Making it in Stainless

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Keynote Paper : Removing Barriers to Good Design

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This presentation will deal with identifying a number of barriers which exist in many manufacturing and service industries within the process of designing and developing new products and services. It will also speculate on strategies for the removal of these barriers.

The background to this presentation is our "new economy" which is characterised by:-

- Globalisation of markets and manufacture
- New communication technologies
- Increasing emphasis on intangibles

These barriers or conditions are I believe endemic and structural in many industries and although not absolute to the quest for good competitive design solutions at present they may become so in the near future. Without reform of the way in which products and services come about companies may become less able to make the best use of the very talented designers, architects, engineers, etc. that the UK and EU are so good at training and consequently be less able to continue to add value to materials and maintain global competitiveness.

Michael Rodker director of Jones Garrard recently declared “the winners” in business “will be those that own the “genius”. “That genius” he described “can either be an innovative technology, a drop dead gorgeous brand or just some very clever logistics”, "the reality is that the product reflects this genius!!" (Design Week, 13 October 2000).

Barriers exist at three levels in the traditional new product development model, these are in the: -

- supply chain
- design and development process
- and dealing with intangibles

The first is to do with the relationships and structure of the supply chain the second to do with the way in which designers acquire knowledge of users and the third is concerned with the way that we come to terms with the shift from tangible commodities to dealing with intangible values (see figure 1.).

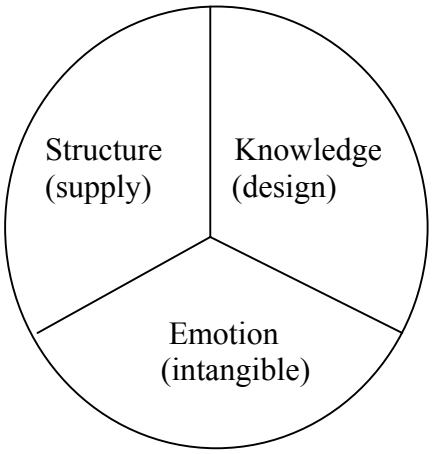

Figure 1. Barrier domains

Structural : Barrier of the segmented supply chain

The traditional way the supply chain works is an end on end process which defines and contains its sphere of operation and connectivity (see figure 2). Segments of the chain have relationships with other growing segments on a customer/supplier transactional basis – this goes for designers, sub contractors, producers, distributors and customers/end users. This model has worked fine up to recently because the environment in which supply chains operate has been slowly evolving, the imperatives fairly fixed and the relationship with customer/end user dependant on control of perceived incremental movements or changes.

It is not just the speed of change that has shaken this model up but the interconnectivity that is required to match more sophisticated expectations of satisfaction required by customers (i.e. generators of orders) and more importantly end users. This state of affairs has also been driven by flattening and compression of existing hierarchical business infrastructures by pervasive, powerful communication tools'; the impact of 'e' commerce and 24 hour product development networks.

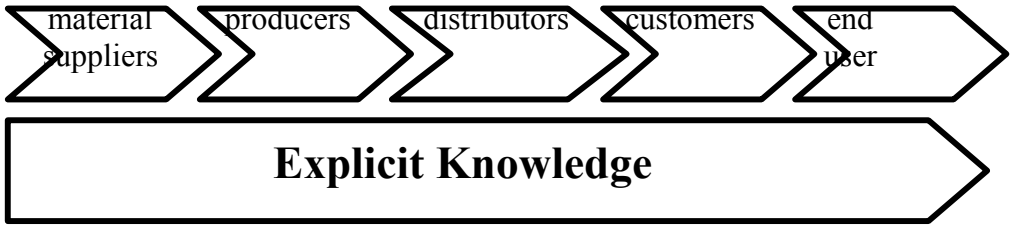

Figure 2: Segmented supply chain model

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My view is that conditions of change are not a threat but an opportunity for looking beyond the next increment when growing new products and services. To respond to these changes the supply chain needs to anticipate and be more knowledgeable about its market context. It needs another level of operating (strategic) which is not only about commodity but is concerned with learning and sharing information about contextual issues towards the goal of improving the way the supply chain works to the benefit of all its participants (see figure 3).

