**Challenge** is an annual publication that documents the work of the Challenge Workshops, a knowledge transfer programme for the professional design and business communities based in the Helen Hamlyn Centre at the Royal College of Art.

**The Challenge Workshops** focus on techniques in inclusive design practice as a tool for innovation. The flagship is the DBA Inclusive Design Challenge, a collaboration between the Royal College of Art and the Design Business Association (DBA). A number of shorter design challenges and workshops are held in different contexts, nationally and internationally, throughout the year.

**The aim of the Challenge Workshops** initiative is to encourage innovation in products, services and environments that include the needs of disabled people, and to foster partnerships with them as an integral part of the design process.

**The Helen Hamlyn Centre** is the Royal College of Art’s centre for inclusive design and it works closely with InnovationRCA, the College’s innovation network for business, to deliver the Challenge Workshops.

**Sponsored by the NPSA**
The DBA Inclusive Design Challenge 2007 was sponsored by the National Patient Safety Agency (NPSA).
Part I
4  DBA Inclusive Design Challenge 2007
12  Project 1: Loadall
14  Project 2: Lugga
18  Project 3: In-Balance
22  Project 4: Talkpad
26  Project 5: Go Steady

Part II
30  24 and 48 Hour Inclusive Design Challenges
34  48 Hour Inclusive Design Challenge Kyoto
42  48 Hour Inclusive Design Challenge Singapore
47  24 Hour Inclusive Design Challenge at Include 2007
56  Web resources
editorial

Throughout their careers, designers deal with all manner of creative challenges. But whatever the nature of the project, their biggest one perhaps is knowing how to set in motion a process leading to that all-important eureka moment that unlocks the great design idea.

If you talk to any of the 330 or more designers who have taken part in the seven DBA Inclusive Design Challenges to date, they will tell you that here is a mechanism that does just that. The Challenge centres on new design partnerships between designers and disabled people. Together they develop innovative and inclusive new product and service ideas over a period of five months. It is all done in their spare time and, unlike other competitions, the process is a mentored one.

The brief is kept quite simple to give maximum creative freedom, but all the designers say that it is a gruelling and rewarding process not for the fainthearted. Why? As Challenge patron Michael Wolff has pointed out, it is about taking off the shoes of preconception and sliding your feet into ones with a distinctly different fit.
It is about operating outside a designer’s usual comfort zone and looking at a problem from the very different perspective of the disabled consumer and using those new insights to innovate for a mainstream market. You can’t fudge the solution, cut corners or compromise but the reward for engagement in the process is a creative terrain full of innovation possibilities.

*Challenge 2007* looks not only at the five shortlisted projects that competed for the seventh DBA Inclusive Design Challenge but shows the results of three extreme versions of the original – 48 Hour versions in Kyoto in October 2006 and Singapore in January 2007 which launched their annual fringe festival, and a 24 Hour version in London, as part of Include 2007, the RCA’s biannual conference on inclusive design organised by the Helen Hamlyn Centre. The time frame for the four events varied but all demonstrated the incredible out-of-the-box thinking that the Challenge Workshops are capable of unleashing.
DBA Inclusive Design Challenge 2007

The design briefs
The challenge to the Design Business Association (DBA) membership was twofold: either design a mainstream product, service, environment, print, on-line or other communication which deliberately includes the needs and aspirations of currently excluded groups of people; or create a design with young disabled people specifically in mind, bringing their everyday lives into the mainstream.

In either case, creating opportunities for Small and Medium-Sized Enterprises (SMEs) and larger companies would be an advantage.
The NPSA brief
The National Patient Safety Agency (NPSA) brief centred on the slips, trips and turns (STATS) that can have devastating effects, particularly for older people. The NPSA invited designers to consider the consequences and contexts in which they occur and design an innovative solution to minimise the incidence or the impact of falling. The solutions could take the form of:
• advertising or awareness campaigns
• protective products
• redesigned environments.

The projects
The judging panel was asked to consider how well entries:
• promote social inclusion through goods, services, communications, environments which have mainstream and/or niche market potential
• show insight into the needs and aspirations of excluded groups of people
• demonstrate a creative approach
• communicate key ideas and messages.

What the judges said
Creative – Loadall
Creative set themselves an ambitious brief based on a very real problem and responded to it with impeccable in-depth research, which was well communicated in their presentation. They highlighted the real issue of the poor design of cars and came up with a solution that was well-engineered, truly inclusive and the result of an impressive level of design work.

Rodd Industrial Design – Lugga
The team from Rodd identified a problem that everyone can relate to, picked up on our natural habits and behaviour but did not go for the easy option of creating a complex ‘bells-and-whistles’ product. The judges applauded the simplicity of their solution, its obvious market-readiness and the fantastic presentation that told the story.

Seymourpowell – Free from Falls, In-Balance System
The jury applauded the impeccable and wide-ranging level of research that the team conducted to understand why and how people fall. They came up with a stylish and innovative product that uses technology as an enabler rather than a barrier and would be attractive to large numbers of those most at risk.

Uniform – Talk Pad
The design team showed strong insight and understanding of the complex issue of how to engage children with special learning needs in the educational process. The judges felt that their idea for Talkpad is more than just a learning aid that addresses the problem and is instead a powerful network-building tool that addresses the underlying issue of socialisation.
Wolff Olins – Go Steady
A ground-breaking proposal for a communications campaign and kitemark that will signal vulnerability, elicit awareness, empathy and a desire to help – but does not stigmatise those to whom it applies. The judges liked the way the team turned a negative into a positive and effectively tackled a large-scale problem that has long resisted satisfactory answers.

