

PART 1

PRINCIPLES OF GLOBAL LEADERSHIP IN THE ENDURING TECHNOLOGY COMPANY

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THE POLYMATH CEO: ENLIGHTENED LEADERSHIP FOR THE ENDURING TECHNOLOGY COMPANY

BY EDWARD KAHN

THE GLOBAL PICTURE FROM A LOFTY PERCH

Credit the thin atmosphere. As I dangled on a ski lift climbing above up to 11,000 feet above sea level last winter, an insight into an economic truth I had learned on a ski lift years before suddenly came to mind.

The initial lift trip took place in the late 1980s. Ascending the snowy slopes of Sunday River, Maine, I listened intently as my lift partner, a Jewish émigré from Poland who had worked many years in America as an electrical engineer for Japanese-owned NEC, spoke reassuringly into my half-frozen ears about the fearful specter of that Asian country's phoenix rising in the East.

"Sure, Ed, everyone is convinced that this is the end of American industrial dominance," he said, shaking his head in disbelief. "Everyone is writing best-selling books about how we are all going speak Japanese and eat sushi. Rockefeller Center is being sold to the Japanese. Well, not to worry. We are cowboys. They can't invent anything. They're not allowed to think. They have to be in agreement with everyone. They will never be able to outthink us in America."

The man was a prophet in his own (adopted) country. Just two years later, the Japanese industrial "apocalypse" had vanished. Poof, and the Rising Sun was yesterday's hysteria.

Twenty years later, again on a ski lift, I remembered that engineer's prophetic view of Asian cultural stumbling blocks as I thought about the

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current debate raging over globalization's impact on our country's supremacy in innovation.

Once more, corporate America is in a cold sweat over the apparition of a flat world, as Thomas Friedman has so articulately envisioned. But how much of this earth-shattering scenario is for real?

Clyde Prestowitz, a former Reagan trade official, makes a plausible case for a tectonic shift of economic power in *Three Billion New Capitalists: The Great Shift of Wealth and Power to the East*.¹ But his prediction is like "déjà vu all over again," considering that in 1990 he also authored *Trading Places: How America Allowed Japan to Take the Lead*.² That being said, the times truly are changing. Although America has been synonymous with innovation since our founding, in the past few years disturbing signs have emerged that our dominance in scientific and technological brainpower may be on the verge of a precipitous decline.

Witness the meteoric rise of India's star. Five hundred fifty-five million young people under the age of 25 are now vying for coveted jobs outsourced from America. Dubbed "Zippies" by the Indian magazine *Outlook* for the "zip" in their optimistic stride, this horde of high-tech college grads represent cheap labor by our standards, but their salaries often approach nine times that of the average Indian.

The rush to get in on the American outsourcing gold mine has spawned a bumper crop of engineers in India—200,000 in 2004 alone, compared to a mere 70,000 in the United States. Meantime, China dwarfs India's output, graduating 500,000 engineers that same year.

Intel's recent experience may be a harbinger of things to come. Chief executive officer (CEO) Craig Barrett reported that his company's 2004 annual science competition attracted 50,000 American high school student entries. In China, that same competition sparked 6 million student entries.

Asia is sending students by the jet load to America for the best education our tax money can buy. In 2005, the National Academy of Science reported that students from China, India, and the former Soviet Union accounted for almost half of all U.S. doctorates awarded in engineering and science in 2004.

Microsoft's Bill Gates has seen the future of intellectual capital and it is not the United States. According to *Barron's*, his software behemoth anticipates hir-

¹Prestowitz, Clyde. *Three Billion New Capitalists: The Great Shift of Wealth and Power to the East* (Boulder, CO: Basic Books, 2005).

²Prestowitz, Clyde. *Trading Places: How America Allowed Japan to Take the Lead* (North Clarendon, VT: Tuttle Publishing, 1990).

ing 3,000 more engineers in India, with the firm's employment growth there exceeding that of its U.S. operations.

As Friedman observes, "The potential speed and scale of this outsourcing phenomenon makes its potential impact enormous and unpredictable." At the same time, he notes that we should be fine "as long as America maintains its ability to do cutting edge innovation."

The optimum word here is *maintains*. Our aptitude for retaining our prized innovative status is in jeopardy not only because of a shortage of engineers, but also a lack of investment in research and development (R&D). Ever since the tech bubble burst and the economy contracted, stakeholders and Wall Street analysts have pushed corporations for beefy bottom lines, causing many companies to shrink their internal R&D.

For years, American blue chips including Microsoft, Boeing, United Technologies, Electronic Data Systems, and Guidant have lobbied Congress for better R&D tax credits, arguing that most industrialized nations offer far more generous write-offs for investing in new technologies.

And where the capital goes, so go the jobs. Look how Ireland's tax structure lured tech and biotech companies, or Puerto Rico's incentives drew big pharmaceutical companies. Forrester Research estimates that in the next 15 years 3.3 million U.S. jobs and \$136 billion in U.S. wages will move offshore.

For every flat-world doomsdayer, though, there is a naysayer. Conservative commentator David Brooks, for one, argues that far from some weary aging superpower, America still accounts for 40% of R&D spending in the world, and its workers remain the most productive and hardworking.

According to Brooks, a RAND Corporation report disputes studies claiming we have a science and engineering gap. Furthermore, under the Bush administration, funding for federal science research has doubled to \$137 billion, and 60 members of Congress want to double the R&D tax credit and open a Defense Advanced Research Projects Agency (DARPA)-style lab in the Department of Energy, dedicating \$9 billion to scientific research and education.³

Perhaps the most critical variable in the innovation equation that doomsdayers overlook is America's huge but largely invisible intangible economy. As *BusinessWeek* notes, statistics issued by the Bureau of Economic Analysis (BEA) in Washington do not reflect our metamorphosis into a knowledge-based economy.

The BEA can track only tangibles. They have no way to capture data on the billions corporations are now spending on innovation, research, product design,

³Brooks, David. "The Nation of the Future," *New York Times*, February 2, 2006.

brand-building, employee training and other intangible assets vital to competing in a global economy. Amazing as it seems, groundbreaking innovations such as inhaled insulin and the iPod aren't even counted in their numbers.

BusinessWeek calculates that since 2000, the top ten corporations that report R&D investment increased their expenditures by 42%, yet most of that outlay doesn't show up in BEA statistics.

As someone who has spent the last 20 years riding the crest of a rising wave of concern over intellectual property (IP) rights, I come down on the side of those who argue that our country is far from losing its leadership position in ingenuity.

My advice is that before you panic over India, and more so over China, remember that NEC engineer's comments. Certain unique cultural strains exist, such as the Chinese autocracy, which is basically a free market economy inside a vicious totalitarian government. In my view, that is probably a bigger barrier to innovation than anything we face. Sooner or later, the Chinese will undergo their own tensions over distribution of wealth.

Nonetheless, the dramatic changes inherent in a global economy, coupled with the rise in outsourcing and impact of the Internet and convergence in communications, have already caused a re-revolution in the way American business designs and builds new products and services.

