

The background is a complex, abstract visualization of a network or ecosystem. It features numerous glowing spheres in shades of blue, purple, and teal, each containing intricate patterns of lines and dots. These spheres are interconnected by a dense web of thin, light-colored lines, creating a sense of dynamic movement and interconnectedness. The overall color palette is dominated by cool blues and purples, with some warmer highlights in green and yellow.

Business ecosystems come of age

This report explores how forward-looking leaders and organizations can thrive in a world of business ecosystems.

A CHANGING WORLD



Business ecosystems come of age

Businesses are moving beyond traditional industry silos and coalescing into richly networked ecosystems, creating new opportunities for innovation alongside new challenges for many incumbent enterprises.



Blurring boundaries, uncharted frontiers

Long-standing boundaries and constraints that have traditionally determined the evolution of business are dissolving, allowing new ecosystem possibilities to flourish.

LIBERATING POTENTIALS



Wicked opportunities

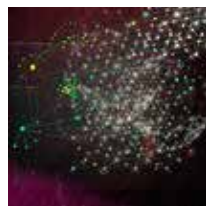
“Wicked problems”—ranging from malaria to dwindling water supplies—are being reframed as “wicked opportunities” and tackled by networks of nongovernmental organizations, social entrepreneurs, governments, and big businesses.



Regulating ecosystems

As ecosystems enable more rapid, cross-cutting innovation, regulators are challenged to create policies and solutions that protect the public’s interests and are also dynamic enough to keep pace with innovation.

EVOLVING ENTERPRISE STRATEGIES



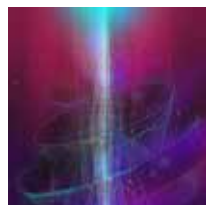
Supply chains and value webs

Supply chains are increasingly becoming value webs that span and connect whole ecosystems of suppliers and collaborators; properly activated, they can play a critical role in reshaping business strategy and delivering superior results.



The new calculus of corporate portfolios

The rise of business ecosystems is compelling strategists to value assets according to an additional calculus, often generating different conclusions about what should be owned.



The power of platforms

Properly designed business platforms can help create and capture new economic value and scale the potential for learning across entire ecosystems.

CRITICAL CAPABILITIES



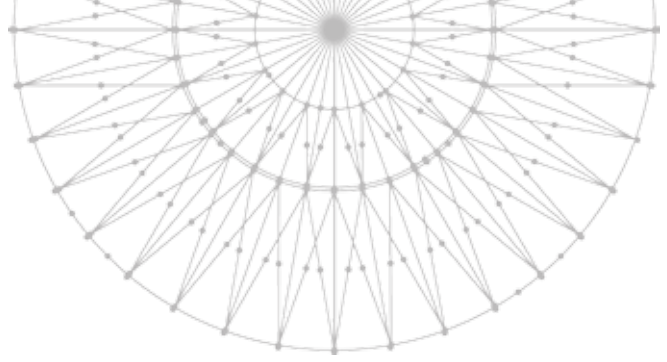
Minimum viable transformation

Leaders are taking lessons from the startup playbook on “minimum viable products” to launch minimum viable transformations—lightweight and readily adaptable versions of potential new business models.



Beyond design thinking

Ecosystems are dynamic and co-evolving communities of diverse actors who create new value through increasingly productive and sophisticated models of both collaboration and competition.



Preface

WELCOME to Deloitte’s latest *Business Trends* report.

The purpose of these reports is straightforward: to provide business leaders with fresh and well-informed perspectives on important dynamics that are disrupting “business as usual.” While change is nothing new, the speed, scale, and impact of a variety of fundamental shifts—in globalization, technology, and societal expectations—are undeniably transforming the business landscape today. We conduct and share this research as part of our commitment to serve as **guides and “wayfinders”** to our clients as they navigate their new terrain and shape the future.

In periods of disruption, uncertainty and challenge are inevitable. However, these times often also uncover new opportunities. Addressing both risks and potential rewards takes **confidence**, in decisions and actions alike, and in the solid analysis that should precede them. Uncertainty should not be denied or ignored—instead, it should be mastered, and grounded in both a deep understanding of the changes afoot and their potential consequences.

In this report, we focus on a critically important transition that has considerable implications for society, the economy, and businesses everywhere: **the continued rise of “business ecosystems.”** Driven particularly by digitization, connectivity, and new modes of collaboration, important core structures of the industrial economy are quickly and dramatically reshaping, as many long-standing boundaries blur and dissolve. The “art of the possible” is expanding—enabling new approaches to serious societal challenges, and new, often platform-based, business models.

In *Business ecosystems come of age* we explore in detail what lies behind these changes, where they might take us, the new options—and threats—they present to many incumbents, and the strategic and operational shifts they enable and demand. We sincerely hope that these perspectives are helpful as you undertake your journey into a fast-changing future.

Mike Canning
National managing director
Strategy & Operations
Deloitte Consulting LLP

Eamonn Kelly
Chief marketing officer
Strategy & Operations
Deloitte Consulting LLP




Blurring boundaries, uncharted frontiers

By Eamonn Kelly

Overview

THE business environment has never been static, simple, or certain: Profound change, sometimes abrupt, sometimes gradual, has been reshaping the world for centuries. As recently as 1900, European empires straddled the globe, and the British empire alone contained 400 million people—25 percent of the world’s population.¹ Only a tiny minority had ever stepped foot on foreign lands, or even travelled more than 50 miles from their place of birth. Well over 80 percent still lived on farms or rural communities.² In the United States, already the world’s wealthiest country, life expectancy at birth was 47 years; about 7 percent of students completed high school; 1 percent of citizens held investments in public companies or mutual funds;³ only 19 percent of women worked for pay;⁴ just 3 percent of households were lit by electricity, and less than a third had running water.⁵ While scientific knowledge and technological capabilities had progressed greatly since the Enlightenment, they remained almost primitive by today’s standards.

But history was in motion. Between 1900 and 1905, Kodak would launch the Brownie—the first mass market camera; Marconi would transmit and receive transatlantic radio signals; the first narrative movie would be watched by



Ecosystems are dynamic and co-evolving communities of diverse actors who create new value through increasingly productive and sophisticated models of both collaboration and competition.

Read more about our view of business ecosystems in the Introduction.

Long-standing boundaries and constraints that have traditionally determined the evolution of business are dissolving, allowing new ecosystem possibilities to flourish.

millions around the United States in the first “nickelodeons”; the Wright brothers would take flight at Kitty Hawk; Hubert Booth would invent the first modern vacuum cleaner; a young Japanese playing card company, Nintendo, would start trading internationally; Henry Ford would incorporate his eponymous automobile firm; John A. Fleming would create the first practical vacuum tubes; Rutherford and Soddy would introduce their general theory of radioactivity; and the 26-year-old Albert Einstein would propose his theory of relativity and postulate the existence of photons. All of these—and many more events in that one brief historic window—were either enablers or manifestations of a rapidly expanding universe of new knowledge, capabilities, and potential.