The verdict
The five teams were commended for the high quality of their proposals but the clear winner was Wolff Olins for their Go Steady campaign. The jury cited the groundbreaking nature of the project and the key role it could play in changing hearts and minds.

Awards event
Professor Jeremy Myerson, Director of the Helen Hamlyn Centre (HHC), welcomed the audience to the Challenge presentation event the RCA on 6 February 2007 and passed the baton to its chair, Professor John Clarkson of the Engineering Design Centre at Cambridge University, a long-term collaborator.
of the RCA through the i~design research project.

Clarkson explained how the seven challenges to date had involved more than 35 design firms. The initiative as a whole aimed “to make designers and businesses more aware of the issues to do with inclusive design, more aware of the business case and more aware of the means to innovate through the involvement of users with extreme disability as partners in the design teams.”

Clarkson went on to introduce the keynote speakers David Godber of Nissan and Anne McGuire, the Minister for Disabled People in the Department of Work and Pensions, who outlined the case for designing inclusively.

Then it was time to see the team presentations, which were followed by a question and answer session with the audience. Before the verdict was announced, Clarkson called on the painter Sally Booth who represented the HHC’s dedicated network of disabled users who had worked with the teams to develop their projects. Booth outlined with great humour her sometimes ‘surreal’ experiences as a partially sighted person and asked the design community to understand and learn from the creativity inherent in disability.

Then it was the moment of truth, as Colum Lowe of the NPSA, which sponsored this year’s event and provided one of the two briefs, read the judges’ verdicts on each individual project.
“Most people become disabled during their working lives … those who are in the business of designing, manufacturing or delivering services – remember that if you get it right for disabled people, you get it right for everyone and that surely makes good sense. So, while I can’t promise good design will ensure a wide audience for your products, I can assure you that poor design will certainly alienate millions.”

Anne McGuire, Minister for Disabled People, Department of Work and Pensions
“As someone who does wear spectacles and contact lenses I do consider myself visually impaired, albeit mildly, and someone who will be old at some point in the not-too-distant future. The fact that someone is bothering to think about me before I need to is a revelation.”

David Godber, Director, Nissan Design Europe
It was then left it to Deborah Dawton, Chief Executive of the DBA, to announce the winner – Wolff Olins for their Go Steady communications campaign and kitemark.

Dawton praised all the teams for their commitment, dedication to the inclusive ideal and the sheer quality of their work and presented the winning team (below) with a ceramic award commissioned especially for the Challenge from the Japanese ceramist Ikuko Iwamoto.
PROJECT 1
Loadall
Creative

A cost-effective, easy-to-use device for transporting heavy goods into and out of cars
Background
The everyday task of loading or unloading a car boot can be complicated, painful or even impossible if you have a back injury, back pain, are in a wheelchair, pregnant or just frail or elderly. Car boots are open, flexible spaces that accommodate all manner of things but they have nothing to assist you as you reach over, bend awkwardly and lift out the item or attempt to load the car.

How does it work?
The design team looked at existing retrofitted products from engineered cranes to inflatable mattresses that lift loads above the sill level. All were impractical in terms of cost and effectiveness for the range of situations they needed to address and the different car types each with their own boot configuration.

Creative’s solution was Loadall, a device encased in a metal box structure with a moving platform and integrated handle. The platform can adjust to different boot heights and can be slid easily in and out beyond the sill, allowing wheelchair users to transfer loads easily. An object can be placed on this platform and the hinged cover drawn over it and secured to the handle to keep it in place as it is slid back into the boot.

In this way, loads can be transferred in and out of the boot space, eliminating the need to bend, place or lift. Unlike a fixed piece of equipment, Loadall can be removed from the boot when necessary or remain as a permanent fixture secured by a simple strap to the eyelet at the back of the boot, allowing drivers to continue to use the car with which they are familiar.

User input
Six disabled and older drivers with a range of disabilities and differing needs.

What the designer said:
“It was an absolute nightmare at times but we got a lot out of the Challenge. We enjoyed it and the hope is we can implement the things we have learnt into our everyday (design) activities.” Rod McBrien, Creative
Lugga is a simple carrying device shaped like a squared hook with an optional strap that helps anyone who needs an extra pair of hands to cope with the things they have to carry.
Background
Carrying shopping is a challenge for anyone not travelling by car. Multiple purchases mean a clutch of different bags, a task made more complicated when a child is holding one hand or you are frail and need a stick to balance. The commuter who also shops, balancing bags and briefcase on a crowded bus or train, finds it tricky when there is no chance of resting them on the floor.

Some shoppers have created their own ‘Heath Robinson’ versions. Lengths of hosepipe with a slit down the middle are a common strategy to alleviate the painful effects of circulation being cut off by heavy bags. Such measures may make one bag slightly more comfortable but do not address the underlying issues of multiple bags, weight distribution and keeping your hands free.

How does it work?
Lugga redistributes loads away from the hands and wrists, making them easier and more comfortable to carry. It allows multiple bags to be carried, put down and conveniently picked up again.

The soft grip handle is comfortable and easy to grip for longer periods without cutting off circulation. The deep mouth of the hook guides multiple bags into position but prevents them from falling off if Lugga is dropped or placed on the floor. The bags naturally collect directly below the centre of the hand, providing the best position for weight distribution.

