

Institutional Innovation: Oxymoron or Imperative?

by Richard P. Adler

Institutional Innovation: Oxymoron or Imperative?

Richard Adler
Rapporteur



THE ASPEN INSTITUTE

Communications and Society Program

Charles M. Firestone

Executive Director

Washington, D.C.

2012

To purchase additional copies of this report, please contact:

The Aspen Institute
Publications Office
P.O. Box 222
109 Houghton Lab Lane
Queenstown, Maryland 21658
Phone: (410) 820-5326
Fax: (410) 827-9174
E-mail: publications@aspeninstitute.org

For all other inquiries, please contact:

The Aspen Institute
Communications and Society Program
One Dupont Circle, NW
Suite 700
Washington, DC 20036
Phone: (202) 736-5818
Fax: (202) 467-0790

Charles M. Firestone
Executive Director

Patricia K. Kelly
Assistant Director

Copyright © 2012 by The Aspen Institute

This work is licensed under the Creative Commons Attribution-Noncommercial 3.0 United States License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc/3.0/us/> or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, USA.

The Aspen Institute
One Dupont Circle, NW
Suite 700
Washington, DC 20036

Published in the United States of America in 2012
by The Aspen Institute

All rights reserved

Printed in the United States of America

ISBN: 0-89843-572-2

12-014

1879CSP/12-BK

Contents

FOREWORD, *Charles M. Firestone*v

INSTITUTIONAL INNOVATION:

OXYMORON OR IMPERATIVE?, *Richard Adler*

Inside the Big Shift 1

Measuring Performance..... 4

Mechanical vs. Organic Models of Innovation 9

Beyond the Edge: New Models for Innovation 15

Lessons about What Works 22

Pulling Talent: The New Recruitment 25

Promoting Innovation in Non-Business Institutions 28

Leading Innovation..... 35

Conclusion..... 41

Notes 42

APPENDIX

Roundtable Participants 47

About the Author..... 49

Previous Publications from the Aspen Institute Roundtable
on Institutional Innovation..... 51

About the Communications and Society Program..... 53

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 Roundtable.

Foreword

For the past four years the Aspen Institute Communications and Society Program has worked with the Deloitte Center for the Edge to produce a series of roundtables on talent and innovation. Specifically, these sessions explored the importance of enabling talent to connect, learn and innovate in order to enhance organizational performance. The series began as a Roundtable on Talent Development and resulted in titles such as “Talent Reframed,” “Leveraging the Talent-Driven Organization,” and “Solving the Dilbert Paradox.” (All are available at the Aspen Institute bookstore or by free download from our website.)

While framed as “talent development,” the real thrust of these sessions was to address institutional innovation. This is all to explain that the following report is the first of the renamed Roundtable on Institutional Innovation, but follows the three previous entries on talent development, all ably written by our excellent rapporteur, Richard Adler.

The declining performance of American corporations suggests that traditional ways of operating are no longer working well. In such an environment, innovation becomes an imperative. The question is how to bring about recurring and productive innovation in any organization?

Participants in the 2011 Aspen Roundtable suggested that innovations occur in ecosystems that support creativity and risk-taking. Tapping into the power of social networks, for example, can allow an organization to leverage knowledge and talent that go beyond its own boundaries. There is also a growing body of evidence that crowd-sourcing solutions from a wide group of potential solvers can yield better results than relying on a small group of highly credentialed experts. New findings about the power of collective intelligence and about the most effective ways of organizing teams are providing practical insights about how to accelerate innovation.

Often in Aspen roundtables, though, we find that some of the biggest barriers to change come from prevailing cultures in large organizations, whether corporations, nonprofit organizations or government agencies. This Roundtable was no exception. But there are examples of change that offer hope.

While harrowing to go through, an existential crisis can be a powerful motivator to change. New narratives that offer a clear focus for supporters to rally around can be effective. And, of course, bringing about far-reaching change requires committed, skilled and strategic leadership that can inspire the workforce as well as build the practical mechanisms that allow change to happen.

Acknowledgments

I would like to thank the Deloitte Center for the Edge for being our senior sponsor for the Roundtable and in particular, John Hagel and John Seely Brown for their leadership, suggestions and assistance in recruiting participants, and developing the agenda. In addition, we thank EMC and John Kunzweiler for their sponsoring contributions to the Communications and Society Program, and Richard Adler for weaving the Roundtable's dialogue, background readings, and his own independent research into a concise and coherent report.

Finally, I thank Kiahna Williams, Senior Project Manager, who managed the Roundtable throughout, and Tricia Kelly, Assistant Director of the Communications and Society Program, for her review and help in producing this report.

Charles M. Firestone
Executive Director
Communications and Society Program
The Aspen Institute
Washington, D.C.
May 2012

**INSTITUTIONAL INNOVATION:
OXYMORON OR IMPERATIVE?**

Richard Adler

Institutional Innovation: Oxymoron or Imperative?

Richard Adler

Inside the Big Shift

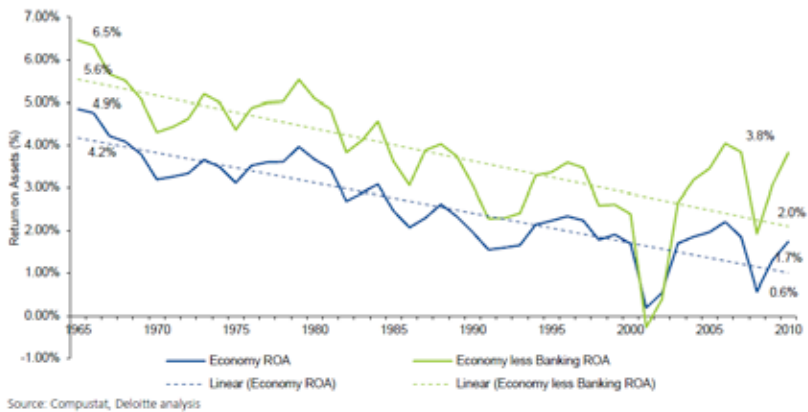
When we think about innovation, we usually think about the creative process that leads to the development of new or improved products or services. Silicon Valley is often considered to be an epicenter of innovation because of the seemingly endless stream of new products, even new product categories that flow from the companies based there. There is also a widespread understanding that the innovation in Silicon Valley is not just the result of an unusually dense concentration of innovative companies, but that it is supported by broader culture that encourages risk-taking, accepts failure and celebrates creativity.

As important as this type of innovation is, it may not be sufficient to ensure continued success in the 21st century. The Aspen Roundtable on Institutional Innovation has been exploring the consequences of the growing disconnect between the fundamental design of most firms and the capabilities of the business infrastructure in which they operate. Companies that were established in a world in which the rules for doing business were strikingly different from today are finding it increasingly difficult to remain competitive. In a world in which change happened more slowly and markets were more stable and predictable, the main criterion for success in business was to achieve and sustain scalable efficiency, not only in routinized operations like manufacturing, sales and distribution, but also in activities like research and development, and product innovation. Success was based on building up and exploiting stocks of knowledge that would give a firm a sustainable competitive advantage over its rivals.

Deloitte's *Shift Index* documents the declining economic performance of U.S. corporations over several decades.¹ For example, the rate of return on assets (ROA) for public corporations in the U.S. has fallen for the past four decades, from an average of 4.7 percent in 1965

to just 0.5 percent in 2008. (If this rate of decline continues, overall ROA for American corporations will reach zero in 2022.) Among the best performing firms—those in the top quartile—ROA has declined slightly, from 13 percent to 11 percent over the past forty years, while ROA for firms in the lowest quartile fell from plus one percent in 1965 to minus 15 percent in 2008. And corporate success has become more fleeting: the “topple rate” at which major corporations lose their leadership positions has increased more than four-fold as the average tenure in the S&P 500 has fallen from 75 years in 1938, when the list was first compiled, to 35 years in the mid-1960s, to just 15 years today. At the same time, poor performing companies—those in the bottom decile in terms of ROA—are more likely to stay there today than they were 45 years ago.

Figure 1: ROA for the U.S. Economy, 1965-2010



The irony in these results is that powerful tools available to business today seem to hold promise of greatly boosting corporate performance. Computers and other digital technologies are continuing to become more powerful and less expensive, offering companies the ability to gather and analyze information about their performance and their markets at an unprecedented level of detail (the so-called “big data” revolution). The global Internet and the emergence of social networks are making it possible to connect and engage with suppliers, partners

and customers in ways that were never previously possible. Yet rather than empowering companies, these changes have created new challenges: According to Deloitte's Index, the intensity of competition, both domestic and international, has increased steadily and consumers and talented employees, rather than employers, are capturing the lion's share of the gains in productivity. On one hand, consumer power is increasing as individuals gain access to information that allows them to be more discerning customers. On the other hand, creative talent, who are key contributors to corporate success, are commanding greater compensation and offering less loyalty to their employers. The result is a pincer movement that is shrinking corporate profitability.

If these negative trends are to be reversed and corporate America is to regain the profitability it once enjoyed, companies need to rethink the way they do business. But what kinds of changes are necessary to adapt to the new digital business infrastructure and the accelerated rate of change that comes with it?

According to John Hagel and John Seely Brown, co-Chairmen of the Deloitte Center for the Edge, in order to take advantage of "the big shift," firms need to abandon the long-standing imperative to pursue scalable efficiency and instead seek to become more agile and innovative by pursuing scalable learning—that is, enabling their workforce to become better faster by leveraging internal and external networks and encouraging them to tackle tough challenges. Rather than attempting to succeed by building up and then exploiting stocks of proprietary knowledge, firms need to recognize that the value of these stocks is declining at an increasing rate and that it is more valuable for companies to become active participants in ongoing flows of knowledge. This means that firms need to become less rigid in defining the borders of their enterprises and be willing to support a freer flow of information internally and between employees and others outside the organization. Leaders must give up the determination to run their organizations through a command and control model that yields consistency but also leads to rigidity, and build organizational resilience by encouraging all employees to take the initiative and seek new solutions.

If institutions developed in and optimized for the previous generation of infrastructure are no longer working, then where innovation is most urgently needed is not in product development but in the design

of institutions themselves. But what does it take for companies to actually abandon established organizational structures in order to function in new, unfamiliar ways? What will the work environment of the future look like? What kinds of institutions are best suited to achieving and sustaining rapid performance improvement? And to what extent do these challenges apply not only to for-profit enterprises but also to nonprofit organizations and even educational institutions and government agencies? These questions were at the heart of the 2011 Aspen Roundtable on Institutional Innovation.

