

*Our annual survey of emerging ideas considers the single most important trait of future leaders, the marketing potential of digitally split personalities, a challenge tougher than managing risk, and the best hope for oil-importing countries.*

## The HBR List

### Breakthrough Ideas for 2006

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## Breakthrough Ideas for 2006

Breakthroughs suggest new beginnings: the opening of avenues for inquiry and discovery. Every year *Harvard Business Review*, in conjunction with the World Economic Forum, scans diverse horizons for ideas that will launch provocative conversations in offices and boardrooms. What new skills are required of leaders in times of chaos and complexity? Which technologies promise to change our lives? Can we find novel solutions to the big, systemic problems that plague business and society?

These 20 ideas reflect the palette of concerns that will likely color managers' thinking in years ahead. They include intimations of both promise and peril. What they don't include are easy answers.

### **1. The Synthesizing Leader**

*Howard Gardner*

The ability to decide which data to heed, which to ignore, and how to organize and communicate information will be among the most important traits of business executives in this century.

### **2. Can I Hear Me Now?**

*Dan Williams*

Body area networks that can tell us things about our physiology—when our blood pressure is rising, when our blood sugar is falling, or when we're about to keel at the wheel—will help lower health care costs and improve public safety. Such networks give new meaning to the word "self-awareness."

### **3. China as a Green Lab\***

*William McDonough*

The urgency of China's environmental problems—including an overreliance on fossil fuels and water shortages in many cities—will open up vast markets for forward-looking energy and technology companies and will offer the world a seedbed for new types of ecologically intelligent products, services, and technologies.

### **4. Risk, Uncertainty, and Doubt\***

*Nitin Nohria and Thomas A. Stewart*

In the twentieth century, businesses concentrated on managing risk—developing assembly

lines, budget tools, and organizational structures that, to varying degrees, made transactions and processes predictable. In this century, businesses will need to tame two more-amorphous foes: uncertainty and doubt.

### **5. Battle of the Networks**

*Jeff Cares*

Companies are steadily mastering the art of networking their products, customers, and suppliers—some to the point of successfully locking out their more traditional rivals. The next challenge for these firms is to determine how to navigate network-to-network competition.

### **6. Science in the Wild\***

*Claire Craig*

More and more, scientists are extinguishing their Bunsen burners, flinging open their lab doors, and using the messy world outside as their petri dish. Corporate R&D departments could benefit from similar forays into the wild, using segments of the general population as test subjects or as amateur collaborators in helping to process hitherto unimagined quantities of data.

### **7. A Homestead Act for the Twenty-First Century**

*Ted Halstead*

What if every newborn in America received \$6,000 as seed money for college, a first house, or a business? The nation would spawn a mass investor class, with ever more citizens deriving their income from returns on financial holdings as well as from wages; there would be less need for a generous welfare state; and the interests of workers and business would be better aligned.

### **8. Customers Demand Their Slice of IP\***

*Georg von Krogh*

It used to be that your customer-collaborators were more than happy to leave their beta marks on your products or services; remuneration didn't matter. Now the novelty is wearing thin, and these enthusiasts are starting to ask, "What's in it for me?" How are you going to reward these people for their great ideas?

### **9. A Cartel for Oil Consumers\***

*Ged Davis*

As worldwide oil consumption begins to over-

take petroleum-producing nations' capacity to pump out black gold, governments may need to convene a controlling organization of petroleum-importing countries, or OPIC. Otherwise, regional groups and large states will pursue their own energy interests in a form of energy mercantilism—and that wouldn't serve anyone's interests.

### **10. Seeing the "Health" in Health Care Costs**

*Harris Allen and Sean Sullivan*

What company would willingly look for ways to increase its health care spending? Still, targeted investments in employees' health—covering the full cost of workers' diabetes or asthma drugs, for instance—can more than pay for themselves by reducing employees' treatment costs and improving workers' productivity.

### **11. Peer-to-Peer Leadership Development**

*Nancy M. Dixon*

When it comes to training your next-generation executives, do you wonder about the effectiveness of conventional methods, in which senior leaders impart general, sometimes outdated, principles to junior managers? A U.S. Army intranet site offers a new model for leadership development, one that has advantages over both formal corporate training programs and informal watercooler-based networking.

### **12. Unstick Your Customers**

*David Weinberger*

Physical stores are designed to "trap" customers—shepherding them past displays retailers want them to see on their way to the products they *really* want. But what if physical stores mirrored the Web's best practices for making information easily and always accessible? Customers would get out quickly with exactly what they needed, never forced to double back for forgotten items. The result would be increased loyalty.

### **13. Follow the Leader**

*Gerd Gigerenzer*

The types of choices you make influence your employees' decision-making tendencies—and, consequently, the corporate culture. Think carefully about what values your decisions communicate, and, if necessary, revise your personal rules of thumb to get the desired results.

#### [14. Wake Up and Smell the Performance Gap](#)

*Zachary Karabell*

The gap between the economic performance of nations and that of companies is growing wider every month, made worse by offshoring and advances in technology. Yet both sides continue to play by the rules for a level field. As a result, states overreach while companies harbor unrealistic expectations about what governments can do for them.

#### [15. The Avatar as Consumer](#)

*Paul Hemp*

Millions upon millions of people have created avatars, personalized representations of themselves that they use in an array of online environments. These alternative selves represent a whole new set of “customers” that marketers can analyze, segment, and sell to—both in the virtual worlds in which avatars live and in the real worlds of their creators.

#### [16. Befriending the Private Label](#)

*Phillip Parker*

In a variety of categories, including cellular phones, financial services, and packaged goods, suppliers are helping their retail customers become competitors through the retailers’ use of their own branded products. This stimulates more than just low-price competition: Many private-label brands created and supported by large manufacturers are of equal or superior value to the manufacturers’ regular brands.

#### [17. A Critical Mass for the Long Term](#)

*Judith Samuelson and Claire Preisser*

Hounded by pressure for short-term results, companies often find it tough to make the long-term decisions that are best for them. But while many CEOs fear bucking the status quo alone, a group of vanguard companies hopes, through its collective strength, to change the market’s orientation for good.

#### [18. The Costly Secret of China Sourcing](#)

*George Stalk, Jr.*

Many companies aren’t reaping the benefits they expected from sourcing their products in China. Physical, logistical, and political limitations—not to mention the inevitable supply chain bottlenecks—are making it difficult. To

combat these obstacles, organizations must think flexibly and act aggressively, even using rivals’ overseas-sourcing strategies against them.

#### [19. The Brain as Boondoggle](#)

*Michael S. Gazzaniga*

Despite the recent buzz around neuroscience, you aren’t going to be able to use brain scans to choose the “perfect” CEO or the R&D scientist with the most “Eureka!” potential. Not next year. Not the year after. Not in this lifetime. Hiring will still require insightful, nuanced reading of people, not biological data.

#### [20. Why They Call It Work](#)

*E.L. Kersten*

Employees should not demand that their companies imbue their lives with meaning. If people’s jobs are simply worth doing—that is, if the positions are commensurate with their skills, experiences, priorities, and goals—that should

\* Codeveloped by *Harvard Business Review* and the World Economic Forum



Harvard Business Review



be meaningful enough.

#### **Breakthrough Ideas for 2006**

When a group of 20 or so provocative thinkers on business, management, and economics got together last July at the World Economic Forum’s headquarters in Geneva to come up with a list of “breakthrough ideas,” people initially stopped to ponder the term. Must a breakthrough idea be enduring as well as earthshaking? Does it represent immediate or future opportunity? Is it defined as much by the way it is expressed as by what it is? Indeed, must it be a brand-new idea at all, or can it simply be one poised to break through from theory into practice?

Despite the variety of definitions offered up, a theme began to emerge from the discussion. A breakthrough idea is a springboard, not a perfect landing; a conversation provoker, not a definitive answer; a starter’s gun, not a finish line. It’s something that makes you stand up and take notice, not sit down and work out the application of a specific formula.

That is certainly true of the 20 essays in this,

our sixth annual HBR List. They are designed to deliver sharp-pointed concepts that may pop open a whole new way of looking at a particular management challenge—or simply prod you into some long-overdue thinking about an issue.

As we did last year, we've collaborated with the World Economic Forum in the compilation of the List. Besides the brainstorming session last summer, a number of sessions devoted to the ideas were held at the WEF's annual meeting in Davos, Switzerland, last month. We hope that you are as stimulated by these ideas as we were in seeking them out and in discussing the possibilities they raise.

### 1. The Synthesizing Leader

The Nobel Prize-winning physicist Murray Gell-Mann once said to me that he thought the most valued personal trait in the twenty-first century would be a facility for synthesizing information. Increasingly, I am convinced he was correct. The ability to decide what information to heed, what to ignore, and how to organize and communicate that which we judge to be important is becoming a core competence for those living in the developed world.

The skill of synthesis is particularly crucial for leaders. The decisions they make are fraught with big-picture complexity, and the consequences of those decisions are often momentous. In addition, because leaders command more information sources than most people, they have more opportunities to be confused or distracted. Information systems, though helpful to a point, are blunt instruments when it comes to nuanced contexts or sensitive emotional issues. And while staff members and advisers provide pieces of information, these individuals are too narrowly focused—and often too biased—to perform the requisite sifting, weighting, and stitching together such information requires. The synthesis mandate, therefore, falls squarely on the leader.

Given the ubiquity of information about the ubiquity of information, I was surprised to find little guidance on how to synthesize in the vast literature on thinking and problem solving. So here I offer my own suggested best practices, illustrated by an example.

Consider an executive asked to produce and present a report on a company she has recently joined. Her conclusions will carry

weight because she is a leader. But because she is an outsider, she must first make sense of an enormous amount of new information. And she is working within a limited time frame.

All syntheses should begin with an initial protosynthesis of the most readily available information. The executive will want to include both published material and insights she has gleaned from personal observations and conversations. And because she must communicate her synthesis effectively, she must decide what format best conveys the relationships among the pieces of information she selects. That format might be a story, a set of propositions, a table or taxonomy, or a PowerPoint presentation.

The most important step in synthesis is establishing criteria for what information to include and what to discard. There are many possible standards. Some involve credibility: For example, the executive might choose to consider only information she can verify with an independent source, or information from people who have proven trustworthy. Other standards have to do with relevance: for instance, information that pertains to a certain time frame or market. Whatever criteria the executive chooses, she must adhere to them rigorously. But she must also step back periodically and ask, Does this information form a coherent story? Do the trends make sense? If not, she should change the criteria and reassess the information she has accumulated against the new standards.

When an outline emerges with a clear direction and enough details to feel substantial, it is time to produce a rough draft of the final synthesis. At this point, feedback from knowledgeable associates is critical. These associates can judge whether the executive has hit the right points. They can also detect holes, comment on the format, and suggest additional information or analysis. There will probably be time for only one revision, but the more iterative the process the better. As synthesizers go about their work, they become masters of their subjects and increasingly sensitive to what is truly new or significant. The synthesizer with enough knowledge to notice nonobvious relationships and anomalies is the one most likely to have important insights and imaginative breakthroughs.

