

Introduction

From margins to mainstream

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Disabled by design

Although the academic and broadsheet worlds still tend to refer to ‘the elderly’ and ‘the disabled’, as if they form distinct groups outside the mainstream of society, there is a growing trend to recognise age and disability as something we will all experience, and therefore part of a normal lifecourse. Disabled people have become increasingly assertive about their rights to access buildings and services, while for older people the emphasis is now on independence. Both groups aspire to active participation within the mainstream of society, reject the dependency and institutionalisation that were the norm for much of the last century, and are beginning to assert themselves as consumers who control significant amounts of disposable income. Such new expectations offer a rationale for design that is ‘inclusive’ rather than exclusive, and more closely aligned to contemporary social expectations.

These changing attitudes and political and economic aspirations have been accompanied by legislation and regulations that have created a framework for a more inclusive society, and triggered shifts in design practice, moving away from special solutions and assistive devices towards increasing accessibility and inclusivity in mainstream design. Underlying these changes is a growing realisation that disability arises not within the individual, due to impaired capability, but is a result of environments, products and services that fail to take into account the needs and capabilities of all potential users. If people can be disabled and excluded by design, they can also be enabled and included by thoughtful, user-aware design.

Civil rights and the inclusive society

Many factors have driven this shift in attitudes and expectations, varying from country to country, and reflecting historic and cultural differences. In the UK, at the end of the Second World War, the sacrifices made by so many soldiers and the hardships suffered by the population in general triggered expectations of social and political justice that led to the establishment of the Welfare State. Across mainland Europe there was a strong desire for a lasting peace and an end to destructive political conflicts and divisions, which triggered the process of unification. Both developments expressed a new sense of shared responsibility, with the focus on the individual as part of a more caring community. More recently, the reality of European union and expansion has brought

with it an emphasis on embracing diversity of culture and ability with the goal of reducing conflict and maximising the economic contribution of all groups within society.

In the USA, a strong civil rights movement grew up, stimulated in part by the sense that black soldiers had died in service of their country and 'freedom' and that they and their families should enjoy the same rights and respect as their white comrades. A watershed US Supreme Court Decision of 1954 established the precedent that 'separate is not equal', and spurred a campaign for educational equality and broader civil liberties for black Americans which provided a model for the disability movement. The Vietnam War was another key factor, since a high proportion of wounded survived, due to the rapid evacuation of casualties by helicopter. As a result, there was a significant swelling in the numbers of young disabled people, and in particular wheelchair users, who found themselves in a world that was not at all disability-friendly. The success of the civil rights movement acted as a stimulus to an equally militant disability rights movement challenging discrimination and championing the aspirations of disabled people. Customized racing wheelchairs, the Paralympics movement and the world's first significant anti-disability discrimination legislation all owe their origins or were deeply influenced by the alliances formed between civil rights activists and ex-combatants.



The assertion of access as a right led to a gradient of expectation, beginning with the demand for a 'barrier-free' environment in which disabled, and primarily wheelchair users would be able to enjoy freedom of movement, and culminating in the concept of 'universal access' to goods, services and environments. The universal design movement was born of this aspirational trend, and should be understood in that context, as a consumer demand that all designs should be universally accessible and useable. There are clearly limitations on how far this aspiration can be met in practice, but the thrust of developments in the US is towards the assertion of individual consumer rights, with the onus being placed ultimately on the provider, supplier or designer to justify why their product, service or environment falls short of the ideal.

In the UK there has been a parallel development of the concept of 'inclusive design', led by both the design and disability communities. The focus here is on encouraging and supporting businesses in a

rapidly changing market place to respond to needs highlighted by social and demographic change. In this context, inclusive design is seen as a progressive, goal-orientated process – an aspect of business strategy and design practice – rather than a genre of design or a performance measure.

A more recent factor has been the growing awareness of population ageing and concern about its potential impact on dependency ratios, and hence on healthcare and welfare services, and on state pensions. This has spurred initiatives aimed at increasing independence in later life, and encouraging active social participation. At the same time, the growth in the number of older people is leading to more assertive campaigning groups and significant associations of older people. In the US the magazine of the American Association of Retired Persons (AARP) enjoys a larger circulation than Readers Digest, while in the UK, the University of the Third Age (U3A) has member groups in over 200 towns and cities across the country. As a consequence of these trends, major companies are now looking to the older consumer as a key market sector.

Design and social issues

It is against this backdrop of population ageing and emerging demands for social justice that we need to see the evolution of more recent thinking about the way we design our cities, houses, transport systems, products and services, and how that impacts on the people who use them. The Measure of Man, published in 1959 by American industrial designer Henry Dreyfus, was the acknowledged starting point for human factors in design (Dreyfus, 1959). It established the study of anthropometrics as an essential tool for designers, calculated average types and supported the mass production doctrine ‘one size fits all’.