...where innovation is most urgently needed is not in product development but in the design of institutions themselves.

Measuring Performance

The first issue addressed by the Roundtable participants was the accuracy and relevance of the yardsticks being used to measure corporate performance. No one disputed that ROA matters, but there were suggestions that other metrics may be needed to fully measure corporate performance. JP Rangaswami, Chief Scientist at Salesforce.com, noted that historical measures of value do not do a very good job of accounting for new forms of value creation. For example, if people are a critical ingredient in corporate success, is it possible to place a value on human capabilities and personal relationships? It has become fashionable to talk about the importance of human capital for a company, but we have not figured out how to put value on it. We praise human capital during good times, but when a “rainy day” comes, we tend to quickly abandon it in favor of more concrete financial measures of performance—cutting expenses by laying off people has become a nearly automatic response to economic downturns.

Perhaps declining ROA for U.S. companies may be a matter of the denominator rather than (or in addition to) the numerator in the calculation. Alph Bingham, Founder and Board Member of InnoCentive, pointed out that even if the price/performance ratio of information

technology is improving, there is a race underway to add this rapidly evolving technology that results in “a constant feeding of the capital asset base” of companies. If assets of this sort are costly, then ROA is likely to suffer. Luke Lonergan, Chief Technology Officer of the Data Computing Division of EMC, responded that any investment is appropriate if it translates into revenue. If information technology is an effective business tool, it should help to increase revenue and drive up profitability. But that does not seem to be happening. If profits do not exist, or if they are going elsewhere, then it poses a real challenge to the viability of a firm.

Another possible explanation for falling ROA may be the diminishing security in tenure for employees. As turnover rates increase, fewer workers remain on the job long enough to see the payoff from long-term investments. As accountability for decisions declines, ROA may also suffer.

Our current metrics are transaction-centric. It may be better, in the long run, to shift from focusing on conducting transactions to building relationships, but we do not have metrics to measure the value of relationships that are amorphous and harder to quantify. In fact, making this kind of radical shift in emphasis may well result in worse (conventional) performance in the short run. Making such a shift is difficult to justify in a marketplace that focuses almost exclusively on quarter-to-quarter results. The only recourse in such an environment may be for a company to go private to give it the freedom to innovate.

Another potential strategy is for managers to focus on process in addition to outcomes, particularly when focused on relationship-building. According to Ellen Levy, Vice President for Strategic Initiatives at LinkedIn, the value of many activities is obvious only in retrospect. For example, Levy had spent a considerable amount of time with the Obama Administration’s Social Media Team without being able to define a specific project or identify a specific goal. But, as a result of the relationship that developed over time, when Obama visited the San Francisco Bay Area in September 2011, they were able to quickly organize an online LinkedIn Town Hall for the President on the subject of “job creation and putting America back to work” —a high visibility event that was valuable for both the administration and the company.³ Levy acknowledged that often when she talks to sales executives about

interesting potential partners she has found, they have to resist the urge to define the entirety of the opportunity based on whether they can translate these connections into accounts, sales and revenues that can be immediately quantified, since that often means overlooking the longer term potential value of the relationship.

If relationships are valuable, then it would be useful to have some sort of metric that can quantify this value. As long as we are better at measuring transactions, relationships get short shrift, especially in a transitory, short-term focused environment. As a result, relationships may be eroding despite their importance.

Another danger of relying too heavily on predictable outcomes is that companies can miss out on the benefits that come from accidents, even from play. Many important discoveries have in fact come from serendipitous discoveries whose value was obvious only in retrospect. When he was Director of Xerox PARC, John Seely Brown prepared budgets that guaranteed that the lab would produce one strategic surprise each year, but he would not—could not—specify in advance what it would be.

One of the most valuable uses of metrics, Brown argued, is in the form of tools that allow individuals to keep track of their own performance. For example, many participants in World of Warcraft (WoW), the massively multiplayer online role-playing game that has attracted millions of players worldwide, rely on highly sophisticated personal “dashboards” to measure their status and accomplishments. In fact, part of the pleasure and reward of playing the game is the ability of players to track their progress and use the feedback as a means of improvement. And the game’s most successful players are those who are continuously learning new skills and strategies.

Such dashboards may well have a useful role in a corporate setting, but it will be up to an institution’s leader to make sure that an individual’s incentives—the metrics they choose to monitor their performance—are appropriately aligned with those of the larger organization.

There have been conscious efforts, particularly among high tech firms, to define new metrics to measure corporate performance. For example, rather than looking at return on assets, some west coast Internet companies have attempted to focus on a different ROA—

return on attention—based on the assumption that they will eventually profit if they can attract and hold the attention of a sufficient number of users (sort of an updated version of the mass media’s strategy of “counting eyeballs”). But Tim Young, Vice President for Social Enterprise at VMware, acknowledged that there is a “dark mood” among managers who have realized that their ability to generate revenue from users’ attention is relatively limited. They may believe that attention should be valued more highly, but so far the market has not agreed with that argument.

Who needs to innovate? In some industries, like financial services and telecommunications, firms that have failed to innovate are “near death” according to JP Rangaswami. But is it necessary for all companies to pursue innovation? Kenneth Cukier, Japan Business and Finance Correspondent for *The Economist* magazine, suggested that there are organizations that do not want to innovate or to empower individual employees. The TSA, for example, needs to have clear rules and procedures that everyone follows closely. They do not want their line workers to have discretionary power. Similarly, power plants or McDonald’s stores focus on reliability and consistency, not creativity in their employees. Where consistency and operational efficiency matter, a hierarchy may be the most appropriate structure.

Jack Hidary, Founder and President of the Jack Hidary Foundation, commented that there are two very different kinds of companies in this country. First, there are companies that have “massive research machines,” that depend on new products and services for growth. Then there are other companies that do little or no research. For example, there are 3,000 utilities in this country that are forbidden by regulation to do research. Companies such as these that lack an internal source of innovation may require an external force to encourage them to become more innovative.

Even if all companies need to innovate to some degree if they are to survive, not all parts of a company may have the same need to innovate. Some people in an organization may need to be innovative while others are needed to keep legacy systems running smoothly. Ray Ozzie, the former Chief Software Architect at Microsoft, noted that during his time at the company there were different approaches to innovation in different parts of the company. How a division approached innovation

depended on its size, the nature of its product and its profitability and the competitive environment in which it operated. In the case of the Windows division, an “existential threat” from alternative operating systems mandated the need for a large-scale response to the challenge it faced. In the case of the Office division, the challenges were more internal than external. And for Microsoft’s search business, the key metric is usage on a minute-to-minute basis. Given this variability, different metrics and different priorities are appropriate for different units. Perhaps the biggest challenge is to develop an overall framework that honors and appropriately rewards different styles of working.

The purpose of the firm. A fundamental question raised by Deloitte’s *Shift Index* is whether there is still a compelling rationale for large firms in a radically changed world. Peter Smith, Senior Vice President of Academic Strategies and Development at Kaplan Higher Education Corporation, argued that an institution can survive only if it does something that no one else is doing or is doing it better or more efficiently. For example, the function of hospitals is changing (and perhaps diminishing) as a higher and higher percentage of surgical procedures are being performed on an outpatient basis. But there is no substitute (yet) for emergency rooms or intensive care units.

...the dividing line between the inside and the outside of organizations is blurring.

—Cathy Benko

Advances in technology have made it increasingly possible for virtual organizations to perform the functions of traditional corporations. Falling communications costs and the decentralization of computing power have changed the rules of competition: Companies can run their businesses “in the cloud,” paying only for the resources they use, making it easy for them to scale the computing power they need as they grow. The cloud can facilitate collaboration among groups of geographically dispersed users by giving all of them access to the same resources. With these capabilities easily accessible, small companies or

even individuals can tap into resources that once were available only to large organizations, thereby lowering the barrier to starting a new business.

At the same time, online social networks represent a potential source of disruption to many traditional assumptions about how businesses operate. These networks provide unprecedented near real-time knowledge about the activities and opinions of a company's customers. They also enable new opportunities for collaboration both internally and, potentially, with external contributors. As Cathy Benko, Vice Chairman and Chief Talent Officer of Deloitte noted, the dividing line between the inside and the outside of organizations is blurring.

Mechanical vs. Organic Models of Innovation

According to Ann Pendleton-Jullian, Director of the Knowlton School of Architecture at Ohio State University, innovation springs from ecosystems. In this context, an ecosystem is a living, dynamic, indivisible whole. It is not a mechanism (or a "system") which has distinct separate parts that can be replaced without changing the essential functioning of the system. Even complex systems operate in an orderly, predictable way governed by definite laws of cause and effect. Complex systems may involve many different agents that have an impact on outcomes, but the agents can be identified and their actions analyzed and understood.

A mechanical system—a watch for instance—is divisible, while an ecosystem is indivisible because of well-developed interdependencies.

—*Sven E. Jorgensen*

Ecosystems, by contrast, are not linear and it is not possible to precisely predict the outcome of any input or action. With ecosystems in which elements are interdependent, every action alters the entire system. When one is dealing with an ecosystem, all one can do is to work on boundaries—for example, to set the boundaries of a task or

a problem, then let the ecosystem work. Rather than pulling levers to make things happen, one can only “modulate” an ecosystem in order to change it. If a modulation leads to a good result, then one can do more of it. If it does not work, then one stops. From this perspective, innovation is not something that can be dialed up in a mechanical way. It can be encouraged by finding or creating the right environment, then supporting that environment.

It is instructive to view organizations as ecosystems rather than as machines. But it is more useful to see individual enterprises as parts of larger ecosystems. Silicon Valley can be understood as an ecosystem that promotes innovation by encouraging collaboration and accepting failure as a normal part of taking risks and trying something new. In many other locations, by contrast, failure is not acceptable, which alters the entire dynamic by which new ventures are formed.