One thing is certain: Companies that refuse to adapt to this protean IP environment will perish. Those that conform to a dynamic marketplace model for innovation will succeed. The key to surviving and thriving is for CEOs to view the management of innovation and intellectual property in a radically different light.

WHAT'S AT STAKE

Perhaps the best way for me to illuminate what is at stake is to share another apocalyptic anecdote from yet another chance encounter (score one for quantum physics). In this case, while on a hotel bus heading to a Licensing Executive Society (LES) meeting, I found myself seated next to the Chief Patent Counsel for one of the Big Three automakers (who must remain nameless).

In a patriotic and poignant moment, he asserted that while America's dearth of science, math, and engineering education was of great concern, what worried him far more was the ultimate fate of our beloved country.

"After Pearl Harbor, we were able to ramp up manufacturing to defeat the global axis powers," he observed. "But if we dismantle all our manufacturing in

this country below some critical tipping point, what will we do when we need synthetic rubber for tank treads—order it from the Chinese in the middle of a war?”

His remark elevates the issue of where and how we innovate into a third dimension. Those who dismiss the loss of our manufacturing base because we are becoming a high-tech service—or the more sexy “innovation”—economy should think again. There are certain platitudes too mission critical to a nation state to be left to mere platitudes.

This third dimension of the innovation game bears reflection as CEOs transition into a new age of competition on a playing field that will be anything but level, and no longer confined within the boundaries of our own country.

From my perspective, the intricate complexity of variables in the coming century will require what I call the polymath CEO. These men and women will have to master an original—and for many, foreign core competency—managing intellectual property and innovation across a worldwide spectrum. They must be executive savants, learned in the acquisition and bundling of preexisting technologies and inventions and using them in ever more creative ways.

To compete in this nascent creativity economy, CEOs will have to adopt a revolutionary, polymath management style, excelling in cross-disciplinary thinking that leads to a new creative plane.

Reading this, you may think the only CEO who could fit this bill would be a Leonardo da Vinci, Thomas Edison, Henry Ford, and Bill Gates all rolled into one, with the added diplomatic finesse of a Henry Kissinger. But we all know people with that amalgam of visionary genius and inventive mind come along one at a time, and once in a blue moon, if that.

Instead, polymath CEOs will have to recognize that to succeed in this new creativity economy, they must possess a panoramic view outside their own corporate field of vision.

This new breed of CEOs will shed old notions and prejudices against partnering to embrace “anything invented anywhere”—as a former Japanese colleague cleverly termed it in the late 1980s—devising a more productive corporate process. Such a process could repurpose technology invented for one market segment to turn a profit in its own niche. The current trend in America is to cut central operating costs and keep divisions autonomous. To leverage innovative capacity, however, the flow of R&D across divisions cannot be hampered by organizational rigidity. True, General Electric may run better that way, but what happens if a plastic tubing breakthrough in the water pollution unit never passes through to the solar energy people? Companies can pay a big price for a lavish wedding to the decentralized model.

Breaking down silos will be imperative to compete. That includes barriers to external partnerships. As Henry Chesbrough sagely advised, “Not all of the smart people in the world work for us.”

Procter & Gamble is so committed to breaking down silos that it has reorganized its innovative platform around collaborative models within and without the company. The *Wall Street Journal* reports that in addition to 7,400 R&D staff scattered around 21 research centers in nine countries, P&G aims to originate half of its new products from global sources like InnoCentive, a body of 88,000 scientists and technologists available at the click of a mouse.

RESTRUCTURING FINANCIAL INCENTIVES

Another fundamental change inherent in cross-disciplinary IP management is the adoption of incentives that aid in breaking down silos. As Karl Jorda asserts in Chapter 3, delineating the fusion model of IP management, “Innovation is everyone’s job.”

Ron Sansone, former Vice President of Strategic Innovation at Pitney Bowes, conducted an analysis showing that the number of inventors on a patent directly correlated to the significance of a patent. In that sense, the individual inventor was found to be the ultimate silo.

Since conditions for strategic IP management require different mental styles, companies must tailor different work incentives for everyone all the way down the research, development, and engineering (RD&E) “production line.” That includes any employee with a potentially profitable creative spark.

The incentive matrix of an enduring tech company may someday require royalty sharing between inventors and engineers, cross-divisional collaboration to leverage existing technology, and design of new technology or products with other companies’ technology.

As evidence of this, an intriguing analysis of new product innovations by Donald Lehman, Jacob Goldenberg, and David Mazursky revealed that the highest success-to-failure rate (13/1) was an idea that took advantage of a random event. By random, they meant a “Eureka” moment in which inventors stumbled on something they were not looking for but immediately recognized its significance. The next highest rate of success (7/1) took place in solution spotting, when inventors discovered a new use for an existing technology.

This study underscores the value in breaking down silos to leverage cross-disciplinary thinking, to nurture collaboration within and without. But it also raises the issue of how a company can stimulate serendipity.

Certainly, one of the major impediments today to effective IP management is patent policies that serve as disincentives, for example, awarding \$1,000 for

a patent application, even if there is more than one inventor. If there are four inventors, companies must bite the bullet to prevent their filing narrow individual patents or, worse, keeping their work to themselves. Even if \$4,000 is invested, the return on investment (ROI) will come.

Inadequate compensation policies like these are a prime driver for the rise of the engineer-entrepreneur. Engineers and technologists don't stay with the same company for 40 years like they used to at General Electric or Dow. They go where they are loved, monetarily speaking, which in many cases means their own start-up. Now a company has to pay far more for the same ideas that same engineer might have generated internally if properly rewarded.

Restructuring incentive policies to leverage IP also requires devising longer-term, more sublime incentives for board members and corporate officers, for example, implementing a board policy that rewards a CEO for long-term pay-out instead of the current Wall Street mania for short-term profits. Boards and major stakeholders of enduring tech companies will have to buy into the concept of a longer-term upside if CEOs are to manage IP spectacularly.

IP AND BUSINESS STRATEGY MUST BE CONGRUENT

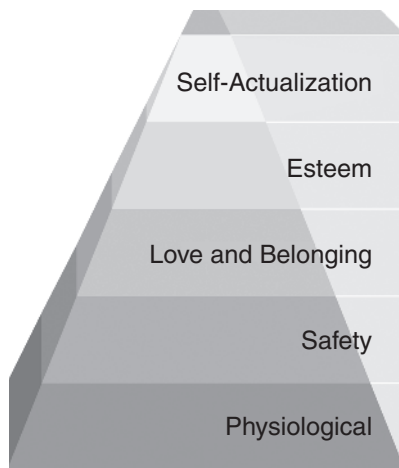
To borrow a popular phrase, "It's the corporate culture, stupid." The internal milieu of a company can determine its innovative spirit, encouraging or depressing idea generation. The CEO of the enduring tech company, therefore, will nurture a totality of employee traits, characteristics, and attitudes directed toward the same strategic goal.

