



Innovation: Survival of the fittest

By Charles Leadbeater

The best way for large organizations to work through the dilemmas posed by innovation is to borrow from the most powerful innovative force in the world: biological evolution.

Not surprisingly, many established companies, comfortable with a slower pace of change, regard the search for innovation as highly unsettling. Executives usually claim they want their lumbering, inward-looking organizations to become fleet-footed, imaginative and entrepreneurial; they just do not know how to make it happen. And to complicate matters further, they often have little incentive to change because their companies are built around profitable product lines.

These executives recognize that incremental innovation is not enough, yet they fear that radical innovation is too risky. What can be done?

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world: biological evolution. Companies should design a process of evolutionary innovation from within by using nine principles borrowed from biology as a guide.

Principle One: Diversity

One of the ways biological diversity is produced is by random genetic mutation. In business, innovative companies create diverse portfolios of ideas and knowledge sources.

Companies should begin the process by unlocking internal sources of new thinking. Shell does this by helping employees develop and present proposals for potential funding within the company at special “ideas fairs.” 3M is famous for encouraging employees to spend 15 percent of their time developing their own ideas.

Ideas can also come from outside sources—customers, suppliers, competitors, potential partners, educational institutions and others. Even companies with strong cultures that

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discourage seeking and acquiring ideas from outside should create “knowledge supply networks” to complement internal sources and provide intellectual support for both existing and future capabilities.

The revival of the US semiconductor industry in the 1990s was partly driven by its creation of an intelligence network at university laboratories, through which companies recruited bright students. These young turks brought radical ideas into the heart of corporate development programs.

In this context, high employee turnover is not a bad thing. Indeed, the most innovative US companies in this industry had a far higher rate of turnover of bright young people than their Japanese and Korean counterparts with lifetime employment contracts. Those companies with low employee turnover risked missing opportunities to bring in new ideas.

Principle Two: Selection

In biology, a process of natural selection identifies the more effective genetic mutations. In business, competition is the ultimate arbiter of effectiveness.

However, within many organizations, the criteria for evaluating new business proposals are often opaque at best and at worst are designed to preserve existing routines and reinforce past success. Innovative companies, on the other hand, have open selection criteria in which promising ideas attract resources, just as promising entrepreneurs in Silicon Valley attract venture capitalists.

Knowledge only advances if good ideas are selected and poor ideas are rejected. Moreover, people must feel confident enough to propose a new idea, and they should not feel demoralized if their ideas are turned down. Selection procedures need to reward

good efforts as well as good proposals, to encourage people to come forward again.

Principle Three: Perpetuation

Once selected, a good idea has to spread to perpetuate itself. It will not succeed if it is trapped in a narrow niche. Biological evolution’s mechanism for perpetuation is reproduction—the genetic transmission of inherited characteristics over many generations. Successful species are good at reproducing. A business organization passes on the equivalent of its genetic code in a far less exciting way: by turning a good idea into a new product, process or routine.

That is how new ideas become embedded in organizational knowledge so they continue even when the originators have moved on. Companies may have to appoint technology integrators, service producers and new-product drivers to take this process of perpetuation forward.

Principle Four: Co-evolution

A species will succeed only if it is fit for the environment in which it must survive. Companies also co-evolve with their environment—the markets they compete in, the people they recruit, their partners and suppliers.

Companies that can shape their environment enhance their ability to evolve successfully. Innovative companies seek environments that encourage innovation.

A good example of corporate co-evolution is the way that companies set standards in global industries. Matsushita adopted a policy of co-evolution with partners to establish VHS as the standard for video. It licensed VHS technology freely to other consumer electronics companies, which widened the initial distribution of the technology, co-opted competitors that



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may have been developing their own products and sent a positive signal to suppliers of complementary products.

The company also helped generate a sense of momentum for VHS, which became the industry standard because it co-evolved through Matsushita and its partners.

In Internet services, many companies are trying to co-evolve with their consumers through open-source software that consumers can help devise and upgrade. An innovative company needs to co-evolve with early adopters and leading-edge niche markets, as well as with profitable established markets.

Principle Five: Unlearning

If a species is too rigid in its behavior and cannot adapt, it will die out when its environment changes. According to one theory, this fate befell many dinosaurs as the earth cooled.

Successful companies develop strong routines and processes, and reinforce them with investment and praise. When the environment suddenly changes, these companies find it hard to adapt because they have been so successful in the past. Core strengths quickly become core rigidities in a rapidly changing environment.