One of the great synthesizers of all time was Charles Darwin. He had his initial intimations

of the theory of evolution at the conclusion of his five-year voyage aboard the *Beagle*. Yet he labored for nearly a quarter-century to gather information relevant to the case he was building: reviewing his notebooks from the voyage, drawing on his own meticulous studies of pigeons and orchids, and corresponding with dozens of informants worldwide. The naturalist Alfred Wallace made the same fundamental discovery, but we honor Darwin for his peerless synthesis of data. As our understanding of synthesis grows, we will have more leaders who, like Darwin, can prune the many trees that may temporarily block our vision and enable us to behold a single, coherent forest.

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*Sensors will eventually appear in a range of consumer products—from shoes to keyboards to jewelry and even makeup.*

## 2. Can I Hear Me Now?

For decades, technology has enhanced our ability to communicate with other people. Soon it will also enhance the way our bodies communicate their needs and influence their environments. Body area networks (BANs) are changing both what we know about our anatomies and how we interact with the space around us.

In many situations, we want information about our bodies—is our blood sugar up or down, for example, or are we dehydrated? We want quick answers so that we can respond promptly or—even better—we want smart environments that can respond for us. But the cuffs and monitors we strap on at the gym or at the doctor's office are clumsy and intrusive. Furthermore, each requires us to consult a different interface for information. We want more information; we do not want more hardware.

Body area networks rely on sensors embedded into “smart” fabrics and materials (researchers at MIT, for example, have built electronic circuits entirely from textiles). These sensors will eventually appear in a range of consumer products—from shoes to keyboards to jewelry and even makeup. They will monitor changes in our temperature and other vital signs, as well as in our emotions and physical activity. They will transmit the re-

sults to interfaces that are already integral parts of our lives, such as cell phones, video screens, and appliances. Consumers, if they wish, will be able to set those sensors so that they transmit data to family, health practitioners, and trainers. However, the overarching goal is not to alert others in case of medical emergency but rather to monitor and respond to our own constantly shifting interior landscapes. This wellness-management model promises to reduce health care costs.

Improving safety is another potential application for this intimate technology. Rosalind Picard and a team at the MIT Media Lab worked with DaimlerChrysler and Motorola to design a car with sensors embedded in the steering wheel, driver's seat, and other components that touch the driver's body. (They also placed eye-movement detectors in the rear-view mirror.) When the sensors detect an increase in heart rate and skin temperature, a tightening grip on the wheel, or other signs of increased stress, the vehicle responds by lowering the volume on the radio, cooling the air, and temporarily diverting calls coming in to the driver's cell phone. Other environments—from offices to kitchens—could be similarly equipped to reduce distractions in periods of increased anxiety. Cars or keyboards might be programmed to alert a user who appears momentarily confused or is slipping into a daze.

A more nascent category of BAN would incorporate gadgets, chiefly for entertainment and communication, onto the body. Ian Pearson, the acclaimed futurist at British Telecom, has described phones that will be “printed” on the wrist and smart contact lenses that will act as video screens. Such devices might charge themselves by drawing on body heat or a user's physical activity. In another application, current BAN research aims to improve spectators' experience of sporting and other events. For example, viewers might pay extra for channels that tell them the physiological status and performance output of athletes. Soon, auto-racing fans will be able to see telemetry data about a driver's condition displayed on their mobile devices' virtual dashboards. That kind of data may later be included in hyperrealistic games, videos, software, and other content.

Not surprisingly, these advances have attracted critics who raise privacy and data-rights concerns similar to the ones surrounding radio frequency identification (RFID) technology.

But body area networks are qualitatively different because the data generated by a person's body are for use by that person alone. Data streams aren't coursing over wires and through the surrounding air, so there are fewer opportunities for abuse. Still, we'll need security features to avoid becoming walking ticker tapes for our own physiological status.

For firms, the challenge is to integrate the technology unobtrusively into simple, friendly offerings. Consumers are unlikely to sacrifice fashion, lifestyle, or convenience even for information that will keep them healthier or more entertained. The history of personal technology is of devices getting progressively smaller and more pervasive. From the onset, intimate technology must be all but invisible.

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### 3. China as a Green Lab\*

China's energetic transformation into a largely urban, market economy may produce more than an economic powerhouse and billions of affluent consumers. It could also give China an advantage in an unlikely arena: the development of strategies for sustainable economic growth.

Consider Chinese president Hu Jintao's recent invitation to Asian-Pacific business leaders to join China in developing a clean, resource-conserving "circular economy," which he said would yield both steady growth and ecological vitality throughout the Pacific Rim. Given China's well-documented environmental problems, it would be easy to dismiss this call to action as political rhetoric. But President Hu's declaration was an explicit acknowledgment that the country—with challenges ranging from water shortages in many of its cities to the voracious appetites of its fossil-fuel-burning industries—must find ways to decouple economic growth from ecological destruction.

Indeed, the very urgency of China's environmental problems is forcing a flowering of innovation. And its search for solutions will have global impact, opening up vast markets for forward-looking energy and technology companies while simultaneously creating a rich seedbed for new types of ecologically intelligent products, services, and technologies.

So what is the circular economy to which

President Hu refers? Broadly defined, it is one based on nature's regenerative cycles. Thus, it is powered by clean and renewable energy; uses material inputs that have positive or benign effects on people and the environment; and employs manufacturing, distribution, and recovery systems that allow those material inputs to be returned to fully productive use (not merely turned into products of lesser value, as in conventional recycling).

One way in which China is working toward a circular economy is through its involvement with the China-U.S. Center for Sustainable Development. Founded in 1999, the center brings together a variety of organizations—business, governmental, nongovernmental, scientific—to develop commercially, socially, and environmentally advantageous enterprises. Among the participants in the center's projects are China's ministries of Science and Technology; Land and Resources; and Construction; private groups such as the China Real Estate Chamber of Commerce; and multinational corporations such as BP, Intel, Ford, and BASF.

In one project in Huangbaiyu, Liaoning Province, a China-U.S. Center team is advising local developers on the planning and construction of a sustainable rural village that the government hopes will serve as a prototype for improving the lives of 800 million rural Chinese. But Huangbaiyu village also highlights the business opportunities that a Chinese circular economy would offer Western companies.

Model homes, which are being used to test environmentally friendly materials and technologies, feature recyclable polystyrene roof panels and insulation produced by BASF; compressed earth-and-straw-bale block walls created with machines made by Vermeer, a U.S. industrial-equipment company; and a 1,000-watt solar panel made by energy giant BP. BASF sees a huge market in China for superinsulating polystyrene as a possible alternative to resource-intensive building materials like coal-fired brick, which was recently banned in many cities under new Chinese environmental regulations. And if BP can accelerate China's move into the mass production of solar collectors, we will see a rapid, cost-efficient expansion of the global solar marketplace.

In another project, my architecture firm, under the guidance of the China Housing Industry Association and the China-U.S. Center, is creating plans for a variety of "new towns"

*The very urgency of China's environmental problems is forcing a flowering of innovation.*

*About some matters, we simply do not know. But managers must act, regardless.*

that we hope will offer a model for healthy, vibrant twenty-first-century cities. The plan for one of the sites, in the city of Miyun, near Beijing, includes eco-industrial sites in which the outputs of one enterprise can be linked with the inputs of another. For example, wasted heat from a green textile factory could be used to dry grain in a nearby brewery; the spent grains from the brewery could be used as bedding for neighboring mushroom growers. These kinds of experiments not only present commercial opportunities for Western firms but also may yield valuable economic lessons for the entire world.

Many of China's sustainable development projects are still in their early stages. But there is another reason, besides economic necessity, for being optimistic about such initiatives: China's 4,000-year-old tradition of resource conservation and regeneration. Though the advent of industrialization may have created a kind of cultural amnesia in China, circular economics is built in part on a simple principle—waste ultimately equals food—that enabled the Chinese to farm the same fields for 40 centuries without destroying the land's fertility. In fact, what represents circular economics more vividly than the traditional admonishment of a rural Chinese host to his guests that, before returning home after a good meal, they replenish his bucket of "night soil"? As a symbol for sustainability, that's no laughing matter.

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#### **4. Risk, Uncertainty, and Doubt\***

Management as a discipline is about a century old. Frederick W. Taylor's *Principles of Scientific Management* was published in 1911. Dartmouth's graduate business school opened its doors in 1900; Harvard's, in 1908. The twentieth century emphasized managing risk: finding ways to eliminate unnecessary risk, control unavoidable risk, and calculate risk/reward ratios. Taylor, time-and-motion experts like Frank Gilbreth, and Ford's assembly line made work routine and therefore predictable. Corporate R&D departments reduced the role of serendipity in

invention. Budgeting made decision making more rational, and business units helped tame organizational politics. Tools such as Six Sigma (for processes) and insurance, hedging, and portfolio management (for finance) also promised to bring risk to heel.

Management this century should take on two bigger fish: uncertainty and doubt. What do they mean? Risk is calculable; it can be expressed in terms of odds. Uncertainty is incalculable. A game of roulette is risky but not uncertain. As John Maynard Keynes said of uncertainty, "The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest 20 years hence...About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know."

*We simply do not know.* Yet managers must act, regardless.

A growing proportion of business decisions must be made under conditions of intrinsic uncertainty, for the following reasons. First, we've emptied our in-boxes of many calculable decisions, leaving them to subordinates or to software. Second, behavioral research by Nobelist Daniel Kahneman, Amos Tversky, and others has fatally undermined the premise that economic behavior is rational. If buyers and sellers make unpredictable emotional choices, then of what value are probabilities? Third, the "butterfly effect"—the imagined possibility that a butterfly flapping its wings in China could cause storms in Chicago—indicates the propensity of a system to be sensitive to initial conditions and subsequent perturbations. It explains why complex systems, like markets, inevitably bubble and crash. Neoclassical economics had it wrong: A stable equilibrium is unnatural.

Finally, greater uncertainty is a result of greater ambiguity in business outcomes. Manufacturing efficiency is easy to measure, but effectiveness of services is not. All these factors obscure cause-and-effect relationships and make managing less subject to calculation.

Then there is doubt—perhaps the ultimate management frontier. Risk and uncertainty presuppose that you know what you want. We bet \$100 on Secretariat or \$100 million in China, calculating our odds. We hire a new CEO, uncertain whether he will succeed. In each case, we know what we want.

Doubt comes into play when there is no right outcome, when one must choose between two evils, or when good outcomes have bad side effects. An archetypal example of doubt was President Harry S. Truman's decision to use the atomic bomb. What made the decision vexing was the difficulty of weighing the calculable benefit of ending the war swiftly against the incalculable future dangers of nuclear warfare. Today, human cloning raises similar anxieties.