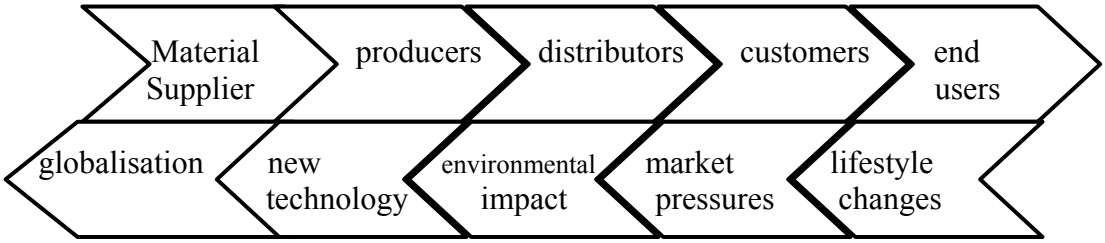

Figure 3: Connected supply chain model

What is required is a cultural change where companies within a supply process come together to form strategic alliances to share ideas, technology, know how, etc. Now this should not be too difficult to achieve as where alliances work across industrial sectors or even down a supply chain there exists the conditions for a natural non-competitive synergy with common imperatives to change, develop and improve in order to survive and prosper.

At the RCA (1987 - 93) and since at UEL I have piloted an approach to developing new products and services through a number of collaborative projects where partnerships of producers, suppliers, manufacturers, retailers, customers and designers were brought together to explore new business opportunities. These projects have not always produced world beating product outcomes- the benefits of the experience however have been seminal for many of the business and academic partners in providing ways in which to reflect on their own culture of innovation and to learn how to work with others across corporate, sectoral boundaries.

Strategic alliances are different in a number of ways from the traditional segmented model.

- driven by objectives rather that solutions
- non transactional relationships
- end user environment at the centre of NPD process rather than at the end of the supply chain.
- researchers from educational sector as neutral brokers.

Stefano Marzano (Design Director of Philips) in his article "Strategic Futures" (ID Magazine, Sept '99) suggested that cross industry partnerships will be crucial to future economic success however he does not say how such partnerships might be established unless by "visionary leadership". My experience is that visionary leadership is a commodity in short supply in most organisations.

Colleagues at UEL and University College Northampton jointly decided to initiate a pilot project to explore and better understand the conditions for successful strategic alliances. The project 'Beyond the Fridge' is the result – lasting three years and involving key actors in the frozen and chill foods supply chain (Electrolux, J. Sainsbury) and supported by technology providers like 3M and Raychem.

"Beyond the Fridge" identified a number of requirements effecting the initiatives, input, outputs and ownership of such a project but above all it highlighted that a shared language is crucial to a successful collaborative project, this we called "collaborative envisioning" using graphical tools, sketch concepts, symbols and visual metaphors to achieve a common purpose. Collaborative envisioning was used to :-

- Audit existing supply chains
- Propose ideal supply chains
- Graphically describe technologies, materials, processes, life style changes which might impact on the project
- Summarise solutions from other industrial sectors which correlate with ideal supply chain requirements
- Propose concepts for products which might evolve from synergies within the partnership
- Embody concepts to allow decisions to be made around shared understanding.
- Communicate concepts outwards and inwards in the partnership.

Our experiences of "Beyond the Fridge" would suggest that industry associations like BSSA are in an ideal position to expand their role to broker deals across and down supply chains to encourage strategic linkages to develop future products and services.

