

# Future Centered Design: Designing for Sustainable Business

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**Abstract.** This paper outlines the changing attitudes of business leaders towards sustainability and the opportunities this presents to product and information designers. Smart business leaders are beginning to understand the importance of sustainable practices to their success. Resource scarcity, increased regulation, and need to safeguard their brand reputation are a few of the key drivers for this mind shift. Just as businesses have to reconsider the way they do business, designers have to re-think aspects of the way they design to participate fully in the creation of a sustainable world. We have to be prepared to rethink our design process, our materials, our product lifecycle, and our notion of customer experience. Information designers and product designers have to work together to create the next generation of sustainability products. While product designers play a direct role, information designers play just an important role by gathering critical information across the enterprise and presenting them in a consumable way to allow decision makers to make informed sustainable choices.

**Keywords:** sustainability, design, product design, interaction design, information design, business software, user experience design, product design, sustainable design, SAP.

## 1 Introduction

*Sustainability is meeting the needs of the present without compromising the ability of future generations to meet their own needs. - Brundtland, 1987*

Over the last decade there has been a significant shift in the way businesses view sustainability. In the past, business leaders may have taken a narrow view that equates sustainability to the environmental movement, dismissing it as irrelevant to their business. Today, business leaders can no longer afford to do so.

Sustainability is now based on the understanding that economies and companies do not operate in a vacuum, but are tightly embedded into societies and the environment. These new stakeholders are forcing business leaders to evolve their perspective on sustainability. Through responsible business practices and sustainable product offerings, business leaders can balance their short term and long term profitability, while considering the economic, environmental, and social impact of their activity.

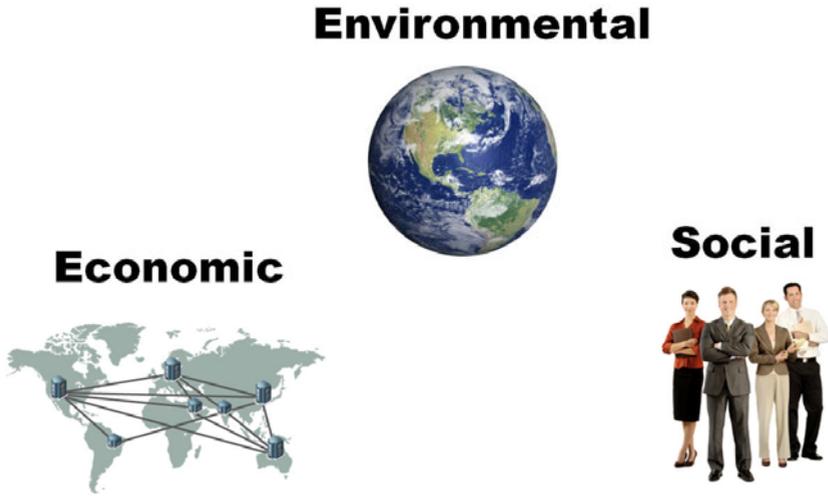


Fig. 1. Environmental, economic and social impact of products

## 2 Key Motivators for Mind Shift

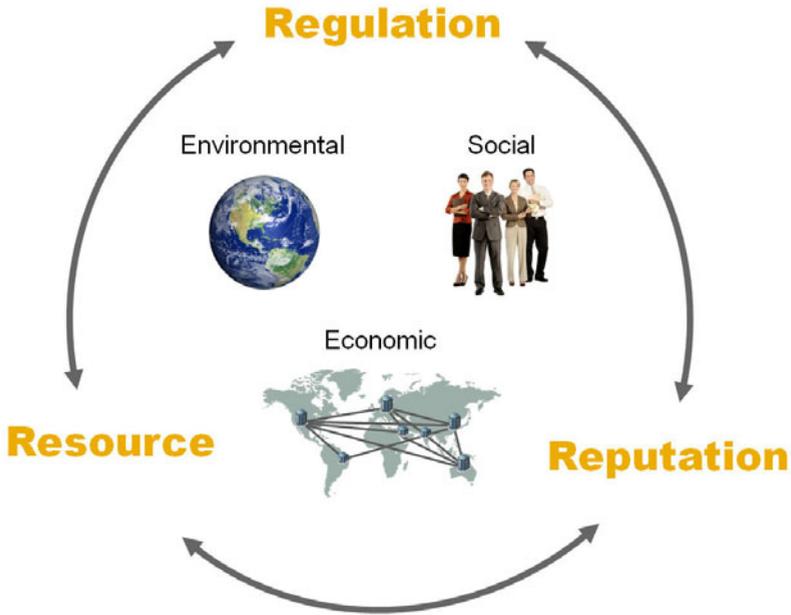
There have been three main reasons that have accelerated this mind shift.

