Crafts Praxis for Critical Wearables Design

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Abstract
This paper treats the contemporary craft market as an under-researched resource for wearable computing, and investigates the alternative values and experiences that contemporary craft may be able to contribute to the design of personal technological products. It offers an analysis of contemporary craft for its potential as a critical design resource with especial relevance to Wearable Computing and its broad development into the everyday. 'Critical design' is given a working definition for the purposes of the argument, and current practice in the contemporary craft genre of jewellery is analysed for its potential as a resource for a critical approach to Wearable Computing. Based on a set of semi-structured interviews with contemporary jewellery practitioners, the paper presents a set of propositions for a craft approach to wearables design, and these are illustrated through the Speckled Jewellery being made as part of the author's doctoral research.

Critical design
Critical design is an approach that recognises the cultural roles of artefacts beyond their technological function, and in the case of novel computational technologies, there is a need to examine and critique the trend for innovation as an end in itself. By reifying critiques in alternative artefacts, this approach can become a powerful agent for change, offering empowerment to those who would normally be profiled as static 'end users', in the manner of action research (Barab et al., 2004; Boehner et al., 2005; Dunne, 1999). Critical practice is necessarily tightly contextually bound in community and human meaning making: it addresses timely issues in the localities in which they arise. In the case of wearable computing, one of these issues can be seen to be a lack of intimacy between artefact and wearer. Jewellery based designs have been criticised for being nothing more than 'opportunistic' in their appropriation of the jewellery form, and there is a need for aesthetic sensibilities in dealing with social constructions of meaning through action (Wallace & Press, 2004; and see for example, Critical Computing, 2005).

Unpacking craft
Craft as practiced currently in the West often bears little relation to how the term is interpreted by those outside the domain. No longer an unconscious activity borne of necessity, craft is instead a "form of practice" uniquely "situated between art and life" (Mazanti, 2003; Mazanti, 2004). The UK market for craft products is growing, with the turnover in England and Wales for 2003 was estimated at £826 million, double that reported by surveys in 1994 (Arts Council England, 2003). McAulay & Fillis (2002) estimated the Scottish sector to be worth between £95 and £151 million, and the attitudes found in the case studies showed that craft was understood to be a lifestyle, rather than merely a job (Arts Council England, 2003). Textiles and jewellery constitute two of the largest genres alongside ceramics, and while some notable aesthetically led Wearable Computing has been developed using 'smart' textiles,

there has been very little in the way of jewellery that is not merely 'opportunistic' (Wallace & Press, 2004). What might it mean, then, to develop crafted computational jewellery? Can wearable computational artefacts be made in such a way that they succeed as contemporary craft objects? This paper presents the artist's side of the experience, and attempts to define the nature of the contemporary craft process. A companion piece of research into the nature of crafts consumption, and the potentially exciting holistic design model linking the two via the object, is still needed.

In the interests of a local detailed description of contemporary craft practice, this paper now presents a set of semi-structures interviews, conducted with five jewellery practitioners around the following core questions:

- Please describe your working process?
- What kind of values do you feel is embodied in these processes?
- How do the objects produced convey these values?
- Is what you do craft?

These participants have all graduated within the last three years, and are currently involved in post-graduate diplomas, masters or artist's residencies. Four are graduates of Edinburgh College of Art, and the other is from Birmingham. The resulting verbal protocols were then combined with transcripts and papers from presentations made by more established makers (Cousens, 2004; Cunningham, 2005; Peters, 2005). Craft design is often presented simplistically as consisting of three discrete steps: a period of visual research, the development of that material into a final design, and the realization of that design. Successful contemporary craft achieves something more than this though, and it is this element that distinguishes it from even the best product design (including 'emotional design'). In order to allow for an illustration of the crafts approach advocated to the design of a set of networked Wearable devices, the main outcomes of the survey are only summarized here. The interested reader is directed to Kettley (2005a) for a more detailed analysis.

The following main strands emerged in analysis of the interviews:

- the role of visual research – in contrast to the discrete steps model of design, the respondents all found value in a continuous immersion in both source material, and the material being manipulated to create the final product. This can be described as a process of internalisation in contrast to a "copying of surface strategies", in which the drawing as an object is not the important outcome. Instead, drawing is a technique for entering into a particular ontological relationship, or synthesis, with the world (Wilson, 2004; Oxlade, 2001; O'Toole, 1994). Source material was understood to permeate their thinking, emerging later "through their hands".