A padded, adjustable shoulder strap allows weight to be redistributed through the shoulder and spine, keeping the hands free. For storage the whole system rolls up and slips into a pocket, handbag or case. The design team did not want to exclude people on price but wished to use high-quality materials to make it a one-time purchase. Depending on the retail environment, Lugga can be a single shot-injection moulding, a series of mouldings or a combination of materials such as a casting and a moulding or even a machined wooden handle.
What the designer said:

“We wanted to find a solution that we termed as a one-page idea – something immediately tangible, very intuitive to use… (that would be) a simple solution to a surprisingly complex problem.”

Ben Davies, Rodd Industrial Design

User input

The initial user input was consumers with dexterity and mobility problems. A prototype was made and then evaluated by a wide range of shoppers in Southampton.
A full-body wearable system akin to thermal underwear with embedded sensors that monitor muscle movement and balance, collect data and give feedback. The In-Balance System provides the wearer with an extra level of awareness about their movements and warns of risky situations, empowering the user to continue their exercise programme with confidence.
**Background**

Falls account for 62% of all fatal injuries to people aged 65 and over, and the resulting burden on NHS resources and time is high. Women have a higher risk of hip fracture following a fall. Patient recovery is slow or only partial, with a hip replacement not always possible. Existing products to protect joints are cumbersome, stigmatising and undesirable.

**How does it work?**

The In-Balance system focuses on preventative rehabilitation or ‘prehab’. Worn next to the skin, sensors at key points within the garment monitor muscle movement, balance and posture. The basic Phase One System warns people with muscular or balance deterioration of sudden or risky movements and prompts them to correct them or simply slow down.

Phase Two augments this with additional muscle sensors and data logging to provide analysis and feedback. It focuses awareness on the control of muscle groups around which a health professional has devised their exercise programme. The Advanced Stage Three System for athletes provides complete body movement sensing to enhance their training, isolate muscle groups and analyse their gait.

A lightweight watch-style cuff collects the data and provides immediate visual feedback on their movements, while simple visual alerts communicate how well they are managing to stimulate specific muscle groups or manage their posture. The diagnostic unit can also be worn as a pendant. If the wearer requires more detailed feedback, an analysis hub gathers data for a detailed record of performance, which can be reviewed by health professionals or coaches.

The garments are made of lightweight cotton mixed with Lycra to provide contact for the sensors, but without feeling restrictive. Tracks linking the sensors are woven into the fabric and they can be removed to allow the garment to be laundered. The modularity of the sensors means that the specific needs of a wide range of user requirements can be met efficiently.
What the designer said:
“The aim of what we were doing was to make an eminently wearable sheer garment that would be comfortable to wear underneath your clothes – the stuff that is out there at the moment is not with electronics or intelligent behaviour but it is starting to formally be seen.”

Katherine Gough, Seymourpowell
PROJECT 4

Talkpad

Uniform

An online learning resource to improve the social and communication skills and literacy levels of children and young adults with special educational needs
**Background**
Children with Special Educational Needs (SEN) have the same kind of interests as other children but many learning aids for them do not reflect this. Their teachers have difficulty in finding age-appropriate ones that engage, motivate and stimulate but remain accessible and can be used across different developmental levels. This can result using materials designed for pre-school children with teenagers. "We need resources with an age-appropriate interest level that could be differentiated down to the children's developmental level and that's really tricky" – Jane Parry, Deputy Head, Abbots Lea School, Liverpool.

**How does it work?**
Talkpad is a conceptual web-authoring software tool that enables children and young adults with SEN to create and interact with a secure, on-line community of their friends, peers and teachers, and have fun. The site is a flexible space where teachers can create diverse online learning communities, allowing pupils from different schools to talk to each other, complete assignments, and reflect on their own development.

The software allows children to create and share a personal profile that expresses who they are and what they like, with a journal that becomes a archived digital portfolio of their work and interests and a space to review their achievements. Unlike existing social networking sites, Talkpad has been designed to be accessible to users with a broad range of disabilities, reflecting the diversity of children with SEN. The variety of accessibility settings allows them to tailor the site to their preferences. Talkpad remembers these and displays content accordingly.

**Talkpad’s basic toolset**

**Navigation**
The main toolbar is simple featuring large buttons with text and intuitive symbols.

**Journal**
The main component of the site where children can add content tailored to make it easier for users to read.

**Accessibility**
Accessibility settings can be reached easily and quickly.

**Functionality**
The scope of the site has been kept deliberately simple to avoid confusion.

**Profile**
Each child creates their own online profile. Children can customise the appearance to reflect their interests and add content in a variety of media - text, image, film or sound.
**User input**
Uniform worked alongside teachers and pupils at Abbots Lea in Liverpool, a school for pupils with SEN, and a group of disabled users to understand the issues and how children learn.
What the designer said:

“The real challenge on this project was that we were doing it in our spare time alongside the commercial demands of other projects. We wanted to extend the scope of work we engaged with, learn more about inclusive design and stretch ourselves creatively. We didn’t have a pre-conceived idea of where the project would take us but we were very happy with the result.” Pete Thomas, Uniform
Go Steady – an awareness campaign and kitemark system designed to create a more mobility-aware society
**Background**
In 1969 the now familiar pictogram by Danish designer Sussanne Koefoed of a stick figure in a wheelchair was adopted as the international standard for disability. There have been moves to change its passive posture to a more active one, but as yet no compelling alternative has emerged despite its unrepresentative nature.

