FROM IMAGE TO OBJECT:

Old Signs, New Meanings

J. Malins, J. Ross, B. Burman, C. Gray

Abstract: The use of IT has become an essential tool for the post-modern designer. Examples of images recycled, re-used and recombined to give new meaning are now common place within contemporary culture (Coyne, 1995**)**. The practice-based research described in this paper problematises the use of codes and conventions used in the production and reproduction of images that are then combined, translated and replicated as 3-D objects via CAD/CAM systems. The theoretical basis for this work is explored in relation to the theories of Baudrillard, Deleuze and Guattari.

To explore the issues discussed in this paper two design projects are used as examples. The first describes the processes involved in making a prototype table and the second focuses on the development of a design for a ceramic object. The processes described use a variety of 3-D modelling packages. The possibilities and limitations of the technologies used are critically reviewed. The paper concludes by suggesting some possible developments for the generation of new object design using new technologies.

Key words*: CAD/CAM, Design, Ceramics, Rapid Prototyping, Furniture, Practice-based Research*

Introduction

The use of multiple sources of imagery or multimedia is a well established part of the design process. As Burt (1998) puts it:

"Electronic Multimedia has a quality that enables both the conceptual and the representational. It may be equated with the working sketch as well as the final work. Used in a sketch-like manner for development, sequencing, and animation of images, new sets of relationships emerge - a different awareness, and a reorientation of practice and experience. Time-based elements, video, for example, and still images, can be mixed with text, with unpredictable effects. Multiple options may emerge, broadening the scope of both perception and output."

Visual information can be acquired by digitising drawings or photographs, frame-grabbing from video sources, or created using a drawing package on a computer. Once digitally captured the imagery can be manipulated, combined or transformed in numerous ways. This process does not limit the designer to the boundaries of two dimensional image-making. Virtual objects can be created from the imagery and viewed as visualisations of potential 3-D objects. The 3-D visualisation can then be converted into data, which can be used to generate a programme to control a CAM (computer aided manufacture) system, such as a CNC (computer numerically controlled) milling machine.

The cost of CAD/CAM technology is falling rapidly and the number of alternative systems is increasing at a similar rate. The combination of falling prices and more accessible technologies is beginning to have an increasing impact on design practice. This paper examines the use of CAD/CAM by designers and explores some of the issues, which arise as a result of using the technology, for example for collaborative research. This issue has become increasingly important as the complexity of the technology usually requires a multidisciplinary approach, and raises questions about postmodern practices.

Culture and Context

Postmodern discourse examines the significance and value of both images and objects by suggesting that our understanding and appreciation of them is not based on aesthetics but on our individual experiences of contemporary culture. Culture is mediated through language and as language signifies different things to different people we therefore have the ability to change and alter our cultural constructs. For the object maker, this liberation from fixed meaning and predetermined roles, such as sculptor, product designer, furniture designer and graphic designer, has, in some instances, led to a dissolution of culturally constructed professional boundaries, in favour of transdisciplinary modes of working which acknowledge others' expertise in the pursuit of creative thinking and the design of culturally significant objects. The boundaryless context within which this process takes place generates modes of practice that communicate or build upon multiple discourses. Interactivity within a boundaryless context, discussion and action with disciplines and communities other than one's own, inevitably leads to new ways of looking, new approaches to problems and new solutions.

An example of how the object maker operates within this boundaryless context is reflected in the writings of Deleuze and Guattari. They advocate a new way of organising knowledge that bypasses traditional hierarchical systems of vertical and linear thought in favour of horizontal and non-linear thought. Together, they have developed the analogy of the rhizome system in contrast to the analogy of the tree, where branches stem from a central trunk and where, in the words of Gare (1994): *"…all the truths are derived from a single principle."* Whereas, the rhizome analogy refers to the root system of bulbs and tubers - a creeping stem that grows horizontally under the surface, in which any point can be connected to any other point. With horizontal thought there are no preconceived barriers or boundaries, and so, thought can permeate across all areas and disciplines.