Instilling a coherent innovation culture requires that you examine whether all the projects percolating in your IP portfolio are congruent with your core business strategy. This may sound obvious, but many CEOs today either assume their IP portfolio and long-term strategy operate in sync or haven't stopped to analyze the fit. Management tends to assess the value of IP projects individually instead of in the aggregate as it relates to the long-term interest of their business.

Abraham Maslow, the prominent American psychologist, developed the famous "Hierarchy of Needs" (see Exhibit 1.1), which presents a range of human physical and psychological needs. As humans grow and gain life experience, their position on the pyramid moves upward, with very few ever reaching self-actualization, or their full potential. Just as with Maslow's famous version of the human order of intangible desires, corporate leaders possess their own hierarchy of essential drives, referred to as the "IP Management Hierarchy of Needs" (see Exhibit 1.2).

At the base of this IP Management Hierarchy lie defensive needs, which, if satisfied, progress into cost control, and then upward to a profit center motive.

EXHIBIT 1.1 Maslow's Hierarchy of Needs



Once management fulfills this level of need, it proceeds to the next stage: integration. All too often, however, CEOs get mired in this level of the hierarchy, and as a consequence, never reach the apex of the pyramid—visionary—where most strive to reside.

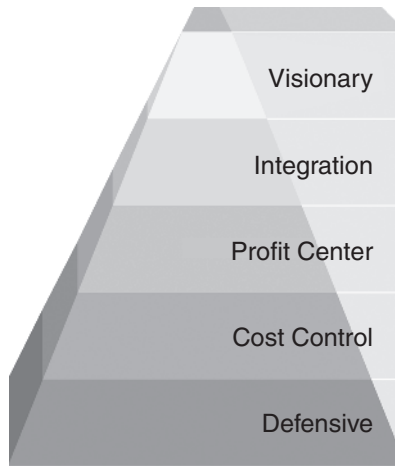
Tech companies, in particular, are prone to getting bogged down at the integration stage because of management's penchant for developing a haphazard portfolio of IP projects. Many of these undertakings offer only short-term profit potential, or exemplify technology for technology's sake—ideas that bear no relation to the company's core business strategy.

In *Connecting the Dots: Aligning Projects with Objectives in Unpredictable Times*,⁴ Cathleen Benko and Warren McFarlan document how many large companies have fallen prey to a scattershot approach to projects and technology-related investments.

Their mantra is “alignment.” Too many projects end up in competition with each other, overlap, or work at cross-purposes, which wastes scarce resources. One study by Gartner Inc. showed that an astounding 90% of information technology (IT) companies have no defined IP portfolio management strategy, a void

⁴Benko, Cathleen, and McFarlan, F. Warren. *Connecting the Dots: Aligning Projects with Objectives in Unpredictable Times* (Boston: Harvard Business School Press, 2003).

EXHIBIT 1.2 IP Management Hierarchy of Needs



Source: J. Davis and J. Coult

that in five years led to \$1 trillion of underperforming assets in the United States alone.

“Your project portfolio is your organization’s future—the truest measure of organizational intent,” the authors note. They suggest a grid on which a company can plot its projects and business objectives. By connecting the dots, management can clearly see if their portfolio and goals cluster or overlap as a measure of alignment.

In an age in which maximizing ROI is imperative, CEOs must ensure that everyone involved in the innovative process is operating on the same wavelength. The metaphor Benko and McFarlan employ is that of “frontier living,” in which a group of pioneers work in unison toward surviving in a new territory rich in resources but subject to unpredictable technological, political, and economic forces.

“Frontiers are uncharted territories,” the authors assert. “They require new mind-sets, creativity, and—most important—the ability to envision how the business can exploit the changes that are under way.”

In their opinion, the confluence of linked technology advancements is fueling the dynamic business world. “The defining characteristics of this shifting landscape include increased organizational transparency, faster and faster data flows, reduced transactional friction, and the further blurring of the traditional roles of competitors, partners, suppliers and customers.”

As my favorite Greek philosopher, Heraclites, presciently advised, “If you don’t expect the unexpected, you will not find it.” Polymath CEOs will thrive in a frontier environment by fostering a corporate culture that champions the power of intellectual capital to propel them into the future.

You might call this quality the “invisible touch.” In *Invisible Advantage: How Intangibles Are Driving Business Performance*,⁵ Jonathan Low and Pam Cohen Kalafut document how innovation muscle and intellectual capital impart a competitive edge in value creation.

They found that the financial success of a corporation correlates directly to a dozen different intangibles: leadership, strategy execution, communication and transparency, brand equity, reputation, alliances and networks, technology and processes, human capital, workplace organization and culture, innovation, intellectual capital, and adaptability. According to Low and Kalafut, “. . . these don’t show on a balance sheet or an income statement, yet they are manageable and usually quantifiable drivers of corporate-value creation.” As evidence, they cite companies like Dell and McDonald’s, which learned quickly and quietly to capitalize on innovation before their competition caught on.

Low and Kalafut also maintain that anticipating change is no longer the sole province of the R&D department, but must involve services, business models, organizational structures, internal processes, profit zones, alliances, marketing, and strategy. Later in this chapter, we will see this view about business models echoed by Clayton Christensen and others. (Most well-run companies have at least removed IP decisions from the sole province of legal, or even just legal and R&D.)

“In fact, a hallmark of the Intangibles Economy is that product innovation is no longer sufficient to stay in the competitive race,” say Low and Kalafut. “Rather, companies must innovate across a variety of fronts. The Intangibles Economy encourages, thrives on, and in fact requires companies to be innovative along many dimensions.”

To do this, though, requires a management attitude adjustment toward cost control. They quote strategy consultant Gary Hamel’s pithy assessment: “In devoting themselves entirely to the pursuit of efficiency, top management inadvertently drives out the ‘waste’ and ‘extravagance’ that is the very fuel of innovation. As top management strives for ever greater efficiency, it must learn to tolerate ‘stupid’ ideas and ‘failed’ experiments.”

Indeed, innovation is now everyone’s job. In this new corporate setting, CEOs must inspire idea generation from the bottom up. Later in this chapter,

⁵Low, Jonathan, and Kalafut, Pam Cohen. *Invisible Advantage: How Intangibles Are Driving Business Performance* (Boulder, CO: Perseus Books Group, 2002).

a few of the best practices adopted by companies in the forefront of this cultural revolution will be discussed.

DISINTERMEDIATION OF RD&E

Dell, Amazon, and exchange-traded funds (ETFs) exemplify the supersonic pace at which disintermediation is taking place in the marketplace today. In effect, disintermediation is cutting out the middleman in classical supply chains, which can result in dramatically lower costs to service the customer.

When I use the term *disintermediation* in the context of RD&E, I am referring to the new paradigm elucidated by Henry Chesbrough in his now classic opus, *Open Innovation: The New Imperative for Creating and Profiting from Technology*.⁶

A leading light of the open innovation business model, Chesbrough explains how companies can develop *disruptive technology*—a term coined by Clayton Christensen—to supersede entrenched competitors. By disruptive technology, Chesbrough means a technological advancement that is such a leap for mankind that it alters the way we live and interact. The automobile, telephone, and now cell phone are prime examples of new technology that revolutionized civilization and, within a short time, rendered their forerunners obsolete.

