MAKING THE INVISIBLE VISIBLE:
REDESIGNING BUSINESS PROCESSES FOR EXPONENTIAL ORGANIZATIONS

A REPORT OF THE 2015 ASPEN INSTITUTE ROUNDTABLE ON INSTITUTIONAL INNOVATION

RICHARD ADLER, RAPPORTEUR
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This report is written from the perspective of an informed observer at the
Aspen Institute Roundtable on Institutional Innovation.
Unless attributed to a particular person, none of the comments or ideas contained
in this report should be taken as embodying the views or carrying the endorsement
of any specific participant at the event.
Foreword

The annual Aspen Institute Roundtable on Institutional Innovation convenes leaders from diverse organizational perspectives to address and reframe approaches to institutional performance through innovation. The summer 2015 topic, “Making the Invisible Visible: Redesigning Business Practices for Exponential Operations,” challenged leaders to examine new ways of thinking about business practice redesign with the aim of becoming more adaptive and increasing organizational performance.

The impetus for rethinking business practices comes from the impact of digital technologies on the way businesses operate. In previous years successful companies secured their growth by achieving economies of scale and maximizing size and efficiencies. Today’s leading organizations utilize digital technologies to leverage assets, respond nimbly to challenges, and most critically, scale learning to accelerate innovation. As a result, these businesses are growing exponentially. Organizations that do not embrace this shift will inevitably fall behind.

So how does a traditional business adjust its strategic thinking and operations in order to innovate and grow? What are the challenges it faces? This report, written by Richard Adler, delves into strategies of modularization, rapid iteration and utilizing transparent metrics, among other strategies. It features strategic anecdotes from major companies like Target and Kaiser Permanente, and gives insights into how corporate leaders are thinking about exponential business operations.

These changes are far reaching, impacting nearly all industries. In the coming months, this Roundtable series will continue to explore exponential business models and investigate how the concepts can apply in governmental settings. We expect to release a supplemental report to this volume in late 2016.

Acknowledgments

I would like to thank the Deloitte Center for the Edge for being our senior sponsor for the Roundtable and in particular, John Hagel and John Seely Brown for their leadership, suggestions and assistance. In
addition, we thank Richard Adler for weaving the Roundtable’s dialogue, background readings and his own independent research into a concise and coherent report.

Finally, I thank Sarah Eppehimer, Project Director, who managed the Roundtable throughout, and Tricia Kelly, Managing Director of the Communications and Society Program, for her review and help in producing this report.

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March 2016
MAKING THE INVISIBLE VISIBLE: REDESIGNING BUSINESS PROCESSES FOR EXPONENTIAL ORGANIZATIONS

Richard Adler
“The real difficulty in changing any enterprise lies not in developing new ideas, but in escaping from the old ones.”

– John Maynard Keynes

A Blessing of Unicorns

A striking recent development in the world of business has been the appearance of a growing number of unicorns. The term was first used in 2013 by Aileen Lee, founder of Cowboy Ventures, an early-stage venture fund, to describe start-up companies that reach a valuation of at least $1 billion from private investors before going public.1 At the time that Lee started talking about the phenomenon, she had identified 39 companies founded since 2003 that had met the criterion, with one company, Facebook, with a valuation in excess of $100 billion, qualifying as a “super-unicorn.”

Two years later, a study conducted for The New York Times found at least 131 unicorns, with 50 more start-ups that seemed to be on a trajectory to reach a pre-IPO valuation of $1 billion.2 Although the majority of these promising newcomers were based in Silicon Valley, as might be expected, the rest were located across the country as well as outside the U.S. in places like China, India, the UK, Germany and South Africa. Virtually all of the emerging unicorns were based on digital and/or online technologies, but they covered many different industry sectors ranging from consumer products and financial services to healthcare and business services.
Any consideration of the phenomenon of unicorns calls for a couple of caveats: first, the lofty valuations placed on start-ups may be more indicative of the optimism of investors than the reality of the marketplace (as the dotcom crash of the early 2000s amply demonstrated). And, second, it is always good to remember that past performance does not guarantee future success. As one Venture Capitalist quoted by *The New York Times* noted, some promising early stars are likely to turn into “zombie unicorns” that fail to live up to lofty expectations and see their valuations fall as they struggle to survive. No matter how promising, every start-up runs the risk of burning through the funds it has raised before reaching profitability.

Still, beyond these cautions, the emergence of a growing number of unicorns does seem to signal a real shift in how businesses operate. Companies that fully leverage the power of digital technology and the reach of the Internet have demonstrated the ability to grow at an unprecedented rate. While it is typical for a current Fortune 500 company to have taken several decades—or more—to achieve a billion dollar market cap, many newer tech-based companies have reached this milestone in less than a decade. And, in the immediate past, a number of start-ups have achieved the billion-dollar valuation within just a few years of their founding. In fact, as this kind of hyper-growth becomes more common, the term “unicorn”—which Aileen Lee chose because it described something that was “rare and magical”—may become less appropriate.

...exponential growth may become the new normal for successful 21st century firms.

A broader and arguably more important trend is the increasing ability of companies, both new and not so new, to function and to grow at unprecedented rates of speed. In fact, this kind of exponential growth may become the new normal for successful 21st century firms.

While start-ups unencumbered by the inertia of legacy systems or the complexities of large organizations are free to grow rapidly, there are examples of companies that have reached substantial scale yet have continued to grow at impressive rates:
• Over the past five years, Google’s revenues, which reached $66 billion in FY2014, have grown at an annual rate of 22.8 percent compared to a rate of 9 percent for the tech sector as a whole and 4 percent for the S&P 500. Even though Google now captures more than half of all digital advertising dollars, it has continued to increase its market share.

• Amazon, with FY revenues of $89 billion, has achieved a five-year revenue growth rate of 29.4 percent compared to a growth rate of 5.2 percent for the retail sector as a whole. The company also continues to gain market share: in 2015, the company captured 26 percent of all U.S. e-commerce sales, up from 22 percent in 2014 and 16 percent in 2011. In July 2015, Amazon’s market capitalization surpassed that of Wal-Mart, the world’s largest retailer.

• Facebook, with FY2014 revenues of $12.5 billion, has actually accelerated its growth rate over the past three years—increasing year-over-year revenue growth from 37.1 percent in FY2012 to 54.7 percent in FY2013 to 58.4 percent in FY2014. In August of 2015, the company announced that for the first time, one billion users—approximately one-seventh of the world’s population—had had logged on to Facebook in a single day.

• Apple has maintained a remarkable year-over-year revenue growth rate of 36.3 percent over the past decade. With current annual revenues of $182.8 billion (up from $8.2 billion a decade earlier), in February 2015, Apple became the first American company to reach a market capitalization over $700 billion, making it the most valuable company on the planet.

The unusual achievements of these firms has inspired the acronym GAFA (Google/Amazon/Facebook/Apple) to identify four companies whose level of success has set them apart from other, more ordinary companies. Each has achieved dominance in its market sector, enabling it to benefit from the so-called winner-take-all effect. But each of them has also continued to innovate in significant and sometimes surprising ways: beyond its core search service, Google has been responsible for creating the world’s most popular mobile operating system (Android), pioneered the deployment of high-speed fiber to the home, and has invested in new areas ranging from robots and self-driving cars to
augmented reality and combatting age-related disease. Amazon has not only steadily expanded its role as the leading online retailer, but has been responsible for the popularization of e-books and e-readers, become a major force in cloud-based computing, has experimented with producing original television content (exclusively for Amazon Prime subscribers) and is exploring the use of drones for package delivery. In addition to its dominant role in social media, Facebook has been actively exploring the potential of new technologies ranging from virtual reality to high-altitude drones to extend Internet access to rural areas. And Apple has steadily moved beyond its initial success in personal computers—in essence, disrupting its own core business—to transform the way in which music is distributed and consumed, establish smartphones and tablets as important product categories, and, most recently, lead the development of smart watches.

In some fundamental ways, each of these firms has continued to think and operate like a start-up even as they have become large publicly traded companies. One critical characteristic shared by all of these market leaders is their ability to execute quickly and effectively. And even as they move into new product categories, these companies continue to steadily improve their existing products, often operating at a scale and speed that would have seemed improbable just a few years ago. In 2013, for example, Amazon announced that the mean time between deployments of updates or new applications for Amazon Web Services was 11.6 seconds, and the maximum number of such deployments recorded in a single hour was 1,079. The mean number of hosts simultaneously receiving these new deployments was 10,000, while the maximum number of such simultaneous deployments was 30,000 hosts.8

Another example of a large company that operates at an accelerated rate is Xiaomi, the Chinese maker of mobile phones. The firm was founded in 2010, released its first phone in 2011 and achieved annual revenues of $12 billion and a valuation of $45 billion by the end of 2014.9 The company updates both its Android-based operating system and its phones on a weekly basis. To help inform its decisions, Xiaomi supports online forums that are used by some 40 million users of its products whom the company regularly polls to help to decide on the features to be included in the OS updates that are issued every Friday. Users also vote for “popcorn awards” that are given to the employees responsible for creating their favorite feature or update.10
Making the Invisible Visible

Over the past eight years, the Aspen Institute Roundtable on Institutional Innovation has explored the challenges of increasing competition and declining performance among many companies that had flourished in the last century. In particular, firms that were built to succeed by achieving economies of scale based on maximizing size and efficiency have found themselves lacking the flexibility to adapt quickly to changing business conditions.

… the 20th century imperative to achieve scalable efficiency as a path to success is being supplanted by the need to scale learning….

Exponentially increasing performance of digital technologies has transformed the infrastructure for business and made it possible for businesses to operate in new ways. In a world in which competition is steadily increasing, traditional firms are under growing pressure to reconsider old assumptions and explore new models of operation. For example, companies are facing the challenge of shifting from deriving value from building and exploiting stocks of knowledge, a strategy that works well in a stable environment, to participating in and benefiting from flows of new knowledge, which is a necessity in an environment that is constantly changing. Enterprises that have built up large asset bases to serve as barriers to entry against new competitors have found themselves outflanked by new ventures that use technology to leverage assets that they do not need to own in order to grow at unprecedented rates. Organizations that have built elaborate hierarchical management structures as a means of dealing with complexity have been outpaced by organizations that have increased their responsiveness and accelerated their rate of innovation by decentralizing decision-making. And perhaps most critically, the 20th century imperative to achieve scalable efficiency as a path to success is being supplanted by the need to scale learning within an organization order to enable it to respond to new challenges.