Doubt also attends the largely ungoverned evolution of the Web. The technology risks may be manageable, the uncertainty of value migration may be inevitable, but the whole enterprise is dogged by doubt: The Internet's openness might be exploited by terrorists or used to deprive us of privacy and hence of liberty. Many tough business-ethics decisions involve doubt of a different sort. Imagine an executive, constrained by fiduciary duty, who knows that a soon-to-be-laid-off colleague is about to buy an expensive house. Should he warn his friend?

Uncertainty and doubt push the boundaries of management as we know it. The *raison d'être* for organizations and their leaders has long been to increase control and predictability. Dealing with uncertainty involves growing comfortable with ambiguity and trying to build robustness into choices. Tools such as scenario planning can help, but one must be careful not to assume away uncertainty or conclude that one of the imagined scenarios will play out. Indeed, the flight from uncertainty and ambiguity is so motivated, and the desire to reduce what is fundamentally unknowable to probabilities and risks so strong, that we often create pseudocertainty. For example, the models in hedge funds map correlations across investment opportunities—but fund managers sometimes forget that these models can't eliminate the propensity of markets to veer suddenly from past patterns.

Confronting doubt, by contrast, involves coming to terms with differences in values. How does one choose between two valued objectives: safety versus liberty, scientific discovery versus the sanctity of human life, individuals versus groups? Sometimes we overcome doubt with faith, sometimes we privilege one set of values over another. And sometimes we just live with the burden of making choices when there are no easy answers.

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## 5. Battle of the Networks

Companies have sought to exploit network effects since W. Brian Arthur dubbed them the competitive linchpin for information-age business. Many have used technology to tie together critical masses of customers and the most or best suppliers and so have gained an edge. But now enough companies derive competitive advantage from their networks that they are coming up against one another. That means we must learn a whole new set of principles: not how companies compete against networks but rather how networks compete against networks.

Companies that introduce new networked products or define the standards by which networked products interact can quickly dominate a market. That strategy is known as “lockout,” and it's tough to beat. Companies seek lockout not just through product design but also through an advantageous arrangement of buyers or sellers, through ingenious feedback or feed-forward loops within supply chains, or through the exploitation of technology-enhanced social interactions within markets (think eBay and Friendster).

We now have techniques for evaluating some characteristics of networks, such as the distance between nodes, diffusion dynamics, and connectivity patterns. But we know almost nothing about how networks compete against each other. And since most of us think in linear, nonnetworked terms, our intuition provides little help.

One approach to studying this new dynamic is to redesign the boards of games like Battleship, checkers, and Go into complex networks and observe how players compete. These games are traditionally played on grids, which are very regular networks (nodes and links are evenly distributed across the board). The redesigned boards are modeled on the Internet and other real-world competitive networks whose link and node distributions are irregular because of “rich-get-richer” connection schemes identical to lockout in business. The boards comprise a small number of very

*The flight from uncertainty and ambiguity is so motivated that we often create pseudocertainty.*

well-connected nodes, a medium number of moderately connected nodes, and a large number of sparsely connected nodes. This connection pattern is a primary source of adaptation—and complexity—in networks.

Consider Go, an ancient Chinese game in which players capture stones and occupy territory. We found that when a Go board was redesigned for greater complexity, competitors could not visualize even basic patterns of play without such mathematical tools as a “connectivity matrix” (a map of who links to whom) at hand. (See the exhibit “The New Rules of the Game.”)

Once armed with such tools, however, players began to invent entirely new strategies, even though the basic rules of play remained unchanged. For example, one classic Go strategy is to occupy territory (nodes and links) with large contiguous masses of stones. Occupying the nodes with the most links achieves this goal quickly, so the smart thing to do is seize those nodes first. Players using the redesigned board soon found that with this strategy, a first-mover advantage heavily influenced the outcome, and the winner was determined

within several moves. After repeated play, however, participants discovered several ways to counter that advantage. For example, they distributed small clusters of stones around the board so they could keep their options open until much later and prevent competitors from guessing the specifics of their strategies. Players could win by rapidly amassing their stone clusters into a large group at the appropriate time, in effect unlocking the lockout achieved by the first mover.

Such research has practical business applications. Consider, for example, the supply chains of competing companies. Suppose Company A operates an innovative vendor network that rearranges inputs to its production process according to the latest market data. Company B might build a similar network and compete with A on the basis of network efficiency, lower cost of inputs, or better market data. But it might be locked out because A has already climbed the learning curve (and perhaps invested its enhanced profits to further improve its innovative process). B might be able to overcome A’s growing advantage with heroic efforts in traditional competitive competencies

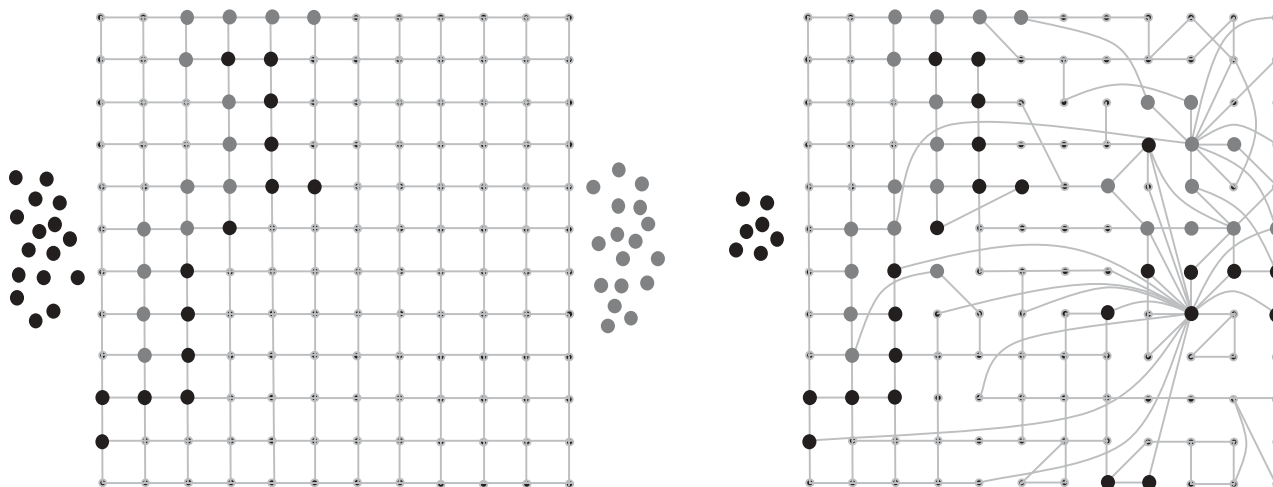
## The New Rules of the Game

Companies don’t just go head-to-head anymore; they go network-to-network. That makes strategy more complicated, as the ancient Chinese board game Go demonstrates.

The object of the game is to occupy territory and capture your opponent’s stones by

surrounding them and removing them from the board. The board on the left shows a traditional grid; the board on the right shows a grid hypothetically designed for a complex network, with large hubs, small clusters, and long-range links. On the left, traditional strat-

egies call for economies of scale, or deriving advantage from a greater number of adjacent stones. On the right, new strategies call for economies of scope, or deriving advantage from long-range connections between cleverly placed clusters.



(for example, by recapitalizing plant production, tightening profit margins, or slashing transportation costs). Or it could go network a network, for example, by examining the structure of its emerging vendor network for undetected strengths, such as connections within vendor clusters that are even more advantageous than those in A's value chain.

Of course, once B has unlocked A's lockout, it will have to continually reexamine and, when warranted, reconfigure its network to fend off attacks by others. Close attention to competitive dynamics is the key to long-term survival in networked competition.

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## 6. Science in the Wild\*

Scientific research is migrating from the sterile, controlled environment of the laboratory to the messy, disorderly world outside. In fields from biochemistry to astronomy, large segments of the population are becoming the source of hitherto undreamed-of quantities of data. This migration has interesting consequences for business and for society at large.

Edward Steinmueller, a professor at the University of Sussex, calls this phenomenon "science in the wild." He notes that the traditional wall between research and the rest of life, between scientists and the public, was erected centuries ago and has remained intact for a number of reasons. Scientists have sometimes needed to be protected from people who weren't ready to have their worldviews challenged—those who didn't like hearing that the Earth wasn't the center of the universe, for example. Society needed to be protected from the dangerous consequences of some research—for instance, the creation of radioactive material. And, while field research has always been a part of disciplines such as biology, much of the most exciting scientific work in areas such as physics and chemistry could be carried out only in the highly controlled environment of the lab, where causes and effects could be pinpointed and proved.

But many of today's greatest scientific challenges, especially in computing and the life

sciences, raise questions about the nature of sprawling and complex systems. Work in a lab—no matter how sophisticated the experiment or how big the number-crunching capability—often can't replicate such real-world systems or yield rules about how they function. So modern scientists, building on well-established physical and mathematical principles, many of them in fact established in formal scientific settings, must range widely in order to tackle the challenges.

Members of the public may even be enlisted as collaborators in the research. Amateur scientists, who in the past played an important role in astronomy, again are active in that field, contributing to experiments that require massive data-processing capabilities. Initiatives range from the well-known Search for Extraterrestrial Intelligence—which, through the SETI@home program, allows individuals to use spare capacity on their PCs to analyze radio signals from space—to a NASA project in which amateurs perform routine analysis of the Martian landscape.

The empowerment of amateurs extends to other scientific disciplines. Individuals also employ the collective number-crunching power of their home computers to simulate how molecules created to treat one disease might affect other illnesses. In a less technological vein, nonscientists contribute to ecologists' studies by tracking the spread of invasive plants and animals or by contributing local knowledge of flora and fauna that can help scientists spot patterns of disease.

More controversially, scientists are looking at ways in which the general population might be used as test subjects. In Iceland, with its relatively homogeneous genetic stock, some see an opportunity to learn how lifestyle and genetics intertwine to create diseases, though the project has sparked concerns about privacy and the commercial incentives driving the research. In the testing of new drugs, we may someday see clinical trials that extend across populations and long beyond the time of a medication's formal approval. Patients willing to continuously monitor themselves—or even be electronically monitored—for data on a drug's efficacy and side effects would receive in return the latest detailed information on the drug's benefits and risks for people like them. Such testing could generate currently unavailable information on a medication's safety over

*Today's greatest scientific challenges raise questions about the nature of complex systems, and work in a lab often can't replicate those systems.*

*Endowing the next generation with resources to invest in its future would create a mass investor class.*

time or for particular individuals, as well as help identify unanticipated uses for a drug.

Flinging open long-sealed laboratory doors in this way, while spurring controversy in some instances, could quell it in others. For example, making research more transparent may well foster greater public trust in those pushing the boundaries of science, whether they are working on quarks or Quorn.

