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AN AESTHETICS FRAMEWORK FOR DISCUSSING 'INCLUSIVE' ISSUES IN DESIGN

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1. Introduction

This paper examines the issue of the aesthetic acceptability of products and systems and, with the demographic shift towards an older population, discusses how one might approach the issue of aesthetics for an ageing population. It asks if this is informed in any way by fresh understanding gained from new 'inclusive' models mapping the sensory, cognitive and physical capabilities of individuals and populations, and if so, do these models limit or enlarge our thinking of aesthetic issues. It explores aesthetics with reference to a three-level model of 'aesthetic intelligence' previously proposed by the author which recognises bio-evolutionary, personal and cultural influences on aesthetic response, and from which is derived a framework to assist engineers and designers in handling the complexities of aesthetic issues in product acceptability.

2. Capability Models

The purpose of inclusive design is to counter the exclusion of individuals and sectors of the population through the design of products and services which allow for as full a range as possible of functional capabilities of the users who may wish to use them. Within a number of ageing and capability models, e.g. as in Pirkl and Babic's [1988] 'demographic charts', or in Clarkson et al's [2000] 'inclusive design cube', there is an implicit suggestion of capabilities deteriorating from 'ideal' or 'perfect' states. Despite the very usefulness of these models of dynamic change in our physical, cognitive, and sensory capabilities, this inevitable process of loss of e.g. acuity, strength, and memory may undermine our psyche, no matter how positive a spin we may put on the prospect of our diminishing capabilities. This is partly due to social conditioning and attitude. To counter this, it would be useful to locate the aesthetic implications of these capability models within a broader aesthetic model, to find a greater value for ageing phenomena and attributes.

3. An aesthetics framework

Here, the author uses the term 'aesthetics' to mean 'that which is perceptible through the senses'. Aesthetics is one of a number of factors that influence the acceptability of products and systems. While functionality and usability are relatively familiar to the design engineer, readily usable models for handling the complex issues of the aesthetic acceptability of products are not generally available. This area has seen much recent work emerging principally, but not exclusively, from the design and human factors communities where it has been discussed with reference to 'design for pleasure – beyond usability' [Green and Jordan 2002], or 'design for emotion' [Hekkert and McDonagh 2003]. Although much useful discussion has taken place, models which are immediately accessible to, and usable by designers and design engineers are still lacking.

In his discussion of the idea of culture, Hofstede [1991] uses a three level model. Described here simply, these levels are 1) those which represent 'a universal level in one's mental software', i.e. part of our human nature, and whose values he describes as 'broad tendencies to prefer certain states of affairs over others'; 2) th□□ose values specific to an individual/personality, and 'his/her unique personal set of mental programs'; and 3) those specific to a group or category – 'the collective programming of the mind which distinguishes the members of one group or category of people from another'. This author's aesthetics framework has been developed from Hofstede's model, which is simple and helpful, and is adapted here with certain other considerations with respect to technological acceptability, aesthetic response and inclusivity issues. Using this model as a basis, the author has previously illustrated, how aesthetic response can be described as a combination of responses at these three levels [Macdonald, 2001].

3.1 The framework - level 1: bio-evolutionary

A bio-evolutionary (or innate) level of aesthetic response reflects the way that our brains, bodies, and our senses have evolved, i.e. how they have been 'hard-wired' to influence or determine the particular meanings and values we associate with information perceived through all our senses. Important here is our physiological, physical, sensory and cognitive make-up as this will affect e.g. physical and mental reaction times at a product interface, or emotional reactions to anthropomorphic product features. This will determine, to an extent, the acceptability of e.g. products, systems, interfaces, and technologies.

3.2 The framework - level 2: personal

At a second, personal level, response is influenced by one's unique physical and mental make-up on the one hand and one's personal history of memories, circumstances, experiences, preferences and associations on the other. For example, one may have grown up with, enjoyed familiarity with, and become adept at using traditional SLR cameras and to prefer the mechanisms, controls, and formats of output of this system over digital technologies. Here one may be familiar with an older technology and have a reluctance or lack of desire to engage with a new. Another example would be how one chooses to personalise and customise a mobile phone, both in its functions, in its appearance, or its call tone. These reflect personal values.

3.3 The framework - level 3: cultural

The third level of response, at a socio-cultural level, is conditioned by factors that shape common values and behaviours shared with certain sectors of the population. An example of the socio-cultural level at work is the exercise [Macdonald, 2002] to determine perceived 'quality' in technology.