Mobility is the key to independent living and the statistics relating to falls are grim. Every five hours in the UK someone dies as a result of a fall – they kill more people over 65 than cancer or coronary heart disease. Yet only five per cent of disabled people are wheelchairs users.

While the pictogram shows the extreme consequences of mobility loss, the subtlety and range of disability issues it aims to cover are ignored. It gives no picture or warning of potential risk and the sign sets apart the population it aims to integrate. All in all it begs the question how one can signal vulnerability in a way that is subtle, unequivocal and elicits awareness, empathy and a desire to help.

**How does it work?**
The design team wanted the logo to be a bullet of information that was “arresting, intriguing and jarring” and made sense in symbolic terms. They rejected red, the colour of danger, and chose instead a lively pink for the symbol – an arrow and its partner with one part of the arrowhead missing. Side-by-side they suggest the M for mobility and the helping hand that can make a difference.

The campaign sign can be drawn, applied, printed and used as a way of encouraging people to offer help again and again. In some situations, it could signal the need for increased levels of vigilance – the symbol could be painted on uneven or dangerous surfaces or at the beginning of transition areas in buildings where the lighting is poor or the surface changes abruptly.

The simplicity of the symbol would allow a doctor to signal a patient’s vulnerability and level of risk. It could be drawn or stamped on medical notes and become a point of reference for staff in busy healthcare settings who can know at a glance who has a tendency to fall.

For the general population, the symbol printed on a package of medicine could indicate that it causes drowsiness and increases the risk of a fall.

The possibilities are endless – it could be stamped on a bus pass to alert the driver of a passenger’s need for assistance or posted on a route planner or website to indicate areas where extra care is necessary. Conversely the symbol can be placed on products that enhance mobility, such as shoes with soles that grip.

The Go Steady initiative would need to be launched initially by a public body in collaboration with organisations concerned with health, age and disability. Once established, however, it would have a viral life of its own and, importantly, one that speaks to all.
Every 5 hours someone dies from a fall. Look out for others and offer a helping hand, you could save a life.

www.gosteady.org
What the designer said:

“Since working on this project I have noticed that there seems to be different realms – the world of business that is engaging with inclusive design and the world of business that isn’t. Taking this argument to businesses that are reluctant is not as straightforward or as easy as it should be.”

Luke Gifford, Wolff Olins
Extreme versions
The 24 and 48 Hour Inclusive Design Challenges

The flagship of the Challenge Workshops initiative – the DBA Inclusive Design Challenge – lasts for five months from start to finish. But what if the key elements of the programme were to be condensed into a short, intense period lasting from one to three days? Could a much-abbreviated Inclusive Design Challenge still deliver powerfully in terms of unlocking innovation by exposing designers to the needs and ideas of disabled users?
According to the Office for National Statistics: total population of 59.8 million people in the UK 2003, aged 50 and over, 20 million projected to increase by a further 36% to 27.2 million by the year 2031. The Financial Services Authority has calculated that this population group owns 85% of the nation's wealth (excluding housing and pensions) spend £175bn a year or 45% of all household expenditure. a business opportunity not to be missed.
Over the past three years, the Royal College of Art Helen Hamlyn Centre has been experimenting with the Challenge Workshops format under the direction of Senior Research Fellow Julia Cassim. There have been shorter Challenges in the UK in collaboration with the College of Occupational Therapists, in Israel with the Holon Academic Institute of Technology outside Tel Aviv, and in Japan at the universities of Kyoto and Kyushu. All were non-commercial in nature and geared to design students or multidisciplinary teams.

Other workshops have taken place in a business context with companies as diverse as Reckitt Benkiser, Nokia and TOTO, the Japanese market leader in bathrooms, resulting in commercial design ideas that are confidential to those enterprises. What has become clear is that a short, intense distillation of the Challenge experience really does work in terms of identifying user needs and capturing new ideas in creative form.

Why does it work? The reasons are various, but participants point especially to the out-of-the-box design thinking that the partnerships between designers and disabled people engenders. Designers, engineers and those from other disciplines are shown places, contexts and strategies that they have not visited before. As a result, they have to draw upon reserves of creativity against a very tight deadline that allows no prevarication or uncertainty and drives an idea through to its innovative conclusion.

In Part 2 of Challenge 2007, we look at extreme versions of the Challenge model in three different international contexts – Japan, Singapore and London. The shorter format was first piloted at Include 2005 with great success and, like any compelling idea, it has bred a family of its own.

The question then for designers and industry is how to design mainstream products and services which take account of the physical and sensory changes
of ageing but do so in a way that reconciles their aspirations and functional needs without the stigma of conventional special needs products.

Exemplars of inclusive design are in existence. The Oxo Good Grips range has led the way, as have the exciting prototypes emerging each year from the DBA Inclusive Design Challenge and the Helen Hamlyn Research Associates Programme at the Royal College of Art. Here, designers have used methodologies centred on user involvement at all stages of the design process. The result: better design whatever the context.

In principle, designers and their clients will often agree that this is the way to go. But they will also say that they do not inhabit a perfect world – they are time-pressured and involving users can be logistically complex and expensive. Designers also fear that working with older and disabled users will restrict them and bring some form of fatal creative compromise to their final design.

Seven years of the DBA Inclusive Design Challenge have laid that idea comprehensively to rest and shown that you can reconcile aesthetics and function and innovate significantly through interaction with users with severe disabilities. After all, these are people who often do things in radically different ways that in themselves suggest new, lateral approaches to design problems.