Disruptive change is hardly a new phenomenon: Preceding generations have enjoyed and endured rapid shifts arguably even more transformative to their lives and work than those

we experience today. And yet, it does appear inevitable that change will continue to accelerate. Knowledge begets knowledge; today's technologies fuel and catalyze each other's development; fast-spreading tertiary education opportunities around the globe are creating tens of millions of new actors in multiple fields of expertise; and massively enhanced connectivity combines, melds, and disseminates this increasingly rich mixture to accelerate learning and innovation.


The story of change in our time, however, is not only a story of speed. Even more disruptively, long-standing boundaries and constraints that have powerfully determined the evolution of business, the economy, and society are now blurring and even dissolving. As a result, a new era of extraordinary possibility and potential is unfolding. Unprecedented opportunities are inspiring entrepreneurs and innovators. But these are also challenging incumbent leaders and businesses to adapt and act with confidence in order to thrive in the future.

What's behind this trend?

Many factors are together driving the transformation of the business environment. The global economy has changed beyond recognition. Newly powerful nations and organizations are growing, consuming, and helping to set new rules. Sustainability challenges, demographic shifts, and the needs of a new global "middle class" are increasingly important sources of innovation. Social and cultural shifts occur everywhere, empowered by an increasingly influential generation of entrepreneurial and impact-oriented "digital natives." New ways of collaborating and interacting are creating new organizational forms, business models, and approaches to talent engagement. Evolving

societal expectations and scrutiny of businesses are reshaping the regulatory environment and challenging the "license to operate" and "license to grow" for multiple industries.

Fueling all of these, however, is rapid technological advancement. Few would dispute the central importance of technology, especially digital technology, as the key source of change



Few would dispute the central importance of technology, especially digital technology, as the key source of change in recent decades.

in recent decades. Nor would they deny that it will continue to play an absolutely critical role. As writer Stewart Brand has observed, computing is not like previous technologies—it is "autocatalytic," or self-accelerating, as each development allows the next one to come about faster.⁶ Seymour Cray, when told that Apple Inc. had bought one of his Cray supercomputers to help design the next Macintosh computer, declared: "I just bought a Mac to help me design the next Cray!"⁷ Computers have also catalyzed rapid advances in other fields, including engineering, materials science, nanotechnology, and biotechnology.

Moore's Law—which defines the remarkable exponential growth in computing power and decline in cost—has held for 50 years, despite recurring concerns it would hit technological limitations.⁸ It appears likely to endure longer; yet even if the pace should slow, the stage is already set for continuing digital disruption. After all, the process is still relatively new. The Internet only started entering the mainstream economy less than 20 years ago. Broadband access only overtook far slower dial-up modems about 10 years ago. Mobile devices designed for a digital economy—notably smartphones and tablets—arrived about

seven years ago, and cloud computing and storage became truly effective shortly afterward. Even more recently we have witnessed the growing reach and power of software “applications,” already altering the worlds of individuals and enterprises alike. Today the “Internet of Things” (connecting objects just as the Internet has connected people) is poised for takeoff. And the ability to analyze and interpret massive amounts of new data will grow, as machine intelligence continues to evolve, generating powerful new insights and predictive capabilities.

Digitization of the economy has already had tremendous impact, but we are only beginning to witness the sheer scale and scope of its transformative power.

The trend

Increasingly, businesses operate in complex, dynamic, and adaptive ecosystems. A variety of phenomena—including feedback loops, stocks and flows, scaling and network effects, power laws, and so on—must be understood to properly appreciate and anticipate how systems behave and might evolve. But one major change is already underway. *The fundamental boundaries that have specified the relationships, interactions, and possibilities of most businesses are rapidly blurring and dissolving.* Historically, when boundaries have moved—geographic, scientific, technological, institutional, or cultural—the results have been momentous. When multiple boundaries shift simultaneously—as happened during the Enlightenment and the Industrial Revolution—truly extraordinary breakthroughs and great strides in human progress occur, through the creation of new connections, possibilities, and ideas.

Many long-standing boundaries have been blurring in recent decades. Industries and sectors have been converging, reducing the clear lines of demarcation originally defined and codified almost 80 years ago.⁹ Boundaries between and within firms have been weakening. Old distinctions between products and services are breaking down as businesses

traditionally specializing in one seek to integrate the other, to create fuller “solutions” and more compelling experiences that serve customers’ growing expectations. The historically profound gaps between the capabilities and influence of large and small organizations are steadily declining. For many individuals, the boundary between paid work and passionate pursuit of interests and hobbies is falling.

Even the respective roles and contributions of the private, civic, and public sectors are blurring. Businesses were historically driven by market values, and the civic sector by moral and social values; governments set the rules and provided public goods. Today, they are merging and becoming increasingly interdependent through new partnerships and collaborations—often in pursuit of shared goals in light of another blurring, as externalities become internalized within market-based solutions. The liberalization of trade policies following the demise of the Soviet Union has served both to soften borders between countries, and also greatly diminish the vast dividing line between the “developed” and “emerging” economies. Cross-fertilization and increasing collaboration across scientific and technological domains are dissolving multiple knowledge boundaries.

These are all crucial changes and are already impacting every sector and almost every business today. But three key types of blurring are poised to have growing and ubiquitous impact.

The human-machine boundary

From the advent of the most basic tools, technologies have always replaced and expanded upon human endeavor. The Industrial Revolution brought widespread mechanization of *routine manual* labor—a process continued ever since through multiple manufacturing innovations. The advent of office machines, especially computers, expanded automation into the *cognitive* domain—again, mainly in routine areas, as software algorithms captured well-codified and rule-based procedures and expertise, enabling faster, cheaper, and more reliable business

operations. Meanwhile, since General Motors introduced the first industrial robots in the 1960s, machinery has been steadily extending its reach into *nonroutine* manual work.¹⁰ Recently, for example, the US Navy tested a prototype bipedal firefighting robot equipped with multiple sensing and actuation capabilities.¹¹ General Electric is designing robots that can, for example, climb and maintain wind turbines.¹²

There will be further machine encroachments into manual work and routine cognitive fields, but the new and transformative blurring boundary today is occurring in the *nonroutine cognitive* domain, which has historically largely defied automation. Artificial Intelligence (AI), including machine learning, natural language processing, knowledge representation, machine-to-machine communication, and automated reasoning, is evolving fast.¹³ Investment here has exceeded \$17 billion since 2009, with private investment growing around 62 percent a year.¹⁴ The extraordinary consequences are already becoming manifest. Apple's Siri voice recognition software applies natural language recognition to interpret and act upon spoken words. Google Translate has over 500 million active users every month, and now features a "conversation mode" that enables real-time bilingual conversations.¹⁵ Self-driving vehicles have been road tested for millions of miles.¹⁶ Symantec's Clearwell software, designed to address the explosion of "e-discovery" efforts in legal matters, uses language analysis to review and sort hundreds of thousands of documents in just hours.¹⁷ IBM's Watson, having won *Jeopardy!*, is now detecting and diagnosing medical conditions and outlining patient-care plans.¹⁸ Financial services firms such as Betterment and Wealthfront provide automated, customized investment advice. The Associated Press (AP) is implementing a system to automate the writing of corporate earnings reports, allowing reporters to concentrate on tasks that require more ingenuity and add more value—"more journalism and less data processing" in the words of the AP's Lou Ferrera.¹⁹

Looking ahead, the implications of increasingly autonomous non-human intelligence are profound, though still uncertain. Many, including scientist Stephen Hawking and entrepreneur Elon Musk, have voiced serious, perhaps existential, concerns regarding the potential consequences.²⁰ More immediately, however, we need only look backward at the transformative impacts of automation on manual and routine cognitive work—growth, productivity, and prosperity, alongside challenging social disruptions—to get a sense of the sheer scale of what likely lies just around the corner.