The focus of the 2015 Roundtable was the challenge to existing enterprises of achieving “exponential operations” that have produced
results that would have seemed improbable if not impossible a few years ago. In particular, the participants considered how organizations can shift from pursuing scale efficiencies to achieving scalable learning in a rapidly changing environment.

Performance By and Within 21st Century Organizations: Accelerating Innovation

The opening session of the Roundtable explored strategies for enhancing learning by embedding educational experiences in the texture of work rather than delivering education in separate formal “training” programs. Participants also considered some of the ways established companies are attempting to move toward new operational paradigms and identified some of the often powerful forces that exist within large organizations that actively work against large-scale change and how they might be overcome.

In a guided tour of the contemporary workscape, John Seely Brown, Independent Co-Chair of the Deloitte Center for the Edge, cited several interesting developments in work environments and in learning technology that hold promise of helping to expand opportunities for operating exponentially. He began by introducing two new collaborative spaces that help to accelerate learning by encouraging serendipity.

Hacker Dojo in Mountain View, California, describes itself as a “tech hub that is one part working space, one part events venue and one part maker space.” Housed in a 16,000 square foot former stained glass factory, the Dojo offers desk space and office space as well as high-speed Internet connections, a communal kitchen, a library, an electronics lab, and social spaces including a gaming lounge equipped with ping pong and pool tables. The facility also maintains a full schedule of activities that includes classes and workshops (e.g., laptop music production, product management, computer languages), talks (“how to negotiate the best salary if you are a girl,” “leading and managing innovation”), and meet-ups on a variety of topics (virtual reality, cognitive computing, big data, UX design). Founded in 2009, Hacker Dojo is the place where Pinterest was first conceived, and it served as the West Coast headquarters for the developers of the Pebble smartwatch. More recently, the Dojo was in the news as being the first location in the state of California to have a Bitcoin ATM. Hacker Dojo provides an environment that combines work, play and learning in order to encourage exploration and
innovation. For many young people, the Dojo is a great place for them to learn the practical skills that they did not learn in college.

While Hacker Dojo offers individual memberships, RocketSpace has been designed to provide a home for fast-growing start-ups. The collaborative co-working space located in a 75,000 square foot, four-story building in San Francisco has an explicit set of criteria that companies have to meet to gain entry: they must be in the tech or new media business, have already secured some outside funding, and have fewer than 30 employees. The criteria are intended to attract fast-growing companies with good chances for success. According to founder Duncan Logan, RocketSpace wants to be known as a “hit factory,” and its track record suggests that it is succeeding: companies that got started at RocketSpace include Zappos, Spotify, Leap Motion and Uber. In fact, the facility’s web page boasts that its alumni include a dozen billion-dollar unicorns and that 1.5 resident companies secure outside funding every week.

Like Hacker Dojo, RocketSpace’s environment has been designed to “shape serendipity” among its residents. As one report on the facility noted, “setting a high quality bar means your company is rubbing shoulders with other successful companies, and your A-level employees are meeting and chatting with other A-level employees.” RocketSpace also offers educational programs (Startup Fundraising 101, How to Go from 100 to 3,500 Employees in Three Years), events and a support network. And in addition to providing a “curated community” for start-ups, RocketSpace also welcomes large corporations, encouraging them to visit and take up residence in order to spot promising tech concepts and develop relationships with start-ups that can lead to commercialization trials or even partnerships or joint ventures.

Taken together, Hacker Dojo and RocketSpace embody a range of strategies that are intended to spur creativity for individuals, small start-ups and even large enterprises. As examples of enriched environments, they can be seen as templates for workspaces that accelerate learning and innovation. In other words, they represent enablers of exponential organizations.

* Co-working spaces like Hacker Dojo and RocketSpace have now proliferated around Silicon Valley and in many cities in the U.S. and abroad. An online directory of these spaces lists more than 40 in San Francisco and several dozen in cities such as London, Berlin, Hong Kong and Beijing. http://wiki.coworking.org/w/page/29303049/Directory
From Artificial Intelligence to Intelligence Augmentation

Technology itself is also having profound influence on the nature of work. Previous Roundtables have explored the institutional implications of technologies ranging from cloud computing and pervasive mobile connectivity, which are lowering the barriers to entry for new competitors and changing how and where work gets done, to social networks and telepresence that are enabling new forms of remote collaboration.

In his new book, *Machines of Loving Grace*, John Markoff tells the story of the long-standing rivalry between two diametrically opposed ways of using digital technology: artificial intelligence (AI) which strives to replicate specific functions of the human mind in software, and intelligence augmentation (IA) which attempts to create software tools designed to help people to work smarter and more effectively. Both strands go back to the middle of the last century and both represent ambitious attempts to push the power of computing beyond processing data to connect computers more directly to the realm of human cognition.

The field of artificial intelligence traces back to the 1950s, when the term was coined by the computer scientist John McCarthy to describe efforts to replicate the human thought processes in software. In its early years, the field seemed to make rapid progress, creating programs that could play checkers, solve certain kinds of mathematical problems, and even carry on plausible conversations with a human being. Looming in the distance was the prospect of building intelligent robots capable of autonomous action. But then progress slowed: while it was possible to build “expert systems” that could mimic the thought processes of a professional in a particular area of knowledge, creating such systems were highly labor intensive and remained restricted to narrow domains. And building machines that could perform many functions that are easy for humans—like understanding spoken language or recognizing a particular face—proved to be much more difficult than originally assumed.

But the field continued to make progress and has benefitted from the availability of vastly more powerful computing resources. In recent years, computers have developed the capacity to play chess at a very high level, to scan complex documents and create cogent summaries, and even to drive a car without human assistance. As AI has grown
more powerful, it has raised the real prospect of machines taking over an increasing range of functions from people. Thus, workers need to compete not only against workers all over the world who may do their jobs as well or better than they do and for less money, but increasingly will need to compete against machines who may have the ability to outperform them and can work non-stop.

The parallel quest to augment human intelligence has received less attention than AI, but it has an equally long history that traces back to the pioneering work of Douglas Englebart whose goal was to create tools that would help individuals and teams grappling with highly challenging problems. Englebart invented the computer mouse and built interactive systems that were ahead of their time, but he failed to move beyond building experimental prototypes to develop a practical product. Like AI, progress in the field of IA was much slower than initially expected. Early attempts at creating “virtual personal assistants” such as Microsoft’s Bob (in 1995 to help users of its Windows OS) were notable failures. But like AI, the steady increases in networking and computer power has made applications of IA possible that were previously not practical. One familiar example is the emergence of a new wave of virtual personal assistants such as Apple’s Siri or Microsoft’s Cortana that enable users to control multiple functions of their smartphones through voice commands.16

According to John Seely Brown, some of the most promising current applications of technology use the power of AI to complement human intelligence rather than replace it. To illustrate, he cited the changing role of computers in the world of competitive chess—a classic challenge to the developers of AI programs. In 1996, Gary Kasparov, the then reigning world chess champion, defeated IBM’s chess-playing program, Deep Blue in a six-game match (4 games to 2). But in a rematch one year later, Deep Blue prevailed (3 ½ to 2 ½ games), the first time a machine beat a human grand master in a formal tournament.

The match was widely seen as a landmark in the evolution of AI that demonstrated that a machine was in fact capable of excelling in a challenging area where human intelligence seemed to be required. When IBM’s Watson defeated the best human players at Jeopardy! in 2011, it provided another confirmation of the potential power of AI to outperform humans. According to IBM, the triumph of Watson ushered in the age of what it has called “cognitive computing.”
But John Seely Brown noted that there is an alternative to pitting people against machines, and that is the prospect of working with machines. Back in the late 1990s, Gary Kasparov proposed what he called Freestyle Chess (also known as Advanced Chess or Centaur Chess) in which individuals or teams able to make use of any chess-playing computer programs played against each other. Kasparov believed that combining men and machines would result in chess matches played at levels never before reached by either human or machine players alone. Freestyle tournaments have taken place regularly since then, with perhaps the most interesting match being the PAL/CSS Freestyle Chess Tournament that took place online in 2005. As the tournament’s organizers noted, “The use of computers is not just allowed, it is encouraged.” Remarkably, the winner of the tournament was a team named ZackS, which was led by two young unranked amateur players, Zack Stephen and Steve Cramton, who made use of three different computer programs to defeat teams that included established grandmasters. What enabled Stephen and Cramton to prevail was not their stronger chess skills but rather their greater ability to combine the power of a computer with their own intelligence.

Another example of the power of AI to amplify rather than replace human capabilities comes from the domain of military training. With funding from DARPA, a small company called Acuitus is attempting to “revolutionize training” by using AI to provide students with highly personalized programs that allow them to learn and to practice skills anyplace and any time under the guidance of a computer-based tutor. In addition, the company is “creating an online community of instructors and learners modeled after the online communities formed around multi-player games that are so familiar to this next generation of soldiers.” According to Brown, the evaluation of an early trial found that computer-based mentoring outperformed both conventional classroom instruction and training by fleet experts by two standard deviations while substantially reducing overall training time.

In fact, we have entered a time in which a wide and expanding range of technologies are available to leverage human capabilities and enhance the value of human workers. Data is everywhere, and new possibilities exist for sensing and reacting to changes in the environment. An unprecedented amount of data—and the tools to analyze** John Seely Brown is a member of the Acuitus board of directors.
The Report

Reports from the Field

Can established hierarchical organizations move from a linear method of operating to a more dynamic and highly leveraged exponential operation? How can an organization shift its core strategy from attempting to achieve economies of scale to pursuing scalable learning? John Seely Brown suggested that the biggest obstacle to overcome in achieving such a transformation is the challenge of “unlearning and reframing”—letting go of the very principles that have been responsible for past success in order to embrace a new, less familiar (and therefore less trusted) set operating principles in pursuit of goals that previously would have seemed impossible if not improbable.

