

Navigating Continual Disruption

*A Report of the 2014 Aspen Institute
Roundtable on Institutional Innovation*

By Richard Adler



THE ASPEN INSTITUTE

Communications and Society Program

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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 Aspen Institute Roundtable on Institutional Innovation is a series of annual roundtables that address how organizations can strategize for success in the constantly changing digital environment. Each year, 20 to 25 diverse business and academic leaders bring their vast knowledge and experience to arrive at new insights on the particular focus of that year's session.

For the 2014 Roundtable, the group sought to assess ways to manage organizations in the face of continual disruption—the almost constant onslaught of new offerings or business models that can challenge the dominance of core businesses. No industry seems immune and it applies as well to nonprofits and governments.

With the group's focus on information and communications technologies, the disruptions they saw most are those that create new types of networks, new pricing models or new relationships between producers and consumers. Furthermore, as the author observes, the acceleration of the rate of learning required to remain viable in a market is also a source of disruption. The most successful firms—and leaders—figure out how to enable its workers to get better faster.

Often, the following report details, this comes through new platforms that create new ecosystems which challenge the older order of things. They can also create novel forms of collaboration between large firms that provide scale and resources, and small entities that provide individualized customization and local expertise. The most successful businesses in the future will understand how to shape these platforms and ecosystems to their advantage.

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March 2015

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Richard Adler

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By Richard Adler

“It’s the best possible time of being alive,
when almost everything you thought you
knew is wrong.”

– Tom Stoppard, *Arcadia*

Digital currencies. The cloud. 3D printing. Wearables. MOOCs. E-books. E-commerce. E-health. Wireless broadband. Social networks. Immersive media. Augmented reality. Big data analytics. Natural language processing. Cognitive computing. Quantum computing. Drones. Robots. Self-driving cars. Crowdsourcing. Smart phones. Smart cities. Enchanted objects. The Internet of Everything.

The list of potentially disruptive technologies keeps getting longer. Each one, by itself, is likely to have a substantial impact on many different aspects of society. Taken together, they are creating an environment that is dramatically different and far more volatile than the world that came before—an environment filled with novel challenges and opportunities.

A notable characteristic of this period is the accelerating rate at which novel technologies keep appearing and evolving. We are witnessing the results of what Google Chief Economist Hal Varian has called “combinatorial innovation,”¹ the ready availability of component parts (each of which is evolving) that can be assembled in different ways to create new products and services. Virtually all of these technologies are digitally-based: they exist either as software or as combinations of hardware and software that take advantage of powerful, widely available, low-cost resources like the cloud and open source development

tools. They leverage the power of digital computing and the global reach of the Internet to accelerate their development and speed their adoption.

In addition, the traditional development cycle has been compressed through a process of “lightweight innovation.” Instead of spending long periods of time to create, test and refine a product, the new approach involves fast prototyping, quick release, then a continuous iterative process of product improvement based on user feedback that leads to scale and builds reliability. The first version of Gmail was written in one day, and the prototype of Twitter was developed in two weeks. (The first commercial version of Twitter was launched in 2006; a year later, it was generating 4 million tweets per day; by 2013, more than 200 million users were sending over 400 million tweets daily.)

...the gating factor on progress is no longer the technology but rather our imagination....

These new products and services—even entirely new categories of products and services—are coming from a wide range of sources: academic research groups, small start-ups, even individual entrepreneurs. Barriers to entry keep falling. As documented in last year’s Roundtable report, even as the new digital environment is seeing greater concentration in providers of infrastructure (e.g., cloud computing, Internet access and transport), it is witnessing ongoing fragmentation in many other aspects of business.² Innovation, which has historically been seen as the domain of large corporate and academic R&D labs, is now coming from much smaller entities. In fact, the gating factor on progress is no longer the technology but rather our imagination in figuring out how to make use of it.

From Innovation to Disruption: The Big Shift Revisited

In light of all these developments, it is not surprising that the notion of disruption is “in the air.” In fact, the idea that we are living in an age of disruption has become almost a cliché. But what, exactly, do

we mean by “disruption?” According to the dictionary, it is an event, often unexpected, that interrupts the normal, course of events or challenges the unity of something. In the context of business, the term has come to refer to a new offering, a new business model or a new value proposition that challenges the dominance of an incumbent leader in a particular arena and has the potential to lead to its demise.

What makes disruptions so disruptive is that they “turn the assets of incumbents into potentially life-threatening liabilities.” – John Hagel

According to John Hagel, the co-chair of the Deloitte Center for the Edge, we have entered an age of continual disruption, which can be manifested in any of three different ways by which a new business approach can disrupt an incumbent leader: first, by rendering obsolete a significant part of an incumbent’s existing assets or installed resource base; second, by requiring an incumbent to significantly cannibalize its existing revenue or profit stream to respond to the new approach; or, third, by offering a new set of assumptions regarding the drivers of value creation and capture relative to the assumptions that have been the basis for the success of current incumbents. What makes disruptions so disruptive is that they “turn the assets of incumbents into potentially life-threatening liabilities.”

In all three instances, reacting effectively to a disruption can be challenging because it “requires incumbents to radically change their view of the world and embark on a very painful transition that will significantly erode performance in the short-term”³—a prospect that can be particularly problematic for publicly traded companies that feel compelled to keep investors happy on a quarter-to-quarter basis. In fact, Hagel noted, incumbents have an “almost infinite” capacity to rationalize why responding to disruptive challenges is not necessary. This makes it more likely that devising and implementing an effective response will be put off, sometimes until it is too late. New York University’s Clay Shirky summarized this process of rationalization as follows:

First, the people running the old system don't notice the change. When they do, they assume it's minor. Then that it's a niche. Then a fad. And by the time they understand that their world has actually changed, they've squandered most of the time they had to adapt.⁴

John Hagel noted that a new or dramatically improved technology alone cannot disrupt an existing business. Disruption occurs when someone uses the technology to develop a fundamentally different approach to the market: digital currencies are creating opportunities for payment mechanisms and funds transfers that completely bypass banks and other traditional financial services institutions. 3D printing seems poised to stimulate the growth of entirely new production and distribution channels in which the manufacture of goods takes place much closer to the end user and the time of use. Telemedicine applications are challenging traditional assumptions about how health care is delivered. Self-driving cars and pilotless aircraft (drones) have the potential to reshape entire sectors of the transportation industry.

How disruption plays out will vary from sector to sector—much of the 2014 Roundtable was devoted to exploring likely scenarios for several of these sectors. But all of these specific disruptions are being amplified and accelerated by a set of “foundational disruptions” that John Hagel and his colleague John Seely Brown have characterized as “the Big Shift” that is playing out over multiple markets and social arenas.

Four key dimensions of this shift, which have been explored in previous reports in this series, include:

- ***Stocks to flows.*** In the past, the source of value creation for business involved development of proprietary knowledge stocks, which businesses were able to exploit over time. In a world that is constantly changing, knowledge stocks depreciate at an accelerating rate. The result is that the winners in the future will be those who find ways to more effectively participate in a broad range of diverse knowledge flows that refresh their knowledge stocks faster than they are depleted.
- ***Push to pull.*** In the past, the most efficient way to deliver value to the market was based on making accurate forecasts of

demand and then ensuring that the right people and resources are pushed to the right place at the right time to meet that demand. In a world of increasing uncertainty, making reliable forecasts becomes more challenging. If the forecasts are inaccurate, push approaches become hugely inefficient. The alternative is to adopt a more agile approach based on scalable pull platforms where people and resources can be mobilized where needed and as needed.

- **Consumption to creation.** Individual status and identity used to be determined by the size of one's house, the model of one's car and the clothes one wore. The Big Shift is altering the source of status and identity from consumption to creation. Meaning will come from what one has created and how others have adopted and built upon it, not by what one's possessions.
- **Financial capital to social capital.** In the past, the primary source of wealth was financial capital—either having money or having access to money. In the Big Shift, financial capital recedes in significance while social capital becomes more important. Wealth and well-being will increasingly be a function of the breadth and diversity of the social ties and the reputation accumulated from collaborating with others.

Taken together, these foundational shifts define a fundamentally new and different environment in which businesses must operate—an era of continual change and disruption. The purpose of this report is to identify the challenges and the opportunities presented by this new environment.

The Taxonomy of Disruption

Disruption typically involves a challenge to the seemingly entrenched success of an incumbent. But what form do these disruptions take? According to Hagel and Brown, they can play out along two different dimensions—the scale of operations or ways of connecting with others.

To provide a framework for considering how disruption is taking place in specific sectors, Hagel and Brown proposed the following taxonomy.

I. Disrupting the scale of operations

Two diametrically opposed forms of disruption are playing out along this dimension, one that is driving toward greater fragmentation of operations and a second that supports increased concentration.

A. Increasing fragmentation

In significant parts of the economy, smaller economic entities are becoming more viable and are taking increasing share of markets from large, established firms. Empowered by the erosion of the scale economics that have protected incumbents, start-ups and small entrants will increasingly disrupt the leadership positions of large firms.

One factor driving fragmentation is the increasing ability of smaller players to aggregate and deliver their offerings through online platforms. For example, one of the most potent forces that has contributed to the decline of the once mighty newspaper industry has not been the rise of another mass medium but the emergence of thousands of independent “citizen journalists” and quasi-journalists (bloggers, tweeters, etc.) who are able to use the Internet at little or no cost to provide faster, more immediate coverage of events than traditional publications. Hotel chains that have dominated the travel industry through their ability to offer access to accommodations globally are being challenged by millions of individual householders who are able to aggregate their offerings through online reservation services.

In addition, the means of product design and development are becoming increasingly affordable by smaller entities. This initially played out in the digital arena but there is now increasing potential for this to expand into physical product categories as well. Activities that still require scale—for example, manufacturing, logistics and call center operations—will increasingly be available on a “rental” basis to even the smallest players.

B. Increasing concentration

At the same time that increasing fragmentation is playing out in certain parts of the economy, increasing concentration is playing out in other parts. In many cases, concentration is not being driven by incumbent leaders but by “edge” participants who understand where and how scale economics are evolving to enable greater value creation.

These disruptive approaches are being driven by two supporting trends that are the “flip side” of the previous trend:

- ***The availability of shared utilities.*** A growing number of companies are beginning to realize they can drive significant scale by providing outsourced services to third parties—whether it is in the form of massive data center operations, manufacturing facilities, logistics networks or customer call center facilities. The emergence of cloud-based services is perhaps the most dramatic example of how vital business assets can be provided on an as-needed basis rather than owned, giving smaller players access to large-scale resources without requiring large-scale capital investments.
- ***The growth of aggregation platforms.*** We all benefit by having access to platforms that enhance our ability to find and connect with relevant resources and people. Whether it is content platforms like YouTube, product marketplace platforms like eBay or Etsy, data platforms like Axcion, trading platforms like electronic stock exchanges, labor platforms like oDesk or Elance, funding platforms like Kickstarter, or even idea platforms like InnoCentive and Kaggle, a growing array of platforms are leveraging network effects to provide value to participants.