Chesbrough points to the Xerox Palo Alto Research Center (PARC) as a prime example of a company that developed promising disruptive technologies, but failed to capitalize on them because of a closed innovation model. Seeing opportunity elsewhere, some of their best and brightest departed to create successful start-ups like Adobe and 3Com.

Since the open innovation model began to evolve in the 1990s, the recognition by CEOs of the danger that disruptive technologies pose to their ability to compete and even survive has driven some to radically reengineer their innovation business model.

The open innovation model comprises how something gets designed and made, and how many different elements reside outside a division or physical plant. What Chesbrough dubs the “virtuous circle” is no longer unbroken. “Open innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model.”

As he sees it, in an era when the only constant is change, “The knowledge that a company uncovers in its research cannot be restricted to its internal

⁶Chesbrough, Henry William. *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Boston: Harvard Business School Press, 2003).

pathways to market. Similarly, its internal pathways to market cannot necessarily be restricted to using the company's internal knowledge. This perspective suggests some very different organizing principles for research and innovation."

Under an open innovation model, companies will no longer employ 500 R&D scientists and 200 employees in the new-product development department. RD&E will be more virtual, utilizing outsourcing when and where it works to their advantage.

Under this scenario you might buy your research in India and your development in Taiwan, with the final assembly performed in the United States. This is where the polymath CEO's skills are put to the test. You must evaluate every variable in the value creation equation. While you might prefer to do your research in Brazil for cost reasons, you can't because there is no regulation of employee theft. So you do your research in India because they have good laws on that. (Warning: this is hypothetical; consult your IP attorney!)

This simple example makes crystal clear why the polymath CEO must know—or assemble a crackerjack team of people who know—law, science, and the best source of good engineers for the type of product or service under consideration. To use a biotech metaphor, you have to become a master at recombinant DNA.

Once you adopt an open IP mind-set, though, the world becomes your innovation oyster, with many seedbeds capable of producing pearls of great price—and potential profit.

In a later section of this book, John Tao, Corporate Director of Technology Partnerships at Air Products and Chemicals, Inc., and Vince Magnotta, Technology Transfer Manager of Technology Partnerships at Air Products, offer a macro view of how they model use of universities as a source of innovation. Then, in a later chapter, Teri Willey, a former Managing Partner of ARCH Development Partners, describes how university spinouts and corporate joint purposes can come together even in what were previously considered geographically infertile environments.

With the disintermediation of RD&E, your intellectual property may not come from inside your door, your division, your company, or even your industry. Your R&D scientists may not be born in this country; they may also come from a wholly different discipline.

How much harder is the life of the global high-tech CEO? Previously, the question was relatively simple: Will the country I am exporting to enforce IP protective rights on my product sold there? Now, as stated earlier, that analysis has to be done versus research, development, manufacture, and sale, region by region.

Imagine a small entity that needs funding from your 1,000-employee mid-sized public company and wants to do the development in India. It turns out

that they are close to those brainy Indian professors and there's a whole generation of migrated back Anglo-Indian engineers who can do the design. It might be a more seamless process to do it there—if it can be protected.

Then again, you might choose to go the iPod route, employing young American R&D techies and paying them high U.S. rates because no cost is too high for getting market share.

Here's yet another option: Say one vital part of your new product is the “secret sauce,” so you decide to let that get added only in a place where you can control it physically, legally, and with the full force of IP laws established. You may decide to do 98% of it overseas; the last 2% may be the variable you can truly keep secret. So you ship it to Silicon Valley and do it there. Or you may add the secret sauce in Silicon Valley in an irreversible way, then ship it back to India where the final assembly is done because it's still worth it for the two ocean trips—one for protection and one for the assembly.

In light of the complexity of issues involved today, I'm not certain I want to be a polymath CEO—I'm not that smart. Seriously, though, be advised there is no perfect model of RD&E out there. If anything, models are deadly. If you read this book and try to find one ideal model for your situation, your days of leading an enduring tech company won't last long. The model that fits your scenario may not be the one that guides you in a different situation tomorrow.

VARIED PATHS OF INNOVATION

Polymath CEOs must begin by looking at the spectrum of various business models before they can get down to practical implementation within their company.

In contemplating the paths of innovation that “diverge in the woods,” a CEO has to decide where to place the company's focus, a task that to most appears daunting. Clayton Christensen, a Harvard Business School professor and leading light of the innovation movement, says that for many CEOs innovation resembles the proverbial “black box,” which is a mistaken notion.

In *The Innovator's Solution: Creating and Sustaining Successful Growth*,⁷ Christensen and coauthor Michael Raynor dissect the enigma wherein brilliant ideas seem to spontaneously arise out of nowhere. They insist that creating new growth businesses is predictable once you study the process by which innovation transpires.

⁷Christensen, Clayton M., and Raynor, Michael E. *The Innovator's Solution: Creating and Sustaining Successful Growth* (Boston: Harvard Business School Press, 2003).

“The quest for predictability in an endeavor as complex as innovation is not quixotic. What brings predictability to any field is a body of well-researched *theory*—contingent statements of what causes what and why.” The goal, they say, is for managers who need to grow new businesses with predictable success to become disruptors instead of disrruptees and kill the well-run established competitors.

In their opinion, top management has three jobs: “The first is a near-term assignment. To personally stand astride the interface between disruptive growth businesses and the mainstream businesses to determine through judgment which of the corporation’s resources and processes should be imposed on the new business and which should not.”

The second is longer-term, shepherding the creation of a process the authors term a *disruptive growth engine* that reliably churns out successful growth businesses. The third is the perpetual role of sensing when circumstances are changing and teaching others how to read these tea leaves.

We seem to be back to that recombinant da Vinci, Edison, Ford, and Gates persona. Since geniuses like that are in short supply, however, the solution for most CEOs is a transformation in management mind-set.

As Christensen has noted, leadership attributes that propel a large corporation with a profitable core business do not translate to a marketplace driven by the growth imperative. In an age of disruptive technology, the best management practices that ensured a company’s success can prove to be its Achilles’ heel, abruptly bringing about its downfall.

Instead, CEOs must engage their imagination, relying more heavily on their creative right brain. Much as the Renaissance flowered under original thinkers, the creativity economy will reward executives who possess intellectual vigor and a belief in endless possibilities—and inspire those same qualities down the line.

According to Daniel Pink, author of *A Whole New Mind: Why Right-Brainers Will Rule the Future*,⁸ unlike employees of yesterday who were technology competent and left-brain dominant, the employee of the future must have a well-developed right-brain talent that reflects the attributes of an artist (i.e., creativity, inventiveness, empathy, and meaning), as well as those of an inventor—one who has the ability to see new combinations and relationships that lead to breakthrough thinking and innovation.

Ingenuity by top management will be even more critical to sustain growth. CEOs will have to develop mastery of innovation intelligence gathering. This

⁸Pink, Daniel. *A Whole New Mind: Why Right-Brainers Will Rule the Future* (New York: Riverhead Books, 2006).

synthesized approach includes inspiring; acquiring; in-licensing; out-licensing; spin-offs; enforcement; and cross-company, cross-industry, and cross-border partnering.

