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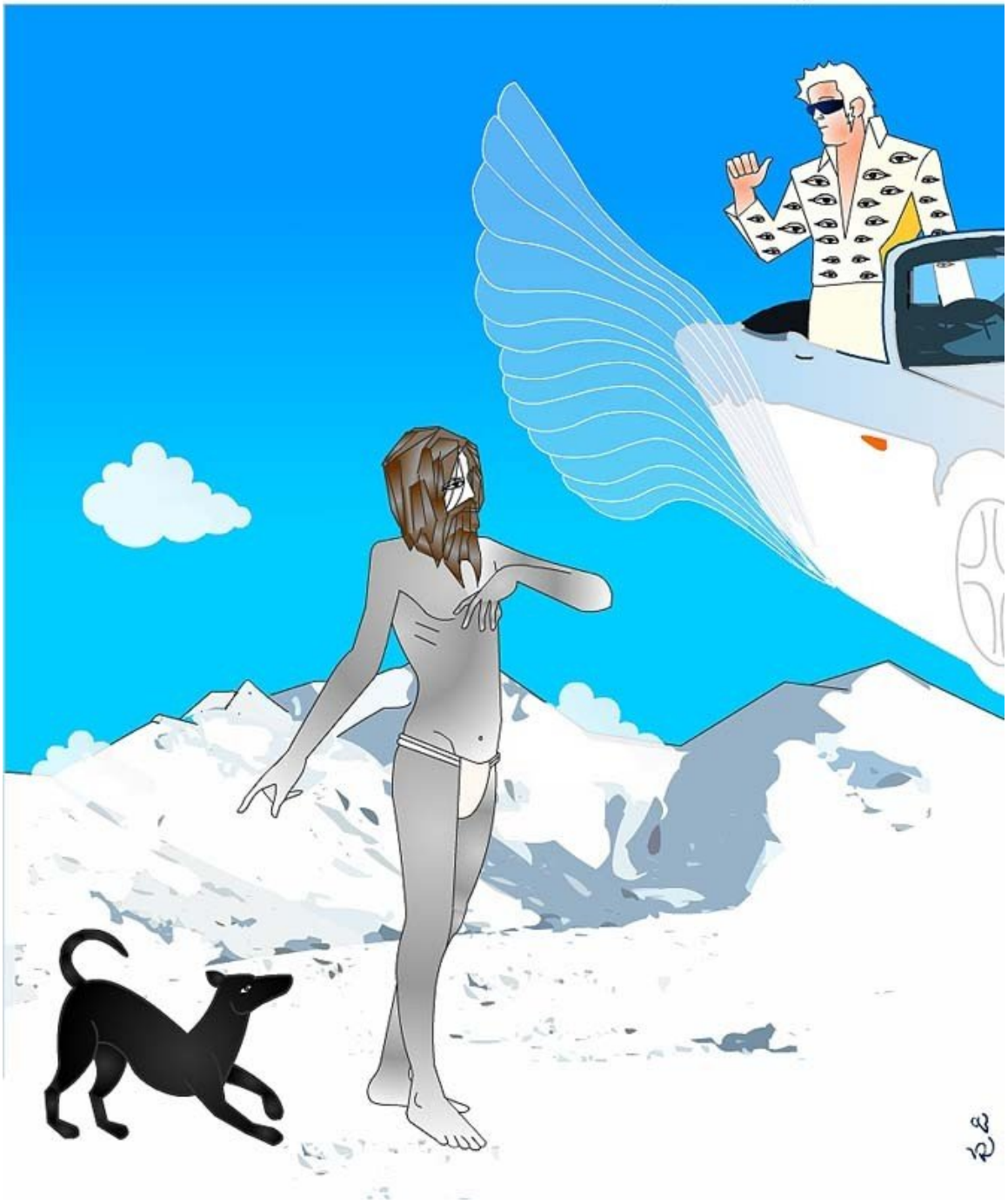

Chairman's Desk:

Bringing designers together

"We have heard after the end of the conference in the lobby or portico of the venue from a few delegates who were praising and some were disappointed and others were just quiet after attending the conference". When people praise, their eyes are sparkling and when they criticize their faces are long. They come to attend the conference with varied motives such as 'learn as much as possible' and attend every sessions and some attend the conference not to learn from this rather but have some other hidden design of fun and enjoyment. A few others say that it helps in decorating their bio-data. Some others simply enjoy the hospitality of the host.

I question "which conference is worth attending?" Should we attend that one which satisfies our urge for knowledge and enhance and add a new dimension to our wisdom or on how much we receive the attention of the host in the conference or what shall be our gain in economic terms?. Selection of a fruitful conference is very difficult task for delegates. We all have some kind of intuition which is not always right. This is minimal intuition in us and commonsense morality places more stringent constraints on our decisions. The second is little higher than the first one and it is our basic collective perception. In this, the present generation can't gratuitously cause great suffering to future generations. These factors influence our selection as also other factors like "who are the key speakers, what are the proceedings and in which season's conference are conducted?" Some are simply influenced by the abstracts submitted by different speakers. We have invited many distinguished personalities for our January 2007 international conference in New Delhi, India and few agreed to attend by bearing all their expenses in toto. A few demanded the reimbursement of expenses of their visits. We were heavily dependent on our sponsors and they did not come to our expectations and we failed to arrange the funds for their visits from different countries. But we have achieved a good deal from our failure. It was our immature decision in organizing such a magnum show depending on external resources. It is my personal opinion that delegates from developed countries would have played a vital role in making our efforts worthwhile and they would have selected our

conference as a platform of popularizing their views in India as well as in Asia. They should have questioned themselves," Is this conference a reproduction project?" They should have allocated substantial amount of their own money or they would have applied for their support of their visit for our conference from their institute or organization for the new project as ours for conceiving and maintaining the conference. The second one was they should have adopted our conference from the day of our announcement and should have kept and allocated certain funds. The third one is the Oxfam approach where the developed countries have no such projects and they should have helped by advertisement, sponsorship and arranged some funds for our conference from other resources from their respective countries.

I submit that evaluating or attending any conference is very a personal matter. No one should compel any one. It is not an emotional issue and should never influence our judgment that we have very personal rapport with the host. If our equation is good we should accept the invitation; otherwise we should refuse the same. Sometimes we give our consent for attending a conference that we wish to popularize the concepts in that region where these are still in infancy and are yet to pick up the threads of basic movement. This was the case for us. In spite of all our efforts from endorsement of IDSA, USA , IAUD, Japan, EIDD-Design for All Europe and Design For All Foundation, Barcelona we could not achieve what we aspired for by holding the conference. This was depressing experience but we have not lost hope. We are still in the fray. Success and defeat is immaterial. Efforts are more important.

It is not always that all the conferences lead to progress. While attending the conference if delegates grab one or two new genuine ideas or concepts you must consider that conference is fruitful and successful so that you can devote your entire life in exploring these ideas further. Mahatma Gandhi got one idea of non violence and he had changed the fate of many nations. Einstein got the idea of relativity and worked till his death in exploring that. Freud opened the human consciousness and opened new vistas in human thoughts. Never judge the conference by the speakers, participants, its proceedings and past records. Idea is important not the knowledge. We have all praise for those who

have carried some iota of fresh thinking. That is our gain that is to their advantage

Man's sense of balance between knowledge and wisdom is about as good as it can possibly be. This sense is made available to mankind. Our exposure, education and perception work in collaboration and our wisdom prevails all in sharpen our intelligence. The quality of life of future generations by such efforts depends to a very large extent on the decision of the present generations. What can future generations do for us? We can do a great deal to (or for) posterity can not do anything to (or for) us.

We have requested the IAUD, Japan for publication of the special issue of forthcoming issue of our newsletter of Design For All Institute Of India on INDO-Japan Friendship 2007 and they have principally welcomed our invitation and agreed to contribute the articles from prominent persons from their country . I am looking forward to such efforts from designers from different countries for joint venture in publishing articles of merit.

Thanking you.

With regards

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Forth coming issue:

April 2007, Vol-2, No-4

Culture as Design	Prof Lalit Das
E- Governance in India	Dr Dinesh Katre
Indian rural Design	Mr. Garuv Raheja
Look!... don't see.	Mr. Sandip Paul
Metro train and Design For All	Mr. Pudi Ravi

From the Editors Desk

The editor and staff of newsletter of Design for All Institute of India proudly present the March 2007 vol-2, no-3 issue. This issue is concerned with social, business & industrial sensitivity, to 'design for all' concepts and their utility from a cultural, business and productivity viewpoint. There are three papers in this issue.

The first paper is titled 'Strategic Design of Built Environments for Safe Ageing' by Jim Harrison. Jim is a lecturer at Queens University Belfast. He illustrates how design of the built environment can greatly improve the lifestyle of people by accommodating the widest range of users and their abilities, providing supportive buildings and spaces to allow everyone to lead a fulfilling life. He talks of built environment for safe aging. He emphasizes the importance of affordance , access

statement and consultation with users. Simple approaches in strategic planning and coordination can make the built environment more friendly to wide spread users. It will also make the society more pleasing as it would not highlight the difference in the society. He gives examples from public places like museums, elderly homes, and market places to illustrate his point.

Hua Dong, Ph.D from the Human-Centred Design Institute, Brunel University discusses industry attitudes towards inclusive design in the context of UK. He highlights the earlier studies in USA and Japan with similar objectives. There is a need to understand the obstacles that prevent industry in different countries to adopt inclusive design. Dr. Dong's paper describes two studies into industry attitudes towards inclusive design in the context of UK. The first study investigated perceptions of manufacturers and retailers of consumer product in the UK The second study described a survey of over 100 UK companies regarding their awareness of inclusive design, consequently the nature of the main barriers and drivers for inclusive design. The paper is well researched and documented and comes complete with suggestions to increase the uptake of inclusive design in industry.

The third article in this series is contributed by Ernst A.P. Koningsveld and Marinka D. de Groot from TNO work and Employment, Netherlands. This article discusses two case studies the first deals with of a new tram cabin. The design aimed to allow people of a large range of body dimensions to

work efficiently. Major items were: the potentials to adapt the workplace to people with a large range of anthropometric specifications; a much better view on traffic; logical operation; operation that reduced the risk of musculoskeletal sprains and strains. The second case concerns the development of improved workplaces for the inspection of microchip wafers during the production process. The paper illustrates how good design for all principles reduces stress, and work related absenteeism. It is seen that D4All principles are often adopted by companies incidentally as part of a caring corporate practice.

We wish you happy reading and continued support. May thinking for all become a way of life for all

Lalit Kumar Das
IIT Delhi

Strategic Design of Built Environments for Safe Ageing

Jim Harrison, BArch. LittD.
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1. INTRODUCTION

Design of the built environment must accommodate the widest range of users and their abilities, providing supportive buildings and spaces to allow everyone to lead a fulfilling life. An inclusive design approach considers the widest range of abilities and brings benefits to a much wider group of users. This is particularly true in the built environment, which is static and permanent, so it is imperative to get it right first time.

Although originally driven by the needs of people with disabilities, inclusive design now acknowledges the needs of users with the widest range of abilities, to provide the physical environments needed to support and sustain them in leading fulfilling lives. Where any built environment has not been considered holistically, with elements placed together *ad hoc*, there will be barriers to individual mobility and hazards for more vulnerable people – people who are old and frail, or limited by health conditions, encumbered by baggage or with young children. For many, the greatest obstacles and dangers are the most obvious ones: steps, kerbs and uneven or slippery surfaces, particularly when these are poorly designed,

maintained or badly lit. These all-too-familiar features generally come about by default, because those who create them are unaware of the potentially grave risks that they present, say, to someone with weak eyesight, or a frail elderly person with osteoporosis. For such a person, a fall can very easily occur, resulting in serious injury and permanent reduction of mobility.

When we age we will almost invariably experience decrease in abilities, which may be gradual in the normal ageing process, or sudden and precipitate where an individual has an accident, breaks a bone or has a stroke. But in either case the degree of loss of ability will be particular to the individual and not necessarily follow a set pattern. It may also be paralleled by a number of other impairments, sometimes related and sometimes not. But the majority of older people generally do not consider themselves to be disabled and they may actually feel inhibited about using facilities which are labeled for the use of people with disability, such as lifts or accessible toilets, even though they have a right to benefit from them in terms of amenity and increased safety.

Figure i.

Steps and stairs are major causes of falls for older people, particularly if there are no handrails and the step nosings are not distinguishable.

Familiar and Unfamiliar Environments

Whilst one of the driving forces behind inclusive design is to increase personal independence, this may be less effective unless the elements that provide such support are well integrated into the environment, rather than appearing as separate parts within the system. Such integration needs to be consistent and 'joined-up' so that users may move about and use the amenities confidently, whether in their own home locality or in places further a field. This is important because we all as individuals inhabit a world where there are two sorts of built environment: one is familiar – our personal and everyday "home-zone" including our dwelling and its surroundings and places that we regularly visit. The second sort of environment includes any places that are unfamiliar, that we do not visit regularly. In these surroundings we rely on some degree of consistency in the elements for finding our way (signage, identification of routes, etc.) and using a whole range of amenities and facilities. These include such simple things as moving about and navigating our way across streets and up and down changes in level.