One particularly interesting form of targeted disruption in this category is the opportunity for product-based companies to shift their focus from product to platform. An early example of this was Apple’s move to redefine the smart phone from a stand-alone product with applications supplied by the device vendor to a platform that invited third parties to develop a growing array of applications. (While Apple still makes most of its money from the sale of hardware, the existence of a vigorous ecosystem of applications and content add considerable value to its products.) Google’s initiative with Android took this shift one step further by creating a two-sided platform that invites both application developers and device manufacturers to create a growing array of products and connect with each other using its operating system as a platform.

It is worth noting that these two trends are simultaneously promoting both concentration and fragmentation: at the same time that the creators/operators of shared utilities and aggregation platforms are effectively moving toward concentration through their ability to dominate a particular market space, they also encourage fragmentation by empowering the growth of smaller participants. In fact, these ostensibly opposing trends are mutually reinforcing!

II. Disrupting ways of connecting with others

Here again, two primary forms of targeted disruptions focus on re-conceiving ways people and institutions connect with each other—first, by redefining relationships to tap into existing resources more effectively, and second, by accelerating learning to enable participants to realize more of their potential.

A. Redefining relationships

Disruption can happen not just by aggregating resources. It can also be based mobilizing and coordinating resources, including human resources, in new ways that increase value for all participants. This is a direct reversal of the trend over the past several decades by which large, established companies intentionally reduced the number of relationships they maintained with suppliers and distribution channels in order to improve their efficiency. We are now seeing innovative approaches that help participants dramatically expand the scope and substance of their relationships with others, opening up new forms of collaboration and putting those who continue to adhere to the narrower practices of the past at an increasing disadvantage.

Approaches to redefining relationships can take several different forms:

- ***Moving from hierarchical to peer-to-peer networks.*** One approach involves moving from relationships based on hub and spoke networks that are ultimately controlled by the network operator to mesh networks that enable participants build relationships directly with each other. Another approach involves the development of peer-to-peer transparent ledgers where decentralized interactions among participants can be reliably recorded and tracked in ways that build trust and elim-

inate the need for a central “authority.” The blockchain shared transaction database pioneered by Bitcoin is an example of this approach. (A sidebar on the significance of digital currencies appears later in this report.) Both of these approaches suggest the potential contribution that a radical decentralization of relationships can make to increasing returns from rapidly scaling networks.

- ***Developing modular, loosely coupled networks.*** In some networks, it is necessary to have an orchestrator who can organize multiple stages of activity across participants. Modular, loosely coupled networks substantially reduce the complexity overhead of mobilizing and coordinating the activities of a growing number of participants by limiting the role of a central orchestrator. This in turn enables organizers to more effectively tap into the increasing returns that come with network effects as more and more participants join. The Internet itself is a dramatic example of the power of a simple set of operational rules developed and adhered to entirely through voluntary participation to create a robust and highly scalable global network. In fact, it is the demonstrable success of this loosely coupled model that is inspiring emulation in other areas.
- ***Moving from transaction to relationship through new pricing models*** where participants can access resources more flexibly through a rental or usage-based model or where the price is determined by outcome. A transaction mindset (buy low, sell high, move on to the next transaction opportunity) has been fostered by the prevailing purchase pricing model where the participant must pay up front. By contrast, these more flexible models encourage development of a relationship mindset. They also tend to significantly increase the utilization of products that are underused or that stand idle for long periods of time under a conventional purchasing model. (For example, compare use patterns of shared car services like Zipcar to existing auto rental agencies, or consider the more intensive use of private vehicles made possible by ride sharing services like Lyft and Uber.)

- ***Shifting from reactive product/service vendor to trusted advisor*** through greater awareness of context. The ability to develop a much deeper awareness of context of individuals through technology like mobile phones, wearables and sensors makes it possible for network organizers to add value by becoming trusted advisors, making participants aware of resources that they had not even thought to seek out. A trusted advisor proactively makes recommendations rather than simply waiting for a participant to request something. Today, there is an opportunity to move the trusted advisor relationship model from the niche of the very affluent, who are able and willing to pay for expert advice or personalized concierge services, to a mass market offering. A current example of this trend is the re-conception of Foursquare from a simple “check in” app to a recommendation service keyed to users’ locations or activities.⁵

B. Accelerating learning

In a world characterized by a more rapid rate of disruption, institutions that have built their success on scalable efficiency are increasingly vulnerable to a new set of players who develop the institutional architectures and practices that enable them to learn faster at scale. These approaches stand in contrast to the ones discussed in the previous section: rather than focusing on building relationships in order to make better use of existing resources, these practices focus on building relationships that will help all participants to get better faster by working together. They unleash a second level of increasing returns—rather than just growing value with the number of participants, these approaches amplify value by enabling all participants to rapidly increase the value that they can provide through acquiring (or generating) new knowledge or learning new skills. This form of targeted disruption can play out at two levels:

- ***The Institution.*** By systematically applying user-centered design thinking to the day-to-day work environment, institutions can tap into significant potential for more rapid learning and performance improvement. As competitive intensity increases and change and uncertainty accelerate, institutions that embrace this approach could disrupt the established positions of incumbents

that are still wedded to the scalable efficiency model of the past. This requires taking a holistic view of the work environment—physical layout, virtual platforms and tools, and management systems—and pursuing more rapid learning and performance improvement as the primary design goal.⁶

This approach goes well beyond traditional corporate training programs to deeply embed learning opportunities in the fabric of daily work. For example, jobs can be redesigned so that any project, role or initiative that an employee or a team takes on can offer a meaningful opportunity for learning. To achieve scale, these initiatives need to integrate participants who are not employees of the company—e.g., suppliers, distributors, customers and domain experts—who could help accelerate learning and performance improvement for everyone.

By systematically applying user-centered design thinking to the day-to-day work environment, institutions can tap into significant potential for more rapid learning and performance improvement.

- ***The Ecosystem.*** Beyond the level of individual institutions, we are beginning to see the emergence of mobilizers who explicitly take on the task of focusing large numbers of independent participants on ambitious performance outcomes. In doing so, the mobilizers are creating governance structures and processes to enhance the coordination of these participants and evolving environments that can help all participants to learn faster by working together. The open source software community is a classic example of a decentralized but robust mechanism (including making the source code for every open source program freely available) that enables collaboration and shared learning among programmers who use these non-proprietary

programs. An example of this approach in the corporate world is provided by Li & Fung, the Hong Kong-based company that orchestrates a global network of thousands of small independent apparel manufacturers through an incentive and support system that encourages them to keep improving their performance.⁷

While these two types of disruption—targeted to the scale of operation and to ways of connecting with others—are distinctly different, they do not necessarily occur in isolation, and may be woven together in ways that substantially intensify their impact. In the rest of this report, we explore how these approaches are being manifested in different domains, ranging from lodging and transportation to healthcare and education.

Living in a time of disruption is always challenging and is destined to produce casualties. Experience shows that new ventures and “edge” initiatives that are free of burdensome legacies of the past are most often the main beneficiaries of—and perpetrators of—the disruptive forces that overthrow old models and replace them with newer models that leverage new opportunities. It is undoubtedly more difficult for large, well-established institutions to react quickly to changing circumstances and transform themselves—essentially becoming their own disruptors. But it does happen and there is no reason why larger organizations cannot thrive in the era of the big shift. In fact, there are opportunities emerging for new kinds of collaborations between large and small entities to create offerings that blend the distinctive strengths of each in new ways.

Patterns of Disruption

The concept of disruption is hardly new, but the idea of continual disruption is relatively new. The role of technological innovation in driving disruption has been studied for some time. At the 2014 Roundtable, John Hagel noted that he is a “big fan” of the work of Carlota Perez, the Venezuelan-born scholar and consultant who developed the theory of techno-economic paradigm shifts. In fact, the report from the first Aspen Institute Roundtable on Institutional Innovation, published in 2009,⁸ cited Perez’s theory that economic progress has been based on a series of periodic technological breakthroughs that have extended human capabilities and brought about fundamental

changes in the way that work is done. But according to Perez, just five major paradigm shifts have occurred over a period of 200 years since the Industrial Revolution (1771-1971). The gating factor in determining the duration of these waves is the time required for society to understand and assimilate the true power of each type of innovation, a process which necessitates the “collapse” of the prevailing paradigm—which, historically, has involved a major economic crash—in order to clear the way for the shift to a new paradigm and full deployment of the new technology.⁹

**Figure 1. Technological Revolutions and Financial Capital:
The Dynamics of Bubbles and Golden Ages**

INSTALLATION	COLLAPSE & READJUSTMENT	DEPLOYMENT
INDUSTRIAL REVOLUTION 1771	CANAL PANIC 1797 (BRITAIN)	<ul style="list-style-type: none"> • Diffusion of manufacturing with water power • Full network of waterways (canals, rivers, oceans) • Development of public companies
STEAM & RAILWAYS 1829	RAILWAY PANIC 1847 (BRITAIN)	<ul style="list-style-type: none"> • Economies of scale • Joint stock companies • Repeal of tariff laws/free trade
STEEL, ELECTRICITY & HEAVY ENGINEERING 1875	GLOBAL COLLAPSES OF THE 1890'S (ARGENTINA, AUSTRALIA, US)	<ul style="list-style-type: none"> • Transcontinental rail, steamships, and telegraph • Gold standard, global finance
AUTOMOBILES, OIL & MASS PRODUCTION 1908	GREAT CRASH OF 1929 (U.S.)	<ul style="list-style-type: none"> • Interstate/international highways and airways • Welfare state, Bretton Woods, IMF, World Bank
INFORMATION & COMMUNICATIONS 1971	NASDAQ CRASH 2000 & GLOBAL COLLAPSES (ASIA, ARGENTINA, U.S.)	<ul style="list-style-type: none"> • Global digital communications network • Institutional framework, facilitating globalization

Source: Carlota Perez, www.bedfordfunding.com/focus/trends.html

Today, more than 40 years since the last big technology-driven innovation, society would seem to be poised at the brink of a sixth grand “wave” of disruption. Or has it entered a Post-Perezian world of continual innovation and continual disruption? Are the processes of innovation-driven concentration and fragmentation now permanent parts of the economic landscape across a wide range of industries? Do virtually all enterprises, no matter how well established they may seem, need to worry about the possibility that the markets they dominate may be disrupted?