However, it is now apparent that the ‘universal types’ of much 20th century design failed those on the margins of society – especially as assumptions about what is ‘average’ or ‘normal’ have been too often based on the stereotype of the young, fit, white, affluent male. At the same time, design for those at the margins, essentially older and disabled people, tended to focus on ‘special need’, rather than lifestyle aspirations, and so remained trapped in equally narrow markets where turnover and profitability are too low to justify adequate investment in

design itself, giving rise to a plethora of stigmatising and poor quality aids and adaptations.

Nevertheless, over the past twenty-five years or more, ideas have been developing around the desirability for products, services and environments to better match the needs of those previously excluded or denied access by inappropriate design. Designers, from a variety of disciplines, have been instrumental in developing these ideas, which have evolved differently depending on local and individual circumstances. For example, in 1963, UK architect Selwyn Goldsmith published the first comprehensive set of building guidelines on the subject of *Designing for the disabled* (Goldsmith, 1963), while in the US the work of designer Ron Mace led to the concept of universal design (Ostroff and Prieser, 2001) which was further advanced through the Adaptive Environments Centre, Boston, founded in 1978 by Elaine Ostroff and Cora Beth Abel.

The research of designer Patricia Moore, who between 1979 and 1982, toured America disguised as an old woman raised the profile of age discrimination and related design issues (Moore, 1985). These ideas have been influential in Japan, Australia and elsewhere. In Europe, a range of initiatives has been supported by the European Commission and national research funding bodies, while pioneering work has been carried out in by Maria Benktzon and Sven-Eric Juhlines of Swedish design consultancy, Ergonomi Design Gruppen (Benktzon, 1993). Their work was in part inspired by the writings and teaching of American designer Victor Papanek, one of the first people to flag up social issues in the design world. In 1976, Papanek and other leading practitioners from around the world gathered in London at the Royal College of Art, for a conference on 'Design for Need', which explored social aspects of design, including the idea of 'designing out disability', which presaged modern thinking on the subject (Brignell and McQuiston, 1977).



Walking stick handle: Ergonomi Design Gruppen.

Legislative push

A major driver for change has been the militancy and determination of organisations and individuals pressing the case for equal rights for disabled people, and more recently for older people. The legitimacy of these developments was first established by the United Nations Declaration of Human Rights (1948), but until recently progress has been slow, and there is still a long way to go before we will see a world

where accessibility and inclusion are fully recognised and supported by international standards and levels of provision.

In the United States, an important first step was taken by Tim Nugent – Director of Rehabilitation Services on the Champaign-Urbana campus of the University of Illinois – who recognised in the early 1950s that architectural barriers stood in the way of his disabled students (Goldsmith, 2001). His pioneering work led to the concept of ‘Barrier-Free’ architecture, and was instrumental in the creation of ANSI A117.1 ‘Standard Specifications for Making Buildings and Facilities Accessible to, and usable by, the Physically Handicapped’ (American National Standards Institute, 1961). This led to the recognition of the need to remove architectural barriers, which was enshrined in the 1981 Architectural Barriers Act, a federal law referencing ANSI A117. This legislation, and the ANSI standard it embodied were highly influential in the United States, leading to later federal laws including Sec. 504 of the Rehabilitation Act of 1973, the Fair Housing Amendments Act of 1988, and eventually the Accessibility Guidelines enshrined within the Americans with Disabilities Act of 1990 (ADA).

Progress was not achieved without significant campaigning by disability rights groups

This progress was not achieved without significant campaigning by disability rights groups, which built on the successes of the civil rights movement, and in particular the Civil Rights Act of 1964. This legislation provided a building block for Section 504 of the 1973 Rehabilitation Act, which established new legal definitions of disability, and for the first time gave disabled people access as of right to employment, education, buildings and social participation ‘under any programme or activity receiving federal financial assistance’. It took a further four years of campaigning and protest, culminating in a 25 day sit-in at the San Francisco office of the US Department of Health and Welfare, before the regulations giving guidance on the implementation of the act were signed on 28 April 1977 (Ostroff, 2001). This was a significant victory for the increasingly militant disability rights movement, and shaped the way the issue was perceived and addressed in the US. Although Section 504 itself was limited to organisations receiving federal funding, it led ultimately to the establishment of the 1990 Americans with Disabilities Act (ADA).

The ADA was the result of a national coalition of disabled people representing all key groups, along with their families and carers, and gave a high profile to disabled people in the US. It also focused

This convergence of the two issues of disability and ageing ... has underpinned the dramatic shift in thinking that has taken place over the past 50 years

attention on the significance of legislation as a driver for changes to the design of the built world. Further legislative initiatives have since pushed beyond the built environment to include telecommunications and products, in particular, the Telecommunications Act of 1996, and Section 508 of the 1998 Amendments to the 1973 Rehabilitation Act (Follette-Story and Mueller, 2001). The Telecommunications Act extends universal access to communications for people with hearing, speech and vision disabilities, and has had a powerful impact on the development of the World-Wide Web and computing software. Engineer Greg Vanderheiden, cofounder of the Trace Center at the university of Madison, Wisconsin (1972), has been highly influential in this field, introducing the concept of ‘electronic curb cuts’ to describe software and IT implementations that promote accessibility. In 1986 he worked with Alan Brightman on integrating accessibility into Apple computer products (Ostroff, 2001), and in 1996, the Trace Center conducted research which identified the power of legislation in incentivising companies to adopt inclusive practices. (Trace Center, 1999)

Section 508, has been equally influential in that it requires that suppliers of information technology to the federal government make their products usable by people with disabilities. This places a legally enforceable obligation on government purchasers, who command a highly significant proportion of US IT spend. This obligation, whereby the purchaser must choose an accessible product even if it costs more than a technically equivalent but less accessible competitor, in turn stimulates competition between suppliers on the basis of accessibility.