Like scientists, managers must recognize that the complexity of their own R&D efforts often means that ideas can be truly tested only “in the wild” in which they will be used. Of course, customers have always taken part in market testing, and successful companies have always gathered continuous feedback about their products. But market testing is just that—a test of the views, values, and behavior of customers at a particular time and place. In order to create products whose revolutionary design grows out of scientific principles that hold true across time and space, companies quite simply (and not so simply) need to understand a bit better how the world works. Clever businesses, like clever scientists, know that they can’t always find this out from behind the Bunsen burner.

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## **7. A Homestead Act for the Twenty-First Century**

The United States owes much of its status as the first mass middle-class society to enlightened social policy designed to broaden asset ownership. To this day, a quarter of all adult Americans enjoy a legacy of asset ownership traceable to the Homestead Act of 1862, which awarded 160 acres of land in the American West to families who lived on the land for five years. Likewise, the GI Bill, the Federal Housing Administration, and mortgage deduction policies paved the way for one of the highest home-ownership rates in the world.

But America’s middle class has begun to atrophy. Poverty has grown over each of the last four years, and real wages are falling. Meanwhile, income inequality has reached an all-time high, and asset inequality is even more acute. Hurricane Katrina laid bare those stark

realities.

The most promising way to revitalize America’s middle class is to update old traditions. In the nineteenth century, the U.S. sought to broaden the ownership of land; in the twentieth, the ownership of homes. In this new century, the target should be the ownership of financial assets. The logic for such a course follows from the economic dynamics that are widening the gap between today’s haves and have-nots.

The historic correlation between economic growth and wage growth has broken down, largely because returns on human and financial capital are outpacing those on labor. As growth and productivity increase while real wages decline, it is not hard to understand why those who depend solely on wages fall behind, while those who benefit from returns on financial assets get ahead. The best way to break this cycle is to help far more Americans accumulate a sizable ownership stake in the most productive sectors of society.

Imagine if every newborn in America were to receive \$6,000 at birth as a down payment on a productive life. With the magic of compound interest, that sum could grow to \$20,000 or more by the time the child reaches 18. This young adult could then apply his or her nest egg toward various investments, such as college tuition, a down payment on a first home, seed money for a legitimate business, or retirement savings. Given the number of children born in America each year, the annual cost of such a program would be about \$24 billion—roughly what the government squanders on farm subsidies. The benefits, however, would be immeasurable.

Endowing the next generation with resources to invest in its own human capital and financial future would create not only a much broader middle class but also a more self-sufficient, skilled, and entrepreneurial workforce. Gradually, the U.S. would witness the birth of a mass investor class, with ever more citizens deriving their income from returns on financial holdings as well as from wages. There would be less need for a generous welfare state, and the interests of workers and business would be better aligned.

A Homestead Act for the twenty-first century could also offer inner-city kids a new social contract: If they play by the rules and graduate from high school, then a pot of money

will allow them to invest in their own futures. Paired with financial-literacy education in schools, such a policy could help turn a culture of poverty and dependency into one of hope and opportunity.

Those who doubt the political viability of such an idea should think again. Britain recently enacted its own version of accounts at birth and has already funded 2 million of them. In the United States, this is one of the few social policy innovations gaining bipartisan support in a deeply divided Congress. Last year, an odd-bedfellows alliance led by Senators Santorum, Corzine, Schumer, and DeMint introduced the Aspire Act, calling for deposits of \$500 for every newborn, with an additional \$500 for babies from low-income families. The policy's biggest advocate may turn out to be President Bush, who wants to make bipartisan headway on his "ownership society" agenda now that his Social Security plans have stalled.

Let us hope that historians looking back on twenty-first-century America will see the re-emergence of a vibrant middle class. If they do, they will likely credit bold policies that enabled ever more citizens to enjoy the benefits of capital ownership.

concocting ideas for new and improved products. Third, it enhances loyalty as customers become emotionally invested in the products they help nurture. The practice has paid off handsomely for such industry leaders as BMW in automobiles, Tiger Electronics in toys, Sony in consumer electronics, General Electric in medical equipment, and Electronic Arts in game software.

The payoff for customers is less clear. Intellectual property resulting from company-customer collaborations is typically owned by the company, and so are the profits generated by that IP. Back when opportunities to contribute to innovation were rare, remuneration mattered less. Today that novelty is wearing thin at the same time customers are discovering their own worth: The most creative innovators may find more than one company competing for their time and ideas. Meanwhile, public battles over file sharing and Chinese piracy have given the public a crash course in the value of IP. Not even the open-source software movement is likely to turn back the tide. Linux may mobilize thousands of developers, but the vast majority of open-source projects have difficulty attracting more than one innovator—the project's founder.

So customers, understandably, are starting to ask questions. If my ideas are incorporated into a product, why don't I get a piece of the intellectual property? If that product is profitable, why don't I share in those profits? What's in it for me?

Companies that want to keep the ideas flowing must provide concrete incentives to their restive contributors. These five strategies can help:

**Show preemptive generosity.** Offer customers free trials of the service or samples of the product that incorporates their ideas; or award prizes for the best customer inventions. Where contributions are more significant, consider exchanging some intellectual property for customer engagement. IBM, for example, recently released 500 patents to the open-source community. Free access to those technologies will make it easier for developers to innovate, and IBM, in turn, can build on their advancements.

**Create customer communities.** If customers gain by learning from one another, help them do so. Provide physical or online sites where people can meet, and offer to set the agenda,

*Customer-collaborators  
are starting to ask,  
"What's in it for me?"*

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## **8. Customers Demand Their Slice of IP\***

When widespread Internet access first brought companies and customers into unprecedented intimacy, businesses dreamed of transforming purchasers into zealots through personal interaction. The ne plus ultra of such engagement would be collaborative innovation: customers and product developers freely exchanging ideas, experiences, and constructive criticism online. Consumer cocreators would be motivated by a passion for the product. But as companies have increasingly profited from customer suggestions, that passion is being threatened by coolheaded questions about intellectual property rights.

Collaborative innovation bestows three advantages on companies. First, it gives R&D deeper insights into customer behavior and preferences. Second, it reduces the cost of

moderate discussions, and establish communication platforms for follow-up. Customers will benefit immediately from the suggestions of their peers, while your company can pick up new ideas. Cadence, which builds design tools for integrated circuits and electronics, recently set up such a Web-based community. Both company and customers benefit from the free exchange of technical information, best practices in chip design and manufacturing, and suggestions for getting the most from Cadence technologies.

**Leverage your brand.** Customers who love your brand want to be associated with it. Celebrate their involvement by publishing their names and contributions on your Web site. You might even cobrand products with some customers, whose own brands would benefit from having contributed intellectual property to yours.

**Encourage customers to set up shop.** Sometimes customers can create their own businesses from engagement with your products. In

the 1990s, a very active CompuServe forum developed around a personal information manager called Ecco. Customers shared ideas for new features and improvements, and several built on those ideas to create consultancies and add-on software firms that supported rather than cannibalized the vendor's business.

**Pay them.** A customer's contributions may prove so valuable that a company will pay to keep her involved. Assuming you can't hire her outright, you could negotiate a flat fee—or even a share of the royalties—in exchange for her time.

Of course, companies can also simply ask their customers, "What will it take to keep those great ideas coming?" In fact, the next fruitful target for cocreation may be strategies for parceling out cocreation's rewards.

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## 9. A Cartel for Oil Consumers\*

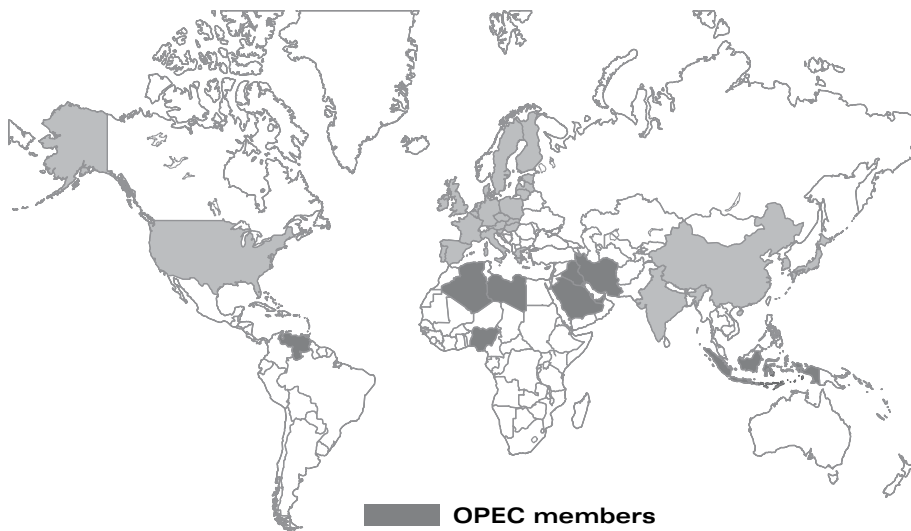
Oil cartels were originally conceived of as *defensive* instruments, created by or on behalf of suppliers in a time of excess capacity, with the aim of stabilizing crude oil prices. The idea was that by maintaining sufficient spare production capacity, producers could influence market prices and minimize volatility—a boon not only to them but also to oil consumers (even if they preferred that such stability came at a lower cost). Today, though, with producers working pretty much at capacity and analysts talking of \$100-a-barrel oil, it's consumers who feel a need to band together for mutual defense.

The Organization of the Petroleum Exporting Countries, established in 1960, wasn't the first cartel. In the 1930s, the somewhat incongruously named Texas Railroad Commission regulated the state's oil production to keep prices from plummeting. Around the same time, the big international oil companies sought to stabilize prices through the Achnacarry Agreement, in which they agreed to collaborate on the management of crude output. Both the Texas commission and the Achnacarry Agreement became obsolete in the early 1970s, when U.S. oil production was going full tilt and OPEC states had replaced the oil companies as the primary custodians of the oil spigot.

## From OPEC to OPIC

As excess crude oil production capacity gives way to excess demand, OPEC (Organization of the Petroleum Exporting Countries) may be succeeded by an

"OPIC" (Organization of the Petroleum Importing Countries), which would manage consumption, not production.



### OPEC members

Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela

### Possible OPIC members

U.S., the European Union, Japan, China, South Korea, and India

Of course, regulation of crude oil prices through the management of production has its limits. It's easy to forget that during the 1998 Asian Crisis, oil prices plummeted to \$10 a barrel because of the abrupt drop in demand. More recently, rising demand in Asia, along with growing concerns about oil supply security, have pushed prices above \$70 a barrel.

And OPEC can do little about it. With crude production at capacity in most OPEC countries, the cartel is unable to rein in prices by increasing output. Indeed, despite the roughly 15% projected growth in worldwide production capacity over the next five years, output will only barely keep up with demand. Absent a cataclysmic economic downturn among oil-consuming nations, OPEC—or any other conceivable organization of oil producers—will no longer be able to manage the market.

Which raises a question: As excess capacity gives way to excess demand, will some institution replace OPEC as a controlling mechanism? The International Energy Agency currently monitors energy markets, coordinates oil stockpiling, and recommends options to consuming countries. Could the next step be a more active institution to manage the collective concerns of oil importers—an “OPIC” (Organization of the Petroleum Importing Countries) instead of an OPEC?