The first situation – our own "home-zone", is generally an environment where we can make choices, or perhaps bring about changes to make it more accessible and, hopefully, safer as we age or become less able. These may be personalized and idiosyncratic in their arrangement but are familiar and placed

according to our needs. The other type of environment is the unfamiliar one. For this form of environment it is, therefore, far more important that the elements that provide safety, accessibility and way finding have some degree of consistency and are recognizably useful, even if their overall arrangement varies from place to place. Any user of this form of environment will probably be more cautious and dependent on ‘reading’ the clues that show routes, locations of amenities or ‘affordances’ – and be aware of potential hazards and obstacle or barriers.

The Theory of Affordances

One helpful way towards understanding the potential value any design element, particularly in a built environment, is the notion of ‘affordances’. This term was coined by the ecological psychologist, J. J. Gibson (1979), and subsequently developed by Ingold (2000) to explain the common interactions between organisms and their surroundings. In the man made-world this helps us to understand the emergent properties of interactions between specific combinations of environmental features and the users of this environment. This is often referred to as our ability to ‘read’ the environment or a designed object; an example of this might be our ability to recognize how to operate a piece of equipment by recognizing the ‘on/off’ switch or turning a knob to increase the power. As a useful conceptual tool for designers ‘affordance’ can be used to explore the amenity required by users with a range of abilities (or disabilities) for different environments to achieve

acceptable levels of health and safety and accessibility, including how this may be discreetly integrated (Zaff, 1995). Donald Norman took the notion further, writing on this topic, including the useful book “The Psychology of Everyday Things” (1988).

An illustration of how affordances can have positive or negative qualities may be found in the use of glass doors which have the potential for some users of having a positive affordance in allowing one to see through it, but for people with low vision this transparent quality may mean the door is invisible and so presents a serious hazard and they may accidentally walk into it. It is worth noting that the affordances are not of the door alone but of its relationship to the total environment, such as lighting conditions, as well as the users’ perception. Using affordance as a tool for analysing design intentions enables us to see that the same physical property of an environment can give rise to both positive and negative affordances simultaneously for different people, depending on their physical abilities or ‘effectivities’. For older people there is a greater need for these elements to be overt, either in recognisable forms and positions, such as handrails, visible nosings on steps, or through signage - usually the familiar blue and white ‘disabled’ logo.

Faced with any physical situation we all have different ways of perceiving what is there and deciding how it fits our needs and abilities, particularly if these are impaired. A flight of steps will appear to many users as the best way to go from one level to

another, but to a less sprightly individual it may imply hazards in the possible slipperiness of the tread material, aggravated by the absence of a handrail. For a person in a wheelchair steps will always be an absolute barrier, whilst person with impaired vision may be concerned with his or her ability to distinguish between the edges of the steps and the potential hazard that this presents. A well-designed staircase might incorporate positive affordances of safety , ease of ascent / descent and, for people who may become fatigued half way up, perhaps a welcoming resting place on the landing. However, as well as being a potential barrier to some, or a viable means of ascent to others, yet other users may see a step as a good place to sit, provided that no one will fall.

Figure ii

This flight of steps at the V & A Museum in London is designed with a ramp incorporated, so that it may be used in different ways by people – not just as a means of ascent.

Figure iii.

The designer of this Danish Day Centre for the Elderly shows an appreciation that users may need to rest at the lending – and it makes a sociable place to sit.

In order to promote independent mobility it is especially important that the design of environments in both the public realm and in each individual's 'home-zone' should both anticipate (and so reduce) potential hazards, whilst supporting the spectrum of users' needs for access and safe use of all the

facilities. Inclusive or Universal Design approaches embody these principles and recognise that everyone has limitations. But in achieving a built environment that is truly inclusive it is necessary to take a holistic approach, rather than solving each part as it happens. Merely installing special provision for wheelchair users wherever there is a change in level, for example, is not a complete solution. A more fundamental and strategic attitude is needed.

Access Statements

Achieving inclusive environments has much to do with responsibility on the part of the players who make the environment and how they ensure that it is appropriate – not just in design of the various component parts, but of the way in which these join together. It is the continuity and integration of the access provision that is so important and without which the other parts, no matter how well designed, may become ineffectual. For the architect more and more regulations may bring about safer and more accessible building interiors, but it is sometimes the case that a perfectly well-designed place is rendered confusing or inaccessible by poorly-coordinated provision of routes to its entrances.

Analysis of many problems in accessibility, for example, will reveal that the barriers come about by default rather than design. Sometimes this is due to a lack of appreciation of the need or technique, but frequently the problems occur through

lack of coordination between one provider and another, where the boundaries of one agency's responsibility changes to another. It is not unusual to find that a building may be designed to be fully accessible internally, but the external routes, designed by another department, present barriers which mean that a wheelchair could not enter. Even where access for wheelchair users is possible, it may be cumbersome and often entails expensive duplication of routes.

Figure iv.

The approach to this student hostel in Singapore obeys the code on accessibility – but it is a costly and non-inclusive duplication of routes.

Figure v.

With the same building, if the designer had reduced the grade level of the building and used the topography to begin the pathway from higher up the road the result would have been more effective and inclusive.

Strategies towards Inclusive Access

To make accessibility more complete, an ‘Access Statement’ is now a mandatory part of any planning application in Britain, to ensure that key access requirements are incorporated into all design proposals. Consultation with potential users including disabled people is recommended, as is the appointment of an “Inclusive Design Champion” or professional access consultant to promote these issues. Together with the design team they

will help to provide an Access Statement to support outline and detailed Planning Applications. Guidance on this innovative approach is given by various agencies, including the Disability Rights Commission, who describe Access Statements as 'achieving an inclusive environment by ensuring continuity through the planning, design and management of building and spaces'.

The ‘Lifetime Home’ Concept

Another initiative to achieve more complete mobility, especially for independent living is the concept of the “Lifetime Home” and its application into all housing in Britain. This idea was developed by the Joseph Rowntree Trust in England, a charitable organisation concerned with the quality of housing. Recognising that most accidents occur within the home and many houses in Britain are two-storey, this concept reduces the need for older people to have to go up and down stairs to use the toilet during the day. Recent legislation now requires a toilet to be provided at entry level, so that an occupant could go about their daily life without having to go from one floor to another, even if they are in a wheelchair. Part M of UK Building Regulations also requires thresholds to doors to be level and for circulation spaces to be large enough for a wheelchair to manoeuvre. This standard has been taken up by a number of countries, and recent legislation in Singapore’s code on barrier-free access in buildings now includes similar requirements for stepless thresholds.

Shopmobility

Pedestrianisation of many British town centres has meant that there is no longer the same ability for people to park at or be dropped off close to the front door of shops. Because this causes problems for people with limited mobility and discourages them shopping and visiting leisure and commercial facilities in their local towns, a system called “Shopmobiliity” has been developed linking local authorities, local chambers of trade and a charitable organisation concerned with the needs of older and disabled people. There are currently some 250 Shopmobility schemes in operation in towns and cities in the UK. These loan manual or powered wheelchairs and scooters for use within a town centre or shopping mall. They are for everyone, young or old, whether their mobility impairment is temporary or permanent. What is interesting is that this widens the range of people who use wheelchairs and motorised scooters to include people who would not normally own one, but do so for a specific purpose – increasing their mobility range to avail themselves of the town’s facilities.

These facilities are generally based in a public car park, where reserved parking is provided for users and their helpers and wheelchairs are available. But since provision of wheelchairs is pointless if the built environment is not compatible with their use, the Shopmobilty scheme relies on collaboration between

local authorities, who are responsible for the roads and pavements, and the local chambers of trade, whose shops need to be accessible, especially at their entrances. Pedestrianised routes in the town centre are all wheelchair-accessible and entry to shops and public amenities are level and barrier-free. In this way, a good many customers are encouraged to return to using their local town shopping centres, rather than out-of-town supermarkets and malls, which are designed to allow shoppers with laden trolleys to use barrier-free routes from shop to car, laid out to standards similar to those required by wheelchair users.

Figure vi.
Shopmobility schemes in British towns go hand-in-hand with accessible streetscape and level thresholds to shops and public buildings.

Conclusions

Those responsible for the built environment, be they architects, planners and engineers, may still consider accessibility a somewhat condescending gesture towards people with disabilities, especially wheelchair users; but now there is growing regard for the rights of every individual. An inclusive approach to design acknowledges that anyone may potentially be handicapped by environments that are not supportive, at any time over their life course. This is particularly true with an increasing global population of ageing people who will live longer, more of whom are likely to develop degrees of physical and sensory impairment as they age and yet demand more independence in their living habits. For many reasons it makes good sense to ensure that they are not alienated or endangered by inadequate design or poor planning.

If considered from the outset of any design programme, access need not require elaborate or expensive technological solutions which are often not cost-effective ways to make up for design deficiencies. Simple approaches in strategic planning and coordination, especially by reducing unnecessary changes of level can make the built environment significantly more user-friendly. When these are properly specified and located they should be a seamless and natural-feeling pattern that is also unobtrusive. There is a saying that “the best pair

of shoes are the ones you don't feel" and so it should be with all the elements that make design inclusive and supportive.

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Disability Rights Commission (UK): www.drc-gb.org

Joseph Rowntree Foundation (UK):

www.jrf.org/housingcare/lifetimehomes

Shopmobility (UK): www.justmobility.co.uk

Inclusive Design: an investigation in the context of UK industry

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Abstract:

This paper describes two studies into industry attitudes towards inclusive design in the context of UK. The first study investigated perceptions of manufacturers and retailers of consumer product in the UK and compared their perceptions with those of companies in the United States (US) and Japan. It was found that the perceptions of major drivers for inclusive design were similar for manufacturers and retailers, but their perceptions of barriers to inclusive design differed. Industry attitudes towards legislation or government regulations in the UK differed from those in the US and Japan. The second study described a survey of over 100 UK companies regarding their awareness of inclusive design, consequently the nature of the main barriers and drivers for inclusive design was discussed, and suggestion on how the barriers can be overcome and the

drivers encouraged to increase the uptake of inclusive design in industry was proposed.

INTRODUCTION

Inclusive design is an approach to the design of mainstream products and services that are ‘accessible to and usable by as many people as reasonably possible, without the need for adaptation or specialist design’ (BSI, 2005). Many European countries adopted the term ‘Design for all’ and in American, Japan, and Australia the same approach is often referred to as ‘universal design.’

Professor Sir Christopher Frayling, Chairman of the UK Design Council, pointed out that the challenge of inclusive design was not just about offering equality of social opportunity, but also a huge business opportunity (Clarkson *et al*, 2003). However, the widespread adoption of inclusive design in UK industry has been slow (Underwood and Metz, 2002; Keates *et al.*, 2000; Sims, 2003; Dong *et al.*, 2004; Goodman *et al.*, 2006). There is a need to understand the obstacles that prevent UK industry to adopt inclusive design.

There are some preliminary studies in UK and in other countries exploring motivations and barriers to inclusive design. These are briefly discussed in the following paragraphs.

The United States of America

The American National Institute on Disability and Rehabilitation of the Department of Education funded a universal design research project. Telephone interviews were conducted to investigate why and how companies adopted universal design, and what factors were the most important in bringing this about (Vanderheiden and Tobias, 2000). A total of 26 manufacturers from six different industry sectors were selected.

It was found that:

- universal design was perceived by most companies as a special interest;
- common barriers to the adoption of universal design were the perception that it would slow down the time to market, and increase the costs of development;
- the key external driver for universal design was that of government regulations requiring the accessibility of products and services;
- other drivers included training and educational programs in universal design and development of market data.

A few years after the study, a consumer inquiry was sent to 125 large companies (Fortune 500), asking: "*Do you offer universally designed products for older consumers or people with ability concerns?*" Only 12 out of the 125 responses made any reference to universality or accessibility. This suggested that US industry still perceived universal design in terms of accessibility and mobility rather than being part of a broader design approach (Mayerson, 2003).

Japan

In Japan, the Ministry of International Trade and Industry commissioned a questionnaire survey about universal design, targeting 1000 businesses. Feedback was received from 307 companies in five different industry categories (The report was not formally published, but a copy is available from the Helen Hamlyn Research Centre, Royal College of Art). It was found that the major drivers for companies to be involved in universal design were:

- high demand from consumer and society needs;
- quality improvement / more consumer satisfaction;
- the development of a new and expanding market;
- differentiation of own products.

Government drivers for the adoption of universal design included:

- guidelines;
- regulation of data measurements;
- preparation of fundamental techniques (such as human factor databases);
- evaluation of awareness of universal design among the consumers;
- information about universal design.

Barriers facing the involvement in universal design included:

- technical complexity and lack of cost-effectiveness;
- lack of knowledge and techniques;
- lack of guidelines.

The results showed that most of the notions of universal design were widely known among all industries in Japan, but the tendency to introduce the idea into its own products varies

from sector to sector. With the significant effort of Japan Government in pushing universal design, it seems that more and more companies begin to adopt a more inclusive approach to design, and the recent International conference for Universal Design in Kyoto has attracted many attendees from Japan industry.

The United Kingdom

In the UK, the Design Council organized a workshop in 1999 to assess the level of industry awareness of the needs of the disabled and elderly communities and their openness to universal design. There were over 150 participants with representatives from a wide range of companies, including British Telecom, Virgin Atlantic Airways, Omron Corporation, NatWest Bank and Tesco. The initial stance of most of the industrial participants was that they were willing to implement universal design providing that it was either easy to do, or that a consultancy would do it for them, and providing that it did not increase the cost of the product or service. There did not appear to be widespread acceptance of the need for universal design training programs for designers or an appreciation of the potential increased market for more accessible products. The concept of ‘undue-burden’ appeared to be anything that would cost more than the able-bodied version. In addition to this, stereotyping was also a very common problem: for example, designing for universal accessibility was perceived as a code-word for designing for the elderly and disabled only (Keates *et al*, 2000).

