

From margins to mainstream: why inclusive design is better design

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Inclusive design has come a long way since the first collaboration between the Royal College of Art and the Ergonomics Society in 1992. The emphasis is now firmly on knowledge transfer to industry and competitive advantage. This paper reviews developments over the past 15 years, discusses the strengths and limitations of the inclusive design approach and goes on to consider the potential for applying the same thinking to related and socially relevant fields such as design for patient safety.

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A little history

Happy birthday Roger!

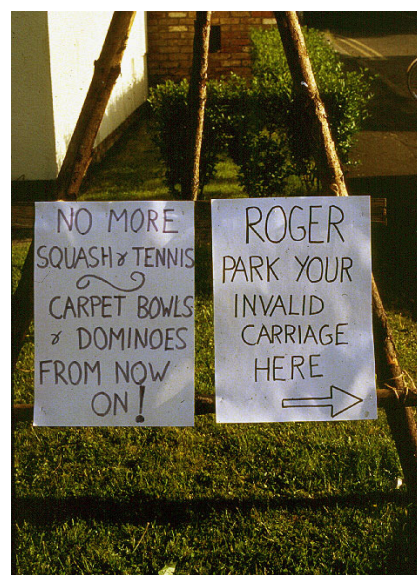
Not only is it a great honour to be asked to make this address, for me the fact that inclusive design features so strongly in the Ergonomics Society Annual Conference 2006 marks an important milestone on a journey that started in 1991 with an extended collaboration between the Royal College of Art (RCA) and the Ergonomics Society. It also affords an opportunity to look back and reflect as well as look forward to the next stages in the development of inclusive design.

Since this is a relatively young field I think it is important to hear different stories about how ideas and thinking developed about what experiences and insights prompted these developments and how they evolved. For that reason, I have chosen to give a personal rather than dispassionate account of the way I have seen these ideas about design developing.

For me, one of the most important drivers for inclusive design is the fact that we live in a world that is almost entirely fabricated, manufactured and constructed. By accident or design, the shape and form of the environments we live in and the products and services we use tells us things about ourselves. Sometimes this can be liberating, but when these messages reinforce negative stereotypes the result can be disabling and demoralising.

A few years ago I was cycling through my village on a bright May morning, when a roadside message caught my eye. It said 'Happy Birthday Roger'. The children of my namesake had prepared a surprise for their father, and also advertised his fortieth birthday to all passers-by. How delightful I thought, until I looked closer and found a more sinister sub-text that read: "No more squash and tennis, carpet bowls and dominoes from now on! Roger park your invalid carriage here."

Not only was he clearly 'past it' in his children's eyes, but the language used stuck me too. He was destined, not for a wheelchair, but an *invalid* carriage. Powerful stereotyping was in evidence, and the language was extremely negative. All too often, inconsiderate or bad design delivers similar messages to people, making them feel incompetent and worthless.



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DesignAge

In June 1991, when I started working on design and ageing at the RCA, a strong motivation for me was the need to make mainstream design and designers more aware of the needs and aspirations of older and disabled people. My previous experience of working on design for older and disabled people was that it was trapped in a rather depressing and under-resourced market niche dominated by statutory providers and inhabited by small companies with little ambition and no grasp of what design could do for either products or a company.

We now have the shining example of OXO Good Grips with its rise from 15 products launched in 1990 to a current range of over 750 and annual compounded growth of 30%, all inspired by founder Sam Farber's concern at his wife Betsy's early onset arthritis. In my own way I could see then that such things were possible, but not in the context of the UK assistive products market.

A collaborative process

To be exact, my brief at the RCA was to explore the design implications of ageing populations. After a summer of preparation, discussions with key people and interviews with leading UK designers and ergonomists, we went public with an action-research programme entitled 'DesignAge', and an open lecture series at the RCA on the theme of 'Designing for Our Future Selves'. One of the first people to contact me after that announcement was David Pullinger, long-standing member of the Ergonomics Society and then at the Institute of Physics Publishing in Bristol. He regarded population ageing as an important social issue and one around which the design and ergonomics communities should come together. More than that, he said to me, 'Roger this is an opportunity to demonstrate that design and ergonomics can do something constructive about one of the big issues currently facing society.'

We agreed that what was needed was a seminar or conference to raise the profile of the subject and build a community of interest around it. The challenge of population

OXO Good Grips products



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Applied Ergonomics

ageing went well beyond the field of assistive products and technology, and would touch all of our lives in significant ways. The potential impact was so far-reaching as to require a fundamental rethink of the nature and characteristics of the population for which we would be designing in the future, and the design process we would need to adopt to do this. Such issue-based challenges had to be considered in a broader context than that of design or ergonomics alone, and so we drew the net wide. We also set ourselves a challenging date of May 6 1992, leaving a bare six months to organise and stage the event.

We next set about contacting an ideal set of speakers, which initiated a further round of immensely interesting meetings and conversations which taught me a great deal in a very short space of time. Eventually we brought together a panel of ergonomists, designers, social scientists, researchers, medics and futurologists. This allowed us to cover a wide range of issues from social and demographic trends to design strategies, evaluation methods and older people in a consumer society. The speakers were of a very high calibre, and the event drew a full house to the RCA, clearly indicating that we had touched on a real and 'of the moment' issue.

Designing for Our Future Selves

That conference resulted in a special edition of Applied Ergonomics, Volume 24, Number 1, published in February 1993 under the same title as the lecture series that it brought to a fitting close. The name was inspired by the late Peter Laslett, of Trinity College Cambridge, who I met in the summer of 1991. Peter, with his team at the Cambridge Group for the History of Population and Social Structure, had carried out the painstaking research that mapped the international population ageing trend to its origins in the UK alongside the Industrial Revolution.

Peter's book on the subject, *A Fresh Map of Life: the emergence of the Third Age* (1989) drew out the social and personal consequences of this demographic shift. Not only did he do the science, he was keenly aware of what it meant for society as a whole, and for us all as individuals. He asserted



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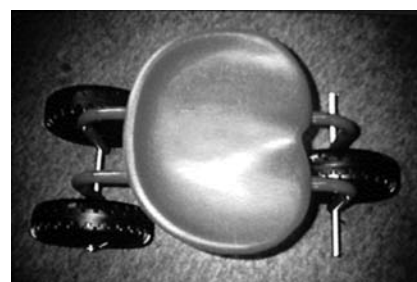
that if we were to adapt and adjust to the new reality, we would all, nations and individuals alike, have to learn to 'live in the presence of our future selves.' In other words, we would have to plan and design for a world full of older people and construct our lives in ways that could make an extended life-course enjoyable, productive and fulfilling.

I was seeking ways to encourage young designers at the RCA to engage with the realities of ageing populations and the everyday challenges that older people face. Not an easy task, considering that their eyes were set firmly on their own future carers and current trends in design. A gentle repositioning of Peter's axiom gave me the title for the lecture series, a number of conferences and workshops, and the subtitle for the DesignAge programme itself. 'Designing for Our Future Selves', signalled a clear connect between the reality of being old and the role young designers might play in creating a future world to accommodate such a radical shift in population dynamics. We were not asking them to design for a distant social group, or another species, but for themselves in the future. A very positive and dynamic message that encompassed the idea of creativity and innovation, and positioned design as powerful mechanism for addressing social issues and concerns.