The producer-consumer boundary

Another clearly drawn line quickly losing resolution is the distinction between producers and consumers. In the first half of the twentieth century, powerful producers forged and dominated the new industrial era; consumers were the passive recipients of their output, far from active participants. In recent decades, increased choice enhanced consumers' power in the marketplace, but they were engaged rarely and weakly, through mechanisms like focus groups. Persuasion prevailed over participation. Even today, many businesses declare themselves "customer-centric," but still strategize around "value chains" that relegate consumers to the far end of increasingly complex production arrangements.

Such approaches are becoming increasingly inadequate as the old boundaries between producers and consumers blur in a variety of ways. Consider YouTube, where millions of users create and share 300 hours of content *every minute*.²¹ Today, we also see people contributing real value to many communities of shared interests and needs—related to, for example, particular medical conditions or hobbies—and to blogs, citizen journalism, and other knowledge- and opinion-sharing portals. Five of the ten most popular web content sites worldwide are primarily user-generated.²²

But consumers have also become deeply engaged in the production of physical products. In some cases, ecosystems of "makers"

empowered by newly accessible and affordable technologies, are actually leading the evolution of products—for example, drones.²³ More commonly, consumers help design, improve, and prioritize within existing categories, on powerful platforms established by many firms explicitly for “co-creation.” UK-based startup MakieLab, for example, allows customers to create one-of-a-kind 3D-printed dolls using its FabLab app. A similar concept underpins the successful fashion company Threadless, which gets all the graphics for its T-shirts as submitted designs and allows visitors to its site to vote for the ones Threadless should produce. Such approaches are being further spread through the increased deployment of prizes and competitions, and the growing success of crowd-sourcing businesses such as Applause, the world’s largest open community dedicated to professional testers of software.²⁴

More recently, peer-to-peer networks have proliferated, enabling individuals to “share” their assets, skills, and time. Businesses like Airbnb, Uber, and SoMoLend, for example, are creating radically different and fast-scaling options in hospitality, mobility, and finance, respectively. In some instances these are making previously “idle” assets productive, thereby benefitting society; but as such networks spread to other parts of the economy, they will threaten the existing business models of many incumbents.²⁵

Consumers are also prolific producers of arguably the most valuable commercial resource today—massive volumes of data. Consider the data exhaust captured by Google’s aggregation and prioritization of our searches. Or Amazon’s “collaborative filtering” which captures our preferences to promote suggestions to like-minded people. And, as companies increasingly enable their customers to

customize their own products, services, and experiences, they will accumulate ever more prodigious amounts of individual and collective data. As more of our lives move into the digital arena, almost every action and choice will create and transmit dynamic data with latent value—posing both new opportunities, and new dilemmas.

The physical-digital boundary

Digitization began influencing the physical economy 50 years ago, with information technology automating many business processes.

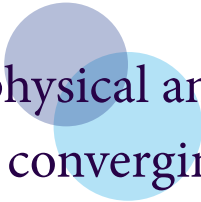
The advent of the Internet increased the pace,

scope, and scale of that process, with some commentators initially distinguishing between an “old” physical and “new” digital economy: “E-commerce” was different from “commerce,”

“bricks and mortar” separate from “online.”²⁶

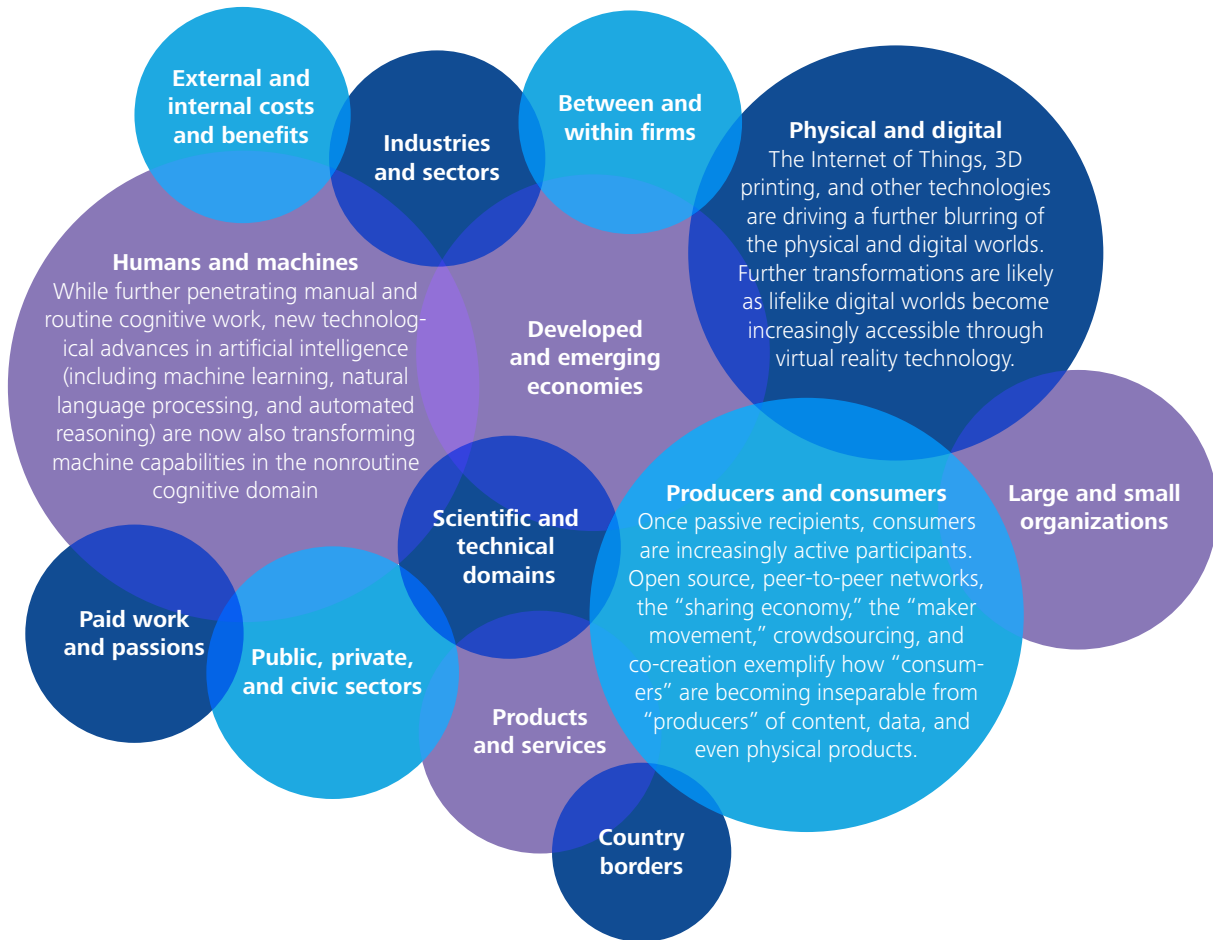
That boundary, however, quickly blurred, with terms such as “clicks and mortar” and “omni-channel” emerging in retail, for example, to describe a much more blended and integrated reality.

