Emerging Strategies

Okala Practitioner **Chapter 4**

Emerging Strategies

This module explores several ecodesign strategies and categories in depth:

Provide Product as Service

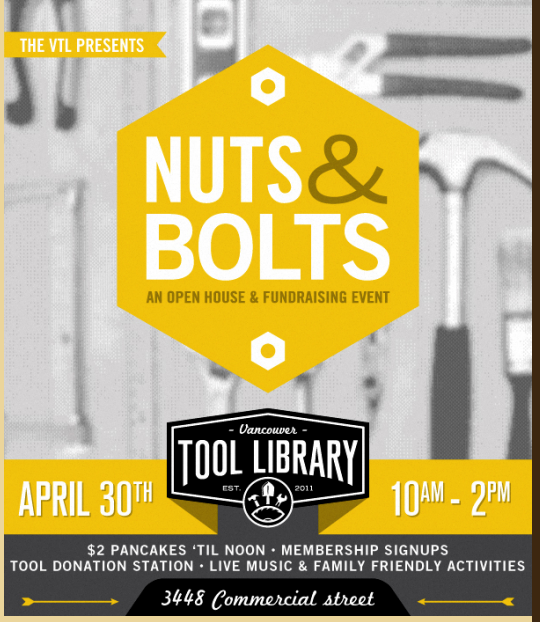
Mimic Biological Systems

Carbon-Neutral Energy

Encourage Low-Consumption Behavior

Design for System Longevity

Provide Product as Service



A tool library allows many users to share a few products.

Product-service-systems (PSS) and **service design** focus on meeting needs while minimizing the physical product component. Service design can manifest in many ways:

- Product cooperatives that share products
- Ownership models (like leasing) that insure system repair and upgrading
- Systems that reward environmentally attuned behavior
- Support **extended producer responsibility** for used products
- New business models with ecological advantages

Provide Product as Service

Service design requires that perceived hurdles to the service system are overcome. For instance, in car-share or bike share programs, design can address the potential perceived inconveniences.

The service platform of car-share programs can immediately allow vehicle reservation changes. Multiple drop-off locations for borrowed bicycles relieve the user of returning the bike to the rental origin.

A working PSS system requires considerable design effort, including detailing the points of interaction (touchpoints) and rethinking how the service is sold.

Bike share program users purchase bike access, thus intensifying bike usage.

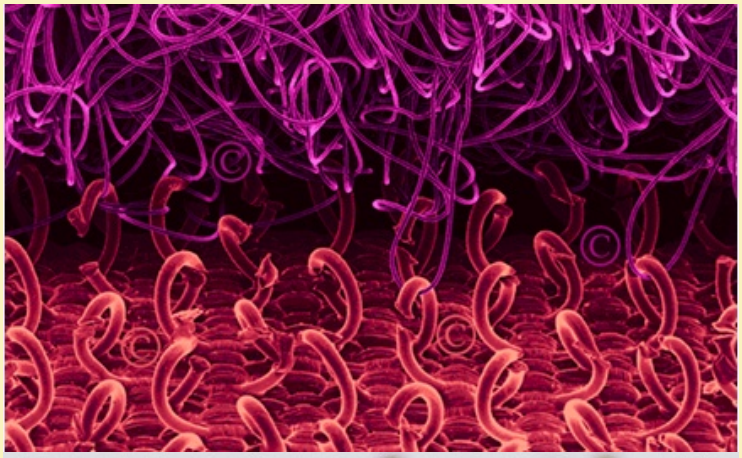
Mimic Biological Systems

Janine Benyus is a leader in researching biomimicry. She suggests that designers ask these questions about biologically inspired design concepts:

Does it run on sunlight?
Does it use only the energy that it needs?
Does it fit form to function?
Does it recycle its materials?
Does it sometimes reward cooperation?
Does it rely on biodiversity?
Does it demand local expertise?
Does it curb excesses from within?
Does it respect limits?