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Segmented	Connected
Innovation limited to neighbouring segments	Innovation having systemic impact
Impact responding to next level	Innovation driven by understanding of whole context
Limited to explicit knowledge	Influenced by tacit knowledge
Transactional relationships (threats orientated)	Strategic alliances - (seeking opportunities)
Responding to change	Anticipating change
Demand led	Tactical and strategic

Figure 4 : Supply Chain Characteristics

Knowledge: Barrier to knowing how in design process

Companies are shifting from a Product Centric form to a Knowledge Centric one – know how, intelligence and knowledge are becoming critical elements in terms of differentiating companies and sustaining success on basis of what companies know and how they know it.

Davenport + Drusak (1998) from Harvard Business School said "The only sustainable advantage a firm has comes from what it collectively knows and how readily it acquires and uses new knowledge".

Knowledge can be crudely divided into two kinds:-

1. "know how" or tacit knowledge
   This is highly personal, fluid, hard to formalise but can be taught or demonstrated, difficult to write down, creating mental models and skills like designing are good examples.

2. "know that" or explicit knowledge
   This can be codified or written down and is 100% transferable and tends to be formal i.e. a computer programme of performance specification is a good example:

The management consultant Thomas Stewart (1998) classified knowledge assets as follows:-

- Structured capital – patents, designs, trademarks, copyright, databases, etc
- Relationship capital–relationships with customers, suppliers and external agencies.

- Human capital – cumulative skills knowledge and productivity of a group, organisation or a group of organisations

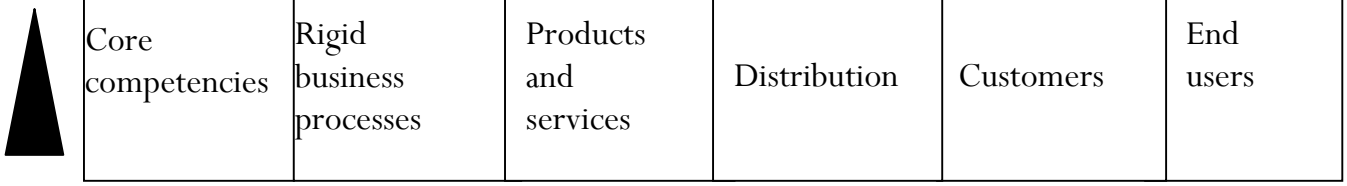
Further more Davenport and Thomas (Harvard Business School) estimate that two thirds of working knowledge (i.e. ideas, know how, mental models, etc) come from face to face contact only one third from documents. What is more they go on to say "processes, projects, tactics and strategies are best communicated through shared working platforms".

Now how does all this common sense relate to the Stainless Steel Industry? Well in a general sense it is possible that with a little willingness to change the way you share information and allow ideas to develop especially through coming together across the sector or down the supply chain as previously described, you will find that combined working tacit knowledge is all you need to put future strategies for business developments, products, together and to design structures to carry them out.

On a more specific level the tacit knowledge of designers should not be relied upon in preference to knowledge from all key actors involved. The self interested supply side of the design process at present denies "a pre-contract/pre-briefing" research phase where early connection to customers / end users / public consumers enables those developing new product to get at latent requirements and perceptions. The same issue relates to architecture as well as product design. There is a widely held belief by design professionals that post "purchase/occupancy" experience is not part of the design process.

"Ignorance and non understanding of the consumers/customers requirements has always been the main source of design failure" (Cooper, 1988). It is imperative that the end user in the design process is seen as an individual. Unarticulated perceptions of the user are created in the mind of the user and are difficult to generalise and capture. Hallus and Hallus (1999) commented that they "believe improved ergonomics to be the main thrust of design in the future". Industries who do not listen to what consumers are saying or who are not in touch with shifts in consumers values may end up making expensive mistakes. It is all very well to base a business on something that is technically possible, but no use at all if the consumer doesn't want to buy it.