Cells, cities and corporations. Using biological analogies to describe how organizations function can be appealing and provide important insights. But there is a growing body of research that is providing evidence that the connections between these two realms is more than metaphorical. Geoffrey West, former President of the Santa Fe Institute, spent most of his career in high-energy physics before becoming interested in exploring “whether you can take some of the powerful techniques, ideas, paradigms developed in physics over into biology and the social sciences.”⁴ His work has revealed some remarkable connections between biological organisms and human institutions like cities and corporations.

From West’s perspective, biology has been largely a descriptive activity. He was interested in seeing whether it was possible to discover fundamental laws that govern biological processes. He began by investigating the lifespan of different species. Using a form of network theory, he found that the relationship between the lifespan and the size of different organisms ranging over 30 orders of magnitude, from tiny insects to the largest mammals, could be represented by a “very simple curve.” What the data showed was that metabolism, the most fundamental process of life, “scales non-linearly with size.” Essentially,

the bigger a creature is, the slower its metabolism is, and, as a result, the longer it lives. Since all living organisms are made up of the same types of cells, what is different is the way in which they are connected: “The cells of the whale...are pretty much indistinguishable from yours or mine....When you evolve a new species, you use the same units but you change the network.”

Having discovered this relationship in the world of biology, West began to wonder whether a similar type of analysis could be useful in the realms of social science and economics: “Can we make a science of cities...and a science of corporations?” Like animals, different cities seem to be very different from each other, but are there laws that can be expressed mathematically that describe how cities function at different scales? In particular, he wondered whether there is some way to account for the fact that, unlike animals, cities appear to be open-ended; that is, they seem to have no maximum size limit and, once established, never die.

Sure enough, West found that there was a predictable relationship between the size of a city and a number of different characteristics. This finding closely mirrored the relationship he had found among biological organisms, with one critical difference: As cities got larger (in terms of population), their requirements for infrastructure—measured by everything from the number of gas stations to the total lengths of roadways or electrical lines—scaled proportionately, but at a “sub-linear” rate. In other words, “the bigger the city, the less gas stations [or miles of roads or electrical lines] you need per capita.” This is an interesting finding, but it makes sense in terms of the similarity of cities to biological organisms in terms of their physical components.

But then West looked at “socioeconomic” characteristics of cities—things like “wages, the number of educational institutions, the number of patents produced” that have no direct analogy to biological functions and how they related to the size of cities. These factors, he found, also scale with a city’s population, but in a super-linear rather than a sub-linear fashion: “Instead of [having] an exponent less than one, indicating economies of scale, the exponent [for socioeconomic factors] was

bigger than one, indicating what economists call increasing returns to scale.” There are economies of scale in physical infrastructure, making cities more efficient as they get bigger, a different relationship applies to non-physical factors which increase at a greater rate as cities grow. Proportionately, larger cities are more creative, wealthier and more productive than smaller cities.

According to mathematical theory, a big problem that comes with open ended, super-linear growth is that it leads to collapse: “You hit something that’s called a singularity...and it turns out that as you approach this singularity, the system...will collapse. You have to avoid that singularity in order to avoid collapse.” The answer to avoiding collapse, West concluded, is innovation: “A major innovation...that really changes the cultural and economic paradigm...resets the clock, and you can start over again with new boundary conditions.” In other words, if you want to have “continuous open growth, you have to have continuous cycles of innovation.”

Finally, what about companies? When he first began his research, West just assumed that companies were “little cities.” But that turned out not to be true. While cities are virtually immortal, companies have a finite lifetime. In terms of scaling, companies are more like animals than cities. Companies initially grow rapidly, then, at some point, they stop growing. While a company’s revenues increase linearly with size, their profits increase sub-linearly. Interestingly, “all the big companies stop at roughly the same value [which is] roughly a half trillion dollars” (which was precisely the market capitalization reached by Apple to become the world’s most valuable company the day that this was being written⁵).

Why do companies, unlike cities, die? West speculates that cities are able to achieve open-ended growth because as they get larger, their “dimensionality” increases—that is, the range of opportunities they offer, their ability to support specialized jobs, the diversity of their population, even their ability to accept “crazy people.” By contrast, companies, as they grow, tend to become more bureaucratic and rule bound, and their tolerance for diversity diminishes. (West notes that he seldom encounters crazy people walking down the corridors of large companies.)

Ecosystems for innovation: plantations and rainforests. Victor Hwang and Greg Horowitz are venture capitalists who have not only provided funding for many Silicon Valley start-up ventures but have worked with organizations like the World Bank and U.S. Agency for International Development (USAID) to promote innovation internationally. As practitioners, they came to appreciate the challenges involved with attempting to replicate the distinctive environment of Silicon Valley in places with very different histories, traditions and economic systems. Having observed a number of failures in efforts to spur innovation, they concluded that traditional models of innovation do not accurately convey the conditions that are actually conducive to encouraging and sustaining entrepreneurs to build new companies.

Interestingly, both the traditional view of innovation they describe and the new model they propose are based on biological paradigms. They characterize the conventional model of how to support innovation as that of a “plantation” where agricultural techniques are systematically employed to produce useful crops. Adding nutrients and eliminating weeds make it possible to produce a reliable crop yield. In this model innovation is based on providing appropriate inputs (ideas, capital and talent) and eliminating barriers (“weeds”) like burdensome regulations.

But unfortunately, these ingredients are not enough to produce successful innovations. One flaw in this traditional model is that when they started, many successful ventures were more like weeds than crops. There was little about these ventures in their earliest stages to differentiate them from many other ventures that were not ultimately successful: “Innovation is chaotic, serendipitous and uncontrollable.” Thus, the environment that is most conducive to nurturing innovation is not a carefully controlled and regulated farm but rather an environment in which all sort of organisms including weeds are able to take root and flourish. According to the authors, the most useful question to ask is not “How can we produce more crops more efficiently?” but “How quickly can we nurture the growth of good weeds?”⁶ The answer they give to this latter question is a rainforest. The authors use the analogy of a rainforest to account for the distinctive characteristics of Silicon Valley and suggest that attempts to replicate its success elsewhere

involves creating a pervasive culture made up of many different elements that is more complex, and more organic, than typical formulas for encouraging innovation.

Successful innovation requires a high degree of collaboration that involves openness and sharing of ideas, which requires a high degree of trust.

Analogies to biological processes permeate the authors' efforts to describe the conditions that promote innovation. For example, in arguing for the value of rapid prototyping, they argue that there is no substitute for experimentation and iteration when it comes to prototyping new products and testing them out in the real world with real customers. Natural selection works the same way in a real rainforest. The more genetic variations and mutations that are created, the more likely it is that a plant or animal that is better adapted to its environment will be produced. Innovation in rainforests is akin to the process of evolution. The authors cite research from biology, neuroscience, psychology, sociology and anthropology about how natural systems including human beings and human cultures operate. They assert, for example, that successful innovation requires a high degree of collaboration that involves openness and sharing of ideas, which requires a high degree of trust. They also acknowledge that people are fundamentally wired to be distrustful, especially of others who are not members of one's own family or tribe: "Our brains were designed for basic survival, not for building startup companies." Therefore, establishing the optimal environment for innovation requires creating conditions in which the "combined value of social norms and extra-rational motivations outweigh the human instincts to fear." Just as keystone species are critical to maintaining the biological diversity of an ecosystem, keystone individuals (dealmakers and brokers) and keystone institutions (banks, lawyers, VCs) play critical roles in making connections between people that are vital to accelerating the process of turning good ideas into successful enterprises.

Beyond the Edge: New Models for Innovation

In a world in which change is happening at a faster and faster rate, where competition is becoming ever more intense, the pressure to accelerate innovation also increases. In many cases, innovation involves coming up with new and better solutions to problems. But are there better alternatives to traditional approaches to problem solving? Participants in the Aspen Roundtable shared a number of stories about efforts they were involved with to introduce new ways of working that involved making changes to internal operations and opening up companies to more external input.

As an executive at a large pharmaceutical company, Alph Bingham was asked to review the company's research and development strategy. He found a striking lack of diversity to how problems were being addressed: Every problem was assigned to someone who was expected to solve it and was typically well-qualified to do so based upon what could be gleaned from their resumes and career experiences. The most challenging problems were assigned to the company's best, most experienced experts. But how good was the company in figuring out who was actually best suited to solve a particular problem? As an experiment, Bingham devised a new system that would broadcast problems that needed solving in order to "precipitate out hidden problem-solvers." He discovered that solutions did not always come from the most obvious candidates (in fact they rarely did), but rather from people who happened to be best qualified to solve a very particular problem at that particular time. Unfortunately, who these problem solvers were was very difficult to identify in advance.

Thinking about this experience, Bingham realized that in any population in relation to a particular problem there is not a hard line between experts and non-experts, but rather there is a wide distribution of people in terms of their qualifications:

Experts <-----> Amateurs

In fact, expertise is distributed according to a power curve, with relatively few highly qualified (highly probable) individuals but a "long tail" of people who might have just the right knowledge, perspective,

experience and “aha moments” needed to solve that problem on that day. The cumulative area under this long tail would appear to be larger than that under the credentialed experts.

To test this hypothesis, Bingham’s colleagues at InnoCentive and several academicians (Karim Lakhani, Eric von Hippel and Kevin Boudreaux) looked at more than a thousand problems posted on InnoCentive and the proposed solutions without identifying the qualifications of the solvers. Sure enough, most of the solutions came from the right side of the curve. The slope of this expertise curve was even more obtuse than the one that characterizes the original “long tail” that describes the sales of current best sellers versus backlist books on Amazon.com.⁷

But how can a company take advantage of this knowledge? When a firm decides to hire new staff, it always concentrates on the left side of the continuum, seeking to recruit the most qualified experts. Is there some way for companies to take advantage of the resources all along the continuum? How can companies move beyond reliance on individual experts to tap into larger reservoirs of talent? Participants in the Aspen Roundtable offered a number of examples of new approaches that are yielding real results.

Creating a marketplace for solutions. What if it were possible to wait until after a race is run, then place a bet on the winner? In a less connected world, it made sense to identify and recruit the best experts and put them to work solving a company’s problems. But in a highly connected world, it is possible to broadcast problems beyond the confines of a company and its employees. In fact, there are far more potential problem solvers in the world at large than in any one company, no matter how big it might be. InnoCentive, which Bingham co-founded, is an Internet-based “global innovation marketplace” that matches problems (“challenges”) with problem solvers. Companies describe problems for which they are seeking solutions and indicate how much they are willing to pay for solutions. Anyone anywhere in the world can respond to these challenges by proposing solutions. Some challenges are highly technical and specific (“Seeking

2-(4-Pyridyl)-4-Phenyl Thiazoles”), while others focus on finding interesting product or business concepts (“Seeking Products that Enable the Elderly to Fulfill Their Potential”).