“Commoditization of technology offers a wealth of new opportunities as innovators around the world tinker with cheap, ubiquitous information technology commodities,” declares Hal Varian, a professor of business, economics, and information management at the University of California at Berkeley and regular contributor to the *New York Times*.

Although there is a wealth of opportunities out there, there is an equal number of potential land mines. To avoid these, a CEO must develop a sixth sense for accurate valuation of IP.

In the experience of Mark Peterson, CEO of Robinwood Consulting and an expert in IP valuation, a useful working definition of IP is protectable distinctiveness.

“People today often refer to IP as being anything from training, customer lists, patents, trade names, and everything in between,” says Peterson. “In valuation, however, protectable distinctiveness determines in large part how valuable an asset is. IP value is really the competitive advantage you get over the next best alternative.”

If you are dealing in the international market, one of the first variables to consider is what kind of protection you can expect to be granted. Peterson has found that most of the value of technology comes from those areas of the world with strong IP rights. “If you’re doing business in a country without strong IP laws, be very careful. The value you should assign to an asset when you have no way to protect it most likely needs significant discounting as compared to a protectable asset.”

I second the notion that foreign IP entanglements can prove to be risky global business. Remember that U.S. patent protection stops at our borders. Bangalore is not Silicon Valley. If you are getting your R&D done in India or another foreign country, don’t assume that the ownership rules are the same as they are in Silicon Valley.

Stephen J. Frank, a leading patent attorney with Goodwin Procter LLP, warns of recent cases of offshore buyer’s remorse. In “Out Goes Development, In Come the Risks,”⁹ Frank notes, “When proprietary technology gets loose in jurisdictions with poor enforcement records, it often spreads quickly and elusively. Underground businesses can spring up and compete with an IP owner

⁹ Frank, Stephen J. “Out Goes Development, In Come the Risks,” *IP Advisor* (Goodwin Procter newsletter), October 2005.

on a worldwide basis, zapping stolen software, for example, to anyone with an Internet connection and a credit card.”

This can even take place when development is done at home in the United States. “An outsourcer’s first step is always due diligence,” Frank counsels, listing procedures a company can implement, from vetting an offshore partner for physical security measures to asking whether employees can take source code home to determining legal jurisdiction in the offshore partner’s home country.

In Chapter 2 of this book, Edmund Walsh, an intellectual property attorney at Wolf Greenfield, and former Chief Patent Counsel at Teradyne, offers his view of maximizing business value from IP through various business models. According to Walsh, applying the value equation at each point of the decision process can lead to the best investment of the limited resources available to developing and maintaining an IP portfolio.

Walsh’s chapter provides a battlefield-style analysis of your options in this competitive war. At one extreme is the licensing model, and at the other extreme is open source and antiproprietary, with most companies falling somewhere in between.

Today, businesses are also increasingly looking to generate IP value through a balanced protection of trade secrets and the new class of business method patents. In chapter 3, you’ll learn from Karl Jorda, a professor at the Franklin Pierce Law Center and former Chief Patent Counsel at Ciba-Geigy, and Wayne Jaeschke, Patent Counsel at Connolly, Bove, Lodge, & Hutz, and former Chief Patent Counsel at Henkel, the critical distinctions between these two, and how some savvy companies are utilizing these forms of legal protection to leverage IP value.

Certainly, taxation issues are another key variable in the IP calculus. “Accounting treatment can change the cash flow of a deal and thus affect the price of the deal,” says Peterson. “However, the mere fact that a licensing deal is expensed on the P&L statement while an M&A deal involving the same technology is only referenced on the balance sheet is only one of many factors when deciding between the strategic use of licensing vs. M&A.”

In this rough and tumble disruptive innovation world, however, fear of falling victim to creative destruction is driving some companies to slavishly jump on the innovation bandwagon and in potentially suboptimal ways.

General Electric may be one example. Eric Mankin, Executive Director of the Babson Research Center on Innovation and Entrepreneurship, analyzed the difference between GE’s full frontal top-down model versus Best Buy’s “popcorn stand” bottom-up approach.

The question in Mankin's mind is whether GE's top management-driven model will crowd out bottom-up innovators within the organization. Operating in its famous disciplined strategic style, GE's top brass has selected four strategic areas for their innovative push.

"GE's approach revolves around picking winners—determining the areas where the company should be making major investments so as to have big new businesses in the near future," observes Mankin. "It is concerned about initiatives that have the ability to 'move the needle'—specific kinds of innovations that can deliver big economic benefits within a reasonable period of time."

In contrast, "Best Buy customizes its innovations by store and even by sales associate. Each innovation on its own has a small impact, but the many new initiatives add up to strong growth in sales and earnings."

Mankin sums up GE's top-down model as a few big bets leading to big success in a few markets, but with a low level of iteration focused on hitting the right target. In contrast, Best Buy's bottom-up approach is based on many small bets generating results via many successes, but with a high level of experimentation.

"Bottom-up innovations often reflect a deep operational understanding of the business and its current customers," asserts Mankin. In his view, innovations descending from on high reflect strategic decisions by senior executives. While the two approaches are not mutually exclusive, he suggests most companies will want to use a combination.

Mankin concludes that Best Buy utilizes both approaches. "Its overall 'customer-centric' strategy is driven from the top, and entails systematic remodeling of its stores and selling approach. The top-down customer-centric approach complements the bottom-up experimentation that the company encourages."

As I think about the varied paths a company can traverse, the seemingly heretical Nagoya model also comes to mind. According to the *Wall Street Journal*, the very same heavy industries suffering from cheap overseas competition in the United States are thriving in this region of Japan—a country certainly no longer "low wage."

"Nagoya's manufacturers have kept them [competitors] at bay with a maneuver now being copied by producers across Japan," reports Jathon Sapsford. "They moved production of low-end products overseas, but continued to make lucrative high-end goods at home. Demand is growing for such products, which range from engines for hybrid cars to micro-robots for industrial use. To maintain its competitive edge, Nagoya spends robustly on research and development."¹⁰

¹⁰ Sapsford, Jathon, "Japan's Economy Gains Steam from Manufacturing Heartland." *Wall Street Journal*, October 11, 2005.

While pressure for consistent earnings deters high R&D spending by U.S. counterparts, Nagoya companies like Toyota have been frugal. They've also kept to the conservative Japanese customs of lifetime employment, seniority, and cozy shareholder agreements that many economists blamed for the country's slump during the 1990s.

Sapsford maintains that at most Nagoya firms, shares are still held by affiliates, suppliers, or other loyal allies. "The intricate web of cross-shareholding that ties many of them together makes it easier for them to set aside capital for such long-term purposes."

Toyota is a prime example. By owning shares in many of its suppliers, when Toyota chooses to invest in R&D instead of paying a dividend, those suppliers probably won't object. As Paul Sheard, an economist at Lehman Brothers in Tokyo, sees it, the Nagoya strategy doesn't necessarily result in a lack of shareholder returns. "It means you have the freedom to make the best cars, and you don't have the capital markets breathing down your neck."