### 2.1 Regulation Proliferation

Businesses are faced with an ever increasing number of new environmental, social, and product regulations per year. Such regulations pertain to product and material compliance, employee health and safety, sustainability reporting, and carbon trading. These regulations provide a clear incentive for businesses to think about their operations from a sustainability perspective to minimize or eliminate the risk of non-compliance.

### 2.2 Resource Scarcity

There is a growing awareness that resources such as oil, water, and raw materials are not unlimited. The current rate of growth and ways of doing business will deplete our planet's resources and threaten our very existence, unless we make serious changes. This impacts businesses directly via the rising cost and extreme price volatility of energy and other natural resources. Resource intensive businesses need to innovate and find other sustainable alternatives or risk going out of business.



**Fig. 2.** Key drivers for this mind shift

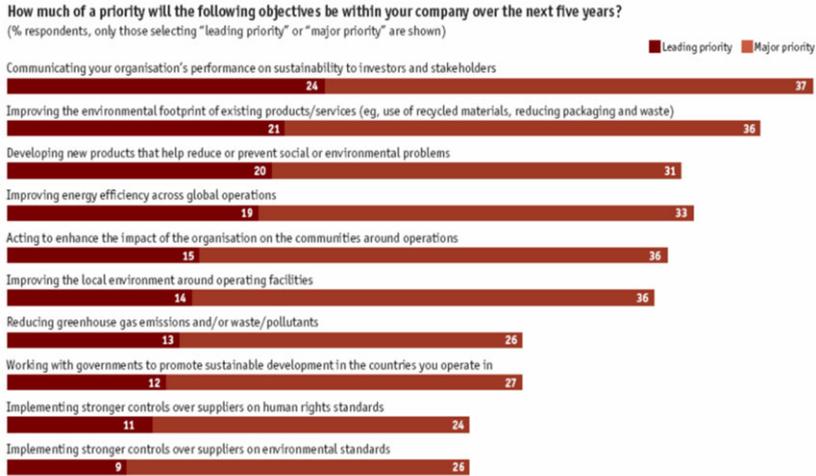
### 2.3 Reputation Management

The world is more connected than ever, and as such, there are no longer any local events in the new global economy. With business supply chains spanning the earth in most cases, an ill-advised business decision on one link impacts the entire value chain. Child labor in a major shoe manufacturer's network, and toxic substances in toys comes to mind. Consumers are becoming increasingly interested in the health, social, and environmental impact of their purchasing decisions and are willing to share their experience online with their virtual communities. Businesses no longer have sole control of their brand and are only one of many sources of news about the company. Bad news is impossible to contain and has a severe effect on reputation, sales, and share prices. The recent oil spill in the US is an example of this phenomenon.

## 3 Business Opportunities for Sustainability

This mind shift translates to real business opportunities. Sustainability is top of mind for many global executives. In a study by the Economist magazine, CEOs see the need for information systems to create transparency around their sustainability Key Performance Indicators (KPIs) and communicate these to their stakeholders. This is closely followed by CEOs wanting to improve the environmental footprint of existing products by using recycled materials, reducing packaging and waste.

To truly seize these opportunities and make a positive contribution, businesses have to rethink some aspects of the way they do business.



Source: Economist Intelligence Unit survey, October 2007.

**Fig. 3.** Sustainability survey of executives

These business opportunities present unprecedented design opportunities for UX professionals. Industrial designers can lead the creation of sustainable product offerings, while HCI professionals such as information designers, information architects, and enterprise software designers can play a leadership role in the creation of information systems that allow executives to monitor and reach their sustainability goals.

Just as businesses have to reconsider the way they do business, designers have to re-think aspects of the way they design to participate fully in the creation of a sustainable world.

## 4 Re-design Design

### *Design for sustainable consumption – Bill McDonough in Cradle to Cradle*

Future product designers need to take a leadership position in articulating the social and environmental cost of their designs and help stakeholders make sustainable choices. Information designers need to create systems that help gather relevant information across the organization to enable business leaders to make sustainable decisions.

Here are some specific areas of focus to help designers design the next generation of sustainability products and information systems.

## 4.1 Rethink Design Process

To design the next generation of sustainability products and information systems, UX professionals need to design for the future, not just the user. Design's traditional anthro-centric methods are necessary but not sufficient for the task at hand. Industrial designers need to reconsider user 'needs' when designing a new object and question if these needs can be met in a more sustainable way, either through a different type of product or mode of use. For example, car share systems reconfigure the perception that the consumers need a car when what they really need is transportation.