- the integral nature of material – in addition to the above, material was also identified as a source of what has been described as the metaphor and myth of transformation (Kälviäinen, 2000), where the agentive power felt by the maker is mirrored in the experience of the owner through the knowledge of the transformation of "a useless lump of metal, or a piece of plastic" into "something beautiful, wearable, useful…". Further, the potential for change is generalisable by the owner to other areas of life, and thus choosing to buy craft objects may not only be perceived as political, but also as personally empowering.

- an inherent value in the embodied nature of the process - the challenge and exploration embodied by the craftsperson engaged in making a new work was

seen by all respondents as the “strongest point of craft’, its “greatest benefit”. The ability to challenge thinking, and to take risks, was felt to be extremely important, a responsibility almost of the craftsperson; this is again a metaphorical element from which the cultural construction of craft as essentially economically marginal, and thus political in nature, has emerged. The central importance of this risky, non-predetermined nature of agentive exploration was also the consensus of the recent Challenging Craft conference (Challenging Craft, 2004). In the literature, the domestic nature of craft is also raised, as an historical factor which allows critical work to take part in ‘real life’, and so to be a kind of ‘intervention’, in the fine art meaning of the word, closing that gap between how a thing is first seen, and how it is imagined in use (Mazanti, 2003; Mazanti, 2004; Dunne, 1999).

A mention here on technology is also needed. It was notable in the interviews that the respondents felt ambivalent about technology, possibly as a result of their age and lack of exposure to new technologies both as design tools and around which design is creating new products. In contrast, presentations at recent conferences have highlighted an exciting and mature approach to technologies by craft researchers. The makers interviewed were concerned about a loss of original expression, and a loss of the metaphorically valuable explorative element in mass production processes, while more experienced makers were able to demonstrate technology’s affordance of new ranges of expression. With this knowledge, the “something in the putting the hammer to the metal” may be equally present in the control of the centrifugal casting process, in the rapid prototyping of a complex form, and so on, in an appropriation of the novel process towards the artists’ own ends. While Helen Rees wrote in 1997 that “even the most ardent champions of craft would agree that manufacturing is not necessarily a dehumanising process” (Dormer, 1997), what the jewellers’ concerns did find resonance with was Pye’s analysis of ‘diversity’, that is, the levels of effective range of the formal elements within a design: “every little incident of form and surface and every departure from regularity however minute will begin to tell as a formal element at some particular range” (Pye, 1968; also O’Toole, 1994).

Design principles

Craft has been described as being “without design” (Wilson, 2004), and this research demonstrates that this is because contemporary practice is, to borrow from the consciousness literature, ‘smeared’ across the embodied mind (Dennett, 1997). It is continuous, rather than discreet in nature, and it is suggested that this is the root of the ‘holistic’ perception of craft. The set of principles here lays out the key features that emerged from this work in the hope that some may be usefully transferable to other design domains, and in particular, to Wearable Computing.

- the risky non-predetermined process embodies its own political and metaphorical values, and results in original visual language
- internalisation of material – both source material and the material being worked – is essential for the development of original visual language
- this internalisation is achieved through action – techniques include drawing, direct manipulation of material, and repeated exposure to the material
- ‘material’ may include traditional materials, technologies, processes and methods, each having their own affordances and constraints

- signifiers of craft are not to be confused with the original visual language which emerges only from the internalisation of material

- control over formal expressive elements at diverse effective ranges is dependant on an embodied understanding of the process of production

Speckled Jewellery

Speckled Jewellery - Since April 2004, the author has been engaged in the collaborative development of a suite of networked jewellery using prototype Speckled Computers (specknet.org). At the time of writing, June 2005, a second design iteration is underway, addressing issues of wearability, user control, power supply and readability of output, as well as the more nebulous aesthetic aspects of the pieces. The first set of three pieces is shown in figure 1, and a series of stills from a video showing the light output in interaction in figure 2. The interaction has been designed to map the social activity of greeting, and the three distances at which members of a friendship group greet each other are reflected in the LED display on the two brooches and one pendant.

figure 1
first set of networked Speckled Jewellery
from left to right, brooch, pendant and brooch

figure 2
stills from demonstration of Speckled Jewellery interaction
October 2004

Process – From October 2003 to April 2004, the author based her investigations of tangible materials (enamels and precious metals, figure 3), on the vision of the Speckled Computing Consortium (specknet.org), of the 1mm cubed autonomous speck, combining the notion of this spray-able, scatter-able sensing dust, with the vision for a malleable computational material of Maggie Orth (2001). These materials were exchanged for plastics, and the forms became enlarged as a result of new technological knowledge (i.e. the metals interfered with the radio signals, especially

at crucial short distances, and the ProSpeckz were to be joined by PCB boards and batteries).