The Nagoya story also caught my eye because it's in that context of the Big Three patent counsels' concern about losing our manufacturing heft. It's not an economic concern. It's U.S.-centric. Maybe you can make more money selling Mickey Mouse brands over the Internet, but then no one here will be able to weld the axle in the drive train of your car. The collective of a tech company is a tech nation, and that is something we have to ponder in the rush to become a service economy.

Another lesson of Nagoya for CEOs is that if you are doing some of the final innovative assembly and a lot of that value is held back in "your Nagoya," whether that is in Kentucky or the Argentine Pampas, then what competitors "borrow" isn't as valuable. It's a component of the innovation but doesn't stand alone.

Already, hallmarks of leading innovative companies have emerged that can serve as guideposts for CEOs. These firms are translating their enhanced creative platform into increased growth and profitability.

Hallmarks include, first and foremost, developing and executing a synthesized, balanced approach to innovation. A strategic, cross-disciplinary approach leads to increasing their rate of innovation, shortening the time to market of new products and services, and increasing sales, with a concomitant reduction in development and production costs.

To accomplish this, companies often must find a way around traditional internal roadblocks such as a poorly designed incentive structure, an entrenched corporate cultural mind-set, and a fuzzy strategy when it comes to innovation and their IP portfolio.

Interestingly, studies show that the size of a company, per se, has no bearing on whether an entity can become the leading innovator within its industry. The most effective innovators achieve a higher rate of return more through deft management of the innovation process than merely throwing RD&E resources against the wall. Another hallmark is superior market intelligence. Attracting and retaining a top creative talent pool is also vital.

I'm a great believer in innovation by example—companies that those in the know have ranked as the most admired and successful innovators in the business world today. Polymath CEOs need not despair, for best business practices abound. For instance, Google allows engineers to spend up to 20% of their time on a project of their choice, subject to an oversight-and-approval process.

Google may think their brainchild original, but for me, it's back to the future. Google simply took a page—or should I say sticky note—from 3M, which long ago had their 15% rule, allowing employees to devote 15% of their time to projects of their own concoction, from which whole new businesses were created. When some engineer discovered that a particular adhesive wouldn't work properly, in a 15% “Eureka” moment he saw a potential use and invented Post-It® notes.

To give you a more precise picture of the two basic organizational models a CEO can choose to create for IP and R&D management, in later chapters of this book, two well-known corporate IP experts provide detailed descriptions of their particular setup.

Chapter 5, by Damon Matteo, Vice President of IP Commercialization at PARC in Palo Alto, presents a refreshingly decentralized and embedded IP asset distribution sensing system. PARC was famous (or perhaps infamous) at Xerox years ago as the place where everything was invented but no money was made. Now a subsidiary of Xerox, PARC is a veritable powerhouse of IP commercialization.

Playing counterpoint is Abha Divine, President and CEO of AT&T Knowledge Ventures Inc., the strategic IP management arm of AT&T. The model SBC adopted represents a more centralized system than PARC.

These two discussions provide a glimpse into two differing styles of managing your RD&E and resultant IP. Although one company might have a few hundred R&D scientists, and the other a few thousand, both are large enough that they give you an idea of the choices you have in strategic IP management. Both govern the flow between divisions—including those external to the company—and deals. That is always going to be a vital part of the cross-boundary process, whether it involves cross-divisional, cross-corporate, or cross-national or -international boundaries.

In the final analysis, polymath CEOs will have to take the pulse of the business they are going to be in and make a decision as to whether IP will be held closely or given away to drive business to your door and whether IP is a disruptive kind of business practice or technology or just a modest change. You will have to filter all of those factors through your strategic prism before you get down to choosing a Matteo or Divine style for managing large swaths of your RD&E in a larger organization.

OPEN INNOVATION AND DISRUPTIVE TECHNOLOGIES

For a CEO to fathom open innovation and disruptive technology, he or she must first know this: Invention is not innovation. Understanding the difference is critical.

As Henry Chesbrough once elucidated in *Optimize* magazine, we should think of invention as new discovery. A discovery could be new to the world or new to industry, but it consists of something we did not know before. Furthermore, inventions are the province of people with scientific training or who are answering questions like how and why. They're plumbing the depths of difficult, long-term questions that result in fundamental new knowledge.¹¹

Innovation, by contrast, is applying knowledge to a real-world problem and taking an idea to market. You may not have any customer in mind during a process of discovery and invention, but ultimately a customer is critical to the process of innovation.

In many cases, a company owns the rights to an invention, but innovation doesn't take place until they figure out how to package it, market it, sell it, and devise a business model that wraps around the invention.

Christensen points to the classic case of Xerox: The fact that you invented the Xerox machine doesn't mean anything until you come up with the leasing business model that meets a customer need and makes that copying machine profitable in the marketplace.

Anticipating the innovation, not just the invention, is the name of the disruptive technology game. That being said, the ability to scan the horizon and spot disruptive technology before it topples your business may sound like a mission impossible. But in Chapter 8 of this book, Dr. Bruce Vojak, a professor in the Department of Engineering at the University of Illinois, and Dr. Frank

¹¹ Chesbrough, Henry. "Are You Open to Innovation?" *Optimize*, July 2003.

Chambers, a former innovation director at Eaton, present a heuristic methodology for road-mapping disruptive technology threats.

Instead of relying on ESP or tarot cards, the senior technology visionary and his or her junior cohorts can use the authors' methodology based on observations of past patterns of changes in complex, technology-based subsystems to guide their intuition and predict the future of technology.

It is unlikely that Vojak and Chambers' modeling or the best general principles of Christensen and or Chesbrough can keep companies ahead of the relentless curve of change and the oh-so-elusive "disruptive" factor.

But three principles can be applied that keep a company, regardless of industry or size, more likely to be thinking outside of the lagging perspective of even its own customers, marketing people, and scientists:

1. Application of "open innovation" architectures across the entire corporate enterprise.
2. Using the beauty of small-scale initiatives (cf. Mankin) based on outside developed intellectual assets, often at smaller entities, via strategic alliances.
3. The use of outsourced, "out-of-the-box," and cross-disciplinary scientist businesspeople has been advocated and is increasingly being adopted. P&G's decision to tap InnoCentive's worldwide coalition of 80,000 technologists and scientists to originate half of its new product innovations is a prime example.¹²

An outstanding example of the first principle has taken shape at Air Products and Chemicals, Inc., a company that has evolved the open innovation model in a profitable manner. In Chapter 9, Dr. John Tao, Air Products' corporate director of technology partnerships, and Vince Magnotta, technology transfer manager of technology partnerships, outline the organizational structure and process begun in 1995 to centralize their external technology efforts and implement best practices across the company.

At Air Products, partnering is a cornerstone, mostly external. As the authors quip, "The best R&D is not an individual sport." They explain how solutions are identified and accelerated utilizing partnering strategies such as university R&D alliances, global R&D insourcing, external providers, licensing-in, and joint development. Case studies are reviewed covering university alliances, working with a Russian institute, and measuring external research programs.