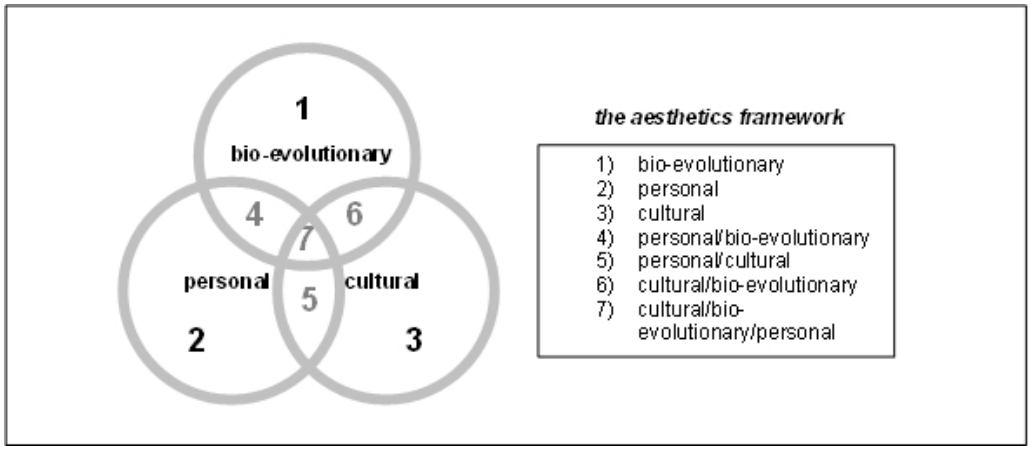

Figure 1. Differentiated levels of aesthetic response – generic model

If only two qualities are attributed to e.g. a personal stereo, the first being its weight, and the second being its thickness, the densest combination, i.e. thin and heavy wins most times over 'thick and light',

as ‘compact, dense’ technology has traditionally been perceived as of better quality than ‘bulky, light’ technology at least in recent European culture. Another example is the unexpected phenomenon of the huge popularity of text messaging and a new and original form of text language that evolved from this. This reflects its cultural value.
Each and all of these complementary sets of responses combine to shape our value judgements when responding to other people, products and services. Together these provide a model with a set of differentiated spaces in which to situate discussions about aesthetics relevant to the theme of this paper (Fig. 1).

4. Inclusive design issues discussed within the aesthetics framework

Using this framework, the general description and effect of the physiological process of ageing would be situated in the bio-evolutionary space (1), e.g. as discussed in Pirkl and Babic’s [1988] description of the diminution of the acuity of each of the senses. Here, aesthetics specifications need take cognisance of general ageing trends, e.g. of the yellowing of the fluid of the eye, or acuity of vision or hearing. Alerted to this, one requires to approach, e.g., colour graphic design in a more considered way. The implications of Clarkson et al’s [2000] Inclusive Design Cube model, and Gregor and Newell’s [2001] Design for Dynamic Diversity model would sit well in the personal/bio-evolutionary space (4) as these models relate more to developing the profile of the complex combinations of capabilities of individuals and the products, services, environments and tasks etc that might suit them best. In this case, the capability profile and the personal preferences for each individual is different.
Having established and described the concerns of inclusive design and the aesthetics framework, it is now used in a series of four brief discussions and examples to illustrate how it can be used to identify and stimulate discussion of a broad range of aesthetic issues in inclusive design and technology: 1) values for capability, appearance, and the signs of ageing; 2) aesthetic issues in the design of inclusive furniture; 3) the aesthetics of technological affixtures and assistive technologies; and 4) aesthetics issues in the design of inclusive medical devices.

4.1 Values for capability, appearance and the signs of ageing

There is an opportunity to re-consider the veneration of elders and their wisdom, the elderly and the signs of ageing so long maligned by the values of youth-fixated society. For example, “the fashion of the powdered wig in 18th century Europe adopted a fashion that mimicked the appearance of the elderly, perhaps as a show of respect for age” [Wilcox and Callahan, 2003].

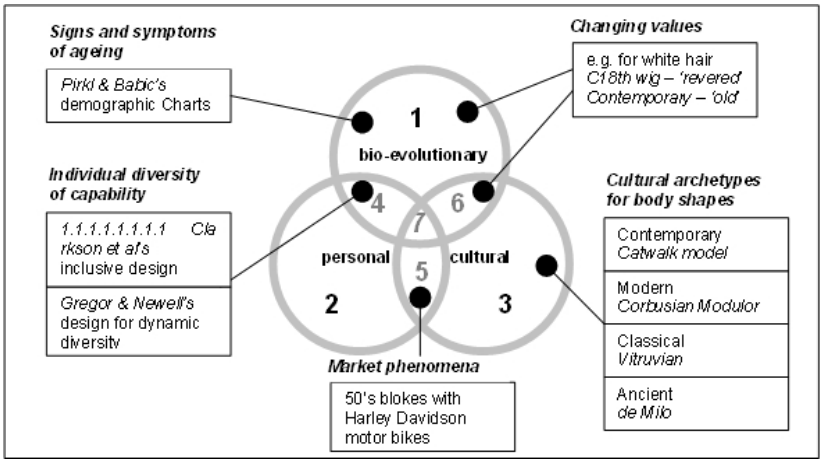

Figure 2. Values for capability, appearance and the signs of ageing

This discussion would locate in the cultural space (3) in Fig. 2 - as would a discussion of the ‘tyranny’ of archetypically ‘perfect’ and youthful body proportions – e.g. the Vitruvian, that of the de Milo, or the Corbusian Modulor. A discussion linking one’s personal associations with broader cultural values would sit somewhere within the personal/cultural space (5), e.g. where one’s individual values tend to accompany one as one ages: the values linked with blue jeans, once iconically associated with 60’s