Information designers cannot merely study current processes in an enterprise when designing the next generation of sustainability software. They instead envision a new kind of enterprise that monitors its sustainability KPIs, similar to its financial KPIs, and creates a reliable and credible report of its sustainability activities. Information systems need to work hand in hand with product design to address issues such as product safety. Today, there is insufficient information available to companies and consumers to make sustainable choices, even if they are motivated to do so.

In many cases, "a typical user" of sustainability information systems does not exist. All organizations have Chief Financial Officers, but it is rare to meet a Chief Sustainability Officer<sup>1</sup>. When the user does not exist, whom does the designer observe and create for? Designers need to go beyond user-centered design methodologies to create sustainable systems for the future enterprise.

## 4.2 Rethink Materials

Consumers are increasingly aware of the safety of materials. In 2007 alone, 231 recalls in the US resulted in 45,000,000 children's product units being pulled off the store shelves. Beyond putting millions of children at risk, such dangerous products that result in recalls have a negative impact on the company's brand and ultimately end up polluting our landfills having wasted raw materials and energy in its production.

Packaging presents a huge opportunity for CO<sub>2</sub> reduction and cost savings for companies. Consumers are questioning the ridiculous amount of packaging they receive when they purchase products. Innovative companies like REI are looking at alternative approaches such as offering customers free shipping if they pick up their online purchases from an REI store close-by, doing away with individual shipping boxes and additional packaging. Lexmark, an SAP customer, set a goal to reduce their packaging by 50%, and in working toward this goal, found that they reduced their energy consumption by 50% as well.

In some cases, the entire industry undergoes a transformation. Digital photography, for example, revolutionized photography and made dark rooms and toxic chemicals a thing of the past. Furthermore digital media is the ultimate sustainable media since they are reusable by design.

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<sup>1</sup> SAP is an exception in this respect, since Dr. Peter Graf, the co-author of this paper, is the Corporate Sustainability Officer of SAP.

# 45,000,000

children's products were recalled in 231 recalls in the US in 2007 alone.



Fig. 4. 2007 Year of Recall - kids in danger

### 4.3 Rethink Product Lifecycle

Traditional design is concerned with the creation and consumption of products. Sustainable design needs to go beyond this by taking into account raw materials extraction, materials processing, component manufacturing, assembly and packaging, distribution and purchasing, installation and use, service upgrading and maintenance, and disposal and recycling. Thinking through each aspect of the lifecycle, as outlined in William McDonough's book *Cradle to Cradle*, highlights the designer's responsibility to create sustainable products.

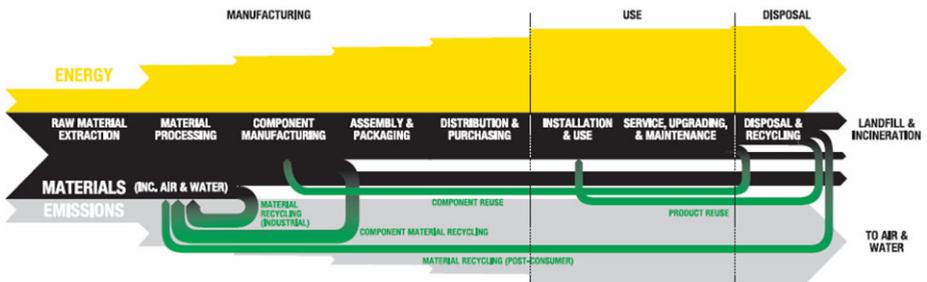


Fig. 5. Total Life Cycle Analysis of products

Today’s information systems provide insufficient and incomplete information to decision makers to help them understand the sustainability impact of their choices. Again, information designers and product designers have the opportunity to work together to create the sustainable future.

### 4.4 Rethink Consumer Experience

Today, the financial impact of the product is made visible via the price. How can designers make the consumer aware of the environmental and societal impact of their choices?

There are some leading companies like Patagonia that have made the product footprint information available on their website.

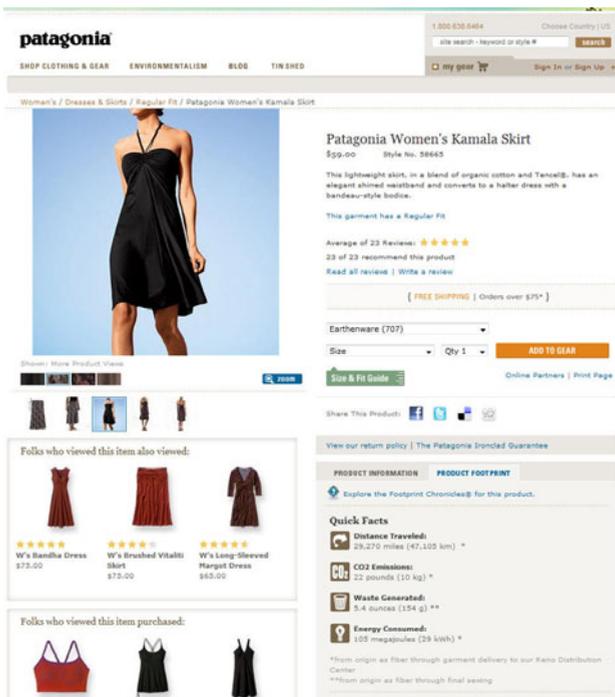


Fig. 6. Quick product footprint information in addition to price and color

Organizations such as Carbon Trust have put in place ways for manufacturers to get a carbon reduction goal and make this information available to consumers.