Now, the physical and digital worlds are converging rapidly in the form of increasingly “smart” objects. The Internet of Things (IoT) is enabled by many factors, including increasing capabilities and falling costs of sensors, actuating devices, and wireless connectivity, and the massive expansion of the Internet Protocol registration regime, IPv6. By connecting far-flung devices, objects, and infrastructure, the IoT enables not only remote real-time awareness, but autonomous adjustment and control to optimize performance, while creating yet more data. For example, the Nest Learning Thermostat senses your presence or absence at home, tracks your heating preferences over time, and adjusts temperatures accordingly. By aggregating what it learns from your and every



Now, the physical and digital worlds are converging rapidly in the form of increasingly “smart” objects.

Figure 1. Fundamental boundaries are rapidly blurring in the business environment and economy



Source: Deloitte analysis.

Graphic: Deloitte University Press | DUPress.com

other household, it continuously improves its algorithms based on large-scale patterns.²⁷

The IoT is spreading across the economy. Gartner has estimated about 26 billion connected objects (excluding smartphones and tablets) by 2020;²⁸ Cisco predicts 50 billion;²⁹ and Morgan Stanley 75 billion.³⁰ Every sector, from health care to security, will be altered. But this is not the only technology blurring the boundaries of the physical and digital worlds. 3D printing enables production of an expanding range of physical goods from digital files, from OwnFone’s simple yet customizable made-to-order mobile phones to NASA-designed tools that can be printed in space.³¹ With significant innovation broadening the array of “printable” materials, this

will only accelerate. For example, Organovo is today printing scaled-down human livers,³² which it sells to pharmaceutical companies for drug-testing purposes, while researchers in Australia have figured out how to print stem cells,³³ a step toward lab-grown hearts and brains. In another interesting twist, Autodesk has recently offered as a free public beta its Memento software, which enables non-experts to turn digital images (scans or photos) of physical objects back into 3D models that can then be physically printed!³⁴

Looking ahead, there is perhaps an even more profound blurring of the physical and digital worlds, as advances in virtual reality technology enable increasingly lifelike “alternate” digital worlds. While virtual reality is

today deployed primarily in the gaming space, Facebook's recent \$2 billion acquisition of Oculus VR perhaps hints at a future of fully immersive connections for maintaining social relationships and sharing information, weaving even more digital threads through the physical fabric of our lives.

Implications

Boundaries typically produce constraints, limiting choices and actions and reducing efficiency. As they diminish, wonderful new opportunities flourish. So, too, does upheaval. The old boundaries and constraints were limiting, but also clarifying. They provided definition and focus, framed what was possible, pointed clearly to sources of advantage, and informed the key elements of business strategy and operations for many decades. Therefore, blurring boundaries are creating extraordinary new potential for the economy and broader society, and enabling remarkable innovation and entrepreneurship; and at the same time, they are also creating new challenges, especially for incumbents who have been masters of the previous game. Successful leaders will have to address increasingly urgent issues regarding cybersecurity and the "fair usage" of data; figure out optimal ways to organize and to access talent; and adopt more dynamic approaches to strategy with far greater built-in optionality.

Cybersecurity and data

The blurring boundary between the physical and digital worlds is a fundamental driver of transformation, creating connections, data, and capabilities that are reshaping almost every part of our lives. But it also presents two substantial and unresolved challenges. First, maintaining a secure, global, open Internet; and second, determining the appropriate use of the mushrooming data we are all generating every day in myriad ways.

Of the various threats to the Internet, the greatest is arguably "hacking"—for fun, for illegal profit, for access to confidential

information, for malicious disruption and damage, and for various ideological reasons. The number of detected cyber-attacks increased by nearly 50 percent in 2014 (reaching some 120,000 per day), while identity theft (up 70 percent) and cybersecurity (up 61 percent) were the top two security concerns for American citizens.³⁵ President Obama's urgent call in his 2015 State of the Union address for more collaboration between government and business on this front raises the prospect of greater collective prioritization—and innovation—for years to come.³⁶

Similar collaboration and innovation will also be occurring in the domain of data—their capture, ownership, distribution, and monetization. An order of magnitude more data will be produced in the years ahead, analytics will continue to get far smarter and more predictive, and opportunities to create value will proliferate. Yet critical issues regarding privacy, ethical questions posed by the ability of data to be used in discriminatory ways, and tensions over ownership of and value extraction from data produced through the activities of citizens are all rising.³⁷ There have been substantial breaches of trust in the past—some occurring because data was not adequately protected from theft or hacking and others because the data was inappropriately exploited by those stewarding it—and there will be more in the future. The resulting erosions in public trust are becoming more costly and are rapidly rising on the corporate agenda as businesses increasingly view the data they are co-creating with customers as one of their more valuable assets.

Evolving organization designs and talent models

Few organizations today bear much resemblance to their counterparts of 30 years ago. As the changing business environment has heightened the imperatives of innovation, agility, and resilience, organization design has changed dramatically. Multiple layers of "command and control" hierarchies have been reduced. Many isolated internal siloes have been connected

and integrated. Core competences have been prioritized, the rest assigned to sophisticated supply chains or otherwise outsourced or “virtualized.” Key business processes have been automated. Digital technology and connectivity have enabled these developments, which have been transformative. But this journey is far from over. As value creation across ecosystems continues to grow in importance, organizations will continue to be further optimized for effective networking, collaboration, and fluidity.³⁸

Recently, talent models in particular have evolved. Long-term employment has been eroding while contracting talent only “as needed” becomes more common. An Intuit report estimates that over 60 million Americans will be “contingent” workers by 2020;³⁹ 87 percent of executives leading global human resource functions have altered or are considering changes to their talent sourcing strategy;⁴⁰ and 70 percent of Millennials expect to spend part of their career working independently.⁴¹ An enabling infrastructure of crowdsourcing and competitions has been growing fast. Specific tasks can increasingly be allocated through TaskRabbit or Amazon Mechanical Turk; entire projects can be planned and responsibilities distributed using, for example, Elance and oDesk; invention ideas can be crowdsourced, designed, and commercialized through Quirky; and marketing needs can be addressed by Tongal’s platforms of tens of thousands of creatives. Talent models will be changed further by increased automation of some types of knowledge work. Companies such as HCL Technologies and Wipro are already talking about the “hourglass” structures that will replace existing “pyramids” as artificial intelligence extends deeper into software testing and IT support functions.⁴²

Dynamic strategy

More than anything, business leaders will have to adopt new approaches to strategy. Successful business strategy will remain anchored on setting clear aspirations, making

well-informed and integrated choices regarding where to play and how to win, and developing the essential capabilities to support these ambitions. However as boundaries blur, the universe of options for creating value is increasing substantially; “winning” increasingly requires collaboration as well as competition with others; essential capabilities need not necessarily be owned or directly controlled; capturing value is becoming more challenging, often requiring the creation of new business models; and the need for enhanced agility means our strategies must be increasingly capable of rapid flex and adaptation.