Mimic Biological Systems

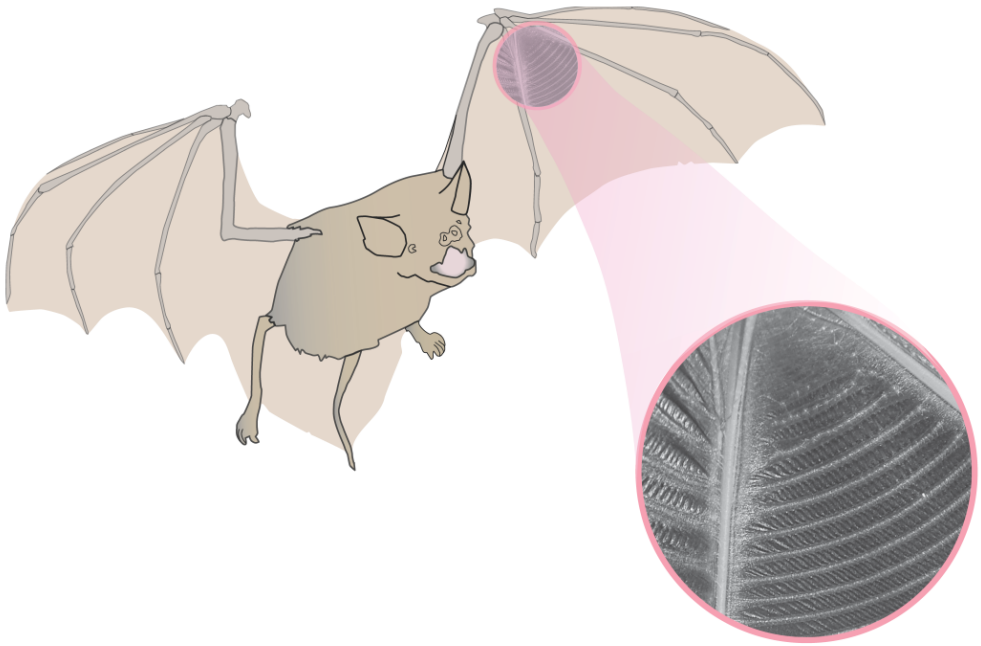
Biomimicry is the application of functional, organizational and chemical phenomena from organisms in manufactured products. Victor Papanek referred to this approach as bionics.

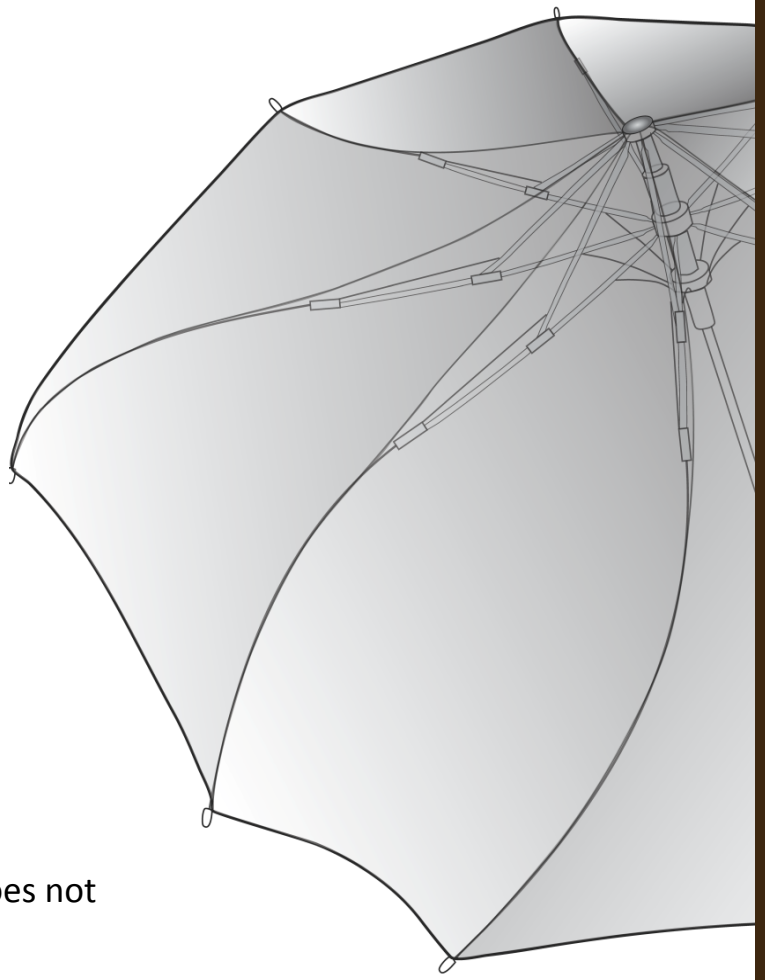


Hooked seed structures inspired Velcro.

The low surface drag of boxfish inspire an efficient automobile design.

Mimic Biological Systems





The bat-wing umbrella adapts the mechanical and geometric characteristics of a bat wing to configure an umbrella that does not invert in strong wind.