Here is a vision for mainstream manufactures like Pepsi calculating and displaying their Carbon footprint at the manufacturing, usage, and recycling phases of the product’s life cycle.



Fig. 7. Detailed product footprint information

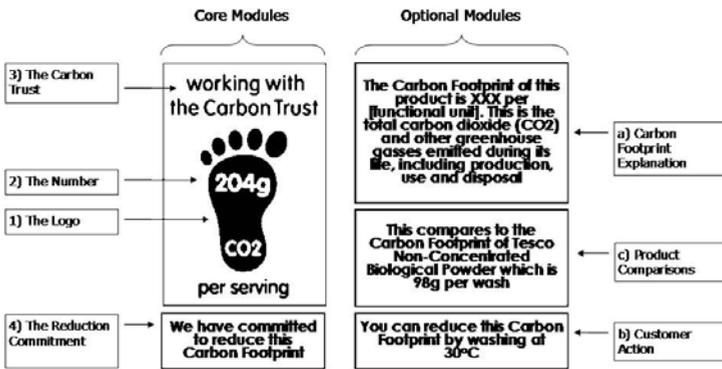


Fig. 8. Carbon Trust logo with explanation

There is a lot yet to be done in this area. Information designers need to create systems to gather product footprint information across the supply chain, while product designers need to present the summarized information to consumers.

Traditionally, design is evaluated on its usability and emotional qualities. We believe that sustainability will become a future product quality that consumers will consider. Savvy consumers are willing to pay extra for the sustainability qualities they value, such as product safety and low product footprint. Therefore, product and information designers need to work together to understand what motivates consumers and help them make sustainable choices.

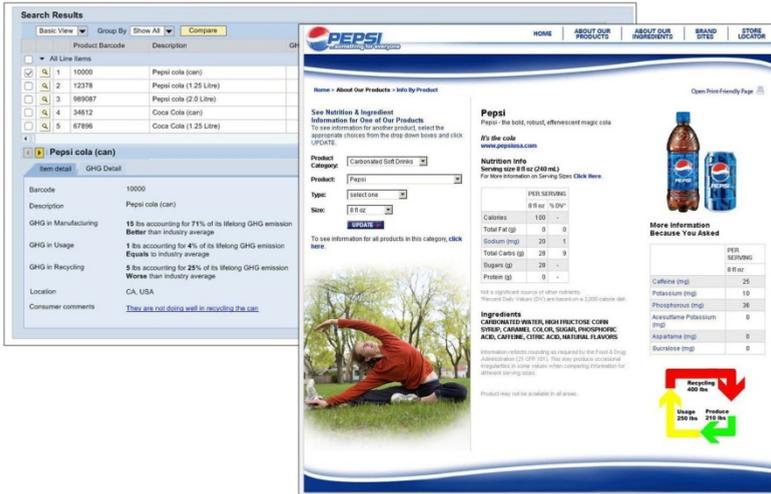


Fig. 9. Product footprint for a can of Pepsi – a vision from SAP

## 5 Conclusion

There is no better time than the present to focus on sustainable design. Businesses are becoming more aware of the financial, social and environmental impact of their offerings, encouraged by increased regulations, consumer awareness, and scarcity of resources.

The growing middle class in Asia, aspiring to a western lifestyle, are poised to create unprecedented demand for products and services. Our current unsustainable practices coupled with this raising demand could greatly exacerbate our problems, if we do not address them with a sense of urgency.

As any thoughtful designer knows, design problems are merely opportunities for creative design solutions. Therefore, there is no doubt that designers will rise up to the challenge of creating a sustainable world.

The principles of sustainable design are compatible with the principles of any good design philosophy. Design for sustainability places additional emphasis on reducing the environmental impact of a product during its manufacture, use and disposal, or reuse. It uses strategies such as avoiding use of toxic substances during production, minimizing materials used, minimizing energy or water required during use, and designing for repair, reuse or disassembly and recycling.

Information designers and product designers have to work together to create the next generation of sustainability products. HCI designers play just an important role in gathering critical information across the enterprise and presenting them in a meaningful way to decision makers to enable them to make smart, sustainable, business decisions.

## References

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