Approaches to strategy are likely to evolve as a consequence, in a variety of ways that are already becoming evident. More emphasis will be placed on designing and renewing business models that take fuller account of the importance of relationships outside the firm.

More than anything,
business leaders will have
to adopt new approaches
to strategy.

New models for profit capture will proliferate including, for example, subscription-based pricing, “freemium” services, micropayments, and other newly possible tools. Shared, cross-firm approaches to strategy formulation, often built on opening up hitherto closely guarded and proprietary data, is also increasing—notably between large retailers and their suppliers. The use of scenarios that paint alternative futures, first pioneered 45 years ago by Royal Dutch Shell, is likely to become increasingly common. And the smart analysis of increasingly abundant data to detect early signals of directional changes and enable dynamic adjustment of strategies will only rise in importance, with big data and analytics already being the top investment priority among CIOs given additional budget.⁴³

What's next?

The significant erosion of long-standing boundaries will likely result in two very different outcomes: **New possibilities** will be discovered and deployed that will have transformative impact; and some **new boundaries** will surely also arise to present different challenges. Writer William Gibson has suggested that “The future is already here—it’s just not evenly distributed yet.” We have already seen powerful cross-cutting ecosystems transform the once-separate sectors of computing, telecommunications, and media. As digitization spreads everywhere, we must expect similar blending and dynamism across the economy. Just as we have seen the growing phenomenon of temporary “pop-up” restaurants and even retail outlets, might the future hold “pop-up firms”? After all, as writer Clay Shirky has noted, it is becoming increasingly possible to “organize without organizations.”⁴⁴ Just as automation has started to make serious inroads into non-routine cognitive work domains, might AI move next into the world of creativity? Software programs are, after all, already producing distinctive gallery exhibited drawings and composing music.⁴⁵

New boundaries are already visible as well. Geopolitical tensions that were relieved

following the collapse of the Soviet Union appear once more to be rising. Fundamentalist belief systems—an obviously divisive force in human affairs—are proving tragically consequential. While the gap between “rich” and “poor” globally is on some measures declining, the divide between the extraordinary wealth of those at the top (the 10 wealthiest individuals own around half a trillion dollars)⁴⁶—and the vast majority of the rest is of growing concern. Our dynamic economy greatly rewards restless entrepreneurship. Might new fault lines evolve between those well equipped for such a world and those more suited to a steadier and less frenetic world of employment? Inevitably, as old boundaries and frictions disappear, new ones will appear.

Yet if we can figure out how to live together on our shared planet, the future prize is extraordinary. The new art of the possible—from far more effective deployment of assets and resources to collaborative integration of expertise and passion—can help smarten and strengthen Adam Smith’s “invisible hand” to create a more sustainable, global, and prosperous civilization. Today, that prize is within our reach, but not yet—not quite—within our grasp. That will perhaps be the greatest challenge ahead, shared by the leaders of today, and tomorrow.

My take

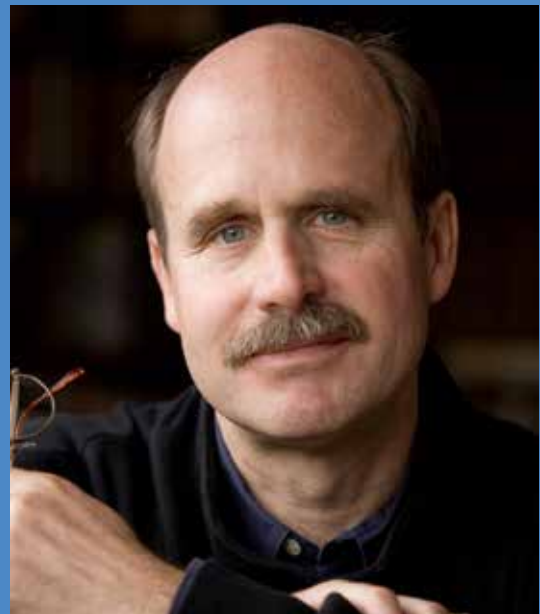
By Paul Saffo

Paul Saffo is a technology forecaster based in Silicon Valley, where he teaches at Stanford University and chairs the Future Studies and Forecasting track at Singularity University. Saffo's essays on the future of technology have been featured in publications such as *Harvard Business Review*, the *New York Times*, *Fortune*, and *Foreign Policy*.

Let's consider the grand sweep of this story. Once upon a time there was just the physical, analog domain. We then started creating and linking digital machines. The resulting bubble of cyberspace was initially small, but it has been growing rapidly since. As it expands, it encroaches on the analog, not in a science fiction kind of way, but in a very real kind of way. Now, even the basic notion of a boundary between digital and the analog is increasingly passé. The world has become more permeable, with much of the most interesting innovation coming from economic "edges" rather than from the historic centers.

"Interfacing" is what once happened through screens, keyboards, and other operating panels that separated humans and machines while still allowing them to connect. Today, we no longer interface with machines—so much as we interact with them. The distinction is subtle, but important because today's more intimate human-machine mingling allows for practically instantaneous and transparent two-way communication enabled by sensors, monitoring, and environmental feedback. Leading firms today are often forced to acknowledge that some of their most important employees are actually machines.

Increasingly, no hard border needs to be crossed in order for insight to exchange "hands" from a person to a thing. Planes, trains, and subways, for example, may still have human operators, but none of them could successfully complete their assigned tasks without guidance, and even fundamental coaching, from machines. The drivers don't need to ask for advice, because the supporting technology is smart enough to simply reach in and offer it. These transactions can be so seamless, and effective, that some organizations are now putting measures in place to guard against human overreliance on technology. For example, next-generation autopilot design now



includes machine-generated prompts reminding pilots to remain engaged.

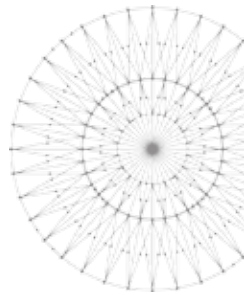
We tend to structure our organizations to reflect our dominant communications systems. In the age of telephony and mainframe computing, organizations were more hierarchical and centralized. As networked communications have evolved, we have increasingly drawn upon organizational designs that are decentralized and even more organic. If I could offer one piece of advice to today's leaders, it would be to read more broadly in ecology and biology. Key ideas like symbiosis and co-evolution are central in that literature and businesses will increasingly need to master them to thrive. Many leaders can also borrow important biological lessons about sharing resources and cross-pollinating ideas in the "intertidal zones" that increasingly link businesses and turn out to be fantastically rich places to innovate.

Author

Eamonn Kelly is a director with Deloitte Consulting LLP, chief marketing officer of the Strategy and Operations practice, and a widely published author and business thought leader.