¹² www.innocentive.com, Press Release, February 10, 2003.

I should note here that Dr. Tao says that Air Products inspired Chesbrough's work on open innovation almost as much as Chesbrough inspired them. Although these two may good-naturedly claim precedence over the other, notwithstanding Professor Chesbrough's original grounding in his hands-on industrial management experience, Air Products has implemented the principles throughout a large industrial entity. Of particular note is their significant foreign partnering in Russia and China.

In any event, based on my career in IP, I think the evolution of Air Products' open innovation model is a healthy and natural one, which may or may not have arisen from the Chesbrough theory.

The second operational principle is exemplified in Dennis McCullough's discussion of how ABB Lummus has used small-scale initiatives as a key growth strategy. He argues that small-scale initiatives provide low-risk entry to new markets. (Once again, the careful executive should observe the implicit cautionary against large company focus on a few big bets.)

McCullough explains how intellectual assets of others, nurtured through the disparate skill sets of larger and smaller partners in strategic alliances, can be made to work for both entities. His insights into specific techniques for "load leveling" in the alliance—giving the innovative lead to the small party and the developmental tilt to the larger party—are great teaching for the corporate leader.

The third operational principle of getting your future thinking into "left field" by using people from "left field," was discussed in an interesting McKinsey work from 2001.

Although that work discussed utilizing these on-call specialists for helping with out-licensing—an endeavor not nearly so mission critical as strategic in-licensing—the concept will work ideally for discovering, analyzing, and exploring development paths for available external technologies, which may prove to be the basis for the healthy internal disruption.

While discussing "how to out-license," the McKinsey work advocated the creation of teams of on-call knowledge partners, both broad-based technologists and industry specialists.

This 2001 idea for using these types of people to suggest applications for "leftover" or "excess" technologies across a range of technologies and industries had been applied by EKMS, Inc. since 1989.

At EKMS, on behalf of many *Fortune* 500 organizations, we had bred such a knowledge partner pool for strategic IP in-licensing, partnering, and out-licensing. At EKMS we dubbed these out-of-the-box thinkers "doctors of dangerous eclecticism" (or affectionately, DDEs)

The polymath CEO will recognize the need for pools of cross-innovating thinkers, scientists, and businesspeople who can look across fields as diverse as pollution controls and telecom and see the unexpected value connection.

Sustainability becomes less a matter of picking the right model than it is of developing a corporate environment that learns to be one subject to continuous reinvention of the very manner in which it innovates.

Generating value from innovation through cross-functional invention teams is a subject covered in Chapter 7 by Carsten Wittrup, Director of Global Technology at the BOC Group. To him, the internal and external connection network is vital because innovation is performed by people connecting with people in a creative and boundary-breaking process in which they are free to challenge rules, practices, and traditions to strive for and reach new and higher ground. His chapter provides a lot of grist for managing the “softer” side of the innovation process.

If you are the CEO reading this and realize that you aren’t a right-brained type, what do you do?

You can open your organization to such types in the highest ranks of innovation management. These people will make tangible in an organization the realization that innovation is best achieved by people making connections in both internal and external networks in a creative and boundary-breaking process. As CEO, you need not be the person who inherently challenges rules, practices, and traditions in an ongoing effort to change more rapidly.

Ultimately, all innovation comes down to the human element. The leadership of the enduring tech company will take a village. It could be a committee of three to five people, some with an emphasis on the financial piece of the equation, some on sourcing of ideas, some on team leadership and innovation. But the person who leads that group must be a synthetic thinker, more right-brained than left-brained, and that may be a big shift.

MERGER MANIA VS. TECH TRANSFER

The urge to merge is back. Apparently, the mergers and acquisitions (M&A) world still possesses the same seductive powers that lured so many companies into disastrous relationships during the 1980s and 1990s. Never mind that every study conducted, including those by leading consulting firms like McKinsey & Company and PriceWaterhouseCoopers, have documented the shockingly high failure rate of this strategy.

“The stats on M&A failure, in fact, might be gloomier than the American divorce rate,” observes the Caxton Group, a Cleveland consulting firm specializing in the needs of emerging companies. “Depending on whether success is defined by shareholder value, customer satisfaction, or some other measure, most research places the merger failure rate somewhere between 50% and 80%.”

Flanagan Consultants of Stamford, Connecticut, places that figure even higher. “Depending on the particular time period and industries studied, the failure rate for M&As ranges from 60% to 90%.”

There’s not a lot of room to succeed in those percentages, which argues that smart CEOs would realize it imperative, as Santayana cautioned, to learn from history so they are not doomed to repeat it.

Interestingly, the Flanagan report noted that one in-depth study of 497 companies concluded that CEO overconfidence was the primary culprit. While other studies posit numerous other reasons for the demise of so many business entanglements, my own experience in this field prompts me to believe that leadership is certainly key to the question of how and when to merge to leverage IP growth.

I surmise the twenty-first century corporate rush to get back in the M&A game is driven by the resurgence of the high-tech sector. For some executives, it may be simply a lingering desire to return to the good old heady days of the 1990s when initial public offerings (IPOs) and M&A dominated headlines and drove stock prices through the roof.

For other CEOs, however, the driving force is the opportunity for market share and profit in a start-up tech rebirth that this time appears grounded in real-world business plans.

According to *Business 2.0*, the reappearance along the Silicon corridor of major players like venture capitalists, IP law firms, and investment bankers spells billions to be made. “What is on display in Palo Alto—indeed, increasingly in all of the nation’s tech centers, from Seattle to Austin to New York—is the early stage of a new technology boom of potentially unprecedented power and durability . . . And this time, even some circumspect observers of the tech scene believe, the industry could soar to greater—and more sustainable—heights than ever before.”

The article states that money invested in early-stage start-ups could top \$1.5 billion in 2005, up 50% from 2004. The average seed investment in 2005, \$4.4 million, is three times what it was the year before and larger than it was in 2000, which means that venture capitalists (VCs) are valuing start-ups at higher levels than at the height of the first boom.

Some veterans of the first go-round aren’t buying, apparently suffering a case of start-up fatigue. But other big corporate names are jockeying for position in what they perceive as a rosy path to sustainable revenue growth.

How quickly they forget. Take XROS, a sure bet that Nortel eagerly ponied up \$3.25 billion for at the time of acquisition. No matter that XROS had only \$3 million in net tangible assets. That particular fiber-optical illusion has the honor of contributing to Nortel’s world record \$12.4 billion write-down in June

2001. Or consider Lucent's acquisition of optical networking systems developer Chromatis in 2000. The price tag—\$4.7 billion in stock—was an unprecedented sum to pay for a start-up with any realized revenue. Even as the stock market bottomed out, investors still yielded a robust 1,600% ROI.

When you look back at the telecom boom, people should have screamed when Nortel stock was worth \$100 billion. The XROS technology was bought by Nortel for multibillions of dollars after only a couple of rounds of VC funding.