Harshul Sanghi, Silicon Valley Managing Partner at Amex Ventures, agreed that even though we have moved from a world in which big shifts were followed by periods of stabilization to a time of essentially continuous disruption, it is likely we will still see big shifts followed by some sort of relative equilibrium. But the timing of these developments is difficult to predict and the periods of stability do seem to be getting progressively shorter. The biggest disruptive force in recent times has been the emergence of the Internet, which has served as a platform for the development and the dissemination of all sorts of innovations.

Disruption may be becoming more pervasive, but is it necessarily a good thing? In general, innovations succeed because they provide new, more efficient ways of operating (e.g., the replacement of water power with electrical power in the textile industry and other manufacturing sectors or the introduction of standardized containers for shipping) or offer new types of products with new benefits that attract customers (the automobile a century ago or the personal computer a few decades ago). But there are almost always losers as well as winners when these transitions occur.

Patterns of Disruption—Industry Examples

Power industry. Sonny Garg, Chief Information and Innovation Officer at Exelon Corporation, noted that many industries start out as fragmented, but move toward concentration over time driven by the desire to achieve efficiencies of scale. An example of this pattern is the electrical industry, which he described as a “great success story,” based on a high level of concentration in power generation that has provided safe, reliable, affordable power to everyone. Today, new decentralized sources of power have become available which could fragment the industry. But the consequences of this disruption could be greater inequity: solar and other forms of clean, renewable power for the rich, while the existing power grid becomes the equivalent of an urban public school system used mainly by the poor or the disadvantaged. The most important factors here are not technological, but human issues of equity and fairness.

Media industry. Some business sectors seem less vulnerable to disruption. Jonathan Taplin, Professor at the Annenberg School for Communications and Journalism at USC, observed that there has never been a time when scale has been more critical among media companies. It has become virtually impossible for anyone to compete effectively against Google, Amazon, Facebook or Apple, all of which have created platforms that seem to be immune to disruption: innovators either get acquired or dragged into the ecosystems that these companies have created. Content companies are also able to maintain their dominant position because their businesses are “hit driven:” 80 percent of all music downloads are for just one percent of songs, and six million out of eight million available music titles have been downloaded four times or less. There are some three million songs on Spotify that *no one* has listened to. In short, the long tail—at least in the music industry—doesn’t really exist.

The prevailing pattern in media has been greater not less concentration. A quarter century ago, many thought that cable companies were doomed, another likely victim to the rise of the Internet and alternative channels for distributing programming. Yet today, cable companies are still powerful, having become the dominant provider of broadband Internet access as well as traditional television programming. Similarly, the telcos that seemed fated to become irrelevant as their legacy copper-based landline business faded away have reinvented themselves as the dominant providers of wireless service for both voice and data.

But even the media industry is not exempt from disruption. Maker Studios was founded in 2009 to create digital entertainment content aimed primarily at Millennials. Making use of the YouTube platform (now owned by Google), the company has attracted millions of viewers and billions of views for videos like Epic Rap Battles of History, a series of short, somewhat silly “confrontations” usually between an historical figure and a contemporary celebrity who take turns belittling their opponent. By 2012, Maker had become the most popular inde-

pendent channel on YouTube, and in 2014, Disney announced that it was acquiring the company for \$500 million, a move that Zipcar founder Robin Chase described as Disney “hedging its bets” in new media.

If Maker Studios represents the disruptive potential of a non-traditional player, an even wilder wild card is Twitch. Launched in 2011, Twitch is a platform that lets viewers watch others playing videogames, either live or on demand. Terry Young, Founder and CEO of sparks & honey, described the service as the “marriage of Skype, Twitter and Xbox.” As of early 2014, Twitch was attracting over 40 million viewers per month and had become the fourth largest source of peak Internet traffic in the United States.¹⁰

Yet, because the content of Twitch is so unlike more familiar media programming, it has been virtually unknown to non-digital natives. Young recounted meeting with a group of senior communications industry executives who admitted that they had never heard of Twitch despite its rapid growth and massive popularity. (When Amazon announced that it was acquiring the company in August, 2014, *The New York Times* reported the story with a headline that contrasted the company’s relative obscurity with its impressive economic value: “What’s Twitch? Gamers Know, and Amazon Is Spending \$1 Billion on It.”¹¹) For Young, the emergence of Twitch represents a “signal” in the environment (i.e., that video gaming was evolving from a solo pursuit to a new kind of spectator sport) that is important to notice and track as a harbinger of bigger changes to come.

The divide that is being created by accelerating innovation may be generational, at least in part. Stephen Gillett, COO of Symantec, and one of the younger participants in the Roundtable, pointed out that he cannot remember a world in which accumulating stocks of knowledge was more important than participating in flows, or a world in which India and China were not dominant powers. He grew up playing video games, and learned to improve his technique by watching videos of

the hands of Koreans, who were especially skilled at playing, slowing them down to analyze their moves, and emulating their techniques. For him, this was as much a part of his education as sitting in classrooms.¹²

Schools and libraries. The world of education has seemed to be relatively immune from the disruptive changes sweeping through other industries and economic sectors. Historically, schools had an effective monopoly on providing education. In fact, the dominant model of the classroom that persists to this day is essentially a “factory” model that arose in the 19th century when the U.S. shifted from an agricultural to an industrial society. To meet the need for workers who were literate and able to function well in structured environments like factories and offices, we developed a system in which groups of students moved through school grade-by-grade in more or less lockstep fashion to learn the three Rs and also learn how to function in a highly regimented environment.

In higher education, the dominant model for instruction today has an even longer lineage. A wit has commented that if it were possible to go back 500 years and visit a lecture hall in a medieval university, the only differences that one would see between then and now would be that the instructor was wearing a monk’s robe and lecturing in Latin.

Technology is now offering the possibility for creating dramatically different models of teaching and learning, but they have encountered a somewhat mixed reception from the educational establishment. In the world of higher education, the emergence of Massively Open Online Courses (MOOCs) represents a potentially big change in how instruction is delivered, even though the content may be much the same. Instead of restricting a class to the number of students who can fit into a classroom and restricting participation to students who have been admitted to a particular school, MOOCs make it possible for a virtually unlimited number of students located anywhere in the world to participate in a single class.

Not all academics have rushed to embrace this new mode of education. One common critique of MOOCs has been that their ability to reach large numbers of students is offset by an inevitable dilution of the quality of the education that they can deliver. However, a recent study at Stanford provides encouraging evidence to the contrary. This past fall, the school's introductory economics course—Econ 1—was given in online form for the first time to a group of Stanford students for full credit at the same time it was offered as a conventional in-person class on campus as well as a non-credit MOOC to any student globally. The Stanford students who took the online version of the course for credit earned the same grades as students who took the conventional in-person version and gave the course equally high ratings. In addition, more than 15,000 students in 150 different countries, most of whom were in Africa and Asia, participated remotely. Taylor concluded with a reassurance that while online learning may in fact disrupt higher education, it need not do so massively: “My experience—starting small, dovetailing with rather than replacing existing structures, and collaborating with people in other fields—has been about creating new ways of teaching and learning, building on, rather than disrupting, existing ones.”¹³ And the fact that courses are being offered online offers new opportunities to gather extensive data on exactly what students are doing in the course—what they are reading and when, what errors they are making on exercises and tests—that provide a basis for identifying what is working and what it not in order to improve how the course is taught.

The Nature of Disruption

A new study of the nature of disruption by researchers from MIT, the University of Toronto and Wharton is based on the evolution of automatic speech recognition software.¹⁴ The study concludes that rather than attempting to become rivals of incumbents in an industry, start-ups that develop new potentially disruptive technologies often choose to license them or agree to be acquired by larger firms. The

first challenge for the developer of a new technology is to establish its workability and its value. But once that has been accomplished, the authors found that start-ups tend to form alliances or merge with market leaders rather than attempting to go it alone. In fact, many large companies have track records of regularly acquiring smaller companies, either to get access to their technologies or to eliminate a potential rival. Multibillion-dollar acquisition by companies like Facebook (Instagram, WhatsApp), Amazon (Twitch, Zappos), Google (Waze, Nest Labs), Yahoo (Tumblr) and Microsoft (Minecraft, Skype) are examples of this pattern.

**Innovation that thrives in small companies often
perishes when it is incorporated into a larger
enterprise.**

Of course, acquiring innovative companies is not a foolproof shortcut to innovation. Jackie Kosecoff, Managing Partner at Moriah Partners, LLC, pointed out that large companies that acquire “something wonderful” can end up killing it. In fact, there are numerous examples of small companies with well-loved products that essentially disappeared after being acquired. Innovation that thrives in small companies often perishes when it is incorporated into a larger enterprise.

Finally, disruption is not necessarily a threat to incumbents if they disrupt themselves. A classic case of a company that has done so successfully is Apple, which remains one of the most valuable companies on earth and currently derives only about one-fifth of its income from computers. Today, over half of Apple’s revenue comes from phones and tablets, products that are largely responsible for the ending the dominance of the personal computer that Apple pioneered and that had been its core business since its inception. But Apple is the exception. As Bill Goodwyn, CEO of Discovery Education pointed out, the television networks could have created CNN, but it was an outsider, Ted Turner, who did so. Netflix could have been invented by a cable company or a movie studio, but the founders came out of the software industry.

John Hagel concluded this discussion by noting a paradox: at a time of mounting competitive pressure on incumbents, they are reacting by consolidating—getting even bigger by buying other incumbents (e.g., Comcast’s proposed acquisition of Time Warner Cable, AT&T’s intention to acquire DIRECTV, Google’s acquisition of Motorola, and Microsoft’s acquisition of Nokia). The question is whether this kind of consolidation is a viable strategy for survival—assuming that these are sectors of the economy where concentration rather than fragmentation is a sustainable strategy—rather than a desperate last gasp of incumbents about to “topple” from their positions of power.

Deeper Disruption: Peers and Platforms


Perhaps the most far-reaching disruption is based on the appearance of a radically new business model that can challenge the dominance of incumbents across many industries. Robin Chase, Founder of both Buzzcar and Zipcar, believes that just such a new model has appeared in the past few years, a model that she calls “Peers, Inc.” The model involves three key elements: the existence of “excess capacity” in a market, the use of a platform to provide more efficient access to that capacity, and the collaborative, creative engagement of a group of peers who serve as suppliers and/or customers. The power of this model comes from its ability to scale faster and engage participants more deeply than is possible for more traditional businesses.