However, there still remains the problem of time and inclusive design is perceived as being very time-consuming. To show that this is not necessarily the case and to ensure that the lessons learned are transferable, the DBA Inclusive Design Challenge takes place within the time frame of a typical design project of around four months. But some projects are even shorter and we wondered whether there could be a quicker format to jump-start the inclusive design process as an effective way to generate innovative ideas or, at the very least, alert design managers to the advantages of an inclusive approach.
48 Hour Inclusive Design Challenge
2nd International Conference for Universal Design
Kyoto, Japan
23-25 October 2006

The designers
John Bateson, Corporate Edge
Adrian Berry, Factory Design
John Corcoran, Wire Design
Tim Fendley, AIG
Stuart May, PDD

The partner
The International Association of Universal Design (IAUD) is a membership organisation composed of 147 leading Japanese companies
The event
Kyoto in the autumn when the maple leaves are changing colour is a spectacular time for visitors. But the five designers from the UK, all veterans of previous DBA Inclusive Design Challenges, barely had a chance to glance outside the windows of the Peace Museum at Ritsumeikan University where they were holed up for 48 hours. They were in Kyoto at the invitation of the International Association of Universal Design (IAUD), to lead five teams of young in-house designers from Japan’s leading companies as they competed in the 48 Hour Inclusive Design Challenge. It was held as part of IAUD’s 2nd International Conference for Universal Design.

The context
In Japan, major manufacturers have comprehensively embraced universal design as integral to their company policy and brand image, and ensured that a greater proportion of their products are inclusive in nature. The business rationale is based on the demographics of Japan’s ageing population, with universal design commonly viewed as ergonomically sound design for older and disabled people. However, while safe, it is also boring and lacking in aspirational appeal. The aim of the event was to bring a new set of stimuli to the subject, to reposition inclusive design as a route to product and service innovation, and to show how the active involvement of disabled people in the design process – as partners rather than ergonomic test subjects – can bring lateral perspectives to bear on long-standing design problems.

The participants
Five teams comprised young in-house designers of different design disciplines working for companies in the IAUD network. Each team was led by an experienced British designer and assisted by volunteer interpreters from Ritsumeikan University. Each team worked with a disabled user introduced by Tanpopo no Ie, a disability arts organisation. The teams were mixed
ones from different companies, with the aim of forming new intra-company networks of young designers to advance inclusive design in Japan.

**The format**

After the brief was revealed on 23 October, the teams worked to a 48-hour time limit. The first 24 hours were spent on field research, brainstorming with the user, issue extraction, storyboarding and design development; the remaining 24 hours were spent synthesizing the design and producing a six-minute presentation. Awards for the best design and the best presentation were made after public judging by conference delegates.

**Other collaborators**

- Ritsumeikan University
- Tanpopo no Ye Foundation
- User Science Institute, Kyushu University
- Symbiotic Systems Lab, Kyoto University

**The design brief**

Teams were asked to address the theme of lifestyle, leisure or sport, and design a new product, service, environment or communication that addresses the aspirations of young disabled people to be integrated into the mainstream. Creating business opportunities for large and small firms was part of the challenge.

**The verdict**

Two prizes were awarded for best presentation and best idea. Team E won the award for best idea for their customisable remote control, which has since been prototyped by Toyota. Best presentation prize went to Team B.
The projects

Team A
Leader – Tim Fendley, AIG

Team members
Mitsubishi (audio visual design), Toyota (automobile design), Toto (product design), Ricoh (information systems), Kawashima Seikon Textiles (textile design), NEC Design (advanced design).

Lead user
Remi – a young, profoundly deaf office worker who lipreads.

The issue
Helen Keller noted that while blindness cuts you off from things, deafness cuts you off from people. While one-to-one conversation is possible for hearing-impaired people who lipread, much socialising takes place in groups. To understand the ebb and flow of conversation, and be an active participant in it, being able to track the changing context is crucial.

Audio Sphere
Audio Sphere is a device akin to a crystal ball, which skilfully exploits existing software that allows moods to be observed, speech to be translated into text and audio sampling to take place. This freestanding sphere contains a four-directional microphone, a processor and a display. On this the flow and direction of speech and the position of the main speakers are indicated, as are the keywords of the conversation at hand. The shifting moods of the conversation are also indicated throughout.
Team B
Leader – Stuart May, PDD

Team members
Oki (usability, interface design), Fujitsu (usability research), Nissan (interaction design), Hitachi (product design), Sony (graphic design), Toto (product design), Toyota (automobile design).

Lead user
Haruo – a young man with cerebral palsy who enjoys fishing, shopping, movies, web surfing and fast food, especially his favourite teriyaki burgers.

The issue
Fast food has some advantages for him – there is no washing up and no need for cutlery but the separate wrappings for each component are flimsy, create piles of waste and make it difficult for him to eat with dignity.

Any Pack
Any Pack is a three-piece modular pack suitable for eating in or taking away. Made from insulated paper, the envelope will accommodate the different food portions, keep them separate and warm and allow each to be accessed in turn. When the meal is finished, the paper can be used as a napkin to wipe the mouth.
Team C
Leader – John Corcoran, Wire Design

Team members
Ricoh (interaction design), Clarion Co Ltd (graphic user interface), Panasonic/Matsushita (product design), Nissan (automobile design), Toto (appliance design), Toyota (textile design).

Lead user
Keiko – a female office worker with poor dexterity who lives independently, uses a wheelchair and drives, but occasionally needs assistance.