People in licensing know that an idea by a university professor at Weitzmann Institute three years earlier would never have gotten licensed by anyone in corporate R&D at those telecom companies for even \$100,000. Why? If the last 500 feet of fiber to the curb was so important that it was worth \$3.25 billion, isn't there something wrong? XROS strikes me as a prime example of the puzzling CEO penchant for buying a whole company for \$2 billion instead of licensing a much wider array of technologies and having a great deal of cash left over for moving them forward in a measured manner, and funding those that prove to be the better candidates—diversification over that “one big bet.”

Outsized stock market rewards for M&A; financial disincentive to patent acquisitions; and lack of ability to assemble development teams to test, sort through, and scale only the winners all tip conventional practice toward acquiring a fully integrated technology company rather than placing, via license, discrete, multiple technology bets.

As the public markets continue to rebound, now is the time for the visionary CEO to at least consider that 100 technology licensing bets, complete with “portable” R&D teams, could be made for the price of one M&A deal.

Your stock price is inflating, but so is the price of the smaller but rarely VC-funded company that has some reduction to practice and initial beta sales.

Most VC operations finance later-stage ventures, keeping strong technologists with poor business prospects, very hungry for the larger company's advances.

WIDE IP VISION AS AN ANTIDOTE TO TROLLS

A resurgence in M&A activity has occurred at the same time that much attention is being paid to the vexing problem of the patent troll.

The ability and willingness to practice “open innovation,” to broadly and regularly survey the IP landscape of seemingly irrelevant invention activities in (seemingly) nonrelated industries, and to add strategic in-licensing as a business

development complement to M&A could go a long way in reducing the rising threat of the patent troll.

Trolls, a term invented by Peter Detkin while he was at Intel, refers to a firm whose sole purpose is to assert allegedly fundamental, infringed patents against those technology firms shipping products that allegedly practice those patents' claims.

Owners of these fundamental patents would rather use the term *legitimate enforcement operations* rather than the more commonly used *troll*.

But as evidenced by the \$600 million-plus settlement that ended the RIM (BlackBerry)-NTP battle, this is a growing problem for companies shipping products.

These patents picked up by trolls did not start life, for the most part, with assertion in mind. They were the embodiments of would-be technology products that, for one reason or the other, never got off the ground.

Failed technology product companies, whose only remaining value is a few patents filed years before, have no other monetization avenue than assertion. Certainly, many of those patents are not truly seminal. In those cases, these patents, handled by skillful assertion pros, can still, after cleverly gauging the cost of defense, set the price tag accordingly and collect several hundred thousand dollars per patent set, per licensee, without ever testing the substance of the issued claims—not good for innovation.

However, some of the patent “resurfacing” and assertion painfully in the here and now could have been picked up much earlier. A healthier mix of strategic in-licensing to complement M&A could have been a vaccine against some of these trolls.

An open innovation corporate culture will lead inevitably to a wider strategic view, better skills at landscape assessment, and more proactive in-licensing.

Had the telecom bubble not burst and an XROS succeeded, how many patents would have lined up to collect? And whether XROS should have been worth not 3.25 billion, but even \$325 million, how many acquiring companies would have defensively and aggressively in-licensed related patents at the same time, as complement to the larger product acquisition?

In looking at the buying habits of an M&A-active company how many seminal patents were turned down while avoiding the “early-stage risk” of a tech transfer partnership with a small firm?

Most companies conduct “freedom of action” studies (patent clearance) before launching major product initiatives, but how much do most invest in in-licensing those patents that lie around the periphery of their otherwise “cleared” product?

SUSTAINABILITY REQUIRES CONSTANT CHANGE

The original title of this book was not *Innovate or Perish*; it was *Adaptive Innovation*. Not only must twenty-first-century CEOs adapt innovation to the globalized world, but they must continuously adapt their own internal innovation models to ever fast-changing circumstances.

CEOs of enduring technology companies must not only redesign the organizational structure to foster IP cross-pollination, they must also reengineer the business model for acquiring and productizing intellectual assets.

Polymath CEOs will have to take the pulse of each product initiative they are going to launch and make a high-level decision as to whether it will be held closely or given away to drive business to their door. These variables will have to pass through your prism before you can decide on the functional style for combining disparate operational elements on this particular subventure.

Traditional and even recently reengineered business models will not survive long; that's just the reality of a flattened world. The time-honored practice of listening to your customers for new ideas won't get you that leapfrog product or service because the customer doesn't necessarily anticipate the future. The existing market won't have the disruptive suggestion you're searching for because they want stability, too. This is why, as Chesbrough and Christensen have cautioned, the incumbent gets surprised.

Even if you ask your major customers, they will tell you to keep giving them that proverbial mimeograph machine. An invention alone without the innovative construct has no real value, however. To stay with the mimeograph machine analogy, no one will buy a \$50,000 Xerox machine when a perfectly good mimeograph machine exists. But if they can lease it per usage, that changes the whole equation. This distinction is critical in understanding the difference between a great idea and an innovative construct that can open new markets. That is the now seemingly simple teaching of Christensen and Chesbrough—even your customers don't know when they want the next great thing.

Inspiring an environment in which a brainchild like Post-It® notes can be brought to life requires CEOs to ensure that a creative atmosphere permeates every aspect of their organization. 3M's Post-It® notes are the billion-dollar by-product of management commitment to the value of free thinking. Granting employees time to engage in scientific experimentation may sound like a new thing, but it's basically letting people engage in a random walk.

It is those random walks that spark the rich associative process that leads to innovation. As a global technology leader, you must understand how to train

your organization to identify disruptive technology from anywhere and decide how to link your company's complementary R&D to it. At the same time, you must determine what style of workforce and compensation structure will allow people to support that type of thinking. A CEO must also decide what kind of geopolitical role his or her corporation's country of origin and its economic policy plays in relation to all this.

The only way this transformation in leadership and culture at technology companies will take place is if everyone—including stakeholders—sees it as a business opportunity. Perhaps the ultimate innovation would be an innovative financial model that would account for and reward creativity and imagination. For example, a company might create a separate set of books or even stock—GE green might attract certain types of investors over regular GE stock.

One thing is certain: The revolutionary approach of the open innovation model is not without risk. But as Sir Francis Bacon observed, "He that will not apply new remedies must expect new evils, for time is the greatest innovator."

In closing, I deliver to you on stone tablets my Five Simple Commandments for Managing the Enduring Tech Company:

1. Make sure your incentive structure lets scientists build on other people's technology with an equal reward as if they had invented it in house.
2. Be cognizant that your archrival in one field may be your key technology partner in another product line.
3. Don't panic when you see a great national technology economy merging like a Brazil, India, or China. See only opportunity. Don't fear the danger. Learn to work with a gift.
4. If you do not understand it, that does not make it unimportant.
5. Governments, regulators, and stakeholders of all types are already demanding the longer view. If the lowest common denominator of the short view is to be found in a Houston courtroom, why not anticipate society's rewards for the company that builds transformative value for today and tomorrow?