

---

# Everyday Designers on Sustainability

**Earl Friedberg**

David R. Cheriton School of Computer Science  
University of Waterloo  
Waterloo, Ontario, Canada  
efriedbe@uwaterloo.ca

**Edward Lank**

David R. Cheriton School of Computer Science  
University of Waterloo  
Waterloo, Ontario, Canada  
lank@uwaterloo.ca

**Abstract**

This paper reports the preliminary findings of a study undertaken to understand how everyday designers address sustainability throughout the design process.

**Keywords**

Sustainable Interaction Design, sustainability, environmental studies.

**ACM Classification Keywords**

H5.m. [Information interfaces and presentation (e.g., HCI)]: Miscellaneous. K.4.m. [Computers and society]: Miscellaneous.

**Introduction**

In Agenda 21 and at the United Nations World Summit on Sustainable Development, the international community referred to planetary sustainability as three interdependent and reinforcing pillars - economic development, social development and environmental protection [1][2]. It has become common to consider sustainability within the conceptual framework of these pillars. Creating products that are better or “healthier” for society often require mediating between these three concerns.

Within the broad domain of sustainable products, one domain that has been studied in the HCI research community is mobile phones, and, in particular, end-user perspectives on sustainability with respect to mobile phones [3]. Creating mobile phones that satisfy the requirements of economic, social and environmental sustainability is a process that begins with design. Blevis, for example, notes that addressing environmental issues requires both the redesign of technology products and a change in the ways in which designers create and make things [4].

This argument easily extends to a more comprehensive view of sustainability. Specifically, to design products that are—*simultaneously*—healthier for society, for the company that builds them, and for the environment, requires the designer to assume the role of mediator between economic, social, and environmental concerns.

The goal of our current research is to examine how designers, working for a large mobile phone manufacturer, trade-off social, economic, and environmental concerns during design. Are they aware of the tension between these sometimes misaligned priorities? Do they feel responsible for the designs that they create? What, in their view, represents success or failure in enhancing the sustainability of the mobile phones they design?

While HCI research has typically focused on broad classes of users, such as consumers and technology users, product designers have been one of the least studied populations by the HCI community [5]. By overlooking the very people who shape the world we live in, we may be missing out on opportunities to create a healthier planet.

## **Research summary**

Research participants are 14 designers at a mobile phone manufacturer. These include 1 industrial, 2 interaction, 2 mechanical, 2 packaging, 2 product, 1 user research and 2 visual designers as well as 2 design managers. These individuals' professional activities place them in the position of making significant resource-allocation or design decisions.

The study is qualitative in its approach. Participants are being interviewed to respond to a range of open-ended questions as well as asked to walkthrough a variety of projects relating to their mobile phone designs. The analytic process is based on data immersion, repeated sorting, coding and comparisons that characterize grounded theory.

## **Environment a gateway to social and economic sustainability**

Designers referred to a wide range of environmental factors that need to be considered in the design of phones, such as eco-toxicity, recyclability and renewability, many of which traditionally have lied outside their expertise. This required ongoing learning, often across disparate functional units. "I'm learning as I'm working."

On the surface, a designer's understanding of sustainability was oriented as the physical dimension of a product, such as energy consumption and material renewability. The designer's role was perceived, both personally and professionally, as one of ecological stewardship. "Sustainability means to consume resources without depleting any future resources".

Occasionally, environmental considerations served as a gateway into social issues. One designer, who walked us through their new packaging design, explained that the incentive for the packaging refresh was primarily environmental. "Compact packaging reduces our transportation footprint." The designer further discussed how the packaging redesign allowed for social opportunities to emerge, such as improved access for seniors, who often had trouble opening these packages as well as better child safety. Social considerations were born out of environmental motivations. Although the designer was not aware of the UN-constructed pillars, practically it was understood that social outcomes, such as improved access, encompass the ideals of sustainability.

In another instance, a designer was trying to improve the energy efficiency of a product. Initially, this effort was environmentally motivated. "Using less electricity is good for the environment." The designer moved on to discuss the social and economic benefits that energy preservation would provide. "This [design] lets people, who may not have continual access to electricity, to carry something that lasts a lot longer. [...] This is especially important in developing countries, where users rely on their mobile phones, but may not have a steady access to electricity". Here, what started out as an improvement for environmental reasons, seemingly served as a launching point into social and economic considerations.

### **Sustainability as a wedge issue**

Designers tended to be divided in their attitudes towards sustainability. Some viewed themselves as "swimming against mainstream" and went as far as describing themselves as "designer-activists".

Others remained reluctant to incorporate environmental considerations into their everyday practices. Some felt environmental sustainability was too "difficult" to achieve, particularly in the area of consumer electronics. Others viewed environmental sustainability solely as a regulatory constraint, which should be considered realistically in relation to other factors that bring a product to market.

The divide was further highlighted between design managers and designers. Managers tended to be more moderate in their views, favoring increased energy and material efficiency over more novel alternatives. Managers were especially hesitant to encourage their design staff to explore expensive sustainable alternatives, emphasizing costs to business. The perception, and perhaps current reality, is that cost premiums are too large for businesses to practice sustainable product design.

### **Conclusion**

Although designers did not necessarily consider sustainability within the UN conceptual framework of the three pillars, many designers identified social and economic considerations that were often born out of pro-environmental initiatives. Furthermore, sustainability was seen as a wedge among designers as well as between designers and management, affecting the coordination of the design organization.

It seems reasonable to recommend that the HCI community should invest in the advancement of practical support for designers. The community may also consider developing economic support for those involved in sustainable practices.

Future work will continue to examine how designers balance the three pillars of sustainability, with the hope that other technology designers may draw on the

themes and patterns discovered to create a more sustainable world.

### Citations

[1] Johnson, S.P. (1993). The Earth Summit: The United Nations Conference on Environment and Development (UNCED). Graham & Trotman/Martinus Nijhoff, London.

[2] UN General Assembly. (2005) World Summit Outcome: resolution / adopted by the General Assembly. A/RES/60/1

[3] Huang, E. M., & Truong, K. N. (2008). Breaking the disposable technology paradigm: opportunities for sustainable interaction design for mobile phones. *ACM CHI*, 323-332.

[4] Blevis, E. Sustainable interaction design: invention & disposal, renewal & reuse. *ACM CHI '07*, (pp. 503-512).

[5] Khan, A., Bartram, L., Blevis, E., DiSalvo, C., Froehlich, J., & Kurtenbach, G. (2011). CHI 2011 sustainability community invited panel: challenges ahead. *ACM CHI*, pp. 73-76.