In order to assess the current state of design knowledge and practice with respect to ‘design for all’ in the UK, Sims (2003) conducted a telephone survey of 29 design professionals. It was found that ‘design for all’ was widely known or understood but was not widely practised by design professionals. “Lack of time”, “lack of client backing”, “lack of money” and “lack of awareness of the possible market” were reasons given for this.

Summary

The surveys carried out in the US and Japan identified some barriers and drivers for inclusive design. However, the surveys did not yield statistically significant results. Moreover, the US surveys did not differentiate conclusions between various industry sectors. The Japanese survey included five industry categories but did not differentiate between manufacturers and retailers’ perceptions. Hence the findings were too general to guide specific strategies for facilitating the adoption of inclusive design in different industry sectors or for different parts of the supply chain. In addition, as the research was based in the US and Japan, the relevance of those findings to the UK was unclear. The two investigations (Keates, 2000; Sims, 2003) in the UK revealed that inclusive design was not widely practised by large corporations or professional designers.

From the literature review, a need to understand why inclusive design is not widely practised in the UK emerged. This paper describes two empirical studies exploring the industry attitudes

to inclusive design in UK, and compares the results with those from other countries.

STUDY 1

Aim
The first study was proposed to:

- identify barriers and drivers for inclusive design to manufacturers and retailers in the UK;
- compare perceptions between UK manufacturers and retailers;
- compare perceptions of UK industry with those of the US and Japan.

Method

The study targeted small and medium consumer product manufacturers and retailers rather than many different industry categories. A number of industry directories, such as *Kompass*, *Applegate*, *Kelly*, *Yellow Pages* and the *DTI Company Index* were searched, using the Simple Random Sample Strategy (Breakwell *et al*, 1995). Initially 200 companies were selected. After telephone inquiries about the willingness of participation, 148 companies were chosen.

The survey questionnaire, in addition to requests for background information about the company, included:

- a list of 18 potential drivers with a 1-7 Likert type scale, a commonly used rating scale (refer to Table 2 and 3, with '1' representing 'least effective,' and '7' representing 'most effective') ;
- a list of 26 potential barriers with a 1-7 Likert type scale (refer to Table 4-6, with '1' representing 'least significant,' '7' representing 'most significant');
- a space to add additional drivers and barriers; and
- questions asking participants whether they would consider further involvement in the research.

The questionnaire was sent to individuals at middle management level or higher (design directors or managing directors), together with a covering letter to explain the research aims, a pre-paid and self-addressed envelope for returning the feedback. To maximize the response rate, reminders and repeat questionnaires were sent to non-respondents six weeks after the initial distribution.

Results

Altogether 53 responses (36%) were received. Of these, 33 (23%) was useful feedback.
Among the 20 companies that returned incomplete questionnaires, 14 explained why they could not answer the questionnaire. The reasons are summarised as follows:

- the questionnaire was thought not relevant to the company (8 companies);
- no time to respond because of the pressure of work (1 company);
- no resources to respond with the amount of details that was required (4 companies); and
- could not provide information that was commercially sensitive (1 company).

Among the 33 completed feedback forms, 18 were from manufacturers and 15 were from retailers. Their perceptions of drivers for inclusive design, computed as the average scores (i.e. means) on the 1-7 Likert type scale, are shown in Table 1 ('financial drivers') and Table 2 ('non-financial drivers').

Table 1. 'Financial drivers' for inclusive design

Financial Drivers for Inclusive Design		**Manufacturers**		**Retailers**	
		Mean	SD	Mean	SD
A	Successful business studies (i.e. those showing commercial success)	4.2	1.6	4.8	1.5
B	Potential market for those currently excluded	6.0	1.1	5.5	1.6
C	New market opportunities by practising inclusive design*	5.9	1.2	5.1	2.0
D	Assessment of how many people are excluded	5.2	1.5	5.5	1.5

Table 2. ‘Non-financial drivers’ for inclusive design

Non-financial Drivers for Inclusive Design		Manufacturers		Retailers	
		Mean	SD	Mean	SD
E	Consumer dissatisfaction with current products	5.7	1.3	5.5	1.5
F	Chances of innovation by practising inclusive design	5.4	1.0	5.4	1.2
G	Analysis of why people are excluded	5.2	1.0	5.0	1.6
H	Public/consumer awareness of inclusive design	3.8	1.7	4.9	1.2
I	Availability of expert consultation on inclusive design	3.9	1.6	4.3	1.9
J	Availability of tools/methods to help the practice of inclusive design	4.0	1.4	4.7	1.5
K	Government regulation/legislation on inclusive design	4.4	2.1	3.1	2.2
L	Users available for testing prototypes during the design process	4.1	1.4	4.8	1.7
M	Availability of training on inclusive design to staff/designers	3.8	1.6	4.6	1.8
N	Chances of improving brand image by practising inclusive design	5.1	1.7	5.3	1.4
O	Champion for inclusive design on company boards	4.1	1.7	4.7	1.9
P	Corporate strategy incorporating inclusive design	4.5	1.7	4.6	1.7
Q	Availability of standards/guidelines on inclusive design	4.0	1.8	4.6	1.5
R	Major competitor’s adoption of inclusive design	_	_	4.4	1.5

It was found that the top five drivers were similar between those perceived by manufacturers and retailers. Thus it was assumed that there might be a correlation between the perceptions of manufacturers and retailers. Consequently the two sets of average scores were marked as points in a scatter plot, where a best-fitting straight line was identified (Figure 1).

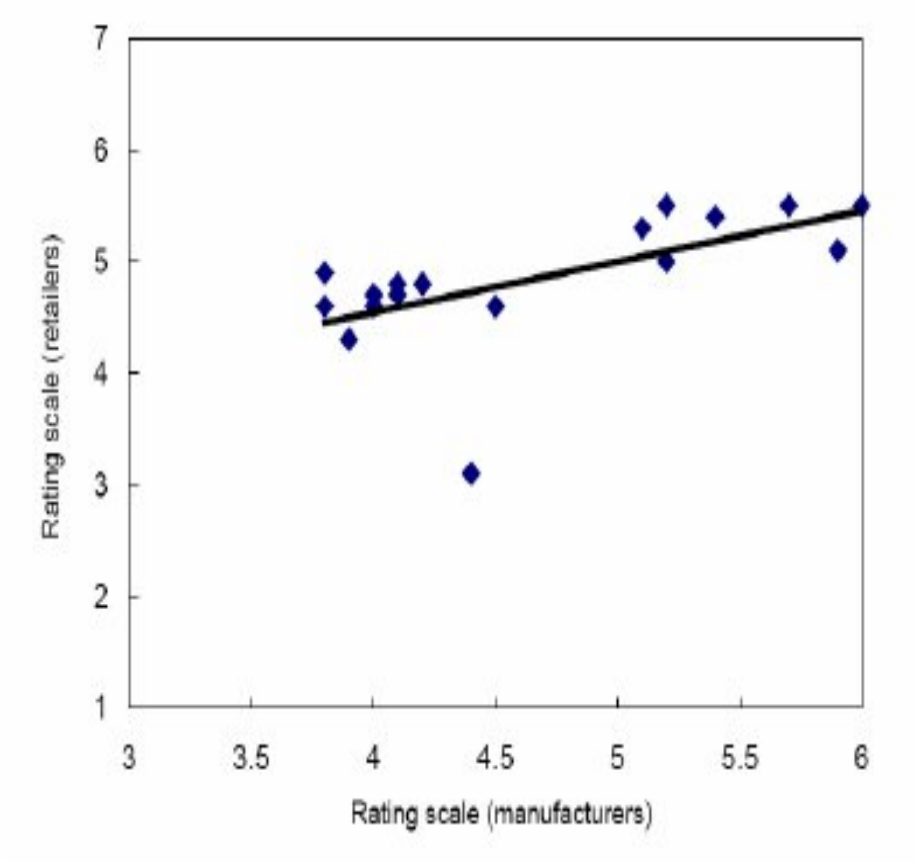

Figure 1. Correlation of manufacturers and retailers' perceptions of drivers for inclusive design

The 26 barriers were grouped into 'perception barriers' (Table 3); 'technical barriers' (Table 4) and 'organizational barriers' (Table 5).

Table 3. 'Perception barriers' to inclusive design for manufacturers and retailers

Perception Barriers to Inclusive Design		**Manufacturers**		**Retailers**	
		Mean	SD	Mean	SD
a	Lack of awareness of inclusive design	4.2	2.0	4.9	1.9
b	Lack of interest in inclusive design	4.3	2.1	4.4	2.1
c	Lack of motivation for tackling inclusive design	4.1	2.1	3.9	2.0
d	Perception that inclusive design is more expensive	4.1	1.7	5.2	1.8
e	Perception that it can be complex to design inclusively	3.8	1.6	5.2	1.8

f	Perception that inclusive design represents a niche market	4.3	2.0	4.7	1.9
g	Lack of business case	5.0	1.7	4.3	1.9
h	Perception that inclusive design is an unachievable goal	3.9	2.0	4.2	2.1
i	Perceived problems of brand association with disabled/older people	2.9	1.7	3.0	1.2
j	Perceived 'sacrifice' of the aesthetics of the brand	4.6	1.4	3.7	2.0
k	Perceived longer development time to market	3.9	1.7	4.8	1.6
l	Perception that there is no need to practise inclusive design	3.7	2.0	3.7	1.7
m	Perception that inclusive design is contradictory to the diversity of the market/market segments	3.8	1.7	4.4	1.9
n	Perception that the social context for inclusive design has not been set	3.4	1.5	4.3	1.9
o	Perception that inclusive design is a passing trend	2.8	1.6	3.5	1.9

Table 4. 'Technical barriers' to inclusive design for manufacturers and retailers

Technical Barriers to Inclusive Design		**Manufacturers**		**Retailers**	
	Descriptions	Mean	SD	Mean	SD
p	Lack of resources/guidance on inclusive design	4.3	1.9	4.8	1.6
q	Time taken to learn the approach	3.9	2.0	4.1	1.7
r	Lack of availability of good design examples	4.3	1.8	4.5	2.0
s	Lack of government regulations	3.7	2.2	3.3	2.0
t	Lack of methods/tools for practising inclusive design	3.8	1.6	4.3	1.9

Table 5. 'Organizational barriers' to inclusive design for manufacturers and retailers

Organizational Barriers to Inclusive Design		**Manufacturers**		**Retailers**	
		Mean	SD	Mean	SD
u	Difficulty in changing the culture of a business	3.8	1.9	4.1	2.0
v	Lack of company policy on inclusive design	3.7	2.1	3.9	2.2
w	Business is sales-led rather than design-led	4.4	1.9	4.6	2.2

x	Lack of willingness to change	3.7	1.8	2.9	1.8
y	Lack of risk-taking/unwillingness to invest money in a new practice	3.7	2.3	4.1	2.0
z	Working for short-term financial objectives	3.7	2.0	2.9	1.7

It was found that retailers tended to assign a higher level of significance than manufacturers to most of the barriers. The average rating score regarding the barriers was 4.1 for retailers and 3.9 for manufacturers.

The most significant barriers to manufacturers were '*lack of business case*' (score: 5.0) and '*perceived sacrifice of aesthetics*' (score: 4.6), while for retailers they were '*perception that inclusive design is more expensive*' (score: 5.2) and '*perception that it can be complex to design inclusively*' (score: 5.2).

The average scores to individual barriers assigned by manufacturers and retailers were compared and the majority of them were different. T-test was used to test the significance of the differences and the significant results are presented in Table 6.

Table 6. Comparison between perceptions of barriers for manufacturers and retailers – significant results

Barriers	**Probability (P)**	**Means of manufacturers**	**Means of retailers**
Perception that inclusive design is more expensive	P=0.045	4.1	5.4
Perception that it can be complex to design inclusively	P=0.024	3.8	5.3

The statistic test suggests that UK manufacturers and retailers have significantly different perceptions regarding whether inclusive design is complex and whether inclusive design is expensive. Retailers are more likely to perceive inclusive design as expensive and complex than manufacturers.

Comparison

In this section, comparisons are made between the findings of this study and those of the US and Japan. The findings from this study are also compared with earlier studies in the UK.

The findings from the survey in the US suggested that government regulation was a key external driver for the adoption of universal design, and other drivers included training and educational programs in universal design and the development of market data. However, to manufacturers and retailers in the UK, government regulation was not a key external strategy. The average scores of the driver '*government regulations/legislation on inclusive design*' were 4.4 for manufactures and 3.1 for retailers, and the average scores for the barrier '*lack of government regulations*' were 3.7 for manufacturers and 3.3 for retailers.

'*Training on inclusive design available to staff/designers*' as a driver was of average effectiveness (4.0 for manufacturers and 4.7 for retailers), so was the '*availability of tools/methods to help the practice of inclusive design*' (4.0 for manufacturers and 4.7 for retailers).

Both UK manufacturers and retailers assigned a high score (5.2 for manufacturers and 5.5 for retailers) to the driver '*assessment of how many people are excluded*,' and this was similar to the findings in the US where '*development of market data*' were regarded as an important driver.