Design by Clint Penick, biology student at Arizona State University.

Mimic Biological Systems

The complex process of applying biomimicry requires highly specialized knowledge about biology.

It demands that designers either invest considerable time studying biotic processes, work with biologists, or both.

Designers can visit the website, *ask nature*: http://asknature.org/

Design for Carbon Neutral Energy

Designers can reduce global warming gases in three primary ways:

- **Actively develop and use climate-neutral energy sources**
- **Design products and systems for minimal energy demands**
- **Design products, systems and services that encourage low energy-consumption behavior**

Design for Carbon Neutral Energy

Actively develop and use climate-neutral energy sources:

Low-carbon energy technologies
(typically also renewable energy sources):
wind energy, photovoltaics, solar thermal, geothermal energy, nuclear fission electricity (nuclear energy has other ecological and social risks)

Not climate neutral:
fossil fuels (petroleum, natural gas, coal), hydrogen from fossil fuels, ethanol from corn or sugarcane

Yet to be fully developed (with other pollution types):
methanol from non-irrigated grass, wood, or other plant cellulose

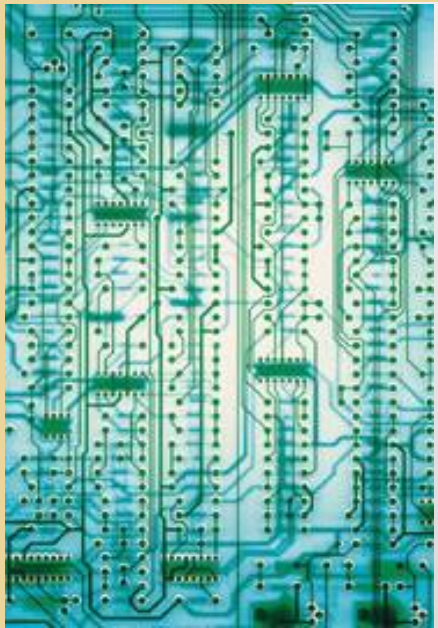
Design for Carbon Neutral Energy

Design products and systems for minimal energy demands:

Automatically shut off products when not in use

Use components with the most energy efficient available technologies

high efficiency circuits



automatic shut off switches

LED lamps

Design for Carbon Neutral Energy

Design products, systems and services that encourage low energy-consumption behavior:

Designers can support users to take a range of actions ~~that do not reduce convenience,~~ including:

- Drive cars with more than 40 mpg
- Avoid unnecessary plane flights
- Buy energy-star appliances
- Use led lamps

We can also support laws and regulations, such as automobile CAFÉ standards, that require lower CO_2 emitting technologies be developed and used.

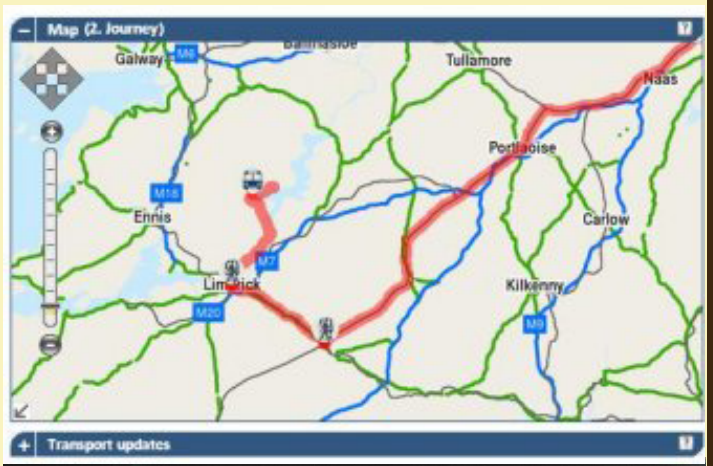
Encourage Low-Consumption Behavior

Guiding users to new, lower-impacting behaviors is a critical ecodesign skill. People make some decisions based on deliberate rational choices, however many decisions are based on quick instinctual cues.

Increasingly, digital technology can give detailed feedback that supports more environmentally responsible decisions.

For instance, online services inform a user how to most quickly connect public transportation systems to reach their destination.

On-board car feedback can inform the driver when fuel is wasted. This teaches fuel-efficient driving behavior.



Encourage Low-Consumption Behavior

For a target behavior to occur, B. Fogg suggests that a person must have "*sufficient motivation, sufficient ability and an effective trigger*".

