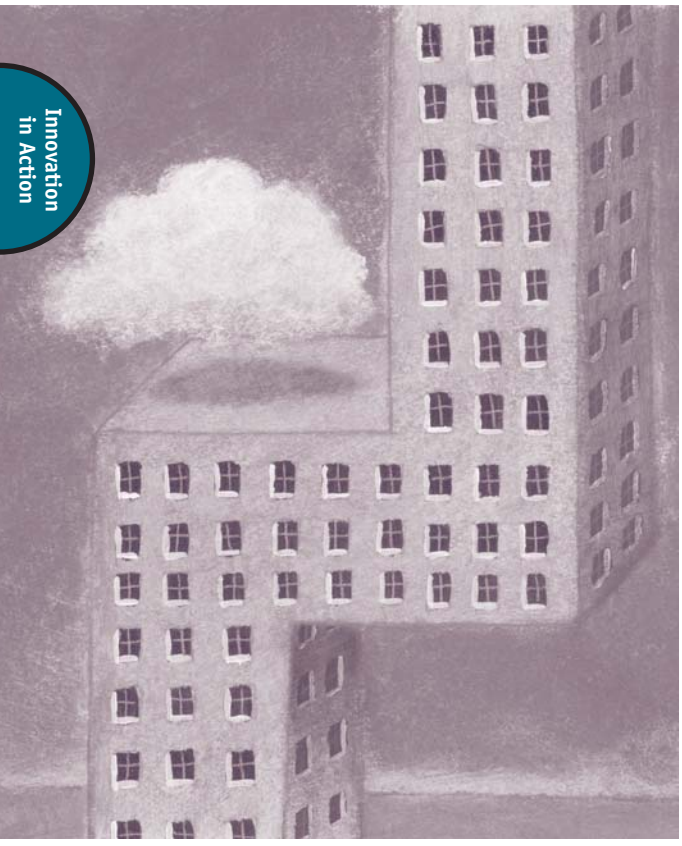
Johanna Woll

NOT ALL ADAPTIVE ENTERPRISES ARE ALIKE



Innovation in Action

The following article was adapted from material contained in the forthcoming book, It's Alive: The Coming Convergence of Information, Biology, and Business, *by Christopher Meyer and Stan Davis (Crown Business, Spring 2003).*

Veterans of the fashion industry have mastered the art of keeping up with the unpredictable whims of cultural trend-setters. Haute couture and mass-market designers alike are accustomed to changing their collections frequently and look for ways to surprise and entice consumers whose appetite for novelty sometimes seems insatiable. Operating in an environment of instability and continuous change, fashion houses have had to create organizations that are primed for adaptive response.

Where else, beyond the predictably transient fashion industry, might you look for an adaptive enterprise? We might expect to find one anyplace where change is frequent yet unpredictable . . . which in today's global economy means nearly everywhere.

But we can't expect that all adaptive enterprises will look the same. A company's mode of adapting to change is context-specific. Each industry environment changes at a unique rate and presents a different combination of opportunities and threats. Yet the forces propelling organizations toward the adaptive enterprise model are universal: accelerating rates of change and an increasingly volatile overall economic environment. As our global economy becomes more densely connected, we are less able to predetermine outcomes. We can no longer assume one-to-one relationships between cause and effect. Becoming an adaptive enterprise means abandoning our management habits of prediction and control and developing instead the capacity to respond to change.

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Johanna Woll is a manager at the Cap Gemini Ernst & Young Center for Business Innovation. Johanna has led the research for and managed the publication of *It's Alive: The Coming Convergence of Information, Biology, and Business* co-written by Christopher Meyer and Stan Davis. She is currently studying how newly developed capabilities in the molecular sciences and nanotechnology will increasingly become key sources of economic value creation, and how developments in neuroscience and cognitive science may help us understand and influence employee, consumer, and investor behavior.

Understanding the Accelerating Rate of Change . . ., pg. 55

Embracing Evolution . . ., pg. 7

> "Becoming an adaptive enterprise means *abandoning our management habits* of prediction and control and developing instead *the capacity to respond to change.*"

Amid a global economy where enterprises are becoming larger, more complex, and more geographically dispersed, adaptive enterprises are creating corporate cultures that emphasize a core set of behavioral rules that enable collaboration, useful experimentation, and decentralized decision-making. Adaptive enterprises are building capabilities that allow them to sense and respond to changes in their environment—letting feedback from the marketplace direct strategic decisions or using feedback from the marketplace to select and improve product designs.