The organization's members would be the largest and fastest-growing energy users: the United States, the European Union, Japan, China, South Korea, and India. Its aim—a response to both oil supply constraints and the negative environmental consequences of fossil-fuel use—would be the management not of production but of consumption.

Such an organization's programs and policies would need to cover three time frames. In the long term—say, the next 50 years, during which oil consumption will certainly peak and then drop off as remaining reserves dwindle—the organization would need to promote the development of alternative energy sources, such as biofuels, and technologies to reduce energy use. In the medium term, roughly the next 20 years, the group would need to invest in new production facilities—and work to protect such investments by improving security in oil- and natural-gas-producing areas. In the short term (the next five years), the organization, its policy options constrained by existing capital stock and prior investments, would

work to foster a closer coordination of members' energy policies. It would also need to encourage an active program of buying and selling crude from expanded stockpiles in order to maintain prices within an agreed band—even as it acknowledged the historical difficulties in trying to stabilize commodity prices through buffer stocks.

Could such an organization—an OPIC—actually work? Despite an array of conflicting interests, OPIC's members would share the strong desire to ensure continuity of oil supply at the lowest feasible price. Most of them would also see the benefits of addressing environmental issues and lessening their collective dependence on oil. Undoubtedly, there would be disagreements over whether to rely on market mechanisms or long-term purchase agreements with oil producers in order to achieve the group's goals—differences that would test members' policy-making and diplomacy skills. But the alternative to such an organization—an array of regional groups and large states pursuing their own energy interests in a form of energy mercantilism—wouldn't serve the interests of any of the big oil-consuming nations.

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## 10. Seeing the “Health” in Health Care Costs

Amid corporate hand-wringing over rising health care spending, researchers—and a growing number of companies—are validating the truth of a well-known but often ignored principle: An ounce of health is worth a pound of health care. That is, businesses can reduce their overall health care costs through targeted spending to prevent illness and improve health among their employees.

The relationship between a healthy workforce and health care spending can be seen most easily in a company's medical and pharmaceutical claims: The healthier the workers, the lower the claims. It's becoming increasingly apparent, though, that many companies' greatest health-related expense is the almost invisible decline in productivity resulting from employee health problems, including common ailments such as allergies and headaches.

Dow Chemical, which employs 43,000 people, estimates its annual employee health-related costs at \$635 million, more than half of which can be attributed to the indirect costs associated with worker “presenteeism”—impaired performance on the job because of a medical condition.

Researchers are identifying promising opportunities for reducing both direct and indirect costs—for example, by monitoring and redirecting the course of lifestyle-related conditions, such as high blood pressure, in order to help employees avoid more serious and costly problems. And, increasingly, companies are able to calculate which programs designed to improve employee health will yield a positive return on investment.

Pitney Bowes analyzed its health care costs and found a link between increased costs for certain diseases, such as asthma and diabetes, and low employee use of drugs to treat those diseases. So the office-technology company altered its drug reimbursement benefit to make all asthma and diabetes medications available either for free or with a small co-payment. The move lowered Pitney Bowes’s average annual health care costs for asthmatic employees by 15% and for diabetic employees by 6%, because the increased cost of providing the drugs to workers was offset by the lower costs of medical treatment. In fact, the company even reduced its average annual pharmacy costs for treatment of the two conditions, by 19% and 7%, respectively, because fewer prescriptions were written for the more expensive medications needed to treat complications of the two diseases.

International Truck and Engine is making creative use of health-risk assessments obtained from employees upon hiring and periodically thereafter. Employees voluntarily respond to questions about their health status, behavior, and risks; their responses are used to develop individual risk profiles and health self-management plans. In 2006, International Truck will be waiving a scheduled increase in the employee portion of health insurance premiums—resulting in an average savings to workers of some \$20 a month—for those who can document that they are taking the health-related steps recommended for their risk category. The aim: keeping low-risk employees at that level while improving the profile of their higher-risk colleagues.

In some cases, top management is taking a leading role in promoting health-related programs. Every week, Johnson & Johnson CEO William Weldon invites employees to get out and “walk with Bill” for an hour in a highly visible statement of the company’s priorities. On a less personal level, CEOs (including ten from *Fortune* 200 companies) are collaborating through Partnership for Prevention’s “Leading by Example CEO-to-CEO” program to promote research and education on health promotion and disease prevention.

Targeted health programs like these exemplify a fundamental shift in attitude toward health care costs, one prompted by the growing realization among employers that smart investment in employee health not only is cost neutral but will more than pay for itself. Companies that take this approach gain some control over seemingly uncontrollable health care spending and create a win-win situation: Their workers enjoy better health and quality of life while they realize more productive employees and improved financial results.

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## 11. Peer-to-Peer Leadership Development

In 1995, two young U.S. Army officers who had been friends at West Point found themselves living down the street from each other at a base near Honolulu. Nate Allen and Tony Burgess were both in their first stints as company commanders, each responsible for three platoons, or about 120 soldiers. At the end of the day, after their kids were in bed, the two would get together on the lanai and talk through the challenges they faced in their new assignments.

Out of those back-porch bull sessions grew a venture called CompanyCommand, an internal Army Web site where junior officers facing professional challenges can seek advice from others who have been in similar situations. Launched as a low-budget Internet discussion group financed largely by its two founders, CompanyCommand was ultimately brought behind the Army firewall and, to encourage participation, provided with funding, techno-

*Peer-to-peer leadership development challenges some traditional assumptions about the training of future leaders.*

logical support, and greater structure. Just as communities of practice help employees develop greater technical competence through the exchange of ideas among peers, so CompanyCommand is designed to help individuals improve their leadership skills through the sharing of experiences and advice. The program offers a new model for leadership development within an organization, one that has some advantages over both informal social networks (which often are formed by chance and function based on participants' geographic or organizational proximity) and structured company training programs.

Peer-to-peer leadership development challenges some traditional assumptions about the training of future leaders. Instead of drawing on the wisdom of anointed experts, CompanyCommand provides young officers with knowledge based on the daily struggles of frontline professionals like themselves. Why the emphasis on peers? Knowledge accumulated by experts over the years may no longer be relevant in a rapidly changing battle environment like Iraq. People have greater trust in, and therefore are more receptive to, advice from someone in their situation. Furthermore, peer conversations can provide emotional as well as practical support. When fellow officers respond to your query about handling the combat death of a soldier who was a galvanizing force in your unit, you don't just get useful tips—a sample letter of condolence written by another officer in a similar situation, for example, or suggestions on helping your unit members deal with the blow. You also get the reassurance that others have been through this before and that they care enough about you to respond.

Another difference from conventional leadership-development training is the focus on context-specific rather than broadly applicable advice. People go to CompanyCommand for help with a particular issue and draw on knowledge that has grown out of another individual's unique experience. Because users seek information to solve particular problems, the information must be available immediately—just in time, not just in case. When that soldier from your unit is lost in combat, you don't have the luxury of waiting for the next training course in personnel management, which wouldn't be tailored to the specifics of your situation anyway.

Finally, CompanyCommand replaces the one-

way flow of information typical of training programs—the pour-and-snore approach—with fluid online conversations. This format means that questions can be refined, issues can be re-framed, and a solution can be woven from several people's advice. Frequently, the conversation about a given topic—say, a changing security environment in Afghanistan's Shai'kot Valley—is taken off-line and expanded to include other participants, through conversations around a Humvee or, more formally, at occasional gatherings of CompanyCommand participants. In this off-line setting, CompanyCommand bears similarities to CEO roundtables and similar forums in which business leaders from different companies get together in person to learn from their experiences.

In adopting this kind of peer-to-peer approach, an organization gives up considerable control. Despite the Army's oversight of CompanyCommand, junior officers run the show, facilitating conversations and setting the agenda. Many organizations wouldn't feel comfortable placing this kind of trust in their people (who in turn would find it hard to develop the trust in the organization needed for candid conversations to occur). Those enterprises would begin to wonder if the program is worth it, both in money and in employee time. And, it must be said, a program like CompanyCommand is designed to meet individual development needs rather than institutional objectives. But by creating a place where soldiers can freely and in their own way develop leadership skills, the Army is enhancing the quality of today's and tomorrow's leaders—certainly a primary goal of any organization.

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## **12. Unstick Your Customers**

Paco Underhill's acclaimed 1999 book, *Why We Buy*, exposes how merchandisers get us to pile our shopping carts with items not on our lists. The most popular products are placed at the back of the store, and retailers fill the intervening space with tempting goods. Customers must walk by displays to get from the top of one escalator to the bottom of the next. The

*Creating a real-world version of an online organization means treating retail space as though it were information space.*

most appealing offers are positioned at eye level.

Physical space in stores is “sticky”—people *must* pass through it to get where they’re going. The Web, by contrast, lacks natural stickiness. A profusion of links encourages users to leap from one “lily pad” to another, and it’s as easy to leap from pad A to pad Z10 as from pad A to pad B.

The ease of Web shopping is creating higher expectations among consumers. So imagine that you designed a physical store that mirrored the Web’s best practices for getting customers to make purchases. Customers would get out quickly with exactly what they need, never forced to double back for forgotten items. The result would be increased loyalty and lifetime expenditures.

Creating a real-world version of an online organization means treating retail space as though it were information space. The first principle of Web design is that signage be clear, visible, and well thought-out, with logical and consistent naming and arrangement of product categories. So the same must be true of the signage in your physical environment.

Second, the Web makes it easy for shoppers to get as much product information as they want. Real-world stores can do something similar by, for example, placing detailed catalogs in the appropriate aisles, putting cards that highlight distinctive features on shelves, and positioning knowledgeable sales attendants around the floor. As on a well-designed Web site, however, all that information should never get in the way of customers who just want to come in, grab that DVD of *Look Who’s Talking Too*, and get out.

Third, e-commerce sites serve both their own interests and their customers’ by suggesting appropriate add-ons. A real-world store can do that by, for example, grouping stereo receivers with the corresponding set of cables, or using signage to indicate everything the consumer will need to use the product and exactly where to find it, even if that means pointing him to another store. For years, supermarkets have positioned the pasta sauce next to the noodles; an appropriate add-on here might be a lasagna recipe on the shelf along with the aisle number for ground beef and the address of a nearby wine merchant where customers can buy a nice bottle of Chianti.

Finally, Web sites draw on customers’ past

purchasing behavior to present clusters of products they buy frequently. Real-world stores can’t customize offerings for each customer, but they can make it easier to find the most sought-after goods overall. Move the milk to the front.

Some of these practices are being tested at the Staples Prototype Lab, located down the street from the company’s headquarters in Framingham, Massachusetts. Every day, vice president of visual merchandising Bob Madill and his staff work to overcome the limitations of atoms and space so customers can navigate a Staples store as if it were pure information.