Endnotes

1. Christopher Daniell, *A Traveller's History of England* (4th edition) (New York: Interlink Books, 1998).
2. The United Nations Department of Economic and Social Affairs, "World urbanization prospects: The 2005 revision," 2005, <http://www.un.org/esa/population/publications/WUP2005/2005wup.htm>.
3. Steven Mintz and Sara McNeil, "Twentieth century revolutions," *Digital History*, http://www.digitalhistory.uh.edu/disp_textbook.cfm?smtID=2&psid=3176, accessed March 10, 2015.
4. Donald Fisk, "American labor in the 20th century," *Compensation and Working Conditions*, January 30, 2003, <http://www.bls.gov/opub/mlr/cwc/american-labor-in-the-20th-century.pdf>, accessed March 12, 2015.
5. Stanley Lebergott, "Table 1.1: US living standards, 1900-1970," *The American Economy: Income, Wealth, and Want* (Princeton Legacy Library), 1976, p. 8.
6. Stewart Brand, *Whole Earth Discipline: An Ecopragmatist Manifesto* (Viking, 2009).
7. Gordon Bell quoting Jim Gray, "A Seymour Cray perspective," *Seymour Cray Lecture Series*, presented at the University of Minnesota, November 10, 1997, <http://research.microsoft.com/en-us/um/people/gbell/craytalk/sld089.htm>. Macintosh is a trademark of Apple Inc., registered in the United States and other countries. *Business ecosystems come of age* is an independent publication and has not been authorized, sponsored, or otherwise approved by Apple Inc.
8. Dean Evans, "Moore's Law: How long will it last?," *Tech Radar*, February 22, 2014, <http://www.techradar.com/us/news/computing/moore-s-law-how-long-will-it-last--1226772>, accessed March 10, 2015.
9. The Standard Industrial Classification (SIC), a system used by US government agencies to classify industry areas, was first established in 1937 (it has since been supplanted by the North American Industry Classification System). See Farlex Financial Dictionary, "Standard Industrial Classification Code," 2012, <http://financial-dictionary.thefreedictionary.com/Standard+Industrial+Classification+Code>, accessed March 10, 2015.
10. GM installed its first robot at a factory in 1961. See Shimon Y. Nof, *Handbook of Industrial Robotics* (Wiley, 1999), p. 33.
11. Peter Shadbolt, "US Navy unveils robotic firefighter," *CNN*, February 12, 2015, <http://www.cnn.com/2015/02/12/tech/mci-saffir-robot/>, accessed March 10, 2015.



12. Staff, "Robotic crawler climbs wind turbines, inspects blades," *Design Engineering*, June 15, 2012, <http://www.design-engineering.com/general/robotic-crawler-climbs-wind-turbines-inspects-blades-67587/>, accessed March 10, 2015.
13. Deloitte, *Technology Trends 2015*, Deloitte University Press, January 29, 2015, <http://dupress.com/periodical/trends/tech-trends-2015/?per=1076>.
14. Kevin Kelly, citing quantitative analysis firm Quid, "The three breakthroughs that have finally unleashed AI on the world," *Wired*, October 27, 2014, <http://www.wired.com/2014/10/future-of-artificial-intelligence/>, accessed March 10, 2015.
15. Quentin Hardy, "Language translation tech starts to deliver on its promise," *New York Times*, January 11, 2015, http://bits.blogs.nytimes.com/2015/01/11/language-translation-tech-starting-to-deliver-on-its-promise/?_r=0, accessed March 10, 2015. Siri is a trademark of Apple Inc., registered in the United States and other countries. *Business ecosystems come of age* is an independent publication and has not been authorized, sponsored, or otherwise approved by Apple Inc.
16. Mark Harris, "Google lobbies to test self-driving cars in Matrix-style virtual world," *Guardian*, August 21, 2014, <http://www.theguardian.com/technology/2014/aug/21/google-test-self-driving-cars-virtual-world-matrix>, accessed March 10, 2015.
17. Symantec, "eDiscovery Platform powered by Clearwell" 2015, <http://www.symantec.com/business/support/index?page=productlanding&key=60705>, accessed March 10, 2015.
18. Mary Shacklett, "IBM Watson's impressive healthcare analytics capabilities continue to evolve," *TechRepublic*, March 3, 2014, <http://www.techrepublic.com/article/ibm-watsons-impressive-healthcare-analytics-capabilities-continue-to-evolve/>, accessed March 10, 2015.
19. Paul Colford, "A leap forward in quarterly earnings stories," *Associated Press*, June 30, 2014, <http://blog.ap.org/2014/06/30/a-leap-forward-in-quarterly-earnings-stories/>, accessed March 30, 2015; David Shtaksky and Jeff Schwartz, "Machines as talent: Collaboration, not competition" Deloitte University Press, *Global Human Capital Trends 2015*, February 27, 2015, <http://dupress.com/periodical/trends/human-capital-trends-2015/>.
20. Stuart Russell et al., "Research priorities for robust and beneficial artificial intelligence: An open letter," 2015, http://futureoflife.org/misc/open_letter.
21. Mark R. Roberston, "300+ hours of video are uploaded to YouTube every minute," *ReelSEO*, November 21, 2014, <http://www.reelseo.com/youtube-300-hours/>, accessed March 12, 2015.
22. Alexa, "Top sites," <http://www.alexa.com/top-sites>, accessed March 10, 2015.
23. Chris Anderson, "How I accidentally kickstarted the domestic drone boom," *Wired*, June 22, 2012, http://www.wired.com/2012/06/ff_drones/all/, accessed March 10, 2015.
24. Applause was recently named one of the most promising companies in the US by *Forbes* ("Our story," Applause, <http://www.applause.com/our-story>, accessed March 10, 2015).
25. Rachel Botsman, *What's Mine is Yours: The Rise of Collaborative Consumption* (New York: Harper Collins, 2010).
26. For example, see Jonathan Rauch, "The new old economy: Oil, computers, and the reinvention of the earth," *Atlantic*, January 2001, <http://www.theatlantic.com/past/docs/issues/2001/01/rauch.htm>, accessed March 12, 2015.
27. Nest, "365 days with Nest," 2015, <https://nest.com/thermostat/life-with-nest-thermostat/>, accessed March 12, 2015.
28. Gartner, "Gartner says the Internet of Things will transform the data center," press release, <http://www.gartner.com/newsroom/id/2684616>, accessed March 10, 2015.
29. Cisco, "Seize new product and revenue opportunities with the Internet of Things," <http://www.cisco.com/web/solutions/trends/iot/portfolio.html>, accessed March 10, 2015.
30. Tony Danova, "Morgan Stanley: 75 billion devices will be connected to the Internet of Things by 2020," <http://www.businessinsider.com/75-billion-devices-will-be-connected-to-the-internet-by-2020-2013-10>, accessed March 10, 2015.
31. Brian Krassenstein, "OwnFone launches PrintFone, the 3D printable customizable mobile phone," *3DPrint.com*, February 6, 2015, <http://3dprint.com/42814/ownfone-printfone-3d-print/>, accessed March 12, 2015; NASA, "Space Station 3-D printer builds ratchet wrench to complete first phase of operations," http://www.nasa.gov/mission_pages/station/research/news/3Dratchet_wrench/#.VPtZvvnF9jc, accessed March 10, 2015.
32. Organovo, "exVive3D" liver, tissue performance," <http://www.organovo.com/tissues-services/exvive3d-human-tissue-models-services-research/>