In the UK, architect Selwyn Goldsmith was a seminal figure. As a wheelchair user, he had an early appreciation of the realities of inappropriate design of buildings. In 1963 his book ‘Designing for the Disabled’ was published by the Royal Institute of British Architects, and set a practical standard in designing for accessibility, primarily based on wheelchair users, which later underpinned the 1967 British Standard Code of Practice CP96, on Access for the Disabled to Buildings. This was revised in 1979 as BS 5810, and in 1987, augmented by Part M of the UK Building Regulations which sets out statutory requirements for accessibility in new buildings.

On the world stage, although the UN Declaration of Human Rights was made in 1948, the first UN conference on the subject did not take place until 1967, followed later in that year by the UN

Declaration and subsequent Convention on the Elimination of All Forms of Discrimination Against Women. However, disability and age discrimination remained in the wings until 1982 was designated UN Year for Disabled Persons. One outcome of this was the adoption of a World Plan of Action Concerning Disabled Persons at the 37th session of the General Assembly in 1982. By 1988 concern was widespread as to the lack of effectiveness of the World Plan of Action. Consequently, Swedish and Italian delegates to the UN Commission for Social Development pressed for an international human rights convention for disabled people, and in 1993 the UN Standard Rules for the Equalization of Opportunity for Persons with Disabilities were adopted, setting out the basic rights of disabled people to access and participation (Sarà-Serrano and Mathiason, 2001). In 1999, similar moves to focus on the rights and needs of older people were cemented in the form of a UN Year of Older Persons; a move that had been made six years earlier in Europe, reflecting the rapid ageing of European societies, and will be further reinforced as a result of the 2002 EU directive on age discrimination, and subsequent legislation in member countries.

This convergence of the two issues of disability and ageing, and the shift in focus from welfare and healthcare provision to human and civil rights has underpinned the dramatic shift in thinking that has taken place over the past 50 years. At a political level it has resulted in powerful legislation being enacted in the United States, and in the UK in the form of the 1995 Disability Discrimination Act, which comes fully into force in 2004, when disabled people will have a legally enforceable right to access buildings and services. Australia has been particularly progressive in this regard, with the 1991 Disability Discrimination Act, the 1995 Australian Adaptable Housing Standard (AS 4299), and the Sydney Olympic Stadium and Village as a model of accessibility. Elsewhere, standards and guidance for accessibility, along with legislation establishing and protecting the civil rights of disabled and older people, increasingly support efforts to integrate them into the mainstream of society and promote social participation as of right (see chapter 18, The Japanese experience). The net result of these developments is a raising of expectations about the design of environments, products and services that both public and private sector will have to respond to in practical and positive ways.

Despite the increasing profile of these issues, difficulties remain with the interpretation of legal requirements, and a lack of consistency between standards, in particular at the international level. There is concern that inappropriately phrased legislation could lead to disabled and older people being treated as separate or special groups, rather than promote integration, while a ‘deemed to satisfy’ approach to standards and guidelines could result in recommended minimum provision becoming the maximum in practice. For example, in the UK, fully ‘accessible’ toilets in public places are often only accessible to those carrying the ‘national key’ that unlocks special toilets at railway stations and public venues (Goldsmith, 2001). This has two repercussions: first it reinforces the stigmatising idea that disabled people are somehow different, and second it makes facilities that would benefit many other people inaccessible to them, for example those suffering from temporary disability through accidental injury, mothers with children, and older people who have difficulty using stairs to access ‘regular’ toilets, etc.

Clearly it is important that as legislation and standards become more widespread and uniform they advance inclusivity rather than special provision, as is the case with section 508 of the US Rehabilitation Act 1998. There is reason to believe that companies will welcome moves to set requirements for accessibility, where these create level playing fields within which companies can compete in delivering accessible goods and services, with the confidence that success will be rewarded through increased sales. (Trace Center, 1999)

Design responses

As more progressive designers began to grapple with the reality of population ageing and the failure of mainstream design to address the issue of disability, they saw the need for fresh thinking about design – new approaches to the subject, new strategies for practice, and new research methods that could help designers better understand and respond to the needs of an increasingly diverse range of users. These developments took place alongside a growing interest in user-centred design, and a realisation that interface design would become increasingly important in a world of intelligent products and environments. As a result, the emphasis in mainstream product development began to shift away from the harder, technical and

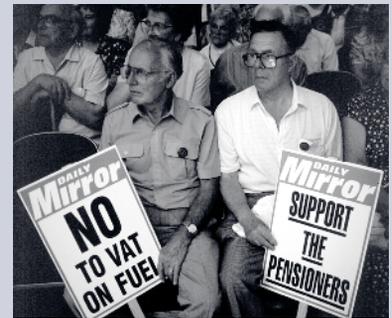


functional performance factors, towards the softer, more human aspects of emotional engagement, lifestyle and aspirations.