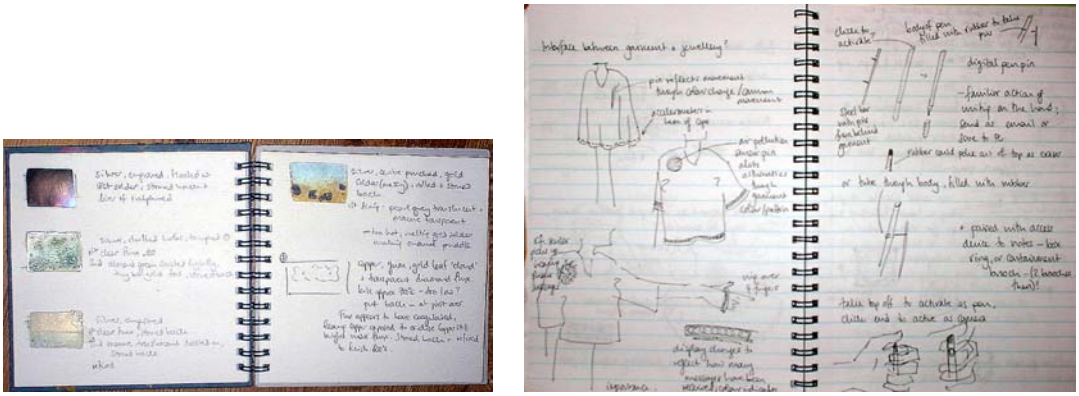

figure 3
enamel test pieces and designs for
conceptual social interaction

Simultaneously, the intangible material of social interaction was researched (figure 3), and the modes and materiality of input and output became increasingly important as expressive materials in their own right, leading to a design philosophy based on ambiguity (Kettley, 2005b). The first three working pieces were ready for demonstration in September 2004, but were not robust enough to allow any user evaluations, or the necessary engagement of the designer with the interactivity of the network for any expressive refinement. Resource constraints then meant that a second iteration was delayed until the following January. Continuing to make using the unfamiliar tangible materials (Perspex, Formica, modelling clays, resin, and precious metal clay) was essential for the internalisation and emergence of a personal visual language, as outlined above, but was also extremely time consuming, and in many respects, untenable in terms of such a time-constrained project. However, the delayed arrival of essential components had a positive result in that the time became available for this visual development. At this stage, the goals of the artist have been partially transferred to the electronics specialist, who now selects and designs hardware according to aesthetic rather than functional criteria alone (figure 4).

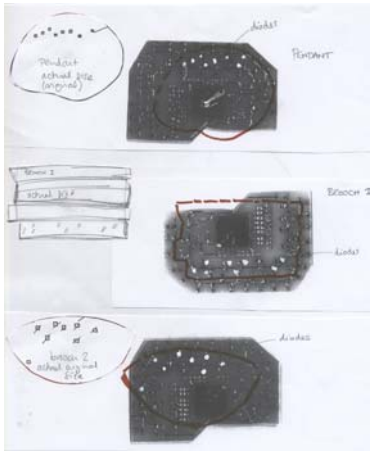

figure 4
non-orthogonal PCB boards
led by aesthetic requirements

To date, the authors' need for a deeper understanding of the technologies in hand has not been fully addressed. However, the development of a shared language for collaborative work cannot be underestimated, and this must be seen as a long-term goal. The collaborative nature of this kind of work was not touched upon in the analysis of craft process, above, but can have a major impact on how work progresses, and in particular, on the experience and expressive control of the artist. Timescales are typically longer, and there may be political aspects to the project (see for example Dorsey & Siewiorek, 2003; and Kling & Scacchi, 1982). Best practice may allow true trans-disciplinary work, in which all members of the project learn from each other's disciplines, both in terms of methods and end goals, although this seems to be an emerging understanding of collaboration (National Academy Press). In the author's experience, these design principles have been an outcome of the work and have not therefore been available to the team from the start. Neither was the availability of the team a given for this work, but was rather assembled on an opportunistic basis, with a growing sense of purpose (due in part to the lack of a wearables lab at the author's host institution, and the emergent nature of the research aims themselves). However, the Speckled Computing Consortium is now pushing for dedicated resources to support art as an application area in its own right, and Napier University is now able to support cross-school doctoral research in design and computing, with funding for an embedded systems and wireless lab recently being made available.

Conclusion

Contemporary craft practice was found to be embodied, or 'smeared', in a continuous and apparently inefficient way across the previously discrete design process. However, there is a perceived metaphorical value in this manner of working, both to the consumer and the maker, and there appears to be no real substitute for this process. Is it viable then to create Wearable Computing artefacts in this way? Projects as complex as wearables, which tightly bind the technological with the social and cultural, are necessarily multi-disciplinary, and at their best, trans-disciplinary in nature. It is suggested here, then, that crafts practitioners seek to position themselves, as designers and artists are doing, as informed and available to such teams, and that wearables developers actively consider Contemporary Craft as a resource in approaching complexity in design, and as a means to an alternative, culturally constructed, market.