...the biggest obstacle to overcome in achieving such a transformation is the challenge of “unlearning and reframing....” - John Seely Brown

Roundtable participants described recent efforts they have been involved with to innovate more rapidly or to sustain rapid growth:

- Casey Carl, Chief Strategy and Innovation Officer at Target, agreed that the need to unlearn operational routines represents the largest source of inertia that must be overcome in order to do things differently. Ironically, people who have been the most successful, who have accumulated the most institutional knowledge, are often the hardest to change.

One of his main goals at Target has been to “infuse a digital mindset” in a company that has long been defined by brick and mortar operations. One key to getting new answers is to ask new questions. To do this, he brought together disparate
IT teams from across the company and put them under a new leader who has been teaching them to ask different questions about what they can create. Another strategy has been to create a new cohort of change agents inside the company. He began by identifying a group of “unicorns,” front line people throughout the company who have been “doing things the right way”—not the way they are “supposed to be done,” but the way that actually works. This group of highly talented people had not been recognized for their contributions, but had generally felt stifled and frustrated by how slowly things changed. He thanked them for their contributions and gave them a chance to meet and support each other in their efforts to make things happen more quickly. His next step will be to invite each of the initial group of unicorns to “bring a friend” who is also struggling with change. Rather than attempting to follow a grand master plan, Carl described his strategy of “iterating through a transformation.” His goal is to encourage staff to find ways to “disrupt themselves,” rather than waiting to respond to disruption that comes from the outside.

• Kaiser Permanente is attempting to achieve a major transformation. With annual revenues of $54 billion and 10 million members, Kaiser is one of the largest health care organizations in the country. It has long been a pioneer in providing integrated care by combining health insurance and health care services in a single organization. Although its structure is distinctive, the way in which it has defined and delivered medical care is relatively conventional: It employs nearly 18,000 physicians and 50,000 nurses who provide care through a network of 38 hospitals and 619 clinics in eight states and the District of Columbia.20

According to Vivian Tan, Vice President for Strategy and Transformation, like other doctors, Kaiser’s physicians have been trained “to identify medical problems and solve them.” But it is becoming increasingly clear that the definition of health is much broader than most physicians recognize and the determinants of well-being go beyond those factors that they normally deal with. Like Casey Carl at Target, Tan is attempting to change the fundamental mindset of her organization: instead of focusing on discovering “what is wrong with you,”
the goal is to shift the conversation with patients to exploring the question of “what matters to you.”

...the biggest influencers are not the early adopters but the “early resistors” who start out opposing change but switch to supporting it.

Changing the mindset of physicians and other professional providers is hard to do. But Tan identified four key factors that can drive change: First is *mission*, having a shared goal that can provide strong support for change if a new way of doing things can be clearly linked to it. Second is *affiliation*, which means that if someone in the organization is already functioning effectively in a new way, there are more likely to be followers. Interestingly, the biggest influencers are not the early adopters but the “early resistors” who start out opposing change but switch to supporting it. Third is *mastery*, which is manifested in the visible presence of a respected change advocate who can help bring about wide adoption of proven innovations. Fourth is *autonomy*, the fact that people do not want to be told what to do, but can be empowered to change. One good way to do this is to include real patients in the process. For example, Kaiser brought in a group of pregnant women and new mothers to interact with an internal team working on redesigning maternity care. Their input about their own experiences proved instrumental in shifting the mindset of the care team, defusing opposition to change and resulting in a better end product.

Tan noted that Kaiser is engaged with pursuing two different types of innovation, one that involves physical changes in how services are delivered (e.g., new types of clinics or hospital rooms), the other that is digital (new uses for electronic health records or new forms of doctor-patient communication). Although both are important and Kaiser has made progress in both areas, it has been challenging to bring these types of innovation together.
The Digital Imperative: AT&T and GE Attempt to Reinvent Themselves

Even the largest corporations in America are recognizing the need to respond to the challenge posed by the rise of digital business and are attempting to remake themselves in some fundamental ways.

AT&T, which had revenues of $147 billion in 2015, is attempting to reinvent itself in order to compete more effectively, not just with other telecom companies but with technology companies like Amazon and Google. In the past three years, the company has invested more than $20 billion annually to build its digital businesses. AT&T Chairman and CEO Randall Stephenson has announced that he expects the company’s 280,000 employees to develop new skills such as digital networking and data science. To help them make the transition, AT&T has partnered with Udacity to offer a range of online courses and will provide employees up to $8,000 per year to pay for the courses.21

In early 2016, General Electric announced that it was moving its headquarters from suburban Connecticut to Boston, a move which has been described as illustrating “how much old-line companies in nearly every industry have been force to rethink their business for the digital age.” With 360,000 employees and 2015 revenues of $117 billion, GE is the nation’s largest industrial company. Nonetheless, CEO Jeffrey Immelt has stated that he expects the company to be a “top 10 software company” by 2020. To help facilitate the transition, the company decided to relocate its headquarters to the Seaport District of Boston which is a center for computer, biomedical and pharmaceutical companies. And most of the people who will work at its new headquarters will not be traditional corporate staff, but rather “digital industrial product managers, designers and developers in disciplines like data analytics, life sciences and robotics.”22
Change and Resistance to Change: Lessons Learned

Starting with these real world examples, Roundtable participants explored the main barriers to change, particularly within large, established companies that often have long histories of success. The same is true for individuals within these organizations: people who have been the most successful, who have accumulated the most institutional knowledge and developed the strongest operational skills, are often the most resistant to change.

… persisting in operating linearly in an exponential world may well be a “recipe for oblivion.” - Greg Folley

Vivek Kundra stated that most organizations are hardwired not to change. Greg Folley, Chief Analytics and Innovation Officer at Caterpillar, Inc., added that big companies often see more risk in changing how they operate than not changing—even though persisting in operating linearly in an exponential world may well be a “recipe for oblivion.” Sonny Garg of Uptake who has had a long career working in the energy industry, commented that employers have created a “pinstripe assembly line,” commoditizing workers, treating them all as interchangeable and replaceable. HR Departments are typically designed to build a homogeneous workforce, which entails isolating and eliminating divergent thinkers (human “unicorns”) who can cause disruption. As a result, some three-quarters of workers describe themselves as “disengaged” from their jobs and therefore have little reason to take on challenging assignments or welcome change. Rather than discarding unicorns among their workers, organizations need to learn to recognize them and give them opportunities to take on challenging projects with visible impact.

Some types of organizations, particularly those in the public sector, are particularly resistant to change. Jon Wilkins, Managing Director of the Federal Communications Commission, noted that the average employee tenure in that agency is 26 years, and the prime goal for most civil servants is to “avoid making mistakes” that can cause trouble.
Harold Levy, Executive Director of the Jack Kent Cooke Foundation, pointed out that the field of K-12 education is “incredibly resistant to change,” in part because those who are attracted to the teaching profession tend to be people who often do not want to change. And the fact that teaching remains a heavily unionized sector of the economy provides a strong mechanism for resisting change. Another vast area that has been highly resistant to change is health care. According to Kelvin Westbrook, President and CEO of KRW Advisors and Chairman of BJC Healthcare in St. Louis, the mindset of healthcare providers is much like that of government workers: there is no downside to being risk-averse. In fact, saying no to change is often the best strategy for insuring career longevity.

A counterexample of a governmental entity that has embraced change is the military, which is probably the branch of government with the strongest sense of mission, one that involves responding quickly to constantly changing threats. John Seely Brown noted that the military has been one of earliest and most enthusiastic supporters of the development of accelerated learning.

Several participants pointed out that understanding how large organizations actually operate is critical for any attempts to bring about change. For example, it may not be realistic or even desirable to attempt to create a culture of continuous learning for everyone within an organization. Large organizations are rarely homogeneous, and some parts may be more receptive to change than others. Tom Rosenstiel, Executive Director of the American Press Institute, pointed out that big organizations are typically made up of different tribes—salespeople, IT staff, senior management—each of which has its own codes and its own vocabulary. In fact, there is a lot of creativity within tribes. And workers are often members of multiple tribes. For an organization to change rapidly, everyone needs to be able to see a common purpose across their tribes, which may involve creating a common vocabulary. Rather than attempting to come up with a single grand vision for the future, organizations may be better off taking small steps that can lead to something larger, teaching people to work across boundaries through small wins that respect the dynamism of the different tribes.

Laura Ipsen, Senior Vice President of the Industry Solutions Group at Oracle, added that HR is an important piece of the equation when it
comes to enabling change, transforming the workforce and driving job
satisfaction at all levels. But HR organizations can often times become
mechanical and detached from the real business goals, and, many
rewards and recognition programs do not recognize the ‘unicorns’—
the doers and innovative thinkers who drive needed change. For
example, programs that focus exclusively on “what” rather than “how”
fail to see that “how” things get done can be the most magical part of
transformation even if controversial. Companies that find unique ways
to recognize and empower their unicorns will stand a better chance of
surviving disruption.

Companies that find unique ways to recognize and
empower their unicorns will stand a better chance
of surviving disruption.

If fundamental change requires “unlearning,” that can represent
another obstacle to transformation. Andy Billings, Vice President,
Profitable Creativity at Electronic Arts, stated that recent discoveries in
neuroscience suggest that there is actually no such thing as unlearning,
just new learning layered on top of old learning. In addition, people
tend to over-respond to the prospect of loss compared to the prospects
of gains. People really do not want to fail. And people do not want
to hear bad news. As the novelist John Barth once wrote, “All true self
knowledge is bad news. If it were good news, you’d already know it.”

John Pittenger, Senior Vice President for Corporate Strategy at Koch
Industries, added that neuroscience has also shown that people are
hardwired to stay alive, and that when threatened, they react with fear
and alarm, which are rarely conducive to pursuing systematic change.
Crises are often necessary ingredients to trigger change, and the prac-
tice of crisis management is well established. But how does one bring
about change in the absence of a visible crisis?