Since the Japanese survey provided some quantitative results in the form of percentages, the data collected from this study was also converted into percentages to facilitate the comparison. The method of conversion was as follows: the findings from my study used the 1-7 Likert type scale, and scores above 4 were regarded as '*significant*.' All significant scores were counted and converted to percentages. For example, if 18 out of 23 manufacturers assigned scores above 4 to a certain question, then the percentage regarding this question would be 18 out of 23, i.e.78%.

The comparison on drivers for inclusive design between industries in Japan and in the UK is listed in Table 7. Since the formulation of questions was different for the two surveys, similar questions were combined to generate comparative categories, for example, the '*new and expanding market*' in the survey of Japan and the '*potential market*' in the survey of the UK were combined into a common category '*potential market*'

to facilitate the comparison. Such combinations of categories were also used in the comparisons on barriers to inclusive design between the two countries. The data from Japan reflect the perceptions of industry as a whole, while the data from this study in the UK separate the perceptions of the manufacturers and retailers.

Table 7. Comparison between perceptions of drivers for companies in Japan and in the UK

Drivers	**Survey in Japan**	**Survey in the UK**	
		Manufacturers	Retailers
Consumer dissatisfaction	77.0%	78%	81%
Potential market	44.8%	74%	81%
Guidelines and Standards	53.7%	43%	50%
Government regulations	50.9%	48%	44%
Fundamental techniques/Tools and methods	42.9%	48%	56%
Consumer/Public awareness	42.3%	39%	69%

In general, most of the drivers for inclusive design listed in Table 7 were of relative importance to industry in both Japan and the UK. A remarkable difference was found regarding the driver 'potential market.' It seems that much more manufacturers and retailers in the UK regard this driver as important than companies in Japan. Fewer manufacturers and retailers in the UK seem to regard '*government regulations*' or '*guidelines and standards*' as important drivers for inclusive design, compared with the findings from the survey in Japan.

The survey in Japan also identified a number of major barriers facing the involvement in universal design, and they were compared with the findings from the UK (Table 8).

Table 8. Comparison between perceptions of barriers for companies in Japan and in the UK

Barriers	**Survey in Japan**	**Survey in the UK**	
		Manufacturers	Retailers
Technical complexity	39.1%	26%	60%
Lack of business case	39.1%	57%	53%

Unable to achieve	39.1%	30%	40%
Lack of knowledge, technique and methods	36.8%	39%	40%
Lack of resources or guidance	34.5%	48%	53%

A couple of remarkable differences were found from the comparison, namely, the perception on barriers '*lack of business case*' and '*lack of resources or guidance*.' A much higher percentage of manufacturers and retailers in the UK perceive these two barriers as significant barriers than companies in Japan.

As mentioned in the Introduction section, the workshop organised by the Design Council showed that industry were willing to implementing inclusive design providing that it was easy to do, or a consultant would offer help, or it did not increase costs, and stereotyping was also a very common problem (Keates, *et al.*, 2000). This survey of manufacturers and retailers revealed that the industry regarded 'complexity' and 'expensiveness' as major barriers to the adoption of inclusive design, and retailers were especially concerned with such issues. This explained why industry in the UK was slow to adapt.

STUDY 2

Aim

The second study was based on the first study but aimed to develop training materials for industry, so the focus was on the examination of what needs company have in order to adopt inclusive design.

Method

A similar, but refined, survey questionnaire was adopted. The questionnaire was divided into six main parts:

- Company profile
- Current understanding of inclusive design
- Position on inclusive design
- Perceived drivers for inclusive design
- Perceived barriers to inclusive design

- Desired approaches to increase the adoption of inclusive design

A 1-4, rather than 1-7, scale was adopted in this questionnaire when ranking was required, so that neutral responses were minimised. With the specific aim of the study and the input of a commercial management consultancy, the drivers and barriers listed in the questionnaire differed from those included in the first study.

A wider range of companies were included in the survey; the sampling was not random: those who might be interested in inclusive design training were targeted, especially companies in the following sectors: telecommunications and IT; consumer electronics, household durables, energy, medical/pharmaceuticals, transport and fast moving consumer goods (FMCG).

Results

Complete responses were obtained from 101 UK companies and organisations, mostly from the design, retail and manufacturing sectors. Among these respondents, 76% had heard of the term 'inclusive design'; and 16% had heard none of 'inclusive design', 'universal design' or 'design for all'. The definitions given by the respondents suggested that the majority had a reasonably good understanding of what is inclusive design.

Regarding current position on inclusive design, 48% of the respondents rated their companies as 'low' or 'very low' on inclusivity of their current products/services. About half the respondents (49%) suggested that the effort their companies invested in ensuring inclusivity 'low' or 'very low'. The majority of the companies had an interest in inclusive design, but 23% indicated low interest.

The key drivers for inclusive design included demographic and consumer trends, social responsibility and brand enhancement. Key commercial benefits are increasing customer satisfaction and producing innovation and differentiation. Barriers most frequently identified were a lack of time and budget for supporting inclusive design, a lack of knowledge and tools for practising it , and that inclusive design was not a perceived need of the end users (Goodman et al., 2006). One fifth of the respondents suggested that was no real

barrier to inclusive design. The desired approaches to increase the adoption of inclusive design includes ‘convincing argument’, ‘increased understanding’, ‘skills or tools to assist design’ and ‘tools to market inclusive design’.

A factor analysis was carried out to determine the main factors affecting companies’ responses to inclusive design. Details of the factor analysis and the implications of the analysis can be found from (Goodman et al., 2006).

Four key factors were identified:

Factor 1: Awareness of inclusive design and lack of corporate barriers to it

Factor 2: Arguments for the commercial (rather than social) value of inclusive design

Factor 3: Concern about the possible effects of inclusive design on brand positioning.

Factor 4: Effect of size (or type) of company on attitude to inclusive design.

These factors correspond to distinct company types:

- Companies with a high level of awareness and low corporate barriers. It is important to keep supporting and encouraging these companies, but efforts at raising awareness and overcoming barriers may be more profitably spent on other companies. This factor also indicates the importance in general of raising awareness and of addressing corporate issues, as well as helping individual designers.
- Companies influenced primarily by commercial, rather than social, concerns. These companies need a clear business case and emphasis on commercial drivers. Social arguments may

have a negative effect. Although many companies fall into this category, many charitable and specialist organisations are heavily influenced by social factors and others have over-riding concerns, as in the following category.

- Companies strongly concerned with brand. For them, it is important to show how inclusive design need not be stigmatising or compromise aesthetics but rather enhance brand. These companies are also often motivated by legislation and consumer trends so it is useful to include these in the approach.

CONCLUSIONS

From the first study, it was found that the perceptions of the drivers for inclusive design were similar between UK manufacturers and retailers, with the '*potential market for those currently excluded*' and '*consumer dissatisfaction*' the top two. Perceptions of barriers to inclusive design for UK manufacturers differed from retailers. The top two barriers to inclusive design for manufacturers were '*lack of business case*' and '*perceived sacrifice of aesthetics*', while the most significant barriers to retailers were '*perception that inclusive design is more expensive*' and '*perception that it can be complex to design inclusively*'.

The comparison with the survey in the US revealed that the companies in the UK did not tend to perceive government regulation as a most effective driver for inclusive design. 'The

development of data showing the number of people excluded' proved an effective driver for inclusive design to companies in both the US and UK. Compared with the survey in Japan, the '*potential market*' seems to be a more effective driver for the adoption of inclusive design for UK manufacturers and retailers, while '*government regulations*' and '*guidelines and standards*' seem to be less effective drivers. The '*lack of business case*' and the '*lack of resources and guidance*' seem to present barrier effect to more manufacturers and retailers in the UK than to the industry in Japan.

The comparison with earlier studies in the UK reinforced some of the common findings:
for manufacturers and retailers, major barriers to inclusive design are associated with perceived complexity, expensiveness, and lack of aesthetics and business case.

The main drivers for inclusive design identified in the second study (i.e. the potential to increase customer satisfaction and produce innovation and differentiation, demographic and consumer trends, social responsibility and brand enhancement) are similar to those found in the first study. However, since different barriers were used in the two questionnaires, no direct comparison could be made between the two studies.

Barriers can vary between different originations and companies; this suggests that while common training materials, such as awareness raising materials, could be useful, there is also a need to develop company-specific training

packages. The second study identified three distinct company types, i.e. those with a high level of awareness and low corporate barriers (such as some small design consultancies with a user-focused approach); those influenced very much by commercial concerns (such as small manufacturers); and those strongly concerned with brand (such as large retail corporation). To increase the uptake of inclusive design in industry, it is important to create training materials based on common drivers for inclusive design as well as tailor such training materials to address specific barriers perceived by different types of companies.

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BIOGRAPHY

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Inclusive design : industrial case studies in The Netherlands

(Part of this article was discussed on the Include Conference 2005, London and finalized in 2006).

Drs. Henny Overbosch , Labour and Organization Sociologist, The Netherlands

Preface

Design4All (D4A), or inclusive design, being mainly a designers topic coming from experiences in technology for the third age and handicapped helping in their daily functioning, has become a subject of policy searchers too. D4A experiences with products and tools show success where flexibility, adaptability

and user comfort are used. People function better, and request for external help can be extended. The question arose: would D4A also be applicable on work, resulting in a broader user group and better working conditions? If this is the case, peoples self supporting capability and their autonomy would raise. Social exclusion would then be prevented because people, whether elderly people, handicapped people, or people that have acquired impairments during course of life, will be able to take care of themselves in stead of relying on employers-or public benefits. The latter not only increases the psychic health it also helps people to maintain (or re-gain) autonomy over their lives and last but not least: labour participation increases too.

In 2004/5 TNO performed an explorative project in order to get insight in the state of inclusive designed workplaces, work organisation en policies in industrial companies. The basic 7 Principles of Universal Design (North Carolina State University) were adapted to use for the selection of cases. These seven adapted principles can be considered as criteria for a D4A approach for the design of work organisation and workplaces, but not for companies' policies. With these criteria three intervention cases were selected and evaluated. Six cases of D4A policies were selected further. The evaluation focused on the ambitions to include all or as many people as possible: what did management drive to spend extra efforts? The specific measures and solutions that the companies choose were mapped out. An inventory of each specific aspect that was given attention was made to include as many people as possible. The efforts and effects of those were assessed, where

possible in quantitative data. In participatory sessions with management, users and cost benefit experts estimations were made if no data were available. The conclusions drawn, give learning points for further promotion of D4A principles in policy and practice.

Summary

Actual societal developments do request the promotion of the employability of people in work and of their competencies. In general people's ability to live independently is better amongst working people; they are less dependent from care and social benefits. As a consequence, they have more autonomy over their lives. As aspect of their human resource management many companies pay attention to the employability of people within the organisation and in relation to competence management. The level of facilities to develop competencies has a direct relation to a person's employability. Spending more attention to the design of tools, equipment, workplaces and work organisation, improves evidently the availability of people for work. An important trend in this regard is Design for All, in English usually called Inclusive Design or Universal Design. This approach aims to improve accessibility for as many people as possible, in order to exclude the least number of people. Here accessibility is meant as a broad notion. It is not only physical accessibility of the public space and buildings. It deals as well with participation in social intercourse, access to information, to work and so on. This study deals specifically with the accessibility of regular work in commercial companies. In that respect D4A allows people with different characteristics

to participate in work, and so prevents unnecessary early retirement, resign and drop out. Thus the participation in work is not only improved; the prevention of drop out is reduced and the rehabilitation after illness or after developed handicaps gets better chances. The Dutch Ministry of Social Affairs and Employment asked TNO to provide insight in the state of the art in businesses in The Netherlands. At one hand we analysed interventions in workplaces and equipment that were undertaken to create work in which people with different capacities fit. At the other hand we looked at companies' strategic policies and organisational measures that aimed to incorporate people from groups that are underprivileged for employment. This explorative study shows what is going on with D4A in a sample of relative front-runner companies. Three cases of major workplace designs were analysed, next to seven cases of company's policy development and organisational changes. As the activities of these companies can be indicated as D4A performances, it is remarkable that none of the ten companies has formulated goals in terms of D4A. The ambition to undertake extra effort generally is implicit; plans are not earmarked as D4A. Only incidentally extra budgets were granted. The cases comprise large, middle-size and small companies. There is a wide diversity in sectors, in approaches and in results. In the analyses interviews were held with management and workers. The efforts and effects of the intervention cases were assessed, both in regard to work loads and to company's core targets. Nevertheless, these front runner companies can act as examples for other companies. People tend to be reluctant to start something new. The extra

efforts are quickly seen, as well as problems of many different kinds. Positive effects and unexpected chances are not easily recognised. A study like this provides companies an objective and a more differentiated view on the potentialities. The given calculations of costs and benefits of D4A interventions will be illustrative: within usual business case principles all investments are well spend. This report contains a list of all potential cost and benefit categories. Companies can use these to make their own calculations and evaluations of plans and realised projects. The calculations of the intervention cases illustrate what is feasible in cost effectiveness calculations. A guideline is developed on the basis of the cases. This is a step-by-step approach which helps companies that consider activities in the field of D4A.

“Design for All should bring the most of the best to the greatest number of people for the least.”

