Several shades of green

Do you do eco-design or sustainable design or neither, asks Dr Tania Humphries-Smith BSc PGDip MPhil EdD MIED CEng FHEA?

Introduction

The aim of this article is to raise awareness of the difference between eco-design and sustainable design and to explain the three dimensions of sustainable design, based on the Royal Academy of Engineering model. However, I wish to focus on the less well understood social dimension. The article presents the main aspects of socio-centric sustainable design and explains why it is now so important to both the development of truly sustainable products and also to developing new sustainable business models.

There are already some web based resources aimed at assisting practicing designers and engineers to develop sustainably designed solutions. However, these are essentially aimed at the techno and eco-centric dimensions and there is limited and disparate information available on the socio-centric dimension.

A website (*www.sociocentricdesign.com*) has been set up in an attempt to develop a learning resource, currently aimed primarily at undergraduate designers and engineers, on the socio-centric dimension. The article considers whether this resource could be beneficial for practicing designers and engineers and, with development, could be used as a forum for the development of practice in this area. I will conclude by asking for volunteers to participate in further research to enable this development to take place.

What is the difference…

... between sustainable design and eco-design? Sustainable design, as opposed to eco-design or green design, is considered to include three aspects, namely the technological, ecological and sociological, whereas eco-design generally considers only the technological and ecological aspects. The definition provided by Dewberry and Goggin (1994), when they discuss the development from eco-design to sustainable design, is particularly relevant here: “The concept of sustainable design, however, is much more complex and moves the interface of design outwards toward societal conditions, development and ethics… and involves a general shift from physiological to psychological needs.” (p49).

Madge (1997) also states that sustainable design is: “also the study of needs and ethics, of current and future technologies, of sociologies, consumer behaviours and environmental impacts and improvements.” (p53).

The Royal Academy of Engineering report introduced the requirement to have three dimensions, the eco, techno and socio-centric dimensions in order to

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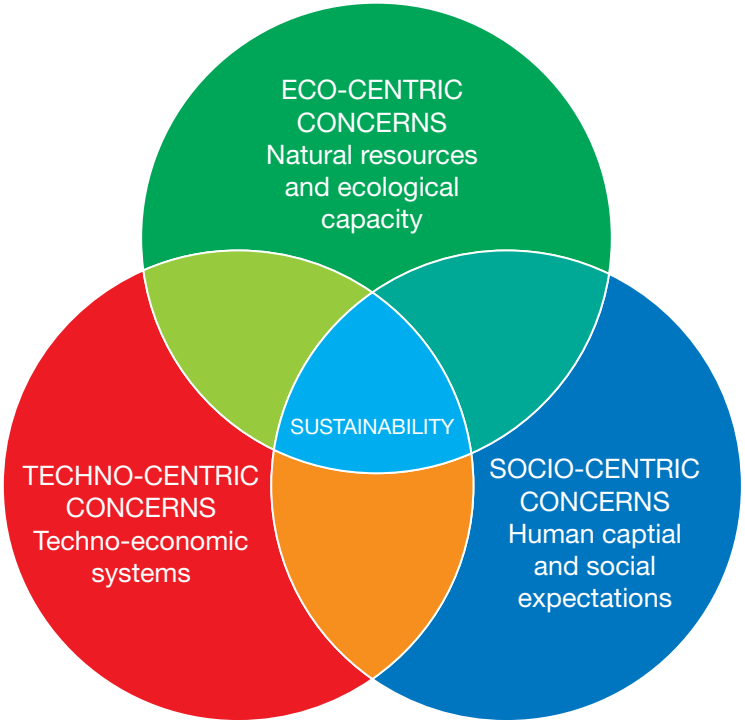


Diagram prepared by Crane Environmental Ltd after an original idea by Roland Oft

Figure 2a: Three dimensions of sustainability

achieve true sustainability (Dodds and Venables, 2005).

In summary, the three dimensions can be defined as:

- Eco-centric – The ability of the planet to sustain us – by providing material and energy resources.
- Techno-centric – economic systems that include the skills that engineers must continue to deploy and the economic system within which they are deployed.
- Socio-centric – Human expectations and aspirations – the needs of human beings to live worthwhile lives.