Given all of these barriers, it is not surprising that the majority of
change efforts fail. A critical success factor may be finding the right
language to describe the changes that are necessary, or that the risk
of doing nothing is greater than the risk of undertaking change. John
Clippinger, CEO of MIT’s ID3, cited his experience in working with two industries facing massively disruptive change: the banking industry, which could be made obsolete by crypto-currencies such as Bitcoin, and the newspaper industry which has already been disrupted by the rise of digital media. In both cases, survival may depend on the ability of industry participants to let go of long-held beliefs and reimagine who they are: What role might banks play when currency is digital, virtual and decentralized? What is the future of journalism in a world in which bloggers have as much prestige and trust as professional reporters? Clippinger suggested that the ability to come up with good answers to these questions depends on finding and articulating a “massively transformative purpose” that identifies a positive opportunity that can motivate and align people around a big change. And rather than having all of the answers, it may be more useful for leaders to be asking the right questions as a means of redirecting attention from the threats to opportunities.

John Seely Brown concluded the discussion by pointing out three additional factors that can serve as effective catalysts to accelerate change. First is the power of mobile, which is rapidly becoming the dominant global medium. The concept that “mobile is first” has already gained wide acceptance in places like Asia, even while recognition of its central role has been slower in Western countries. What makes mobile important is its role as a connector and a “curiosity amplifier” that empowers individuals in new ways. Second, we may be underestimating the impact of a variety of “exponential technologies.” Smart algorithms are emerging that are making it easier to design teams that amplify group intelligence and enhance serendipity. Findings from the field of neurolinguistic programming are helping us to understand how the same thing can be heard differently by different people, a result that can be used to custom tailor learning experiences. Re-conceptualizing learning to focus leading students on their own epiphanies, which can bring about rapid shifts in perception and that are never forgotten, is far more powerful than traditional instructional techniques that are based on simply conveying a body of information. The third factor is the potential role of play as a path to innovation. For young people, play is perhaps the most important lens for understanding the world. As we grow up, we define work and play as mutually exclusive. But there is great power in bringing the two back together.
Learning and Performance: Learning by Doing

A starting premise of the Roundtable on Institutional Innovation is that the most critical factor in determining the success of organizations is not achieving economies of scale, which was the chief goal in the 20th century, but to provide scalable learning. But what kind of learning is needed and how can it be scaled?

…the kind of learning that is key to operating exponentially should focus on improving workers’ ability to solve problems and make good decisions….

According to Maryam Alavi, Dean of the Scheller College of Business at Georgia Tech, the way companies typically “learn” is by codifying procedures in order to minimize uncertainty and avoid mistakes. Most corporate training still takes place through formal instruction, either in a classroom or more recently, delivered online to workers’ desktops, a process that is designed to convey a specific body of knowledge or skill set to employees.

But the kind of learning that is key to operating exponentially should focus on improving workers’ ability to solve problems and make good decisions, rather than simply acquiring lower level skills or knowledge. It typically involves acquiring tacit knowledge as well as explicit knowledge. How can this sort of learning best be delivered at scale? The short answer, according to Maryam Alavi is by deliberately designing jobs to enable workers to learn by doing and by deploying technologies that can accelerate learning.

First it is useful to understand how learning happens. The research literature on learning identifies two different types of learning: cognitive and social. The first focuses on what goes on in students’ heads when they learn; the second is concerned with the environment that best supports learning.

The goal of cognitive learning theory is to elucidate the mental processes involved with learning: it focuses on the relationship among
factors such as perception, attention, information processing, reflection, drawing inferences, memory and recall. According to this theory, learning is most effective when it is a constructive, goal-oriented process that happens most effectively during solving real world problems that provide engagement and a sense of purpose. By emphasizing intention and motivation, this concept of learning is very different than the “empty vessel” approach, in which students progressively acquire knowledge. It acknowledges that learning truly new skills is hard work, and that higher level learning in particular requires a lot of effort and can be frustrating. Without sufficient attention to students’ motivations, this kind of learning can be difficult to achieve.

Social learning is based on the premise that the most effective learning is not a solitary activity but is best accomplished in cooperative activities with others that involves asking and answering questions, sharing information and participating actively in learning communities.

Both approaches to learning are important, and they are not mutually exclusive: there must be cognitive changes taking place in a student’s mind in order for learning to take place, and social interactions promote engagement that supports cognitive learning.

The most effective learning is connected directly to a worker’s job, and the best way to support and accelerate both cognitive and social learning is through the way in which work is designed. Research has shown that specific work attributes—perceived significance of one’s job, the variety and challenge of work assignments, autonomy to find the best solution to problems, timely feedback from managers and peers, and participating in small teams—can lead to psychological and social states that promote learning and performance and can contribute to positive affect in organizations.

In addition, there are a number of emerging information technologies that can be deployed to further enhance learning: Automation can take over the mundane, repetitive and boring aspects of work, freeing workers to concentrate on more challenging tasks. Simulation models and machine learning can support cognitive learning by enabling workers to explore and understand relationships among multiple interacting variables. In addition, data analytics provides tools to draw inferences from and recognize patterns in big data sets. And social media can
facilitate team building and team interactions that include information sharing, giving and receiving feedback, asking and answering questions. In what is truly a win-win situation, the same work design principles and IT tools that are key to improving work performance are also important ingredients in promoting continuous learning. In fact, the two objectives go hand-in-hand.

Alavi added that the most effective learning is “scaffolded”—that is, it happens under the supervision of a mentor who is able to give learners timely feedback. This kind of structure is vital to good learning; efforts by teams to learn that are undirected and unsupported are generally less successful.

Finally, Alavi pointed out that the process of “unlearning,” which is an important ingredient in keeping up with a changing environment, does not involve “erasing” old information from the brain, but rather recognizing that an existing mental model is no longer accurate or adequate and building a new mental model (See Sidebar, Emergence of a 21st Century Infrastructure). This is a distinctly different (and more challenging) process than incremental learning, where new knowledge is used to elaborate an existing mental model.

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**Emergence of a 21st Century Infrastructure**

As digital technology evolves, it not only gets cheaper, faster and more powerful, but it enables entirely new ways of operating. A series of such paradigm-shifting breakthroughs, many that build on previous technologies, is creating a new infrastructure for the 21st century that is fundamentally different from the infrastructure that prevailed in the last century.

John Seely Brown has illustrated the need for continuous unlearning, as well as new learning, through his efforts to keep up with the evolution of technology. Over a period of a dozen years in at least six different domains, he has had to discard old assumptions and understandings about how technology works and acquire entirely new paradigms. (Each of these tech areas is fairly technical and relatively complex; each is described here with just enough detail to explain the nature of the shift. More information on each is listed in footnotes.)
1. **From Two-phase Commit to Eventually Consistent.** When computers began to support multiple applications and multiple remote users, a need arose to find a way to synchronize transactions to ensure consistency of data. The two-phase commit protocol accomplished this by providing for an orderly process for gathering requests for a transaction (phase one), then making a decision to commit to or abort that transaction (phase two). With the growth of distributed databases that serve thousands or millions of customers simultaneously, a different approach to ensuring consistency was needed. A new protocol, known as “eventual consistency,” was developed initially by Amazon.com to postpone the total consistency check till the end of a complex set of transactions such as checking out with a shopping basket.

2. **From Client-server to Cloud.** Although cloud computing might seem to be just a new version of the old client-server paradigm, in fact it raises entirely new challenges that call for new solutions. For example, as Netflix understood ahead of many of us, in cloud computing one must design for failure with the spirit of graceful degradation, which requires a lot of thought about what to do when (not if) a component fails. General principles include:

   - **Fast Fail:** Set aggressive timeouts such that failing components do not make the entire system crawl to a halt.

   - **Fallbacks:** Design each feature to degrade or fall back to a lower quality representation. For example if we cannot generate a personalized list of movies for a user, fall back to cached (stale) or un-personalized results.

   - **Feature Removal:** If a feature is non-critical and if it is slow, remove it from any given page to prevent it from impacting the user experience.

   Also consider designing with N+1 redundancy in mind. In other words, allocate more capacity than you actually need at any point in time to provide the ability to cope
with large spikes in load caused by member activity or
the ripple effects of transient failures, as well as the fail-
ure of up to one complete zone.

3. **From CPU to GPU + CPU.** The “brains” of every com-
puter is its central processing unit (CPU) that executes
the instructions of a computer program by performing a
series of arithmetical and logical calculations. The earli-
est stored-program computers relied on CPUs, and suc-
cceeding generations of personal computers were based on
microprocessor-based CPUs. Initially, displays were just
text on monochrome screens that could be supported by
CPUs, but beginning in the 1970s and 1980s, arcade games,
and then personal computers began to integrate specialized
graphic processing units (GPUs) to provide increasingly
sophisticated visual capabilities for such things as video
games, graphic user interfaces, and photo and video edit-
ing.\(^{26}\) GPUs are highly parallel processors that run moderately simply instructions. The key to maximizing their per-
formance is to lay out information in the internal memory
of the chip so that instructions can be effectively streamed
to each processor with almost no latency. Unlike the past
(except the distant past—see below), understanding the
geometric layout of information in memory in a GPU is
important. (On the truly ancient IBM 650, getting optimal
performance entailed considering where information was
stored on a rotating drum. So, in a way GPUs represent a
return to those early days of computing, but now infinitely
more complicated.)

4. **From SQL to NoSQL.** Structured Query Language (SQL)
is a programming language designed to manage data in a
relational database in which information is stored in rows
and columns. As relational databases became the dominant
standard for databases, SQL became the most widely used
database language.\(^{27}\) SQL databases required pre-defined
data schemes/models that structured the data in order to
handle a wide variety of queries efficiently. NoSQL (a name first coined in 1998) refers to a radically different approach to databases where both structured and unstructured big data can be accessed without first being converted to a schema model. Many of the techniques for dealing with SQL regimes do not map over very well to the more free-form NoSQL regimes, which, for example, allow for a rapid exploration of data to find the most appropriate model for schematizing the data.

