designed to be usable by these groups of people. These changes, however, could also lead to a substantially increasing market for assistive technology products. In order for the assistive technology sector to take full advantage of these opportunities, the attitudes of mind of some of those working in the sector needs to change.

In the same way as the Universal Design movement recommends mainstream design should include a consideration of 'all users', the assistive technology sector should extend its appeal towards 'all users'. 'Design for All' in its true sense, i.e. one product for all, is virtually impossible, so there is always going to be a need for specialised accessibility features and equipment, and also for equipment which has been designed primarily for an impaired user. Both of these markets are potentially expanding markets.

The assistive technology industry should become more like mainstream industry and think of the people for whom they are designing not as clients or patients, but as customers, consumers, citizens, or even people. This will not only give the potential user population more dignity, but also implies a very different relationship between provider and user than is customary in medical models, where the users are regarded as people to whom "something is done to cure them". Thus, by changing the perception of the users, they become more important and the commercial imperative will consequently change to become production of what the users want, rather than what someone else (be they carers, prescribers or therapists) believes the users need.

## **The changing market place**

Designers of assistive technology should also respond to the effects of the changing demographics of their user base. The population is getting older. No longer will the majority of users be young people with a single disability, but they will be older people with multiple minor disabilities over which a major disability may or may not be superimposed. They will also have different lifestyles and different needs to those of younger disabled people. Many will still be economically active, and some may have a major role in caring for another older and possibly disabled person. The special needs of older people include more emphasis on:

- safety and security in the home,
- assessment, monitoring and support, and maintenance of function,
- support for memory loss and dementia,

- reduction of social isolation,
- provision of entertainment and leisure, and
- support to remain economically active.

The demography of the 'traditional' disabled customer is also changing. Increased life-span and better medical care mean that many more people who have been disabled for all, or a majority, of their lives, are showing the symptoms of ageing. There are higher levels of sensory and cognitive dysfunction, and different user motivations within this user group. In addition, the functionality and characteristics of this group of users can change more rapidly with time and the ageing process than is the case for younger disabled people.

Thus there is a need for a new design paradigm, which takes into account the increased diversity of the user population, and the changes which occur in their characteristics. This concept is being investigated within the UTOPIA (Usable Technology for Older People: Inclusive and Appropriate) project

( <http://www.computing.dundee.ac.uk/projects/UTOPIA/>).

This is a joint project of four Scottish Universities, led by the University of Dundee, which is developing methodologies for Scottish industry that encourage the recognition and consequent inclusion of older and disabled people within different market segments. While focusing primarily on the needs of mainstream industry, the findings of the UTOPIA group are just as valuable to assistive technology industries as to mainstream industry. Principal findings include the need for direct and continuous contact with older and disabled people in a variety of roles such as experimental subjects, members of the research and development team, within project advisory groups, and as 'test pilots' for prototype systems.

### **Who is the customer, and the differences between 'needs' and 'wants'**

The fact that the typical user of assistive technology was not usually the purchaser may have had a major influence on equipment design. Assistive technology often has an institutional 'air' about it – being more suited to a hospital ward than to a living room. It is interesting to note that, in the Christmas season, very many consumer durables are not purchased by the eventual user. This does not produce obvious design changes in the products, however, and this is perhaps because the purchasers of Christmas presents are, in general, trying to buy what they think the recipient might want rather than what they need, as an act of generosity rather than a charitable gesture.

The difference between 'need' and 'want' has very important effects particularly regarding the aesthetics of equipment. Those things we want usually are beautiful - in the eyes of the purchaser at least. Those products which it has been determined - by others - that we 'need', do not have the same requirement to be beautiful as their functionality is considered to be of utmost importance. However, this need not be the case. There is no absolute reason why assistive technology devices should be ugly. They probably end up like this because of the lack of motivation of designers to design beautiful products for the rehabilitation market, and, either the reluctance to employ designers with visual awareness, or to allow such designers to consider aesthetics as an important part of their remit.

As a proponent of the importance of the 'usability' of products, I usually extol the virtues of function over form – many designers in the rehabilitation and assistive technology fields, however, seem not to have any concept of 'form' to the major detriment of the popularity of their products.

Assistive technology designers should listen to their users more and find out what they really want. Much of the assistive technology equipment prescribed to users ends up languishing, unused, in cupboards. There is a need to understand why such equipment, that is supposed to be useful for the users, is not being used.

It is not always obvious that all assistive technology manufacturers are fully aware that understanding why the technology is not popular or commonly used, should a part of the design cycle for a new product.