In the face of such trends it became clear that designing specifically for disability and ageing could create more problems than it solved through an over-attention to capability deficits and therefore a reinforcement of the medical model as opposed to the social model of age and disability (see chapter 3, Lifestyle, design and disability). This recognition prompted a similar shift away from a technical, problem-solving emphasis on design 'for disability', which placed it firmly in the margins of design practice, towards more inclusive approaches that focus on the softer, destigmatising aspects of designs that promote social integration. A rethinking that opens up the possibility of addressing issues of ageing and disability within the mainstream of design.

Just as the legislative push has moved beyond removing physical barriers, towards delivering access as a universal right, so assertive campaigning by NGOs and other representative groups has repositioned older and disabled people as valuable consumer groups rather than welfare recipients. This in turn has stimulated a growing interest on the part of business and industry, all of which is beginning to create a climate in which inclusivity is likely to become a central aspect of business practice and management, along with quality assurance and equal opportunities. Importantly, inclusivity is something that can be delivered through appropriate design and design management, and the new approaches, strategies and research methods emerging within the design community should be seen with this potential in mind.

What follows is a swift introduction to some of the new approaches, strategies and research methods that have and are being developed within the design community. Many of these are dealt with at length elsewhere in this book, and many have been overlooked because space does not allow. However, the sheer scope and scale of these very interesting and novel expansions of design thinking and practice, is enough, we hope, to convince the reader of the significance of the transformation that is taking place in design practice in response to the social trends of population ageing and the move towards an inclusive, consumer society.



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Philosophical and educational approaches

In Europe the focus has been on social inclusion, in the US on individual rights, and these drivers have resulted in a range of philosophic, academic and practical approaches, ranging from ‘universal design’ in the US, and its European counterpart, ‘design for all’, to initiatives that have responded more directly to population ageing. For example, the new discipline of Gerontechnology, that has emerged from collaborations between European and North American academics, and the practice and education-based programmes supported by the Helen Hamlyn Foundation in the UK.

Inclusive design

The European approaches of design for all and gerontechnology are discussed at some length in the chapter ‘A European perspective’, as is inclusive design, the subject of this book. Inclusive design has emerged in the UK and other countries (Coleman, 1994) from collaborations between industry, designers, researchers and educators. It constitutes a framework and growing body of practice within which business decision-makers and design practitioners can understand and respond to the needs of diverse users, with the ultimate aspiration of developing products and services that can meet the needs of the whole population within the context of a consumer society.

It is important to stress here that what is being attempted through this book, and the research it reports on, is to frame an inclusive approach to design as a reflection of some of the best thinking and practice from around the world, allied to significant information about user needs and capabilities. And to do so in such a way as to present a rationale to support more inclusive business decision making and design practice. A key aspect of the inclusive approach is to expand the target group of a product or service to include as many users as possible, without compromising the business goals of profit and customer satisfaction. The focus is not on age or disability, although these are very important issues, but on inclusivity at a social level, and achieving that through a range of products and services that together accommodate the whole population without stigma.

An emerging concept has been that of ‘countering design exclusion’, which is particularly powerful because identifying why

and how end-users cannot access or readily use a product or service enables us to take steps to counter such exclusion. This is an extremely important concept. While it is useful to know who and how many can use a particular product or service, that information will not provide guidance on how to include more. However, knowing who and how many cannot use the product immediately highlights aspects of the product that need to be improved. For example, if a product excludes a significant proportion of the population because of perceptual demands, this implies that users cannot hear or see the output from the product necessary to interact successfully with it.

Many of the existing approaches to inclusive design and design for all are focused on making products and services more accessible by extending the initial concept of the end user to include a wider range of users. While this is an excellent starting point, the success of the resultant design is highly dependent on the choice of the end user at the outset. If the end user is very specific, then the needs of that group should be well catered for. However, the overall ability of the final product or service to meet the needs of other end users may be compromised if the design is tailored too closely to the needs of the specified group.

The underlying principle of design exclusion is that by identifying the capability demands placed upon the user by the features of the product or service, it is possible to establish the end users who cannot use it, irrespective of the cause of their functional impairment. Consequently, by re-designing the product or service to lessen the capability demand, a wide range of end user groups can potentially be included and no one is excluded unnecessarily by considering one design aspect to the detriment of others.

Another important concept is 'design for ability'. The key factor here is to recognise disabled and older people as important consumer groups that are currently under provided for, due to the inappropriate capability demands of mainstream products and services. As the major groups suffering the consequences of design exclusion, it is important to gain a better understanding of their lifestyle needs and aspirations, as part of any business or design strategy aimed at countering design exclusion.