It is reported that the common approach adopted by industry to eco-design, as opposed to sustainable design, is eco-efficiency, this is a linear 'cradle to grave' approach (DeSimone and Popoff, 2000). However, McDonough and Braungart claim that eco-efficiency as a strategy only makes people 'less bad' (2002) and propose a 'cradle to cradle' approach.

The common industry approach is to start at the bottom of the hierarchical approach of the 3Rs of sustainable design:

- Reduce;
- Reuse;
- Recycle.

... that is, recycle, thus "…the methods through which we currently address sustainability are not as sustainable as we might like to think." (Chapman, 2005, p170). In other words, what is being said is that to begin to address true sustainable design, it is necessary to take account of all three dimensions rather than focusing on the eco and techno.

Currently industry largely considers how to change production patterns by:

- Use of renewable energy sources;
- Prevention of pollution;
- Minimising waste products;
- Using renewable resources to make products;
- Use of cleaner production technology and practices.

That is, concepts associated with the techno-centric dimension. Many of the tools and techniques used to achieve these can be found at the very informative and instructive web-resource provided by Loughborough University, *www.informationinspiration.org.uk* (refer to Humphries-Smith, 2008a, 2008b, 2010 for detailed analysis).

However, to address the socio-centric dimension, it is also necessary to change consumption patterns by:

- Examining life styles and their impact on demand;
- Educating consumers about the products they buy;
- Providing ways to live a sustainable lifestyle;
- Increasing recycling efforts.

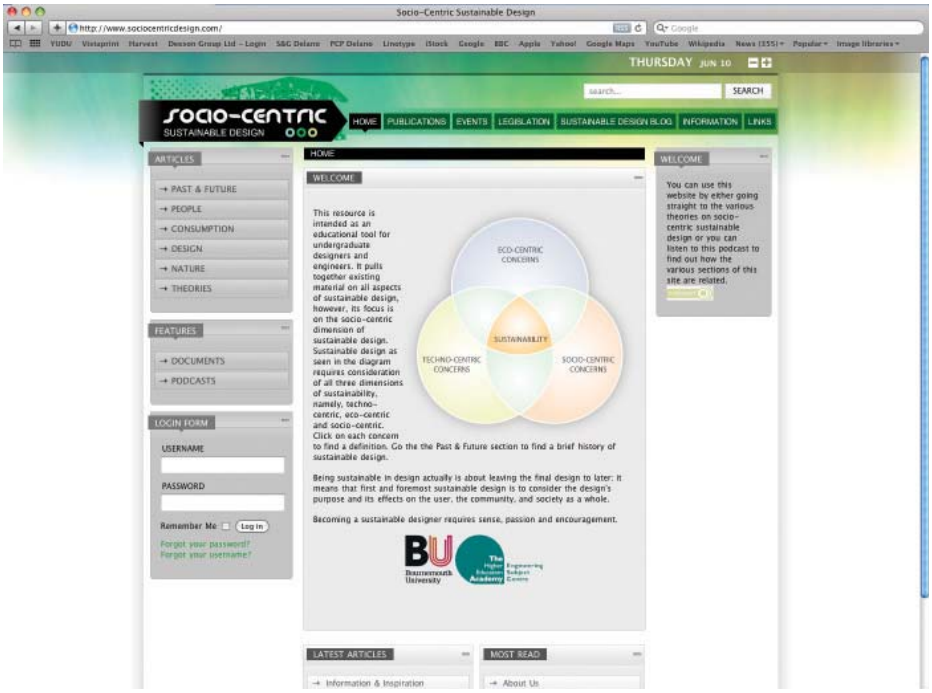
In other words, the concepts encompassed by the socio-centric dimension. This is evidenced by data such as:

- After six months 60% of consumer products are no longer in use;
- For every tonne of products we have to use 10 tonnes of resources;
- 665 Mt domestic extracted materials;
- Water 16,830 Mt – 25 times solid material consumption.

What is socio-centric sustainable design?