## **Aesthetics and assistive technology as a fashion statement**

These criticisms, of course, are not universally true. For example, most hearing aid manufacturers focus on 'form' as well as function. In this case 'form' usually implies invisibility and many hearing aids are designed to be as unobtrusive as possible, often at the expense of functionality and usability. These manufacturers, however, are fully aware of the preferences of their customers.

Indeed, the design of hearing aids highlights the differences that the perception of who the 'customer' is has on design. For instance, hearing aids designed for, and distributed by, the UK National Health Service are often larger and a more obvious 'aid' than those supplied directly to private customers. The private market has led the field for smaller and more discrete aids, first of all focusing on 'behind the ear' aids and, more recently, 'in the ear' aids.

Current assistive technology is not considered to be a fashion accessory, but demographic changes are likely to produce the need for incorporating aesthetic design within products. This will favour those assistive technology designers who are fastest to respond to the true needs and wants of the users.

The UK and many other societies in the developed world have promoted youth and its virtues for a long time. Industries have made large profits by pandering to this aspect of society. It may even be claimed that we have forgotten that there are alternatives to a youth-oriented approach, such as one where the wisdom of age is respected, and it is not embarrassing to admit that one is older or infirm.

There have been times when areas of fashion were particularly beneficial to older users. In Victorian times, the walking stick was a fashion accessory for many (and also could even serve as a repository for hard liquor and a weapon of defence/attack). In those days one could easily purchase a wide variety of very beautiful walking sticks, and using a stick was a badge of honour rather than shame. This is still true for country-walking enthusiasts, but there is little cross linkage between design of walking sticks for outdoor pursuits and those intended for therapeutic purposes.

There are also moves towards efficient artificial legs as a fashion statement, rather than the design being compromised in an attempt to make them 'cosmetic', i.e. conceal that they are artificial, and 'cool' wheelchairs for children. BT, a mainstream telecoms company, designed a telephone specifically for older and disabled people, which became a very successful mainstream product. Part of its success was probably due to it being neither ugly, nor marketed as a piece of assistive technology.

The questions that the assistive technology industry needs to address include:

- Should assistive technology 'delight' the user (and their friends and companions)?
- What is most appropriate way to do market research in this field?
- What is the best way to market assistive technology products to a wider group?

- How can one best obtain accurate feedback from current users (including but not exclusively their professional carers)?

Example detailed questions concerning design could be along the lines of:

- What are the concepts of ugliness applied to artificial limbs? Is this likely to change? Should an artificial hand look cosmetic, or be functional?
- Can and should alarm call buttons be designed as a fashion accessory?
- Would remote controlled curtains, with a beautiful control panel, add to everyone's home?
- Most bath rails look as if they were designed for the hospital ward, and thus have no place in ones own bathroom. Is there a market for a 'designer' bath rail?

## Assistive technology for all

In responding appropriately to these challenges, the assistive technology industry could make great inroads into traditional mainstream product markets. This has happened, and my later chapter in this book gives examples of equipment, which were at first designed for people with disabilities, becoming popular mainstream products. Other such products include the Water Bed, which was first designed for rehabilitation. Such companies as Possum (significantly standing for 'Patient' Operated Selector Mechanism) pioneered the remote control of domestic equipment. Research into simple e-mail systems for old people produced an application which was preferred by executives over their standard e-mail system.

The assistive technology industry will never be really successful while it sticks to the medical model, because there is always a greater thrust towards, and resources available for, towards cure rather than care within the medical model. The domestic product market, however, is entirely devoted to providing 'support for daily living', and the methodology used in this market place, is more suited, I believe, to assistive technology of the future.

Designers of assistive technology need to consider what compromises should be made between:

- low cost and high quality
- institutionalised versus personalised design, and
- requirements of the user rather than the service provider

Developers of Assistive Technology need to think in a more generic way and ask questions such as:

- How can I increase the potential market for my products?
- What other groups of users may find it beneficial?
- How can I increase the beauty of my product without too great a cost penalty?
- How can I market it successfully to this increased range of potential users?
- What lessons can I learn from mainstream design to improve my sales?
- How do I design successfully for people rather than clients?

## Summary

Older people constitute a growing market segment, and the characteristics of the market of people with disabilities are changing. The changes in the demography of the developed world will change perceptions and markets for traditional assistive technology. The assistive technology industry can benefit from these trends, and can provide improved design for

'everyone'. It must, however, adopt the appropriate frame of mind, be focussed on the actual characteristics of its potential customers, rather than stereotypes, be aware of the importance of aesthetics and good visual design, and use appropriate marketing techniques. Over and above all this, it should ensure that it includes older and disabled people fully in the design process

## Further reading

ADA, 1990

DDA, 1995

UTOPIA - <http://www.computing.dundee.ac.uk/projects/utopia/>