Free after Charles Eames, 1950

Introduction

Societal developments and demographic prospects require more attention for the employment of the labour force. In this regard design for all (D4A) is most important. The design of products, workplaces, the working environment and the work organisation has great impact on the potential employability of as many people as possible. Within companies the employer sets the policy and manages the employability. He is responsible for the efforts to rehabilitate and reintegrate

people with an (potential) occupational disability or a chronic disease as well as for the prevention of dropouts. Many expect that the application of D4A principles will be complex, and that D4A results in higher initial and operation costs, compared to designing on the basis of less stringent specifications. Mostly these expectations are not based on facts. However, the D4A approach may very well lead to better core company's performances and so result in a positive costs benefits balance. In 2003 an explorative study gave a first insight in the impact of D4A and Disability Management (DM) interventions within companies. In this study, granted by the Dutch Ministry of Social Affairs and Employment, ten cases were evaluated. Basic calculations learned that in almost all cases the cost effectiveness was positive. However, the study did not make clear why companies choose for a D4A or a DM intervention and how these were organised and structured. To promote the implementation of D4A principles at a larger scale, insight in the goals, ambitions, and approaches of companies is required. A more sophisticated cost effectiveness evaluation method and more case studies would be of great help to convince other companies. These items were the main topics of a new project performed in the years 2004 and 2005.

Goal of the project

The goal of the project was to answer the following questions:

1. Why and how do companies apply D4A principles in practice?

a. Which are the basic assumptions for a D4A approach for workplaces, working environment and organisation by companies?
b. Do companies' D4A approaches meet these basic assumptions? If so, is there a pattern to be seen in these assumptions? If not, is there a reason to adapt the basic assumptions?

2. Which effects may be expected from a D4A approach?

The project

Subject of the project were industrial companies as these are more or less homogeneous. Cases in not for profit companies and governmental bodies might have different characteristics. On the basis of the seven principles for universal design (Connell, 1997) the basic assumptions for a D4A approach were set. The aim was to find six major interventions in the field of D4A. However, it turned out that several of the proposed case studies did not meet the basic assumptions; though good ergonomic design cases, these were in fact no D4A approaches. A further inventory of potential cases led to certain cases that are more or less D4A policy cases rather than D4A interventions. After discussion with the Ministry it was decided that both intervention cases and policy cases be subject of the project. Finally three major D4A interventions were analysed, and six D4A policy cases. In the evaluations documents were studied, interviews with stakeholders and (where applicable) relevant parameters assessed. In all cases the efforts performed were investigated, as well as the effects.

Where possible quantitative parameters were set, next to qualitative findings. Expert guesses were made where relevant data missed.

Design4All starting points

The following definition of Design for All was found in the Ministeries Workdocument ‘Design for All in work situations’, (Molenbroek J.F.M. 2001)

> *Design for All is the continuing consideration during the whole design process to not unnecessarily exclude specific users and to increase the accessibility and user comfort for a well described target group, without regards to age, sex eimpairments or cultural background and starting from the greatest possible variation in users situations.*

Socially the main goal however lies in preventing social closure and social exclusion (Parkin 1987), reason why in the UK people speak about ‘inclusive design’.

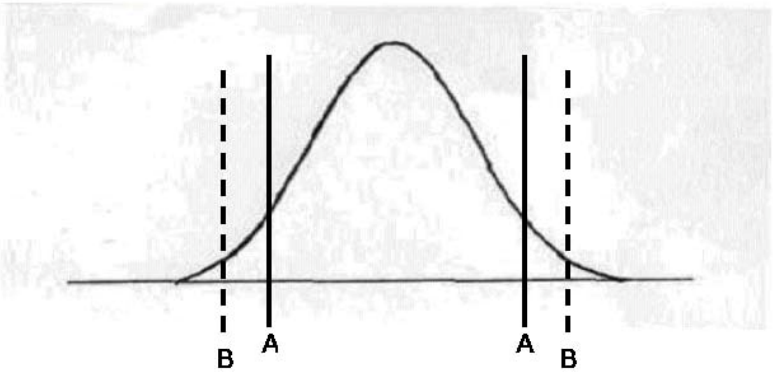
The Human rights approach, specifically in article 15 of the (revised 1996) European Social Charter speaks of the right of persons with disabilities to independence, social integration and participation in the life of the community requires employers to hire and keep in employment persons with disabilities in the ordinary working environment and to adjust the working conditions to the needs of the disabled. Inclusive design helps and it is important to convince employers to

create workplaces that are flexible and adjustable. Design4All is a multidisciplinary concept, which leads to the conclusion that a definition of Design4All must be interpreted in a broader way in order to meet the challenge of not excluding people preventing social closure.

In spite of the above it will not be possible to have one model of workplaces designed for everyone. Main target must be the adaptability of workplaces to individual needs and that is precisely the meaning of Design for All.

Flexibility of work, workplace and work environment makes it possible for employer to have the workplace used by people with different capability – same time makes it possible for potential workers to use the workplace without the need for extreme adaptations costing a lot of money. Though it might be possible that more flexibility is needed. Therefore work, workplace and work environment should be adaptable too, easily and without great extra costs. High user comfort enables people (with or without impairment) to function better in their surroundings, and should be a prior condition for everyone.

The meaning of Design for All (D4A) in scheme



The curve above stands for a frequency distribution and gives the distribution for a number of people with a certain variable, in every class. In this schema on the **horizontal axis** human quality being in this example: **height:** the leftside small people and at the right side tall people. .
The **vertical** axis gives the **relative number of people.**
The point of intersection between a vertical line with the curve gives on the vertical axis the relative number of people having a certain height.
In the diagram it is shown that people with extreme heights are less represented than people with medium height.
The usual designs of products and workplaces cover the reach A-A. The scheme shows that extreme heights are excluded from the average user groups. D4A make the design suitable to the reach of B-B, although certain adaptations might be necessary. .

Even with D4A it will not be possible to reach every extreme heights outside B-B. In this cases individual adaptation of the design is necessary.

This example can be used for different human qualities.

D4A intervention cases

Design and realisation of a new tram cabin The design aimed to allow people of a large range of body dimensions to work efficiently. Major items were: the potentials to adapt the workplace to people with a large range of anthropometric specifications; a much better view on traffic; logical operation; operation that reduced the risk of musculoskeletal sprains and strains. Within the margins of a standard tram the design team developed a new cabin concept. A multi disciplinary workgroup developed the design from a D4A perspective, though it was not called so. More than 100 drivers were involved in test seating in a mock up; their findings have resulted in sincere adaptations of the draft design. The total extra expenses for the D4A approach were € 63,000. The trams at such did not cost extra. The final design of the cabin has 60 cm more length, allowing more space to individually adapt the workplace. The chair and operating equipment can be adjusted to allow males and females of almost any size and body differences to sit and work in comfortable postures. New design of fewer and ultra narrow window posts result in excellent view to the outside world. The tram has a low access for both passengers and drivers. Nevertheless getting off and on the tram is a frequent task in the work of a streetcar

Organisational characteristics		
Number of tram drivers		460
Number of trams		60
Gross wages per hour		€ 16,00
Investments		
Consultancy costs		€ 48.107
Project group, 10 sessions, 12 men, 3 hours/session		€ 5.760
Participation of tram drivers in test seating		€ 4.800
Work sessions at the factory in La Rochelle (F)		€ 4.680
Extra costs per tram for the D4A cabin		nill
Total of investments		**€ 63.347**
Performances		
Reduced risk of collissions (based on first 4 months)		10%
Previous mean number of collissions per year		556
Mean non recoverable costs per collission		€ 778
Portion of the new tram in all trams		44%
Effect on the costs of collisions	**€**	**19.225-**
Occupational health		
Total of gross wages per year		€ 13.478.400
Absenteeism rate		5,50%
Permanente extra loonkosten door verzuim		€ 741.312
Reduction by the new trams		0,50%
Reduction of absenteeism costs per year	**€**	**67.392-**
Number of prevented cases of occupational disability		1
Prevented expense for disability (incidential)	**€**	**119.808-**
Return on investment:		
Investment is already paid back by 1 prevented case of disability		
Investment will be paid back in 9 months by reduced oprational costs		

Table 1. Cost benefit analysis of the new D4A tram design

Microscope workplaces in microchip fabrication

The second case concerns the development of improved workplaces for the inspection of microchip wafers during the production process. This inspection with microscopes is highly skilled work; only after a thorough training and a rather long initial period workers are able to perform the task according to

the high standards. The work is done all days per week, 24 hours per day. In the old situation many of the workers had health complaints related to physical sprains and strains at work. The absenteeism rate was high and several cases of permanent disability

Fig.2 Manual loading of a wafer in the microscope

occurred. microscope Goals were set for a new design, aiming to allow all workers to do the job and to stay healthy, and free of complaints. A quick scan of existing microscopes and workstations learned that a tailor made design was required. Ergonomists were called in to support the design process as well as workers' participation. The result is a workplace that is infinitely adjustable to any body dimensions between 1,55 m

and 2,00 m. The workers have been instructed to adjust the work place properly. Changes in the microscope allow a better sitting position and improved arms postures. The loading and unloading of wafers in the microscope is now done mechanically. This is a great improvement, as workers' physical strain was partly caused by the fear to damage the surface of the wafers. Initially the slow pace of the mechanical device annoyed the workers; later they experienced that this allows them to physically relax for a moment. A real disadvantage for the D4A ambition of the company is the fact that the clean rooms in this factory do not allow wheelchairs to enter. Since the new workplaces are in use workers' neck and arm complaints are significantly reduced. In the first one and a half year after the changes no work related absenteeism was recorded. The total of the investments ranged to € 166,000. Almost half of this amount was spent as design costs, the rest for the purchase of six microscopes and workstations. The benefits are reduced costs of absenteeism (€ 12,000/year). Next a better performance may be expected as workers are less hampered by complaints and as the damage of wafers is reduced. For these two factors the company was not able to supply data; many factors do influence these factors. So a best guess was made between the company and the evaluators (€ 66,000/year, equivalent 3% of the personnel costs). The return on investment is 2 years, an acceptable outcome for the company. The design may be used for workplaces in other factories, making the payback period even shorter. As the group of workers is rather small, the chance that workers become disabled is not calculated. However, a potential case of

disability will cost the company an amount in the order of € 100,000.

Conclusions of these two intervention cases

As only two cases were evaluated, we have to be careful with conclusions. However, combined with the ten smaller scale interventions evaluated in the pilot project, the following conclusions may be drafted. D4A interventions can be defined as projects that aim to design workplaces, products and work organisation to allow the work to be performed by a much larger population than the usual target group, consisting of 90% of the able bodied, healthy males and females between 18 and 50 years of age. The cases illustrate that good work design is feasible. The cost effectiveness is generally good to very good. Usually the return on investment is less than 3 years. Next to financial benefits, several qualitative improvements can be demonstrated in any of the cases.

Cases on company's D4A policy

Six cases were evaluated on company's policies in the field of D4A. Most of the cases were selected from nominations for national awards in the fields of: the i.e. rehabilitation to work of people with impairments and the employment of elder workers. The list is completed with a few companies of which the project team knew their ambition, but that meet troubles in realizing.

The companies range from small (less than 20 employees) to

large (2,000 employees). They represent different branches, like construction, installation, assembly, communication, and electronics. One of these cases is described here: the former TPG, now TNT-post-case. about renewal of the mail delivery-production process (operational formula)

TPG-case: renewal of production process using Design4All-criteria as starting point.

After liberalization of the European Mail delivery market TPG-Post in the Netherlands renewed its Corporate mission statement, leading to renewal of the mail and parcel delivery, by having designed new production processes, including new work cloths, bikes and other necessary work tools, shaped according to the standards and norms of the working conditions act. TPG wants to be a front runner and achieve a strong position in Europe on the mail delivery market. This ambitious grow-strategy will be achieved departing from a strong societal involvement and working towards becoming a front runner in taking responsibility according to Corporate Social Responsibility. The new vision and mission statement is based on a future in which change is necessary, due to the upcoming grey wave, based on which it may be expected that in future much more people facing impairments will search on the labour market for a job. At the same time the existing poor working conditions of the mail delivery employees will be renewed so that a different workforce will be able to do the job in future too.

Evaluation

The evaluations of the cases were mainly qualitative. None of the companies call their policy ‘Design for All’, although much of it has a D4A character. In most cases the intention for the ‘D4A‘ policy comes from intrinsic values, like: “that’s the way we want it”. Sometimes a well considered intention was the background: the need for a high level of experience implicated a policy on elder workers. The communication company is very active in the field of the handicapped; the employment of four handicapped people was a logical step to demonstrate the potentials of employing handicapped. Several companies report that the costs connected to their policy are of secondary importance; others are convinced that the cost effectiveness is positive, but cannot demonstrate it. Some are successful to implement their policy and have great benefits. Others meet sincere hampers by legislation, administrative barriers, unions and so on.

Expert meeting

In an expert meeting a definition of a D4A policy was drafted:
A *D4A policy at company level implicates that the company intentionally allows the largest possible part of all potential work force to be employed, which can be demonstrated by the way work is organized and equipped.*
Then characteristics were drafted that play an important role for the policy setting as well for the execution of the policy.

- *An initiator.* Someone has to take the initiative. He or she must have enough charisma or a powerful position to convince management and workers.

- *The vision of the top manager/founder of the company.* Ethics based on religion or life principals play a demonstrable role in the more successful cases. Many of the successful companies have a background as a family firm.

- *Strong management.* This is necessary to keep one's footings against established opinions and habits. Insight in non-financial benefits will help.