5. **From Desktop to Mobile First.** Early computers filled entire rooms. As they shrank in size, they came to reside on individual desktops. Then, as computing devices got even smaller and wireless broadband networks grew, computers were no longer tethered to the desktop. Now smartphones and tablets are providing the main connection to the Internet, first for millions, then for billions of people who may never own a full-fledged computer. Organizations that grew up providing content for PCs have found themselves needing to shift their focus and adjust their mindset to a world dominated by mobile apps. For example, it is now possible to tap the power of geo-fencing to determine what information should be streamed to a device or even allowed to be displayed on it depending on its location. Exploiting such opportunities requires new ways of thinking, but these may be incompatible with organizations’ established practices or their legacy ERP systems.

6. **From Defense to Offense in Cybersecurity.** When the Internet was first launched, it linked a tiny number of researchers and computer scientists. Because use was limited to a small community, virtually no attention was given to the issue of security. As the Internet grew to connect the entire world, the lack of security provisions in its fundamental design has become a bigger and bigger problem. Today, virtually any entity connected to the Internet can expect to be attacked by malicious unknown parties from
anyplace in the world. Cybersecurity experts have concluded that taking purely defensive measures and waiting to be attacked is no longer sufficient; government agencies and large companies are actively exploring options for taking the offensive in responding proactively to threats, or even constructing honey pots that attract cyber attackers in a way that enable the attacked to determine a signature of the attacker.28

One characteristic shared by several of these innovations is that they are not the result of academic research but rather came about as a response, often by a commercial venture, to a real-world problem or constraint. It is also true that the old paradigms do not completely vanish but continue to be relevant in certain contexts.

Reports from the Field

How can big established organizations that typically have large HR departments that provide conventional corporate training move to new forms of embedded exponential learning? Roundtable participants described some of their efforts:

• When he was at Marriott Corporation, Tony Scott, now the United States Chief Information Officer, ran a portion of the company’s Great America theme parks. He experimented with getting the park managers to play a lemonade stand game that ran on Apple II computers, but he found that while the game was useful in teaching certain basic skills, it was not particularly effective in teaching business strategy or how to run a team.

• At Target, Casey Carl implemented an “Action Learning for Leadership” program that brought a group of five or six young staff members together for a week of intensive activity in which they had to work together to solve an actual business problem, working under an executive who is actually accountable for solving the problem, which is linked directly to the firm’s overall corporate strategy. One key ground rule that helped
shape the participants’ experiences was that on the first day of the program, they were only allowed to ask questions, not even begin to think of responses. The goal of the rule was to teach the participants to “fall in love with the problem” rather than with a particular solution to the problem.

- Tom Rosenstiel also emphasized the importance of asking questions. Getting to exponential learning requires asking the right questions. But most companies ask the wrong questions that lead to incremental rather than more far-reaching innovations. What organizations need to do is to ask questions such as “What function do we perform in people’s lives? What problems do we solve? How could what we do be done better if we did not exist?”

- John Hagel and John Seely Brown of the Deloitte Center for the Edge both pointed to the worlds of online gaming and extreme sports as places where extreme learning takes place. The best learning is an adventure: as young gamers put it, “If I ain’t learning, it ain’t fun.”

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**Getting to exponential learning requires asking the right questions.**

Andy Billings of Electronic Arts agreed, noting that almost all learning is based on games. When involved with a game, the best players make note of the consequences of their decisions. In game-based instruction, a mentor is able to pause a game and ask the players to consider how they can apply what they are learning to their real-world assignments.

A key to accelerating learning is to organize learners into communities of practice—groups that are typically no larger than 10 to 15 people who share deep trust with each other and are connected to a broader learning platform. These platforms
are making it possible to scale learning beyond an individual enterprise to a larger business ecosystem by building “collaborative creation spaces” that can include millions of individual learners. Another powerful learning strategy is to learn from adjacencies. In their book, *The Power of Pull*, Hagel and Brown describe how a group of youngsters in Hawaii who were determined to become world-class surfers learned important lessons from skateboarders and motocross participants.”

**Business Practice Redesign to Foster Learning**

If the key to success in the 21st century is to scale learning, and the best way to scale learning is to maximize opportunities for people to learn while doing, then how can organizations be structured to optimize this kind of learning?

John Hagel offered a framework for the discussion by summarizing the differences between a 20th century company focused on achieving scalable efficiency and a 21st century organization committed to scaling learning (see chart on next page). He noted that the first big step toward scalable efficiency occurred in the early part of the last century with Taylorism—the attempt to achieve “scientific management” by rigorously measuring and specifying the components of each task in a production process in order to standardize business activities to ensure that they would be carried out as efficiently as possible. The second major step came in the 1990s, when Michael Hammer attempted to move beyond a focus on discrete tasks with the concept of business process re-engineering that took a larger end-to-end view of business processes but with the same goal of specifying and standardizing these processes and eliminating all inefficient buffers between activities in order to maximize operational efficiency.
By requiring workers to fit into closely specified, highly standardized and tightly integrated processes, these traditional approaches leave no room for improvisation or experimentation and therefore provide no opportunities for on-the-job learning. The only way to do training in such an environment is through formal programs that are separate from work. In fact, virtually every large institution today is following this model for corporate training.

If the alternative to pursuing scalable efficiency is to seek scalable learning, how can this change be made? What does an organization
that is consciously designed to facilitate learning look like and how does it actually function? While acknowledging that his thinking on this subject is still evolving, Hagel offered several ideas:

**Shift from process to practice.** A key to encouraging scalable learning is to shift from focusing on *business processes*—explicitly defined sequences of tasks that yield specified results—to focusing on redesigning *business practices*—the ways that organizations—or, more accurately, the people working in organizations—actually respond to an issue or problem in a particular context. Practices are a matter of how one perceives and thinks about an issue and how one acts on it, actions that are often based on tacit knowledge that may be difficult to communicate explicitly and are not amenable to tight definition or standardization.

**Learn from exceptions.** One way to encourage learning on the practice level is to focus on exceptions. Remarkably, despite all the efforts to standardize business processes, exceptions that have not been anticipated by these processes or are outside of the boundaries of these processes account for 60 to 70 percent of the time spent by an organization’s workforce. Yet exception handling remains a kind of “shadow activity” that provides evidence of the failure of automation to rationalize all processes, but often is not acknowledged.

One of the reasons that exceptions take so much time is that they are handled inefficiently. It generally takes a group of people to resolve an exception. And typically, the goal of the organization is to reduce or eliminate exceptions (i.e., turn them into processes). Organizations that recognize that exceptions are the norm can decide to make the most of them and treat them as opportunities for learning and innovation.

**Make the invisible visible.** Providing workers with appropriate metrics can play an important role in helping them improve their performance. LiveOps enables companies to outsource call center operations by employing more than 20,000 people who work from home but are linked by a powerful routing platform. In addition, LiveOps provides each worker with a “dashboard”—inspired by World of Warcraft game players—that provides continuous feedback on their performance. By inviting workers to seek help from others when they find themselves falling behind and rewarding those who provide help to others, LiveOps was able to create a powerful peer-to-peer learning environment.
**Tap the power of diversity.** Organizations seeking to scale learning will also emphasize diversity in an organization’s workforce rather than seeking homogeneity. Research by people like Scott Page at the University of Michigan, who has shown how diverse perspectives are the key to making breakthroughs, and Tom Malone at MIT, who has identified the characteristics of teams that contribute to their “collective intelligence,” have established the value of diversity in the workplace and provide useful guidance about what that diversity should look like.

Fortunately, there are technology-based tools available that can help organizations to build effective teams. In particular, matching algorithms can be used to build teams that are optimal in terms of creativity and productivity—a sort of eHarmony for businesses.

**Seek friction not harmony.** The goal of diversity, however, should not be to achieve “harmony,” but rather to encourage the productive friction that arises when people from different backgrounds, experiences and perspectives come together to pursue a shared goal. When people are able to argue and to vigorously challenge each other in an environment of mutual respect, the result is often insights that no one on their own would have come up with.

**Modularize.** While business process re-engineering attempts to eliminate all of the buffers between activities, an organization that is dedicated to learning should deliberately “modularize activities” by creating buffers that provide opportunities for people working within particular modules to experiment and improvise how they work without disrupting adjacent modules as long as they meet the requirements of the interfaces between modules. (More on this topic appears on page 35.)

**Rapid iteration.** Another characteristic of learning-focused organizations is a commitment to investing the minimal time and resources needed to deliver some output, then rapidly iterating that output in order to improve it, refining and enhancing it over time based on the feedback obtained through each iteration. To ensure that learning does happen during this process, organizations need to create spaces for reflection in order to carry out what the military calls after-action reviews that consider what worked and what did not work and how positive experiences can be captured and extended.

**Go exponential.** A final principle for enhancing learning is a focus on the trajectory of performance. In an exponential world, linear
improvement is not sufficient to ensure success. Accelerating improvement requires a relentless focus on the performance metrics that really matter and that can support an ongoing process of reflection: what are we doing to accelerate performance? What else do we need to do?

Hagel concluded by offering four unconventional principles for scaling edges:

1. When you find an edge, starve it. Do not flood an edge—however promising—with money, because it will foster complacency. Rather, force it to engage in partnerships with outsiders, which will strengthen external support.

2. Recruit for passion, not for skills.

3. Avoid cannibalizing an edge in its early stages. Let it grow its own revenues and earn its own profits.

4. Do not try to get an organization’s entire leadership to support an edge, but find one senior executive (either the CEO or a direct report) who is convinced about the importance of scaling an edge, and will defend it when resistance occurs.

Making Change Happen

Assuming that an organization’s leadership is convinced that it needs to shift from pursuing efficiency of scale to focusing on scaling learning, how can such a big change be brought about? John Hagel cautioned against attempting to impose such a transformation from the top down. Such a sweeping change almost always triggers an organization’s immune system that can be extremely effective in defeating an effort to change. An alternative approach that is frequently used is to incubate a major innovation in a skunk works that is separate from the rest of an organization, and then once an innovation has been developed, bring it back into the core of the organization. Unfortunately, this approach has also experienced a high rate of failure since corporate immune systems are also good at detecting and crushing foreign bodies before they have a chance to change the core.