youth rebellion, now form part of 'silver' market values and campaigns. Harley Davidson ownership is a phenomenon in the over-50's age group that occupies that same space (5).

4.2 Aesthetics issues for inclusive furniture design

Given that injuries can occur when older users' balance and motor skills are affected with age, the aesthetics of the design of e.g. furniture (Fig. 3) for older users in a care institution is determined to an extent by the need to reduce risk and minimise injury through e.g. stability, rounded corners, and easy-to-open drawers [McNally, 1996] - in effect an 'aesthetics of compensation' for levels of diminished capability (space 1). However, issues of reminiscence and memory inhabit space 2, reflecting personal history and associations: personal 'mementos' and the processes of personalisation help retain the identity of who we are/were in the face of e.g. dementia - an aesthetic of individuality and personality. So, an item of furniture retained from one's own previous home would not only have a personal history (space 2) but also provide a shared point of reference – i.e. occupy a cultural space (space 3): the designer might develop a modular structural approach to the furniture but its optional visual styles might reflect the aesthetic reference points of these individuals - Victorian, Edwardian, Nouveau, or Modern.

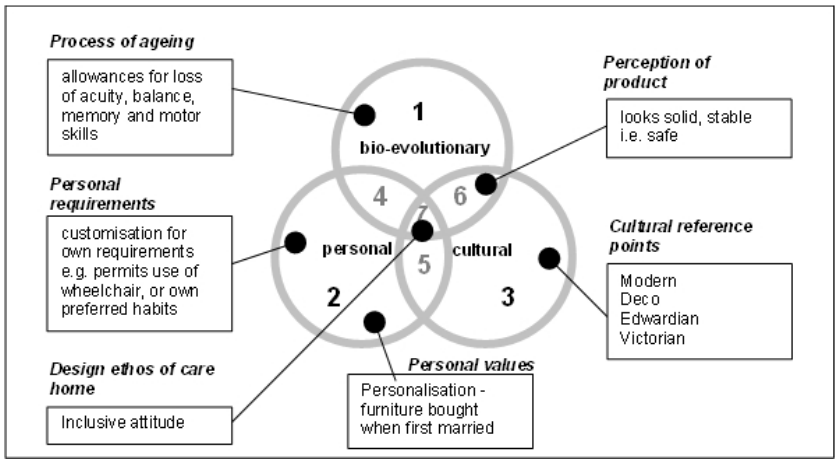

Figure 3. Aesthetic issues for inclusive furniture design

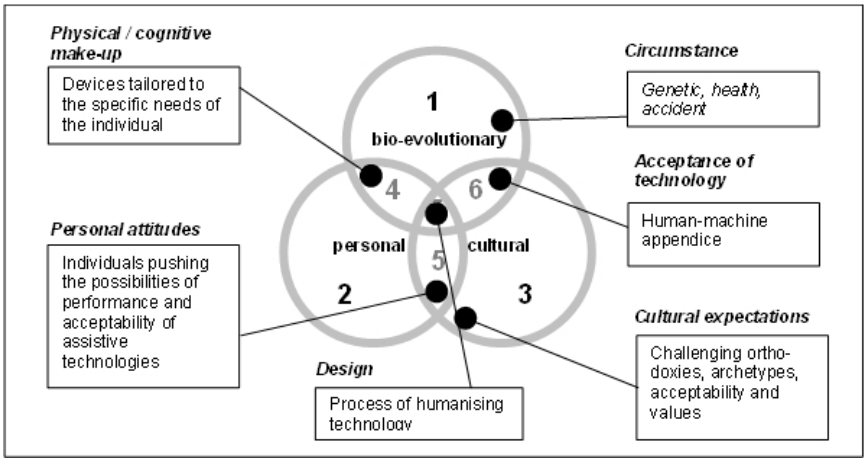

Figure 4. Aesthetic acceptability of technological affixtures

4.3 Aesthetics and assistive technologies and technological affixtures

The move into mainstream events of previously excluded (e.g. paraplegic or amputee) athletes, and their accompanying prosthetics shifts the acceptability of technological affixtures (Fig. 4). Our ingenuity, through engineering design, can compensate the loss of sensitivity, mobility, or cognitive function by way of prosthetic, orthotic, or assistive devices. Although these artifices compensate for bio-evolutionary accident or personal circumstance, their aesthetic acceptability presents both a personal and a cultural issue.