Thus inclusive design sets out to influence both business leaders and designers to adopt appropriate strategies and acquire the specialist

knowledge necessary to implement those strategies. Hence there is an emphasis on the provision of design tools and techniques to encourage such participation. Particular attention is being placed on appropriate user involvement in design and the provision of design assessment tools. Both these approaches are putting their focus of inclusive design firmly on understanding the 'user'. This is a shift that looks set to continue in the UK, led by the Helen Hamlyn Research Centre at the Royal College of Art, and the Engineering Design Centre at the University of Cambridge.

Universal design

In the United States, although there is still a debate about whether the focus should be on accessibility or broader issues, the key development has been that of universal design, as promoted by Ron Mace from 1985 onwards, and is the subject of a comprehensive handbook (Ostroff and Prieser, 2001). Like inclusive design, the intention behind his coining of the term 'universal' was to promote an approach to design that understands and respects the needs of a diverse range of users. Ron Mace, who unfortunately died in June 1998, was an architect, product designer and educationalist. He was also a wheelchair user and, like Selwyn Goldsmith in the UK, used the insight this gave him as a springboard for a professional life dedicated to changing people's perception of design. He was a key figure in promoting the interests of disabled people, and in 1989 established the Center for Accessible Housing at the College of Design at North Carolina State University – later renamed the Center for universal design. Mace's dedication and example inspired a growing movement in the United States. As has been pointed out above, the major thrust of legislation and campaigning has been around access to the built and in particular the public environment.

What Mace realised was that this was just a beginning, and that accessibility and equal opportunities depend not simply on wheelchair access – ramps, turning spaces and accessible toilet facilities – but on the detail of all our interactions with the designed world. The concept of accessibility had therefore to be expanded to apply to the design of products and services, and the way in which people interact with them. His instinct was that the debate needed to shift beyond accessibility – which continues to be perceived in terms of adapting buildings or

products to disabled users – and towards designs that are usable by people of all ages and abilities, and therefore more universal. This also implies that mainstream design should become universal design thereby obviating the need for ‘special’ products for older or disabled people. It should not be possible to ask: ‘Do you want the universal design or the regular design?’, and everything should work for the greatest number of people possible.

Between 1995 and 1997, the Center for Universal Design developed, evaluated and refined a set of principles or criteria against which designs could be judged, along with a set of guidelines for the design community. Universal design was defined as: the design of products and environments to be usable by all people, to the greatest extent possible, without adaptation or specialised design. The seven principles, along with the guidelines on the Centre’s website have more recently been supported by a CD-Rom of case study exemplars and a listing of performance measures for products.



Ron Mace: champion of universal design.

The seven principles are:

- 1 Equitable use – the design is useful and marketable to people with diverse abilities.
- 2 Flexibility in use – the design accommodates a wide range of individual preferences and abilities.
- 3 Simple and intuitive to use – use of the design is easy to understand, regardless of the user’s experience, knowledge, language skill or current concentration level.
- 4 Perceptible information – the design communicates necessary information effectively to the user, regardless of ambient conditions or the user’s sensory abilities.
- 5 Tolerance for error – the design minimises hazards and the adverse consequences of accidental or unintended actions.
- 6 Low physical effort – the design can be used efficiently and effectively with a minimum of fatigue.
- 7 Size and space for approach and use – appropriate size and space is provided for approach, reach, manipulation, and use regardless of user’s body size, posture or mobility.

New design for old

In the UK, the Helen Hamlyn Foundation (HHF), which was established in 1984, and is dedicated to improving the life quality of older people, has initiated a range of projects aimed at raising the profile of older people within the design community and encouraging industry to respond to population ageing with innovative, well designed products and services.

In 1986, the HHF organised and sponsored an exhibition, 'New design for old', at the Design Museum in London (Manley, 1986), which brought together some of the finest design talent in Europe. The brief was to develop a collection of new designs for older people, forward-looking concepts that would challenge the commercial world to recognize an increasingly significant market for age-friendly products with a universal appeal. Furniture, clothing, consumer-durables, bathroom and kitchen fittings, door furniture, and personal items showed that products for older people could combine functionality with the appearance and material qualities that made them a pleasure to use and own. New Design for Old was unique in that it demonstrated, for the first time ever, that addressing the needs of older people in the design of everyday items could be a route to innovation, and that the lessons learned from one sector of society could be applied to design as a whole. What emerged was the beginning of a new design approach offering both human and commercial benefits.

On display alongside the professional exhibits were the results of a competition organized as part of the Student Design Awards of the UK Royal Society for the Encouragement of Arts, Manufactures & Commerce (RSA). Sponsored by the HHF and other bodies, this section of the competition has encouraged hundreds of students to work each year on the brief as part of their degree courses. In all the competition has attracted in excess of 1,000 entries, with winning designs ranging from consumer products to interior designs and inter-generational games.