Bad design disables

An important theme at the conference was evaluation. Do we have the right products and services? Do they do what they are supposed to? Do they meet real needs? Jim Sandhu, director of the Special Needs Research Unit (SNRU) at the University of Northumbria, discussed the involvement of older and disabled people in product evaluation and assessment, describing how his unit had established user groups for the purpose, along with a task-analysis based methodology that could probe the usability of products available to those groups. His work revealed the considerable gaps between the design of products and environments essential to daily living and the ability of older and disabled people to use them. The conclusion was clear: the independence of these people was significantly compromised by poor and inconsiderate design.

Product evaluation



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Product evaluation

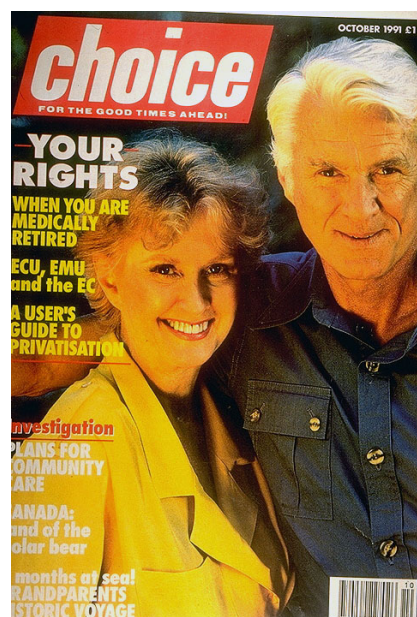
They were, in effect, disabled by design.

Lorraine Gardner, Lesley Powell and Magdalen Page, of ICE Ergonomics reported on their appraisals of 28 non-prescription items marketed as aids to daily living and intended to plug some of the gaps that Jim Sahdhu's work had revealed. They also analysed data from the Home Accident Surveillance System (HASS), and concluded that many such products were not only inappropriately designed and inadequate for the task, they were of poor quality and hazardous to use. Not only are vulnerable people disabled by design, they are put at risk by products purporting to assist them.

The final twist in this tale of disjunct between older people and the designed world was unravelled by Andrew Blaikie of the Department of Sociology at the University of Aberdeen. Dr. Blaikie outlined his and colleagues' research into how social stereotypes and constructs of age are reflected and shaped by the way older people are represented in the media and through popular imagery – as I found out when I investigated the 'Happy Birthday Roger' message in my village. Not only do these social constructs separate older people from the mainstream of life, the situation is very similar for disabled people,

in the context of a consumer society, attempts to bring older people into the market place could further marginalise those with limited means, whose needs can only be met through the inadequate supply chain of assistive products. Not only are vulnerable people disabled by bad design and put at risk by poor quality assistive products, the whole semantic of such products is one of dependency and often poverty.

I see this as an important indicator of how far we had to go then, and also of how fundamental a rethink of design practice and process was necessary in the early 1990s to begin to achieve change. As James Woudhuysen of the Henley Centre for Forecasting put it "The challenge with design for older people is not older people, but old ways of thinking."



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Better bathrooms

Good design enables

A measure of how far we have come in the 15 intervening years is found in the March edition of Occupational Therapy News (14/3). The monthly newsletter of the College of Occupational Therapists and its 27,000 members, is given over almost entirely to inclusive design, and is full of very positive stories. OTs are in the front line of assessment and prescription for aids and adaptive equipment. As community they have long been aware of the failings in terms of design, appearance and quality of much of what they have to offer, and are determined to be in the vanguard of change for the better. Hence their adoption and promotion of inclusive design.

Apart from an excellent historical overview of developments in the UK by Maggie Winchcombe, there are two particular stories that highlight progress. The first is of a one-day workshop and design challenge for manufacturers the College of Occupational Therapists on 18 January 2006. Under the title of 'Innovation through inclusive design', this workshop attracted many manufacturers in the assistive products and related sectors, as well as more mainstream bathroom and kitchen suppliers.

The event flagged up the fact that if people do not like assistive products, or if they look out of place in their homes, then they will not be used. It also replicated the inclusive design challenges that my centre at the RCA coordinates with the UK Design Business Association, where designers work in teams with disabled users to rethink everyday products and services, and invent new more inclusive ones. This process was kicked off by a presentation from manufacturer Armitage Shanks and interior designer Alison Wright. Together they have been rethinking the design of bathrooms, in particular to make them more inclusive. They also talked about the new product development underway in parallel with this programme and the commercial value to the company. Alison had spent some years working as a researcher for me prior to setting up her own consultancy and a website entitled devoted to inclusive interior design and sourcing appropriate products.



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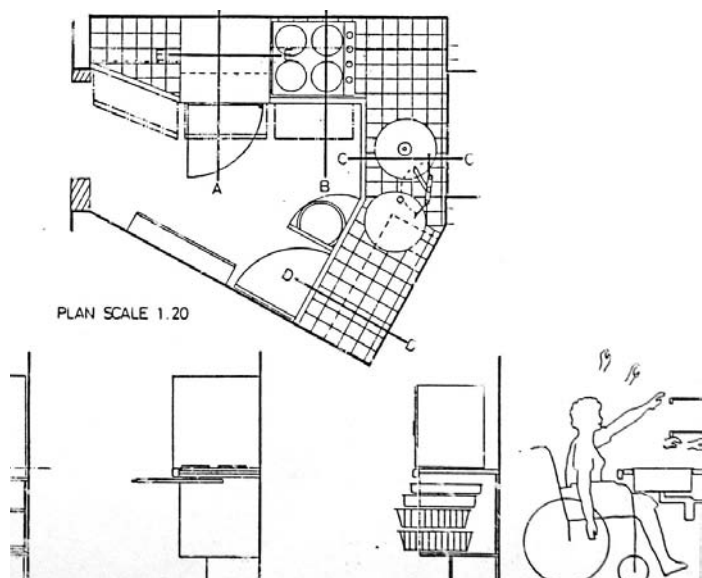
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The second story is about how that work won Alison and OT Kate Sheehan the KBB Design Award for Accessible Bathrooms, for proving that accessible design can be attractive as well as effective. Alison and Kate have also set up a company with Maggie Winchcombe in order to make design and assessment expertise available to people who can benefit from inclusive bathroom, kitchen and interior design. Ideally they want to encourage people to consider their future needs and 'future proof' their homes before their needs become acute and while they can afford the costs of conversion – for example, when the kids leave home.