Is one prepared to accept as aesthetically equal a) an individual with one arm without an artificial replacement, b) another with a prosthetic with a cosmesis, and c) a third with a non-cosmetic (i.e. technological) prosthesis as one would an individual with two 'normal' arms? This then presents us with the question of what is an acceptable image of ourselves and others which includes the technological, resulting in a conjunction between human and machine, carbon and silicon, the natural and the artificial, between the evolved and the manufactured. This then brings us to the issue of the acceptability of prosthetic appendages which are not evolutionary in the biological sense, but in a cultural sense. The economics of new technologies such as Sony's AIBO offers us new opportunities to explore the relationship between much more responsive forms of technology and ourselves. This is a process of humanising technology described by the author [Macdonald, 2003]. Such complexities are best discussed in the central space (7).

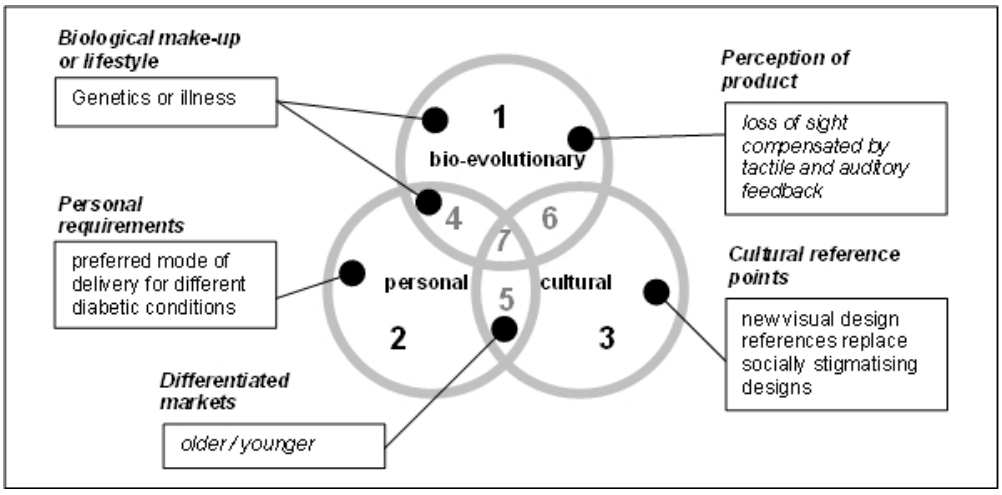

Figure 5. Aesthetic issues for medical products – insulin delivery devices

4.4 Medical products – the insulin delivery device

Figure 5 illustrates both how the framework can be used to analyse a situation where an improved design is required, and also to evaluate a product with improved aesthetic acceptability and effectiveness. Diabetes is a condition on the increase, due in part to rises in obesity rates. Until fairly recently insulin delivery devices were unpleasant both to look at and to use. They had the appearance of an older generation of clinical/medical products and could also be associated with forms of drug misuse (socio-culturally stigmatising – space 3). Functionally, they also had the potential to deliver the wrong dosage of insulin because these early devices made no concession to other conditions particularly associated with diabetes (bio-evolutionary causes – space 1) and the specific needs of different individuals, be they older or younger (personal requirements – space 2). Using the framework, one can analyse the innovation and improved aesthetic acceptability of one of a new generation of delivery devices - e.g. the NovoPen™ by Novo Nordisk. As diminution or loss of sight can occur with diabetes, the NovoPen™ compensates for the bio-evolutionary condition by incorporating not only tactile and colour codes, but also through auditory feedback in the form of discreet but positive clicks assisting the correct levels of dosage for the individual (acceptability at a personal level – space 2). The product itself is more visually analogous to a technical pen than a

medical device (socio-cultural acceptability - space 3) [Macdonald, 2002]. There are various models for differentiated markets, e.g. those marketed towards children and which employ visual references by way of the colours and patterns of artefacts with which children surround themselves (this works on both personal and socio-cultural levels – spaces 2 and 3). This family of innovative products has not only successfully synthesised functional, ergonomic and aesthetic requirements, but when evaluated against the framework appears to meet the three different levels of aesthetics acceptability.

5. Conclusion

This relatively straightforward three level framework for the analysis and discussion of aesthetic acceptability issues appears to accommodate a broad range of different aesthetic issues and concerns within Inclusive Design. It will help researchers, designers, technologists and engineers working in this field to separate out and clarify issues, and to identify other issues that may typically be overlooked. It can be used as an analytical tool, or to identify gaps in the specification of new products or systems, to stimulate discussion through e.g. brainstorming events, and to provide a framework for other design tools and methods, such as user research methods, focus boards, scenarios and storyboards.

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