In *It's Alive: The Coming Convergence of Information, Biology, and Business*, authors Christopher Meyer and Stan Davis have profiled four very different organizations each following an adaptive regime—petrochemicals giant, BP; the United States Marine Corps; Maxygen, a small biotech company; and Capital One Financial, the nation's sixth-largest issuer of credit cards. Together, these organizations demonstrate how the adaptive enterprise model suits companies of many sizes, at various stages of maturity, in many sectors of the economy.

Capital One

While working at Signet Bank in the early 1990s, Capital One founders Rich Fairbank and Nigel Morris realized that low-cost information technology could transform the credit card industry. They recognized that interest rates and customer desires were changing faster than anyone in the business was responding, so they focused their energies on developing the adaptive capabilities that would fill that gap. Morris and Fairbank were on to something far too innovative for an established bank, where credit decision-making had always been done by people making informed, but subjective, judgments. Fairbank and Morris proposed replacing those people with computer algorithms for data-mining—an approach they called "information-based strategy" (IBS). In 1994, they spun out to pursue their vision. They were creating a totally new way to run a business, discovering the rules of the adaptive enterprise as they went along.

By using a "test-and-learn" approach that combines detailed information about customers and disciplined analysis, Capital One can target market segments with great accuracy and maintain a highly flexible product development process. The modularity of IBS means that Capital One can recombine variables in countless ways to create mass-customized offers that suit the lifestyles, demographics, and credit risk profiles of each credit card applicant. Since product variables—such as annual fee, credit limit, and annual per- centage rate—and customer variables—such as payment history, average monthly balance, and usage habits—are represented as binary data embedded in a computer model, it's easy to change an offer, especially compared to other industries. The company knows very well that every offer it tests, win or lose, represents an opportunity to elicit feedback from the marketplace.

"We are a test-and-learn culture" echoes through many aspects of Capital One's business, including

The behavior of these four different organizations demonstrates that the adaptive enterprise model is applicable and useful in multiple contexts. Themes common to each case study include the establishing of core behavior rules, frequent experimentation, decentralized decision-making, and an explicit directive to sense and respond to changes in each of their environments. While the path to the adaptive enterprise is different for each company, they share a common endpoint—prosperity amid increasing volatility.

article abstract

recruiting and performance evaluation. As CEO Rich Fairbank describes, "We have taken our entire recruiting process and used IBS in it. How you recruit people is linked back to who tested them and what tests were used. We track this information, then link it to later performance. It's exactly like soliciting a credit card customer."

Capital One also makes a habit of hiring without defining a specific role in the organization. After completing training programs designed to teach them a few simple rules that will govern their decision-making, employees are given areas of responsibility and empowered to innovate, rather than being assigned rigid roles and job titles. This means crossing boundaries, changing jobs, and forming new teams to meet evolving needs.

Capital One also separates outcome from behavior and balances these factors when evaluating performance. Employees have permission to fail—there are no negative repercussions for trying something that doesn't work, as long as they behave according to the rules. Fairbank often asks staff to share their failing experiences so that others can learn. In doing so, not only does he reinforce the organization's test-and-learn culture and tolerance of risk and failure, he sets expectations and helps revise best practices.

Fairbank explains: "The key thing is they're learning. I think that in many ways, failure is a better teacher than success. Our organization tries to institutionalize learning so that we don't make the same mistakes. Failure is not great, but learning is, and allowing people to take risks."

Fairbank and Morris have focused their efforts on creating a company whose staff can not only learn from failed tests, but can also adapt to the new demands of an unpredictable economy. Capital One was "built to withstand stormy weather. Knowing that no one can accurately predict when a recession will occur, we assume a recession from the beginning . . . Marketing and operations are, by design, highly flexible, allowing for quick response to opportunity and change."[1]

United States Marine Corps

Dealing with an unpredictable environment is the United States Marine Corps' stock in trade. For the Marines, an adaptive response is the only response, and over the years they have evolved procedures that better conform to the pressures they face. Once perceived as the archetypical hierarchical organization, the United States Marine Corps dispensed with conventional command and control long ago. Established in 1775 as a ship-borne service skilled in amphibious landings, the Marines have, in modern times, responded to a changing threat and become "an agile force in readiness prepared to respond to an infinite array of contingencies spanning the entire spectrum of conflict."[2]

Since the mid-'90s, the U.S. Marines have been developing a program called Project Albert (as in Einstein), which includes sophisticated computer models that commanders can use to explore three fundamental

phenomena of warfare: nonlinear outcomes, co-evolving threats, and intangible behavioral dynamics. Project Albert's models capture complex battle situations and can be run millions of times to test a vast landscape of possibilities, and can reveal counter-intuitive consequences that could never have been discovered on a "real-world" battlefield until it was too late.