A seminal moment

Alison's success is particularly poignant for me, because it links back to a seminal moment in my career that fundamentally changed the way I think about design. Some 25 years ago, a good friend, Rachel, who had classically contracted multiple sclerosis in her early 30s, was under threat of institutionalisation. She lived in a Local Authority ground floor flat, but the consensus from welfare and housing was that she could not properly look after herself as her kitchen was not safe. This was before the advent of 'Care & Repair' and similar schemes for housing adaptation, so the choice was stark. For someone who led a full social life, loved live music and people,



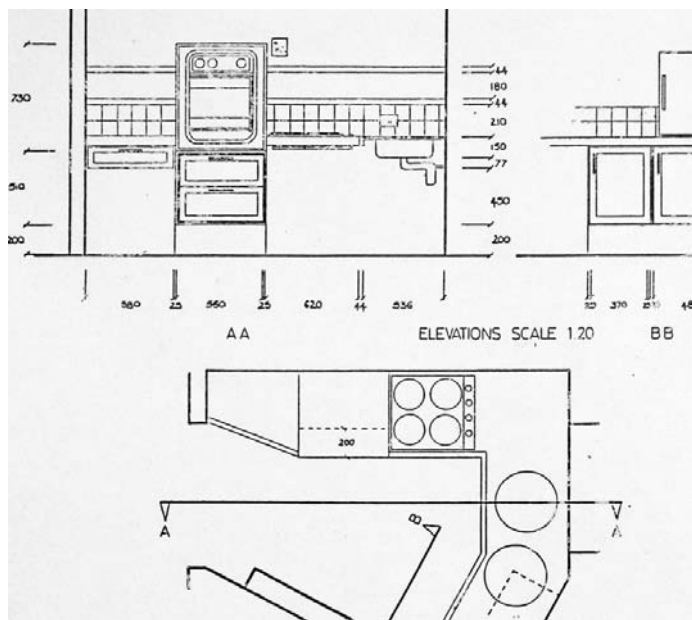
Better bathrooms



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Better kitchens



institutionalisation amounted to a life sentence. So, with my then partner we challenged the local authority decision on the grounds that it was not Rachel's health condition that was the problem, but the design of her kitchen. And that was something that could be rectified.

The argument was accepted. But without appropriate expertise or delivery mechanism, the Local Authority could do nothing. To cut a long story short, having won the argument we redesigned the kitchen – not an easy task as the space was tiny – manufactured the appropriate elements, installed them and redecorated the room. The result of that, and other work on the flat, was that Rachel's independence was greatly extended. Sadly she died last year, but I will always remember her courage, and the incisive comment of hers that changed my thinking.

Making the neighbours jealous

One evening, talking things through with her – where should this go, how high should that be – all the practical ergonomics of a bespoke wheelchair kitchen, I asked her what was the most important thing for her. A simple question to which I



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fully expected a practical answer about how things might work better for her. Instead, after thinking for a little while she said: "I want the neighbours to be jealous."

And at that moment I realised that she did not want a wheelchair kitchen, but a kitchen she could be proud of. I had been focused on the wheelchair side and usability challenges, but for her that was necessary, but only incidental to the main issue. This was first and foremost a new kitchen, and like everyone else, Rachel wanted to be proud of it and show it off, not be typecast by it.

From then on aesthetic issues – detailing, materials, surfaces, finishes and so on – were just as important as practical issues such as making door panels and frames removable and replaceable when damaged by the wheelchair. It was not simply an issue of finding the right oven with shelves that were safe when fully extended, and easy to operate controls, it was also a question of what that looked like and how it was housed. A good example – although unfortunately, it being 25 years ago, I have few photos – is the worktop lipping.

Because of the tight space, the easiest way for Rachel to move around was to have a grip rail that she could pull herself about with, instead of constantly moving her hands from the worktop to the wheels and back again. But a rail would have said all the wrong things. Instead, I made a chunky 'D-shaped' solid ash edging which extended down below the worktop with generous curves on the corners to create a continuous grip rail and feature detail. Stained yellow as part of the colour scheme, it was much admired.

A further detail, also much admired, was the fitting of sections of the edging to pull out flaps hung on slides under the worktop. These provided additional resting places for dishes and convenient work areas that could pull out over her lap. Making these of solid wood added to the quality feel of the whole kitchen. In other words, pushing the envelope in terms of user demand forces us to innovate in design terms. Rather than being a hindrance it can be a spur to new thinking and ideas, and crucially a route to better design.



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EU year exhibition

European year of Older People

Back in 1992, the first step in the collaboration between the Ergonomics Society and the RCA, did more than sketch out key issues, it gave shape and visibility to a natural community of interest. The European Year of Older People and Solidarity Between Generations, 1993, was to provide a further opportunity to grow that community, and in November, over 300 people from more than 20 countries gathered in London for Designing for Our Future Selves– the sequel.

That conference and exhibition was organised in collaboration with the Ergonomics Society, the Design Business Association and the RSA, and supported by the European Commission, Safeway Stores, Rockwell Glass, Marks & Spencer and Apple Computers. By the end of 1993, design was clearly on the agenda as an important mechanism for addressing and embracing population ageing. Not so 12 months earlier when the European Year was in its planning stages. Then the focus was almost entirely on the likely social and economic consequences of rapid population ageing. Design would not have figured, had it not been for the vision of Sally Greengross, then Director General of Age Concern England whose advocacy made the conference possible.

The consensus view of the conference was that we live, and grow old in a world that is almost entirely designed, built and manufactured, and the quality of our later years depends on whether or not it is designed with an awareness of the needs and aspirations of older and disabled people.

After the conference I wrote an overview paper for the International Ergonomics Association conference in Toronto in 1994, entitled 'The case for inclusive design'. The thrust of that paper was that considering the life-course as a whole, disability and ageing should be recognised as normal rather than exceptional experiences, that by responding to such needs design improvements can be made which benefit the majority of users.

Later I edited a book 'Design für die Zukunft' (1997), to showcase an important outcome of the conference, the European Design for Ageing Network (DAN), which was



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The Swedish story

established in Amsterdam in 1994. The network was very practice-based and centred on design initiatives across the European Union.

Convergent thinking

I have given extensive coverage to these origins of inclusive design from a personal perspective, not to claim ownership – as you have seen there were so many good and committed people involved in all these initiatives that it would be churlish for anyone to do so – but to emphasise that this was very much a collaborative project, with the ergonomics community at its heart. There are many parallel, personal stories of similar developments in different countries and communities of interest. There is not time here to tell the Scandinavian story or the US story, the Japanese Story or the Dutch story, some of which is covered in 'Inclusive Design: design for the whole population'. It is important however, to recognise that inclusive design was an idea that emerged from the work of an extended community of practitioners in the UK, and paralleled similar developments in other countries that are similar but different because they were shaped by differing local, political, professional and commercial factors.

For people like myself, the real issue was to understand how we have to change design practice in the light of ageing populations. For others it was more to do with creating a barrier-free environment for disabled people and in particular wheelchair users. For others it was about ensuring access for all to information and communications technology as it played an ever more important part in our everyday lives. And for others it was about the rights of older and disabled people to enjoy a fulfilling life and maximise their independence. Much of these aspirations chimed with a European drive for social inclusion, highlighting the potential of design to help achieve this.

Inclusive design = better design

In essence, what we have seen is a gradual shift from the idea of design for special needs and specific groups to design for inclusion, or inclusive design. It is in light of that shift that I believe we have to recognise that inclusive design is not a



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new design genre, but in essence, simply better design that is more aware of the diversity of people who interact with the designed and manufactured world, and more aware of the way our needs and capabilities change across the course of a lifetime, or even throughout the day.