Baudrillard's particular interest in the connection between code and reproduction provides a theoretical framework for the examples described in this paper. He argues that in the twentieth century it is not the production but the reproduction that is original. This shift from production to reproduction has occurred because codes (of which DNA, digital and binary are examples) now have the ability to replicate and produce an original. Lechte (1994) explains this as follows:

"The code entails that the object produced - tissue in biology for example - is not a copy in the accepted sense of the term, where the copy is the copy of an original, natural object. Rather, the difference between copy and original is now redundant."

Two recent examples of collaborative object making, utilising CAD/CAM systems and demonstrating postmodern attitudes to the significance of the object and non-linear approaches to practice-based research, are presented in this paper. The two examples highlight some of the issues that arise as a consequence of using CAD/CAM.

Example 1: *Shaken Not Stirred*: Cocktail Table by Carole Gray

Carole Gray's work is characterised by the use of contemporary materials and technologies, and an enduring fascination with geometry, space and light. Originally educated as a fine art object maker, she believes that work must be responsive to particular contexts, and has made both small scale three dimensional pieces for interiors, as well as larger scale exterior site-specific sculpture. Working with the research group Artesign (http://www.rgu.ac.uk/artesign/) has enabled her to explore, through creative collaborations, issues of function, technology and context on the interface between fine art and design.

The table *Shaken Not Stirred* was designed specifically for the Artesign exhibition *Room With A View: Milan* at the Milan Furniture Fair, April 1999. In response to this particular context, Gray wanted to explore the issues of furniture production for an international design market. The title of the piece obviously refers to James Bond's preference for his dry Martini, and the whole idea of cocktail time as a civilised and sophisticated social event, such a characteristic feature of the fringe Fair. As sponsors of the exhibition the Martini Group are also referenced by the title.

The form of the table is based on a cocktail glass and its associated geometry: circle, cone, equilateral triangle. The materials used reflect the nature of cocktail making: glass, perspex, stainless steel, aluminium, bar lights. Some of the features of the table - the spiral image and the fibre optic lighting in the table top – refer to 'stirring', 'shaking', and bubble-making! Although the table could be considered 'serious' and the geometry and materials clinical and technical, the tongue in cheek references to 50's and 60's kitsch culture prevent the piece from taking itself too seriously. Cheers!

Gray explored initial ideas through a series of hand drawn sketches on paper, and several 3D ‘sketches’ using different materials. Once a design had been decided upon drawings were made on the Mac using Aldus FreeHand (vector-based drawing package). The use of the computer enabled many changes to the basic idea to be explored (scale, proportion, colour, etc) without jeopardising the original version. This process naturally led to adopting some changes and towards refining the idea. Throughout this process Gray had been thinking about how to make the table – materials and making techniques – and decided that, in order to try and address the issues of potential reproduction of the table, the use of computer-aided design and manufacture should be explored. At this stage advice from two designers (Malins and Burman) familiar with CAD/CAM methods was sought.

The decision to collaborate immediately provoked questions about authorship and ownership and the strength of working relationships. The responsibility for individual production by one fine artist shifted to collaborative reproduction by an interdisciplinary design team, where absolute trust between participants became essential. This shift also prompted questions about roles – originator, facilitator, developer, technician, manufacturer, and the way that these changed and combined - at different times in the process. For example, the design of the fittings between the legs and the table top were originated by Malins and Burman, and manufactured by a precision engineering company. Gray sometimes took on the role of technician, clearing swarf and lubricating the cutter as a lengthy CAM operation proceeded. Other artists and designers were consulted in the quest for aesthetic and technical resolution. This collaborative process inevitably and quite rightly must acknowledge the involvement and contribution of others. The finished table is shown as figure 1.

Figure 1: Shaken Not Stirred: cocktail table by Carole Gray

The relationship between the individuals involved, materials used, and process are adopted have been summarised as a mind map, figure 2