- exvive3d-liver-tissue-performance, accessed March 10, 2015.
33. Tanya Lewis, "3D-printed human embryonic stem cells created for first time," <http://www.livescience.com/26865-3d-printed-embryonic-stem-cells.html>, accessed March 10, 2015.
 34. Daniel Terdiman, "With Autodesk's Memento, anyone can create 3D models of buildings, sculptures, or other physical objects," *VentureBeat*, March 3, 2015, <http://venturebeat.com/2015/03/03/with-autodesks-memento-anyone-can-create-3d-models-of-buildings-sculptures-or-other-physical-objects/>, accessed March 12, 2015.
 35. PricewaterhouseCoopers, "Global State of Information Security Survey: 2015 results by industry," September 30, 2014, <http://www.pwc.com/gx/en/consulting-services/information-security-survey/index.jhtml>; Harris Polls, "Identity theft, personal cybersecurity and terrorism top the list of Americans' security concerns, finds University of Phoenix survey," University of Phoenix News, <http://www.phoenix.edu/news/releases/2014/09/personal-cybersecurity-and-terrorism-top-americans-security-concerns-uopx-survey-finds.html>, accessed March 12, 2015.
 36. The White House, Office of the Press Secretary. "SECURING CYBERSPACE - President Obama announces new cybersecurity legislative proposal and other cybersecurity efforts," <http://www.whitehouse.gov/the-press-office/2015/01/13/securing-cyberspace-president-obama-announces-new-cybersecurity-legislat>, accessed March 10, 2015.
 37. Some scholars have characterized the effort to balance protection of privacy and the benefits of big data as possibly the biggest public policy challenge of our time. See Ira Rubinstein, "Big data: The end of privacy or new beginning?," International Data Privacy Law no. 3, 2013, DOI: 10.1093/idpl/ips036.
 38. For more information on the implication of this fluidity on legacy supply chain management, see "Supply chains and value webs."
 39. Intuit, "Intuit 2020 report: Twenty trends that will shape the next decade," http://http-download.intuit.com/http.intuit/CMO/intuit/futureofsmallbusiness/intuit_2020_report.pdf, accessed March 10, 2015.
 40. Deloitte, *Global Human Capital Trends*, http://dupress.com/wp-content/uploads/2014/04/GlobalHumanCapitalTrends_2014.pdf, accessed March 10, 2015.
 41. Deloitte, *The Deloitte Millennial Survey*, January 2014, <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-dttl-2014-millennial-survey-report.pdf>, accessed March 12, 2015.
 42. Varun Sood, "HCL Technologies to replace employees doing simple software testing with domain experienced staff," *Economic Times*, http://articles.economictimes.indiatimes.com/2015-01-23/news/58382554_1_hcl-technologies-software-exporter-automation.
 43. Deloitte, "The Deloitte CIO Survey 2014: CIOs – at the Tech-junction," 2014, <https://www2.deloitte.com/content/dam/Deloitte/fi/Documents/technology/CIO%20Survey%202014.pdf>, accessed March 10, 2015.
 44. Clay Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations* (Penguin Books, 2009).
 45. Richard Moss, "Creative AI: The robots that would be painters," *gizmag*, February 16, 2015, <http://www.gizmag.com/creative-ai-algorithmic-art-painting-fool-aaron/36106/>; David Cope, "Experiments in musical intelligence," <http://artsites.ucsc.edu/faculty/cope/experiments.htm>, accessed March 12, 2015.
 46. *Forbes*, "The world's billionaires," 2015, <http://www.forbes.com/billionaires/list/7/#version:static>, accessed March 12, 2015.

About the authors



Mike Armstrong | mikearmstrong@deloitte.com

Mike Armstrong is a principal with Deloitte Consulting LLP in the US Strategy service line Monitor Deloitte. Prior to joining the firm, he was a partner in the Monitor Group and chief executive of Monitor's M&A Advisory practice. He has worked on a variety of corporate strategy projects and inorganic growth mandates across a range of industries including heavy industry, specialty chemicals, life sciences, and consumer durables. Armstrong had previous careers as a lawyer and investment banker. As a banker he worked on a variety of M&A mandates including acquisitions, hostile takeovers, private company divestitures, portfolio analysis, and private placements. Client industries ranged from mining to consumer goods to high-tech. He began his career as a corporate attorney with a large national law firm, focusing on M&A, securities law and financial restructurings. He received his BA and law degree (JD) from the University of Toronto and an MBA from INSEAD in Fontainebleau, France.



Jacob Bruun-Jensen | jbruunjensen@deloitte.com

Jacob Bruun-Jensen is a principal with Deloitte Consulting LLP in the US Strategy service line, Monitor Deloitte, with a focus on strategy and innovation. He works with leading companies in the Consumer Product and Retail sectors to make sense of the converging forces of customer desires, technologies, and business ecosystems to rethink business models and innovation. Bruun-Jensen is currently completing his PhD in Business Model Innovation at Rotman School of Management in Toronto, and holds two master's degrees in management from Henley Business School and ESCP Europe Business School.



Bruce Chew | brchew@deloitte.com

Bruce Chew is a director with Deloitte Consulting LLP in the US Strategy service line Monitor Deloitte. For more than 20 years, his work has focused on strategy development, implementation, and the building of organizational capabilities. Chew has worked with the federal government, universities, and companies across a broad range of industries. He holds an MBA from Harvard Business School and a PhD from Harvard University after graduating from the University of Michigan.



Don Derosby | dderosby@deloitte.com

Don Derosby is a specialist master with Deloitte Consulting LLP in the US strategy service line Monitor Deloitte. Derosby has nearly 20 years of experience in strategy, scenario planning, risk assessment, problem framing, system dynamics, and in the creation of learning laboratories for executives. His work has been equally distributed between the corporate and public sectors with an emphasis on health and wellness, information security, globalization, innovation, and economic development.



William D. Eggers | weggers@deloitte.com

William D. Eggers is responsible for research and thought leadership for Deloitte's Public Sector industry practice and has advised governments around the world. He is an internationally recognized authority on government reform, a columnist, and author of eight books. His books have won numerous awards and his commentary has appeared in dozens of major media outlets including the *New York Times*, *Wall Street Journal*, *Washington Post*, *Guardian*, and the *Chicago Tribune*.



William Engelbrecht | wiengelbrecht@deloitte.com

Will Engelbrecht is a principal with Deloitte Consulting LLP and leads its M&A Strategy and Strategic Diligence practice. He has more than 15 years of experience serving clients, with a focus on creating value through M&A, and assists clients across the deal life cycle from strategy development to post-merger integration. Engelbrecht serves both strategic and private equity clients on the buy and sell side across a variety of deal structures including foreign inbound, MOEs, LBOs, carve-out, and multinational transactions.



John Hagel | jhagel@deloitte.com

John Hagel is co-chairman for Deloitte LLP's Center for the Edge and has nearly 30 years of experience as a management consultant, author, speaker, and entrepreneur. He has served as senior vice president of strategy at Atari, Inc., and is the founder of two Silicon Valley startups. Author of *The Power of Pull*, *Net Gain*, *Net Worth*, *Out of the Box*, and *The Only Sustainable Edge*, Hagel holds a BA from Wesleyan University, a B.Phil from Oxford University, and a JD and MBA from Harvard University.