As stated earlier, this dimension considers the human aspects of sustainable design, thus incorporating ethical, moral and social issues. Clearly there are a range of approaches, tools and techniques that have been developed within each of the three dimensions. Of interest here are the range of approaches to the socio-centric dimension that have been developed (Humphries-Smith, 2010):

- Emotionally Durable Design – Chapman (2005) focuses on the problem with the current methods and techniques which tend to lead directly to the third of the three Rs of sustainable design – reduce, reuse, recycle – when what is required for true sustainability is reducing and reusing. To do this will require people to be more emotionally connected to their belongings, thus not wishing to dispose of them.
- Cradle to Cradle – McDonough and Braungart (2002) are also critical of the focus on recycling, pointing out this is a one way process – cradle to grave – when what is required is a cycle of reuse. They look at an analogy with nature where 'waste' is simply a nutrient for something else.
- Biomimicry – Benyus (2002) also looks to nature, pointing out that nature produces everything without producing toxic waste, etc, and suggests we need to copy/emulate nature's processes.
- Product Attachment – Mugge (2004), Desmet and Hekkert (2007) and Schifferstein (2004) explore how designers can design products in such a way as to encourage their consumers to become attached to them and, thus, not wish to dispose of them.
- Behavioural Design – Lilly and Lofthouse (2008) look at how designers can design products so that they consciously change the way people behave, with the aim in mind of reducing carbon footprint.
- Slow Consumption – Cooper (2005) also considers product attachment so that people reduce their desire to acquire more and thus slow down the cycle of consumption.



All of these authors criticise the limited scope of sustainable design tools, techniques and approaches currently in common use and stress the need for designers to take an interdisciplinary approach when working in the socio-centric dimension and work with psychologists, biologists, chemists, ecologists and sociologists, so that problem solutions are found that are not only beneficial to the user but also to the wider community and environment.

As stated above, in order to address the real issues of sustainability, as defined by the Brundtland Report of 1987, all three dimensions must be addressed. Legislation is the current blunt instrument used by governments to move business in this direction, which in terms of EU Product legislation encompasses: End of Life Vehicles (ELV); Packaging & Packaging Waste Directive; Waste Electrical & Electronic Equipment (WEEE); Restrictions on Hazardous Substances in EEE (RoHS); EuP (Energy using Products); Batteries Directive; REACH and ISO Standards – covering management, design, LCA and labelling.

To truly address the spirit of the legislation and to consider all three dimensions of sustainable design has implications for a traditional business model. No longer can it be based upon selling 'more stuff' and continuous 'new stuff' to make money. It will be necessary to return to what might be considered 'older' values of repairing, maintaining and owning a product for life.

How to engage with the social dimension?

A new web-based resource, known as 'Socio-Centric Sustainable Design – a resource for designers & engineers' has been developed with a view, initially, of assisting undergraduate designers and engineers to develop some understanding of the socio-centric dimension.

The home page pictured above features a diagram of the three dimensions with 'pop-out' explanations of each dimension. The intention of this is to ensure the full breadth covered by sustainable design, as opposed to green design or eco-design, is understood. There is also a podcast which provides a brief history of sustainable design to help the user understand how the three dimensions have come about.

This resource has potential for use by practicing designers and engineers but clearly needs modification and expansion to be appropriate.

In order to develop this resource further, input from practicing designers and engineers is needed. So I would urge you, if you are a practicing designer or engineer, to visit the current website *www.sociocentricdesign.com* and email or phone me with a response to the questions below:

1. Is the website a helpful tool for designers interested in the integration of sustainability into the design process? Please explain your findings.
2. How accessible is the information provided by the website?
3. Would you be able to use/incorporate these theories/ideas into your design work using the information provided on the website?
4. If you could add more information to this site, what would it be?
5. Is there sufficient interactivity to make the site engaging, if not what else would improve it?

There is also the possibility that if sufficient interest can be generated, the website could become a forum for development of practice.

Further reading

- *www.sociocentricdesign.com*
- *www.envirowise.gov.uk*
- *www.o2.org/index.php*
- *www.informationinspiration.org.uk*
- *www.ecobarkingcrickets.org*
- *http://www.businesslink.gov.uk/bdotg/action/detail?site=210&type=RESOURCES&itemId=1084673888* for accessible information on sustainable legislation.

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