Often the obstacle to innovation is a company's inability to discard the routines, product lines, relationships and assumptions that made it successful in the past. Xerox was slow to respond to the threat of low-cost Japanese plain-paper copiers because it was apprehensive about cannibalizing the profits from its high-volume copiers.

Companies must be prepared to initiate "unlearning programs" to expose the tacit assumptions that underpin their business models. That need often means exposing corporate conventional wisdom to skeptical questioning from younger staff or outsiders.

Principle Six: Disruption

Biological explosions, such as the appearance of multicell organisms in the Cambrian Period 540 million years ago, have taken place in environments with climates in transition. The same is true in business: Long periods of incremental change can give way to explosions of intense innovation caused by complementary changes in competitive pressures, technology and regulation. That is why companies need to be hybrids, capable of continual incremental innovation but also radical reinvention.

Standard Life, a British insurance company, was able to move swiftly

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into electronic banking by creating a stand-alone unit with its own management, culture and style. As a result, it is now one of the fastest-growing retail banks in the United Kingdom.

British Airways is trying to pull off the same trick with Go, its low-cost European airline, which it is developing as a sub-brand. Dixons, the leading British consumer electronics retailer, created Freeserve, the country's largest Internet service provider, by fostering an atmosphere in which radical innovation could flourish. It was valued at about £1.5 billion (\$2.4 billion) at its initial public offering in July 1999.

Principle Seven: Simplicity

Species that survive tend to have simple designs. For instance, to prevent an animal from going around in circles, the left and right sides of its body are mirror images. This simple rule of design precludes unsustainable mutations that are inefficient and elaborate.

Successful companies seem to follow simple rules and embody clear values that allow people the scope for entrepreneurship and innovation. Some of the most innovative companies—Cisco, Sybase, Science Applications International—are modular. They are made up of self-managing units, operating with considerable discretion but within clear parameters, like policies for capital investment.

These simple rules impose a basic shape on the company but encourage self-management and motivation within a decentralized organization.

Principle Eight: Spare capacity

One of Charles Darwin's most important arguments was that successful organisms have spare capacity. Evolution is only possible because successful organisms—as well as

organizations—are not perfectly specialized machines. They bristle with multiple possibilities.

If animals were perfectly developed, with each limb or organ doing one thing and one thing perfectly, then successful evolution would be next to impossible. Change in one feature would automatically destabilize the entire finely tuned organism because no other part could compensate or take up the strain. Perfection does not work in business either. In other words, evolution offers little support for business-process reengineering taken to the extreme.

Principle Nine: Timing

Evolution teaches us that timing plays a vital role in bringing out the value of apparently superfluous characteristics. Evolution is full of stories of organisms with features that developed for one purpose but eventually found another, even richer, role. Feathers, for example, may have first evolved from reptile scales as a superior form of heat insulation. Only later did feathers come into their own to allow fast-running reptiles to become birds.

A business created for one purpose can take on a different life at a later date in a changed environment.

The British company Centrica was formed in 1997 from the restructuring of the former British Gas, until 1986 a state-owned monopoly. The business it inherited was the supply of gas to domestic, industrial and chemical customers. But now Centrica is becoming a major player in electricity supply and is rebranding itself as a one-stop shop for domestic services, ranging from heating and plumbing to repairing appliances, televisions and cars. Skills and technology developed for the deregulated gas market are being made more

valuable by deploying them across a wider range of markets.

Innovation can be daunting, especially viewed from within a large corporation. But it can become more comprehensible and manageable viewed from an evolutionary perspective.

Not every insight from evolution can be carried over into business, of course. The Cambrian explosion may have been no more than a *whoosh* in geological time—but that means it took several million years to unfold. And when it comes to innovation, time, even on a more modest scale, is a luxury most corporations do not have. ■

About the author:

Charles Leadbeater is an author and independent consultant. He drafted the British government's white paper on the future of the economy—"Our Competitive Future: Building the Knowledge-Driven Economy"—which was published in December 1998. Leadbeater is also a member of the government's Competitive-ness Council and an advisor to Prime Minister Tony Blair's Downing Street policy unit. His latest book, *Living on Thin Air*, examines the role of entrepreneurship and innovation in the global economy. A former editor at the *Financial Times* and *The Independent*, Leadbeater studied politics, philosophy and economics at Balliol College, Oxford.

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