Consider, for example, the lodging industry, which is dominated by a handful of large international companies that offer hotel rooms globally. Hilton Worldwide, which is now 93 years old, has built a network of 4,100 hotels (under brands such as Waldorf Astoria, Hilton Hotels, Doubletree and Embassy Suites) that provide a total of 680,000 rooms in 91 different countries. The Intercontinental Hotels Group (IHG), which is 65 years old, has created a network of 4,400 hotels under several brands (Intercontinental, Crowne Plaza, Holiday Inn, and Candlewood Suites) that operate in 100 countries and offer 645,000 rooms. Accor, a relative newcomer based in France, took just 44 years to create a network of 3,600 hotels (Sofitel, Novotel, and Ibis) with a total of 440,000 rooms in 92 different countries. These companies have grown into multibillion dollar enterprises by building strong hotel brands, unified

by a central booking system that offers a highly standardized product, typically at different levels of price and service ranging from luxury to economy, in many different locations. Even though smaller, boutique chains of hotels that can offer more distinctive experiences have grown rapidly, they have not posed a serious threat to the dominance of the global hotel companies.

But in the past few years, a very different and potentially more formidable challenge to these incumbents has emerged in the form of Internet-based room-sharing services. These services have shown the capacity to grow at a rate that the older, more traditional companies have been unable to match. The pioneer in this new arena is Couchsurfing, which matches travelers with hosts who offer free lodging in their homes. Founded in 2003 as a not-for-profit organization (and operated since 2011 as a “mission-driven for-profit corporation”), Couchsurfing now provides access to the equivalent of 2.5 million rooms located in more than 200 countries. Using a model that is somewhat closer to that of traditional hotels, Airbnb enables travelers to rent a room from a host. Founded in 2008, the company has 500,000 listings for lodging in 33,000 cities and 192 countries globally. (An April 2014, investment of \$450 million in Airbnb gave the company a valuation of approximately \$10 billion.¹⁵)

Figure 2. Leaders in Lodging

	AGE	ROOMS	HOTELS	COUNTRIES
	9	2,500,000		207
	4	650,000		192
	65	645,000	4400	100
	93	610,000	3800	88
	44	530,000	4452	92

Source: Robin Chase

What has allowed these services to grow so rapidly? Rather than creating new capacity, they have established platforms that leverage the existing infrastructure of the Internet to match people with excess capacity (empty couches or rooms) with other people who can make use of that capacity (travelers). Unlike the hotel chains that have to build and operate (or franchise) their own facilities,¹⁶ these services have figured out a way to make more efficient use of existing resources by aggregating them and devising a convenient way to match users and suppliers. In others words, the value added is software not hardware.

A similar model for aggregating and then offering access to excess capacity is used in transportation by companies like Lyft in the U.S. and BlaBlaCar in the UK that make use of empty space in drivers' cars to offer a taxi-like service in dozens of cities at rates that are substantially lower than typical cab fares. This model also describes the fundamental strategy of eBay, which built a vast marketplace for buying and selling goods of all kinds that created a cadre of small merchants who lacked the means or the desire to operate a retail store or a conventional mail-order business.

In addition to these businesses based on an aggregation strategy, Chase identified two other types of platform-based business strategies—"slice" and "open." Slice models make use of a platform to provide more efficient sharing of a resource than was previously possible. In these cases, the providers typically own and operate the resources themselves but have found a better way to share their use. Perhaps the most prominent current example is cloud computing, where companies offer online access to remote computer capacity that enables users to "rent" just the amount of capacity they need when they need it, rather than having to buy and maintain their own hardware. (The availability of cloud-based computing has dramatically lowered the barriers to entry for many businesses. Jonathan Taplin, who had been an early pioneer in delivering entertainment content over the Internet, noted that when he launched his business in the mid-1990s, it was necessary for them to buy all of their own servers in order to provide video on demand. Today, starting such a business would require much less capital thanks to the availability of resources in the cloud.) Another example of a slice-based platform is Zipcar, which provides a fleet of vehicles stationed in key locations that drivers can rent for as long as they need a car—essentially, a more convenient, more flexible version of traditional car rental services.

The third model—based on an open platform—holds the greatest potential for growth and disruption. In fact, the potential of this type of model is so large that it is almost always vastly underestimated when it first appears. Consider the case of GPS-based applications. In 1996, the Clinton administration considered opening access to the satellite-based global positioning system that was being run by the Pentagon exclusively for military use. The administration estimated at that time that opening the system for civilian use could generate \$8 billion in revenue and create 100,000 new jobs by the year 2000.¹⁷ In fact, by 2013, there were more than two billion GPS units installed worldwide, and more than \$200 billion in annual revenue was being generated by the technology.

**One of the Internet’s essential features is
precisely its radical openness....**

Perhaps the most potent example of the power of an open platform is that of the Internet itself, which Harshul Sanghi described as the biggest of all disruptive innovations. One of the Internet’s essential features is precisely its radical openness: anyone who agrees to conform to the technical standards that define the Internet’s operation can plug into it and use it without requiring permission from anyone else. Owned by no one and controlled by no one, the Internet has become the most pervasive global communications infrastructure ever built and has served as an unprecedented engine for innovation on many different scales.

Ping Fu, Vice President and Chief Entrepreneur Officer of 3D Systems Corporation, described a partnership with the Smithsonian Institution that will involve “scanning national treasures” to make them more widely available. The Smithsonian currently has some two million objects on display, but it has another 10 million items in storage that cannot be shown publicly due to lack of exhibition space. By scanning these hidden objects and putting the templates online, it will be possible to give Americans an entirely new relationship with their cultural heritage. Since the objects are in the public domain, individuals will be free to make exact duplicates or “hack” them to create unique

artifacts. Instead of being confined to museums, these historical objects can have a new existence in the world, providing a new way to leverage human capabilities.

Another example of an emerging technology-based platform is 3D printing. In this case, the platform is disrupting the process by which physical objects are created and distributed. According to Ping Fu humans have always been involved with “making stuff,” but it is only in the last two centuries that, as the result of the Industrial Revolution, people no longer felt the need to make their own goods. Education became more academic and deemphasized vocational training that taught the skills for making things. The rise of the maker movement and the emergence of 3D printing are responses to this loss and an attempt to bring back the full capacity of human beings to make as well as to think. 3D printers mobilize the power of digital computing to open up new opportunities for making—marrying bits and atoms to enable a new relationship between people and the physical objects that surround them.

The rise of the maker movement and the emergence of 3D printing ... are attempts to bring back the full capacity of human beings to make as well as to think. – Ping Fu

The exploration of the potential for 3D printing is still in its infancy. In November 2014, a small 3D printer was delivered to the International Space Station in order to evaluate “how well 3D printing and the microgravity of space combine.”¹⁸ According to NASA, this new technology may enable new opportunities for space-based manufacturing and also could enable astronauts traveling in space to make their own spare parts by transmitting the instructions needed to print the part to them rather than having to send it physically via a resupply expedition from Earth. Closer to home, a number of public libraries have acquired 3D printers to give patrons an opportunity to learn about the capabilities of these devices for personal making.¹⁹

The Power of Platforms

In each case, it is the existence of a platform that opens new opportunities for innovation and makes it possible to share resources more efficiently. These platforms are responsible for creating a new model for business, which Robin Chase calls “Peers, Inc.,” that marries the “industrial strength” of large organizations (corporations, nonprofits, governments) and the “individual strength” of people and small, local businesses to support a range of capabilities that neither party alone can provide. Large enterprises have the scope and the resources to make the large, multi-year investments needed to build and maintain the extensive infrastructure that is required to operate a successful global platform. At the same time, individuals and small enterprises are able to make small investments and have the local knowledge and unique expertise needed to provide specific, customized offerings over these platforms that larger enterprises cannot deliver.

Figure 3. Peers and Incorporated, Characteristics

PEERS	INCORPORATED
(people, local NGOs & local companies)	(companies, institutions, governments)
Small investments	Large investments
Short-term sporadic efforts	Multi-year efforts
Delivery of small services	Integration & Aggregation of many parts
Local knowledge	Deep Sector knowledge
Specific unique expertise/offering	Diverse technical expertise(s)
Customization, specialization	Standard Contracts & standardization
Creativity	Consistency
Personal social networks (trusted individual)	Brand Promise (trusted company)
Local	Global
DIVERSITY of offering	PLATFORM for participation

Source: Robin Chase

Combining these two complimentary sets of capacities results in a new business model and makes possible new kinds of offerings that take advantage of the strengths of both types of entities: products and services that are both global and local, broadly available and highly customizable. Large enterprises can provide the consistency and assurance of an established brand, while smaller participants can leverage the power of their personal social network connections.

Exactly what the boundaries between these two types of capabilities should be is still in flux and is likely to remain so as long as the ongoing evolution of technology continues to influence the capabilities of both types of enterprises. In some cases, large established businesses may build a platform that changes the dynamic within an industry sector (think of the impact of Apple's iPod/iPhone/iTunes platform on the music industry or the impact of airline reservation systems on travel agencies), while in other cases, a start-up (e.g., Airbnb, Lyft) may take advantage of available infrastructure to create a highly disruptive new platform. But the combined power of large and small organizations is already generating new business models that are challenging the dominance of traditional businesses.

Figure 4. Peers Incorporated Yin-Yang Relationship



Source: Robin Chase

The interface in this kind of “yin-yang” relationship is highly dynamic. A lot of interesting things can happen there. For example, Peers, Inc. businesses can be powerful generators of other types of capital than financial. John Seely Brown pointed out that when he uses a ride service such as Lyft or Uber, he often sits in the front seat, next to the driver, rather than in the rear seat as in a taxi or limo, creating an opportunity for different kinds of interactions that can create new types of social capital. While there is no monetary payment for “homestays” arranged through Couchsurfing, many users “show their appreciation [by] bringing a gift, cooking a meal or teaching a skill.”²⁰

There are also rich opportunities to generate “learning capital” at the interface between entities. For example, a number of large enterprises have launched reverse mentoring programs that involve getting senior executives up to speed on emerging opportunities by linking them with employees who may be more junior but have current knowledge or experience in key areas.²¹

As John Hagel pointed out, platforms can be useful not just for supporting the development and delivery of innovative products and services; they can also be used to enhance collaboration and accelerate the generation of ideas. Terry Young described how his firm, sparks & honey, has created a platform-based “cultural intelligence system,” that it uses to generate insights that can help its clients’ brands to “leverage culture in real time.” The company closely tracks cultural developments (“weak signals”) that enable it to forecast emerging trends and quickly develop and deploy targeted campaigns that play off of these trends.