Since its founding in 2001, more than 250,000 registered solvers have submitted more than 30,000 solutions to more than 1,400 posted challenges, earning more than \$9 million in awards. The scale of the problems that InnoCentive is designed to solve fall somewhere between the X Prize (multimillion dollar awards for grand challenges) and Amazon’s Mechanical Turk (very modest rewards for performing small tasks). Awards on InnoCentive vary from \$500 (“Submit a compelling descriptor of a crowdsourcing innovation”) to as much as \$1 million (“Provide a method for doubling the scale of genome sequencing using a specific device”), with most awards ranging from \$10,000 to \$150,000. True to the shape of the long tail, a few participants have submitted winning solutions to multiple problems, but the majority of winners have been successful in just a single challenge. In fact, the winners are often teams of people rather than lone individuals. InnoCentive actively encourages people to work together and offers online “team project rooms” to facilitate collaboration. Solution seekers include companies, government agencies and nonprofit organizations. The result is a win-win: Organizations are able to tap into a network of problem solvers that is vastly larger than their own employee base, while many individuals who may lack the credentials to be hired as experts get the opportunity to take on real problems and get rewarded for solving them.

John Seely Brown noted that InnoCentive has found a way to tap into a deep reservoir of craft, tools and tricks that can be critical to solving specific problems. Ironically, these techniques are neither taught nor valued in the formal education process but they are often more useful in practice than the knowledge that has been accumulated by credentialed experts with academic degrees. Moreover, even though divergent thinking across disciplines is often powerful, firms are generally reluctant to hire divergent thinkers. But a mechanism like InnoCentive makes it possible for companies to take advantage of such thinkers in solving difficult problems without having to put them on staff.

The Power of the Right Incentives: DARPA's Balloon Challenge

In December 2009, to commemorate the 40th anniversary of the founding of the Internet, the Defense Advanced Research Projects Agency (DARPA) offered a prize of \$40,000 to the first individual or team that found the geographical coordinates of ten red weather balloons tethered in different locations around the U.S. Given the nature of the challenge, it was apparent that it would be necessary to recruit a large number of people to help find the balloons, but a group of MIT students led by Professor Sandy Pentland beat out 4,000 other competitors by offering the right incentives: Each individual who found a balloon was awarded \$2,000, but, in addition, the person that recruited the finder got \$1,000 and whoever recruited the recruiter got \$500 and so on. In the end, the MIT group required just eight hours and 52 minutes to find the ten balloons.⁹

Democratizing expertise. Another example of the limits of expertise was provided by Luke Lonergan, Chief Technology Officer in the Data Computing Division of EMC. He noted that there is a growing recognition of the power of “big data” to tackle problems that have not previously been solvable and to help businesses operate more efficiently. Unfortunately, the only people who are currently able to use the tools needed to analyze these large data sets are statisticians with PhDs. The number of people with such credentials is limited, and finding and hiring them is difficult. To break this bottleneck, EMC is attempting to create a “more democratic environment” by developing simpler analytical tools that can be used by a larger number of people. The company is also creating use cases that can be shared with others to demonstrate how these tools can be used.

Decentralizing authority. Is there a better way to ensure that workers are working on the right tasks? When he was in charge of a group of technical workers, Alph Bingham struggled to find the best way to allocate work to his staff. He found that he was guessing about who should be assigned to what project. He realized that his choices were rarely optimal and that individuals knew best what workloads they had and when

they are or are not available to take on additional tasks. So he decided to experiment with a “pull” system that was based on creating a marketplace for work: Tasks that needed to be done were posted publicly and workers could bid on the right to work on them using time as a currency (they had to specify a date by which they committed to completing the project). During a six month pilot phase, the new marketplace structure resulted in a better record of projects getting completed on time compared to the traditional process of giving assignments. The next logical step would be to align the incentive system with the new regimen by providing bonuses for projects that were completed on time. But, before he was able to implement this next step, the experiment was shut down after objections from managers who felt that ability to allocate work was a key duty that they were reluctant to relinquish.

Bringing social networking into the enterprise. Socialcast was founded in 2005 to be a “Facebook for the enterprise”—that is, to provide companies with social networking tools to increase their “internal metabolism” by enabling employees to communicate with each other more efficiently, share knowledge, identify co-workers with compatible skills and encourage greater internal collaboration. In July 2011, the company introduced a new feature that allows companies to incorporate external contributors—partners, vendors, contractors and customers—into existing internal social networks.

Tim Young, Vice President of Social Enterprise at VMware and founder of Socialcast (which was acquired by VMware in 2011), described two examples of how large companies are using these tools to increase their responsiveness to changes in their markets. A large “big box retailer” was concerned that the feedback that it was getting on product sales was too slow for it to react in time to make adjustments that would drive greater sales, particularly in the fourth quarter of the year, which is the company’s most important period for sales. The company equipped its employees with digital cameras and asked them to take photos of shelves in their stores and competitors’ stores and submit them via Socialcast. The retailer received more than 150,000 photos, all tagged with GPS data, which it used to understand what was happening in the market at an unprecedented level of detail and make adjustments in real time. The result was a year-over-year increase of 22 percent in same store sales.

For book publishers, the ability to make accurate forecasts of the sales of new book titles is extremely important. However, a few years ago, Random House discovered that the forecasting technique that it had relied on for more than two decades was breaking down and becoming less reliable. The reason, they discovered, was that their model was not able to account for sudden spikes in sales of books that “went viral” because of social media. The publisher modified its methodology to incorporate more market data; it would make an initial forecast as before, but then obtained real-time sales data from its network, which it used to trigger changes to the forecast.

Salesforce.com’s Chatter, introduced in 2010, is also intended to integrate the capabilities of social networking with more traditional business processes. The network can be run inside an organization’s firewall to enhance internal communications. It allows workers to follow other workers or to link to business documents or data files. It can also be opened up to include external parties. JP Rangaswami described how Toyota adopted Chatter as a means of moving beyond the confines of its consensus culture. It created a network that linked the company with its dealers, suppliers and customers in order to help it respond more quickly to external issues. Toyota realized that there was a risk in enabling customers to talk with each other, but recognized that they would find other channels to do so even if Toyota did not set up its network.

Customers strike back. It is not only companies that are using social networks to improve their decisions. Customers are doing so as well. According to Jack Stephenson, Director of Mobile, E-Commerce and Payments at JPMorgan Chase, the Wi-Fi networks at Best Buy stores crashed on Black Friday (one of the busiest shopping days of the year, driven in part by big sales) because so many customers were using their mobile phones to check on prices from other sources for products they were considering buying.

Recent research studies confirm the growing importance of social networks. The 2011 Social Shopping Study published by PowerReviews found that 90 percent of consumers in a survey reported that online reviews had an impact on their buying decisions, and 60 percent said that reviews were the most important factor. Approximately one-third of all consumers were using social networks for product research and

half said that they had “liked” a brand or a product.¹⁰ Another recent study from Performics reported that half of active social networkers used those networks either to give or get advice on products/services, companies or brands.¹¹

Crowdsourcing news. It is no secret that the traditional news business is under pressure. Newspapers all over the country have been experiencing declining readership and diminishing ad revenues, while broadcast news organizations are facing growing competition from both from cable news channels and online media. At the same time, the rise of online networks has created interesting new opportunities for gathering and disseminating news. One encouraging example of how public broadcasters have leveraged the power of the Internet to expand their ability to tap into multiple news sources is provided by the Public Insight Network (PIN), developed and operated by American Public Media. The Network provides some 60 participating public radio newsrooms with access to a database of more than 130,000 individuals with expertise in various topics who have agreed to serve as “public sources” and can be called on by journalists working on news stories. Involvement of PIN members ranges from providing background on a story under development to being quoted directly by reporters in their final on-air reports. Network members also have opportunities to suggest topics for stories that they would like to see covered.

Joaquin Alvarado, Senior Vice President for Digital Innovation at American Public Media, illustrated the value of PIN by describing how one public radio reporter used the network to amplify a story. When a reporter for Southern California Public Media (which operates stations in Pasadena and Redlands, California) was working on a story about a prison riot, he initially believed that it had been precipitated by racial tensions among inmates. But then he connected online with a woman whose husband was an inmate at the prison who claimed that the real cause of the riot was inmates’ anger about overcrowding and inadequate health care services in the prison. The reporter used PIN to develop more than 500 sources who contributed to the story, which changed the coverage substantially. The resulting reports eventually won awards for the station and the woman who was the original impetus for expanding coverage of the story. PIN can also be used by reporters to “pretest” a story idea by putting out a concept to the network and seeing how much interest it generates.

Another approach to increasing audience involvement with news is represented by Budget Hero, an online game developed by American Public Media and the Woodrow Wilson Center. The game was originally introduced in 2008 and updated in 2011. Based on real data from the Congressional Budget Office, the game challenges players to balance the federal budget by making decisions about levels of spending and taxation. Interestingly, a tab on the game's home page invites players to "be a source" for NPR by joining the Public Interest Network.

It may be possible, Alvarado suggested, to apply the dynamics of games to work. He has launched an experiment at American Public Media that involves getting the members of a team to form a "clan" whose mission is to devise a game to solve a specific problem.

Lessons about What Works

Are there useful lessons about what works in improving decision making and accelerating institutional innovation that can be drawn from this disparate group of experiments? Here are a few that emerged from the Roundtable discussion:

- ***Amplify the power of small teams.*** According to Amazon.com's Jeff Bezos, no team should need more than two pizzas for dinner. As soon as teams get larger, formal procedures and rules start to get developed, political forces start working and efficiency goes down. But keeping teams small is not always easy and often requires strong support from the top of the organization to ensure that teams do not grow too big.
- ***Leverage the power of collective intelligence.*** There is a growing body of evidence that groups of people, if organized properly, can make better decisions than any individual in the group. Tom Malone at MIT has been exploring the power of collective intelligence and found that a group's intelligence is not closely correlated either to the average IQ of a group's members or the IQ of its most intelligent member. Rather, how well a group performs together on relatively simple challenges provides a good predictive measure of how they will perform on more difficult challenges.¹²

The Internet represents a potentially powerful means for expanding and amplifying the power of collective intelligence. Internet-based tools such as wikis that can provide repositories for a group's memory represent mechanisms that can capture and perhaps even amplify collective intelligence.