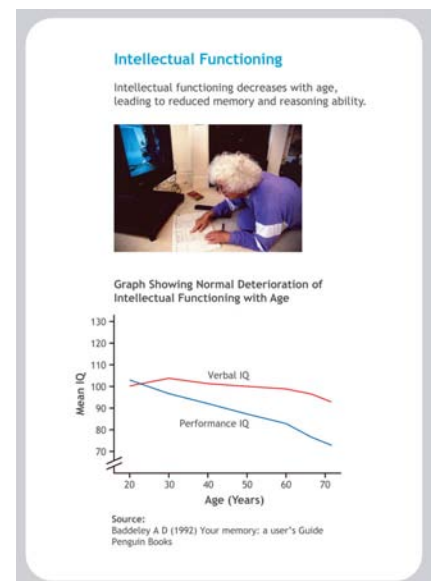
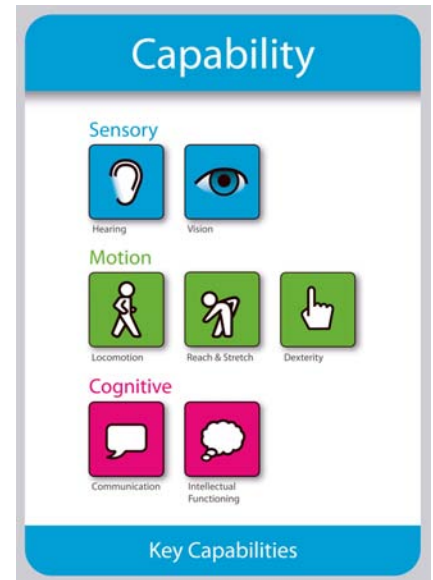
Inclusion is an important extension of the idea of usability, in that usability studies have tended to focus on key user groups and specialised equipment such as aircraft cockpits, ambulances, control centres and individual workstations. If we are designing for inclusion we have to extend usability to embrace people who have more extreme impairments, as well as those who experience the multiple minor impairments associated with ageing, which interact in problematic ways.

You only have to watch an older person trying to work out how to open an unfamiliar pack, or operate an unfamiliar mobile phone to realise how challenging such apparently simple tasks can be for some people. If we couple this extended understanding of usability with acceptability and pleasure in use, then we start to see that to really work for people, design has to understand both capability and lifestyle aspirations, and reflect positive self-images for the user. Functionality, yes, but also fitness for purpose in a broader, more life-enhancing sense.

Inclusive design is not a new type of design, but an intentional project that sets out to include significant sectors of society that are all too frequently ignored or overlooked. That means building a better understanding of a wider range of users and making rational decisions about specific elements of a design. And this is where it starts to become difficult. The social case is relatively self-explanatory – extending independence can improve life quality, contain the impact of some age-related conditions and reduce the healthcare and welfare costs of dependency.

The design case is also clear: taking an inclusive approach introduces a new set of challenges that can drive innovation, and gave design a locus in addressing important social issues, thereby adding both value and gravitas to professional practice. The business case is harder to articulate, beyond the

Understanding capability



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market carrot of growing numbers of older consumers relative to static or even shrinking numbers of younger consumers, and the legislative stick e.g. of the 1990 Americans with Disabilities Act (ADA) and the 1995 UK Disability Discrimination Act (DDA).

Design for the whole population

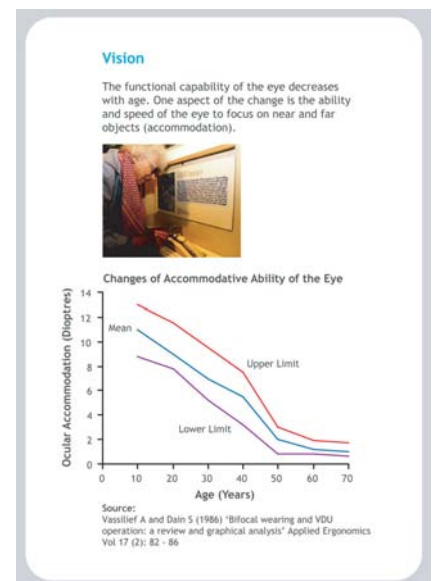
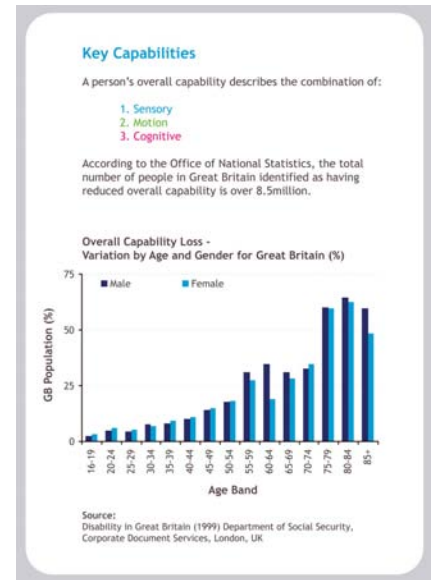
This was something I found myself discussing with John Clarkson, who will be giving the Plenary Lecture on April 6. We met at an EPSRC event in 1998 at the Design Council offices in London. The subject was the EQUAL programme on extending life quality for older and disabled people. John and I were agreeing that we needed to start to pin down more exactly who could benefit from design improvement, how they would benefit, and what could be done about it, in particular by business and industry.

What was needed was a strong business case supported by appropriate tools and techniques for designers, along with good information about capabilities and health conditions and their impact on the population as a whole. In addition we needed a better understanding of how this fitted into conventional design processes, and a better understanding of how to present the often dry data and research findings that underpinned it to busy, time poor designers, and in formats they could understand and would use.

This discussion framed a proposal to EPSRC, which was successful, and we started to grapple with the scale of what we had taken on. The project coincided with extended funding for my work at the RCA, allowing us to establish the Helen Hamlyn Research Centre and expand its focus beyond design and ageing to a more holistic approach that embraced disability. I had wanted to do this for some time, but had held back while we developed the work on design and ageing, as I felt that it would be the market and economic implications of population ageing that would drive the shift from margins to mainstream and carry disability with it.

Additional funding meant that I could take on Julia Cassim, who had a strong track record in working with disabled people, primarily in Japan, and at the same time strengthen

Understanding capability



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my existing links with the Japanese companies and other organisations that were beginning to marshal a response to population ageing in the country that was by then the oldest society on the planet.

From then on, my focus shifted from ageing to inclusive design and the EPSRC funding gave us the opportunity to concentrate on understanding what was needed in design and industry. The short title of the EPSRC project was INCLUDE, and the full title, Inclusive Design: providing decision makers in new product development with tools to address the needs of the whole population. We recognised very early on in that work that dissemination was going to be just as important as research. There were key communities we need to reach, and so there had to be several strands to the dissemination process.

A research community

A first priority was the nourishment of an active research community. We needed to build the knowledge base and importantly we needed to cast a sufficiently wide net to ensure that the focus was not only on improving mainstream design, but also on improving the quality of assistive technology and accessibility design. In enlarging the catchment of mainstream design, we run the risk of neglecting those areas of most challenging need that will continue fall outside mainstream provision. Neglecting these would fail the goal of addressing the needs of the whole population. To this end we established two biennial conference series running in tandem. INCLUDE at the RCA taking place in the odd numbered years – 2001/3/5/7 etc., and CWUAAT, taking place in Cambridge in the even years 2002/4/6/8 etc. INCLUDE was targeted at the design and business communities, with CWUAAT – the Cambridge Workshop for Universal Access and Assistive Technology being targeted at the AT community. The intention was that researchers should contribute to both and that there would be significant overlap and continuity in participants and themes.