Commanders can model their forces' capabilities—how far and straight a Marine can shoot, how far his walkie-talkie can communicate, how fast he can move—and study the impact of intangible human factors such as courage, fear, determination, and trust, which are themselves intrinsically unpredictable. Intangible factors are captured in equations that approximate human behaviors. For example, the model might represent courage as a soldier's (probabilistic) propensity to continue advancing when fired upon. These digital proxies help commanders identify tactics and characteristics that are most likely to lead to success, or failure. The information derived from in silico testing contributes to the Corps' decisions about procurement and training.

General Paul Van Riper, who recently retired after 41 years of service in the Marines and is now a senior fellow at the Center for Naval Analyses, tells us, "It's an oxymoron to think of managing a battle. A battle has its own dynamics, and because it's nonlinear, it's going to unfold in its own way. There's no way to predict the outcome."

To meet the challenge of today's inherently nonlinear warfare, the Marines are focusing on establishing key tactical principles for their fighting forces, which will equip them to adapt to changing conditions and to organize and direct themselves when there's no commander around to tell them what to do.

In the new Marine lexicon, the most important factors in determining outcomes are not guts and glory but the right rules of engagement. Accordingly, they have modified their entire high-level doctrine to allow their 174,000 people to adapt and thrive in a rapidly changing environment by sensing and responding, learning and adapting.

"In fact, we've been trying to bring about a subtle change in the language we use," Van Riper says. "Rather than speaking in terms of operating—as in 'it's my job to operate this bulldozer or this plane and I'm awaiting orders on how to do that'—we'd like our Marines to speak in terms of adapting to a situation as it evolves." This represents a fundamental shift in the military's vision of combat operations, one based on "shared awareness, increased speed of command, and higher tempo of operations," worthy goals for a private enterprise as well.[3]

BP

Entering the world headquarters of BP, formerly British Petroleum, the United States Marine Corps is one of the last things that comes to mind. Yet Lord John Browne, director and CEO of the energy giant, is fighting the same war as General Van Riper: develop-

Figure 1 Adaptive Strategies at Four Leading Organizations

Source: Cap Gemini Ernst & Young Center for Business Innovation

	Sector	Adaptive Strategy	Adaptive Operations	Adaptive Organization
Capital One	Financial services	Test and learn	Scientific testing and market feedback	Rules include permission to fail
USMC	Public/government	Network-centric warfare	Project Albert	Instilling tactical principles in soldiers
BP	Oil & gas, chemicals	Anticipating change in product-market mix	Internal trading group	Atomic structure with consonant set of behavioral rules
Maxygen	Biotechnology	Planned opportunism	Directed molecular evolution technology	Permeable corporate boundaries

ing the organizational capacity to respond to permanent volatility better than his competitors. He has accepted that volatility is a permanent factor affecting his business and he is looking for ways to make volatility BP's friend, not its enemy.

Like the U.S. Marines, Lord Browne has come to recognize the same irreversible shift that marks the connected world of the 21st century. "As we've grown in scope and scale and become more global, I think we've begun to realize that instability is the norm not the exception—and that we have to adapt to that reality without sacrificing performance."

Most oil companies don't like change, let alone volatility. Their strategies emphasize global stability in an environment that changes at a tectonic pace. Browne, however, is keenly aware of the industry's instability and is guiding BP toward a strategy that seeks not to eliminate volatility, but to thrive in spite of it.

Though Browne believes that the industry "will be dominated by oil and gas for the next 30 to 50 years," he is thinking today about the industry's evolution, and he's preparing BP to lead the way.[4] BP is developing a portfolio of product options, which will still include petroleum-based fuels, but also renewable sources of energy such as hydrogen and solar power. All major oil companies are focusing on these new products to some extent, but BP is the most aggressive about being "green," about co-evolving with changes in the marketplace, and its leadership genuinely believes that by pursuing this strategy, BP can beat its competitors in the long term—through innovation and first-mover advantage.

After a series of acquisitions and mergers, which nearly tripled BP in size over the past four years, Browne realized that he needed to devolve BP's organizational structure so that its 150 business units scattered across 80 countries could operate more independently.

Developing the capacity to respond, BP's evolution meant, initially, creating stronger coordinating mechanisms at the core of the business and enabling business unit leaders to make on-the-spot decisions, aligned with overall corporate strategy. So, Browne summoned his top management team to London headquarters and focused on instilling in them the behavioral rules they would need to guide themselves in their decision-making. Once they were equipped with an understanding of BP's culture and new direction, they returned to their regions to run their operations—and their own P&Ls—with a great deal of autonomy.