A more effective strategy is to grow opportunities at the edge of an organization and then scale those edges. An example of this approach is the transformation of State Street Corporation, which was founded in 1792 and is the country’s second oldest financial institution. Since its
founding, it had functioned as a traditional bank. Starting in the 1970s, the company began to invest in technologies for securities management and by the 1990s, the company was responsible for managing several trillion dollars in securities for third parties. In 1999, the company decided to exit entirely from retail banking to concentrate on securities processing and management, which became its new core business.  

Target has been described as a “tech laggard,” but the company achieved a notable technology win with the development of Cartwheel, a mobile app that encourages customers to shop more often by offering them discounts and deals. Users pick discounts that interest them, then use a barcode generated by the app to claim the discount when checking out at a Target store.  With shopping apps heavily dominated by online retailers Amazon and eBay, Target has been one of the few success stories among brick-and-mortar retailers in getting customers to download and use its app. After Cartwheel was introduced two years ago, it quickly became one of the most popular apps in Apple’s App Store. Between mid-2013 and mid-2014, customers spent more than 100 million hours per month browsing and shopping at Target, an increase of 251 percent. More importantly, Cartwheel users visited Target stores more often and spent 30 percent more per visit on average. According to Casey Carl, Target partnered with Facebook to develop the app, and users are encouraged to share deals they have found through Cartwheel with friends on Facebook.  

Another example of a major corporate transformation is Ericsson, in this case spurred by a crisis. The company began in 1872 with a telegraph repair business opened in by Lars Magnus Ericsson in Stockholm. By the early 1900s, the company had grown into a global supplier of equipment for the rapidly growing telephone industry. In the later years of the 20th century, Ericsson had become an important player in mobile phones and by 1997, the company controlled nearly one-third of the global market for mobile handsets. But the company lacked experience in building consumer products and, despite teaming up with Sony in 2001, the company failed to respond effectively to the emergence of smartphones. In 2011, when its share of the global handset market had plummeted to just two percent, Ericsson sold its 50 percent share in its joint venture to Sony and exited the handset busi-
ness entirely to concentrate on providing infrastructure technology and services to the telecommunications industry.

Caterpillar would seem to be the epitome of an old-line hardware company, but the company has realized that software is an increasingly important component of its products. According to Greg Folley, the company began several years ago to put sensors on its tractors, which generated a lot of data on such things as fuel efficiency, idle times and mechanical diagnostics. It eventually became clear that this kind of data could be highly valuable to its customers if it could be quickly analyzed and made actionable. In March of 2015, Caterpillar, a 90-year old company, announced that it was partnering with Uptake, a one-year old data analytics start-up. The announcement stated that, “Caterpillar has made a minority investment in Uptake and will jointly develop an end-to-end platform for predictive diagnostics to help Caterpillar customers monitor and optimize their fleets more effectively.” Caterpillar Chairman and CEO Doug Oberhelman was quoted as explaining that the partnership would enable the company to “transform the quintillion bytes of incoming data we see every day into useful information we feed back to our customers for on-the-spot decisions and planning purposes”—a novel role for a manufacturer of heavy equipment.

While owning a newspaper was once viewed as tantamount to having license to print money, perhaps no other industry has been as deeply challenged by the rise of digital media. Virtually all major newspapers have struggled to respond to the onslaught of digital media, but few have been able to replace rapidly shrinking revenue from print with income from new sources. Many have had to undergo repeated downsizings while others have disappeared completely. Two publishing companies that have been unusually successful in making the transition—the Deseret News in Utah and Axel Springer in Germany—demonstrate the power of starting on the edge, even though they have followed quite different paths to change.

The Deseret News, which was founded by the Mormon Church in 1850 and has the distinction of being the first newspaper publisher and the longest continuously operating business in Utah, has been more successful than almost any other newspaper company in adapting to the new digital environment. Rather than trying to add digital capabilities to its existing operations, the Deseret News decided to set
up an entirely new company—Deseret Digital Media—to pursue new opportunities online. In addition to serving the company’s flagship newspaper, it also took responsibility to playing the same role for the parent’s other properties, which include a television station and several radio stations. Because it was separate from the existing media, Deseret Digital Media was free to take a fresh look at the opportunities available to it, and respond quickly to them. Thus, rather than simply attempting to shift to creating digital content, the company decided to focus on creating “social spaces” built around the interests and passions of its readers.

Axel Springer has been Germany’s largest print publishing company, with two newspapers, Bild and Die Welt, which have been among the largest in Europe. When Mathias Döpfner became CEO, he worried that “the company’s management culture was too hierarchical and risk-averse” to move quickly and boldly to respond to the digital challenge. So, in 2012, he sent three of the company’s top managers to live in California for nine months in order to “network with Silicon Valley executives and study the habits and mores of American start-up culture.” Upon returning to the company’s offices in Berlin, one of the sojourners told his staff that they must be prepared to make mistakes and realize that “failure can be a precondition to success”—attitudes that are definitely not typical of German businesses. As a result of a series of investments in new companies, digital ventures now account for more than 60 percent of the company’s revenues and fully 70 percent of its operating profit, and Döpfner has been quoted as saying that he “would not exclude that, in 10 years’ time, our company could be 100 percent digital.”

**Innovation in the public sector.** Several Roundtable participants pointed out that promoting innovation within government poses special challenges. The FCC’s Jon Wilkins noted that the agency has been strongly committed to increasing connectivity of schools. The Commission’s E-Rate program has helped almost every K-12 school and library in the country to get connected to the Internet. But the average school today still has less connectivity than the average home, partly due to the high prices schools have been paying for their Internet connections. As technology and the marketplace have grown more complex, the FCC’s statutory mandate to ensure low connectivity prices for schools and libraries proved difficult to apply through traditional
regulatory means. As an alternative strategy, the Commission was able to bring attention to the high prices paid by schools by collecting data from schools on their connectivity costs, then making the data publicly available, which allowed others to analyze the data and make comparisons—an example of what Wilkins described as “massive transparency with open analytics.”

Another barrier to progress in using new technology to improve education is a lack of sophistication among buyers of educational technology, a problem epitomized by the firing of the superintendent of the Los Angeles Public School System over the botched rollout of educational tech (iPads) to students. One solution proposed by Harold Levy would be to form a consortium of large school districts to allow them to pool their knowledge and raise their level of sophistication in making tech-related decisions.

**The Power of Modularization**

Several people commented on the role of modularization in spurring innovation by giving individual participants in a larger production system the ability to improvise and experiment in order to improve their performance. A key to making this approach work is to create “process networks” that provide the freedom to improvise while ensuring that each component meets required specifications.

The way that movies get made in Hollywood provides an instructive example of the effectiveness of modularization. Each time a new movie goes into production, independent craftspeople from different guilds (e.g., set building, lighting, makeup, cinematography) are assembled and are expected to quickly begin working together. While each guild has its own practices, developed and honed over time, each also understands the practices of other guilds, which enables them to immediately begin working together efficiently.

An example of the power of modularization to spur innovation is provided by the evolution of motorcycle manufacturing in Chongqing, China as described in a 2014 report from the Deloitte Center for the Edge:

One of the largest [Chinese motorcycle] manufacturers, Dachangjiang, found itself short of high-quality local sup-
pliers. Rather than try to build a single, verticalized channel of suppliers, however, it broke its design into several modules and, for each, awarded two to three suppliers the responsibility for developing parts. The suppliers worked under common, tight timeframes, but were given great latitude to fashion the different modules, and assurance that Dachangjiang would support innovative designs with investments in the appropriate equipment and processes to build them. The suppliers responsible for each module found modes of collaboration that worked for them, and they varied; there were vertically integrated state-owned enterprises, traditional joint ventures, and more loosely coupled arrangements. The network proved capable of far more innovation than would have occurred had it been directed and controlled by a single entity.

Brown added that one reason this arrangement worked is that the suppliers were located in the same city, which enabled them to meet informally in tea houses in order to figure out how they could best work together.

Another notable example of the power of a loosely coupled process network is Li & Fung, the Hong Kong-based sourcing company that has created a dynamic ecosystem of more than 10,000 small manufacturers to supply apparel to major multinational clothing companies. The role of Li & Fung is to provide standardized interfaces for participants that clearly define what comes into each participant’s module and what the output of the module will be. While the members of this network are located all over world, Li & Fung provides a common platform that enables them to work together effectively and to learn from one another.

Moving toward the modular at Kaiser Permanente. Vivian Tan noted that Kaiser Permanente had been successful precisely because it operated as a single, integrated system that combined a health plan (insurance) with comprehensive healthcare services. But now, Kaiser is attempting to embrace a larger view of health that extends out into the community.

To illustrate the shift in focus, Tan cited the example of a hospital in an urban setting that finds itself coping with an increasing number
of patients coming into its emergency room with gunshot wounds. A conventional response would be to review the hospital’s procedures for dealing with trauma to see how they could be improved to provide better care to gunshot victims. But taking a broader view could entail considering the causes of gun violence in the community and exploring what might be done to reduce its prevalence. (Kaiser recently gave a grant to the police department in Vacaville, California, to enable it to establish a sub-station at a Kaiser health center there with the goal of not only improving security at the center but also improving police coverage of the surrounding neighborhoods.\textsuperscript{40})

This shift involves moving from seeing Kaiser as a separate, independent entity that is responsible for keeping people healthy or treating them when they are ill to seeing itself as part of a larger ecosystem that plays a big role in creating health or sickness. This new, wider perspective makes it necessary for Kaiser to begin seeing constituent components as modules in a larger system and seeing itself as one module in a larger entity of which it is a part. Tan described the challenge to the organization as “determining how each cog in the wheel works with other cogs.” She then presented four facets of the challenge in terms of “MINDing (Movement/Information/Norms/Design) the Gap between Modules”:

- Transforming an organization as large and complex as Kaiser Permanente involves creating a **MOVEMENT** that can help focus everyone on a larger common purpose. For example, in 2013, Kaiser launched a program called Thriving Schools, which promotes healthy eating, active living, school employee wellness and a positive school climate. In explaining the rationale for the program, Kaiser pointed out that “almost one in five Kaiser Permanente members spends the majority of their weekdays on a school campus,” and noted that “investing in school health is vital to improving the overall health of these members and their communities.”\textsuperscript{41}

- **INFORMATION** is a vital element in health care, and Kaiser has invested some $3 billion in creating a system-wide electronic health record (EMR). In order to maximize the value of information in EMRs, Kaiser is converting information such as EKG records from PDFs to a readable form. In addition to
enhancing usefulness of electronic records for its own staff, it has also worked to expand access of patients (and authorized members of their families) to their EMRs from mobile devices, and has enabled them to exchange emails with their doctors, schedule appointments, refill prescriptions and check lab results.