- ***Move beyond “the tyranny of the expert.”*** To illustrate the perils of relying on the abilities of a single expert, Alph Bingham suggested thinking of a complex problems (and “solution space”) in terms of outer space, with solutions to the problem represented by individual stars with a lot of dark emptiness between them. If a lone expert tries and fails to solve a problem, he is likely to find himself in a cold, dark place. By dint of persevering, he may eventually find a star, but that may not represent the best possible solution to the problem. Through a mechanism like InnoCentive, it is possible to introduce a problem to perhaps 10,000 potential solvers. If, say, 500 of them self-select and tackle the problem, the great majority is likely to end up in empty space, but a handful may step right upon a star and that handful will map stars of varying brightness (optimality). With this kind of math, it is much more likely to generate multiple good solutions to a problem than even the most brilliant lone expert is likely to do.
- ***Tap the desire to learn.*** Learning comes from doing, and especially from tackling challenging assignments. Peter Smith noted that most people do not have to be forced to learn. In fact, people typically spend more than 700 hours each year learning new skills, with some people spending as much as 1,500 hours per year in learning activities, much of it voluntary. Appealing to an employee's desire to learn by undertaking something new can provide the “juice” that powers innovation.
- ***Create a marketplace for ideas.*** Providing the right incentives and rewards can be critical elements in building a successful culture of sharing. Lew Tucker, Vice President and Chief Technology Officer for Cloud Computing at Cisco Systems, described an effort that he made when he was at Sun to cre-

ate a community of Java developers. The first iteration of the community failed because it lacked incentives for participation. When the community was re-launched, it included a marketplace mechanism that enabled developers to get paid for finding solutions to problems. Before long, community members were providing bug fixes for Java faster than the company could. Customers were happy because of the rapid response to their problems, and the company's engineers' jobs got easier without the pressure of having to respond to every problem.

Salesforce.com has created a similar marketplace, AppExchange, where developers can offer applications they have created for sale, and where companies needing custom development can post their projects and solicit bids from potential contractors.

- ***Reduce the cost of failure.*** Innovation will not happen if people are afraid to fail. One of the hallmarks of Silicon Valley that is often cited as part of the region's success in creating an environment conducive to starting new ventures is its willingness to accept failure as a normal part of trying something new. Alph Bingham proposed that it's useful to think of Silicon Valley as a "supercorporation" where risk is distributed widely, and those who take risks (like venture capitalists and entrepreneurs) are celebrated and often richly rewarded. If it is serious about pursuing innovation, a willingness to tolerate failure has got to be part of a firm's—or a region's—culture, not just a slogan.
- ***Align with corporate culture.*** No innovation, no matter how promising, is likely to succeed unless it is aligned with the existing culture of an organization. Initiatives that run counter to a prevailing culture are almost certain to meet with resistance. When Marshall (Mike) Smith, a visiting scholar at the Carnegie Foundation for the Advancement of Teaching, worked at a large government agency, he discovered that anyone who tried to be innovative was violating the agency's norms and had to confront peer pressure. Organizational cultures can be changed, but doing so is typically a large challenge that takes time and a strong commitment.

- ***Treat every problem as unique.*** Large organizations like telecommunications companies get large numbers of complaints. Typically, these complaints get summarized then passed on to the ultimate recipient who is supposed to solve the problem. But the summaries they get are often flawed and filter out key aspects of the problem. An alternative way of dealing with problems is to create a “reverse blog” in which every complaint becomes an individual blog post. Instead of handling “routine” problems routinely and handling the rest as “exceptions,” this approach encourages more customized, more nuanced responses. The result will be more satisfied customers and greater organizational knowledge of the actual state of the marketplace. By recognizing that it is no longer possible or necessary to pursue repeatable processes, it becomes possible to treat every problem as unique.

Pulling Talent: The New Recruitment

How do firms attract the talent they need? What mechanisms can broker between the needs of companies and the skills and interests of potential employees? And what can companies that are committed to innovation do to hire creative people and encourage them to be innovative?

As companies develop a short-term perspective, so do their employees.

According to John Kunzweiler, CEO of M Squared Consulting, the world in which business operates has changed over the past decade in ways that directly affect the hiring process. First of all, in the wake of the financial crises, companies laid off a lot of workers. The people who had to do this found the process to so unpleasant that they do not want to have to do it again, which makes them reluctant to hire a lot of full-time employees. Second, the nature of work has changed. Work has become more “modularized.” Rather than worrying about the long-term development of a group of employees, managers now have to function more like portfolio managers with a bunch of projects.

Finally, employees' expectations have changed. Having watched what has happened to themselves and their parents, they do not expect to get a long-term commitment from an employer, and they are not interested in developing a long-term relationship. As companies develop a short-term perspective, so do their employees. At the same time, workers are interested in having more freedom and more choices of what they will do and how they will do it. In fact, the basic definition of a worker's identity is changing. It used to be based on where they went to school, what job they had last, or their place on an org chart. But now identity can be based on what an individual can contribute, which may have little to do with formal credentials.

Most innovation comes from teams.

—Jack Stephenson

Some companies are actively attempting to mine this kind of nontraditional information, to find employees who have a wider range of skills that can be mobilized to improve corporate performance. Tim Young recounted that when VMware rolled out Socialcast's network to all of its employees after it acquired Socialcast, it quickly discovered that some employees were "superconnectors"—people who were unusually active in linking people to others inside the company and were engaged in constructing identities for themselves on external networks like Twitter and LinkedIn. This kind of information made it possible for the company to identify skills that had not been captured in employees' standard job descriptions.

Not all companies are the same, however. For example, a company's size and maturity determines how it recruits new hires. A large, well established (and still growing) company like Microsoft is able to hire in a programmatic way, according to Ray Ozzie. It can offer well defined career paths. But start-ups are completely different. Since they cannot offer a clear vision of a future, they need to recruit people who are comfortable with risk and can live with uncertainty. (Ozzie acknowledged that, while Microsoft has faced challenges, it has not experienced a "big failure" which would motivate it to change the way it operates. And

because of the company's size, it now has complex internal cultures that resist change. The best way to get results in such an environment is through "subversive methods.")

How companies treat their workers after they are hired is also in flux. If both employers and employees are unwilling to make long-term commitments to each other, then it makes sense for both to focus on different goals. Cathy Benko noted that individual workers need to take more responsibility for their careers. If advancement is no longer a matter or an orderly climb up a corporate ladder, then workers need to be more actively engaged in the choices they make and to find multiple pathways for their own development. If they believe that the knowledge they have is becoming obsolete, they need to make sure that they keep learning.

Companies should share the responsibility of helping employees develop their skills, even if their careers are not going to be entirely within that company. But firms that only manage for the short-term may not be willing to invest in this kind of development. In addition, it can be difficult to recruit people internally to work on projects that are viewed as risky. The main goal for many workers, particularly in large organizations, is just to have a stable, well-paying job. If workers are assigned to projects without taking into account their risk tolerance, it is possible to get people who are not comfortable in their assignments, providing a potential obstacle to successful innovation.

The "I" in team. If innovation is a team sport, then the key to acquiring talent may be less about hiring outstanding individuals and more about assembling the right groups of people. According to JP Rangaswami, successful teams need four very different kinds of people: spades, people who enjoy doing research and will dig deeply into a subject; hearts, individuals with high emotional quotients who are interested in building community; diamonds, those who are motivated by accumulating points; and clubs, those who "like to beat up and kill people." He discovered that he himself was not good at putting effective teams together, but that there are people who are skilled at building teams.

Sustaining a strategy of hiring only the "best and the brightest" is difficult and may not lead to optimal organizational performance. If there really is such a thing as collective intelligence, then the goal of recruitment should be to hire the collective that will perform the best.

As Jack Hidary noted, the challenge today is not finding the most talented individuals, but finding the best fit between a company's needs and the capabilities of its workers. The good news is that we have gotten better at doing this kind of matching—online dating services are now responsible for nearly one out of six marriages.¹³ The bad news is that companies have so far not made use of this knowledge. At a time when millions of Americans are looking for work, there are more than three million unfilled jobs¹⁴ that are being filled at about half the rate as before the crash.

If there really is such a thing as collective intelligence, then the goal of recruitment should be to hire the collective that will perform the best.

Promoting Innovation in Non-Business Institutions

If getting companies to be more innovative is challenging, it is even more so in the nonprofit world. Since businesses are presumably motivated by profit, there are powerful incentives for them to make changes that will increase their profitability. As we have seen, factors like complacency, tradition and deeply entrenched corporate cultures often work against change, but ultimately the marketplace should ultimately force companies to make the changes needed to remain competitive. But these pressures do not operate in the same way among nonprofit organizations or government agencies, which, even though they still have bottom lines, tend to be “mission driven.” (Since nonprofit organizations do not, by definition, generate profits, it is not possible to measure their performance over time as Deloitte's *Shift Index* does for corporations.)

Despite these formidable challenges, the Roundtable found examples of innovation in the nonprofit world that offer useful practical lessons and argue against giving up hope for positive change.

A growing number of nonprofit organizations are becoming more “entrepreneurial,” driven in part by funders who are putting more emphasis on accountability and outcomes rather than funding “activi-

ties.” When an organization sees funding as an asset—a way to cover its costs—it generally discourages innovation. But when funding is viewed as a liability—an obligation to achieve something—it can spur innovation. Jack Stephenson stated that the nonprofits he has worked with were “among the most innovative organizations he has seen.” They had big missions and were attempting to take on tough problems with limited resources, which forced them to be creative in order to accomplish anything.