The issue
Keiko said: “I would like to change the way that people act towards me. It feels like a barrier.” The store assistant said: “If I knew she needed help it would be OK but I wasn’t sure if I would offend her.”

Assist
A discreet but ubiquitous symbol system that would remove such barriers of uncertainty. It would allow those who need help or who want to offer it the ability to communicate their wishes to each other. The symbol could be printed on event tickets to indicate an assist service at the venue and displayed on buses and store windows. When a RFID tag is embedded in the symbol on a storefront for example, it could signal through a user’s mobile phone their proximity to a helping hand.
Team D
Team leader – Adrian Berry, Factory Design

Team members
Toshiba (medical/healthcare products), Canon (industrial design), Clarion (product design), Panasonic/Matsushita (product design), Toyota (automobile design), Fujitsu (product design).

Lead user
Mrs Shirasaka, a blind housewife.

The issue
Like many visually impaired people, Mrs Shirasaka finds shopping for clothes a chore – she must depend on the variable taste of others for advice on the colour, size and style of each garment and whether it suits her or not. At home, classifying her clothes and selecting an outfit poses problems. How can she tell what goes with what?

Tag Wear
The Tag Wear system is based on one already in use throughout Japan – differently – shaped notches on prepaid travel and telephone cards indicate the value and type of card. As applied to clothing, the swing tag on a garment would have similar coded notches to indicate its size, colour and the context of wear – formal, casual, street, extreme sports and so on, with the same information given in Braille. The barcode would deliver additional information and stores would hold a reference set of all the variations to enable them to give advice to customers.

Importantly the tag could exist as a decorative feature in its own right as a single, double or triple loop of ribbon, with the Tag Wear mark to show a brand’s buy-in to the idea and its implementation in its clothing ranges. An RFID embedded in the Tag Wear sign outside a store would signal to shoppers that the system is in place.
Team E
Team leader – John Bateson, Corporate Edge

Team members
Hino Motors (automobile design), Toyota (automobile design), Mitsubishi (product design), Toshiba (product design), Toto (product design), Toppan Printing Company (packaging).

Lead user
Takayuki Mitsushima, a blind artist and masseur.

The issue
How to make remote controls easier to use for all.

U Control
The standard remote control that we rely on to access so many consumer products presents problems to all – if you have impaired sight, there is no sound or tactile feedback and the buttons are too small and all the same. If your dexterity is not what it should be, the remote control is difficult to press, the buttons are too close for accurate selection and it slides around. For those with impaired hearing, no visual feedback is given and how do you access the subtitles for your programme? If you are old, the numbers are too small, there is no contrast and it can be all just too complicated. For everyone, remote controls present difficulties.

U-control resolves all these problems by being completely customisable to each user’s needs – it can be as simple or as complicated as you want since the functions can be slotted in separately and added or subtracted in the manner of Lego blocks.
48 Hour Inclusive Design Challenge
M1 Singapore Fringe Festival 2007
Singapore
27 January – 11 February 2007

Supported by
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Polytechnic
The event

First held in 2005, the M1 Singapore Fringe Festival is an annual celebration of the performing and visual arts created and presented by Singaporean and international artists. Themed differently each year, the Festival aims to bring the best of contemporary, cutting-edge and socially-engaged works to a Singapore audience. The 2007 festival theme was Art and Disability. The RCA Helen Hamlyn Centre was invited to organise a 48 Hour Inclusive Design Challenge to launch the festival and extend its remit to include design.

Eight teams made up of student and professional designers competed for the prize. It was won by the Singapore office of the international advertising agency Grey for their design of lingerie combining functionality with desirability for women who find conventional underwear impossible to put on and the special needs variety deeply unattractive. In two days the team produced a prototype, communications campaign and a six-minute film documenting their project.

The projects were the subject of the opening exhibition of the Festival at Vivo City, Singapore’s newest mall designed by Japanese architect Toyo Ito, and the event opened by Dr Amy Kor Lean Suan, Mayor of South-West District and Senior Parliamentary Secretary, Singapore Ministry of Environment and Water Resources.
WINNER
Grey: Wunder™

Wunder™ is a comfortable and stylish range of lingerie for women with disabilities that meets their desire for good-looking underwear with inbuilt functionality. Wunder fastens at the side, opens flat at the crotch and can be slipped on easily for carer-assisted or independent dressing.

SECOND PRIZE
The Articulators: Zip’n Pluck

Thermal food packaging comprising a lunch box and container using an integrated ‘zip lock’ fastening that solves the problem of takeaway food and spilling drinks while on the move. The packaging is recyclable and bio-degradable.

THIRD PRIZE
White: i-Ball

i-Ball is a sport system travelling along a designated track that encourages everyone, especially those with mobility and visual impairments, to participate in the activity. The i-Ball has an outer spherical casing speed and inner spherical unit with an ergonomic seat that allows the rider to sit upright throughout the ride and hand-pedals with which they control the speed through a rowing action. The i-Ball comes in various sizes to suit different body sizes. Potentially, leg pedals can be introduced to allow a workout for your arms, legs and lower back.
Conventional scissors are problematic on many levels for people with limited dexterity. Kato presents stylish scissors with an encased blade for maximum safety that are operated by a simple downward push of the palm.

The Nana: Idea

An aluminium clothes hanger shaped like an aesthetic question mark with an extended arm for people to reach for clothes hung on high racks. The arm can be unscrewed for easy packing and the hook rotated 45 degrees to allow clothes to be hung on wall edges.