- Spreading an innovation throughout an organization requires establishing **NORMS** that make it easier for it to be adopted. For example, an effort to get staff to follow checklists that ensure that best practices are followed consistently has resulted in measurable increases in efficiency. Accordingly, adoption of a “preflight checklist” in Kaiser Permanente operating rooms resulted in improved nurse retention and a decrease in the number of operations that were canceled or delayed. Today, Kaiser also offers a variety of checklists for patients on topics ranging from “getting ready for surgery” and “turning 65” to “new baby” and “preventing falls at home.”

- Kaiser is using formal **DESIGN** processes to reinvent the ways in which health care is provided. A multi-year project called Re-imagining Ambulatory Healthcare Design (RAD) in Kaiser’s Southern California region is exploring new forms and formats for “the medical office of the future.” According to Kaiser, “The underlying premise for Project RAD’s vision is to shift the center of care from KP venues into member’s activities, relationships, and communities. Instead of asking the members to work around the way Kaiser Permanents system operate, strategies have been developed to bring healthcare to members.” For example, one of five new “service delivery platforms” completely eliminates the traditional waiting room where patients come for appointments. Instead, arriving patients are met by a nurse with a tablet who checks them in and sends them directly to their appointment with no waiting.

As an example of a success story, she cited the results of KP’s PHASE program which produced substantial, quantifiable improvements in the health of a large group of at-risk members (see “The Power of Data”).
The Power of Data: Preventing Heart Attacks and Stroke at Kaiser Permanente

In 2004, the Northern California region of KP initiated a program called PHASE—Prevent Heart Attacks and Strokes Everyday—to improve the health of patients at risk for cardiovascular disease by promoting the adoption of proven prevention therapies for controlling blood pressure, blood lipids and blood glucose. Interventions included prescribing four drugs—aspirin, lipid-lowering medications, ACE inhibitors and beta-blockers—whenever appropriate, and promoting four lifestyle changes: tobacco cessation, physical activity, healthy eating and weight management. As a result of the program:

- The rate of adult smoking declined from 12.2 percent to 9.2 percent of members from 2002 to 2005, more than twice the rate of decline for the California population as a whole over the same time period.
- Blood pressure control more than doubled.
- Blood glucose control among diabetic patients improved from 66 percent to 73 percent, while cholesterol control for all PHASE patients improved from 50 percent to 63 percent from 2005 to 2008.
- Hospitalization rates declined by 30 percent for coronary heart disease, by 56 percent for heart attacks, and by 20 percent for strokes from 1998 to 2007.44

A Day Made of Glass. Jeff Evenson, Senior Vice President and Chief Strategy Officer at Corning Inc., noted that at his company modules are thought of as something quite small: a specific behavior or task. They are, he said, small things that can make big things happen. For example, one module would be a mandate to “make transparent displays happen.” Another module that had a big impact was the creation of “A Day Made of Glass,” a video that presents Corning’s vision for the future of specialty glass and its impact on the world. One commentator described the vision presented in the video as “so breathtakingly stunning that it puts to shame the science fiction display technology from movies such as Minority Report.”45 Since it was posted on You Tube
in 2011, the video has been viewed more than 25 million times, and has led to the creation of several sequels.

**Module as fractal.** John Hagel suggested that the concept of a module is fractal—i.e., that it can operate on multiple levels. As an example, he described the strategy that was behind Portal Player, a fab-less semiconductor company founded in 1999. The company “modularized the design for a portable music player,” then built a network of experts around each module and put out challenges every six months for each module. The company’s role was to act as an “orchestrator” of the modules and managed the interfaces among them. The company’s biggest success was when Apple decided to use Portal Player’s reference platform as the basis for the software for its new iPod, which was released in 2001.

Laura Ipsen of Oracle described how she managed the task of building use cases to drive business outcomes for the company’s software across 20 different industries. She had to “bucketize” the work into more digestible, “bite-sized” pieces to accelerate specific use cases and drive x-industry adoption to achieve maximum impact and higher ROI. Tony Scott noted that the way architects approach a big new project is by “chunkifying it” into smaller pieces that can be worked on by different groups. But getting the boundaries of the pieces right is extremely important.

**The Power of Two Pizza Teams.** According to John Seely Brown, experience at Amazon.com (where he has served as a member of the board) has shown that the ultimate module is a team that engages ten to fifteen people in a community of practice to drive change. This is what Jeff Bezos has described as “two pizza teams.” (Bezos has declared that no team should be too big to have two pizzas provide dinner for everyone.) Amazon does not have a separate R&D group, but it has over 1,000 two pizza teams working on specific challenges or problems. Every team must write a press release describing what will happen if they are successful—the “so what” of their activity. Every team also must describe what they intend to accomplish over the next six months, and if they fail to deliver on that commitment, the team is terminated. But the team is asked, “What are we lacking in infrastructure that has prevented you from accomplishing your goal?” Teams are self-forming and are now responsible for nearly 1,000 new releases each day, making them a key to enabling Amazon to continue to grow exponentially.
Jason Crawford, a former Amazon employee (and now co-founder and CEO of his own start-up) has provided additional insight into how the combination of accountability and autonomy make two pizza teams (2PTs) effective:

The most important aspect of a 2PT isn’t its size but its fitness function. A fitness function is a single key business metric that the senior executive team agrees on with the team lead. It is the equivalent of the P&L for a division: a single metric to provide focus and accountability. In some cases, the fitness function is literally a P&L: for instance, when I was on the [Search Engine Marketing] team, we used the contribution profit from the sales driven through sponsored links, minus the cost of those clicks. In other cases, it is something more clever: e.g., teams that built fulfillment center software would have metrics related to the efficiency of picking, packing, and sorting. Once approved, the team is then free to execute relatively autonomously to maximize its fitness function—to pursue creative strategies and to set its own internal priorities.46

The limits of modularization. It is clear that modularization is a powerful means for accelerating innovation. But, as Casey Carl asked, how can the right balance be struck between modules and shared services? Target wants to have a single view of products and customers, which places a limit on the degree to which modules can be separate and independent. Without a single focus, how can one be sure that modules are properly aligned? Maryam Alavi concluded by noting that when we talk about modules, ecosystems and gaps, we are pushing the limits of organizational complexity. It is important to remember that there are humans in these systems. After all, hierarchies are just one way to deal with the challenges of complexity.

Leading the New Organization

All organizations need leaders. But what is required to lead an exponential organization?

Rather than providing a formula for a successful leader, Kelvin Westbrook offered a set of questions that a board should consider in choosing a new leader:
• What are the most important skills that a leader needs?
• Is the right choice of leader different than the safe choice?
• How capable is the organization of changing? Seventy percent of change efforts fail.
• Is the job of the leader to force change? What should a leader be doing to prepare for the days ahead?
• What will motivate change? Passion for disruption, fear of becoming obsolete?
• Where does one start?
• How do you manage through turbulence? Who is really comfortable in the kayak?
• Once we have the right leader, what can the board do to ensure he or she makes the right decisions?
• How do you instill ownership in change?
• What does success really look like for us? What do we look like today, and what do we want to look like tomorrow?

Peter Beck, Executive Chairman of The Beck Group, observed that too often boards make poor decisions in picking a new CEO, allowing themselves to be swayed by a candidate’s reputation or likeableness. An effective leader should be able to change, or at least adjust, an organization’s culture. But every leader does not need to be a change agent. A board needs to understand where their company is, and what type of leader it requires at that point.

Gary Shapiro, President and CEO of the Consumer Electronics Association, responded by proposing that what kind of leader is best is totally situational. But he added that every leader must set the moral tone for a company and reinforce its values and culture. And while it is important to make sure that new people who are hired are in-tune with an organization’s culture, it is a mistake for leaders to just hire people like themselves, but rather, good leaders hire those who complement their weaknesses. Everyone in an organization does not need to be a leader—and not everyone wants to be a leader—but it is a good idea to hire some risky candidates who have the potential for pushing an organization further. Still, organizations need people who run
operations. Challenging them to “think outside the box” is usually not a good idea. Although growth is important, flexibility to respond to changing circumstances is more important, even if the organization is not “exponential.” Finally, almost every successful company focuses on its customers, and many good CEOs spend time on this. But it is also important for them to spend time thinking about the future.

According to Andy Billings of Electronic Arts, 70 percent of the capabilities of an effective leader are “classic skills,” while the other 30 percent are “situational.” Among the fundamental skills every leader needs are:

1. Awareness of self and others
2. Candor
3. Balancing strategic with operational considerations
4. Ability to have collaborative conversations
5. Being a good presenter
6. Ability to form effective teams.

Successful leaders also need business acumen and customer awareness and a passion for quality and innovation. Finally, they must know a company’s industry and its business “stone cold.”

John Pittenger agreed that having a good set of values is the first requirement for a leader. The worst leader is someone who is highly talented but has bad values. And a leader cannot think of or treat individuals as commodities.

In a time of constant change, leadership must be widely distributed.

New leaders for new times. Returning to a theme from earlier Roundtables, Maryam Alavi asserted that the definition of a leader should not be confined to the one person at the top of an organization. In a time of constant change, leadership must be widely distributed. The best definition of a leader is anyone who can bring about positive change within a social system (including companies large and small).
The requirements for a successful leader in the 21st century are different than in the past. In the old model, leaders needed to be good at creating valuable content and creating an inspirational vision for the future. Today, leaders need to be good at reading contexts and managing them proactively. This requires emotional intelligence, as well as self-awareness, clear values, resilience, the ability to read and relate well to others, and to deal with ambiguity. In developing new leaders (which she does at the business school at Georgia Tech), Alavi is most concerned with making sure they develop strong life skills rather than imparting content. This kind of education does not happen in classrooms or through lectures, but rather by providing students with “learning experiences” that enable them to learn about managing themselves, a process that involves a lot of coaching and feedback.