At a daily noontime meeting, the staff convenes to share the signals they have picked up from the environment and brainstorm ways to leverage them. Each day, participants identify somewhere between 50 to 70 signals which are winnowed down to a dozen or so that are used to develop new campaigns built around these developments. The signals are logged in a “cultural database” that can be searched for larger patterns and trends. In addition to aggregating the insights of the people who meet daily in the company’s “newsroom” in its New York headquarters, the company uses the Internet to gather input from more than 2,000 contributors around the world, including a group of 50 key “influencers” from different domains (e.g., design, entrepreneurship, spirituality, corporate innovation) and some 70 “scouts” in 11 different countries who scan their local environments for similar signals.

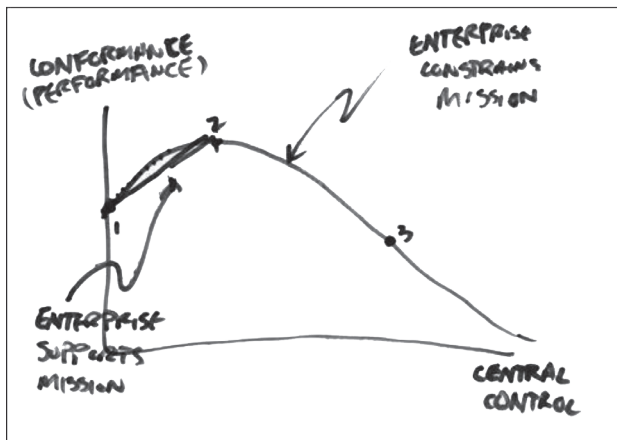
The company uses multiple platforms to open up their scanning process, to aggregate and derive insights from the signals it gathers, and to accelerate the process of turning insights into campaigns for its clients. For Young, using platforms is about “the fast getting faster.”

...using platforms is about “the fast getting faster.” – Terry Young

The Limitations of Platforms

Platforms can accelerate innovation, but they are not silver bullets. To be effective, platforms need to strike the right balance between openness and constraint. George Dan Doney, Chief Innovation Officer at the U.S. Defense Intelligence Agency (DIA), sketched a curve that showed the relationship between the performance of an enterprise—which equals the sum of the individual performances of all of its individual contributors—and the extent of control that the enterprise attempts to exercise over its operations. Some degree of central control is necessary to provide a framework for and alignment of the efforts individual participants. But as soon as the degree of control exceeds an optimal point (point “2” in the diagram below), overall performance declines.

Figure 5. Control/Performance Curve



Source: Dan Doney

Gene Han, Director of Enterprise Strategy at Target Corporation, agreed with Doney's analysis, noting that when companies get large, issues of command and control almost always arise and are difficult to resolve. In big enterprises, it is typical for innovation to get killed by "corporate antibodies." While a few companies such as Google and Amazon have "embraced the power of the individual," they remain the exception rather than the rule. Most companies still are organized with kings and fiefdoms.

The reason that virtually all large organizations perform sub-optimally is that they have gone well past the ideal point for enhancing performance (i.e., they are closer to point "3" than to point "2" on the curve). Doney noted that platforms, like formal organizations, can serve as "engines for coherence" that offer many benefits for individuals, including responding to the desire to belong, to be part of a larger movement. But they can also block innovation that is not consistent with the platform. In a variety of institutions—religion, unions, gangs, nation states—the desire for control can be stronger than the desire for change. At the extreme, these entities can behave like organized crime families, striving to hold onto their turf at all costs.

There are some telling examples of corporate responses to platforms that were perceived as shifting the locus of control too far in the direction of individuals and away from the corporation. John Hagel described how the giant furniture retailer Ikea reacted to the emergence of a lively "hacker" movement of people who were assembling the company's products in creative, nonstandard ways or adding new features to them and sharing their designs publically. The movement began in 2006 when Jules Yap (a pseudonym for a young woman who lives in Malaysia), started IkeaHackers by setting up a website (www.ikeahackers.net) and a Facebook page (<https://www.facebook.com/IkeaHackers>) to post examples of customized Ikea products.

In June 2014, just one month before the Aspen Roundtable convened, Yap received a legal "cease and desist" notice from Ikea that demanded that she stop using the company's trademarked name. When Yap shared the news about IKEA's action, the result was an immediate "worldwide outcry" that criticized the company for acting like a bully and failing to appreciate the real value of the movement. A column on Gizmodo titled "Why Ikea Shutting Down Its Most Popular

Fan Site is a Giant Mistake” was typical of the responses: it argued that “Ikea is a company that prospers from the devotion of its fans.... IkeaHackers is harmless fun, a burgeoning community of fans who are excited about Ikea and the hidden genius of its products. And what’s more, it gets people excited about the company (and into its stores).”²² Ikea (which Yap affectionately refers to as “the blue and yellow mother-ship”) quickly realized that it had overreacted and reached out to seek a compromise that would allow the site to continue to operate. As of the writing of this report, the site is still up and running under its original name and has undoubtedly gained additional followers as a result of the controversy.

David Stern, the recently retired Commissioner of the National Basketball Association, commented that professional basketball has had to deal with a media environment that changed dramatically during his 30-year tenure, which required an ongoing consideration of how it should relate to various media. A key issue was how open or closed the league should be in relation to access to its multiple products. They decided that they needed to retain control of the broadcasting of games—which represented the league’s largest single source of revenue—and they granted distribution licenses to multiple outlets in order to grow ticket sales and viewership. But in order to increase interest in the game, they also decided that they should be as open as possible in allowing the use of game highlights and not try to control their use. Stern and the team owners seemed to have found a happy balance between closed and openness: during his three decades as commissioner, total revenues earned by the NBA grew from approximately \$100 million per year to nearly \$5 billion, while the collective value of the league’s teams increased from \$400 million to more than \$12 billion.²³

Confronting Disruption in Higher Education: The Committee for Coherence at Scale

As noted earlier, after years of seeming to be immune to the impact of technology, the field of higher education has begun to experience real disruption, with the expectation of more to come. The rise of Massively Open Online Courses (MOOCs) has presented a direct challenge to the traditional model of

how instruction is delivered. But while MOOCs may be the most visible manifestation of a digital revolution in education, they are literally just the tip of a much larger iceberg: Open Educational Resources (OERs), learning management systems, electronic textbooks, online journals and remote collaboration tools are a few of the digital innovations that are impacting higher education.

Different schools have reacted in different ways to the challenge posed by these technological innovations, and many experiments are underway to figure out their appropriate role in higher education. But rather than seeing new technologies as a threat, some educators have chosen to see the emergence of new capabilities as an opportunity to fundamentally rethink the way education is organized and delivered as it migrates from analog to digital: i.e., from a dependence on classroom-based in-person instruction to online instruction and from paper-based to electronic publication as the key means of communicating and preserving knowledge.

In the past few years, a series of new national initiatives launched that include participants from multiple educational institutions. They are working collaboratively to make use of technology to create resources that benefit all of them. Several of these initiatives involve efforts to rethink the roles traditionally played by university libraries and librarians and are focused on providing standardized means for the capture, storage, dissemination and preservation of the products of scholarly work. These projects can be seen as attempts to jointly create platforms that can provide standardized means for aggregating and sharing knowledge—a fundamental task of higher education. Among these initiatives are:

- ***The Digital Public Library of America (DPLA)*** is intended to unify disparate digital collections in libraries to provide “open and coherent access to the country’s digitized cultural heritage.” Launched in 2013, the DPLA amassed a collection of over seven million items and is developing

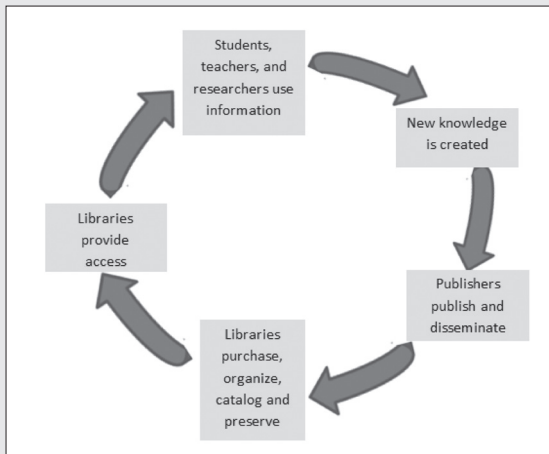
innovative tools for accessing and using these resources. Since many items are geo-coded, for example, users can search for resources by using a map. An interactive timeline allows users to find resources published in any given year going back to the year 1000. A recent initiative funded by the Gates Foundation will help local public libraries to work with patrons to digitize personal archives to create a shared digital history of their communities.²⁴

- **HathiTrust** is a joint effort of major research libraries to create an “above campus” digital repository that now includes more than 11 million volumes contributed by 28 institutions. The project is also engaged in research projects that include a review of various works in order to determine whether they are in the public domain, and an effort to expand legal access to in-copyright materials.²⁵
- **Unizin** is a federation of universities working together to share access to large-scale, cloud-based services based on open standards. A key goal of the project is to define digital workflows for scholars and researchers that can “guide and route digital content to the appropriate destinations, complete with information about the rights that go with that content.”²⁶
- **Shared Access Research Ecosystem (SHARE)** is an initiative to enhance access to and preservation of research outputs. SHARE’s goal is to make research results more “discoverable” and to enable researchers to make creative and productive use of these assets. SHARE will consist of four layers: a notification service to inform stakeholders when research is released; a comprehensive registry of research outputs; a discovery layer to help interested parties find research across repositories; and a content-aggregation layer that will facilitate data and text-mining and other value-added services.²⁷
- **Digital Preservation Network (DPN)** is attempting to address the problem that “digital expressions, whether they are words, data, or images, are inherently fragile,” and that “digital collections are one catastrophic, economic, technological, or

organizational failure away from irrevocable loss.” The DPN is designed to ensure the preservation of research and scholarship in digital form by providing for its replication “across diverse software architectures, organizational structures, geographic regions and political environments.” Initially, the DPN is building a “digital preservation backbone” that will allow content that resides in existing digital repositories to be replicated at a minimum of three different locations to ensure the integrity and retrievability of that content.