Traditional business design process



New economy design process

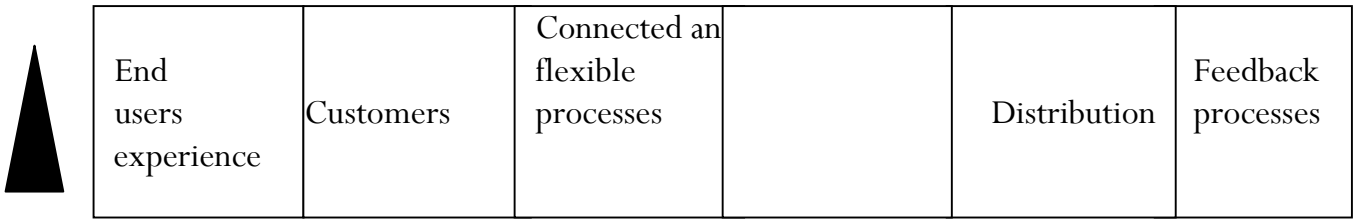


Figure 5

Take for example the next level of mobile telephony (3G) which incorporates mobile internet access, live video and stereo reception. Having bid £22 Billion to HMG the network operators (i.e. Vodaphone, Orange, etc) faced with trying to recoup their investment by persuading people to buy a phone that they have not asked for and don't actually want. To quote Ben Hammersley and Anna Söderblom in the Times (25-09-00 "Toughtimes for 3G technology).

> "Virtually no market research has been done or made public about how consumers would like to use their mobile devices. Nobody has gauged consumer desire for the applications. It is tempting to interpret this as an "ostrich syndrome" on behalf of industry".

It is easy to understand how this has come about within a very new industry like mobile communication, where the machismo wisdom that new technology applications will continue to entice the consumer to part with more and more cash for less and less actually benefit. Without a real understanding of the social/ environmental/ behavioural/ cultural context of this business it is easy to see how one small change (i.e. refusal to site microwave aerials in built up areas) or a health concern similar to the recent scare on micro-wave damage to the brain could bring the virtual world down to real size with major financial consequences for the supply side.

Research conducted at UEL and funded by DGVII of the EU under the project title "MIMIC" identified the crucial justification for connectivity with the end user at all stages of developing new designs. A case study of Stratford Station (a key out of

town interchange on the Jubilee Line Extension in East London) identified the social and business cost of not giving due care to capturing local knowledge and passenger perceptions at the pre-briefing stage – in this case the architects were asked to propose solutions as a part of a 'beauty parade' in just over one week with subsequent public consultation to confirm design decisions after the event.

Even in the case of the Ark building at Hammersmith, standard consultation models failed to prevent a design which amplifies sound of passing tube trains and road traffic down onto residential premises.

A new model of design is needed which raises the importance of research alongside practice to provide total satisfaction to customers and end users. Consultants should not expect clients to fund pre-contract/pre-briefing research. This should be an on-going commitment on behalf of the design offices and design professionals to infuse and enhance their knowledge base, and develop a multitude of methods and tools to capture and act on user perceptions and individual user experience.

Emotional : Perceptual barriers to choosing Stainless Steel

In 1988 John Thackera, design critic, writer and journalist declared that "design is now beyond the product". Ten years later Ries and Trout reflected the fact that "customers perceptions (here meaning the general public) are really what makes or breaks you. The look, feel, smell and taste of a product is what counts". Environmental and contextual factors – i.e. where, when and under what circumstances a product is encountered effect behaviour and condition responses and attitudes to that product (see figure 6).

Following commodities, goods and services consumers now unquestionably desire 'experiences', where the user/public create the meaning rather than the product.