**...when funding is viewed as a liability—
an obligation to achieve something—it can
spur innovation.**

Entrepreneurialism in the nonprofit world can take many forms. When Ellen Levy moved from the corporate world to take on an industry affiliation program at Stanford, she needed to figure out what would motivate everyone who might be involved to participate. She quickly realized that each key group—university faculty members and potential corporate or government sponsors—had different perspectives and different needs which would have to be satisfied if they were going to support the program. She needed to “structure serendipity” so that they could come together around a single project by identifying a research topic that would interest all of the parties. While the topic was the same, the way it was valued by the different parties varied. Faculty members are typically motivated by the desire to generate new knowledge in their disciplines and are much less interested in getting involved with the application of their work. The “ROI” that generally mattered most to them was about their ability to do *research of interest*. By contrast, companies are not set up or incented to think about academic boundaries; they just want practical results they can apply to their businesses. Therefore, corporate sponsors were willing to fund research only if it generated a tangible *return on investment*. Government sponsors and university administrators cared about yet a different ROI—*results of importance*. The best scenario was when a single research project provided positive ROIs to all of the parties.

Compared to independent nonprofit organizations, inertia tends to be stronger and openness to change to be lower within government agencies. Entrepreneurial initiative is sometimes recognized and rewarded at nonprofit organizations, but this rarely happens in government agencies which are typically driven by external mandates and dominated by bureaucratic structures. According to John Edgar, Vice President of Information Technology at the U.S. Postal Service, success in government agencies is too often defined as spending money, not getting something done. Being efficient is a good thing in so far as it frees up capital, but no agency can, on its own, divest itself of a part of its mission. For many agencies today, including the Postal Service, the biggest challenge is figuring out how to do everything they have always done but with less money. Mike Smith, who spent nearly two decades working in government including serving as Under Secretary in the U.S. Department of Education, agreed that cutting government programs is difficult since decisions about funding are unavoidably political. Every program has a constituency that supports it and will fight to keep it going. Governance of agencies is “a huge problem.” And the prevailing narratives that government does not work—that it is too big, too dumb, too inefficient—work against bringing about positive change.

Still, the Roundtable participants insisted, change is possible. One strategy that has often been used by those who are determined to make a difference is to act subversively. While this can produce short term results, it rarely scales. Another approach is to work incrementally over time, gradually building support for a new direction. When he was at the Hewlett Foundation, Mike Smith provided the initial funding to MIT for its initiative to provide free online access to its course materials, which inspired other universities to join what came to be known as the open education resources (OER) movement. OER resources were free to everyone with access to the Internet and, for the most part, licensed to allow users to modify and adapt the materials to their particular circumstances. Eventually, the Hewlett foundation provided over \$100 million to support the movement.¹⁵

When he moved to the Department of Education, Smith was interested in expanding support for OER by providing federal funding to supplement the contributions from private philanthropy. When the Department was unable to secure substantial new funds, he found

money in existing programs that could be repurposed to support OER. As more materials were made available, the Department supported a meta-analysis of evaluations of existing technology interventions research which showed that, on average, taking a course online was as good as or actually better in terms of student learning than taking the same course in person. Studies of OER courses at Carnegie-Mellon showed the same pattern of results as the meta-analyses. As the evidence accumulated for the value of OER and educational technology in general, it helped the OER movement gain acceptance. Despite strong resistance to the OER movement from publishers and some faculty members, we are now beginning to see “serious innovation” taking place in opening access to education.

Changing the narrative. Key to Smith’s success in generating support for OER, according to John Seely Brown, who has been an enthusiastic supporter of the movement, was his ability to create a new narrative that mobilized action. Instead of narrowly defining the role of technology as improving the efficiency of education (typically by bringing computers into the classroom, which was the classic view of “ed tech”), Smith saw technology as liberating education from the confines of the classroom and making it freely available to students anywhere in the world.

Another encouraging example of how “changing the narrative changes the game” is provided by the experience of Dan Atkins at the National Science Foundation (NSF) in focusing attention on the importance of “cyberinfrastructure.” For many years, NSF’s interest in computing was limited largely to supporting computer science research and the development of advanced supercomputing capabilities. After an initial career conducting academic research on computer architecture and high speed computer arithmetic, Atkins became interested in cyberinfrastructure—the potential of computers as tools for learning and for supporting distributed “communities of knowledge.” Because the concept was so new, there was little awareness of it. To build support for the field, Atkins chaired a blue ribbon NSF panel that issued a landmark 2003 report titled *Revolutionizing Science and Engineering through Cyberinfrastructure*¹⁶ that greatly expanded the visibility of the concept. The report helped to shift the agency’s priorities and led to the creation of an Office of Cyberinfrastructure at NSF that oversees an ongoing program of funding in this area.

Designing change. It is possible, according to Ann Pendleton-Jullian, to consciously design transformative changes. Narratives have an important role to play in motivating and shaping change, but they need to have some particular characteristics to be effective. First, a narrative cannot be “single minded.” It has to have enough strategic ambiguity that it can encompass a variety of interpretations and perspectives that allows a larger number of people to buy in. In addition, a large-scale “meta-narrative” needs supporting micro-narratives that are consistent with it. The micro-narratives provide pathways that let individuals connect to the meta-narrative. Thus, someone interested in effecting change is well advised to be aware of what micro-narratives currently exist “on the street,” then offer a meta-narrative that is consistent with the micro-narratives and provides a context that aligns them into a bigger, grander story.

Finally, while a narrative can be effective in catalyzing change by providing a rationale for action, it cannot, by itself, effect change. In addition to meta- and micro-narratives, practical mechanisms are needed to do that.

Strategic plans often serve as a mechanism to guide change within an organization. In the case of Arizona State University (see sidebar), the meta-narrative of transformative change is supported by a set of high-level “grand challenges,” which, in turn, are being translated into a series of specific initiatives and programs that respond to the challenges and that serve as mechanisms for effecting change. For example, the campus now houses a Decision Theater—a physical facility that incorporates visualization and simulation technologies intended to be used to explore and seek solutions to problems in areas such as public health, environment and urban development. The theater, which is open to use by groups from the community, represents a concrete manifestation of the challenge to “focus information and technology to produce meaningful change.”

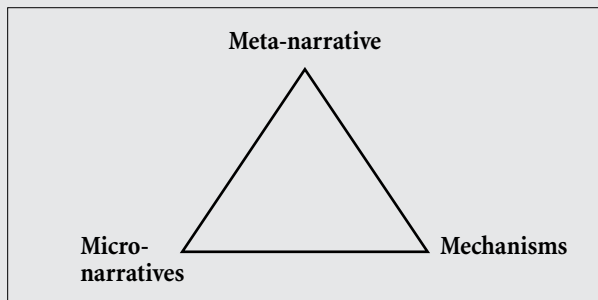
The Power of Narrative: Reinventing an American University

In 2002, Michael Crow became President of Arizona State University (ASU) in Phoenix. Before long, he announced that he intended to transform the school into a national model for the New American University that would not merely pursue research and education, but would focus on finding solutions to important real-world problems. Instead of being organized according to traditional academic disciplines, the university would be structured around eight “grand challenges.”

- How do we educate in a rapidly changing world?
- How do we focus information and technology to produce meaningful change?
- How do we build strong, vibrant communities?
- How do we create a sustainable way of life?
- How do we promote economic opportunity and security?
- How do we lead healthier, more fulfilling lives?
- How do we defend and extend human rights?
- How do we understand the past and present for the sake of our future?

To fulfill this vision, ASU established more than a dozen new transdisciplinary schools and large-scale research initiatives including a Biodesign Institute and a School of Sustainability.

These three elements—meta-narratives, micro-narratives and mechanism—form a triangle whose precise shape is determined by the prevailing circumstances.



Change and crisis. What is happening at Arizona State is an example of radical change. Another example, offered by Jack Hidary, is the MC2 STEM High School, an educational initiative sponsored by the Metropolitan Cleveland Consortium for STEM in collaboration with General Electric, a major employer in the community. GE had become concerned about the quality of public education in Cleveland because of the increasing difficulty it was experiencing finding qualified job candidates who had been educated in the community. Incremental change would not make enough of a difference. So, the project planners decided to “rip out the entire procedure-based curriculum” for science education at the secondary school level and replace it with a new challenge-based approach. The new school, which is part of the Cleveland Metropolitan School District, was launched in 2009. It is located on the campus of General Electric’s Lighting World headquarters in Cleveland, which permits students to work with and even have lunch with GE engineers.¹⁷ The school runs on a year-round basis, and each quarter, the school’s faculty get together to prepare a new challenge that will engage the students. Because the school represents such a radical departure from conventional education, it was not easily accepted by the school district’s unionized teachers.¹⁸ After its first year of operation, half of the teachers left, while the other half have stayed.

It took a crisis in education to bring about this kind of radical change in Cleveland. But is it necessary to provoke a sense of crisis to engender a big change? Mike Smith suggested that in the area of science education we may be revisiting the scenario that took place a half century ago after Sputnik. The shock of that event convinced many people that the Russians had beaten us through better science education and, therefore, we needed to make big changes. But the sense of urgency eventually dissipated. In the era of No Child Left Behind, education has focused increasingly on “teaching for the test” with the predictable results that “we get what we test for” and the goals and focus of education are narrowed.

However, there are some places where test results are being used well as part of larger improvement efforts. For example, the state of Massachusetts and the Long Beach School District have been using test results over the past two decades to help re-align resources to continuously improve the quality of education. These efforts have created

educational enterprises that function well and that are internationally competitive. But such long-term improvement efforts are rare in an educational system whose governance is politically driven. This leads many to suggest that dramatic rather than incremental change is necessary to compete internationally. The intersection of the new opportunities for education through the growing availability and quality of OER, together with the urgency created by international competition, may be creating a receptive environment for truly disruptive innovation.

Leading Innovation

What are steps that an organization's leader can take to maximize innovation and empower the value that that talent can bring to the organization? What policies, internal or external, are necessary to create talent-driven organizations?

**Leadership is how we behave at
10:00 in the morning.**

—*Peter Finkelstein*

If an organization's culture shapes behavior, if it helps determine how much risk and how much innovation an organization is willing to tolerate, what shapes that culture? Peter Finkelstein, partner at Change Logic, was trained as a psychiatrist and has specialized in understanding the interactions between people and organizations. In his view, culture is set forward every minute by how we behave. For example, Finkelstein described working with the CEO of a high tech company who wanted to create a more open, more risk-tolerant environment for employees. Yet the CEO himself often displayed impatience, sometimes by the second PowerPoint slide, with presentations that did not meet his expectations. The result was to discourage risk-taking by his own staff members.