If the product offers a reward, the potential to change behavior increases significantly.

A reward can take many forms:

- **earned app model points**
- **sensory pleasure: music or images**
- **financial remuneration**
- **the satisfaction of helping others**

An electricity meter listing "solar input" alongside other data subtly "triggers", the idea to install photovoltaic panels.

Design for System Longevity

The “Design for System Longevity” category encompasses a variety of strategies.

These strategies a help us design products that people want to keep much longer than products currently are kept. Several approaches can assist in this process.

Why we throw things away

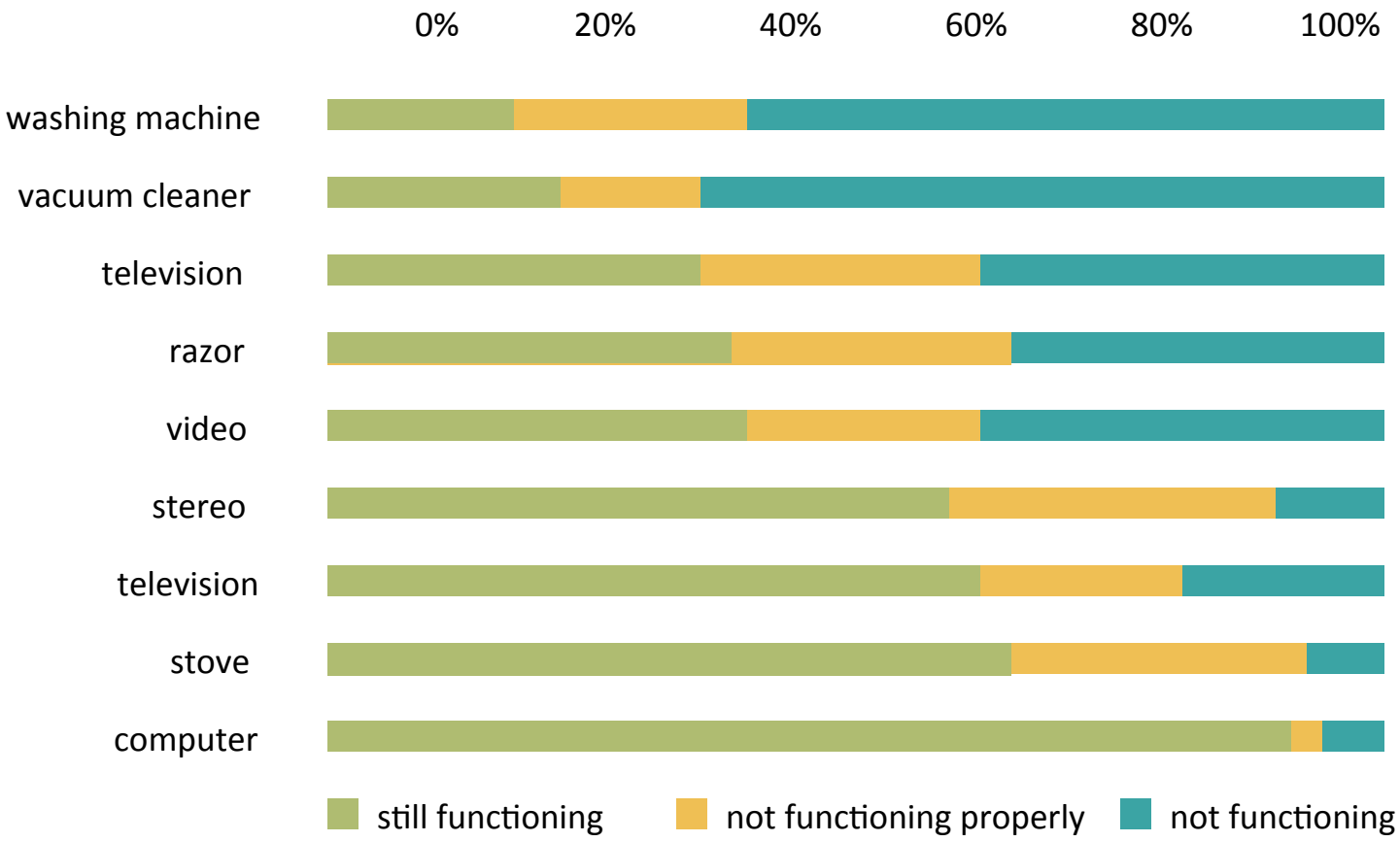


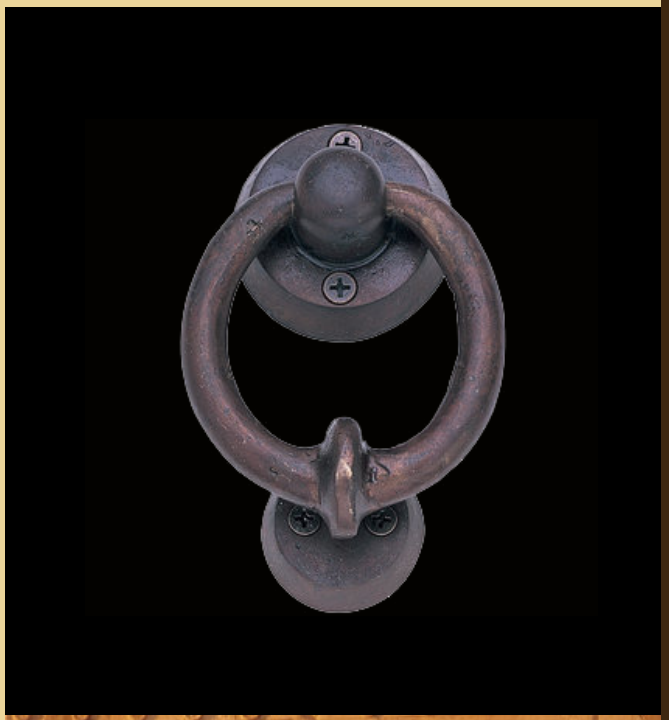
Chart courtesy of the Eternally Yours Foundation, 1999

Understanding why we throw things away is valuable. Loss of functionality is often only part of the reason for product disposal.

Design for System Longevity

Durable material quality encourages people to connect to a product.

Products made from materials that age gracefully (such as wood, stone or some metals) are more likely to be appreciated and kept than products made from materials that age quickly (such plastics that are easily scratched and nearly impossible to restore).



Bronze door knocker with the patina of age

Architecture made from stone ages gracefully.
(Caryatides at the Acropolis, Athens)

Design for System Longevity

Layered product functions can increase how long people keep a product.

Layered functions can increase the user's memories and attachment to the object, with several incarnations over a period of years.

Example: This kitchen table supports different use scenarios as a family matures (the play space scenario is shown).

Design for System Longevity