One of the most interesting and ambitious “meta-projects” to reimagine education in the digital age is the *Committee on Coherence at Scale for Higher Education* founded in 2012 by the Council on Libraries and Information Resources (CLIR) and Vanderbilt University. The goals of the initiative are to support individual projects like those described above and “to encourage academic leaders to see their individual institutions as part of a larger digital ecology and to connect and coordinate existing projects so they can integrate all facets of the cycle of knowledge.”²⁸

Figure 6. The Cycle of Knowledge Creation and Use



Source: Committee for Coherence at Scale in Higher Education, <http://vimeo.com/103828743>

According to Elliott Shore, Executive Director of the Association of Research Libraries and a member of the Committee, the group is attempting to “redefine the academic environment” by making more efficient use of excess capacity in the system. For example, university libraries compete to have the largest collections, which means that multiple copies of the same works are held in many different places. But when publications exist digitally and can be instantly accessed from any place, how many different copies will really be needed? By reducing the need for libraries to keep redundant copies of the same books and journals, it may be possible for universities to save millions or even billions of dollars in unneeded physical facilities—but only if they work together to create a common system. A fundamental assumption of the Committee is that one of the greatest opportunities offered by the new digital technology is for existing institutions to think collaboratively and imaginatively about how they can reinvent their operations. Its goal is to take advantage of current disruptions to build a new kind of coherent ecosystem in higher education.

Disrupting Government

Like other institutions, government must deal with the challenge of disruption. In fact, in the long run government may be the institution that is most profoundly challenged by the increasing rate of social change.

What is the appropriate role for government in a world of continual disruption? Can it function in such a way as to keep pace with the changing environment in which it must operate? Sonny Garg, Chief Information and Innovation Officer at Exelon Corporation, pointed out that even as the pace of innovation increases, government structures are built on assumptions of stability and are slow to adopt to change. For example, many municipal governments depend heavily on revenue from taxes on hotel rooms. This reliance is being disrupted by services like Airbnb which siphon business from hotels. Even though Airbnb’s CEO professed a willingness to begin paying these taxes, he claimed that no mechanism currently exists to collect these taxes.²⁹ Similarly, governments that have closely regulated taxis by granting a

fixed number of medallions are struggling to come to terms with ride sharing services such as Lyft and Uber: some have tried to include them in their regulatory frameworks while others have attempted to ban them outright. The real problem, Garg concluded, is the discrepancy between the pace of social and economic change and the rate at which government is capable of changing.

...in the long run, government may be the institution that is most profoundly challenged by the increasing rate of social change.

Entrepreneur Robin Chase responded that while some government regulations make sense and deserve to be kept, others are outdated and need to be changed to accommodate the growth of a sharing economy. Some regulations involve tax revenue (and are often built on old, outdated models); others determine what kinds of activities are permitted and what are prohibited. For example, the federal government, which is responsible for assigning different portions of the electromagnetic spectrum for various wireless applications, still treats bandwidth as if it had to be strictly segregated into different uses and different users (to avoid interference). In fact, in recent years, new techniques for sharing spectrum make it possible to increase spectrum utilization by using bandwidth much more efficiently. Yet government regulatory policy is not yet updated to allow for sharing, in part because of the resistance of incumbent users reluctant to share a resource that have many come to believe belongs to them.

Another problem area involves copyright and the protection of intellectual property, which seem to be increasingly out of step with an economy that is based on sharing. Companies whose success was built on the old model of creating and exploiting stocks of knowledge are not likely to be comfortable in a world based on maximizing participation in flows of knowledge, and are likely to seek the protection of existing copyright schemes. For example, Elliott Shore with the Association of Research Libraries noted that educational publishers are attempting to keep control of scholarly publications, and pointed out the irony that

these publishing businesses are based on charging colleges and universities a high price (in the form of expensive scholarly books and journals) to buy access to the work of their own researchers and scholars. Even though publishers' revenues might actually increase if information could be shared more openly, they remain firmly committed to the traditional model based on restricted access.

A troubling question that ran through the discussion of the rise of the sharing economy was who ultimately benefits? Will this new model of business do anything to help those who are disadvantaged, to reduce the growing inequality in our society? The optimistic view is that new technologies like the Internet have already provided benefits to everyone. But skeptics argue that the poor and uneducated who lack access to the tools necessary to participate in collaborative enterprises and the skills to use these tools may end up being relatively worse off than they already are. Several participants noted that the digital economy tends to be driven by a power law in which a few participants garner the lion's share of the rewards, while everyone else must share what is left over.

Perhaps it is the role of government to ensure that the benefits of technology are equitably distributed (for many years, for example, the federal government provided subsidies to help rural and poor residents to help them get electricity and telephone service). But Bob Brook, Distinguished Chair for Healthcare Services at the RAND Corporation, posited that the federal government does not routinely do any analysis of its policies to determine their impact on reducing discrepancy.

Reshaping Ecosystems

The most successful businesses of the future will not only have knowledge of the ecosystems in which they operate but will play an active role in shaping—and, since disruption is an ongoing, dynamic process, reshaping—those ecosystems. Therefore, participants will need to have a deep understanding of how ecosystems operate and access to the right shaping tools. What do organizations need to do to gain these capabilities?

We begin with a case study from the field of healthcare. To a large degree, healthcare is a success story: many infectious diseases have been eliminated or dramatically reduced while Americans' life expectancy increased dramatically during the 20th century. At the beginning of the century, millions of people died from infections and battle wounds.

The development of vaccines and antibiotics, and advances in public health services led to major improvements in overall population health. In the second half of the 20th century, scientific and clinical research led to the development of pharmaceuticals to treat everything from heart disease and ulcers to depression and insomnia, while surgical techniques including micro- and laparoscopic surgeries and organ transplants made progress in treating such things as cancer, heart disease and kidney failure.

Now at the beginning of the 21st century, medicine is confronting new challenges: in much of the developed world, the population is aging rapidly (the number of people over age 60 is growing twice as fast as the number of younger people, and the fastest growing age group of all is 80+), and treating chronic diseases is now the leading problem along with the affordability of healthcare.

Like education, healthcare is delivered by a large and complex ecosystem. And like education, healthcare is proving to be relatively resistant to disruption. Medical practice has been heavily regulated for many decades and dominated by individual physicians largely able to determine what services they provide and how much they charge for them. Even though spending on healthcare has soared,³⁰ individual patients have been largely insulated from the direct impact of the costs of healthcare since most Americans have been covered by third parties, mainly employers or the government.

Changes in the way healthcare is delivered, or at least the prospect of change, is becoming more apparent. The potential of technology to make healthcare more efficient is being explored in a number of initiatives. One major development is the rise of “connected health,” which uses digital network technology to connect different parts of the system together in new ways. Many of these explorations are taking place on the “edges” of the healthcare system, but others are focused squarely on what is arguably the very heart of the modern system—the hospital, which accounts for nearly one-third of total healthcare spending annually.³¹

Specialists on Call (SOC), which was founded in 2004, makes use of video technology to provide hospitals with access to medical specialists in several different medical disciplines. According to Jackie Kosecoff, who is a member of SOC’s board of directors, the company provides another example of using technology to make more efficient use of a scarce and expensive resource—in this case, physicians with expertise

in neurology, cardiology, psychiatry and critical care medicine (intensivists). These intensivists are often difficult for hospitals to recruit or keep busy 24/7 because they cannot provide full caseloads of specialized cases. SOC uses high-quality video links to provide participating hospitals with round-the-clock access to these specialists. It also has access to all imaging and medical data related to the consults, and incorporates hospitals' standard operating procedures to ensure that its service can be easily integrated with other ongoing functions.

Having access on demand to specialists has multiple benefits, for instance, it makes it possible for hospitals to keep patients who otherwise might have to be transferred to another institution. Services such as SOC can also benefit patients in rural areas who suffer from strokes whose recovery may depend on rapid access to specialized care that would not otherwise be available.³² And participating in SOC is appealing to highly trained specialists who can fully utilize their skills by seeing more patients than they would if they were based at a single hospital. SOC assists its physicians in getting licensed in multiple states (the average is 20), so that they can provide services on a national basis. In addition to helping hospitals fill gaps, the company can also help larger hospital systems and academic medical centers to use their own staff more efficiently.

In effect, SOC developed a platform to deliver high quality specialized medical care when and where it is needed. According to Bob Brook of RAND, innovations like SOC are urgently needed since a large portion of current healthcare is mediocre at best: half of what patients really need in the way of treatment they do not receive, he contends, and 20 percent of the care they do get they do not actually need.

Transforming Healthcare. SOC is a good example of “connected care,” an approach to delivering services that has the potential of dramatically reshaping the healthcare ecosystem. As healthcare becomes more digital, there will be opportunities to improve the efficiency of care delivery as well as to increase the quality of care by gathering, aggregating and analyzing data on treatments and outcomes (so-called practice-based evidence³³).

John Seely Brown called attention to the opportunity that a venture like SOC offers to accelerate learning among its participants. Because of the large volume of services it delivers in a few specific areas, it

should be possible to learn what approaches work best by comparing treatments and outcomes in thousands of cases. This kind of learning can be accelerated by actively encouraging participants to share lessons learned. Even a company like oDesk, which provides online access to freelance writers, programmers and designers, provides incentives to its participants to do this kind of sharing as a means of helping all of them get better faster.

Abhi Ingle, Senior Vice President of AT&T Advanced Solutions, pointed out that SOC is really a starting point, not the endpoint of a transformation of healthcare. The company has found an elegant way to solve one specific problem, but there are many others waiting to be solved. For example, in response to pressure to control costs, hospitals are sending patients home “quicker and sicker” more often than in the past, relying on patients and their families to provide needed follow up care.³⁴ Remote monitoring equipment can provide home patients with better support and can reduce hospital readmissions, which is a key goal of the Affordable Care Act (Obamacare).

Beyond supporting post-acute care, remote monitoring can track the health status of patients with chronic diseases. Since most patients—including millions with serious chronic conditions such as diabetes, heart disease or respiratory problems—see a doctor face-to-face for only a few hours per year, it is the patients themselves (and their families) who are responsible for providing the great majority of their own care. Remote monitoring could improve the quality of this self-care.

Despite the promise of connected care, a variety of barriers to its wider adoption remain. One barrier is the fact that the government (Medicare) limits reimbursement for services delivered via “telemedicine.” Other barriers include the lack of interoperability among different electronic medical records (EMRs) and varying degrees of willingness to openly share data. Although the federal government invested billions of dollars to subsidize the adoption of EMRs by physicians and hospitals, it failed to require that they have the ability to exchange information among different systems in a standardized format.³⁵

Ultimately, a service like SOC makes sense because it enables a scarce and expensive asset—in this case, highly trained medical specialists—to be used more efficiently. Robin Chase noted that the reason that services like Zipcar and Lyft have been successful is that they permit the

sharing of cars, which are the second most expensive asset for most people. By the same token, services such as Airbnb make sense because they enable the sharing of what is normally people's most expensive asset—their home. These success stories raise the question of what other kinds of assets could be shared.

