

How does nature run a sustainable supply chain?

Supply Chain

Businesses use the term “supply chain” to refer to the series of steps – the links in the chain -- involved in the production, delivery, and sale of a product or service to a customer. The term “value chain” has been added to business language to capture the idea that value accumulates as resources flow down the chain.

Both terms describe a linear one-way path that begins with raw materials and ends with sale to the consumer. The idea of a chain implies a series of links, each of which interacts with only the links immediately before or after itself, but as in a chain, the stresses and strains within and between each link affect the whole chain. Each link in the chain represents a relationship between supplier and buyer where each strives to minimize costs for incoming resources (information or materials), minimize internal processing costs, and maximize revenue for outgoing resources. These relationships are typically competitive and adversarial, and are not designed to optimize resources of the entire system. Each link is vulnerable to disturbances to links in the chain that are beyond their one-way business relationships.



<http://cabletechsupply.com/Photos/chain/chain%201.jpg>

Ecosystem

As in business, there are constant flows and exchanges of resources in nature: water, energy, materials, nutrients, information. Terms like “dog-eat-dog” or “pecking order” suggest that nature’s supply chains function primarily via top-down competition, like business. In nature, however, competition is only one of many types of relationships that operate within the dynamic interconnected interdependent web of systems and flows that make up an ecosystem.

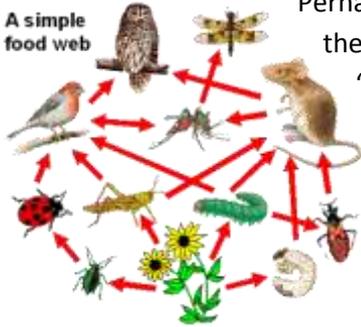
Relationships in nature have evolved to optimize benefits to the individual organism and the species while simultaneously supporting the ecosystem in which it lives. An organism will benefit the system in the process of striving to benefit itself, its family, or its species.

Nature’s relationships are also dynamic – two organisms can have many different types of relationships, even at the same time. If you look at two trees side by side in a forest, they are clearly competing for exactly the same resources in the same location, yet the trees have evolved to live together collaboratively in the forest. The benefits of symbiosis or mutualism, where each organism benefits from the existence of the other, outweigh the cost of competition.



http://upload.wikimedia.org/wikipedia/commons/6/6b/Forest_ialoveni.jpg

A simple food web



Perhaps the most obvious model for a “sustainable supply chain” in nature is the food web. As in business terminology, ecologists have replaced term “food chain” with “food web” to capture the idea that resources flow in many different directions within an ecosystem. It also captures the idea that resources are endlessly flowing through a series of transformations within an interconnected interdependent system of organisms. Each step creates value to the organisms involved while generating benefits to the system

http://www.cals.ncsu.edu/course/ent425/images/tutorials/ecology/trophic_levels/foodweb.gif

Business shaped by nature

Businesses shaped by nature benefit the ecosystem while creating value for themselves, and also benefit themselves while focusing on creating value for the ecosystem. They do not limit themselves and others to fixed roles and one-way relationships between adjacent links in a supply chain, nor do they try to control the entire chain (vertical monopoly). Instead they work to create and support a business ecosystem comprised optimized dynamic responsive relationships based on mutualism and symbiosis alongside healthy competition. The result is a vibrant resilient business that supports and is supported by a vibrant resilient business ecosystem.



<http://samplekickz.files.wordpress.com/2007/0>

A logical extension of your supply chain that moves towards creating a business ecosystem is to make the customer an active part of your supply chain. Nike is a global leader in the design of an expansive variety of sports clothing and equipment. Although well known for fantastic and progressive design, Nike realized that best design is tailored to each customer. Personalized design is too expensive for their customer base– unless the customer becomes part of the design team. Nike created NikeiD to allow customers to design their own shoes online, specifying colors, style, fit, and materials. The customer gets the perfect Nike shoe and Nike gets market feedback and new design ideas.

Another step towards creating a business ecosystem, and to reap benefits from sustainability, is to make the natural ecosystem part of your business ecosystem (and vice-versa). In nature, everything is able to constantly cycle and recycle in never ending value chains because all natural materials are made up of a very few molecules (primarily C, H, O, and N), thus everything is made up of interchangeable parts. Everything that is manufactured in nature can be broken down or decomposed or otherwise transformed and made into something else: waste is food.

The [Able Project](#), nicknamed 'From Cardboard to Caviar' was started as a work rehabilitation project for recovering heroine addicts, and has evolved into a business ecosystem that generates constant revenue from upcycling cardboard into caviar. How it works: Cardboard



<http://www.treehugger.com/system-design-ABLE.jpg>

from restaurants and shops is shredded and sold as horse bedding. The soiled horse bedding is picked up and composted in a worm farm. The compost is sold to gardeners, the extra worms are fed to the fish farm where caviar is produced, and the caviar is sold back to the restaurants where the cardboard was collected. (adapted from: <http://www.treehugger.com/files/2008/10/biomimicry-design-systems.php> accessed 3 Aug 2010)

To meet the challenges businesses are facing, Biomimicry for Creative Innovation (BCI) and The Royal Botanic Gardens Kew (RBG Kew) have formed a unique partnership focused at helping organisations adapt to a more sustainable future, as 'Business Shaped By Nature'.

To find out more about how nature can help your organisation develop a culture that fosters creativity and co-operation please contact Biomimicry for Creative Innovation (BCI) or The Innovation Centre at the Royal Botanic Gardens, Kew.

To learn more, visit our websites:

BCI: <http://biomimicry-bci.squarespace.com/>

Kew: <http://www.kew.org/news/kew-blogs/business-shaped-by-nature-about-us.htm>



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