- *Business economical considerations.* At one hand these play no role at all in most of the successful companies. At the other hand it is likely that economic appraisals do hamper companies that do not intend a D4A policy or make no progress. Apparently they don't succeed to demonstrate the benefits of D4A in shareholders values.

- *Demonstration of successes*. And in combination to that, clearly communicate what difficulties were met.

- *Legal measures and administrative procedures.* In the evaluated cases these do rather obstruct D4A activities than that they support these.

- *Not Universal.* It has become clear that not all companies and organisations are appropriate for a D4A policy. Unfortunately, on the basis of this study it is not clear which characteristics play a role in this regard.

Over all conclusions and recommendations

Next to the conclusions above, we found that companies do not recognize D4A as a basic principle to design their organisation and workplaces. Nevertheless several companies are active to employing people that are underprivileged on the labour market. Others see advantages to design their working environment for a working population, as wide as in fairness will be feasible. Generally their goals are implicit and they do not bother much about costs and benefits. However, lack of insight in costs and benefits may very well obstruct other companies from applying D4A principles. Further promotion of D4A as a policy in work organisation and workplace design requires clearness about what may be expected: potentialities as well as hindrances. The efforts that should be spent must be clear as well. Publications of 'good entrepreneurship' examples and successful cases will help encouraging companies. Cost benefit analyses can be of great help, as in many cases a positive cost effectiveness can be proven, in particular for D4A interventions.

Remaining questions for further research:

1. Can Design4All be considered to be a building block for Corporate Social Responsibility, leading towards Sustainable Social Development?

2. Does Design4All improve working conditions for all, more specific for people with and without impairments?
3. Design4All at work and organization is considered to be a tool, improving peoples autonomy and self-caring capacity –

how can we promote the concept to be applied wherever possible and more applied research will be executed.

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In the Netherlands the term: Design4All (D4A) is used in stead of Inclusive Design.

NEWS:

1.

From wearing pegs on their noses to having tennis balls taped to the back of their pyjamas , snorers have tried a host of solutions to end their partner's nocturnal misery. But Paul Cattell has come up with a cure which sounds much more sensible.

The dental technician has invented an adjustable gum shield which brings the lower jaw forward and opens up the throat, allowing air to pass through quietly. And unlike other similar devices the wearer can move the jaw only as far as necessary.

Cattell's Snorekil has already won an international design award, and now he is planning to increase production after receiving an enthusiastic response from 600 users so far.

One wrote that his affliction was improving every time he used Snorekil, and added: "When I do snore it's more of a purr where before it was like a tractor."

And user David Burbridge said the device "appears to have eliminated my snoring. I can't believe it works so well."

Cattell, 52, who does not snore, designed Snorekil after being asked to fit patients with similar devices which he found complicated and not designed to adjust to users' needs.

His version is made of two "thermoplastic" components — one for the upper jaw, one for the lower — which are placed in warm water and then mould into the correct shape of the individual's teeth.

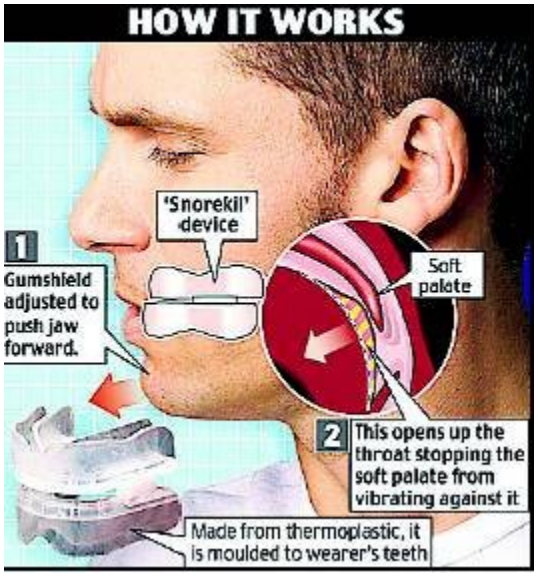
The user then has a choice of five positions in which to connect the two parts, each bringing the jaw forward by a

certain distance. This position helps keep the airways open.

Cattell said his objective was to make “a non-invasive, adjustable, comfortable, effective and affordable over-the-counter device”. After coming up with the idea two years ago, he secured financial backing and set up Sleepworks.

It is now being tried by doctors as Cattell tries to gain more backing to put the gadget in pharmacies. Around 15million of the British population snore, with men outnumbering women by more than two to one. The elderly, whose muscles are weaker, and the overweight, who have flabbier palates, are more likely to snore.

Last week, it emerged that scientists are investigating a drug treatment which will stop the upper airway from collapsing or narrowing during sleep. DAILY MAIL



(Courtesy: Times Of India, India)

2.

PACE Centre unveiled at PES Institute of Technology

Bangalore, March. 6 (PTI): India's "first" PACE (Partners for Advancement of Collaborative Engineering Education) centre, a new automotive, planning, design and engineering partnership, was today unveiled at the PES Institute of Technology (PESIT) here.

PACE is a corporate initiative between General Motors (GM), EDS, Sun Microsystems and UGS with contributions from Altair Engineering, Autodesk, Engineous, Fluent, Hewlett Packard, LSTC and MSC Software.

It (PACE) aims to provide students with practical skills in professional careers including mechanical design, engineering, analysis and manufacturing processes.

PESIT will receive advanced computer hardware and software from these companies, which it will utilise in its engineering curricula, enabling students to obtain practical experience using these inputs currently used by leading global companies including GM.

PESIT will also receive technical, educational aid and automotive parts for students. The contributions are commercially valued at about USD 155 million, Prof D Jawahar, Director, PES Institutions said.

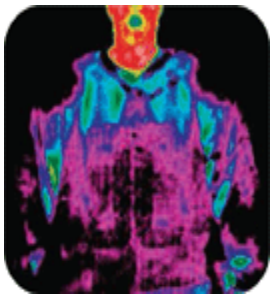
PESIT is the first educational institution in South East Asia to have such a centre, he said.

Describing India as "critical to GM's global strength", Elaine Chapman Moore, Manager Global PACE said the PACE programme though in its infancy, has 15 partners and contributors.

"We are expanding globally to all critical locations where GM has engineering operations and India is our 10th country," she said.

(Source: Hindu, India)

3.



Random Samples

By tradition, a hockey player's jersey is called a sweater, but National Hockey League (NHL) players are getting new togs that will minimize perspiration.

At the request of Reebok, which manufactures uniforms for the NHL, researchers at Central Michigan University in Mount Pleasant tested three different designs against a conventional sweater to see which kept a teenage player coolest during a simulated workout. "The idea is to find the combination of fiber, yarn, and structure that maximizes heat dissipation," says Maureen MacGillivray, a functional apparel designer. She and colleagues used a thermal camera to map the surface temperatures of the jersey, the underlying pads, an undergarment, and the subject's skin. They also used a scanner to make 3D images to study how the tighter-fitting sweaters moved with the athlete. They found that the best design reduced skin temperature by as much as 3.3°C. The new material, which is engineered to transport moisture away from

the body, helped keep the player cooler, but the cut of the garment was also important, says MacGillivray.

Reebok kept close tabs on its prototypes, MacGillivray says. "People on campus say, 'Oh, we want to see the new jersey,' but they took them all back." NHL players will wear them starting next season. Next job for MacGillivray and colleagues: cooler basketball uniforms.

(Source: Science)

4.

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UN, industry, others partner to create world standards for e-scrap recycling, harvesting components

Growing need for elements in high-tech scrap –- often incinerated in poor countries

Standardizing recycling processes globally to harvest valuable components in electrical and electronic scrap (E-scrap), extending the life of products and markets for their reuse, and harmonizing world legislative and policy approaches to e-scrap are prime goals of a new global public-private initiative called Solving the E-Waste Problem (StEP).

EMPA China e-scrap dismantling.
Click here for more information.

Major high-tech manufacturers,

including Hewlett-Packard, Microsoft, Dell, Ericsson, Philips and Cisco Systems, join UN, governmental, NGO and academic institutions, along with recycling / refurbishing companies as charter members of the initiative, officially launched March 7.

Valuable resources in every scrapped product with a battery or plug — computers, TVs, radios, wired and wireless phones, MP3 players, navigation-systems, microwave ovens, coffee makers, toasters, hair-dryers, to name but a few — are being trashed in rising volumes worldwide. Worse, items charitably sent to developing countries for re-use often ultimately remain unused for a host of reasons, or are shipped by unscrupulous recyclers for illegal disposal. And, too often, e-scrap in developing countries is incinerated, not only wasting needed resources but adding toxic chemicals to the environment, both local and global.

“There’s more than gold in those mountains of high-tech scrap,” says Ruediger Kuehr of the United Nations University, which will host the StEP Secretariat in Bonn. “This partnership is committed to salvaging these increasingly precious resources and preventing them from fouling the environment.”

E-scrap in India.
Click here for more information.

In addition to well-known precious metals such as gold, palladium and silver, unique and indispensable metals have become increasingly important in electronics. Among them: Indium, a by-product of zinc mining used in more than 1 billion products per year, including flat-screen monitors and mobile phones.

In the last five years, indium's price has increased six-fold, making it more expensive than silver. Though known mine reserves are limited, indium recycling is so far taking place in only a few plants in Belgium, Japan and the U.S. Japan recovers roughly half its indium needs through recycling.

The market value of other important minor metals used in electronics such as bismuth (used in lead-free solders) has doubled since 2005 while ruthenium (used in resistors and hard disk drives) has increased by a factor of seven since early 2006.

"The large price spikes for all these special elements that rely on production of metals like zinc, copper, lead or platinum underline that supply security at affordable prices cannot be guaranteed indefinitely unless efficient recycling loops are established to recover them from old products," says Mr. Kuehr.

“This recycling of trace elements requires hi-tech processes but it is vital to do it. For manufacturers, improving the e-scrap recycling process is essential to ongoing production and repair operations.”

Unqualified or unscrupulous treatment of e-scrap is still usual in many transition and developing countries. The inappropriate handling leads to:

- Emissions of highly toxic dioxins, furans and polycyclic aromatic hydrocarbons (PAHs), caused by burning PVC plastic and wire insulation;
- Soil and water contamination from chemicals such as: brominated flame retardants (used in circuit boards and plastic computer cases, connectors and cables); PCBs (in transformers and capacitors); and lead, mercury, cadmium, zinc, chromium and other heavy metals (in monitors and other devices). Studies show rapidly increasing concentrations of these heavy metals in humans; in sufficient dosages, they can cause neuro-developmental disorders and possibly cancer.
- Waste of valuable resources that could be efficiently recovered for a new product life-cycle.

In many industrializing and developing countries, growing numbers of people earn a living from recycling and salvaging electronic waste. In most cases, though, this is done through so-called “backyard practices,” often taking place under the

most primitive circumstances, exposing workers to extensive health dangers.

A global guide to dismantling e-scrap and maximizing the recovery and controlling recovered substances is a major StEP objective. A large-scale project to help e.g. China safely dismantle and dispose of its domestic e-scrap is also in the works. Maximizing resource re-utilization will help meet soaring demand in that country and India for increasingly scarce elements.

Inter-related StEP task forces will help shape government policies worldwide and address issues related to re-design and product life expectancy, re-use and re-cycling, and help build relevant capacity in developing nations.

Repairing computer equipment, South Africa.
Click here for more information.

The StEP initiative is the offspring of UNU, the UN Environment Programme (UNEP) and the UN Conference on Trade and Development (UNCTAD). Other prominent charter partners include the U.S. Environmental Protection Agency, the Massachusetts Institute of Technology (MIT), University of California at Berkeley, the Chinese Academy of Sciences, Technical University Vienna (Austria), French National Institute of Telecommunication (France), Technical University Delft (Netherlands), University of Melbourne (Australia), State Secretary of Economics and EMPA (Switzerland), Regional

Environmental Centre (Hungary), the Korea Institute of Geoscience & Mineral Resources, and Umicore Precious Metal Refining (Belgium).

“Companies involved in StEP will benefit through globally standardized, safe and environmentally-proven processes for disposal, reduction or reuse and recycling of e-scrap,” says UN Under Secretary-General and UNU Rector Hans van Ginkel. “Consumers will benefit through knowing what to do with their obsolete machines, less pollution and longer lasting electronic equipment. Member manufacturers will work to design products more easily upgradeable because we all agree buying an entirely new product is wasteful when what’s really wanted are upgraded components.”

The StEP logo will signal to consumers that e-scrap processes associated with a company’s products conform to agreed international standards and guidelines.

OECD figures show global trade of information and communication technologies (ICT) amounted to €1.33 trillion in 2004, 7.7 per cent of gross world product. Trade of ICT goods accounts for roughly 4 per cent of America’s GDP, and 5 per cent and 7 per cent, respectively, of Japan’s and Germany’s GDP.

Annual E-Scrap Today Would Fill Line of Dump Trucks Spanning Half The Globe

E-scrap is one of the fastest growing components of the global waste stream and, arguably, one of the most troublesome. The

European Environmental Agency calculates that the volume of e-scrap is now rising roughly three times faster than other forms of municipal waste. The total annual global volume of e-scrap is soon expected to reach roughly 40 million metric tons — enough to fill a line of dump trucks stretching half way around the world.

Rapid product innovations and replacement, especially in ITC and office equipment — the migration from analog to digital technologies and to flat-screen TVs and monitors, for example — is fueling an increase of e-waste, says Mr. Kuehr.