References

Arts Council England (2003). Making it in the 21st Century – A Socio-economic Survey of Crafts Activity in England & Wales 2002-2003. Accessed 24/05/05. http://www.craftscouncil.org.uk/about/Socio_Econ_Survey.pdf

Barab, S, A, Thomas, M, K, Dodge, T, Squire, K, and Newell, M (2004). Critical Design Ethnography; Designing for Change. Anthropology and Education Quarterly. Berkeley, CA: University of California Press. Vol. 35, Issue 2, pp254-268

Boehner, K, David, S, Kaye, J and Sengers, P (2005). Critical Technical Practices as a Methodology for Values in Design. CHI 2005 Workshop on Quality, Values, and Choices. April 2005

Challenging Craft. (2004). Conference held at Gray's School of Art, Aberdeen, 8-10 September 2004. Accessed 20/05/05. http://www.challengingcraft.org

Cousens, C (2004). A Sense of Place. Lecture given at Craft in Dialogue, IASPIS, September 4th 2004, Konstepidemin, Goteborg, Sweden.

Critical Computing 2005. (2005). Conference at Aarhus, Denmark, 20-24 August 2005. Accessed 20/05/05. http://www.aarhus2005.org

Cunningham, J (2005). Maker, Wearer, Viewer. Talk given at Association of Contemporary Jewellery event, Glasgow School of Art, 12th April 2005.

Dennett, D, C (2004). Consciousness Explained. London: Penguin Books Ltd.

Dormer, P (Ed). (1997). The Culture of Craft: Status and Future. Manchester: Manchester University Press

Dorsey, J, G, and Siewiorek, D (2003). The Design of Wearable Systems: A Shift in Development Effort. 2003 International Conference on Dependable Systems and Networks (DSN'03), p. 273

Dunne, A (1999). Hertzian Tales. London: RCA CRD Publications

Kälviäinen, M (2000). The Significance of 'Craft' Qualities in Creating Experiential Design Products. In The Design Journal, Vol. 3, Issue 3: 4-15

Kettley, S (2005a). Crafts Praxis as Design Resource. (forthcoming) In the Proceedings of the Fifth Engineering and Product Design in Education conference, Napier University, September 2005

Kettley, S (2005b). Framing the Ambiguous Wearable. In the Convivio Online Journal. Accessed 25/05/05. http://webzine.convivionet.net/index.php?option=com_content&task=view&id=23&Itemid=71

Kling, R, and Scacchi, W (1982). The Web of Computing – Computer Technology and Social Organisation. In M. C. Yovits (ed.) Advances in Computers. New York, NY, Academic Press. 21: 3-90

Kytttanen, J (2005). Presentation given at Interrogating Fashion workshop, London College of Fashion, 24th February 2005

McAuley, A, and Fillis, I (2002). Crafts Businesses in Scotland – A Study. Accessed 25/05/05. http://www.scottisharts.org.uk/1/information/publications/1000910.aspx

Mazanti, L (2003). Craft as Avant-Garde. Lecture delivered at Craft in Dialogue, Stockholm, September 1, 2003

Mazanti, L (2004). Re-reading the Functional. In Proceedings of Challenging Craft conference, 8-10 September 2004, Gray's School of Art, Aberdeen

National Academy Press (2004). Beyond Productivity. Washington D.C.: National Academies Press

O'Toole, M (1994). The Language of Displayed Art. London: Continuum International Publishing

Orth, M (2001). Sculpted Computational Objects with Smart and Active Computing Materials. PhD Thesis, Massachusetts Institute of Technology, Cambridge MA.

Oxlade, R (2001). "Good" Draughtsmanship or Real Drawing. In Blunt Edge, No. 1, Ap.2001

Peters, R (2005). Fool's Gold. Talk given in association with the Embassy Gallery and the Association of Contemporary Jewellery, Edinburgh College of Art, 23rd March 2005

Pye, D (1968). The Nature and Art of Workmanship. Cambridge: Cambridge University Press

Speckled Computing Consortium Scotland. Accessed 20/05/05. http://www.specknet.org

Wallace, J, and Press, M (2004). All This Useless Beauty. In Proceedings of Pixelraiders2, Sheffield Hallam University, April 8-10, 2004

Wilson, S (2004). Craft Not Design! In Proceedings of Challenging Craft conference, 8-10 September 2004, Gray's School of Art, Aberdeen

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