Larry Keeley | lkeeley@deloitte.com

Larry Keeley has worked for over three decades to develop more effective innovation methods. He is co-founder of innovation firm Doblin, which is now a unit of Deloitte Consulting LLP, where he serves as a director. Keeley has been identified by *BusinessWeek* as one of seven leading global innovation gurus, and separately as one of 27 leading global designers. He teaches innovation at both IIT's Institute of Design, where he is also a board member, and at the Kellogg Graduate School of Management, where he has been recently appointed as a senior fellow.



Eamonn Kelly | eakelly@deloitte.com

Eamonn Kelly is a director with Deloitte Consulting LLP and chief marketing officer (CMO) of the Strategy and Operations practice. He has, for more than two decades, advised senior leadership at leading corporations across multiple industry sectors, key global and national public agencies, and major philanthropic foundations. Prior to joining Deloitte, Kelly held a wide range of leadership positions. He was a Monitor Group partner and, as CMO, a member of its global executive team responsible for marketing, thought leadership, network strategy, and client experience. He also served as CEO of Global Business Network (GBN), the pioneering scenario planning consultancy and futures think tank, where he led GBN's thought leadership about the future, writing two books and numerous articles and delivering insights and new methodologies for mastering change and uncertainty.



Kelly Marchese | kmarchese@deloitte.com

Kelly Marchese is a principal with Deloitte Consulting LLP and leader of the Supply Chain Strategy practice. She has over 20 years of experience leading projects in complex manufacturing industry sectors. Marchese also leads the Global Supply Chain Risk service offering. She is a master black belt in Lean/Six Sigma and is a thought leader in supply chain innovation and engineering effectiveness.



Bill Miracky | wmiracky@deloitte.com

Bill Miracky is a director with Deloitte Consulting LLP in the US strategy service line Monitor Deloitte. He advises senior government officials and corporate executives on a range of strategic and operational issues associated with institutional performance, competitiveness, economic development, and security. His client engagements have addressed a number of management issues, including corporate portfolio strategy, business unit strategy, cost management, and organization strategy and transformation. Prior to joining Deloitte, Bill was a partner at Monitor Group where he managed the firm's National Economic Development and Security practice and co-founded its High-Performance Bureaucracy practice. He began his career in government at the Federal Reserve Board in Washington, D.C.



Anna Muoio | amuio@deloitte.com

Anna is a specialist leader with Monitor Institute, part of Deloitte Consulting LLP's Social Impact service line. Anna has worked at the intersection of business, innovation, and social change for the past 15 years. She believes deeply in the power of cross-sector collaborations to move the needle on tough social problems. She focuses her practice on how to drive large-scale social change through galvanizing networks around a shared agenda. She has led Aligned Action efforts for organizations such as New Profit, Skoll Foundation, and Venture Philanthropy Partners—designing network strategies and launching large-scale coalitions that work to drive new solutions to old problems.

Acknowledgements

Many people collaborated in the creation of this report. The authors of each chapter, and the truly remarkable “My take” contributors, have already been named.

Many other Deloitte colleagues were generous with their time, energy, and insight—including **Andrew Blau, Kyle Freebairn, Andrew Harris, Steve Jennings, Duleesha Kulasooriya, Tamara Samoylova, and Jeffery Weirens**. From the Federal Strategy & Operations practice—**Jitinder Kohli, Jessica Kosmowski, John Manahan, and Edward Van Buren**. From the Social Impact practice—**Katherine Fulton, Amy Silverstein, Jerry O’Dwyer, Will Sarni, Sally Stansfield, Tony Siesfeld, John Mennel, and Kurt Dassel**. And from the Supply Chain and Manufacturing Operations practice—**Rafa Calderon, Joe Fitzgerald, Ryan Flynn, Doug Gish, Jim Harms, Matthew Humphreys, Tom Phillips, Stavros Stefanis, and Brian Umbenhauer**.

Externally, **Steve Weber, Michael Schrage, Peter Schwartz, James Moore, and James Surowiecki** all helped immensely, each in his own inimitable—and greatly appreciated—way. **Nicholas Davis, Brent Lonteen, Marjorie Paloma, Matt Rodrigue, Emmett Thomas, Michelle Toth, and Lai-Ki Wong** also provided significant and important assistance.

Deloitte’s Strategy and Operations marketing and public relations team—**Henna Verburg, Ryan Nangle, and Jessica Heine**—provided, as always, indispensable support and guidance throughout. Their dedication, professionalism, and enthusiasm are truly inspiring. **Matt Lennert, Junko Kaji, and Sonya Vasilieff** once again demonstrated the outstanding qualities of creativity and editorial experience that have helped establish Deloitte University Press as a powerful communication platform in recent years.

And in every ambitious endeavor there is invariably a core team that, day in and day out, carries the weight, holds the dream, and goes above and beyond the call of duty. Here, that team was Deloitte’s Strategy and Operations Eminence Center. **Don Derosby, Debbie Chou, Jonathan Star, Julia Kirby, Christian Keil, Yiting Zhang, and Lisa Li**—thank you! You were, individually and collectively, magnificent and unwavering over many months of research, writing, editing, interviewing, designing, combining, reframing, and iterating . . . and iterating . . . and iterating! This report is a testament to your passion and your talent. I hope it helps serve as a springboard for your ongoing success, as you each make your own important impact on the world.

As used in this document, “Deloitte” means Deloitte Consulting LLP, a subsidiary of Deloitte LLP. Please see www.deloitte.com/us/about for a detailed description of the legal structure of Deloitte LLP and its subsidiaries. Certain services may not be available to attest clients under the rules and regulations of public accounting.



Follow @DU_Press

Sign up for Deloitte University Press updates at www.dupress.com.

Business Trends is a publication from the Strategy & Operations practice of Deloitte Consulting LLP. Strategy & Operations brings an approach to executable strategy that combines deep industry knowledge, rigorous analysis, and insight to enable confident action. Their services include corporate strategy, customer and marketing strategy, mergers and acquisitions, social impact strategy, innovation, business model transformation, supply chain and manufacturing operations, sector-specific service operations and financial management.

For related information, please visit www.deloitte.com/us/businessecosystems



Follow @DeloitteStratOp #businessecosystems

About Deloitte University Press

Deloitte University Press publishes original articles, reports and periodicals that provide insights for businesses, the public sector and NGOs. Our goal is to draw upon research and experience from throughout our professional services organization, and that of coauthors in academia and business, to advance the conversation on a broad spectrum of topics of interest to executives and government leaders.

Deloitte University Press is an imprint of Deloitte Development LLC.

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or its and their affiliates are, by means of this publication, rendering accounting, business, financial, investment, legal, tax, or other professional advice or services. This publication is not a substitute for such professional advice or services, nor should it be used as a basis for any decision or action that may affect your finances or your business. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser.

None of Deloitte Touche Tohmatsu Limited, its member firms, or its and their respective affiliates shall be responsible for any loss whatsoever sustained by any person who relies on this publication.

About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.com/about for a detailed description of the legal structure of Deloitte Touche Tohmatsu Limited and its member firms. Please see www.deloitte.com/us/about for a detailed description of the legal structure of Deloitte LLP and its subsidiaries. Certain services may not be available to attest clients under the rules and regulations of public accounting.

Copyright © 2015 Deloitte Development LLC. All rights reserved.
Member of Deloitte Touche Tohmatsu Limited