Sales and service support product longevity.

Shifting emphasis from just selling products to maintaining products through the customer relationship also changes the way we think about design.

Emerging Strategies

Provide Product as Service

Mimic Biological Systems

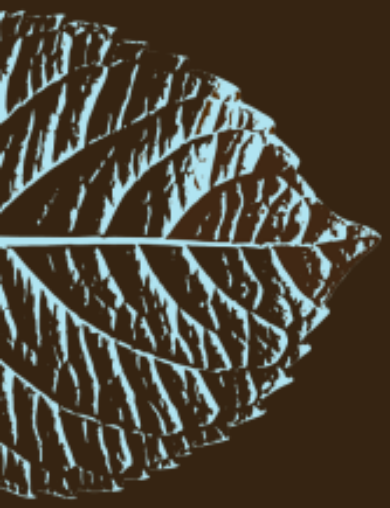
Carbon-Neutral Energy

Encourage Low-Consumption Behavior

Design for System Longevity

Regardless whether you apply these or other ecodesign strategies in a project, before making environmental claims about the design concept, you should determine whether the new product concept creates lower impacts than competing products.

Determining this is best accomplished through an objective method such as Okala Impact Factors, described in chapters 10, 11 and 12.



Okala Practitioner

Integrating Ecological Design

This presentation is part of an educational presentation series that supports teaching from the *Okala Practitioner* guide.

Okala Practitioner and these presentations were created by the Okala Team to disseminate fact-based knowledge about ecological design to the design disciplines and business.

Unless provided in the presentations, Information sources are found in the *Okala Practitioner* guide.

The Okala Team:

Philip White IDSA	Associate Professor, Arizona State University
Louise St. Pierre	Associate Professor, Emily Carr University of Art + Design
Steve Belletire IDSA	Professor, Southern Illinois University Carbondale

The Okala Team initiated the collaboration with the US EPA and the Industrial Designers Society of America (IDSA) in 2003. The team developed Okala Practitioner with support from Autodesk, IBM, Eastman Chemical and the IDSA Ecodesign Section.

Okala Practitioner is available through amazon.com. Background information and the free Okala Ecodesign Strategy App can be found at Okala.net