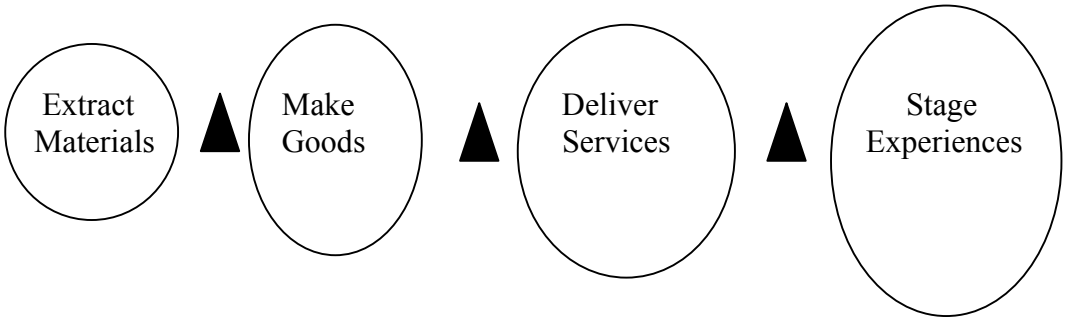


Figure 6: "Destination Society"

In future, if not now business effectiveness may be based on emotional human values rather than measurable tangibles. Look at BP's public promotion of the 'beyond petroleum' concept and its concern to be linked to environmental conservation and

cultural regeneration projects. It may be that empathic and qualitative aspects of design are going to be the most important aspects in the future. Wolf Olins (1990) agrees that companies and brands are increasingly competing on emotional, rather than rational grounds. Michael Rodker again in Design Week (2000) goes even further when he says "the brand has joined with technology to replace labour and materials as the major inputs of value in the new economy".

So if satisfaction is required beyond the physical object and this is effected by psychological perception of the product or in this case stainless steel what do we know about how stainless steel is perceived at an individual level and how do we unlock, know and measure perceptions and build on these truths?

Recent research from your own sector reveals some interesting although not unknown received views in the public consciousness about stainless steel which include problems with confusion about identification and differentiation with other materials, (like aluminium) association of the material with past uses (i.e. the ubiquitous kitchen sink) low recognition of its physical properties, maintenance/cleaning requirements, concerns over ageing (patina, etc). It is not too extreme to assume that if these perceptions occur in the minds of the public then these or other confusions/prejudices exist in the minds of specifiers, and other professionals in the supply chain.

What can we learn from all this? Well firstly "Stainless Steel" brand image needs to be clear, visible and most importantly attractive, not just in an aesthetic sense but as an "experience" beyond its technical performance. Dare I say it but the material brand is tired as it stands at present, it is not attracting a growing market and increased loyalty. "Stainless Steel Appeal" is a step in the right direction addressing the perception barrier at the right end of the supply chain which is with the public – however the word "appeal" to me seems more like a charity event that something that is life style driven. These challenges are not going to go away so how can this barrier be reduced? There are no simple quick fixes but I offer the following suggestions which could be included in any future strategy-

- Involve the public end user in the design process whenever possible as individual and unarticulated perceptions are created in peoples minds as I have previously stated and are difficult to generalise and capture. This applies to design of public buildings, industrial products as well as consumer product.
- Develop or apply design methods and tools which involve evaluation of user responses and include perceptual data. There are tools like Kansei Engineering (successfully used on MX5 Mazda sports car design) and Blue Printing (questionnaires using key descriptors) (Nagamachi et al, 1999) which may be useful.
- Don't try to sell stainless steel solutions at all costs – this is a recipe for reinforcing poor branding. A lot of large public space projects have used stainless steel and glass which have not always proved to be popular in follow up user research. Be prepared to be sensitive to the role and properties of stainless

steel as one of a whole raft of materials. This may mean developing non-competitive relationships with other material producers, processors and industry associations concerned with other materials to share knowledge and practices.

- Marketing campaigns which address life style, environmental and social harmony cues – make the material part of good social solutions and experiences.
- Drive R + D effort and design in architecture and product with an human 'experiential' awareness as well as market pull or technological push. Seek solutions to what people want to buy first and what your core competencies can do second.
- Exploit connectedness with other sectors (including education and research) and finally listen and learn from the know how and knowledge of others.

Thank you.

This paper was originally presented at the BSSA Conference 'Make it in Stainless' on 9th November 2000 at the National Motorcycle Museum, Birmingham

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