In 2004, one-half of German households were equipped with a personal computer, a figure that jumped to three-quarters by the end of 2006. The same 75 per cent rate also applies to households in Japan (compared with just .07 per cent in Niger, 1.2 per cent in India, 2.3 per cent in Bolivia and 4.1 per cent in China). The sale of electronic products market is expected to continue growing in developing markets and industrialized ones, where there is a rising tendency to own more than one computer, telephone etc.

“The efficient, cost-effective and environmentally-sound recovery of metals from complex electronic components requires large-scale, hi-tech processes,” says Hugo Morel, Executive Vice President of Umicore Precious Metals Services, a StEP member specialized in such processes. “As well, the collection, sorting, dismantling and pre-processing of electronic devices require trained labor and offers many job opportunities worldwide.

“We strongly support the StEP initiative as a way to foster cooperation among stakeholders, develop needed infrastructure at a global scale, optimize interfaces between manual, mechanical and metallurgical recycling and recovery processes, and minimize the environmental burden created by E-scrap.”

Improved re-use and recycling would also lessen the environmental impacts caused producing new electronic equipment in the first place. In this context proper recycling at the end of reuse life-time must be ensured.

A 2004 UNU book, “Computers and the Environment,” co-authored by Mr. Kuehr, found the average 24-kg (53-lb) desktop computer with monitor requires at least 10 times its weight in fossil fuels and chemicals to manufacture. This is much more materials-intensive than for the manufacture of an automobile or refrigerator, which only require 1–2 times their weight in fossil fuels.

Manufacturing a desktop computer and 17-inch CRT monitor uses at least 240 kg (530 lbs) of fossil fuels, 22 kg (50 lbs) of chemicals and 1,500 kg (3,330 lbs) of water — a total of 1.8 tonnes (1.9 English tons) of materials — roughly the weight of a sports utility vehicle (SUV) or a rhinoceros.

“There is a clear need and opportunity now to address the resources, health and environmental concerns being created by a surging increase in electronic waste,” says Prof. van Ginkel. “We hope that the StEP initiative will point the way for

governments, companies and consumers alike to reverse this growing international problem.”

“Collectively, the role of consumers is enormously important to the world environment, whether purchasing, using or disposing of electronic equipment,” adds Itaru Yasui, UNU Vice-Rector (Environment and Sustainable Development). “Buying refurbished equipment, selling or donating unwanted equipment and finally recycling as a last step are among the choices we hope consumers will make more often. The StEP initiative is designed to make those choices easier.”

Klaus Hieronymi, Environmental Business Manager Hewlett-Packard Europe, Middle East and Africa says: "Through its Take Back and other programs, HP this year will mark the achievement of having recycled 1 billion pounds (450,000 metric tonnes) of information technology equipment since 1986. And we look for ways wherever possible to recover even more retired materials.

"HP has joined StEP to help countries work through the many legal, scientific and practical issues involved in managing e-waste, treatment standards, and innovative design to maximize re-use and recycling. The cooperation of universities, NGO's, producers, government agencies and UN institutions under the leadership of the United Nations University is a perfect set-up to ensure that basic solutions, workable in countries around the globe, will be developed."

"Ericsson is in the process of implementing globally an Ecology Management Provision to handle all electronic waste resulting

from customer operations and also that generated internally within the company," says Mr. Per Jomer, Ericsson Vice President, Group Strategy. "This provision is an integral part of Ericsson's environmental management system. The EU WEEE Directive has been used as one of the guiding principles in establishing the provision, although the scope of Ericsson's program is global and therefore includes all products, for all markets. Ericsson believes that StEP will make a valuable contribution to industry, in particular in establishing global best practices for evaluating recycling, waste treatment and asset management businesses."

###

In addition to UNU, UNEP and UNCTAD, charter members of the StEP initiative are:

Private-sector:

- AER Worldwide (USA)
- Cisco Systems (USA)
- Dataserv Ltd. (UK)
- Dell (USA)
- Earth Protection Services (USA)
- Ericsson (Sweden)
- Flection (Netherlands)
- Hewlett Packard (USA)
- MicroPro (Ireland)
- Microsoft (USA)
- Philips CE (Netherlands)
- Promtion team Wetzlar (Germany)

- Rifer Environmental (USA)
- SIMS-MIREC (Netherlands)
- Taizhou Chiho Tiande (China)
- Umicore Precious Metal Refining (Belgium)

Government:

- German Technical Cooperation, GTZ (Germany)
- Swiss State Secretariat of Economics, SECO (Switzerland)
- Minnesota Pollution Control Agency (USA)
- United States Environmental Protection Agency, US-EPA (USA)

Academic and research:

- Chinese Academy of Sciences, Research Center for Eco-Environmental Sciences (China)
- Federal Laboratories for Materials Testing and Research, EMPA (Switzerland)
- Fraunhofer Institute for Reliability and Micro integration, FHG-IZM (Germany)
- French National Institute of Telecommunication, INT (France)
- GAIKER Foundation (Spain)
- Korea Institute of Geoscience & Mineral Resources, KIGAM (South Korea)
- Massachusetts Institute of Technology (MIT), Material Systems Laboratory (USA)
- Regional Environmental Centre for Central and Eastern Europe, REC (Hungary)

- Technical University Vienna (Austria)
- Technical University Delft (Netherlands)
- University of California, Berkeley, Consortium on Green Design and Manufacturing (USA)
- University of Melbourne, Faculty of Engineering (Australia)

NGOs:

- INFORM (USA)
- Öko-Institut (Germany)
- 3P Consortium for Sustainable Management (Germany)

Other members:

- AEA Technology, AEAT (United Kingdom)
- Japan External Trade Organization – Institute for Developing Economics, JETRO-IDE (Japan)
- Rifer Environmental (USA)
- Micro Industries Development Assistance & Services, MIDAS (Bangladesh)
- Thai Electrical and Electronic Institute; EEI (Thailand)

United Nations University

UNU is an autonomous organ of the UN General Assembly dedicated to generating and transferring knowledge and strengthening capacities relevant to global issues of human security, development, and welfare. The University operates

through a worldwide network of research and training centers and programmes, coordinated by UNU Centre in Tokyo.

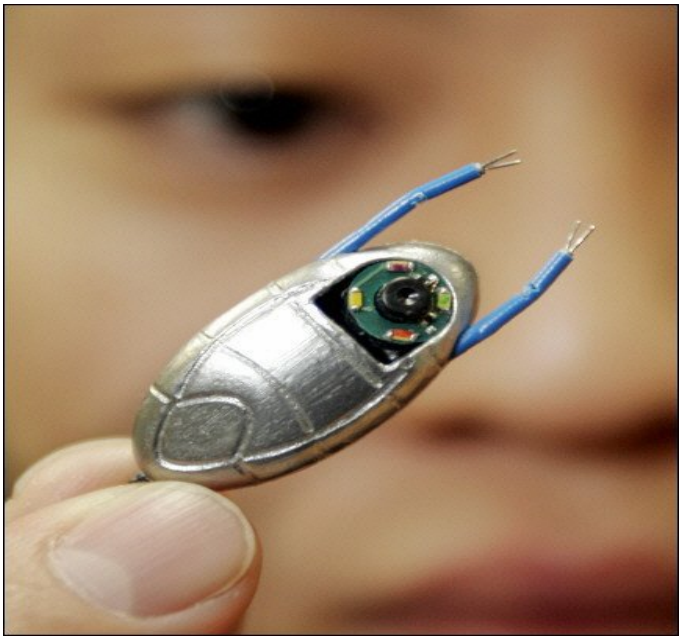
(Source: Info Dev, World Bank)

5.

A Florida advocate, Wally Dutcher, reports that he and Universal Design architect Charles Schwab have influenced a builder of high-end homes (starting at 370K) to incorporate Universal Design features in all homes in his new development near Orlando. All the homes will be constructed not only with zero-step entrances and wide interior doors, but also wide halls, lever handles, roll-in showers, and several other UD features. Beyond that, a list of additional, optional UD features are offered such as grab bars and pool lifts. The builder's advertising material states: "Bountiful Lands, Inc., announces the Monticelli Development of New Vision Homes at Tower Lakes. Monticelli is a unique, new gated community development of 59 New Vision Homes.... Each of the New Vision Homes will incorporate Universal Design features that will allow the homes to adapt to life's altering circumstances, whether they be temporary or permanent ."Since these homes are not zoned as restricted to older people, it will be good for the universal home access movement if the homes sell as well as, or better than, comparable homes without UD features. It will also be interesting to hear if any non-disabled buyers will insist on steps for their entries; that has occurred with a very small number of buyers whose builders participate in the Easy Living Home certification program, which requires a zero step

entry .Features that sell well in high-end homes often spread to mid-priced and lower-cost homes. And of course wealthy people who become wheelchair-users do not fit through narrow doors any more easily than less well-off people (though they have more access paid assistance to help them cope with the consequences) .Mobility-impaired people of all income levels have reason to hope these Florida homes sell briskly. Congratulations to the advocates and the builder.

6. Japan Medical Expert Unveil Medical Mini Robot



Japan's Ritsumeikan University researchers unveil a prototype model of the micro medical robot, measuring 1cm in diameter, 2cm in length and weighing only 5-grammes, which enables it to stay and move inside a human body to remove or treat the

affected part of disease especially cancer, at the Biwako Kusatsu campus of the university in Kusatsu city, Shiga prefecture near Kyoto. The surgical micro robot can attach various kind of medical devices such as micro camera, micro manipulators, various sensors and drug delivery in

7.

India’s first auto design institute

India has one of the largest booming auto industries in the world but not a single dedicated auto design school. This will change with Dilip Chhabria, noted automotive designer, set to introduce the country's first Automotive Design Institute in August this year.

The institute, DC College, will be the country's only and Asia's third automotive institute which will offer courses on par with international institutes in the west.

The courses offered will be on automotive styling and transportation design and there will be live projects, resulting in an actual car being built, besides industry internship.

Dilip Chhabria, head of the institute, says, "Automobile is such a passion with youngsters that they don't hesitate to build a career in it. DC College will provide all the technical training that they require in India to build that career. We will provide practical training too."

The institute has tied-up with Italian design houses like Europeo di Design for assistance in styling courses and Polytechnic di Turino for assistance in automobile engineering courses. It has already signed an MoU with these institutes.

DC College will start with offering diplomas in Digital Modeling CAS (computer aided styling)-ICEM. The course is for a period of one year with batches commencing every six months.

The eligibility criteria for admission are graduation in any discipline. Per batch intake is limited to 40 students. The

institute will offer five more courses from August 2008. It has divided these courses in phase II and phase III. Phase III will start in August 2009 with specialisations in engineering, marketing and design management.

The institute has not worked out the fee structure as yet but according to HP Deshpande, consultant to the institute, the course fees will be approximately Rs 2 lakh per annum - irrespective of the course undertaken. Upon completion of the course graduates can start with a salary of at least Rs 20,000.

DC College would also offer placement with organisations in India or abroad. DC Design, a car design house owned by Chhabria, already has a client list including Renault, Fiat, Bajaj, Tata, General Motors, Toyota, Ford to name a few.

"Placements will not be a problem as DC Design already has a huge client list. We will also organise such placements to help students for quality securing jobs," concludes Deshpande.

Incidentally, other Indian institutes like National Institute of Design (NID), Ahmedabad and Maharashtra Institute of Technology (MIT), Pune, will also start transportation design course this year.

Program And Events :

1.

Warm Greetings! As you are aware Creative-i College is a college based in Pune conducting Under Graduate programs in 5 disciplines viz. Product Design, Interior Design, Fashion Design, Digital Arts and Mass Communication. We are a 400 students, 32 faculty strong Creative Arts / Design college. More details about us are on our website www.creativei. info.

We are organizing a Pune Arts and Design Festival during March 22, 23, 24 & 25, 2007. Given herewith are the brief details of the festival for your perusal and information.

It shall be our pleasure to have you to participate in the round table discussions. Also you may depute some of your associates for the workshops that are being held.

The participation is free with prior registration. More details would be available on our website www.creativei. info by March 13, 2007. Kindly forward this information to people deemed appropriate by you.

In our quest to make this unique festival a success and to build a foundation to an annual event, we seek your support and help. I am available to answer any of your queries. My communication details are mentioned below.

Awaiting your reply!

Hridayesh Deshpande
Director

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Ganga Dham Comm. Phase I,
Sr. No. 612 – 615, Lullanagar Bibvewadi Road
Market Yard, Pune 411 0037
Maharashtra, India

Ph. No.: +91 – 020 – 32917340, 3254 0900, 64000776, 64001810 office
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E-mail: director@creativei. info
Web: www.creativei. info

Pune Art & Design Festival Schedule

Inauguration Function

Inauguration by: Prof. Helmut Langer
Date: Thursday, 22 March 2007
Venue: SM Joshi Hall, Ganjave Chowk, Navi Peth, Pune
Duration: 6:00 pm onwards

Prof. Helmut Langer

Prof. Helmut Langer is one of the revered personalities from the field of Graphic Design. He has been the President of the International Council of Graphic Design Associations - ICOGRADA, London, world organization for design and visual communication, NGO, between 1987-1993. More details are available on his website
www.helmut-langer. Eu

Keynote Address

Topic: Global Challenge for Sustainable Design
Date: Thursday, 22 March 2007

Venue: S. M. Joshi Hall, Ganjave Chowk, Navi Peth, Pune
Duration: 6:00 pm onwards

Workshop

Topic: SUN - Design of a poster on the theme ''SUN''
Dates: March 22 and 23, 2007
Venue: Creative-i College
Duration: 10:30 am onwards

Prof. Peter A. Di Sabatino

He is a Department Chair and Professor since 2001 at the Art Center College of Design. He is the Professor for transdisciplinary design education, within the departments of Graduate Media Design, Mobility Research and Design, Landscapes, Environments and Design, and special projects including coordinating study abroad opportunities, with a focus on India. Earlier he was Professor at Woodbury University School of Architecture & Design.