Reshaping an ecosystem by building a new platform is difficult because it inevitably involves what Elliott Shore describes as disaggregating and recombining functions in new ways. This kind of disruption almost always provokes resistance from incumbents. Jonathan Taplin recalled that when he worked with a very successful movie studio at a time when nearly half of its revenues came from the sale of DVDs, many older employees resisted the move to streaming media because they did not want to have to learn about a new technology. According to Ping Fu, large manufacturers have responded to the prospect of 3D printing mainly by asking about its potential to eliminate traditional manufacturing jobs. (She believes that in the longer run, 3D printing will shift job requirements and will lead to the creation of new types of local jobs). As a result of the resistance from incumbents, the most interesting innovations typically come from the edge. According to Sonny Garg, in the area of energy, the biggest disruptions have come from start-ups such as Solar City (power generation) and Nest (energy management), not from the big power producers or distributors.

Platforms at the Edge of Disruption: Reinventing Money

Money, as everyone knows, makes the world go round. Or at least it has for the past several thousand years. (Gold and silver coins date back at least to the sixth century B.C. while paper money appeared in China in the seventh century AD). For all this time, money represented a promise of value that is backed by a bank and/or a sovereign government. The prospect of reinventing something as fundamental as money to the daily functioning of commerce and capitalism must rank very near the top of the list of potential disruptive forces. That is exactly what Bitcoin hopes to do.

According to Peter Vessenes, Founder and CEO of CoinLab and Chairman of the Bitcoin Foundation, Bitcoin's fundamental innovation is that it makes it possible for anyone "to send money over data." In fact, with Bitcoin, value is directly encoded in data. Until now, any

transaction other than pure cash depended on intermediaries such as banks or credit card companies using currencies backed by national governments. But Bitcoin is completely peer-to-peer and enables these transfers to happen with no intermediary.

Bitcoin 101

Bitcoin—which is one instance of a larger category known as “crypto-currencies” and could also be described as “open source money”—has a short but eventful history. It traces its origins to 2008, when Satoshi Nakamoto (apparently a pseudonym for a person or perhaps a group of people) e-mailed a paper to a group of computer hackers and experts that proposed the creation of a new system for “electronic cash” that did not rely on third parties.³⁶ Nakamoto described a way of encoding value directly in software code that was open but highly secure. Ownership would be protected by use of public/private key encryption where the private key provided the owner with control while the public key enabled that ownership to be transferred openly and securely.

Nakamoto also proposed a process which came to be known as “mining” that would enable the creation of a controlled number of Bitcoins (since no bank would be involved in “issuing” the currency) through a competitive computer processing task that would also serve the purpose of maintaining a public ledger system known as the “block chain” that would keep track of who owns each Bitcoin and to whom it may be transferred. Whoever successfully completed this recurring task first would be rewarded (paid) with a specific number of Bitcoins. Nakamoto also proposed that there would be a fixed total number of 21 million Bitcoins that would be issued over time. To encourage early participation, the total number of Bitcoins created would decline by 50 percent every four years until the pre-determined total is reached.

The first Bitcoin transaction took place on January 12, 2009. The value of a Bitcoin has been highly volatile, with sharp rises and falls happening on a fairly regular basis. After reaching a

high of about \$1,100 in late 2013, the value of a Bitcoin has fallen, losing as much as 20 percent of its value in a few days due to speculation, some of it fueled by news about possible actions by governments to restrict or regulate the use of Bitcoins, or possibly by the steady increase in the supply of the currency.³⁷ The currency has also experienced other growing pains. Perhaps the most spectacular event was the collapse of Mt. Gox, one of the first Bitcoin exchanges, in February 2014, after announcing that it has “lost” some 750,000 Bitcoins, which had a worth of approximately \$350 million at the time.

Despite these ups and downs, the ecosystem of users and facilitators that supports the use of the currency has grown steadily. (Deloitte’s Carmen Medina characterized the collapse of Mt. Gox as “yet another stress test that Bitcoin has survived.”³⁸) The ecosystem includes providers of enabling software such as software “wallets” to hold Bitcoins; processors that enable merchants to accept Bitcoin payments for goods and services; exchanges that permit Bitcoins to be bought and sold for traditional currencies (which help to establish the value of a Bitcoin in these currencies); and service providers that offer such things as insurance for Bitcoin transactions. As of October 2014, there were approximately 13.35 million Bitcoins in circulation, or about half of the eventual total,³⁹ while the number of daily transactions and the number of merchants willing to accept Bitcoins in payment have grown steadily.

What is the future of Bitcoin and other crypto-currencies as well as their underlying enabling technologies? They are still so new that it is hard to be sure how they will evolve. A recent report from Deloitte⁴⁰ offered four dramatically different scenarios for how the future of Bitcoin may unfold ranging from remaining just an intriguing novelty to becoming the cornerstone of a new economy:

1. ***Life on the Fringe:*** Bitcoin, the currency, never solves the trust and security problems, reinforcing price volatility and skepticism. As a result, companies in the Bitcoin ecosystem are unable to enter into mainstream commerce.

2. **Corporate Coin:** Payment and technology companies incorporate the Bitcoin protocol into their payment systems, allowing payments to occur across the Bitcoin protocol without requiring consumers to hold Bitcoins.
3. **Satoshi for All:** Bitcoin becomes the protocol for all transfers of value, creating new visibility into financial markets and transforming the services around these functions. The government creates the Block Chain Administration to oversee cryptographic exchanges and provide consumer protection.
4. **New Networks:** Bitcoin's utility in facilitating micropayments and its self-propelling decentralized, peer-to-peer network provide the infrastructure for new ways to work, enabling payment for the myriad activities individuals perform as part of a networked economy.

According to Vessenes, Bitcoin is both a technology and a new asset class. It has attracted a wide variety of supporters including investors, libertarians, retailers, Russians and anarchists who are attracted to the idea of owning something of value that does not depend on a financial institution or government. Part of the appeal of Bitcoin is that in demonstrating a way to have money without a central authority, it represents an ideology about the nature of money and government fiscal policy. (The appeal of crypto-currencies is somewhat akin to that of gold, but without being as cumbersome to own or transfer.)

Like a religion, Bitcoin has spread due to the enthusiasm of its most zealous and dedicated supporters who have served as evangelists for the currency. Bitcoin's true believers are willing to do a lot to promote their cause. But Bitcoin remains a fringe phenomenon. Jackie Kosecoff pointed out that using Bitcoin is still a scary idea for many people who do not yet understand what it is. CEOs and Boards of Directors of publicly traded companies will remain wary of making significant investment in Bitcoin without more reassurance about its safety. In fact, the Bitcoin Foundation (headed by Peter Vessenes) is working on a "global campaign" to explain Bitcoin to the public.

What, exactly, might be disrupted by Bitcoin? First, it holds the promise of changing a lot of business processes. Conducting transactions using Bitcoin has the potential to be substantially less expensive than using a credit card. Companies that process international remittances charge as much as 15 percent. Using Bitcoin will make the cost of sending money from the U.S. to the Philippines or Africa much cheaper. In the long run, Robin Chase noted, the extent of the impact of the Bitcoin/cryptocurrency technology may depend on the development of mechanisms that take advantage of its potentially lower costs to enable small or even micropayments.

Some major financial institutions have, in fact, already begun to explore the implications of Bitcoin and the opportunities it may offer for new services. Harshul Sanghi, Managing Partner of American Express Ventures, expects that his company might embrace Bitcoin, and sees it as potentially important as the Internet. While he insists that “the current payments system is not broken” and that debit and credit cards work well for almost everyone, there are advantages to being an early mover. But adopting a radically new mechanism like Bitcoin is “non-trivial.” The questions he is asking now are: How should Amex respond to the opportunity? When should they move? When will consumers be ready to adopt Bitcoin?

Moving Beyond Money: The Block Chain. As innovative as the Bitcoin currency is, the underlying block chain ledger technology that provides transparency while preserving anonymity may have even greater transformative potential. For example, RAND’s Bob Brook suggests that a block chain could be used by the health care system to provide a secure universal ID for every patient. This could dramatically simplify the challenge of sharing information among disparate medical records.

Mumtaz Ahmed, Chief Strategy Officer for Deloitte LLP noted that the financial auditing process, which “has not changed at all since the beginning” and is still carried out manually, could be changed dramatically if financial transactions were conducted via digital currencies. Going digital could have a big impact on such things as the detection of fraud. And audits could evolve from a periodic activity to a continuous process taking place in close to real time. Peter Vessenes commented that “the best audit in the world” could be easily performed if an entity were willing to publish the “addresses” of all assets it owns and let an auditor check every transaction.

A block chain-based system could also be used to document ownership of tangible property (ranging from appliances and cars to real estate) and simplify its sale. Another possible use is for “smart contracts” once described as “the killer app of the crypto-currency world.” Today, John Seely Brown notes, we live in a world in which “contracts don’t compute.” A smart contract is essentially a computer program linked to a virtual currency that can automatically trigger a contractual provision when a certain condition is met (for example, paying off a bet once a winner is determined or authorizing payment to an online merchant as soon as a purchased item has been accepted for shipment). Smart contracts could have an especially large impact in the developing world where corruption is widespread and contract law is weak. But they could also have some big impacts in advanced economies like the U.S. For example, if block chain technology is used to automate many tasks that now require legal services, the role of lawyers might eventually shift from providing transactional services “to producing smart contract templates in a competitive market.”⁴¹

**At heart, being prepared to react to future changes
is a talent problem. - Mumtaz Ahmed**

Steven Gillett of Symantec commented that he had asked for his bonus for this year to be paid in Bitcoins (though he did not say whether his request was granted). He sees Bitcoin as a “breath of fresh air” in an environment in which more and more companies are basing their businesses on their ability to collect and “monetize” information about their customers. He pointed out that it is simply wrong to assume that companies like Google or Facebook are giving people anything for free. They are, in fact, selling their users’ personal data to others for a profit. Google’s chairman, Eric Schmidt was quoted as saying that if you want to protect your online identity, you should change your name—which is not exactly a user-friendly solution. By contrast, Bitcoin is not a monetization scheme but a highly distributed payment system with built-in privacy protections. Gillett concluded by observing that Bitcoin today seems to be in much the same place that the Internet was in 1997—poised on the brink of explosive growth.

Today, however, Bitcoin and other crypto-currencies are still an “edge phenomenon.” If companies want to be prepared for future challenges, they need to be scanning the horizon for both threats and opportunities. Unfortunately, many individuals and organizations that should be on high alert are instead in a state of denial that coming changes could have a direct bearing on them and what they do. For many enterprises, the real choice is between being disrupted and disrupting themselves. At heart, according to Mumtaz Ahmed, being prepared to react to future changes is a talent problem.