Such behavior is a good example of what Chris Agyris, the father of action science and a pioneer in organizational learning, described at the difference between espoused theory and theory in use. The former

is how we explicitly explain our goals and our priorities to ourselves and to others, while the latter is the way we actually express them in our actions. It is the latter that most directly reveals the values that determine our behavior. Dissonance is created when the two types of theories are not in sync with each other, and we become more effective when there is congruence between them.¹⁹

For a leader who has created an organization's existing culture, to move that organization to a new culture is particularly challenging. Bringing about systemic change requires a high level of awareness of one's own actions and their consequences, which Agyris defined as double-loop learning. Finkelstein suggested that there is a lot of "wishful thinking" about talent development. It requires a strong commitment to people and their needs which may be at odds with the immediate goals of the organization. Real learning is often the antithesis of efficiency. It often means that someone needs to take on the role of a coach or mentor. Without this kind of commitment, real change on a human scale is often stymied.

The cost of innovation. Innovation is rarely simple or quick. At an earlier Roundtable, innovation was defined as *invention plus implementation*. And the latter step is often the most difficult and time consuming. Consider the case study of the innovation process described by Peter Finkelstein, the introduction of the technique of continuous aim-firing of guns on ships that turned naval gunfire from "an art to a science" and increased the accuracy in hitting a target at sea by some 3,000 percent. This is a classic case of innovation, first documented by historian Elting Morrison,²⁰ that came from the edge and finally prevailed at the core.

In the 19th century, naval gunfire was so inaccurate that a few hits on target out of 100 shots fired were considered a decent record. In 1898, when Percy Scott (later Admiral Sir Percy Scott), the captain of a ship in the British Navy, was observing the ship's crew during target practice at sea, he noticed that while most gunners were doing badly (as usual), one gunner was appreciably more accurate than the others. Recognizing what this gunner was doing differently, Scott figured out a way to take a fixed gun and mount it on gears that allowed the gun to be continuously trained on a target even on a rolling ship, resulting in an immediate radical improvement in the gun's accuracy. This

innovation, which seems obvious in retrospect, came about, Morison observes, as the result of “the intricate interaction of chance, the intellectual climate and Scott’s mind.” Good fortune was also responsible for the meeting the following year of Scott with a junior American naval officer, William S. Sims, while both their ships were posted to the China Sea. After seeing the superiority of Scott’s technique, Sims quickly adapted the guns on his ship for continuous aim firing and began to match Scott’s record of vastly improved accuracy.

Then came the hard part: Sims’ effort to get the U.S. Navy to recognize the importance of the innovation and adopt it for all of its ships. Sims began by writing a series of memoranda to his superiors that “documented the case for continuous-aim firing, supporting his arguments at every turn with a mass of factual data” about the superiority of the technique based on records of the tests he conducted. The memos were first met by complete silence from the Navy, then by “rational” (though completely erroneous) arguments rebutting Sims’ claims,²¹ then by name-calling (Sims was described as a “crack brained egoist” and “a deliberate falsifier of evidence”). Having despaired of getting a fair hearing from the Navy on his own, Sims then took the audacious but inspired step of appealing directly to then-President Theodore Roosevelt. Morison sums up what happened next.

Roosevelt, who always liked to respond to such appeals when he conveniently could, brought Sims back from China late in 1902 and installed him as Inspector of Target Practice, a post the naval officer held throughout the remaining six years of the Administration. And when [Sims] left, after many spirited encounters we cannot here investigate, he was universally acclaimed as ‘the man who taught us how to shoot.’

Although Sims did not discover the technique of continuous-aim firing, he was responsible for getting it widely adopted. A historian, Elting E. Morison, notes that Sims “had little of the mechanical ingenuity of Percy Scott,” but he immediately understood the value of what Scott had discovered. And while another American naval officer had earlier identified many of the key ingredients in the innovation, he had lacked Sim’s “overriding sense of social necessity” that enabled Sims “to force a revolutionary idea on the service.” It seems likely that Sims would not

have prevailed if he (as a junior naval officer) had not been willing to go completely outside of the bounds of accepted protocols of behavior to fight to get his innovation accepted.

Peter Finkelstein points out several other lessons from this story:

- A key factor in spreading the innovation beyond its initial discovery was the exchange of ideas between Scott and Sims in the context of their friendship and of casual time they spent together on their remote posting.
- Getting the innovation accepted by the U.S. Navy was made more difficult by the nature of its initial source—a British officer located far from the Navy’s headquarters.
- Even though the change proposed by Sims had a direct and substantial impact on the Navy’s core mission, it was opposed by the service’s leaders because they were identified with and heavily invested in traditional ways of doing things. Sims was, in effect, demanding that his superiors identify with the larger mission of the Navy rather than their personal interests.
- Creative destruction may be widely celebrated these days, but there is a reason that it is called “destruction.” The difficulty in getting people in power to shift identification is part of the reason that making changes can be harrowing.
- The role of a leader in promoting change involves continually assessing the way in which workers and managers identify with parts or with the whole of an organization.
- Sims was fortunate in having a commander-in-chief who was a champion of progress and thoroughly unsentimental about archaic arrangements. Without President Roosevelt’s support, Sims might not have succeeded.

Perhaps one hopeful sign of progress is that Morison’s account of this episode has been adopted as a case study at the U.S. Postgraduate Naval Academy. But similar battles to bring about change are undoubtedly being fought today in the face of equally intransigent resistance. Lew

Tucker of Cisco admitted that he is pessimistic about the prospects for attempting to explicitly orchestrate innovation. In fact, innovation can happen, and does happen, anywhere. What matters is how people in positions where they can make a difference, respond to it. Often what turn out to be brilliant innovations are initially viewed as “unrealistic ideas” which get crushed by organizations that they threaten. In the 1990s, Tucker was involved in the early days of the development of Java (which later served as the basis for Google’s Android operating system) at Sun Microsystems. Eric Schmidt, who was then the President of Sun Technology Enterprises, supported the project by “disconnecting them from the corporate network,” moving the team out of a company building into another facility and “encouraging them to think big.” In effect, Schmidt protected the project from being attacked by the company’s immune system while it was immature and vulnerable.

Ray Ozzie observed that people can be very creative in resisting change. Big, transformative innovations can take different forms, but often require a crisis to trigger change. And leaders who want to effect change need to have a plan for dealing with resistance. When IBM ran into trouble, CEO Lou Gerstner laid off one-third of the company’s employees and shifted the direction of the firm from hardware to services by rallying the organization around his new vision. When Microsoft recognized the threat posed to its core business by the Internet, the company’s founders acknowledged that they did not have the next narrative, but they did believe that a new narrative could drive change. They told this story over and over again, talking to thousands of employees and field personnel. They gave them all permission to think differently. The process made everyone uncomfortable but it gave them hope. They also celebrated small successes along the way and helped to set up the conditions for transformation by creating a coalition of the willing. This kind of change is not easy or certain to succeed. Ozzie admitted that he had participated in three cycles of 10-year planning that attempted to envision a very different future for the company. Although the exercise felt good, no one was ever able to figure out how they would “get from here to there.” He had greater success in working with one unit of the company, introducing a new process, and then getting it adopted by demonstrating how a new model based on that process could be successful.

When he worked for a very large firm, Tim Young was responsible for studying the morale of the company's workers. When he asked them how they felt on their way to work, the response was "anxiety." When he asked them what they thought about on their way home from work, they said that worried that they did not understand how what they did that day was supposed to contribute to the company's overall goals. A leader is responsible for instilling this kind of understanding in all of a company's workers. A firm will function well when everyone in the firm can share a set of common goals.

A number of large companies have developed specific processes to spur innovation. LinkedIn sponsors monthly HackDays, a series of day-long events at which teams create prototypes of new products or processes. The top 20 teams get to demonstrate their innovations and compete for rewards. PayPal hosts a similar series of competitive events, known as LabRats. What may be most important about these programs is not the particular innovations they inspire, but their role in communicating a message about a company's attitude about the importance of innovation.

Innovation in start-ups. New ventures face a different set of challenges than existing organizations in fostering innovation. Peter Smith, who helped to found two different colleges, notes that a start-up begins with no history and no assumptions. With no past to draw on, the founders have to "project forward" to imagine what its history might look like five years in the future. As a leader, he discovered that if he finds the right people and turns them loose in the right direction, they will generally do the right things. But you cannot try to control where they go or what they do. When he began, he thought he knew the solutions he was seeking. But he discovered that he knew a lot more on day 300, and more still on day 600 of the journey. You are much better off by relying on a passion for learning-as-you-go than on counting on knowing the right answer from the beginning.

Conclusion

Innovation can, and does, come from almost anywhere. It is possible to identify the conditions that are favorable to innovation, but it is not possible to dial-up innovations even in the environments that are most conducive to creativity. The lesson of the long tail is that great solutions are more likely to come from a sufficiently large number of motivated non-experts than from a handful of highly credentialed experts. And even after the spark of creativity has happened, that is often just the beginning. Getting a new solution implemented can be a long and arduous process that has to overcome indifference, skepticism, even active opposition.

The lesson of the long tail is that great solutions are more likely to come from a sufficiently large number of motivated non-experts than from a handful of highly credentialed experts.

And as difficult as successful innovations around products and services may be, innovations that involve changing institutions themselves are more challenging. One Roundtable participant suggested that “institutional innovation is an oxymoron.” But that may be too pessimistic. Although examples of institutions that successfully transform themselves are rare, it does happen. And it is possible to draw lessons from these examples of what works. Facing an imminent crisis helps, so does having a strong narrative that offers a positive vision of change. Hiring the right people and then empowering them to take on tough problems can yield big results. But most of all, institutional innovation needs strong leadership that is clear, consistent and embodied in actions as well as words. If we are going to reverse the disturbing trends documented by the *Shift Index* and begin to create institutions that are able to compete successfully in the 21st century, it is time for this leadership to step forward.