As a result of the lab’s research, Staples stores are laid out in arcs composed of “destination categories”—the classes of items most in demand—in the manner of home pages that present top-level categories for visitors to explore. Large signs hang over each area; smaller signs below designate subcategories. Staples used to disrupt the informational mapping of stores with signs announcing unrelated special offers. Those “focals” might have moved more of a specific product, but they’re the real-world equivalent of pop-up ads, so Staples dropped them.

Customers’ informational needs also determine shelf height and, thus, the number of items a store can stock. “By having a store that’s mostly low, it’s easily scannable” by human eyes, Madill says. Higher shelves would accommodate more items, but customers wouldn’t be able to see the signs.

And Staples has responded to customers’ desire for product information by, for example, breaking up the single, unified listing of printer inks, formerly kept at the corner of that destination category. The company now distributes information about inks in smaller catalogs kept next to the specific brands they cover. In-store catalog use has risen from 7% to 20%, increasing customer satisfaction and decreasing the need for intervention by store assistants.

Shaping space around information is becoming a priority for every business trying to meet customer expectations in a physical setting. The Web has made customers the masters of their own attention. Try making them stick, and they won’t stick around.

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ing, 2000). He is also a fellow at Harvard Law School's Berkman Center for Internet and Society in Cambridge, Massachusetts.

### 13. Follow the Leader

New leaders galvanize companies with inspiring themes and ambitious plans, but they also influence corporate culture in simpler ways. All have their own personal "heuristics"—rules of thumb—that they develop, often unconsciously, to help them make quick decisions. While leaders may not intentionally impose their heuristics on the workplace, these rules are nonetheless noted and followed by most employees. Soon, the heuristics are absorbed into the organization, where they may linger long after the leader has moved on.

For example, if an executive makes it clear that excessive e-mail irritates her, employees—unsure whether to include her in a message—will simply opt not to. A leader who appears suspicious of employee absences discourages people from even thinking about conferences or outside educational opportunities. Employees may be grateful that such conditions help them avoid protracted internal debate over whether or not to take a particular course of action. But as everyone adopts the same heuristics, the culture shifts, becoming more or less open, more or less inclusive, more or less formal. Because such behavior is difficult to change, leaders should think carefully about what values their rules communicate. They may even want to create new rules to shape the organization to their liking.

That's what I did ten years ago when the Max Planck Society hired me as a director to found my own research group at the Institute. Each new director gets to build his staff from scratch, and I wanted to create an interdisciplinary group whose members actually talked to one another and worked and published together (a difficult thing to do because researchers tend to look down on those in other fields). First I considered the question of what values should inform researchers' day-to-day decisions. Then I came up with a set of rules—not verbalized but acted upon—that would create the kind of culture I desired:

**It is right to interact as equals.** Clearly, issues of performance, role, and circumstance make total equality impossible. But to ensure a level playing field at the beginning, I hired all the researchers at once and had them start si-

multaneously. That way, no one knew more than anyone else, and no one was patronized as a younger sibling.

**It is right to interact often.** Research shows that employees who work on different floors interact 50% less than those who work on the same floor, and the difference is even greater for those working in different buildings. So when my growing group needed an additional 2,000 square feet, I vetoed the architect's proposal that we construct a new building and instead extended our existing offices horizontally.

**It is right to interact socially.** Informal interaction greases the wheels of formal collaboration. To ensure a minimum daily requirement of chat, I created a custom: Every day at 4 pm, someone in the group prepares coffee and tea, and everyone gathers for caffeine and conversation.

**It is right to interact with everyone.** As director, I try to make myself available for discussion at any time. That sets the example for other leaders, who will make themselves equally available.

These rules have become an indelible part of who we are at the Max Planck Institute and a key to our successful collaboration. I would advise all leaders to conduct a mental inventory of their own rules of thumb and to decide whether they want employees to be guided by the same heuristics. If not, they should change their actions accordingly. As the boss decides, so the organization decides.

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### 14. Wake Up and Smell the Performance Gap

Since the bubble burst in 2000, we have been obsessed with economic imbalances: low levels of savings and high levels of debt, America's trade deficit, the rise of China and its challenge to developed economies. But one imbalance has received far fewer headlines—the gap between the economic performance of nations and of companies. That gap yawns wider every month, yet both sides continue to act as if the playing field were still level. As a result, states overreach while companies harbor unrealistic expectations about what governments can do

*As everyone adopts the same rules of thumb, the culture shifts, becoming more or less open, more or less inclusive, more or less formal.*

for them.

Of course, the idea that global capitalism would erode state power dates back to Karl Marx. Twenty years ago, then-Citibank chairman Walter Wriston and others were talking about the decline of nations and the rise of multinationals. But states have continued to command a large share of economic output, and 9/11 and its aftermath have only strengthened the perception that nations, with their near monopoly on military might, are the world's driving force. Today, however, a comparison of GDP growth with corporate profits reveals that, the war on terror notwithstanding, companies are outpacing even the best-performing states, and nations continue to lose ground. (See the exhibit "Companies Widen Their Lead.")

In 2005, global GDP growth was approximately 3.2%, according to the IMF, and should be about the same in 2006. That is the aggregate of nearly 200 national economies, and it reflects both China (9.5%) at one extreme and Zimbabwe (-7.1%) at the other. The United States, which represents nearly a third of the global economy, has been registering steady growth of 3.5% to 4% a year.

Now look at companies. In 2004, earnings for the S&P 500 grew 22%, with revenue growth exceeding 10%. Coming off the high base of 2004, earnings in 2005 will be in the 13% to 15% range. Companies with global reach have done even better. For example, in 2004, 101 S&P 500 companies derived between 20% and 40% of their revenue outside the United States and registered a staggering 42% growth in earnings.

The performance gap will likely widen as offshoring and advancements in information technology diminish corporations' loyalty to their home countries. A decade ago, Mercedes-Benz was still a "German" company, General Electric was "American," and Sony was "Japanese." Today, these companies are global not only in reach but also in identity, mission, and outlook. Companies are freer than ever to move capital and human resources in order to maximize returns, arbitraging the world. States, by contrast, are more or less stuck with the resources they have.

Yet despite those changes, states continue to behave as though they were ascendant. Consider their approach to taxation, even in the face of the World Trade Organization's success-

ful erosion of trade barriers, which significantly undermines the right of governments to collect revenue. The European Union's attempt to slap tariffs on bras made in China was laughable, as was the ill-named American Jobs Creation Act of 2004, which gave U.S.-domiciled companies a onetime exemption to repatriate profits from abroad. Meanwhile, central banks maintain the conceit that interest rates are best regulated by the state, even as evidence piles up that global flows of capital exert more influence on rates than any one bank—including the Federal Reserve—could hope to. The result: Governments keep spending and borrowing even as most face shrinking or stagnant revenues.

For the moment, the rise of companies is greeted by applause on the right and dismay on the left. However, everyone is at risk if states and corporations fail to recognize their altered status. States can't turn back the tide, but they can still create obstacles. Government leaders must accept their diminished influence and not try to create regulatory hurdles for errant companies or waste resources prosecuting a random few. Instead, states should look for ways to channel the activities of global companies in constructive directions and create incentives for them to change their behavior.

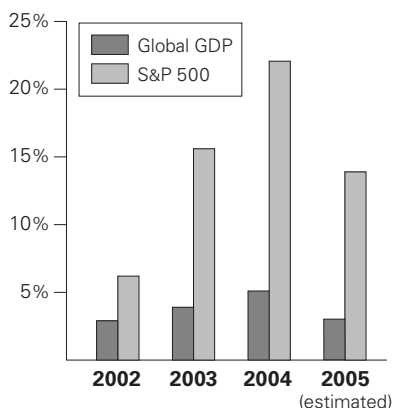
Corporations, for their part, face the opposite challenge. Attend any conclave of business leaders, and you still hear CEOs blaming government for its incompetence or for acting without first consulting industry. But competence and consultation aren't the issues; the decline of government power is. So companies themselves must shoulder a heavier burden in matters of economic and environmental policy, intellectual property rights, and even security.

If states and corporations don't recognize their changed status, others will. Those others will include religious ideologues, and they will condemn both for failing to address the needs of billions of people. The old cliché holds that with power comes responsibility. The old cliché is right.

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## Companies Widen Their Lead

The gap between growth rates of global GDP and profits of the S&P 500 has widened for most of the past few years.



(HarperCollins, 2001).

### 15. The Avatar as Consumer

Advertising has always targeted a powerful consumer alter ego: that hip, attractive, incredibly popular person just waiting to emerge, with the help of the advertised product, from an all-too-normal self. Now, in cyberspace, consumers are taking the initiative and adopting alter egos that are anything but under wraps. These online personae—from suggestive chat-room user names to fully developed characters in virtual worlds—represent a huge population of shadow customers. The message for marketers: Why simply sell to a single (real) individual when you can simultaneously sell to multiple (virtual) ones?

One of the most conspicuous manifestations of people's desire to try on alternative identities is the avatar, a being created by a user as a representation of himself in an online environment. More than 7 million people have created Yahoo avatars, personalized cartoonlike characters used as pictorial signatures in activities ranging from instant messaging to fantasy sports. But the experience of living through another self is most powerful in so-called massively multiplayer online role-playing games, which enable thousands of players to interact within the same three-dimensional virtual world.

In such settings—fantasy environments, such as World of Warcraft, and tamer venues like Second Life, where residents set up households, find jobs, and establish personal relationships—you effectively become your avatar, looking out through its eyes and engaging with other beings, themselves avatars of flesh-and-blood individuals. The intensity of the experience makes an avatar “not a puppet but a projection” of some aspect of the creator's self, says Philip Rosedale, the founder and CEO of Linden Lab, the company that produces Second Life.

These virtual worlds have become a big business. As many as 10 million people spend \$10 to \$15 a month to subscribe to online role-playing games. Players lay out upwards of \$100 million a year on auction sites like eBay simply for accessories—for example, digital weapons earned or crafted by others in a virtual world—that can enhance their avatars' presence and performance.

But marketers have barely begun to explore

what may be the real opportunity: marketing to avatars rather than to their creators. Sure, the creator, however strong an avatar's identity, retains control of the real-world wallet. But avatars can influence purchasing decisions or, at the very least, offer insights into their creators' tastes. Simply observing how inhabitants of a virtual world use a particular type of product or choose, say, their virtual vacation destinations can generate valuable information. “Marketing depends on soliciting people's dreams,” says Henry Jenkins, the head of the Comparative Media Studies Program at MIT. “And here those dreams are on overt display.”