The exhibition was followed by a long-standing collaboration between the Foundation and the Royal College of Art began in 1991 with the establishment of an action-research programme, DesignAge, exploring the implications for design of ageing populations. DesignAge developed as a cross-disciplinary activity engaging with postgraduate



Folding steps: Vico Magistretti and Dinah Casson, New Design for Old.



Bread knife: Ergonomi Design Gruppen, New Design for Old.

students from fashion and textiles to vehicle design, and from photography to industrial design and engineering. .

Practice-based strategies

At the level of design practice, responses have been developed (Coleman, 1993) which set out to bridge between the needs of different groups of users: disabled and able bodied people in the case of ‘design for a broader average’, as practiced by Maria Benktzon and Sven-Erich Juhllins and colleagues at EDG in Sweden; and young people and older people in the case of ‘transgenerational design’, as developed by Professor Pirkel at The University of Syracuse in the US. These strategies are all based on a mixture of practical guidelines, methods and conceptual models that can be applied as part of the design process. Individual designers and researchers have also fleshed out practical strategies that reflect more personal responses and professional interests, such as designer Alan Tye’s concept of ‘healthy industrial design’, and Dr. Jonathan Fisk’s recommendations for ‘design to counter decline’. Together they constitute a growing body of practice and design exemplars that are helping to flesh out the picture of what a more inclusive world will look like.

Design for a broader average

In the past there has been a tendency to associate age and disability with deficit, decline and incompetence. Products that result from this thinking tend to treat age and disability as problems of a medical nature, reflect the vernacular of hospital equipment and are frequently rejected by those for whom they are prescribed as stigmatising and lowering of self esteem. This is not a true reflection of the nature of ageing or disability, and a number of commentators have asserted that such products are longer acceptable (e.g. Gardner, Powell and Page 1993; Sandhu 1993; Mandelstam 1997; Mapstone 2000; Feeney Assocs., 2000). Maria Benktzon and Sven-Erich Juhllins have demonstrated, through their work with older users, and in particular arthritis sufferers and those who cannot walk without an aid or some form of assistance, that it is possible to design in ways that include the needs of such groups within the population⁴. The resulting products offer a combination of performance, functionality and aesthetic appeal

that positions them within the mainstream of consumer products rather than as disability aids and equipment. (Benktzon, 1993)

The key strategy in their work is to target designs at the broad mass of the population in terms of cost and appearance, while accommodating those with more restricted capabilities in terms of performance and functionality. This is achieved by applying the concept of 'the pyramid of needs' and results in what they term 'design for a broader average'. The pyramid helps identify groups with capabilities that challenge and extend the interpretation of the design brief, while Benktzon and Juhlin have also developed a range of observational research techniques that allow them to better understand the functional requirements of older and disabled users. These methods have been successfully transferred from specialist areas of cutlery and walking stick handle design, based on the needs of arthritic users, and applied to the design of hand tools, catering equipment for airlines, and ambulance stretchers. The resulting designs have set the highest standards in user-friendliness and established ergonomic benchmarks in the design of tools and equipment. Further examples of their work are featured in chapter 17 'A European perspective'.

Transgenerational design

Professor James Pirkel and colleagues at the University of Syracuse, have argued that product design has persistently ignored the needs of older people and created an environment that is inappropriate and inconsiderate of a substantial sector of the population. In response to this they have developed the concept of 'transgenerational design' (Pirkel, 1991) to describe products, services and environments that meet the needs of people from a wide range of age groups and with differing needs and abilities. They have also evolved a series of guidelines and strategies for applying this concept, and similar methods for approaching journalism, advertising, retailing, employment policy and marketing. (Pirkel and Babic, 1988)

This concept is best summarised in Pirkel's own words: "... how can we best accommodate the needs of the ageing segment of our transgenerational population? Options include:

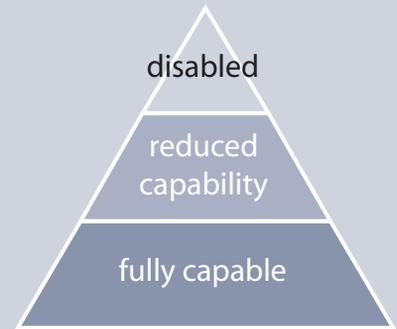
- Do nothing. This will perpetuate the problem.

- Develop specialised elderly products. Such products will immediately become stigmatised, however, and be rejected by the very market for which they were intended.
- Design products at the outset for use by a transgenerational population – including the aged as well as the young and able-bodied. Fortunately, I believe this last option to be the greatest benefit to the aged while at the same time offering a better product to younger generations. I see no reason why a fire extinguisher or a faucet control should not be as usable by a septuagenarian as by a teenager.”