Notes

1. John Hagel III, John Seely Brown and Duleesha Kulasooriya, *The 2011 Shift Index: Measuring the Forces of Long-Term Change*, Deloitte, 2011, www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_tmt_2011shiftindex_111011.pdf.
2. Three previous Roundtables have explored this question. See the three reports from these Roundtables, all written by Richard Adler: *Talent Reframed: Moving to the Talent-Driven Firm* (2009); *Leveraging the Talent-Driven Organization* (2010); and *Solving the Dilbert Paradox* (2011). All are available at the Aspen Institute web site, www.aspeninstitute.org/publications?program=50.
3. The Town Hall took place at the Computer History Museum in Mountain View, California, on September 26, 2011. The president answered questions from “a live audience made up of LinkedIn members and employees, as well as questions ... submitted from LinkedIn members across the country.” “President Obama to participate in LinkedIn Town Hall in Mountain View, California on Monday, September 26th,” White House Press Release, September 20, 2011, www.whitehouse.gov/the-press-office/2011/09/20/president-obama-participate-linkedin-town-hall-mountain-view-california.
4. Geoffrey West, “Why Cities Keep Growing, Corporations and People Always Die, and Life Gets Faster,” *Edge*, May 23, 2011, <http://edge.org/conversation/geoffrey-west>.
5. Apple is only the sixth U.S. company to reach a market capitalization of \$500 billion and is the only one that now is above that level. The other five are Exxon, Microsoft, Cisco, Intel and General Electric. As of February 2012, Exxon was worth approximately \$400 billion, while Microsoft’s market capitalization was \$267 billion. GE’s capitalization is now \$200 billion, while Cisco and Intel are worth just over \$100 billion. Peter Svensson, “Apple Market Capitalization Tops \$500 Billion,” *Huff Post Tech*, February 29, 2012, www.huffingtonpost.com/2012/02/29/apple-market-capitalization-500-billion_n_1310408.html?ref=technology.
6. Victor W. Hwang and Greg Horowitz, *The Rainforest: The Secret to Building the Next Silicon Valley* (Los Altos Hills, CA: Regenwald, 2012), page 25.
7. The concept of the long tail was first popularized in 2004: Chris Anderson, “The Long Tail,” *Wired*, October 2004, www.wired.com/wired/archive/12.10/tail.html. Anderson later expanded the article into a book, *The Long Tail: Why the Future of Business is Selling Less of More*. (New York, NY: Hyperion, 2006). Its specific application to problem-solving is described by Bingham and Spradlin in “The Open Innovation Marketplace,” *FT Press*, 2011, chapter 4.
8. According to Alph Bingham, one InnoCentive participant has been successful in solving eight problems, another has solved six and another couple four, then a few ‘twosies’. After that, all of the remaining winners have solved single problems.
9. Jennifer Chu, “Searching for balloons in a social network,” *MIT News*, October 28, 2011, <http://web.mit.edu/newsoffice/2011/red-balloons-study-102811.html>.
10. “New Study Reveals Impact of Social Tools, Evolving Search Patterns and Mobile Technology on Consumer Shopping Behavior,” *MarketWire*, June 15, 2011, www.marketwire.com/press-release/new-study-reveals-impact-social-tools-evolving-search-patterns-mobile-technology-on-1526949.htm.

11. "New Social Media Study: Nearly 60 Percent Say LinkedIn is Most Important Social Network Account," Performics, June 07, 2011, <http://blog.performics.com/search/2011/06/new-social-media-study-nearly-60-percent-say-linkedin-is-most-important-social-network-account.html>.
12. Carolyn Y. Johnson, "Group IQ," *Boston Globe*, December 19, 2010, www.boston.com/boston-globe/ideas/articles/2010/12/19/group_iq/#.
13. "The Evolution of Dating: Match.com" and "Chadwick Martin Bailey Behavioral Studies Uncover a Fundamental Shift," Chadwick Martin Bailey, April 20, 2010, <http://blog.cmbinfo.com/press-center-content/?month=4&year=2010>.
14. Job Openings and Labor Turnover Survey, Bureau of Labor Statistics, U.S. Department of Labor, www.bls.gov/jlt.
15. Open Education Resources have been defined in a report commissioned by the Hewlett Foundation as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge." See Daniel E. Atkins, John Seely Brown and Allen L. Hammond, *A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities*, (Menlo Park, CA: The William and Flora Hewlett Foundation, 2007), www.hewlett.org/uploads/files/Hewlett_OER_report.pdf.
16. Daniel E. Atkins, *Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure*, NSF, January 2003, www.nsf.gov/od/oci/reports/atkins.pdf.
17. MC2 STEM High School, <https://sites.google.com/site/mcstemhs/>.
18. A formal written memorandum of understanding between the school district and the teachers' union specified that the school's instructors agreed that 1) "they would collaborate with other teachers; 2) they would collaborate with representatives of partnering institutions and higher education faculty; 3) that there would be no traditional homerooms at the school; and that 4) teaching will be based on a problem/project based model and will require use of differentiated instruction, flexible grouping and non-traditional scheduling strategies." Memorandum of Understanding between the Cleveland Metropolitan School District and The Cleveland Teachers Union, AFT Local 279, AFL/CIO, July 6, 2009.
19. For more about Agyris's theories, see "Chris Argyris: theories of action, double-loop learning and organizational learning," Encyclopedia of Informal Learning, www.infed.org/thinkers/argyris.htm.
20. Elting Morison, *Gunfire at Sea: A Case Study of Innovation, Men, Machines and Modern History*, (Cambridge, MA: MIT Press, 1968), <http://rec.hku.hk/steve/MSc/reco%206028/gunfire%20at%20sea.pdf>.
21. Morison describes this second stage of resistance to Scott's and Sims' innovation (the attempt to meet the claims with logical, rational rebuttal) as "in every way... the most entertaining and instructive in our investigation of the responses to innovation."

APPENDIX



Institutional Innovation: Oxymoron or Imperative?

July 16–July 18, 2011
Aspen, Colorado

Roundtable Participants

Richard Adler

Research Affiliate
Institute for the Future

Joaquin Alvarado

Senior Vice President for
Digital Innovation
American Public Media

Cathy Benko

Vice Chairman
and Chief Talent Officer
Deloitte LLP

Alpheus Bingham

Founder and Member, Board of
Directors
InnoCentive, Inc.

John Seely Brown

Independent Co-Chairman
Deloitte Center for the Edge
and
Visiting Scholar and Advisor to
the Provost
University of Southern California

Kenneth Cukier

Japan Business and Finance
Correspondent
The Economist

John Edgar

Vice President of Information
Technology
U.S. Postal Service

Peter Finkelstein

Director of Action Learning
Stanford University Business
School

Charles M. Firestone

Executive Director
Communications and Society
Program
The Aspen Institute

John Hagel

Co-Chairman
Deloitte Center for the Edge

Jack Hidary

Founder and President
The Jack D. Hidary Foundation

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

John Kunzweiler

Chief Executive Officer
M Squared Consulting, Inc.

Ellen Levy

Vice President, Strategic
Initiatives
LinkedIn

Luke Lonergan

Chief Technology Officer,
Data Computing Division
EMC

Ray Ozzie

Rocks Development Group

Ann Pendleton-Jullian

Walter H. Kidd Professor and
Director, Architecture Section
Austin E. Knowlton School of
Architecture
The Ohio State University

J.P. Rangaswami

Chief Scientist
Salesforce.com, Inc.

Marshall Smith

Visiting Scholar
Carnegie Foundation for the
Advancement of Teaching

Peter Smith

Senior Vice President for
Academic Strategies and
Development
Kaplan Higher Education
Corporation

Jack Stephenson

Director of Mobile, E-Commerce
and Payments
JPMorgan Chase & Co.

Low Tucker

Vice President
and Chief Technology Officer,
Cloud Computing
Cisco Systems

Tim Young

Vice President of Social
Enterprise
VMware

*Staff:***Kiahna Williams**

Senior Project Manager
Communications and Society
Program
The Aspen Institute

About the Author

Richard Adler is a Research Associate with the Institute for the Future in Palo Alto, California. He is also a principal with People & Technology, a research and consulting firm in Silicon Valley.

Richard has written reports on each of the first three Roundtables on Talent Development: *Solving the Dilbert Paradox* (2011), *Leveraging the Talent-Driven Organization* (2010), and *Talent Reframed: Moving to the Talent-Driven Firm* (2009). He has also co-authored two articles with John Seely Brown on the future of education and has written a number of other reports for the Aspen Institute Communications & Society Program, including *Updating Rules of the Digital Road: Privacy, Security, Intellectual Property* (2012), *News Cities: The Next Generation of Healthy Informed Communities* (2011) and *Media and Democracy* (2009).

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.

Previous Publications from the Aspen Institute Roundtable on Institutional Innovation

(formerly the Aspen Institute Roundtable on Talent Development)

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. 44 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. Written by Richard Adler, the report, also features a white paper by John Hagel and John Seely Brown. 46 pages, ISBN Paper: 0-89843-498-X, \$12.00 per copy

To purchase these books, please contact publications@aspeninstitute.org.

About the Communications and Society Program

www.aspeninstitute.org/c&s

The Communications and Society Program is an active venue for global leaders and experts from a variety of disciplines and backgrounds to exchange and gain new knowledge and insights on the societal impact of advances in digital technology and network communications. The Program also creates a multidisciplinary space in the communications policymaking world where veteran and emerging decision makers can explore new concepts, find personal growth and insight, and develop new networks for the betterment of the policymaking process and society.

The Program's projects fall into one or more of three categories: communications and media policy, digital technologies and democratic values, and network technology and social change. Ongoing activities of the Communications and Society Program include annual roundtables on journalism and society (e.g., journalism and national security), communications policy in a converged world (e.g., the future of video regulation), the impact of advances in information technology (e.g., "when push comes to pull"), advances in the mailing medium, and diversity and the media. The Program also convenes the Aspen Institute Forum on Communications and Society, in which chief executive-level leaders of business, government, and the nonprofit sector examine issues relating to the changing media and technology environment.

Most conferences use the signature Aspen Institute seminar format: approximately 25 leaders from a variety of disciplines and perspectives engaged in roundtable dialogue, moderated with the objective of driving the agenda to specific conclusions and recommendations.

Conference reports and other materials are distributed to key policymakers and opinion leaders within the United States and around the world. They also are available to the public at large through the World Wide Web at <http://www.aspeninstitute.org/c&s>.

The Program's Executive Director is Charles M. Firestone, who has served in that capacity since 1989. He also served as Executive Vice President of the Aspen Institute for three years. He is a communications attorney and law professor who formerly was 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.