Leadership in an Era of Disruption

The final segment of the Roundtable focused, as in past years, on the question of leadership—in this case, defining the particular qualities needed by a man or woman who can successfully lead an organization in a time of continual disruption.

Jerome Vascellaro, COO at TPG Capital, started the discussion by asking the Roundtable participants to imagine that they had been asked to serve on a search committee for a new CEO at a “big, complicated company” who will be expected to take the firm through a major transformation. What criteria should the committee use in evaluating candidates?

Vascellaro proposed that a leader will need to have three different types of skill sets: a compelling vision for the future, the ability to navigate through disruption, and the skills to effect a transformation of the organization to respond to the new challenges it faces. He then offered a starting list of specific characteristics in each of these categories:

1. Leadership for the future
 - a. Authenticity
 - b. Tri-athlete (ability to deal with financial, social, and environmental issues)
 - c. Telescopic (the ability to work on both the macro and micro levels)
 - d. Boldness: a willingness to take risks
 - e. Transparency
 - f. Stamina (given the demands of global travel and dealing with a myriad of people)

2. Leadership through disruption

- a. Must be an “and” person, not an “or” person
- b. Grasp of scale, scope and barriers, and an ability to work effectively in different conditions
- c. Strong governance skills (ability to work effectively with a board)
- d. Ability to empower and engage employees (not easy to do in a big organization)
- e. Strong, clear values, vision and goals, and the ability to communicate them to others (since everyone will find out everything, it’s better for them to hear it directly)

3. Leadership through a transformation

- a. “Vision with stretch” (how many CEO’s actually have a vision and are willing to stretch an organization?)
- b. Commitment to meeting specific performance (quarterly earnings) and corporate health (retention of best people) goals
- c. Commitment to making tangible changes (a corporate culture will not change without actual physical changes on the operational level, including changing job functions)
- d. Willingness to change personal behavior (or changing personnel)
- e. Growing leadership capacity (going through a transformation doubles everyone’s workload; they need to do their normal jobs and work on moving to the new thing)
- f. Ability to plan and execute the plan (change needs to be rigorously architected, with the right kind of tools: “in a city, you need a map; in a swamp, you need a compass”)

Stephen Gillett responded that his company let its CEO go earlier in the year and embarked on a search for a new leader. He cautioned that companies often seek candidates with “perfect” resumes, who often end up as failures. Given that traditional skills are not as relevant as they

once were, Gillett offered his own list of criteria for leadership in a time of disruption:

1. Always be a student (don't try to be a know it all).
2. Do not outsource talent acquisition (it's not enough to just lower the attrition rate of an organization; leaders need to actively seek out the best talent).
3. Be a coach and mentor to a team.
4. Have intellectual humility (when you encounter a better idea anywhere in the organization, be willing to accept it).
5. Minimize casualties (think hard about the consequences of decisions).
6. Understand your accent (everyone is shaped by their training, their experiences and where they come from; tune into and respect the core space of a company and its distinctive culture).
7. Understand the essential archetype of the business (avoid creating a Mr. Potato Head organization by assembling "best of breed" resources from disparate sources).
8. Be good at giving equity to others (in an experiment at Stanford, half of a group was given a lottery number, while the other half was invited to write their own number, and the group was then invited to sell their numbers: those who wrote their own numbers asked over ten times more for theirs. How can a leader get workers "to write their own numbers?")

These lists provoked a variety of responses. David Stern said that everything on the lists resonated with him based on his 30 years of experience leading the NBA—a period in which the league underwent enormous growth and change. When he first came to the league office, it had a staff 24 people; when he left, there were some 1,500. He personally hired the first 150 new employees, but after that, he could not do it himself. But given the importance of hiring the right people, he believed that the head of HR had to report directly to him.

Other key lessons for leaders:

Distributing power. In order to truly distribute power to others—a necessity in a large organization—leaders need to create a culture that they are happy with, that supports the values that they want the organization to embody. Everyone needs to know that what they are doing is important. And every manager needs to know how to empower others. At a time when things are changing rapidly, everyone needs to learn to act faster, and the primary barrier to change is people. If he were to write a book of advice for leaders, Stern would emphasize the importance of “episodic micromanagement.” When things are going smoothly, there is little need to intervene in management issues. But when a crisis occurs, or when a major opportunity presents itself, it is time for a leader to roll up his sleeves and get involved in responding. Ultimately, a leader needs to be seen as the captain of a ship who is prepared to steer through stormy waters.

Empathize...and Plan. In a continually disruptive environment, a leader needs to be empathetic to everyone, to understand everyone’s value propositions. According to Dan Doney, leaders need to assume that they are always working in a coalition, not a hierarchy in which they can issue orders. In the new environment, management is (still) about exercising control, while leadership is about giving control. While it is important to be decisive, even with imperfect information, decision making should be delegated as much as possible—within a “rigorously architected” plan.

**In the new environment, management is (still)
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about giving control.**

Asking Questions. Jonathan Taplin highlighted the importance of asking questions on the list of key leadership qualities. When Jeff Bewkes became the CEO of Time Warner, conventional wisdom was that it was necessary to keep getting bigger in order to survive. But the first thing he did was to ask questions about whether this imperative made sense for Time Warner. He concluded that the company needed

to get smaller, and proceeded to divest AOL, then sell Time Warner Cable and eventually the magazine division. The result was that the company's stock went up. To accomplish his goals, he had to challenge people on the board who were defensive of their past decisions to grow. He also changed key managers. When he appointed a new head of the movie production company, he picked "a digital guy," since he had concluded that the future of the company depended on learning how to make money in a digital world. As a former CEO who understood money, Bewkes was able to steadily increase shareholder value even through a time of massive disruption and change.

In the past, strong leaders were defined by their ability to have the right answers. In the future, they will be defined by asking the right questions. John Hagel noted that one reason that trust in organizations has been declining is that leaders still present themselves as knowing it all, which is not credible in a world of continuous disruption. Leaders need to maintain a creative tension between not-knowing and taking decisive action. After-action reviews can be helpful in figuring out what worked and what did not, but Stephen Gillett added that in addition to doing a lot of post-mortems, Symantec now does pre-mortems, trying to anticipate why a plan might fail.

Masculine/Feminine. Ping Fu added that CEOs need to take on more female qualities—the ability to form strong relationships, the ability to be empathetic. Like a mother, a CEO needs to offer unconditional love to her employees. Just as all children are different, so all employees are different; not everyone can be an "A team" player. An organization needs different kinds of people, those who like to work on the edge as well as those who are good at process. She agreed that it is essential for leaders to be able to ask questions rather than having answers, and a willingness to seek help when needed. She recalled that when Jeff Imeldt became the CEO of GE, he acknowledged that he did not know everything he needed to know about his job. Although he recognized that he needed to act as "the captain of the ship" at work, when he went home, he focused on the questions he needed to ask. Ping asked him if she were working for him and did not know the answer to a question, how would he react if she came to him for help? His response was that no one in his organization would ever do that.

Being a CEO is not the same as being a COO: the CEO needs to be the coach of a winning team, helping everyone to get better, willing to embrace different types of talent who augment the leader's skills. Leaders need to shift from command and control to trust and track—which is harder to do.

On-the-Job Learning. Sonny Garg confessed that he had made an entire career out of having jobs (including HR, finance, innovation and IT) that he knew nothing about when he started. In fact, the most useless document in a company is the organization chart. The right way to see an organization today is as a network, and leaders need to learn how to leverage that network—identify the key influencers, the people who know what is really going on, no matter what their titles are. The leader's challenge is to “formalize the grapevine.” (Abhi Ingle explained that AT&T established a wiki that allowed everyone to share their opinions. Having the wiki made it possible to get “real input” from employees after a town meeting.)

...the most useless document in a company is the organization chart. The right way to see an organization today is as a network.

Every organization has its own set of narratives, and the stories will be different for employees than for the CEO. There is always the “water cooler narrative” of rank-and-file employees, which often does not get heard since large organizations typically do not allow people to express themselves fully. In a network, human capital and trust are what matter the most. Building trust depends on the willingness of CEOs to reveal themselves, to share openly their personal narratives.

The question that kept recurring throughout the discussion was how to get an organization to change. Robin Chase re-emphasized the need to learn: to posit what you want to do, then do it, and then evaluate its success. The most important ability of an organization is the ability to experiment, iterate, evaluate and evolve.

Jerome Vascellaro concluded with a story from World War II. At the beginning of the war, the U.S. faced a severe shortage of rubber. The President's advisors presented him with two alternatives: he could either go to the existing rubber companies and get them to do whatever was required to increase their production, or he could go to the citizens of the country and ask them to contribute the mats from their cars and other household rubber products for recycling. FDR picked the second alternative because it provided an opportunity to engage people in the war effort.

In a network, human capital and trust are what matter the most.

Change—especially disruptive change—is much more likely to happen when everyone has equity in the outcome.

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APPENDIX

Aspen Institute Roundtable on Institutional Innovation

Navigating Continual Disruption

Aspen, Colorado · July 17-19, 2014

Roundtable Participants

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Note: Titles and affiliations are as of the date of the conference.

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About the Author

Richard Adler is a Distinguished Fellow at the Institute for the Future, Palo Alto. He is also president of People & Technology, a consulting firm located in Silicon Valley. His research has focused on the impact of new technologies on fields including business, education, healthcare and aging.

Richard is the author of reports from each of the previous Innovation Roundtables: *Fragmentation and Concentration in the New Digital Environment* (2014); *Connecting the Edges* (2013); *Institutional Innovation: Oxymoron or Imperative?* (2012); *Solving the Dilbert Paradox* (2011); *Leveraging the Talent-Driven Firm* (2010); and *Talent Reframed: Moving to the Talent Driven Firm* (2009). Other reports he has written for the Aspen Institute include: *Rethinking Communications Policy* (2012); *Updating Rules of the Digital Road: Privacy, Security, Intellectual Property* (2011); *News Cities: The Next Generation of Healthy Informed Communities* (2011); *Media and Democracy* (2009); and *Minds on Fire: Enhancing India's Knowledge Workforce* (2007). He is also the author of *After Broadband: Imagining Hyperconnected Worlds* (Wharton, 2012) and *Healthcare Unplugged: The Evolving Role of Wireless Technology* (California HealthCare Foundation, 2007).

Richard is Fellow of the World Demographic Association and serves on a number of local and national boards. He holds a BA from Harvard, an MA from the University of California at Berkeley, and an MBA from the McLaren School of Business at the University of San Francisco.

The Aspen Institute Communications and Society Program

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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.

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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)

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

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