Transgenerational design is framed as a market-aware response to population ageing and the need for products and environments that can be used by both young and old people living and working in the same environment. Pirkel's book on the subject (Pirkel, 1993) outlines a practical strategies in response to population ageing, along with case study examples based on applying a better understanding of age-related capabilities in tandem with a recognition of the needs and preferences of younger people, in particular where they live in the same house, share the same facilities or use the same products. For example, older people are now far more active than previous generations (Allied Dunbar, 1992; Scales and Scase, 2000). Sporting activities, exercise and fitness classes feature as part of the new lifestyles of older people who are not only healthier, but more experimental than before. For that vision of a dynamic, participatory later life to be realised much will depend on whether or not sports and leisure facilities are designed to appeal to both young and old, and allow them to participate in such activities together.

Healthy industrial design

Healthy industrial design (HID™) is a concept developed in the UK by Alan Tye RDI. In response to growing awareness of some of the problems associated with the use of products and environments, e.g. repetitive strain injury, he has developed a strategy which draws on insights gained from a range of body-mind techniques and applied these to the design of products and environments. The intention is to enhancing the health and enjoyment of the user through appropriate rather than excessive movement. Although the details of this method are not published for commercial reasons and because Tye believes



The pyramid of needs: Maria Benkzton and Sven Erich Juhllins, Ergonomi Design Gruppen, Sweden.

they must be learned through practice, he has applied similar thinking to designing for older people, for example, a range of self-luminous door furniture which is intended to help older people locate handles, keyholes and light switches in the dark. Tye emphasises the importance of not designing 'special' products for elderly people. 'Elderly people are not disabled. A shoe or saucepan designed for the disabled foot or hand is unlikely to suit an elderly foot or hand (Tye, 1993). Provided elderly people are considered at the right stage, all products should be suitable for young and old.

Design to counter decline

Alan Tye's concept of designing in ways that enhance the health and well-being of the user is echoed in a thesis put forward by Jonathan Fisk, a designer and NHS doctor, who argues that design for rehabilitation could be differently oriented as 'design to counter decline' and actively encourage individuals to regain previous skills (Fisk, 1993). This is a reversal of the medical convention whereby disability is seen as a consequence of age and impairment that requires specialised designs and adaptations, which asserts that instead, 'a properly designed intervention, at any age, may reduce the impairment of adulthood and old age substantially'. Fisk applied these principles within the context of a rigorous design method that resulted in a kettle, The Duet, which was awarded joint first prize in the Age Concern Coming of Age design competition in 1991. The key considerations in the design were the avoidance of accidents through scalding, improved grip (especially for arthritics), light weight, balance and user-friendliness leading to increased self-sufficiency.



Duet kettle proposal: Jonathan Fisk.

User research methods

A growing interest in how people interact with products and services, especially in terms of emotional engagement, combined with a awareness of the breadth of individual capabilities across the lifecourse and the cultural diversity of modern communities, has obliged designers to rethink assumptions about who their typical consumer is likely to be. One thing that is very clear is that the temptation to design for themselves, that typifies much student work, and indeed the work of some of leading designers, is not appropriate in the modern context. Unfortunately, understanding and responding to user needs

is regarded by many designers as an unwelcome curb on creativity, rather than a spur to innovation. It was with this misconception in mind that the DesignAge programme at the Royal College of Art in London, developed the idea of 'designing for our future selves' as a way of encouraging young students to think about and empathise with older users in the spirit of creating a future world which they themselves might enjoy when older. In the process a range of user research methods have been established on the basis of bringing older and disabled people into the college to work with students (Coleman, 1997a). The result has been a growing body of inclusive design exemplars, ranging from tools and guidance to help airport designers create environments that are easy to understand and navigate, to clothing for wheelchair users, and lightweight power tools for a major high street retailer.

Leading international consultancies, such as IDEO, Smart Design, and EDG; individual designers like Patricia Moore; research institutes such as HUSAT, now part of Loughborough University; and leading design schools, in particular the RCA and Domus Academy of Milan, have all originated their own user research methods to help them better understand and gain insight into the needs and aspirations of an increasingly diverse range of users. Although many of these techniques originally focused in on older and disabled people, the best of them can be just as effectively applied to other consumer groups. Others, that were developed to tap into specific aspects of consumer behaviour and preference, can be effectively utilised in understanding older and disabled people.

What is interesting about this growing body of user research methodologies is that many are readily transferable from specific groups to the population at large. As a whole, they demonstrate the richness of research that is an integral part of the design process. Increasingly, these research methods are being taken up by researchers from other disciplines and valued for the sort of information to which they give access. As designers and academic researchers increasingly work together, both on research council funded programmes and in commercial contexts, there will be scope for interesting cross-fertilisation between these previously separate worlds. The potential value of such developments is demonstrated by the growth of user



Patricia Moore as an old woman.



The Third Age Suit.

research groups within the larger design consultancies, such as Smart and IDEO, and the way in which user research is being integrated into everyday design practice.

Through other eyes

Perhaps the first substantial piece of user research to address the implications of population ageing was carried out by designer Patricia Moore, when employed at Raymond Loewy's famous NY offices. During her 20s, she spent 3 years (1979-82) travelling throughout US and Canada disguised as an 85 year old woman, visiting over 200 cities and experiencing life through the eyes of an old woman (Moore, 1985). To achieve this she not only dressed as an old woman, she also restricted her joints, her hearing, her vision and so on, and the discoveries that she made shaped her thinking about design and were influential on the growing universal design movement in America.