Student awards

A second strand was dissemination to education, and in particular design education at graduate level. The mechanisms

INCLUDE conferences



include 2005

Friday 8 April 2005 Royal College of Art, London, UK

A community of purpose



As competitors seek a better understanding of their customers, designers recognise more user-centred methods and education bridges social issues into the curriculum, the time is right for inclusive design. That was the encouraging message to emerge from the third include conference held at the Royal College of Art, 5-8 April 2005, which was attended by 110 delegates from 18 different countries (up from 14 in 2003).

In paper sessions, poster presentations, workshops, panel discussions and design stories, the mood was clear: business, the design profession and academia are all gearing up to create a more inclusive future in which empathy with users of all ages and abilities holds the key to commercial success and social equity. The industry response in particular featured strongly at include

2005 with a breakfast briefing by five Japanese corporations, members of the Japanese International Association of Universal Design, one of the highlights of the conference. Another well received innovation was the 24 hour Inclusive Design Challenge with the Design Business Association, which demonstrated the commitment of professional designers to the cause. The presence of researchers from Australia, Brazil, Canada, Finland, France, Germany, India, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, South Korea, Sweden, Taiwan, UK and USA revealed what a global phenomenon the inclusive design movement has become in recent years. The task now is to build on the sense of energy and initiative generated by include 2005 and continue to press for change in the way we design our world.

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Conference sponsored by

SCOPE EPSRC
DS DESIGN SCIENCE
innovathon

Student designs



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Design challenges

for this were the RSA Student Design Awards and Design Directions Competition. The establishment of an 'Inclusive Worlds' brief has attracted in excess of 100 entries each year, and as far more students work to the brief than submit and entry, the impact is considerable. Additionally, the results are well publicised, creating an addition dissemination route. Feedback from design tutors at secondary and degree level indicated that well-defined project briefs with readily available support material are an effective way to embed specific subjects within design education. Consequently a special section was written for the Design Council website based on inclusive design projects from the Helen Hamlyn Research Centre. For Higher and Further Education a special resource was developed for the RSA website to accompany the Inclusive Worlds brief. It gives ready access to over 1,000 pages of information along with links and case study examples.

Inclusive design challenge

Dissemination to the design community has been achieved through an annual inclusive design challenge in which leading UK design companies work with often severely disabled users to develop concepts and designs for better mainstream products and services. This has proved popular and influential. Some of the leading UK design consultancies have taken part over the past 5 years, and produced inspiring design exemplars in the process.

Follow-up studies have indicated that design companies benefit by building up new competencies and adding to the range of work in their portfolios. In a number of cases this has led to new business, especially where clients are aware of obligations under the DDA. Another important benefit has been team-building among younger staff, who identify strongly with the inclusive design focus and the contact with disabled users. In addition, the DBA is seriously considering a hands-on inclusive design offer to its membership as part of a continuing professional development package.

Working with the DBA has also given insight into the sort of support needed by the design community which is in itself



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Working with industry

Better DIY products

an end-user of inclusive design information. A further outcome has been that participating DBA companies have encouraged their clients, including leading household names, to engage in workshops with disabled users as part of the design and innovation process, in particular for packaging of fast moving consumer goods and communications products and services.

This has been an added benefit supplementing earlier dissemination to the business community which was achieved largely through Design Council publications such as *Living Longer: the new context for design*, a 2001 design policy paper with recommendations for government, industry, education and consumer groups; and the Design Council website section on inclusive design, part of its public knowledge base.

Industry involvement

Growing industry interest prompted the establishment of a British Standards Institution panel to draft an addition to the BS7000 design management series. BS7000-6: Guide to managing inclusive design (2005) sets out the business case and a practical methodology for integrating inclusive design elements into standard design processes, offering guidance at the organisational and project levels.

The other element that has contributed to dissemination to the business and voluntary sector communities has been the Research Associates Programme at the Helen Hamlyn Research Centre. A good example is a long-standing collaboration with major UK home improvement retailer B&Q. The company had an early interest in the older consumer, and also found benefits in employing older people whom it found to be more flexible, reliable and loyal than its younger workforce. Older sales staff were also welcomed by older customers and B&Q found this helped build bonds with local communities. From this base of awareness, the company was quick to respond to the Disability Discrimination Act, and put in place a diversity strategy that aimed to make stores accessible to older and disabled customers and similar employees.

Some years ago I approached B&Q to discuss the results of research that revealed a significant and continuing interest



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Working with industry

Top gifts for Xmas

in DIY among the 50+ population, but one that tailed off after 65. My suggestion was that there could be significant commercial opportunities for easy to use DIY tools and equipment, and that these could open up further possibilities in terms of bathroom and kitchen products that would appeal to all, but work well for older people..

Before this, B&Q had not properly used design or employed designers for product development. Instead, Its business model was based on sourcing products, largely from Asia, and in particular China, that could be sold on price advantage. An initial audit of power tools identified significant usability problems, and resulted in a guide for product buyers to help them identify and ask for ease of use features. This was followed by research with older users, including older women and retired tradesmen with long experience of using hand and power tools, and also with young women.

Matt White, the Helen Hamlyn Research Associate involved went on to develop designs for four new or improved products, on which five patents were secured. Two of these – a lightweight palm sander 'The Sandbug' with a hand-strap for easy use, and lightweight electric screwdriver 'The Gofer' – were chosen for full development, and launched on the market in time for Xmas 2002. Matt White paid particular attention to the styling and packaging of the products to ensure that they were perceived as having real design value as well as being lightweight and easy to use. The products have sold well, and been twice voted as in the top ten power tools on the UK market. More recently the Gofer was restyled to increase its already established appeal to women.

Matt continues to work as a designer for B&Q, and a second Research Associate project investigated garden power tools, a big potential market, especially for older people, who are often keen gardeners. Research Associate Robert recruited a group of older gardeners to test products, which they took home, assembled and used in their gardens. Again, many problems emerged, from assembly instruction manuals to usability. The end result was again a series of innovative designs, two of which were taken forward for production.



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The important factor in this story is that B&Q came to appreciate the power and importance of design through these two universal design collaborations. As a result, the company could see very clearly the link between more inclusive design, real innovation, bigger profits and brand strength through customer satisfaction. This was a significant journey for the company, but did not stop here.

First, the Helen Hamlyn Research Centre hosted an innovation day for B&Q senior managers, which has led to a better understanding of design within the company, and second, Research Associate Rob Brown was commissioned to produce guidelines on Inclusive Design and Sustainable Design, not just for B&Q, but for the whole of the Kingfisher Group, which owns B&Q.

Inclusive design and design exclusion

Establishing a standard definition of inclusive design and the flow of information and practical collaboration to back that up was essential in making inclusive design 'sticky' for the business community, but in terms of research, important questions were: how appropriate is our understanding of capabilities? is it good enough? do we have adequate data? and importantly, how should that be presented to the different communities that need access to it – from business decision makers to working, and often dislexic designers?