Springboard: PatLock

The PatLock or Pattern Lock was inspired by a visually-impaired member of the design team. It does away with the need to memorise a sequence of numbers using pattern recognition instead as a navigational method, thus opening up an entire spectrum of market possibilities for other products.
NafNaf: Myst_ry Map Co™

Myst_ry Map Co™ redefines the experience of navigating our way to a party. Guests begin the adventure by peeling off the perforated strips of their invitation to a 'mystery' event to discover sequential cues to the final destination. Cues are imbued with the delicate sights, scents and sounds of the journey as experienced by a visually impaired person. Braille translations are embossed on top of the text cues to add another dimension.

Panasonic: The Drift

A compact shelving system that addresses the problem of shelf height, inspired by Philip, a wheelchair user who finds many objects out of reach. It works by shifting shelves up and down at the press of a button. The same number of books can be housed as conventional bookcases and the system can be used in homes, libraries or retail spaces for easier browsing.
24 Hour Inclusive Design Challenge
Include 2007 conference
RCA London, UK
2-3 April 2007

Sponsored by
Communities and Local Government
The event
‘Astonishing’ was the word British design luminary Michael Wolff chose to describe the results of the 24 Hour Inclusive Design Challenge, held as part of Include 2007. Four teams of young designers received their brief on Monday 2 April at the first plenary session of the conference and were introduced to the disabled people who would work with them. They had just 24 hours to come up with an inclusive concept in response to the brief.

On Tuesday evening, after little sleep but lots of coffee, pizza and creative adrenalin, they presented their projects at Imperial College London, using slides and short films to make their point. An appreciative audience of Include 2007 delegates voted on the winner.

The speakers
Luke O’Shea of Communities and Local Government, the UK Government department that sponsored the event, said: “We’re all here on a real journey… we want to move from a position where everyone has to adapt houses and products to meet ordinary needs to a place where all products are designed to offer better functionality for everybody. I feel it’s the vanguard of a very quiet revolution to create this inclusively designed society that we all aspire to.”

While the votes were being counted, Challenge patron Michael Wolff praised the teams whom he had spent the day visiting. “I can’t imagine anyone having a more exhilarating or inspirational day than I’ve just had,” said Wolff. “Inclusive design is actually common sense, it’s being sociable where so much of design is about creating isolation.

Wolff added: “I think we saw today the beginning of designers being in other people’s shoes and doing something that makes life better for other people. And if that is the destiny of the design business then I’m happy to be a designer.”
The brief
To develop and present a design proposal that enhances independent living for older people and those with disabilities. The focus of your project should either be on independence within the home or mobility from the home. Design outcomes can take the form of a product, service, environment or visual communication.

The verdict
Hyphen Design was partnered with Sally and Robin, who live with rheumatoid arthritis, and their project focused on their difficulties in travelling by bus. A team of RCA Alumni and friends from Edinburgh College of Art and Musashino Art University in Tokyo looked at the difficulties of wayfinding in unfamiliar areas experienced by Alison a visually impaired therapist. Sprout Design, aided by Totem and Sarah Lloyd Design, were paired with Sally, a visually impaired artist, and developed not one solution but two tools to aid her independence and working needs. Automotive designers Fenomenon worked with Susan, an older driver, to develop a new concept car aimed at senior citizens. Sprout Design won the popular vote, with RCA Alumni and friends runners-up.
ePod: a car for senior citizens and wheelchair users

Fenomenon

A three-wheeled, eco-friendly electric car aimed at senior citizens or wheelchair users.

The issue
Despite older people forming the wealthiest and fastest-expanding consumer segment of the car-buying market, vehicle manufacturers have yet to design a car specifically tailored to their needs and aspirations.

How does it work?
Manufactured from 100% recycled and recyclable material, the ePod is a three-wheeled vehicle with easy single-door access from the front. This compact urban car can be manufactured in either a single or double seat formation and exploits drive-by-wire technology to allow wheelchair users and others to select their preferred driving position; ePod can park sideways in all parking bays.

This ergonomic concept is based on available benchmark-setting technology. The chassis is formed of extruded aluminium, it has a single-hub motor, single swing-arm suspension and a top speed of 70mph. ePod runs on Lithium Ion batteries and should be capable of an average range of 150-200 miles between charges. As such it is 100% eco-friendly with zero emissions and a zero carbon footprint and thus not subject to road tax or the congestion charge. The design team envisages that it could be provided under a competitive finance or leasing scheme of £30 per week based on the Motability model.
**Oyster Plus**  
Hyphen Design

The Oyster Plus is an innovative extension of London’s current Oyster card system that can be easily implemented to encourage mobility and independence for people with clear or hidden disabilities.

**The issue**
Getting around by bus presents its own set of challenges for disabled people, especially those whose disability is not obvious to the travelling public or even the driver. Letting others know that you need a seat, reaching your seat or leaving it safely can present problems. The design team looked at how the existing Oyster card system could be made more responsive to alert fellow passengers and the driver to the need for care and support.

**How does it work?**
Oyster Plus extends the benefits of the Oyster card system by providing discreet information to bus drivers and other bus users. When a passenger with disabilities swipes their card on the reader, they can identify reserved seats by a yellow indicator light and the driver is informed of the need to wait until they are safely seated. When the passenger swipes their card on the indicator light on the seat, a green light appears on the dashboard and the driver knows he can proceed. The other passengers also know that the seat is legitimately occupied since the indicator light is now off.