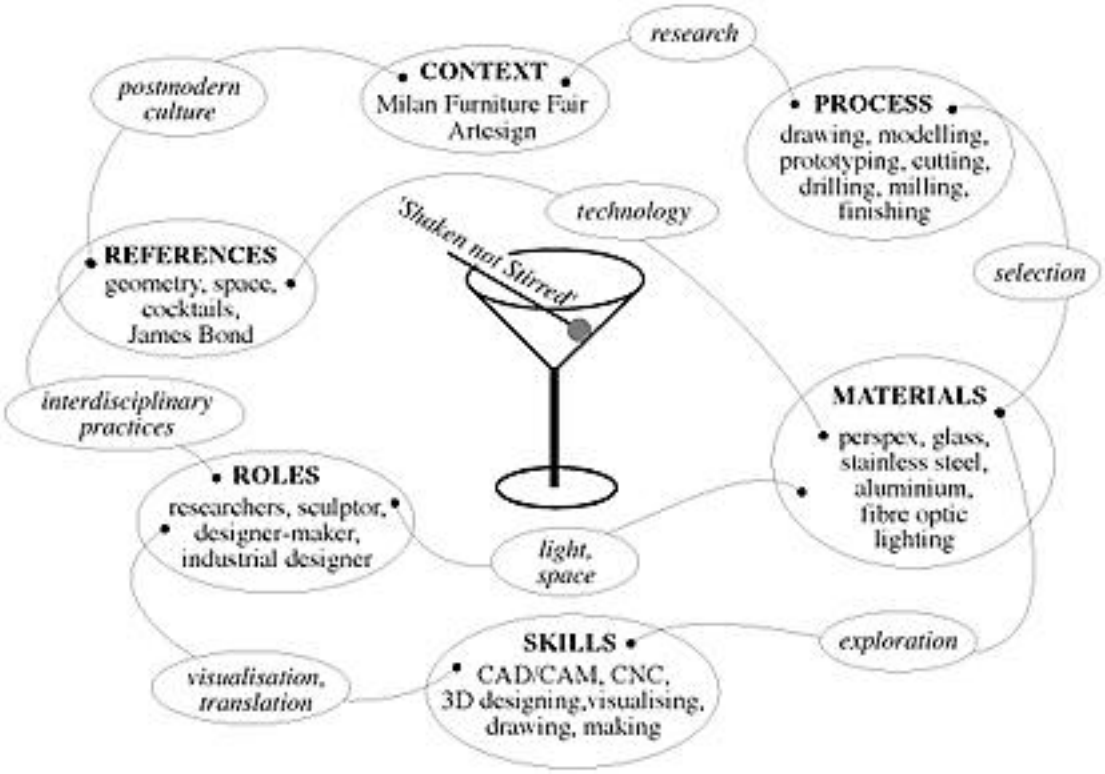

Figure 2: Mind map of the prototype table project

Example 2: *Reclining Heart*: Ceramic Object by Julian Malins

Julian Malins is a ceramicist with a particular interest in the use of CAD/CAM as a designing and making tool. His recent work focuses on significance of the ceramic object and with reference to Baudrillard's four logics in relation to the object (use, exchange, symbolic and sign value) he plays with the relationship between the user, the design object and context. The *Reclining Heart* is one of a series of ceramic pieces made of moulded components. The initial idea came from a series of drawings of symbols depicted using outlines. The reclining heart was based on the Cupid symbol of the arrow fired through the heart. This was developed into three dimensions by exploring the idea of the outline as a container or vessel first on paper

and then on the computer utilising the software applications Illustrator and Amapi. In the design and manufacture of this piece CAD/CAM was used both to manipulate forms and to manufacture the moulds from which the components of the piece were made.

Malins had autonomy, control and authorship of the design of each component and a vision of possible final combinations but ultimately leaves the final decision to the end user. In the same way that the game of ‘Consequences’ plays with different heads, bodies and feet to create different characters, the components that comprise the piece can be played with to create different visual and functional attributes. The components may be arranged in a variety of combinations to make either a dish, vase or decorative object. This means that not only can the user play with the visual appearance of the object but that they can also control the function. This gives control over what Baudrillard refers to as the use value and utilitarian role of the object. Malins’ decision to decorate the object with lustre glaze adds another dimension to the work. The status value of the object as sign is dependent on the various users’ different interpretations of the use of metallic lustre effects. For example, these effects may be seen as glitzy, theatrical and superficial or gold, gleaming and precious. This also means that the symbolic exchange value is not a fixed or static concept but is left entirely open to a multitude of perspectives and interpretations. The object may appear kitsch or alternatively may be regarded as a designer product.