John Clarkson's team at the Engineering Design Centre in Cambridge has focused on this for some time now, and no doubt he will enlarge on it in his lecture. This required identifying appropriate data sets that could be unpacked in terms of the incidence of disability and impairment, and the resultant spread of capabilities across the population. It gradually emerged that there is no fully adequate data set for this purpose, and a current challenge is to specify its composition and how to gather it. Once that data is assembled it should be much easier to answer questions about who is excluded and how, by different product features, which would be extremely useful to the design and business communities. I have used the word excluded intentionally, because in our

Corporate design guidance



Inclusive design is:

...the design of mainstream products and services that are accessible to, and usable by, people with the widest range of abilities within the widest range of situations without the need for special adaptation or design.

...comprehensive, integrated design which encompasses all aspects of a product used by consumers of diverse age and capability in a wide range of contexts, throughout the product's lifecycle from conception to final disposal.

BS7000-6 2005

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early exploration of the knotty problem of how to quantify design inclusion, and through subsequent discussions with designers and business partners, we realised that it was a difficult concept to grasp. It took us some time to perhaps see the obvious, that if we turn the idea on its head and ask 'how do we measure design exclusion?' that was a much better fit with the data we had. This was something that could be summed, and allowed us to look in more detail at age-related multiple minor impairments and how they interact.

It also, importantly, offered a route to more rational decision making, especially for business. For at each step in the new product development process – from initial idea to final product – we make decisions that will either exclude or include specific groups of users. A quality design process would be aware of those decisions, track and audit them and ensure that there was a clear rationale behind them. Faced with growing anti-discrimination legislation this should become part of sound business practice and eventually a standard requirement in product development.

The challenge was how to measure that design exclusion, and John's team worked hard on this, producing a book on the subject in 2003. That was a companion volume to the book by the larger research team: Inclusive design: design for the whole population, which set out to encapsulate the full output of the EPSRC project and place it in the context of similar work on an international front.

Industry awareness

An indication of the importance of quantifying exclusion is given by the results of surveys carried out in 2003 and 2004, for Microsoft by Forrester Research Inc. The goal was to identify the range of physical and cognitive abilities among working age adults and current computer users in the US, and also to identify the types of difficulties and impairments that limit computer use, their range and degree of severity, and the number of people who could benefit from accessible technology.

When the results were analysed the 15,000 people sampled

Corporate design guidance

Business Drivers

“In the US, 60% (101.4 million) of working age adults who range from 18 to 64 years old are likely or very likely to benefit from the use of accessible technology.”

Source:
Accessible technology market research
commissioned by Microsoft, conducted
by Forrester Research, Inc., 2003.
www.microsoft.com

Microsoft Survey

Microsoft Survey

A US-wide survey of 15,477 working-age adults and computer users asked questions about levels of difficulty with ordinary daily tasks (such as reading newspaper print and using the telephone) as well as direct questions about impairments and their impact on employment.

The findings show that the majority of working-age adults are likely to benefit from the use of accessible technology.

Category	Percentage
Very Likely	22%
Likely	38%
Not Likely	40%

Source:
Accessible technology market research
commissioned by Microsoft, conducted
by Forrester Research, Inc., 2003.
www.microsoft.com

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delivered a clear and very powerful message: 57% of them could benefit from accessibility features that are often buried within the operating system, rather than being made evident to the mainstream user. In other words, software developed for what Microsoft regarded as a minority of the population – disabled and older users – offers benefits to the majority.

The second phase of the research examined the use of computers and accessible technology among those identified in phase 1 as being likely or very likely to benefit from accessible technology. The report concludes with a forecast of growth in the demand for accessible technology, and an overview of the opportunities for the IT industry, in particular by making this technology easy to discover and use. The impact of this research on Microsoft has been significant, pushing accessibility high up the agenda for management and software developers alike.

Similar research was initiated in 2004 by electronics giant Philips and very much confirms the Microsoft surveys. Philips is active in three interlocking business sectors: healthcare, lifestyle and enabling technology. The research was intended to calibrate the convergence of these three sectors through a web-based on-line survey of a small, but representative sample of the US population of 1,501 US Internet users aged from 18 to 75+. Though primarily examining attitudes towards healthcare and well being, the research is also revealing about attitudes towards technology. For example, two out of three respondents reported having lost interest in a technology product because it seemed “too complex to set up or operate”. While only 13% believed that in general, “technology products are easy to use”.

Clearly usability, and accessibility are moving up the agenda for major companies, and the inference is that these issues are better tackled through an inclusive design approach from the outset, rather than later add-ons and adaptations.

Centre for Inclusive Technology and Design

At a ‘Disability Summit’ of UK charities and voluntary sector bodies, organised by Cerebral Palsy charity Scope, there was

Corporate design guidance

Business Drivers

“Only 13% of the American public believes that in general ‘technology products are easy to use’.”

Source:
The Philips Index (2004), www.usa.philips.com

Philips Survey

Philips Survey

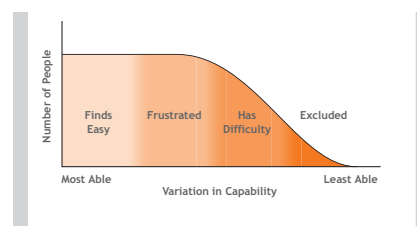
A US-wide web-based survey of 1,501 internet users, aged 18-75+.

“Two out of three Americans report having lost interest in a technology product because it seemed ‘too complex to set up or operate.’ This sentiment is especially pronounced among females (74%) and people over aged 55 (70%+).”

“Only 13% of the American public believes that in general ‘technology products are easy to use’.”

“Consumers are beginning to demand that products be accessible for easy operation and set-up. The fact that some products have achieved this has raised the bar for what’s possible. ‘Ease-of-use’ is so important to the public (76%) that it is now equal in importance to the dimension of ‘high quality’ (76%).”

Source:
The Philips Index (2004), www.usa.philips.com



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Design process

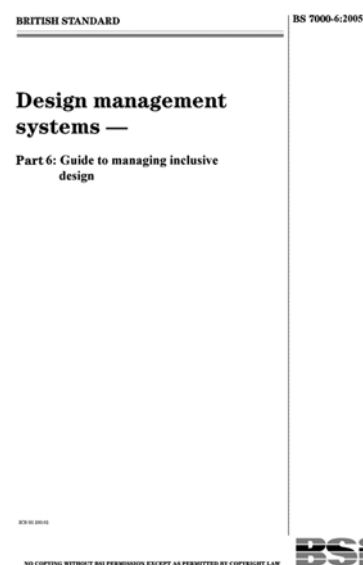
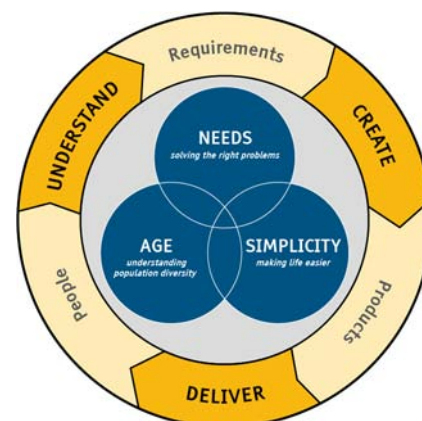
agreement that inclusive design is key to the integration of disabled people into the mainstream of life and work in the UK. In response, Scope set out to encourage major companies to develop inclusive products and services, by establishing a 'Centre for Inclusive Technology and Design' (CITD) – a network of interested organisations, with the required skills and expertise. The partners in this initiative included: from the voluntary sector, Scope, Ricability, RNIB and the UK Institute for Inclusive Design; and from design and research sector, The Cambridge Engineering Design Centre, Scientific Generics and the Helen Hamlyn Research Centre.