Companies may also be able to market directly to avatars in their virtual worlds, persuading them to, in effect, purchase real-world goods for their creators, just as those creators buy virtual-world paraphernalia for them. Of course, this can be tricky: McDonald's is still smarting from the uproar in cyberspace several years ago when it set up a fast-food kiosk in the Sims Online game. But marketing that is consistent with the virtual environment—no Pepsi cans littering the banquet table in a medieval fantasy game—and that enhances the experience of participants could bear fruit. In the shopping mall of a virtual world, for example, an avatar could try on—and try out in front of virtual friends—real-world clothing brands or styles her creator wouldn't dare to wear. If she got rave reviews from her pals and became comfortable with the idea of wearing a particular outfit, a purchase in the real world might follow.

Marketers may even discover ways to sell to avatars after they accompany their creators back to the real world. A company might, for instance, create an advertising campaign aimed at “furrries,” a class of genderless beings that enjoy a Beanie Baby-like popularity in many corners of cyberspace, including Second Life, where they have proliferated as, essentially, avatars' avatars. Or it might offer a distinctive clothing line only to people whose avatars have, through achievements in an online world, earned their creators the right to wear the gear. Marketers could thus “tie products to the game without busting the fantasy of the game itself,” says Edward Castronova, a professor of telecommunications at Indiana University and the author of *Synthetic Worlds: The Business and Culture of Online Games*.

This is virtually unexplored marketing terri-

*Marketers have barely begun to explore the opportunities of marketing to avatars rather than to their creators.*

tory. But conceiving of avatars and other on-line personae as a new set of potential customers, one that can be analyzed and segmented, provides a useful lens for identifying marketing opportunities. Indeed, the day may not be far off when someone says to a store clerk, "Wait a minute, give me one of those as well. After all," the customer will add, in a near-echo of pregnant women's perennial refrain, "I'm buying for two."

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## 16. Befriending the Private Label

On a recent visit with retailers in the Middle East, a Sony sales representative astonished his hosts by offering to manufacture knockoffs of some of Sony's products and brand them with trade names of the retailers' choosing.

They shouldn't have been so surprised. Although the practice of creating private labels for retailers has long been considered a suicide strategy, national and global brands such as R.J. Reynolds, Nabisco, Panasonic, and Siemens are embracing it. Corporations are helping retail customers compete with their own branded products in categories that include cellular phones, financial services, packaged goods, and clothing. And they are doing more than just stimulating low-price competition. Many private-label brands created and supported by large manufacturers are of equal or superior value to the manufacturers' own.

Why are so many companies doing this? Research that David Soberman of Insead, Namwoon Kim of Hong Kong Polytechnic University, and I have conducted points to a seeming paradox: An effective way to grow profits as a manufacturer is to advertise your best-selling or premium-priced products like crazy while encouraging private-label versions of them.

We all know why private-label brands have become so powerful. As product markets matured and the retail industry consolidated, a growing percentage of sales was controlled by a shrinking number of retailers. That shift considerably strengthened the power of retailers relative to both manufacturers and consumers. Retailers exploited this power by replacing generic product offerings with their own store brands, which were manufactured by the former suppliers of generic goods. That process helped drive a number of relatively down-

market national brands from retailers' shelves. (Remember Royal Crown Cola?)

Inevitably, many strategists reckoned, premium national and global brands would also feel the squeeze. But that hasn't happened. Our empirical studies across hundreds of categories show that the price differential between big brands and private-label brands has remained steady or even widened. The big brands have maintained or improved their margins even as private labels have proliferated.

That has happened because consumers can be divided into two basic categories. "Brand seekers" buy only branded products. "Private-label seekers" prefer the store label. The more (and more effectively) a manufacturer uses advertising to enhance the perceived value of its premium brand, the more the brand seeker is willing to pay for it. That, in turn, allows the retailer to mark up its private-label prices without having to narrow the differential between its brand and the premium one (the differential, of course, is what makes the store brand look like a bargain to private-label seekers). Heavy advertising by the manufacturer increases the perceived value of the product category as a whole. Both manufacturer and retailer benefit.

That dynamic means that retailers have every reason to stock the heavily marketed big brands, whose price differential with their own brands is largest and whose customers will never buy private labels anyway. At the same time, premium-brand manufacturers have every reason to encourage retailers to launch private labels rather than carry cheaper national-brand products that might compete for brand-seeker customers. And by actually manufacturing private-label products for retailers, a big brand manufacturer further weakens direct competitors while retaining a bit more power in the value chain.

Last October, ACNielsen announced the results of its global study "The Power of Private Labels 2005." According to Hubert Lobo, the head of ACNielsen's Retailer Services, "private labels will give global brands a run for their money in the next two years." The money may, in fact, be for those global brand managers who are courageous enough to exploit the upside economies of the private-label market.

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*Although the practice of creating private labels for retailers has long been considered a suicide strategy, many national and global brands are now embracing it.*

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### 17. A Critical Mass for the Long Term

In an open letter filed with Google's 2004 prospectus, founders Larry Page and Sergey Brin promised to pursue high-risk, high-reward projects, despite the intense short-term earnings pressure they expected as a public company. They wrote of the "fortitude" such actions required and asked shareholders to take a long-term view. Their tone conveyed a message: This would not be business as usual.

Now, if a vanguard group of corporations has its way, the Google guys won't feel so lonely. A number of companies have banded together to see if they can orient markets toward the long term.

Corporate leaders are expected to base decisions—about outsourcing, for instance, or employee benefits, or investment in new markets—on those decisions' medium- or long-term implications. But only 59% of financial executives say they would pursue a *positive* net present value project if it meant missing the consensus earnings-per-share estimate for the quarter, according to a recent study by Fuqua's Campbell Harvey and John Graham and the University of Washington's Shiva Rajgopal. Worse, 78% say they would sacrifice value—in some cases a lot of value—to smooth earnings. Similarly, research by Wharton's Brian Bushee shows that managers are more likely to cut R&D to reverse an earnings decline if a significant amount of the company's equity is owned by institutions with high portfolio turnover. Many companies have the same philosophy about such long-term investments as infrastructure and employee training.

The harmful effects of short-term thinking aren't limited to companies' investment decisions. Calling for extended corporate time horizons, the Conference Board's Blue Ribbon Commission on Restoring Public Trust blamed "short-termism" for contributing to business malfeasance. It also creates a formidable obstacle to corporate involvement in social problems like global warming.

CEOs consider reducing short-term market pressure to be outside their purview. Certainly, one company by itself can do little. But history shows that the right people, working in concert, can alter markets for good.

In 1950, the right people were the 21 leaders of Japan's most important industries, who at-

tended a dinner party in Tokyo with the American statistician W. Edwards Deming. Deming persuaded his dining companions that quality was the answer to the country's woes. Collectively, and without regulatory or legislative goads, those leaders adopted his recommendations, kicking off what ended up being a manufacturing and economic renaissance.

Lengthening corporate perspectives will require a similar critical mass. The effort to build one began in 2004, when Bill McDonough, then-chairman of the Public Company Accounting Oversight Board (created as part of the Sarbanes-Oxley Act to oversee the auditors of public companies), suggested assembling 20 "vanguard" companies—organizations with a collective market cap big enough (approximately \$1 trillion) to move the market. They would become champions of the long-term perspective: evangelizing for it, adopting policies and practices that promote it, and openly communicating their successes and failures. Last year, the first of those 20—blue-chip corporations including General Electric, IBM, and PepsiCo—started meeting with other companies that support taking a long-term view. Together with institutional investors and professional service firms, these organizations are exploring principles and designing or bolstering practices that promote long-term competitiveness.

The group identified four areas in which to pilot practices, beginning with compensation and incentives. Research by Michael Jensen of Harvard Business School and Kevin Murphy of the Marshall School of Business, among others, has carefully examined why maximizing the total long-run value of the firm is separate and distinct from maximizing shareholder value. Now several companies are testing ways to realign incentives with long-run value. GE's CEO Jeffrey Immelt, for example, is receiving performance shares instead of typically structured options. The shares vest only if GE meets or exceeds share-owner return and cash-flow benchmarks measured over five years. Citigroup, meanwhile, has remodeled its incentives so that performance evaluations of its 30,000 managers consider individual efforts to promote the company's long-term interests.

The group also wants boards to refocus on long-term issues. Tyco's board, for example, is devoting five days each year to detailed reviews of the long-term implications of corpo-

*Lengthening corporate perspectives will require effort by a critical mass of vanguard companies.*

rate strategies and their inherent risks, working closely with leaders of each business unit. In another area—metrics—participating firms are testing prototypes of tools for tracking early indicators of an organization’s long-term health. The final area is investor communications. IBM took the lead by issuing a companion “prospectus” to its annual report—not an offer of stock but an in-depth discussion of the company’s business model,

talent base, management systems, and quality of customer relationships, with an eye toward long-term prospects.

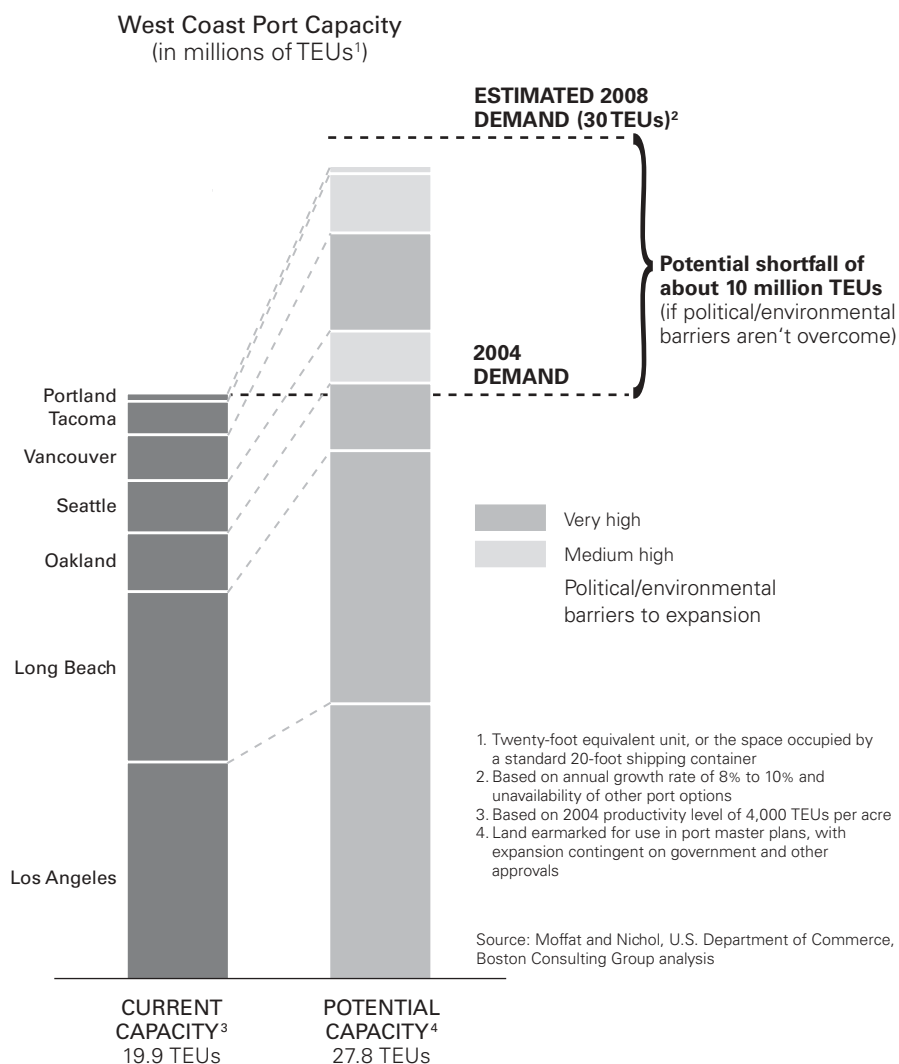
Reintroducing long-term bias is itself a long-term proposition, and participating companies are actively recruiting others. The group hopes that members’ innovations, paired with ongoing investor dialogue, will produce a meaningful response from the market in three to five years. Its initiative has a better chance than the usual ephemeral passes at reform because it starts with—rather than builds to—critical mass. The actions of a few minor players can change who wins one contest. The collective action of major players can change the rules of the game.