Baudrillard's symbolic exchange value relates to the logic of ambivalence and the value of the object as a gift. The idea of the end user deciding its final function puts the configuration and interpretation entirely at the user’s disposal. It may, for example, be constructed as a dish and given and received as a precious object of love, overflowing with melt-in-the-mouth chocolate goodies and the next day returned to the sender rebuilt and reformed as a kitsch vase. The object as sign, and its status value are open to interpretation. The exchange value and its value as a commodity is equally bound up in the freedom of multiple perspectives or viewpoints. Baudrillard ‘s exchange value of the object relates to the logic of equivalence and the market value of the object as a commodity. Originally produced as a ‘one off’ to display in a designer maker gallery the use of CAD/CAM allows for batch production at any point in time instantly challenging the concept of the role of the designer maker. Equally the ability of the user to alter the function and meaning by recomposing the elements defies description and categorisation of the designer as a maker of decorative, functional or aesthetically acceptable objects. The Amapi visualisation of the piece shown as figure 3.

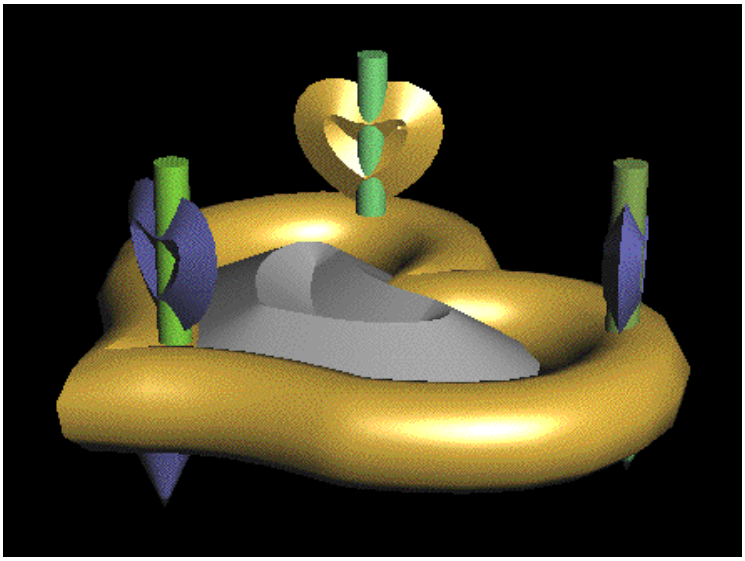

Figure 3: Visualisation of the components of Reclining Heart.

Evaluation of CAD/CAM systems used: limitations and benefits

So far this paper has emphasised the possibilities that CAD/CAM can offer to the designer as a means of translating an idea from drawing to visualisation to model or finished object. At the same time the trend towards more user friendly interfaces and more accessible desk-top CNC machines provides the means by which the designer-maker can gain more autonomous control of the final product**.** The fact that the data required to develop and produce the work is in a CAD environment provides many more opportunities for a collaborative approach to the design process through the sharing of information. The table project described earlier relied on collaborative working in which knowledge was pooled. The technology facilitates this, although an essential ingredient was also required for a successful outcome, namely, mutual trust and respect for one another's expertise.

The ability to make a virtual model of an object before it is made, combined with the ability of the software to generate complex shapes is presenting the designer with a new range of possibilities. Forms can be generated using a Boolean operation in which two or more shapes are either combined or extracted from each other. The resulting forms could have been developed without the use of CAD/CAM but probably not

at a realistic cost or time scale. Organic shapes or designs based on borrowed or combined imagery can be generated rapidly within the digital environment. As the software improves and designers become more familiar with its possibilities there will be an increasing impact on the types of new products developed, and perhaps the development of a new kind of aesthetic.

Conclusion

The two examples described in this paper suggests many postmodern characteristics (Hassan, 1987):

- the use of codes – social, cultural, aesthetic and technological (digital)
- the eclectic use of ironic references
- democratic multi-authorship and ownership
- collaborative (horizontal) networking practices
- fluidity of working roles and interdisciplinarity
- the capacity for 'original' reproduction through the use of contemporary technologies
- indeterminacy – sculpture or furniture? vase or sculpture?
- participation – the user designates function
- parody, pastiche, pleasure!

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