This idea was taken to the UK Department of Trade and Industry (DTI), which funded an in-depth questionnaire study into levels of awareness in UK companies. In parallel, a series of pilot workshops was developed and delivered as a prototype training and design development package for UK companies. Currently, this is being refined, prior to a roll-out in 2007 as a practical toolkit aimed at introducing companies to inclusive design and BS7000-6. An important part of that package is detailed guidance for designers and specifiers, in particular with regard to capability and related design considerations, and also on working with and understanding users. This is an extension of the inclusive design card set developed for the original workshops, and illustrated here, and will find a permanent home at www.betterdesign.org

Overall, the intention is to bring together, resources, guidance and expertise in ways that can be readily taken up by industry and private sector organisations, to both help them meet legal requirements and obligations and also build their consumer offers around inclusive design.

Setting a standard

BS7000-6 Guide to managing inclusive design (2005) – provides practical, state-of-the-art guidance on managing inclusive design, at the organisational and project levels. Though not mandatory, organisations that adopt the standard – whether in manufacturing, retailing, services, communications and the voluntary sector, among others – can determine where and how their practices and consumer offers are deficient. They can



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then take prompt steps to rectify such deficiencies, and plan to take advantage of opportunities to innovate within changing market conditions over the longer term.

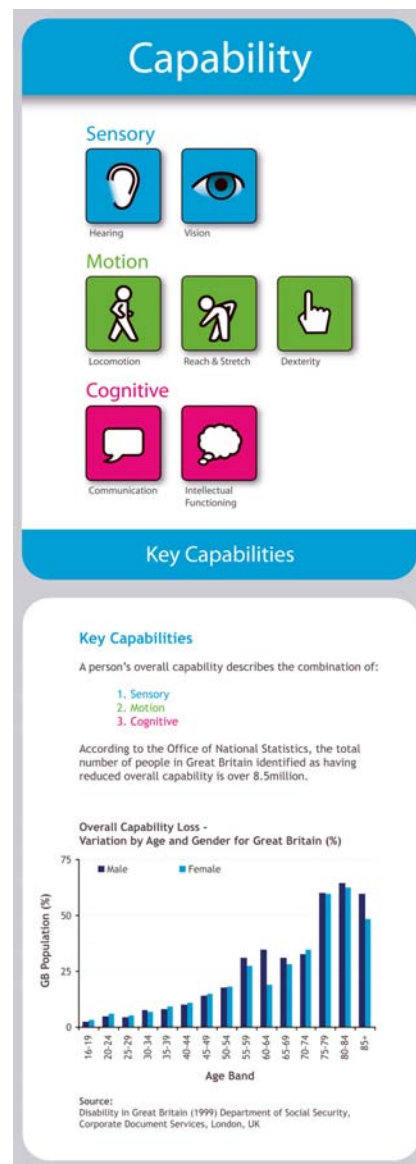
The standard gives us a clear definition of inclusive design, sets out a comprehensive framework for introducing a professional approach to inclusive design into organisations. Preparatory groundwork requires more than adjustments to processes and guidelines: changes in organisational culture and infrastructure may have far-reaching effects extending beyond design to other mainstream disciplines. Therefore, clear direction and support are needed from senior executives.

Issues clarified include top-level responsibility for inclusive design, and the formulation of a business case for adopting an inclusive approach that is tied closely with an organisation's core objectives, strategies and plans.

Guidance is also provided on how current operations and facilities might be reviewed to check their appropriateness, and how experience and best practices elsewhere might be harnessed effectively. Development and marketing strategies are outlined relating to new products and services.

The standard highlights the importance of conferring with target customers and ensuring close co-ordination during the development process so all disciplines contribute effectively at all stages, before and after introduction to market. The importance of preparing markets for new products and services is highlighted. Getting the launch right is crucial to raising the profitability of the product, as is ensuring that promotion, distribution, and customer support are all harnessed effectively throughout its lifecycle.

Communicating the central messages about the 'inclusive design' approach is essential to get the early backing of key staff. Other issues covered include the legal aspects, drawing up and reviewing investment programmes, and evaluating corporate performance. A useful diagram and checklist provide summary overviews of what needs to be done by senior executives and officers at the organisation level. Guidance on managing inclusive design at the project level is provided largely through figures on all prime stages of



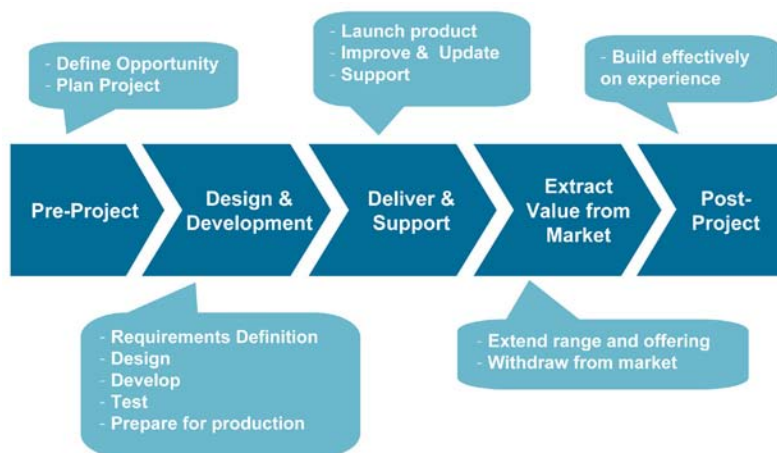
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inclusive design projects – from initial trigger to final disposal. Each includes details of the stage aims, inclusive design tasks to be undertaken, tools and techniques that facilitate work, key outputs, and the basis on which a project might progress to the next stage.

Again, a diagram provides a useful overview of prime project stages, while a checklist summarises the main factors to be considered at project level. An annex outlines the tools and techniques that facilitate work at different project stages, some developed specifically for inclusive design work.



Where next?

The case I have been making is threefold. First, that inclusive design arose out of a need to address important contemporary social issues and a growing realisation that design has much to offer in this regard.

Second, that in order to do that effectively, design itself had to change. It had to become population aware and people aware. It therefore had to understand and address a much wider range of capabilities, more representative of the whole population. Third, there had to be a more effective mechanism than special needs provision through social and welfare services, for delivering life quality improvements to older and disabled people. If the mechanism was to be mainstream goods and services, then business practise and strategy also had to change significantly.

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Where next?

Toyota Well Cab

In short, what was needed to address such social issues was not a specialist form of design, but better, more informed and more responsive design.

This has been a collective journey made many people taking many different routes, but effectively mapping out a single, rich territory with human factors at its core. This enhanced design process is beginning to deliver results, but the real challenge facing manufacturers now is how to market and promote inclusive products.