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## The West Coast Bottleneck

Ports on the West Coast of North America, already operating at near capacity, have limited room to expand and will face major political and environmental opposition if they try to. This bottleneck

creates problems for U.S. and Canadian companies sourcing in China but also offers competitive opportunities for those who find ways around it.



## 18. The Costly Secret of China Sourcing

Companies’ rush to China hasn’t overturned a basic fact, true since Napoléon invaded Russia: The longer your supply line, the greater your risk. Sure, the Internet, better ships, and more sophisticated logistics systems have reduced the vulnerabilities, but they are still there. And in those vulnerabilities lurk danger for companies with a sourcing strategy that’s anchored in China—but also the opportunity for other companies to use rivals’ China sourcing strategies against them.

As more and more companies are learning, a supply chain stretched to reach one-third of the way around the world requires increasingly expensive management oversight. It also has additional places where unexpected delays can occur, extending an already time-consuming trip from the factory to the showroom floor. While managers increasingly appreciate many of the costs of such delays, they often fail to take into account the loss of gross margins when you don’t adhere to a basic business formula: Have on hand what’s selling, and don’t have what isn’t.

Hidden expenses like this can more than offset the benefits of low Chinese manufacturing costs and ruin a China sourcing strat-

egy. As the time to order and receive goods from China increases, so do these costs. At the very least, the supply chain glitches and bottlenecks are likely to result in profit returns that are lower than those anticipated when the decision was made to source in China. Furthermore, the difficulties in managing supply chains to China are likely to increase significantly, particularly for U.S. companies—and for reasons that have nothing to do with the politics of import restrictions.

The demand for freight-handling capacity on the West Coast has been growing at the rate of one Port of Vancouver a year, but increasing the supply is going to be difficult given security concerns, NIMBY-related political pressures, and formidable environmental resistance. (See the exhibit “The West Coast Bottleneck.”) If the West Coast ports can expand in size or overcome their long history of management and union discord to significantly improve productivity, the day of reckoning can be delayed, but only by several years. And the problem is bigger than the ports. The rail infrastructure to disperse the flood of goods from China around the United States is also being strained, with freight out of Los Angeles and Long Beach already very near capacity and out of Oakland, Seattle, and Tacoma expected to reach capacity in 2007 or 2008.

So what can you do? First and foremost, you need to be unusually aggressive in managing your China-based supply chain, looking for ways to squeeze time from it that competitors haven’t identified. This could involve analyzing the costs, direct and indirect, of air freight as a possible way to avoid the West Coast ports. It could mean paying shippers for preferential treatment such as “hot hatching”—loading your goods onto a vessel last and unloading them first. It could involve working with the few shipping companies able to offload containers directly onto rail cars that are then express-shipped to Memphis, Chicago, or New York—cutting days and sometimes even weeks out of the supply chain.

And if you decide not to source goods in China while a competitor does, you may be able to override your rival’s direct cost advantage by heightening its logistical disadvantage. For example, if you are able to raise the fashion quotient in some category of your business, thereby increasing the demand volatility for certain products, your China-anchored com-

petitor, with its long lead times, could find its logistical problems aggravated. You might also consider consignment pricing, requiring your customers to pay only when they sell your product. To match this appealing offer to customers, your competitor will have to incur much higher carrying costs for the greater inventory in its much longer supply chain.

The current problems of sourcing in China represent a giant nontariff trade barrier. (In fact, the best strategy for U.S. protectionists may lie not in quotas but in the active backing of efforts to hinder port expansion!) And the situation is likely to get worse before it gets better. Politicians throughout the U.S. and Canada will dither and debate until the options for alleviating the port bottlenecks disappear. Companies will do what they can—I’ve suggested a number of competitive tactics—but a single corporation can do little to solve the broader problem. An increasingly frustrated China, which has the most to lose from this de facto trade barrier, may undertake a major initiative, such as developing an all-new West Coast port in Mexico, though any such effort would take years to have an effect because road and rail infrastructures would have to be developed, too.

As the flow of goods slows and the cost of products made in China becomes less competitive, current China sourcing strategies may soon seem like yesterday’s good ideas.

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## 19. The Brain as Boondoggle

Neuroscience has been the next big thing in business for some time now—almost as long as nanotech and maglev trains. And there’s no question that neuroscientists know more and more about the automatic ways in which the brain does all kinds of things. For example, we know that when you have a strong emotional response, one part of your brain tends to light up more than others. Such a finding has potentially useful applications in areas like marketing, offering practitioners a clearer picture of the physiology of customers’ desires.

But these very real advances have led to inflated expectations about what neuroscience

*It's impossible to say that this or that person will be the next Lou Gerstner on the basis of a bunch of individual brain scans.*

can do. Several years ago, for example, as part of an article on the nature of innovation, a business magazine published a scanned image of the brain of businessman and inventor Ray Kurzweil while he was engaged in creative tasks. The implication: Such scans may soon help us to unravel the secrets of creative genius.

It's the sort of science fiction that I've found business leaders extraordinarily susceptible to. I can imagine 20 CEOs meeting for dinner and one of them saying, "Hey, did you hear that Harry's company now has consultants using brain science to help pick managers? We've got to do that, too!"

Unfortunately, as a scientist working in this field, I have to tell you that neuroscience isn't the panacea it may appear to be. You won't be able to use brain scanning to help you tell whether your leading R&D scientist has had a genuine eureka moment. Nor will you be able to use a scanner to choose the right CEO to turn your struggling company around. Not next year. Not the year after. Not in our lifetimes.

To understand the scale of the scientific challenge that scanning still poses, just consider what would be involved in using imaging techniques to spot the next Lou Gerstner. Your first problem is that Gerstner wasn't the only person involved in his success. He had a team of hundreds of people who figured things out with him and helped implement the business choices he made. It's impossible, therefore, to say that this or that person will be the next Lou Gerstner on the basis of a bunch of individual brain scans. You'd somehow have to figure out how the person interacts with his or her social group, and scanning is a long way from being able to capture that.

Another problem is that people can do the exact same things but have their actions expressed in different areas of the brain. Mr. Smith may have L, M, and N areas in his brain light up when he does a certain task, while Mr. Jones may have X, Y, and Z light up when he does the same task to the same effect. But this only tells us that Jones's brain is organized a little bit differently from Smith's.

The hype about neuroscience we're now seeing has happened before, with the original left brain/right brain research, which I helped pioneer. Our work got hugely distorted in the popular press, and it was impossible to find hard data for most of the claims that were being made. The failure to live up to the hype

arguably obscured the real advances we did make.

At the end of the day, there *will* be positive gains from neuroscience, ranging from the development of drugs that can help failing memories to a better understanding of which neural networks are active in moral behavior. Yet no one gains from a pseudoscientific approach to business, least of all managers. While I understand the appeal of bringing scientific rigor to this area of management, the quest for certainty could well devalue the intuition that managers traditionally rely on. In the end, investors pay managers to exercise good judgment, not to read scanner printouts.

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## 20. Why They Call It Work

The halls are alive with the sound of carping. Last year, only 50% of U.S. workers were satisfied with their jobs, the lowest point yet in a steady decline that began in 1995, reports the Conference Board. And with the exception of a few anomalous years, job satisfaction in the United Kingdom has been dropping since 1991, according to research done at the University of Kent. Participants in these studies complained, among other things, about lack of personal fulfillment; "robotic," meaningless work; work/life imbalance; insufficient acknowledgment of efforts; and lack of influence with supervisors.

Conventional wisdom blames such pervasive disgruntlement on poor leadership and lousy work environments. But have working conditions in the past decade really degenerated so much for so many? The decline in satisfaction has persisted in periods when employees have had tremendous leverage and when they've been lucky to have jobs at all. Moreover, the average worker spends more than two hours of each eight-hour workday surfing the Internet, conducting personal business, or just "spacing out." That suggests many employees have autonomy and a manageable workload.

Maybe employees are dissatisfied because they have been taught to expect too much from their jobs. In the mid-1900s, organizational behaviorists concluded that great work environments would produce happy, productive workers. At the same time, humanists

*Employees may be dissatisfied because they have been taught to expect too much from their jobs.*

began arguing that work should be a vehicle for growth and self-expression. Those ideas became part of the conversation for companies and observers of companies, including management consultants and the business press. Employees, as a result, came to expect that their jobs would be satisfying and meaningful and that their employers would help them grow professionally and develop their “true potential.”

Such expectations represent a corporate ideal akin to the romantic ideal that guides some people in their quest for a mate. Those animated by the romantic ideal believe that they will someday find “the one” and embark upon a life of bliss untroubled by personal faults, limitations, and weaknesses. Fortunately, most mature adults eventually abandon that myth. Those who don’t not only are doomed to disappointment but make life miserable for their mates.

Similarly, employees animated by the corporate ideal believe in the existence of a “right” job that meets all the needs on their own, personalized versions of Maslow’s hierarchy. But even a good job in a good company is bound to produce disappointment. In time, these deluded souls will realize that the business is more interested in what they do than in who they are. They will be required to perform tasks they consider tedious or misconceived. They will find that their input is not always welcome. As a result, they will feel frustrated, disappointed, and demeaned.

Much misery could be avoided if employees

held less-exalted ideals about work. Why does a job have to be meaningful and fulfilling? Isn’t it enough that work is simply worthwhile—which is to say worth the employee’s time, considering his or her circumstances? A former student of mine sells a remedy for irritable bowel syndrome, a job she doesn’t find particularly meaningful. But she does believe that for someone with her skills, experience, priorities, and goals, selling this product for this company is certainly worthwhile. Consequently, she believes that she has a good job. And she does. The pharmaceutical company she works for pays her a decent wage, provides good working conditions, and does not waste her time. That should be enough.

Employees should not demand that companies imbue their lives with meaning. Employers and employees have something the other needs. One of the keys to a mutually beneficial relationship is a realistic understanding of what that something is.

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