Conclusion

Change is hard, and changing from well-established ways of operating to new ways that are unfamiliar and untested is particularly hard. But few if any enterprises are immune from the challenges of digital disruption which threaten to make the old ways of operating untenable. And the existence of a growing number of organizations—not only start-ups but large established enterprises—that are operating exponentially provides evidence of the value of the new paradigm that seeks to accelerate the process of innovation by scaling continuous learning rather than seeking stability by achieving economies of scale.

Shifting from the old to the new model does entail big changes that include how an organization is structured, how it is led, and what is expected of its workers. These changes are so far-reaching that it is almost impossible to introduce them within the core of an organization. But it is possible to experiment with new ways of doing things at the edge of an organization, and then build on what works. Any enterprise that wishes to ensure its survival would do well to find and cultivate its own edges.
Endnotes


7. Verne Kopytoff, Apple: the first $700 billion company, Fortune, February 20, 2015, http://fortune.com/2015/02/10/apple-the-first-700-billion-company. In February 2016, Alphabet (the parent of Google) surpassed Apple as the company with the largest overall market cap globally. After reports emerged that Apple’s growth might be slowing, some analysts began to refer to the “FANG” companies (Facebook/Amazon/Netflix/Google) as market leaders instead of the “GAFA” companies.


16. The final chapter in Markoff’s book tells the story of the talented team that developed the technology that led to Siri, a process that took several decades.


Characteristics of an Exponential Organization (ExO)

According to Salim Ismail*, Exponential Organizations (ExOs) share a number of distinctive characteristics that enable them to grow at a rate and generate returns that are at least an order of magnitude greater than traditional “linear firms.” In addition to having an explicitly stated “Massively Transformative Purpose,” ExOs are powered by five external characteristics (which form the acronym “SCALE”) and five internal characteristics (“IDEAS”).

A Massively Transformative Purpose: An MTP is not a mission statement but rather an aspirational statement of what an organization hopes to accomplish. An effective MTP can attract customers and employees and help create a community around a company. It can also shift the focus of teams from a company’s internal politics to its external impact.

Five External Characteristics (SCALE):

1. **Staff on Demand:** A large workforce can reduce maneuverability and slow a company down. Thanks to Internet-based services, all levels of work, including highly skilled labor, can now be outsourced. Platforms like Kaggle or InnoCentive can generate better solutions to problems than a company’s own staff.

2. **Community & Crowd:** An organization’s core community is made up of internal staff, partners, vendors, customers, users and fans. The crowd is everyone outside these core layers. They can all be tapped to form a community that can be tapped to provide creativity, innovation, validation, even funding.

3. **Algorithms:** Algorithms allow companies to process and make sense out of vast amounts of data. The impending explosion of data from

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* Salim Ismail, *Exponential Organizations: Why new organizations are ten times better, faster, and cheaper than yours (and what to do about it)*, Diversion Publishing, 2014.
billions of sensors that will soon be deployed makes algorithms a critical future component of every business.

4. **Leveraged Assets:** Just as avoiding hiring a large permanent staff contributes to agility, so does not owning assets, even in strategic areas. The rise of the cloud is the most visible manifestation of the diminished need to own assets, which optimizes flexibility and allows enterprises to scale quickly.

5. **Engagement:** Comprised of digital reputation systems, games and incentive prizes, engagement provides virtuous, positive feedback loops, which allow for faster growth.

**Five Internal Characteristics (IDEAS)**

1. **Interfaces:** Interfaces are filtering and matching processes that enable ExOs to bridge from SCALE externalities to IDEAS control frameworks. They may begin as manual processes by eventually become self-provisioning platforms that enable ExOs to scale.

2. **Dashboards:** A real-time adaptable dashboard that displays essential employee and corporate metrics enables firms to deal with the huge amounts of internal and external information now available. They provide an effective means for tracking Objectives and Key Results (OKRs) by showing results on an ongoing basis in relation to individual, team and company goals.

3. **Experimentation:** Constant experimentation and process iteration reduce an organization’s risk. A prerequisite for experimentation is a willingness to fail: a key principle of Lean Startups is to “fail fast and fail often while eliminating waste.”

4. **Autonomy:** Self-organizing, multi-disciplinary teams operating with decentralized authority provides the basis for “permissionless innovation” to support exponential growth. Autonomy also increases agility, efficiency, transparency and accountability within an organization.

5. **Social Technologies:** These technologies foster horizontal interactions even in vertically organized companies. Most importantly, they reduce information latency—shortening the time from idea to
acceptance and implementation. Examples of social technologies include file sharing, telepresence, virtual worlds and emotional sensing tools.

Not every Exponential Organization has all of these characteristics, but almost all have many of them. A chart in the book identifies which of these characteristics are found in ten different ExOs that include Airbnb, Uber, Quirky, GitHub, Valve and Waze. All of the organizations have an MTP, and on average have adopted four out of the ten internal and external techniques. A quiz included in the book allows organizations to determine their “exponential quotient” in relation to their adoption of these techniques.
Aspen Institute Roundtable on Institutional Innovation

Making the Invisible Visible: 
Redesigning Business Processes for Exponential Organizations

Aspen, Colorado · July 20-22, 2015

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The Communications and Society Program is an active venue for framing policies and developing recommendations in the information and communications fields. We provide a multi-disciplinary space where veteran and emerging decision-makers can develop new approaches and suggestions for communications policy. The Program enables global leaders and experts to explore new concepts, exchange insights, develop meaningful networks, and find personal growth, all for the betterment of society.

The Program’s projects range across many areas of information, communications and media policy. Our activities focus on issues of open and innovative governance, public diplomacy, institutional innovation, broadband and spectrum management, as well as the future of content, issues of race and diversity, and the free flow of digital goods, services and ideas across borders.

Most conferences employ the signature Aspen Institute seminar format: approximately 25 leaders from diverse disciplines and perspectives engaged in roundtable dialogue, moderated with the goal of driving the agenda to specific conclusions and recommendations. The program distributes our conference reports and other materials to key policymakers, opinion leaders and the public in the United States and around the world. We also use the internet and social media to inform and ignite broader conversations that foster greater participation in the democratic process.

The Program’s Executive Director is Charles M. Firestone. He has served in this capacity since 1989 and is also a Vice President of the Aspen Institute. Prior to joining the Aspen Institute, Mr. Firestone was a communications attorney and law professor who has argued cases before the United States Supreme Court. He is a former director of the UCLA Communications Law Program, first president of the Los Angeles Board of Telecommunications Commissioners, and an appellate attorney for the U.S. Federal Communications Commission.
Previous Publications
from the Aspen Institute Roundtable
on Institutional Innovation

(formerly the Aspen Institute Roundtable on Talent Development)

Navigating Continual Disruption (2015)

*Navigating Continual Disruption*, the report from the 2014 Roundtable on Institutional Innovation, explores ways to manage organizations in the face of continual disruption—the constant onslaught of new offerings or business models that can challenge the dominance of core businesses. The report is written by Richard Adler. 66 pages, ISBN Paper: 0-89843-617-6, $12.00 per copy.

Fragmentation and Concentration in the New Digital Environment (2014)

*Fragmentation and Concentration in the New Digital Environment* explores the impact of digital technology infrastructures on the fragmentation and concentration of economic activity. This report, written by Richard Adler, maps the effects of the digital revolution on the business environment, the nature of work and the role of leadership in navigating the organization through the constantly changing landscape. 54 pages, ISBN Paper: 0-89843-606-0, $12.00 per copy.

Connecting the Edges (2013)

*Connecting the Edges* is the report from the 2012 Roundtable on Institutional Innovation. In the current economic environment, growth and underemployment are two outstanding national, indeed international, problems. While technological advances and globalization are often cited as instigators of the current plight, they are also beacons of hope for the future. The report concludes that by integrating the core of an organization with the edge, where innovation is more likely to happen, we can create dynamic, learning networks. 46 pages, ISBN Paper: 0-89843-589-7, $12.00 per copy.
Institutional Innovation: Oxymoron or Imperative? (2012)

Institutional Innovation: Oxymoron or Imperative is the report of the 2011 Roundtable on Institutional Innovation. It explores the consequences of the growing disconnect between the fundamental design of most firms and the capabilities of the business infrastructure in which they operate. The report, written by Richard Adler, captures the insights of the participants with a focus on identifying conditions that are favorable to institutional innovation and maximizing the effectiveness of institutional leadership. 63 pages, ISBN Paper: 0-89843-572-2, $12.00 per copy

Solving the Dilbert Paradox (2011)

Solving the Dilbert Paradox is the volume resulting from the 2010 Aspen Institute Roundtable on Talent Development. This “Dilbert Paradox” finds expression in wasted opportunities for organizational learning, collaboration, and access to knowledge and ideas outside the corporate hierarchy. The report, written by Richard Adler, captures the insights of the participants during the conference and details how some large organizations, as well as start-ups and small companies, are experimenting by giving employees new opportunities to maximize innovation. 48 pages, ISBN Paper: 0-89843-545-5, $12.00 per copy

Leveraging the Talent-Driven Organization (2010)

Leveraging the Talent-Driven Organization details how a number of firms are using social networking tools to open up communication, collaboration and learning across boundaries, and leveraging these tools to develop new products and real-time solutions for customers. The report, written by Richard Adler, is the result of the Inaugural Roundtable on Talent Development. 48 pages, ISBN Paper: 0-89843-519-6, $12.00 per copy

Talent Reframed: Moving to the Talent-Driven Firm (2009)

Talent Reframed: Moving to the Talent-Driven Firm offers new rules for organizations seeking to attain and develop a talented workforce amid a rapidly changing and increasingly globalized business environment. The report, which sets the premise for a new series of Aspen Institute Roundtables on the Talent-Driven Firm, explores how
organizations can build talent by relying less on traditional command-and-control structure and more on horizontal collaboration and shared learning. The report, written by Richard Adler, also features a white paper by John Hagel and John Seely Brown. 46 pages, ISBN Paper: 0-89843-498-X, $12.00 per copy.