This remarkable experiment (described at length in chapter 28, Design and Empathy) along with subsequent publications and broadcasts on the subject triggered a range of simulation and immersive studies and methodologies, aimed at giving designers and business decision makers some insight into the challenges faced by older and disabled people. A training programme 'Through Other Eyes' was developed in Canada, and later taken up in other countries, including the UK, and has proved influential in business management and in particular in relation to the response to anti-discrimination legislation. In ways that parallel Moore's experiment, business managers wear restrictive devices that alter their hearing sight and mobility, and then experience the products, services and environments on offer from their own companies. The impact of these programmes can be significant, and prompt radical changes in design and business practice.

Moore's experiment has also triggered the development of 'age suits' in the UK, Germany, and other countries, that are used in training and product development programmes. In particular in the automotive industry, where companies like Ford and Fiat have taken a serious interest in the subject, triggered by an awareness of population ageing and the relative seniority of the average new car purchaser, as discussed in chapters 13 and 19, 'The Fiat Autonomy Programme, and 'Universal products in the US'.

Design by story-telling

The international design company IDEO has worked on a number of products which address older markets, for instance a remote hearing aid controller designed like a pen for ReSound, an eyedropper for Clement Clarke and an emergency call unit for Nynex, others of which are discussed elsewhere in this book. The company is known for its innovative approach both to design and to the use of the latest technology in achieving user-friendly solutions to practical problems. A key to its success lies in the effective use the company makes of a multi-stage design process, based on scenario building or story telling, which has evolved over the past ten years into an extensive methodology (Moggridge 1993; Coleman, 1997a). By setting themselves to first understand and observe the potential user, and then visualise scenarios around a range of users they can both identify new product opportunities and ensure that the widest possible range of users are considered in the final design (see also chapter 11, Connecting business, inclusion and design). Perhaps not as radical as Patricia Moore's experiments, this technique has proved a very powerful and innovative tool in the product development process and insights gained from its use can later be evaluated in user tests prior to implementation.

The Methods Lab and Userfit

IDEO and the Helen Hamlyn Research Centre have both worked on gathering and categorising a range of user-research methodologies for designers, which have been published under the title of 'The Methods Lab' (Coleman, Bound and Aldersey-Williams, 1999; Coleman 1999). Contributions to this publication have also come from Domus Academy in Milan, Interaction Design at the RCA and other collaborators in an EU-funded research programme, PRESENCE, which explored inclusive and age-friendly applications for new and emerging information technologies. Both IDEO and the HHRC have extended this work in their own ways and formats, and some of which is discussed in chapter 29, A designer-centred approach. The European union also funded work on user-research methods at HUSAT, now part of the University of Loughborough, which resulted in an extensive methodology for rehabilitation design much of which can be readily applied to mainstream design practice, especially where the object is to identify needs and capture design requirements from among specific groups



The important issue is whether or not business and industry rises to the challenge

for the purpose of developing inclusive solutions. The results have been published in book form under the title of UserFit, and key sections can be accessed via the Internet (TIDE User Consortium).

Where next?

Delivering an inclusive society requires that a consideration of the needs of older and disabled people, along with other groups marginalised by changing patterns of working and living, and by technological developments, becomes part of the mainstream of design thinking and practice. Progressive designers and researchers are aware of this priority and have collectively developed a powerful collection of strategies and user-research methods in response. As a result there is now a significant and growing body of work – exemplars of inclusive design in action – that is putting flesh on the bones of more theoretical approaches to the subject. What is clear is that the design profession is well prepared to tackle the challenge.

The important issue is whether or not business and industry rises to the challenge. Legislation is an important driver here, and the pace of international recognition and regulation has accelerated significantly in recent years. Companies that respond are likely to profit as a result, but there is still a disappointing lack of urgency among the business community, that smacks of short-term thinking. What is missing from the picture is significant consumer pressure. Although campaigning organisations have achieved significant gains, these have come, in the main, through legislation rather than as a result of consumer demand, and it is here that the next big changes are likely to occur.

Beyond the stick of legislation and the carrot of future profitability, collaborations between designers, consumer organisations and campaigning groups can help develop the exemplars and expose potential consumer demand in ways that industry can understand. A further crucial element is the establishment of the national and international standards that can begin to create the level playing field on which companies can compete with one another to deliver inclusivity through design and business practice. Moves are being made in this direction, some of which are discussed in the final section of this book. Striking a balance between coercion and incentive will be critical in the future, and one of the most important contributions that design

and designers can make is to continue to develop the inspiring and innovative examples that help to focus attention on the human, social and economic benefits of an inclusive society and bring currently marginalised groups into the mainstream of society.

Acknowledgements

Photo credits: Georgina Ravenscroft, ladies laughing; Center for Universal Design, portrait of Ron Mace; Ivan Coleman, protesting pensioners; Peter Carruthers, sports wheelchair.

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