Topic: Design Challenge
Dates: March 22, 23 and 24 2007
Venue: Creative-i College
Duration: 10:30 am onwards

Prof. Peter Sabatino will lead a "Design Challenge" as a part of the Festival, with some elements of a workshop. This challenge will engage participants in a real transdisciplinary way. The

topic would be mobility and urban products (laptop, cell phone, rfi's, etc) and systems...

Ms. Elena Caratti & Ms. Annamaria Formentini

Elena Caratti_Architect, MA in E-Design, PhD in Industrial Design and Multimedia Communication is currently contract professor in Communication Design at the Faculty of Design of Milan Polytechnic. She also works at the Istituto Europeo of Design of Milan in Design Master Courses Didactics.

Annamaria Formentini, PhD in Industrial Design focused on Environmental and Social Sustainability, has been working in the field of education for sustainable development for UN agencies and at the governmental level. She currently works in Hong Kong as an independent environmental advisor.

Topic: Workshop - Signs and Symbols for Sustainability
Dates: March 22, 23 and 24 2007
Venue: Creative-i College
Duration: 10:30 am onwards

The workshop originates from the will of merging the most urgent issues of "sustainable development" together with "Communication Design". The motivation behind this choice is to enable students to become acquainted and to develop a specific expertise in visualizing and representing some of the key concepts of sustainability related to everyday life.

Nicola Morelli

Nicola Morelli is an architect and an Industrial Designer. He did his BArch with Honours from Naples, Italy, and PhD Industrial Design from Politecnico di Milano, Italy.

He is currently Associate Professor. Institute of Architecture and Design Aalborg University, Denmark. Earlier he was Project Manager, Telecentra Project, Centre for Design at RMIT University Australia, Post PhD Fellow, Centre for Design at RMIT

Topic: Workshop - Urban transportation
Dates: March 22, 23 and 24 2007
Venue: Creative-i College
Duration: 10:30 am onwards

The theme on one hand it touches a local problem and on the other hand it may eventuate in products and services that are exportable in other contexts, therefore local companies can find local solutions and, at the same time a wider market for their business.

The details of the workshop theme and preparation for the same is available on his blog - http://nicomorelli.wordpress.com/pune/

Dr. Dinesh Katre

Presently, Dr. Dinesh Katre heads the National Multimedia Resource Centre of C-DAC, Pune. This centre was established under his leadership and with the sponsorship of Dept. of Information Technology, Govt. of India in 1998. Recently, he has envisioned the R&D charter for Human Computer Interaction Design (HCID) C-DAC. He holds Ph.D. in Human-Computer Interaction (HCI) from BITS, Pilani and Master of Design from Indian Institute of Technology, Mumbai.
More details about him could be had from www.hceye.org

Topic: Application of Interface Metaphors in UX Design
Date: Friday, 23 March 2007
Venue: S. M. Joshi Hall, Ganjave Chowk, Navi Peth, Pune
Duration: 3:30 pm to 6:30 pm

Metaphors are an integral part of our thinking, communication and learning processes. As computers are moving from professional tools to consumer products, learning about interface metaphor becomes essential for enhancement of usability and mass appeal.

Sayalee Joshi

Topic: Workshop - User Research and Ethnography
Date: Saturday, 24 March 2007
Venue: Creative-i College
Duration: 10:30 am to 2:30 pm

The workshop would be preceded by a brief introduction about CKS and the research methods they use. The workshop would have participants use those methods to understand the lifestyle / work process / routine of some chosen subjects around the festival venue and come up with some design solutions appropriate for the respective subjects.

The workshop will be conducted by Ms. Sayalee Joshi Principal Researcher CKS Consulting. More details about CKS Consulting can be had from their Website http://www.cks. in

Round Table Discussions

Topic - What impacts the evolution of Industrial design field in a country more – stimulation by culture and art as against technology and mechanization. – India learning and future mapping.

The idea is to try and discover which of these two factors has the greatest – or should have the greatest – impact or influence in industrial (product) design (or perhaps design in general)? And specifically how this could, or should, influence design education (and practice) in India now and into the future? The discussion is intended to be interesting and provocative.

Date: Saturday, March 24, 2007
Time: 3.30 PM to 7.30 PM
Venue: Creative-i College

Topic - Sustainable design / Responsible Design – a possible opportunity and road map for India
This we feel is an important and timely topic for design, and design practice and education in India. We would like to try and arrive at a vision for "responsible" design and its inclusion in design education. We would discuss not only a vision for India, but also how that translates into opportunities – and strategies and tactics.

Date: Sunday, March 25, 2007
Time: 10.30 AM to 1.30 PM
Venue: Creative-i College

Final Day Show

Date: Sunday, March 25, 2007
Time: 10.30 AM to 4.00 PM
Venue: Creative-i College

The idea is to present generally to all, the work produced during the workshops conducted throughout the festival
2.
Dear Friends,
We take great pleasure in inviting you to the inaugural event of CHI Mumbai Chapter, "A New Avatar of CHI India" to be held on 23rd March, 2007 (2:00-5:30 pm) at Hotel Hyatt Regency, Mumbai. In a continual effort to bring together practitioners working in the field of design, evaluation, implementation, and

study of interactive computing systems for human use, CHI Mumbai (earlier known as CHI India) is proud to present Joseph Kaye (Jofish) from Cornell University and Dr. Eric Schaffer, CEO, Human Factors International.

A. Expanding the Scope: Pushing the Boundaries of HCI

"As information technologies become ever more popular and ubiquitous, it becomes increasingly important to think about how we in human-computer interaction can build for, support, and understand the rich and varied ways that users interact with and through devices".

Jofish will discuss ways to think about experience-focused HCI rather than task-focused. This approach considers technology use outside the workplace and designing information technologies that can support rich interactions.
He will draw from a variety of research both within and outside the field, including his own work on computerized scent output and on building technologies for couples in long distance relationships.

B. Usability PETscan

HFI's Usability PETscan through analysis of persuasion, emotion and trust provides deep insight into the users decision-making processes to create positive relationships with consumers and impact conversion. The PETscan solution provides an opportunity to truly understand the consumer

experience-it gives a thorough analysis of the elements, content and interactions that lead to a more complete experience for your existing and potential consumers." Dr. Schaffer will conduct a session introducing you to the PETscan technique.

We will also share the overview of the planned activities by CHI Mumbai for the year 2007, followed by a Q&A session with the CHI Mumbai panelists.

The event will be followed by refreshments.

Event Date and Time:
23rd March 2007, 2:00 pm - 5:30 pm

Venue:
Hyatt Regency

Sahar Airport Road,
Mumbai, India 400 099
Tel: +91 22 6696 1234

Confirm your participation for the inaugural event by sending a reply mail to Hitesh Agrawal (hitesh@humanfactors .com) with your name and contact details at the earliest.

For any queries, contact hitesh@humanfactors .com or call on +91 98922 57629
CHI Mumbai

Hitesh Agrawal (Chair)

Letter:

Dear Dr Bhatia,

I have been given your email by my friend Prof G Surya Kumar of US, who obtained it from Nancy Hitchcock, Centre for Universal Design, NC State University.

I am a wheelchair user fro the past 17 years and involved in the disability movement in India. Recently I completed a background paper on accessibility for the World Bank. I am interested in looking at professionalizing the practice of designing and building assessable infrastructure. I believe you have done work in this area and I would like to have your views on how this could be brought about.

Regards

Sarabjit A Singh

Dr. Bhatia

Congratulations on your dedication and hard work in your country to provide a way to inform others about inclusive design. Attached is an article that you might like for your newsletter. I am honored to have it included. Let me know when it is published.

Thanks.

Best regards,
Vicki L. Stoecklin
Education & Child Development
Director White Hutchinson Leisure & Learning Group, Inc.4036
Baltimore Avenue Kansas City, Missouri 64111 USA
voice: +816.931-1040, Ext 102fax: +816.756-5058e-mail: vickiwhllg@aol.com
Web: www.whitehutchinson.com/children

Job Opening:

1. Ideally looking for someone near Ahmedabad who has own kiln, space, etc. and who is excited by experimenting with glazes on stomeware. I have been developing normative prototypical forms to be slip-cast in runs of 100-10,000, but want/need to engage those forms in a dialogue with glazes; this collaboration is something that I would like to grow into a business partnership eventually.

Please contact me or send me names of persons I should contact.

James Hicks
The Cooper Union class of 1994, architecture
New York, NY

2. I'm looking for graphic designers to design websites in Bangalore, to work on contract. If anyone is interested in more information please get directly in touch with Ruban Phukan 9845807382 or email ruban.phukan@ mihindia.Com

3.

We at Flextronics Design Consumer Electronics, India are looking forward to applications for an User Interface Designer to join our staff design team at Bangalore studio.

About Flextronics

Flextronics, headquartered in Singapore, is a leading Electronics Manufacturing Services (EMS) that offers complete design, engineering, and manufacturing services to aerospace, automotive, computing, consumer digital, industrial, infrastructure, medical and mobile OEM customers. With a network of facilities in over 30 countries, Flextronics helps customers design, build, ship, and service electronics products worldwide. By combining the advantages of a vertically integrated service offering with the benefits of a global, low-cost manufacturing base, Flextronics enables customers to optimize supply chain operations, accelerate time to market and time to volume, and reduce capital investments and production costs. Flextronics designs and develops innovative, stylish, and cost-effective products that address the needs of users as well as the marketplace. Front-end creative capabilities include product exploration, market research, 2-D sketch level drawings, 3-D mock ups, proofs of concept, interaction and interface models, and detailed hard models and

product packaging. Please visit www.flextronics.com to know more about us.

As a potential member of our team, you are expected to,
a.. have 2 to 5 years experience in user interface design.
b.. be widely knowledgeable of user interface design principles and practiced design standards.
c.. be proficient in conceptualizing on information architecture designs, navigational elements & maps.
d.. have experience in developing UI specifications, creating mockups, wireframes and prototypes.
e.. be highly proficient in computer programs like Adobe Photoshop, CorelDraw and MS Office Suites.
f.. have some knowledge of embedded systems and devices as an added advantage.
g.. have fun and passion in developing the graphics, screen layouts and visual designs.
h.. be in your best spirits while working alone or in a team.
i.. be passionate about design and be very creative.
j.. have a good sense of humor.

Please send in your resume to Dyutiman.Moulik@ in.flextronics . com only and not to the group. If you have a website of your own or other online links to your portfolio, do include such links to your response email. However, please do not send any portfolio files as attachments. We are looking forward to see some excellent work from you and your compensation would be competitive and commensurate to your overall professional skills and experience.

Best regards,

Dyutiman Moulik

Industrial Designer 1998-2003 GDPD, NID

Flextronics Design Consumer Electronics India

#38 KH Circle, Hosur Road Bangalore 560027, INDIA

email : Dyutiman.Moulik@ in.flextronics. com

4.
Geometric software solutions (www.geometricsoftware.com) is looking for creative Visual designers for 1yr contract position at Pune to work with their client. This contract may extend depending on client requirement.

Location: Hinjwadi, Pune

Employment: 1 year contract extendable.

Designation: Visual Designer

Key Responsibilities:

In this role the Visual designer will work with the Interaction design team to come up with visual concepts for their desktop CAD application and web based data management system.
He will work both on Web applications and Desktop applications to define overall visual directions, GUI dialogue designs, web widgets, CSS, icons, etc.
He will create fast prototypes in photoshop / dreamweaver /Flash to demonstrate proof of concept Maintain visual library of icons, style sheets, branding, etc.

Education & Experience

B.A/BFA in graphic design, visual communication or equivalent
1-3 yrs of industry experience designing visuals for web and desktop applications

Requirements

Intimate Knowledge of Photoshop, Illustrator, Flash, Actionscript, Dreamweaver, HTML, and CSS .
Strong conceptual thinking. Thorough understanding of design basics, layout, color, Web standards, Windows style guide, accessibility and current design trends.
Comfortable in working in teams and open to criticism as well as capable of providing others with feedback.
The successful candidate will be responsible for brainstorming creative concepts with the project team, develop original design concepts, executing designs based on established style guides, and developing detailed design specs for production.
Excellent communication skills as well as the ability to work independently and as part of a team required
Must have strong understanding of technical issues as they relate to product development Strong understanding of technologies for compression and other related tools for image and media manipulation required. Knowledge of CAD software is added advantages.

A detail portfolio(online/ on CD/ ppt) to demonstrate previous work is a must.

Rush your resumes to Archana Kadam: Archana.Kadam@ geometricsoftware.com

Thanks and Regards

Archana Kadam

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H/P: 98600 23834
Email: archana.kadam@ geometricsoftware.com

(More jobs are in our web site www.designforall.in)

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Regarding new products or events or seminars / Conferences / workshops.
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Feedback:
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The views expressed in the signed articles do not necessarily reflect the official views of the Design for All Institute of India.

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