Draft notes for paper presented at Design and Consumption: ideas at the interface, a workshop held at Durham University, UK, 12th–13th January 2005.

Jack Ingram

Concepts and design practice, words and objects

The most obvious difference between science studies and design is that one activity is an academic study trading in concepts expressed in words, whilst the other works in a commercial world, trading in concepts expressed in images that define the formal qualities of artefacts. Moreover, design knowledge is largely tacit: industrial design is largely a collection of craft skills relying on know-how rather than explicit, formal methodological rules.

In looking for points of commonality, I am including examples from areas of design and design-related theory that are sometimes rather distant from the conventional centre of industrial design. There is a wide gulf between design theory and design practice: if we are to look for links between concepts from sociology and concepts from design, it is useful to remember that design has not yet attained an equivalent academic maturity.

Latour's reference to human and non-human actors, and hybrids of the two, has some resonance with aspects of design.

For example, the work of Singleton, Easterby and Whitfield in the 1960s and 1970s, in the Department of Applied Psychology at Aston University, attempted to bring together concepts from areas of engineering and psychology to inform the design of what became known as 'man-machine systems'. A high point was the conference 'The human operator in complex systems' in 1965 – the context was 'industrial' (including military and space exploration), rather than domestic, as was the more traditional ergonomics. Indeed, man–machine systems concepts can be seen as a direct expansion of the one man and his machine unit of most ergonomics, to meet the needs of the rapidly developing technologies that created complex control rooms for hazardous enterprises in a pre-computer age (nuclear power, automated manufacturing, the cold war, the space race).

Singleton's small volume "Man-Machine Systems" not only supports the notion of human and non-human actors working together towards a common purpose, but also introduces a formal process for sharing out the tasks between the two teams ('allocation of functions'). He quotes the attempt of Paul M Fitts to compare the competences of each ('Fitts list'), and recognises the need for selection and training of humans to achieve the required skill levels, in parallel to the development of hardware. Man-machine systems design generates routinised practices - we should perhaps note here that whilst the 'stuff' and 'competence' of working practices are there is no reference to what Shove and Pantzar call 'image' in his model.

One of the standard measures of system effectiveness in ergonomics is error rate: stratagems to minimise human error are at the heart of interface design – the design of all features (but principally controls and displays) through which machine and user interact. The principles of arranging elements of the interface to ensure an efficient, error-free sequence of operation are well established. One

example of this formal **scripting** (again from the workplace) is the nuclear hand monitor (reported in 1965) – a device for checking that workers in nuclear plants have washed their hands properly at the end of a shift. In this case, the designers attempted to anticipate all modes of incorrect operation: the considered use of audible displays (alarms) meant that peer pressure (from queuing colleagues) gave extra encouragement to be sure to be given the all-clear on a first visit to the monitor.

The concept of **affordance** was brought to the world of design by Donald Norman in "The psychology of everyday things" (1989) – he used Gibson's term in a particular way that has led to some confusion. He has since said "The concept has caught on, but not always with true understanding. Part of the blame lies with me: I should have used the term "perceived affordance," for in design, we care much more about what the user perceives than what is actually true. What the designer cares about is whether the user perceives that some action is possible (or in the case of perceived non-affordances, not possible). In product design, where one deals with real, physical objects, there can be both real and perceived affordances, and the two need not be the same"

Whilst the word is a comparative newcomer to design theory (and most unlikely to be used by practitioners), conscious design decisions that ensure the user perceives how things might best be used have been well documented. Henry Dreyfuss USA worked as both an industrial designer and ergonomist, and his telephones for Bell Telephone Laboratories, first launched in 1937 and refined over the next twenty years, became the archetype for a handset that contained both microphone and earpiece. The 'semantics' of the handset gave clear messages about its intended use – 'product semantics' as a concept being published much later (Susann Vihma, Semantic Visions in Design; symposium on design research and semiotics, Helsinki: UIAH 1990). In design practice, perceived affordances are made evident through consideration of product semantics in the scripting of product use: scripting to avoid user error is equally about making evident product non-affordances.

The introduction of the term 'product semantics' helped to articulate another set of design concerns that had long been present – aspects of products that generate emotional responses in users. In 1999, the Design and Emotion Society was formed, "to raise issues and facilitate dialogue among practitioners, researchers, and industry, in order to integrate salient themes of emotional experience into the design profession"

At its last conference, in 2004, it had a track for papers on anthropomorphism, a theme addressed as by Latour i his "missing masses" paper. Anthropomorphism and zoomorphism in the form of visual hints has also been used as a design device in a wide variety of products, and some academic research is starting to emerge.

There are several strands of research (and practice) at present that might be brought together as 'design axiology' – values with which products are imbued (either by designers or consumers), including aesthetic, technical, hedonic or any other forms of value. ('Product hedonics' has been suggested as an alternative to 'design and emotion'). Adding value to products is at the heart of industrial design practice, and the articulation of the concept has been useful in encouraging manufacturers to use design. For example, the Centre for High Added-Value Products at UCE, was set up in 2002 to stimulate manufacturing in the West Midlands of the UK.

It is not surprising that design can provide examples of the embodiment of

sociological concepts: it has always appropriated language and concepts when it has felt the need to articulate its methods and purposes. In the last forty years, starting with the Design Methods Movement in the UK, the need to articulate design theory within academic institutions has grown. In those early days, academic respectability was sought by claiming to be scientific – leading to a dominance in the development of design theory by those areas of design, such as engineering and architecture, that could be seen to 'hard'. Design theorists eagerly pounced on Popper's publication of 'Conjectures and Refutations' as justification for the way in which designers work, and appropriated the central theme in the development of models of design process.

In conclusion, although Latour's description of artefacts as "the hidden and despised social masses" comes as something of a shock to those of us who have them at the centre of our attention, his human/non-human concepts seem quite reasonable to the world of design: they are not necessarily stated in ways that make them consciously applicable in design practice, but designers are used to accommodating terminology from other disciplines, preferring to embody the concept in an artefact rather than worry too much about vocabulary.