A good example of this is the Toyota 'Well Cab' system, which was first demonstrated in the Raum, and later in the Porte and other models. The Well Cab concept delivers a fully adaptable cabin as standard, with an integrated system of alternative seats and other fittings offering accessibility to a very wide range of potential users. A truly inclusive design within a portfolio of mainstream products.

Although the early marketing and positioning of the Toyota Raum, the first offering in the Well Cab series, was not particularly successful, Toyota has persisted with the concept and rethought its marketing from a mainstream perspective, demonstrating the designs benefits for families and individuals. In particular, the advertising campaigns have featured families with young children, and women, in one instance with an umbrella, and another wearing a kimono.

These adverts highlighted the accessibility of the design without positioning it as a disability aid, bringing us back full circle to Rachel's kitchen and making the neighbours jealous. New examples, such as the Porte have been more successful setting a benchmark in accessibility that may well have a similar, long-lasting impact on the industry to that of Volvo's initial safety conscious designs.

The effective marketing of inclusivity is without a doubt the next step and big challenge in expanding mainstream product and service offers for tomorrows older consumers, and I fully expect to see significant strides in this area in the coming years.

There is also a strong case to be made for transferring and applying the skills and techniques developed for inclusive



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In conclusion

design to other fields, in particular where larger social issues are concerned. Crime and patient safety in the NHS are two such areas where design can be employed, for example, to reduce opportunities for theft and other crimes, improve the quality of healthcare processes and enhance patient safety through better quality information design.

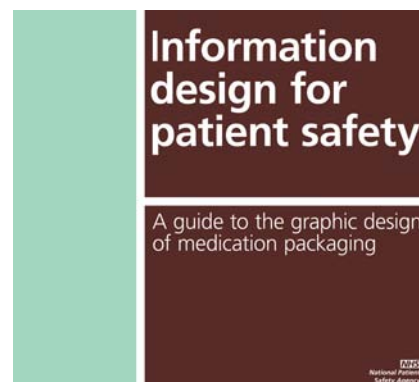
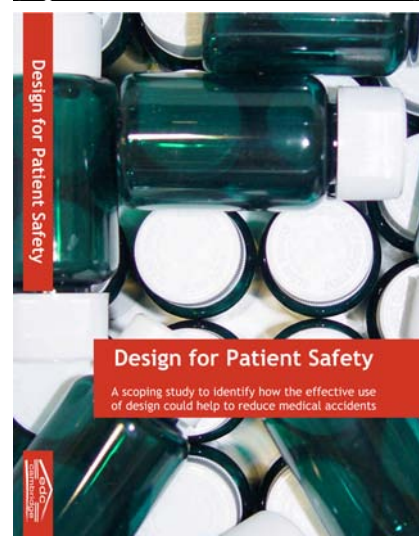
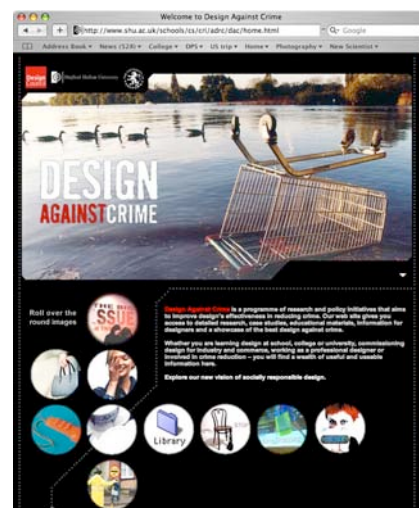
Along with population ageing, the UK Design Council has identified 'design against crime' and 'design for patient safety' as key subjects for both design and industry. In each case it has commissioned studies to raise awareness, and published design policy documents setting out the context and appropriate design responses. It has also supported early initiatives and events in these areas and acted as a catalyst for change. In each instance, the driving rationale was to deliver better design in response to a more in-depth understanding of significant and contemporary social issues.

In conclusion

These big social issues are not easy to address, problems are intractable, many stakeholders are involved, each group with its different motivations; there are huge variations in 'contexts of use', and multiple end users of the same products, services and information. Digging beneath the skin of this complexity and understanding how and why people behave as they do requires a whole range of methods and approaches, many of which have been mapped out and refined as part of the drive for inclusive design.

For example, in investigating information design in medication packaging for the National Patient Safety Agency, much of the research was focused on understanding what happens to medication on the ward, in the pharmacy and in patients homes, especially older patients and those suffering from long-term conditions. The final recommendations were based on a clarity and consistency of information design that could function in these contrasting contexts, and the research methods were precisely the same as those used in inclusive design projects and advocated in BS7000-6.

Patient safety



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The other important factor in areas such as patient safety is the necessity for a systems level approach, as individual solutions to individual problems can be counterproductive. Understanding both the systems level issues and the user level issues, as well as often conflicting stakeholder interests, is clearly an ergonomic endeavour, and I think as a result of the inclusive design journey and the new areas it has opened up we can look to exciting and interesting times ahead for those ergonomists and designers who are prepared to work together on these big and challenging social issues.

The outcome, I am certain, will be better design for all

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W Preiser and E Ostroff (eds), McGraw Hill, New York, 2000, ISBN 0071376054

Inclusive Design: Design for the Whole Population

J Clarkson, R Coleman, S Keates and C Lebbon (eds), Springer-Verlag, London, 2003, ISBN 1852337001

Countering Design Exclusion: an Introduction to Inclusive Design

J Clarkson and S Keates, Springer-Verlag, London, 2003, ISBN 1852336994

Applied Ergonomics, 24(1), 1993

Transgenerational design: Products for an Aging Population

Pirkli JJ, Van Nostrand Reinhold, New York, 1994

Living longer: the New Context for Design

Coleman R, Design Council, London, UK, 2001

The Universal Design File: Designing for People of all Ages and Abilities

Story MF, Mueller JL, and Mace RL, 1998, The Center for Universal Design, NC State University,

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USERfit –A Practical Handbook on User-Centred Design for

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Innovate: The journal of the Small Business Programme of the Helen Hamlyn Research Centre

J Cassim (ed), the Helen Hamlyn Research Centre, Royal College of Art.

Websites

Design Council: About Design

<http://www.designcouncil.org.uk/>

Adaptive Environments: Human Centered Design

<http://www.adaptenv.org/>

Helen Hamlyn Research Centre: Centre for inclusive design

<http://www.hhrc.rca.ac.uk/>

Cambridge Engineering Design Centre

<http://www-edc.eng.cam.ac.uk/inclusivedesign/>

<http://www.eng.cam.ac.uk/inclusivedesign>

RSA Inclusive Design

<http://www.inclusivedesign.org.uk/>

European Institute for Design and Disability

<http://www.design-for-all.org/>

Trace Research and Development Center: Designing a more usable world – for all

<http://trace.wisc.edu/>

Center for Universal Design: Environments and products for all people

<http://www.ncsu.edu/www/ncsu/design/sod5/cud/>

Center for Inclusive Design and Environmental Access, University of Buffalo (IDEA)

<http://www.ap.buffalo.edu/sap/research/idea.asp>

Ricability

<http://www.ricability.org.uk/>

Centre for accessible environments

<http://www.cae.org.uk/>