In 2001, you might have thought Browne's emphasis on addressing volatility premature; by 2004, you may find it prescient. Because of its greater capacity to respond, BP should be positioned to seize opportunities presented by change. "You have to think about the company today," Browne says, "because you've made commitments, you've set expectations. But that's only part of the story, because you're actually thinking about the company over a period of years.

"*By using the techniques of nature*

rather than those of chemical engineers,

Maxygen is reducing the cost of producing

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by orders of magnitude."

And by definition, over a period of years, you will evolve. You must. Otherwise you will die."

Maxygen

Maxygen, based in Mountain View, Calif., is one of a handful of biotech start-ups pioneering "directed molecular evolution technology," a process that involves building on nature's ability to innovate. Staffed with Ph.D.s in molecular biology, Maxygen doesn't have to learn about being adaptive. It was born that way.

Spun off in 1996 from Affymax Research Institute, a subsidiary of what was then GlaxoWellcome, Maxygen was born into the unpredictable environment of a nascent molecular economy, where the frequency and speed of change—of access to capital, of technological breakthroughs and breakdowns—makes adaptation indispensable for survival.

The Maxygen scientific platform is based on what dog breeders and farmers have been doing for millennia. Our ancestors, with no precise understanding of the underlying scientific mechanisms, "redirected" the evolution of the European gray wolf to produce more than 200 breeds of domesticated canines.

Maxygen founder Pim Stemmer came up with a high-tech version of the same idea. Stemmer and his team employed the natural process of genetic recombination, concentrated in time, to identify biological molecules that might prove useful in commercial applications, such as agriculture, pharmaceuticals, and specialty chemicals.

Researchers at Maxygen have an outcome in mind, but they make no a priori assumptions about how it will be achieved. Moreover, they don't really care. "You don't need to understand something in its mechanistic basis before you improve it," CEO Russell Howard explains. "There's no 'human genome project' working on the breeding of Valentine's Day roses. They are boldly engineered by people who do not have degrees in molecular biology. You can breed for success by defining criteria, taking the appropriate genetic material, and then applying this algorithm of recombination." Maxygen breeds a population of molecules, using their DNAShuffling technology, then screens these to select those that perform the best, breed again, and so on. Rather than trying to engineer an outcome, they let the results emerge.

This represents a radical departure from the traditional approach to researching and developing drugs. Rational drug design, as its name suggests, involves knowing in advance what you are trying to create and progressing toward that goal in sequential, incremental steps. By using the techniques of nature rather than those of chemical engineers, Maxygen is reducing the costs of producing some highly desirable molecules by orders of magnitude. Howard explained, "A single enzyme can replace 10 chemical steps. The complexity, the time, the cost of the infrastructure is all dramatically reduced." And Maxygen has mastered a technique for breeding these kinds of enzymes.

Maxygen's business model resembles its evolutionary scientific platform. During the early phases of the

Research Roundup, pg. 92

company's development, management deliberately remained very opportunistic and reactionary. Rather than setting out to capture a particular market, they let the market decide where their scientific capabilities should be applied. Rather than staking a claim in a single market, Maxygen's leaders are placing their bets on a long line of technological developments and the multiple product options that will emerge from these. They know that they have a business model and core technology that are highly adaptive, and they have deliberately restrained themselves from focusing their attentions on specific objectives prematurely. They refer to their strategy as "planned opportunism," a term that evokes an enterprise poised to sense and respond.

These snapshots portray four very different organizations and a variety of adaptive capabilities, each corresponding to a particular climate. Common to all, however, are two characteristics. First, the ability to respond quickly and effectively to changes in external, or internal, conditions. Second, a management mindset that seeks not to predict and control, not to design and operate, but to create, connect, and evolve.

If your environment has not made you adaptive so far, should you set off down the path to become an adaptive enterprise? Absolutely. The way a company addresses volatility affects its performance in terms of both growth and market value. Companies in more volatile sectors of the economy may seek adaptive solutions more than others do—some companies may need to be adaptive all of the time, others only temporarily, to cope with a short-term challenge. Yet no matter the source or significance of volatility, the business imperative is the same: adapt or die.

1. Letter to Shareholders, 2001.
2. Freedman, David, *Corps Business* (Harper Business, 2000), xii.
3. Alberts, David S.; Garstka, John J.; and Stein, Frederick P., *Network Centric Warfare: Developing and Leveraging Information Superiority* (2nd Edition), DoD C4ISR Cooperative Research Program Washington, DC (1999).
4. Buck, Tobias; Buchan, David; Guha, Krishna; and McNulty, Sheila, "Oiling the Political Engine," *Financial Times*, August 1, 2002.