When the passenger wishes to alight, they push a button on the handrail by the seat to inform the driver, who knows that care must be taken in slowing down and positioning the bus. In this way, Oyster Plus provides a safer environment and a more pleasurable journey by discreetly alerting the driver at the point of entry, and fellow passengers in the vicinity of reserved seating, of a person’s need to access a seat. It is intended that this increased awareness will prevent the common occurrence of falls when the bus moves off, educate passengers that disabilities are often not apparent, and promote a more inclusive community.
Patchworks
RCA Alumni and Friends

Patchworks is a web-based system for personal mapping and navigation that enables knowledge-sharing between people of all ages, interests and abilities.

The issue
Going places, especially unfamiliar ones, can be difficult for people with impaired vision. Official access information may give the big picture but not the detail they require to go confidently where they have not been before. In contrast, they will know their own neighbourhood and favourite places like the back of their hand. How can this valuable information be shared with others who need it, and a timely and multi-layered map of a city be built up from which all can benefit?

How does it work?
A city like London is a multi-layered entity – and our individual portrait of an area will be made up of things that interest, inspire and defeat us. The physical fabric of the city is also composed of things that have been there for centuries alongside those that were put there only recently, and this shifting reality can pose problems for people who have difficulty in navigating through urban space.

Patchworks draws on two popular online communities and one resource for conceptual inspiration. It can be described as being like ‘MySpace meets StreetMap meets Wikipedia’. Like them, it can be accessed by all, can grow organically and can adapt flexibly to reflect the changing patterns, activities and environment of the city. Importantly it can meet the need of everyone for current information that is constantly updated, and offers a space where people can meet and share their interests and insights.

Patchworks is not a disability-specific site but one to which people of all abilities and interests can contribute and from which they can benefit on their own terms. Users of the site can build up a personal profile of their physical
and sensory needs, cultural and other interests and share information about their 'patch' with in a virtual community that is open to all. In this way, Patchworks will encourage people with disabilities and difficulties to have the confidence and reassurance to be more spontaneous.
Magnifeye | Eyewonder:
Sprout Design, supported by Totem and Sarah Lloyd Design

Magnifeye is a flat tablet device that captures the world in close detail, magnifies and displays it.

Eyewonder is a handheld image capture, storage and projection wand with a wide-angle high-resolution lens that is intuitive to use and gesture-driven. It has a single button that allows colour and contrast to be enhanced and detail magnified.

The issue
135 million people worldwide have impaired vision, two million in the UK alone, the majority of whom are aged over 65. Many have some useful vision but require vision aids of different types such as magnifying lenses or scanners to maintain independence, access information and to find their way around.

How do they work?
Magnifeye is a magnifying tablet that brings the world closer by capturing and magnifying things that are too distant or indistinct to see. It can store and give easy access to information such as roadmaps, train times and phone numbers and can be used as a camera, digital photo frame or as a sketchbook for taking notes with the finger or a stylus.

The device can also capture, store and...
display enlarged images on any flat surface and can even create images and enhance contrast for better visibility. Based on a seven-by-five inch tablet format, it has a wide-angle high-resolution lens that takes images, which can be studied in detail using its simple touch-screen interface.

**Eyewonder** is envisaged as one of a new generation of pocket-sized projectors currently under development which employ ‘infinite focus’ technology – a laser-based projection technology that needs no optics to adjust for a clear picture and needs no moving parts or fans to dissipate heat. It can produce an image of 11 by 17 feet at a distance of three feet, which can then be magnified as large as 35 feet.

Eyewonder is wand-like device capable of projecting large displays that can be magnified, colour contrasted, and light controlled. It allows images to be stored and viewed at a range of sizes on any smooth surface. It is a simple way of storing and instantly accessing images and information such as maps, names, addresses, food labels and reminders. Eyewonder allows the user to intuitively scroll through images without the need to operate a complicated interface.
## Web resources

### DBA Inclusive Design Challenge 2006/7
**Shortlisted teams**
- www.creative-design.co.uk
- www.rodd.uk.com
- www.seymourpowell.co.uk
- www.uniform.net
- www.wolffolins.com
**National Patient Safety Agency (NPSA)**
- www.npsa.nhs.uk
**Design Business Association (DBA)**
- www.dba.org.uk

### Include 2007
- www.hhrc.rca.ac.uk/events/DBAChallenge/24HC/index.html

### 24 Hour Inclusive Design Challenge Include 2007
- www.hhrc.rca.ac.uk/kt/include/2007/index.html
- www.fenomenon.com
- www.hyphendesign.com
- www.sproutdesign.co.uk
- www.rca.ac.uk
- www.eca.ac.uk
- www.musabi.ac.jp/e-home/index.html

### Communities and Local Government
- www.dba.org.uk

### 48 Hour Inclusive Design Challenge in Kyoto
**International Association of Universal Design - IAUD**
- www.iaud.net/en/
**Ritsumeikan University, Kyoto**
- www.ritsumei.ac.jp/eng/
**Tanpopo no Ie**
- www.popo.or.jp/English/index.html
**Kyushu University, User Science Institute**
- www.usi.kyushu-u.ac.jp

### 48 Hour Inclusive Design Challenge in Singapore
**M1 Singapore Fringe Festival 2007**
- www.singaporefringe.com
**British Council Singapore**
- www.britishcouncil.org/singapore.htm
**Grey**
- www.greyglobalgroup.com
**Singapore Management University**
- www.smu.edu.sg
**Singapore Polytechnic**
- www.sp.edu.sg
**Vivo City**
- www.vivocity.com.sg
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